BUSINESS INTELLIGENCE CAPABILITYAND PERFORMANCE OF COMMERCIAL BANKS IN MOMBASA COUNTY KENYA

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D53/OL/MSA/26153/2018

A RESEARCH PROJECT SUBMITTED TO THE SCHOOL OF BUSINESS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION (MANAGEMENT INFORMATIONSYSTEMS OPTION) OF KENYATTA UNIVERSITY

MAY, 2023

DECLARATION

I declare that this is my original work and has never been submitted for award of an Honor in this or any other university.

Sign……. Date……

Mr. Kihoro Wamahiu

D53/OL/MSA/26153/2018

This research work has been submitted for review with my approval as the University supervisor.

Sign……. Date…….

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DEDICATION

I dedicate this to my late parents Jane and Wamahiu, My sisters Mugure and Wanjiru, and to my nephew Shayne. It is my sincere hope that this work will be an inspiration for you all always to strive towards meeting your goals and aspirations.

ACKNOWLEDGEMENT

I wish to extend my thanks to all of my family members for moral support, to my fellow students and workmates and lastly my supervisor, Dr. Joshua Tumuti for his incredible help and support of my MBA study and work of research.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATION AND ACRONYMS

ALM	Asset and Liability Management
ATMs	Automated Teller Machines
BI	Business Intelligence
CBK	Central Bank of Kenya
CRM	Customer Relationship Management
CSFs	Critical Success Factors
DC	Dynamic Capabilities Theory
ICT	Information Communication Technology
IPM	Internal Process Management
IT	Information Technology
KDIC	Kenya Deposit Insurance Corporation
MIS	Management Information Systems
MLFF	Multilayer Feed-Forward
RBT	Resource Based Theory
RM	Risk Management
TAM	Technology Acceptance Model
TOE	Technology Organization Environment
VRIN	Valuable, Rare, Inimitable and Non-Substitutable

OPERATIONAL DEFINITION OF TERMS

Asset and Liability Management	Asset and Liability Management involves exercising control over the use of cash flows and assets to minimize the risk of losing money as a result of late settlement of credit owed to the company.
Business Intelligence	It refers to the process based on technology that analyzes data to assist users of financial information such as middle level managers and senior level managers in making the best decisions possible.
Credit and loan processing management	It refers to the process of providing credit, coming up with the terms that the credit extended is based on, reclaiming the credit when it falls due and ensuring compliance with the policies on credit that are adopted by the organization among other activities related to management of credit. The administration entails Credit management's three main goals are to reduce customer risk, settle outstanding amounts, and improve cash flow, all of which are critical to establishing profitable success.
Customer Relationship Management	This is the method by which an organization’s interactions with present and potential customers by analyzing data about consumers' previous interactions with the organization.

Macro-Economic Data Management	Macroeconomic data are intended to give a complete picture of the economic activities that take place in a given economy. They're used to track variations in the level of economic activity over time, both short and long term. Interest rates, GDP, government regulation, fiscal policy, and sales are always used as indicators.
Organization Performance	Refers to a number of indicators of financial and non-financial settings that provide data and information relating to the level at which the aims and goals that are set have been achieved by the organization.

ABSTRACT

Most of the institutions that are unstable financially are merger while others are placed under statutory control in Kenya's financial sector, which aims at rescuing them and boosting economic growth and stability. Many firms have resorted to the technology provided by business intelligence as a method of enhancing the performance of financial institutions such as banks. This study investigated the link that may be present between the capabilities of business intelligence and the firm performance in financial terms of the commercial bank in Mombasa County. This study sought to assess the possible link between management of asset and liabilities, customer relationship management, management of business risks and the integration of internal processes as parts of the integration of business intelligence as well as the commercial bank performance. The information was gathered by leaving surveys with responders and collecting them up later. There were 85 IT specialists among the respondents. The data collected was processes and analysed using inferential and descriptive analysis techniques utilizing the regression model. Descriptive statistics of frequencies, means and standard deviation was employed to process that data and to pick out common trends in the data. Inferential statistics which included regression and correlational analysis aided in estimating the relationships among variables of the study. The analysed data was presented using tables and charts to enhance clarity. According to the findings of the study, differences in the Business Analytics System Capabilities components that were discussed, namely data processing, credit processing management, and communication management via BI, account for approximately 45.3% of the differences in the commercial bank's performance in Mombasa County, Kenya.

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

For businesses to survive and thrive in the contemporary swiftly varying and highly competitive organization, industry and business operating environment, the banking industry needs to constantly adapt its operations to the constantly changing environment. Several developments have occurred in the international economy, particularly in the banking industry, on a global scale. To survive in this dynamic environment, according to Techlogix's (2014) analysis of business intelligence for financial services, banks need approaches which are focused on the operations they undertake to manage the mounting environmental and other difficulties that are associated with the banking industry.

Several components of Business Intelligence Systems have been found useful to the management staff in various positions around the world to access, work with, and analyze data in order to manage the firm's operations (Dawson & Van Belle, 2013). According to Olszak & Ziemba (2012), this makes a difference in moving a company's operations ahead successfully, as well as assisting a company in discovering new opportunities and reengineering its operational activities. As a result, according to the literature, many firms have developed BI systems based on maturity models and Critical Success Factors (CSFs) (Yeoh & Koronios, 2010).

In concurrence with the adoption of different devices and capabilities including ATMs, mobile and internet banking as well as agency banking, Kenya's banking landscape has altered dramatically over the last three decades. However, it was after the introduction of M-Pesa that the keeping money segment reached a tipping point. M-Pesa quickly gained a significant market share in cash settlements, a service that was previously only offered

by commercial banks (Mwangi, 2017). The current scenario in the banking sector division illustrates the disparities that exist in the application of innovations within the banking division's management. As a result, the administrative worry for many banks that have not comprehended these innovators is whether they are actively helping to boosting performance or not.

According to Childe, Maull, and Bennett (2014), BI in banking has progressed from manual frameworks to technology-assisted administration data frameworks. Banks had productive exchange recording frameworks until recently, when they were computerized. The manual frameworks had also made it possible to generate basic reports to be used by the administration and for administrative functions. The basic reports were usually generated and consolidated by the lower cadre staff at the lower levels of the organization, and the most recent reports were exhibited at the executive level. These manual frameworks functioned well as long as the banks' operations were small. With the continuous growth of banks in volume of transaction and the size, as well as geographical reach and the multiplicity of functional departments, the process of carrying out manual processes became more and more time-consuming and error-prone. Banks began using computers to cater to the stack of operations from all bank branches scattered across geographies, and eventually banks became entirely robotized (David, Matthew & Suzanne, 2012).

Regionally, in the twentieth century, the most of the financial institutions such as banks gradually started to use Management Information Systems (MIS) (Mosimann & Connelly, 2007). The inflexibility of batch processing and Cobol programs was quickly

replaced by the use of more adaptive online and offline systems such as databases that enabled the financial institutions to examine and process data after receiving it in manual forms from the lower level managers and branches, transcribe it and validate it accordingly. This method was also used to create a number of regulatory reports. These earlier attempts lay the groundwork for business intelligence in banking. Banks record vast volumes of data on a daily basis, according to David et al. (2012); data on financial, psychological, personal and property attributes for all the clients is recorded. In addition, all the accounts, transactions taking place in each of the accounts and credit information relating to the clients is also entered into the system. They went on to say that, in addition to the transactions and the account details and the credit information, transaction databases have indicated that it could turn into a rich source and reservoir of information and can be utilized in improving the business activities in any organization and particularly the banks.

1.1.1 Capability for Business Intelligence

Business intelligence refers to a framework made up of both organizational components and technical attributes that provides historical data to clients for analysis with a view of helping them come up with better choices and decisions as well as providing the management with support with an overall goal of enhancing the organizational performance (Isik et al., 2013). It basically provides an array of data-driven concepts and strategies for bettering commercial decision-making. Integration of Business Intelligence (BI) frameworks to offer backing to enhance the attainment of critical business objectives, business process reengineering, data quality improvement, and, ultimately, enhanced decision-making support (Watson & Wixom, 2017).

Despite the fact that business intelligence and IT capabilities are not the same, according to Yeoh & Koronios (2010), they do have some characteristics, such as IT infrastructure and human talents. They went on to say that data management competence encompasses data collecting capacity, data compliance policies and data quality assurance capacity and that capacity for effective management of data and cater for the skills needed in the management of such huge volumes of data. However, according to Ramakrishnana et al., (2012), information collection competency is an organization's ability to develop feasible procedures to characterize information needs, acquire information effectively and identify the source of information and to address the objectives of the organization. Organizations are faced with difficulties in selecting data that is appropriate, selecting the most efficient data gathering strategies that facilitate need-driven data gathering and efficient collection of quality data useful for decision making.

The adequacy of information collecting strategies, according to Isik et al., (2013), is dependent on characteristics such as competitive weight, inside assets, and trade objectives. The capacity for effective planning and execution of data gathering is usually a crucial stage in trade analytics. The ability to produce superior quality, clean data with critical aspects that address the benchmarks for quality data and information is known as data quality confirmation capability. Quality of data in business intelligence is associated with the consistency, completeness and relevance of the data gathered according to them. Loshin (2013), on the other hand, stressed the importance of data policies, defining them as the ability to specify information policies in terms of openness, security, and responsibility, as well as to oversee adherence to agreements. To ensure information

resources and eliminate risks associated with suspicious activities, information approaches on how information is used, shared, and copied are essential.

1.1.2 Firm Performance and Business Intelligence Systems

Within the contemporary globalized and competitive business environment, Watson & Wixom (2017) opines that intelligence is unavoidable; as a result, businesses use business intelligence (BI) tools to ensure better performance than that of the competitors. The increase in the implementation and utilization of business intelligence (BI) innovations in aiding the attainment of a company's strategic business process reengineering, business goals, information value improvement, and ultimately enhanced decision-making assistance (Watson & Wixom, 2017).

Employees in various positions use various aspects of BI Systems to gain access to the data possessed by the firm, process it, and analyze it so as to manage the operations of the firm. Such capability aids in the efficient operation of the company. BI can also assist a company in identifying new prospects and reengineering its operating activities (Olszak & Ziemba, 2012). Business intelligence and organization performance solutions in the banking sector, according to Henry (2017), use the technology, procedures and experience needed to aggregate, generate reports and evaluate the business information useful to the entire enterprise such as market data, product and customer.

Watson and Wixom's (2017) submissions support Henry's by demonstrating that when a company wants to eliminate the guesswork from profit margins, budgeting, portfolio diversification, customer relationships, commercial lending risk and more, profit stars

and optimal alignment sustains and ensures that the company is performing efficiently and effectively. Analytical management of bank performance, management of customer relationship, management of corporate risk compliance and the management of assets and liabilities are just but a few of the domains covered by business intelligence (Till, 2015). In today's competitive environment, considering and assessing overall client connections is critical for successful bank operations. Most business intelligence software solutions are focused on the segmentation of the market, creation of a clear view of the business clients as well as their relationship with the banks and establishing of a clear view of the potential of the market and the ability of the bank to utilize its potential among other attributes (Childe et al., 2014).

1.1.3 Commercial Banks operating in Kenya

The framework that financial institutions use is among the most vital aspects of a country's financial services sector. Financial institutions such as the banks contribute significantly to monetary development by mobilizing funds and allocating them to speculation enterprises with long-term financial gains (Samuel & Maina, 2012). In Kenya, the most of the banks joined the financial market as early as in the 1950s, mostly originating from South Africa and India. The advancements of the banks in the post-independence were the consequence of a focus on the capitalist economy and thus attracted foreign direct investments and maintained the Africanization of the economic strategies backed by a few administrative and political figures (Ngugi, 2001).

There were 42 appropriately authorized commercial banks as of December 2017. Kenya's banking division has been established and expanded. Commercial banks, non-

financial institutions, microfinance groups, cooperatives, social orders, and legally binding investment funds are typically included in a utilitarian accounting framework, as is the case in most developing economies. In December 2017, eight commercial banks in Kenya dominated the market, accounting for around 66 percent of total shops, net resources, capital, and savings.

Invention and innovation is not only essential in generating new services and products but is also essential in ensuring survival of the organizations in today's highly competitive and demanding market since it offers various prospects of development and generating profit. In Kenya, innovation is a continual activity that includes both incremental and breakthrough advancements in the banking sector, driven by ever-changing needs (Samuel & Maina, 2012).

In the recent past, Kenya's banking sector has been characterized by various improvements, generating concerns regarding the legitimacy of the sector's management practices, oversight, and overall soundness. This has resulted in Dubai Bank being placed under receivership due to a lack of capital and liquidity, which has resulted in the bank's inability to satisfy its needs when they are most critical. CBK named Kenya Deposit Insurance Corporation (KDIC) as subject to the restrictions of the Central Bank restrictions amid conditions of difficult and rigorous commerce conditions in October 2015. As documented in the CBK Bank Supervision Annual Report of 2015, these events were targeted at lessees, investors, and the general public.

1.2 Statement of the Problem

Contemporary financial institutions such as commercial banks operating in Kenya face issues such as severe rivalry, a fast-paced market, and the need for stringent controls (Kombo, 2015). However, according to Ongore & Kusa (2018), the banking sector in Kenya is defined by fluctuating client needs and the challenge in the management of business and operational risks as well as other characteristics of the operating environment of the business in which the banks in the present business environment banks operate. Furthermore, according to Curko, Bach, and Radonic (2017), financial institutions' key difficulties include detection and suppression of fraud, management of business and operating risks, prevention of loss and effective management of the products. Customers' increased demand for high quality and efficient delivery of services at a fair cost, regulatory and legislation compliance, competition, attrition of customers, advancement of technology and the macroeconomic factors prevailing in the operating environment are all difficulties that Kenyan banks face, according to the conclusions of Ongore & Kusa's (2018) study.

Financially distressed financial sector institutions, such as Dubai Bank, Chase bank and the Imperial Bank, have been compelled to merge with other financial institutions or are placed on receivership in order to resuscitate them from the prevailing economic turmoil and enhance their growth in Kenya over the past seven years, demonstrating the poor ratings of the level of performance among the commercial banks in Kenya (Ongore & Kusa, 2018). Besides, according to Kombo (2015), a large share of consumers of banking services constituting close to 40 percent are unsatisfied. According to Childe et al., (2014), today's banks are confronted with issues for instance fierce competition and

the need for stringent control; shifting customer needs and management of business and operational risks constitute some of the most pressing needs in the organizational operating environment in which advanced banks operate. Concerns with blackmail concealment and disclosure, chance organization, customer organization, prevention of loss and the management of production among others, provide an array of the most significant hurdles on the financial performance of the financial institution (as per the CBK Bank Supervision Annual Report (2015). Financial innovation, according to David et al. (2012), is a major element in the global marketplace with vital implications for the management of business risk, political system, securities, and the securities, but it is infrequently researched outside the disciplines of business studies and economics.

Given the various dynamic shifts that characterize Kenya's banking sector, it is critical for the financial institutions such as commercial banks to develop business intelligence systems or frameworks that are competitive, as changes within the banking sector is generally complex and quick, potentially affecting bank performance significantly. As a result, in today's business environment that is globalized, liberalized and highly competitive, intelligence is unavoidable; as a result, firms use Business Intelligence (BI) tools to beat prevailing competition and build a competitive advantage.

The systems of communication adopted by business organizations in future could use the vibrant capabilities viewpoint as a guide to investigate the way Information Technology may assist firms solve market difficulties and increase their competitiveness, as Techlogix (2014) suggests. Furthermore, despite the high potential that BI has in enhancing the performance of financial institutions, only a few studies have looked into

BI-enabled dynamic capacities, according to Davidet al, (2012), implying that additional empirical research is needed in this area. This study examines how the utilization of the BI system capabilities impacts on the performance of the financial institutions which mainly consist of commercial banks.

1.3 Objectives of the study

1.3.1 General Objective

Overally, the overarching goal of this proposed study was to examine how Business Intelligence System Capabilities relates with the level of the performance of commercial banks operating in Mombasa County in Kenya. The key aim of the study was therefore to investigate the possible link between BI system capacities and commercial bank performance in the County of Mombasa.

1.3.2 Specific Objectives of the Study

This study pursued the specific objectives as stated below.

i. To ascertain the how credit processing management relates with the financial performance of commercial banks operating in Mombasa County, Kenya, using the BI system.
ii. To explore how information security impacts on the commercial bank performance for the banks operating in Mombasa County.
iii. To explore the impact of data management on commercial bank performance in Mombasa County.
iv. To assess the impact of management of communication through Business Intelligence on commercial bank performance in Mombasa County.

1.4 Research Questions

Specifically, the study sought to address the following research questions:

i. How does credit processing management through business intelligence relate with commercial bank performance in Mombasa County, Kenya?
ii. How does Customer Relationship Management (CRM) through business intelligence system affect commercial bank performance in Mombasa County, Kenya?
iii. How does data management through the business intelligence system affect commercial bank performance in Mombasa County, Kenya?
iv. How does asset management through business intelligence relate with the financial performance of the commercial bank operating in the County of Mombasa?

1.5 Significance of the Study

The outcomes of this proposed study are expected to have the following benefits:

The study findings will be beneficial to bank management in Kenya since it will assist policymakers in establishing technology based technologies into their banking processes, allowing them to reap financial gains in their businesses. Because the study focuses on how the business intelligence technology impacts on the financial performance of the commercial bank operating in Kenya's financial sector, it is anticipated that the Business Intelligence will have both merits and demerits, so the study will help in identifying the challenges that the banks encounter and the ones that they need to address and improve their technological adoption.

Kenya's government has embraced an information and communication technology (ICT) policy. Every company conducting business in Kenya is expected to utilize technology. The government can utilize the outcomes of this study to inform policy formation and the establishment of a technology based framework for adoption by analyzing how systems of business intelligence impact on the organization performance in the banking and the entire financial sector.

The outcomes of this study may aid academicians in widening the curriculum in relation to this study, resulting in an improved understanding of the business intelligence technology on commercial bank performance in Mombasa County, Kenya. Additional researchers may be enticed to investigate other aspects of business intelligence systems that are not included in the proposed study derived from the findings of the study.

1.6 Scope of the Study

This study's main goal was to look into the possible link between the systems of business intelligence and the financial performance of the commercial bank performance operating in Mombasa County. According to Cytonn's (2019) research, the study concentrated on the eleven peak commercial banks that are listed on the NSE, sorted on the basis of their net worth (Appendices IV). The study's premise is that commercial banks have the capability to embrace complicated and trustworthy business intelligence capabilities. Through BI integration and commercial banks' performance among the banks operating in Mombasa County, Kenya, the study focused on important operational areas of management of business risks, liability and assets management and the management of internal processes.

1.7 Limitations of the Study

Management/senior workers from important operational areas of assets and liability management, customer relationship management, risk management and internal process management constituted the sample of the study. This category of staff were likely to be unavailable readily since they operate of busy schedules. Since the researcher had to operate within the schedule of the participants in the study, significant amount of time was spent when conducting data collection for the study.

Several obstacles were anticipated as the researcher embarked on the process of accessing the raw data that the study needed in meeting its objectives. Some of the data that was of interest to the study was anticipated to be considered by the participants as sensitive and of confidential nature. Thus majority of the participants were likely to be unwilling to provide most of it for fear of reprisals. However, the respondents were promised that exclusive measures would be employed and used as if for scholarly purposes only.

1.8 Organization of the Study

The first chapter of this study contains the introduction, background to the research, research objectives and hypothesis, and the study's significance. The review of the literature in this area of inquiry, as well as derived knowledge gaps in research and the conceptual structure/ framework of the proposed study are addressed in Chapter 2. The choice of research methodology adopted by the study is covered in Chapter 3, which focuses on the research design that was utilized by the study, research philosophy, targeted study population, study sampling design and sample size, data collecting, and

the research methods used by the study in analyzing the raw data collected during the study.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter contains the review and analysis of the related literature and looks into what previous authors and researchers have discovered on the influence that business intelligence technology has on commercial bank performance in Mombasa County, Kenya. According to Mugenda & Mugenda (2010), review of literature entails the systematic evaluation, retrieval, and investigation of documented sources and records that contain the data that is relevant to the research subject under consideration. Literature evaluations also make an effect, determining modern ways and strengthening modern ideas. Basic wetting and gaps to be addressed, as well as the study's conceptual system, are presented in the chapter aid.

2.2 Theoretical Analysis

The suggested research will be driven by hypotheses that have already been developed and have sparked a long-term interest in the issue. Technology Acceptance Model (TAM), Technology Organization Environment (TOE) Framework and Dynamic Capabilities (DC) Theory and are some of the theories that will anchor the study.

2.2.1 Acceptance Model for Technology

Davis was the first to propose the Technology Acceptance Model (1989). According to Davis (1989), the Technology Acceptance Model comprises of two perspectives: the utility perceived and the expected simplicity in the adoption and the use, which both impacts on the attitudes that are held towards the utilization of a new technology. The attitude of those adopting a new technology has an impact on the extent to which they

will behave either negatively or positively to the future technologies that they are expected to adopt. The usage of a data framework is determined by the behavioral intention, as indicated in the hypothesis of Action, the Technology Acceptance Model, whereas the intended behavioral is prescribed by the person's manner on how he/she uses the framework as well as the person’s acknowledgment of its utility (Davis, 1989).

According to Venkatesh, Morris, Davis, and Davis (2003), two beliefs, namely perceived usefulness and convenience, influence planned implementation of an innovation. As a result, the actual application of the framework is influenced by this objective. The degree to which a client believes an innovation will improve execution or efficiency in the workplace is referred to as perceived convenience. The level of perceived convenience is the degree to which the client does not have to put any effort in order to receive a particular innovation. The perceived value is also influenced by perceived convenience. Davis et al., (2003) proposed a model of individual acceptance of IT, where they argue that an individual's adoption of IT is based on the perceived ease in its usage and utility of the technological innovations.

According to Davis (1989), the Technology Acceptance Model is among the most potent models of innovation acceptance, with two critical aspects influencing a person's expectation to use new innovation: perceived convenience and saw value. A more seasoned adult who views computerized games as too difficult to even consider playing or as a futile exercise will likely not require this innovation, whereas a more seasoned adult who views advanced games as providing necessary mental stimulation and as simple to learn will be forced to learn how to use advanced games.

The relevance of the Technology Acceptance Model to the current study is founded on the notion that in the technology era of banking competition, success demands creativity and innovation. The goal of the Customer Relationship Management system is to improve relationships between the firm and its customers, so that integrated information may be used to generate optimal services and gather important customer information, allowing customers' requirements to be addressed and loyalty to be encouraged. CRM can also be used to raise an organization's performance by increasing efficiency and lowering operational costs.

2.2.2 Theory of Dynamic Capabilities

The capability to integrate, grow, and reconfiguration of external and internal competences to look into the fast changing contexts is defined as dynamic capabilities (Teece, Pisano & Shuen, 1997). According to Teece et al. (1997), the Theory bridges the gap created by the failure of the RBV of an organization to produce an interpretation of the redevelopment and the development of the firm’s capabilities and resources in response to often varying surroundings. The Theory of Dynamic Capabilities is regarded as a competitive advantage source (Teece, Pisano & Shuen, 1997).

The assumption that the acquisition of Non-Substitutable, Valuable, inimitable, Rare and valuable resources by a corporation provides it with a durable competitive advantage is challenged by DC theory. Dynamic capabilities, according to Helfat (2007), enable businesses to integrate, assemble, and reconfigure their capabilities and resources so that they can be in a position to adequately respond to the fast changing surroundings. As a result, DCs are procedures that gives a company a chance to rethink of its strategy and

resources so as to create long-term competitive advantages and better performance in quickly changing contexts. Wade and Hulland (Wade & Hulland, 2004).

Information Systems (IS) Resources, as postulated by Wade and Hulland (2004), usually takes a large number of features of active capacity, as well as in the sense may be particularly beneficial to enterprises operating in swiftly developing scenarios. As a result, even if IS assets may not actually take the organization to a level of unequalled sustained benefit, they might nevertheless, be extremely important to the organization's longer-term intensity in uneven scenarios in case they aid in producing, including, incorporating as well as discharging new secret weapons over time.

In terms of the study, the complexity, velocity, and uncertainty of today's market conditions necessitate the adoption of a new theoretical paradigm; as a result, managers must consider how Information Technology can help a company reconstitutes its present external and internal operations and capabilities and support dynamic co-evolution with the business environment that is in a constant change. The fast changes in the business environment are occasioned by the foundation for success which lies on the ability of an enterprise and its management to construct, integrate, and configure both external and internal capabilities, such as the credit and asset management system in the banking sector, to handle quickly changing surroundings, is the foundation for success.

2.2.3 Technology Organization Environment Framework

Tornatzky and Fleisher created the Technology-Organization-Environment (TOE) Framework (1990). To summarize, TOE depicts how multiple parts of an organization

(Technology, Organization, and Environment) influence technological advances, and the framework is excellent for study because it allows for the variation of factors or metrics.

To begin, the environmental context is used to address the operating environment within which an organization exists and operates, which includes a variety of stakeholders including the industry peers, suppliers, competitors, the community, customers and the government among others. They usually have an impact on how a company's outlook towards innovation, the capacity to generate resources needed to pursue it, and its capacity to actually implement it (Tornatzky and Fleisher, 1990).

In the context of the organization, the multifaceted aspect of the organization structure, size of the firm, centralization of the firm, the nature of the human resource function, the level of asset endowment, linkages of both formal and informal nature and the dynamic and inner specialized techniques; and limit traversing components to interface with each other and with the external conditions. Authoritative frameworks that are "natural" and "unthinking" are also available.

Finally, in terms of the context of technology, the TOE model provides a way of adopting an innovation that can be used in the deployment of 7G initiative of sustainability consisting of social centric, techno centric, conflict/bargaining, socio-technical systems socio centric and the systems life cycle approaches (Power, 2013).

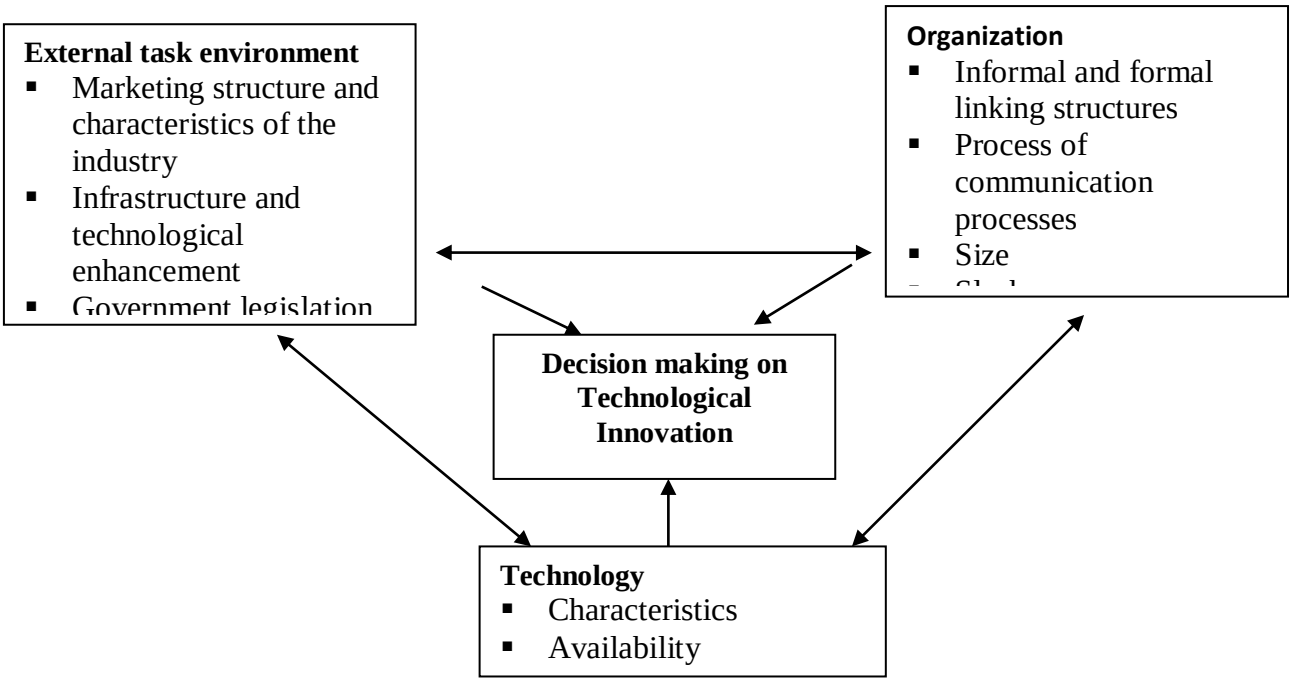

Figure 2.1:Technology, Organization, and Environment Framework (Tornatzky and Fleischer 1990)

The importance of information technology is universally considered as a crucial instrument in boosting a country's economy's competitiveness, as demonstrated by the application of the TOE model to the study. There is an understanding that the IT effect has a direct impact on a company's profitability. These consequences may be recognized if and when information technology is widely distributed and used. Understanding the factors that influence IT selection is essential as well as the model that can be used to characterize the interrelations between the variables.

2.3 Empirical Analysis

This research aims at focusing on some empirical studies conducted on business intelligence as well as organizational performance that have been undertaken both locally and abroad. This will not only involve a critical examination of what has already been

done, but also a demonstration of the linkages between different works, how they relate to the study, and the identification of emerging research needs.

2.3.1 Commercial banks' credit processing and bank financial performance

Alzeaideen and Wahab (2019) evaluated the banking sector's business intelligence and credit management methodology in Jordan. To create a three-layer neural network model, the researchers used a Multilayer Feed-Forward algorithm and a lot training strategy. According to the findings of the study, a neural network could correctly screen around 95percent of the applications that are accepted and 90percent of the applications that are rejected. Moreover, the acceptance set classification accuracy was 93%, while rejection set classification accuracy was 87%, for an overall percentage of roughly 90%.

A comparison research of conventional and Islamic banks on risk management, according to Channar, Abbasi, and Maheshwari (2015) found that conservative banks had a more effective procedures used to manage of risks than Islamic banks. According to the data, procedures of managing risks have a relationship that is negative and insignificant with the operative firm’s financial performance; however, it relates positively to financial performance of a firm.

Barrett (2016) found a statistically important association among Risk Management of Information Technology, size of an institution, and the economic and the financial performance of the Jamaican financial institutions in his study on the factors affecting Risk Management based on Information Technology and size of the institution and its financial performance. In conclusion, his study found a link between the size of the

organization, risk management, Information Technology with the size of the institution being the most important factor.

Using cluster analysis, Bach and Vugec (2018) discovered two clusters in their research on the influence business intelligence has on organizational performance. The study conducted a survey where data was collected from 177 Croatian and Slovenian enterprises via questionnaires and evaluated using cluster analysis. The results of the clusters' cross-tabulation study show significant statistical variations with respect to the dominant organizational culture of the firm as well as the turnover of the firm. Furthermore, the study discovered that organizational aspects including the organizational structure, strategy, culture and process had a favorable effect on both the effectiveness of organizations and the effectiveness in which BI systems are implemented.

2.3.2 Commercial bank information processing and performance

A customer relationship management and organizational performance study by Shavazi et al. (2013), used a model that included two dimensions of processes of CRM such as the four features of organizational performance, that is, customer based, financial, organizational learning, growth and internal processes as well as the initiation and maintenance of relationships within and beyond the organization. A questionnaire survey was paired with a statistical treatment in this investigation. There were 480 surveys in the sample. According to the findings, both CRM components are important types of predictors and indicators of performance. This holds true for all four performance indicators: learning and growth, financial, customer-centric, and internal process. With

these findings, managers may find it beneficial to assess changes in the CRM process as well as monitoring various performance indicators. Furthermore, the research verified the overarching notion of there being a considerable link between CRM and bank performance. Consequently, the study came to a conclusion that managers should observe numerous CRM methods and exercises in banks. The board of directors of a bank should know who their most important potential client is, the kind of the items required as well as the nature of management practices applied, why the client interacts with competitors, the ways through which they can avoid losing clients, and how they may lure big clients to grow their organization.

According to the study carried out by Soltania, Farnaz, and Navimipour's (2018), the nature of impact that the management of the relationships with the customers and its financial performance was meant to figure out the way organization capability, technological innovations, customer knowledge management and customer orientation impacts on the success of CRM. To evaluate the hypotheses and used the PLS-SEM approach. CRM success is driven heavily by information technology use, as well as organization competence, management of customer information and the orientation of the customer according to the findings of the study. According to John (2012), the majority of BI apps in banks are designed to meet the needs of top management. Line managers, on the other hand, have a distinct set of BI requirements than senior management. Operational business intelligence is required by bank line managers.

According to the study carried out by Radda's (2015) on the effect of management of relationship with customers on the performance of an organization, a mixed method

technique was used, with use of secondary data collected on the inventiveness of the CRM of Barclays Bank and their impact supplemented with a primary way of surveying bank personnel. The participants were given a total of 50 questionnaires, and the respondents' answers to the research items obtained were edited, coded and subjected to analysis using the SPSS software. The findings of the study validated the statements of many other writers that CRM has an impact on an organization's overall general performance, and revealed three forms of CRM: analytical, collaborative and operational CRM. The survey also found that businesses maintain information on their customers, such as the behavior and experience of the client. This information is useful in a variety of areas such as improving clients' experiences with services and products, planning novel services and products and so on. Money-related firms, in particular, use specific frameworks of customer relationship management owing to the nature of their services as well as the systems of financial management.

2.3.3 Commercial bank management of data and financial performance

The study by Rayat and Kelidbari (2017) aimed at exploring the impact of BI on the financial and economic performance and organizational effectiveness was to examine the impacts of structure, strategy, organization culture, processes on the effectiveness and efficiency of an organization, as well as the intervening role of BI systems in the performance of the airline companies in Iran. The method utilized was non-random judgmental sampling. Structured equation approaches were employed in data analysis, and questionnaire tools were employed in the collection of data. The study observed that structure, strategy, organization culture, processes on the organizational efficiency and effectiveness, as well as the intervening role of BI structures impact positively on the

performance of the airline companies in Iran. However, these is no plausible correlation between the variables has been documented between the organizational effectiveness and organizational variables.

Gerdivisheh (2013) used a questionnaire as a data gathering instrument in his study on the correlation between BI and the performance of a firm. Since there are a myriad of factors influencing the relationship that exists between the progress of execution of data that have to do with full disclosure and secrecy, it is proposed that the organizations provide their directors with the opportunity to exercise their right to determine the appropriate levels of disclosure.

Buhasho, Wausi, and Njihia (2018) used a questionnaire as a research technique for data collecting in their research on the organizational capacity, BI and complementary resources as well as how they impact on the performance of a firm. The researchers used a multi linear regression model for analyzing the data. The study outcomes indicated that the value of a business is created and enhanced when its BI skills are used to better operational as well as strategic processes undertaken by the business. They went on to say that capabilities of an organization that is, processes, performance management capabilities and customers) illustrate how BI capability relates with the performance of a firm, while the organizations' complementary resources such as human resources, process of decision-making, culture and organizational structure) moderates it. Managers can identify insights and opportunities faster with macroeconomic data reinforced by the level of confidence the consumers have on the data as well as the financial, political and

financial perspective, statistics and indicators and projections obtained from the banking institutions (Njihia et al., 2018).

2.3.4 Information Security through BI and its impact on the performance of a firm

Businesses are frequently advised to safeguard their data and information from infiltration by hackers while also being warned not to disseminate it widely. This is because data is both a benefit and a risk for any firm, according to Tewamba, Kala, Georges, and Samuel (2019). They went on to say that no company is completely safe, and that there is no secret formula for ensuring complete data security. Data-rich Business Intelligence and CRM systems, on the other hand, are a relief to enterprises' data security because the benefits exceed the drawbacks.

The research on the impact of the security of firm conducted by Mosimann and Connelly (2017) observed that the ISMS as well as the level of maturity of the processes of securing information from risk and financial and organizational performance are on the one hand linked directly and indirectly information management systems on a firm’s financial and economic performance as a result of the company's IT capabilities on the other. This demonstrates that the nature of understanding of the information risk management processes is of importance for an organization's success, as it improves the IS' support, including IT infrastructure, personnel skills and the management practices.

Customer Relationship Management (CRM), Performance Management (PM), Compliance and Risk Management (RM) and Asset and Liability Management (ALM) were identified as the forecasters of the superiority of financial and organizational

performance within the banking and financial service sector by Bogdan and Emina (2011) in their study on the way business intelligence may be put in use within the banking sector. The study employed the use of focus groups discussions to collect data and analyzed it with the use of regression analysis procedure. According to the report, in order to efficiently react to market and competitive challenges, a bank employs a variety of procedures and approaches, including the ALM concept, a modern approach on how to deal with the liabilities and assets of a bank or a financial service provider. They went on to say that, in order to provide insurance and more effective risk administrations, banks must come up with a coordinated approach to dealing with the entire on balance and wobbly framework. This leads to the circumstances for associating the predicted threats to the inclusion of higher-risk threats. The bank's board of directors is required to track the changes that take place on daily basis in the status and structure of the assets and liabilities, as well as cut off the risks facing the bank, while using the ALM concept.

According to Vunjak & Kovaevi (2016), the adoption of the concepts of ALM results in more adaptable financial indicators that can respond more quickly to any conceivable shift in the financial market. As a result, the ALM concept's viability is determined by the need for banks to provide appropriate benefit levels, effective utilization of resources by the executives, and the powers that the board exercises over the financial risk management.

2.4 Literature Review and Research Gap Summary

It’s clear that it’s not certain on how business intelligence capacity is contributive to the performance of a firm across the different studies carried out; therefore, there exists a lacuna in the knowledge available on the subject matter as shown in the diagram below;

Table 2.1: Literature Review and Research Gap Summary

Author	Title	Variables	Findings	Research Gap
E.Buhasho ,A.Wausi & J. Njihia, (2018)	Business Intelligence, Organizational Capability, Complementary Resources And Firm Performance	The study tested BI Capability(Technical Dimension, Human Capital Dimension and Organizational Dimension) against firm performance with Complementary Resources as mediating variable	The established that, BI capabilities when configured and tailored with other organizational resources enable higher business capabilities which in turn influence performance.	Unlike this study, the focus of the study analyzes four key ventures of BI capabilities in CRM, Credit & Loan Processing Management, Data Management and Asset & Liability Management (ALM) tested against organization performance
G. Chegini, M. Taleghani & F. Gerdvisheh, (2013)	Relationship Between Business Intelligence And Organizational Performance	In this study BI was categorized in 3 units of; efficient flow of information, employee's capabilities of learning knowledge and policies of continuous improvement as predictors to organization performance	The study findings indicated that business intelligence (efficient flow of information, employee's capabilities of learning knowledge and policies of continuous improvement) has a statistically significant positive influence on a firms economic and financial performance.	The current study is specific to CRM, CLPM, DM and ALM as predators of organization performance in the banking sector hence filling that gap.
Bach and Vugec, (2018)	Understanding impact of business intelligence to organizational performance	This study focused on the maturity, usage of social BPM, BI maturity, CPM, BPM/CPM	The study findings revealed that the dominant organizational culture among the companies assigned to the	The focus of the current study is on the four keys aspects unique to the banking sector (asset liability,

		alignment, BPM/BI alignment, BI/CPM alignment, process performance assessment and organizational culture assessment as predictors of organization performance as variables	first cluster is the flexible and friendly clan culture, while the dominant organizational culture among the firms within the second cluster and the formal and hierarchically structured organizations.	customer relationship and data management) in predicting organization performance
Rayat and Kelidbari, (2017)	The effects of business intelligence on the effectiveness of the organization(Case Study: Airline Companies in Iran)	Tests were conducted to check how BI system intervenes between organizational factors (strategy, structure, process and culture) and organizational effectiveness and efficiency.	The study findings demonstrated that, there is a positive and significant effect between variables of strategy, structure, and culture of an organization on the efficiency and effectiveness of business intelligence Systems in the organization and Of the Iran's airlines.	The current study intends to check BI capability as a predictor not interning variable to organization performance
Radda, (2015)	Customer Relationship Management and Organizational Performance – The Case of Barclays Bank Plc.	The study unpacked CRM into; Know about customer behavior, Improve customer's experience and Design new products & services tested against organization performance	The study results established that, CRM (operational, analytical and collaborative CRM) impacts on the overall general performance of the organization.	The current study inputs a broader scope of BI adoption by analyzing a broader view BI capabilities in the banking sector in relation to organization performance

2.5 Conceptual Framework

The conceptual framework conceptualized by use of a diagram to illustrate the relationships that exist between the variables. The study categorized business intelligence capacity into; Communication Management through data management, BI, credit processing and the management of data using business intelligence and security information management tools and the BI system and attempted to establish the influence they have on Bank financial performance. In the study, bank financial performance was used as the dependent variable.

Independent Variables

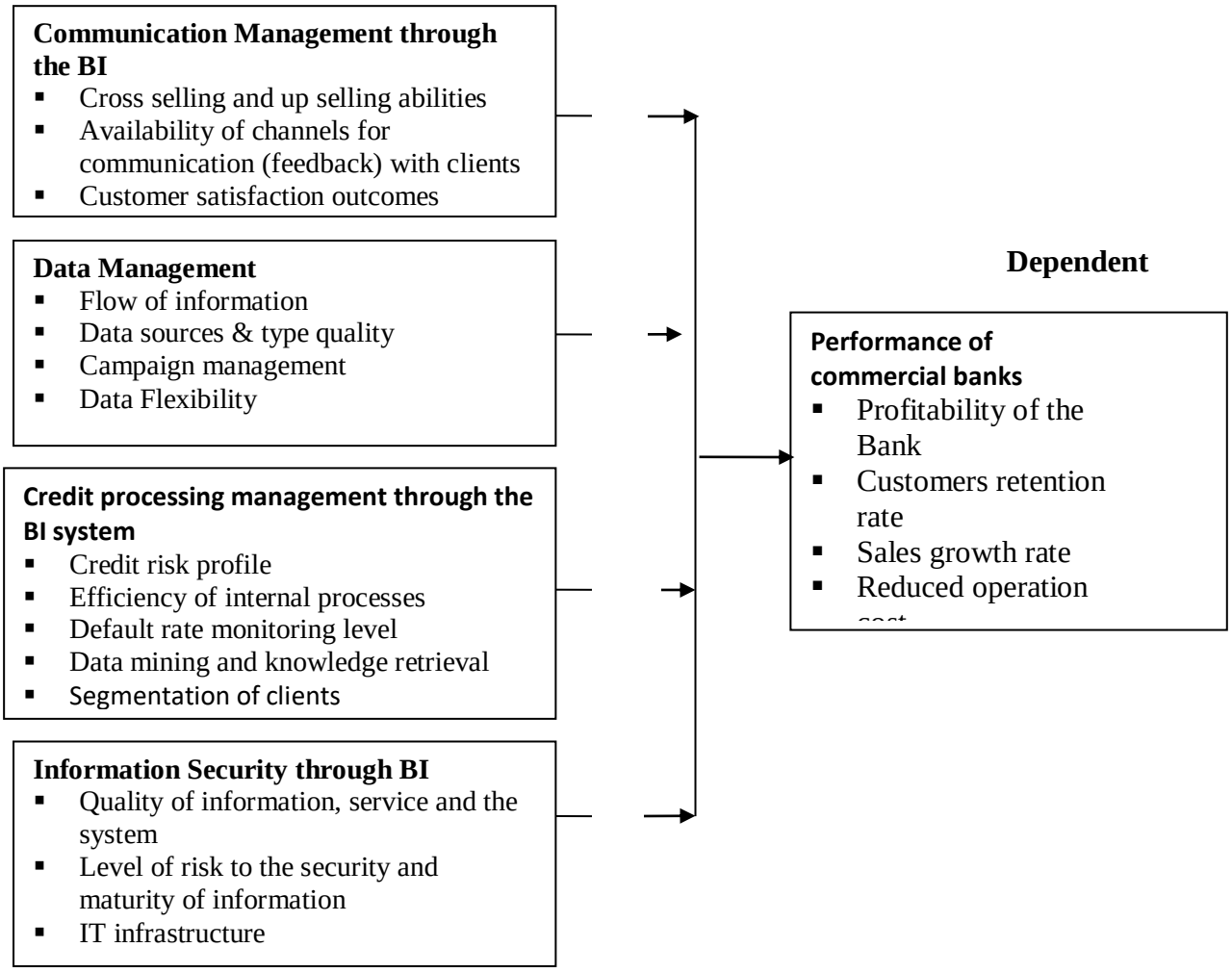

Figure 2.2: Conceptual Framework

Source: Author, (2023)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This section serves as the overarching blueprint of this study. It brings out and explains the testing equipment and tactics that are employed during the collection of data. The section delves into the examination setup, targeted population, and size of the sample, method of collecting data, research model, and analysis of the data collected, and ethical and logistical considerations that will be taken into account during the examination.

3.2 Research Design

A research design is the roadmap that guides the gathering, quantifying, approximating and processing data to identify common trends and draw conclusions. Further, it entails the continuous process of planning and executing the techniques to be implemented for acquiring significant information and data as well as the methodologies to be applied in process of conducting the inquiry (Mugenda & Mugenda, 2010). The research was conducted using a descriptive correlational research approach. The components and the connections that occur naturally among them are depicted graphically in correlational research designs (Cooper & Schindler, 2010). The recommended study design plan is deemed to be appropriate for carrying out a qualitative inquiry using a non-experimental correlation strategy that examines the degree, course, quantity, and nature of affiliations and interconnections (Mugenda & Mugenda, 2010). Hair et al., (2006) opined that a correlational research design examines the connections using associations, links, and investigations such as non-parametric and parametric tests based on relationships between the subjects and the variables.

3.3 Population to be targeted

The population targeted by the study consisted of a group of participants for whom the inquiry was designed for (Cooper & Schindler, 2010). As asserted in Mugenda & Mugenda (2010) target population is a universally accepted set of the participants of an actual or the participants belonging to a hypothetical set, objects, procedures to which a research seeks to use to attain more generality in the outcome of the proposed study. In this study, the participants were drawn from the key functional areas such as risk management, customer relationship management, internal control and liability and asset management as well as the financial and economic performance of the commercial banks in Mombasa County, Kenya, according to Cytonn, (2019) report (Appendices IV). The proximity of the researcher's residence region informs the basis for using head office branches in Mombasa County. The banking sector is favored mostly because business intelligence provides banks with a significant competitive edge by enabling them to gain a better comprehension of their consumers through banking BI, enabling them to handle customer complaints more quickly (Ida et al., 2015). The population was approximated, as stated in Table 3.1 Target Population.

Table 3.1: Target population

Bank	Category (CRM, RM, A& LM and IPM department staff)	Target population
Equity Bank	45	10
Kenya Commercial Bank (KCB)	41	10
Co-operative Bank	38	10
Standard Chartered	40	10
Barclays Group Kenya	37	10
I & M Holdings	32	10
CFC Stanbic Holdings	35	10
Diamond Trust Bank (DTB)	28	10
NCBA Bank Kenya Plc	31	10
National Bank of Kenya (NBK)	25	10
Housing Finance Group (HF Group)	23	10
Total	**375**	**110**

Source: Author, (2020)

3.4 Sampling Technique

According to Cooper and Schindler (2010), sampling technique are the principles and techniques are used to choose aspects of the target population sample. Purposive sampling was used to choose ten employees dealing with ICT drawn from important

operational areas of risk management, management of customer relationships, liability and asset management and the management of internal business processes, bringing the total number of respondents to around 110. As a result, a sample size of 110 accounting for 29 percent of the population of banks was chosen, as stated in Table 3.2 below.

Table 2.2: Sampling design

Bank	**Category (CRM, RM, A& LM and IPM department staff)**	**Sample Size**	**Percent**
Equity Bank	45	10	22%
Kenya Commercial Bank (KCB)	41	10	24%
Co-operative Bank	38	10	26%
Standard Chartered	40	10	25%
Barclays Group Kenya	37	10	27%
I & M Holdings	37	10	29%
CFC Stanbic Holdings	35	10	29%
Diamond Trust Bank (DTB)	43	10	23%
NCBA Bank Kenya Plc	36	10	28%
National Bank of Kenya (NBK)	45	10	22%
Housing Finance Group (HF Group)	40	10	25%
Total	**375**	**110**	**29%**

Source: Author, (2020)

3.6 Data Collection methods, pilot study, Validity , and reliability of the research

Mugenda and Mugenda (Mugenda and Mugenda) defines a data collection instrument as an array containing questions displayed in an ordered, meticulously precise manner (2010). The data collecting tool allows the evaluator to collect data that may be compared, averaged, and submitted to additional factual scrutiny. The study used a predesigned questionnaire to gather the relevant information and data for the study. In this situation, organized items present the respondent with a fixed array of options, which were closed ended. On the other hand, unstructured items in the questionnaire provide an outline of reference for participants' responses (Cooper & Schindler, 2010). Open ended and closed ended items are intended for the proposed study, with selected responses communicated on a Likert scale. Questionnaires were distributed to the participants and then collected for analysis later.

A group focus from the three Commercial Banks branches in resident constituency Mtwapa Town in Kilifi County Kenya involved in the pilot study. The decision was related to logistics, convenience, and proximity to the researcher, who lives in Mtwapa Town. The group of the participants were invited to provide responses on the instructions in the questionnaire, precision of the items on the questionnaire, and the structuring of the questionnaire in terms of the sequence in which the items were presented. Ten people participated in the pilot study. The aim of the pilot study was to determine the suitability of the language used and detecting of any problems with the wording of the questionnaire and the degree to which the questionnaire addresses the objectives of the study.

Validity of research instrument describes to the degree to which it generates results that may be correctly deduced and applied to different sections of the population is. It is a measure of how well research tools measure what they intend to assess (Mugenda and Mugenda, 2010). Moreover, reliability is perceived as the degree to which the results of the test are consistent and replicable. The pilot study was used as a way of ascertaining and enhancing the validity and reliability of the tools used to carry out research. The validity of the research instruments such as the questionnaire was enhanced through expert opinion as explained by Kothari (2010) who notes that through a pilot study, the researcher is able to examine the items on the questionnaire for suitability in terms of content and consistency with the research objectives.

On the other hand, reliability of research instrument refers to the extent to which results do not change over a long time and accurately represents the entire population that is being investigated as well as finding out whether the outcome of the study can be reproduced is a comparable method is applied. If the research tool has those characteristics, then it is considered sufficiently reliable (Kothari, 2010). In order to quantify the reliability of the research tools, Cronbach's alpha is among the statistics utilized in quantifying the reliability and the consistency of the items in the research tool. In this study, Cronbach's alpha was utilized. The statistic is useful when there are many Likert items that are utilized in the construction of the research tools such as questionnaires. This is the case with the present study (Mugenda and Mugenda, 2010). Cronbach's alpha was used whereby an index of 0.6 to 0.7 was considered acceptable.

3.7 Data Presentation and Analysis

Both inferential and descriptive techniques were applied in processing the research data that was collected on the variables from the participants. For the present study, descriptive techniques used included means, standard deviations and variance. In order to precisely determine the degree, direction, strength of the relationships between variables and the level of significance of the relationships between the variables, Pearson Correlation coefficient and multi linear regression technique were applied. The multivariate regression analysis that was used took the form as depicted in the expression below;

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon}$$

Where:

Composite variable

Y= Bank financial performance

β_0 to β_4 = Regression coefficients

X_1 = Management of communication (CM);

X_2 = Management of credit processing (CPM);

X_3 = Management of data (DM)

X_4 = Security of information (IS) and;

ε = Stochastic Error Term.

3.8 Diagnostic Tests

The application of the regression analysis entails making certain assumptions, violation of which leads to a biased, inefficient and inconsistent results in the estimation of the parameters being tested (Cooper & Schindler, 2010). Regression analysis diagnostic

tools such as multivariate normality, homoscedasticity, linear relationship and multi-collinearity will be applied to ensure that the regression model developed can be utilized to foresee the relations between the variables with accuracy and consistency.

3.9 Quantification and Operationalization of the Study Variables

Table 3.1 details how each of the variables in the study were quantified and operationalized.

Table 3.3: Quantification and Operationalization of the Study Variables

	Variable	Category	Operationalization	Measurement Scale
	BI Capacity	**Variables**	**Parameters**	
X_1	Communication Management through the BI (CM)	Independent Variable	▪ Cross selling and up selling abilities ▪ Availability of channels for communication (feedback) with clients ▪ Customer satisfaction outcomes	Ordinal
X_2	Data Management (DM)	Independent Variable	▪ Flow of information ▪ Data sources & type quality ▪ Campaign management ▪ Data Flexibility	Ordinal
X_3	Credit Processing Management (CPM)	Independent Variable	▪ Credit risk profile ▪ Efficiency of internal processes ▪ Default rate monitoring level ▪ Data mining and knowledge retrieval ▪ Segmentation of clients	Ordinal
X_4	Information Security through BI (IS)	Independent Variable	▪ System, service and measurements ▪ IT infrastructure	Ordinal
	Bank Performance (BP)	Dependent Variable	▪ Profitability of the Bank ▪ Customers retention ▪ Sales growth ▪ Reduced operation cost ▪ Efficiency of internal	Ordinal

	processes

Source: Author, (2022)

3.10 Data Collection Procedure

Primary data was gathered by administering the self-administered questionnaires to respondents at the eleven Listed Commercial Banks operating in Mombasa County. The process of collecting the data will commence after the approval from Kenyatta University was obtained, which was acquired through the Academic Supervisor. Before commencing the collection of the primary data, the researcher obtained study permit from NACOSTI. The respondents were then approached using the formal letter of introduction provided as appendix II as well as the authoritization letter from the Graduate School.

In addition, research study assistants were engaged to assist with data gathering, reduce time, and make movement between branches easier. The data was gathered using the drop and pick approach, through which the researcher delivered the questionnaires in person to the participants in the study after they were identified and consented/requested to hand them over or agree on a time to collect the completed questionnaires. Data collection took a duration of four weeks.

3.12 Consideration of Ethical Issues

Before doing the research, the researcher acquired authorization from Kenyatta University by getting an introductory letter which made the respondents less skeptical towards the researcher. The researcher had an obligation to treat the respondents with

high regard such that if a respondent is uncomfortable answering a given question for whatever reason, the researcher respected that decision and did not compel them to do so.

CHAPTER FOUR: RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter discusses the results obtained from the analysis of data as well as its presentation. The primary purpose of the research was to determine whether or not there is a correlation between level of business intelligence in place in the commercial banks operating in Mombasa County and their level of performance. The researcher utilizes figures and tables to summarize and present the summary of the responses obtained from the respondents in order to facilitate the drawing of conclusions on the relationships between the variables.

4.2 Response Rate

The study used a sample consisting of 110 participants, of whom 91 completed and returned the surveys, resulting in an 82.7% response rate. The response rate consisted of the number of people who completed and returned the questionnaires. Mugenda and Mugenda (2003) notes that a response rate of less than forty percent is unreliable, a response rate of forty to fifty percent is poor, a response rate of fifty to sixty percent is acceptable for carrying out credible analysis while a response rate of sixty to seventy percent is good, a response rate of seventy to eighty percent or more is very good, and a response rate of eighty percent or more is excellent. All of these percentages are based on the number This response rate of 91 out of 110 respondents was assessed to be exceptional, acceptable, and representative for the purposes of drawing conclusions regarding the study.

Table 4.1: Response Rate

Questionnaires	Frequency	Percent (%)
Response	91	82.7%
Non-response	19	17.3%
Total	**110**	**100.0%**

Source: Research data, (2021)

4.3 Reliability Test

In the realm of academic inquiry, the term "reliability" describes the degree to which a research tool consistently generates the same results or data, irrespective of the amount of times that it is used (Cohen, Manion and Morrison, 2011). The questionnaire that was utilized in this research was given to the same pilot group, and answers were gathered with the intention of verifying the consistency of the questionnaire. This was done within the context of this particular investigation. Cronbach's alpha, which was used in this research, was applied to the questionnaire in order to evaluate its level of internal reliability.

For the aim of conducting a reliability study relevant to this investigation, Cronbach's alpha was estimated using SPSS. According to Mugenda & Mugenda (2013), the acceptable range for the dependability index is between 0.7 and higher. This range is considered acceptable. The value of the alpha coefficient, which may range from 0 to 1 and can be found in the range, can be used to represent the reliability of the components that are obtained from multi-point structured surveys or scales. This coefficient has a range from 0 to 1, and its value can be found in the range. A scale that has a higher number suggests that it was established with a better degree of precision. According to

the findings of Mugenda and Mugenda (2013), a reliability score of less than 0.4 is regarded as unreliable, 0.4 to 0.5 is regarded as poor, 0.5 to 0.6 is regarded as acceptable, 0.6 to 0.7 is regarded as good, 0.7 to 0.8 is regarded as very good, and more than 0.8 is regarded as excellent. Cronbach's alpha values of 0.878 indicate that the instrument has an exceptional degree of reliability as a data gathering instrument, as shown by the results of the reliability tests that are shown in Table 4.02.

Table 4.2: Reliability Test

Case Processing Summary

		N	**%**
Cases	Valid	91	100.0
	Excluded[a]	0	.0
	Total	**91**	**100.0**

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Variables	**Cronbach's Alpha**	**N of Items**
The tool	0.869	50

Source: Research data, (2021)

4.4 Demographic Information

The goal of the study was to compile background information in order to get a deeper comprehension of the respondents' demographic characteristics. The following table presents the conclusions based on the general information that was obtained from the respondents. This information includes the responders' gender, age group, educational background, and duration of service.

4.4.1 Gender

The table exhibits the gender information of the respondents.

Table 4.3: Gender

		Frequency	Percent	Cumulative Percent
Valid	Male	57	62.6	62.6
	Female	34	37.4	100.0
	Total	91	100.0	

Source: Research data, (2021)

The results of the poll infer that the overwhelming majority of respondents were of the male gender. The number of male respondents totaled 57 out of 91, which is equivalent to roughly 62.6% of the total, whilst the number of female respondents totaled 34 out of 91, which is equivalent to approximately 37.4% of the total. The data made it quite evident that the vast majority of the persons who took part in the research were male. Because of this, it is possible to arrive at the conclusion that male workers constitute the majority of those employed by the Top eleven commercial Banks at the NSE in Mombasa County, Kenya, which were ranked by their net worth as per the Cytonn, (2019) report. These Banks were evaluated by their net worth.

4.4.2 Age Bracket

In addition to determining whether or not the responders were mature and had sufficient information of the aims of the study, the researcher sought to determine the age profile of the people who participated in the study. It was asked of the respondents that they reveal their ages, and the results may be broken down as follows:

Table 4.4: Age Bracket

		Frequency	Percent	Cumulative Percent
Valid	25-35 Years	17	18.7	18.7
	36-45 Years	46	50.5	69.2
	46-55 Years	25	27.5	96.7
	Above 55 Years	3	3.3	100.0
	Total	91	100.0	

Source: Research data, (2021)

According to the findings of the study, the majority of respondents had ages ranging from 36 to 45, with a frequency of 46 responders representing approximately 50.7% of the total, followed by those with ages ranging from 46 to 55, with a frequency of 25 respondents representing approximately 27.5% of the total. The responders who were above the age of 55 years old came in second place with a frequency of three, accounting for around 3.3% of the total responders who were engaged. The respondents who were between the ages of 25 and 35 years old came in third position, with a frequency of seventeen, accounting for around 18.7% of the total respondents. The fact that most of the respondents were between the ages of 25 and 46, as discovered by the researcher, is indicative of a more engaged worker base at the banks that were selected for the study. The findings are consistent with the findings of Simonton (1991), who discovered that the decade between the ages of 30 and 40 is often connected with the decade in which scientists attain their maximum levels of scientific productivity. The findings are in accord with those of Simonton (1991).

4.4.5 Education Background

The findings of the responders' indication of their educational qualifications are as follows;

Table 4.5: Education Background

		Frequency	Percent	Cumulative Percent
Valid	O-Level	1	1.1	1.1
	College Diploma/Certificate	17	18.7	19.8
	Undergraduate	46	50.5	70.3
	Post Graduate	27	29.7	100.0
	Total	91	100.0	

Source: Research data, (2021)

The results of the survey revealed that the majority of respondents had undergraduate degrees in their capacity as workers. The frequency of 46, which represented around 50.5% of the total respondents, demonstrated this conclusion. After those respondents, the next group of respondents consisted of those respondents who held postgraduate degrees, with a frequency of 27 representing around 29.7% of the total respondents. Respondents with an associate's degree or more placed third in the ranking with 17 in frequencies, making up around 18.7% of the total, followed by respondents with an O-Level education, who made up approximately 1% of the total. It was able to get the conclusion that the majority of the respondents had qualifications that are on par with or greater than those needed by the population that was being targeted.

4.4.6 Length of service

The respondents were also asked to state how long they had been employed by the Top Eleven Commercial Banks at the NSE ranked by their Net Worth as reported in Cytonn's (2019) report branches in Mombasa County, Kenya. The answers were as follows: According to Cytonn's (2019) report, the top eleven commercial banks listed on the NSE are ranked by net value.

Table 3: Length of service

		Frequency	Percent	Cumulative Percent
Valid	0-2 Years	13	14.3	14.3
	2-4 Years	26	28.6	42.9
	4-6 Years	34	37.4	80.2
	10-12Years	13	14.3	94.5
	More than 13 Years	5	5.5	100.0
	Total	91	100.0	

Source: Research data, (2021)

The findings of the survey revealed that the majority of respondents, 34 (37.4%), had worked for an organization for between 4-6 years. This was followed by those respondents who had worked for an organization for between 2-4 years, which totaled 26 (28.6%) in frequency. Those who have worked for 10-12 years had a frequency of 13, accounting for about 14.3% of the total, while those who have worked for less than 2 years had a frequency of 14%, and those who have worked for more than 13 years had a frequency of 5(5.5%).

4.5 Descriptive Statistics

Descriptive statistics are a kind of statistical analysis that are used to explain, illustrate, or summarize data in a way that is helpful to the reader. Mugenda & Mugenda (2003) asserts that descriptive statistics is crucial for summarizing our collection of data by applying a combination of tabular description.

4.5.1 Credit Processing Management and Bank Performance

The results of the respondents' level of agreement with statements about the connection between credit processing management and bank performance at the Top Eleven Commercial Banks at the NSE ranked by their Net Worth According to Cytonn, (2019) report branches in Mombasa County Kenya are shown in Table 4.07. These banks are ranked based on their net worth. The Likert scale was used, ranging from 1 to 5. Where:

$5 = \text{Strongly Agree}, 4 = \text{Agree}, 3 = \text{Neutral}, 2 = \text{Disagree}, 1 = \text{Strongly Disagree}$

Table 4.7: Credit Processing Management and Bank Performance

	N	Min	Max	Mean	Std. Dev
Credit risk profiling through the BI process has mitigated the overall credit risk by creditors of the bank	91	2.00	5.00	4.5604	.68652
Credit Processing through the BI system has increased significantly the efficiency of internal processes for the bank in loan processing	91	3.00	5.00	4.2527	.69271

Default rate monitoring level through the BI system is very successful and has significantly reduced default rate.	91	3.00	5.00	4.2418	.75042
The BI system has significantly improved data mining and knowledge retrieval which of great importance to the management	91	2.00	5.00	3.9890	.99437
Segmentation of clients through the BI system has significantly improved the revenue of the bank	91	1.00	5.00	3.5165	1.18662
The BI platform has granted the bank the capability to provide decision support when variations exist in business processes	91	1.00	5.00	4.2198	1.01983
Delivery technologies e.g. automated teller machines (ATMs), Point-Of-Sale (POS) networks have greatly improved operation efficiency	91	1.00	5.00	3.4945	1.24163
Technology integration in devices e.g. mobile phone loan applications to facilitate electronic payments and transactions and mobile phone banking in general have been a success for the bank	91	1.00	5.00	3.4725	1.36903
Valid N (listwise)	91	**Grand**	**Mean**	**3.9684**	

Source: Research data, (2021)

On a Likert scale from 1 to 5, respondents were asked to rate how much they believe credit processing management using BI will affect bank performance based on the descriptive data in table 4.07. Broad agreement is indicated by a grand mean of 3, whereas general disagreement is suggested by a mean of >2.9. As a result, it can be inferred from the grand mean of 3.9684 that respondents generally agree that the terms of credit processing management utilizing BI do affect employee performance. According to Barrett (2016), there is a statistically significant correlation between IT risk management, institution size, and the financial success of the Jamaican Credit Union, which supports this position.

4.5.2 Communication Management through BI and Bank Performance

Respondents were asked whether Communication Management through the BI share a relationship with bank performance. A Likert scale of 1-5 was used. Where;

$5 = \text{Strongly Agree}, 4 = \text{Agree}, 3 = \text{Neutral}, 2 = \text{Disagree}, 1 = \text{Strongly Disagree}$

Table 4.8: Communication Management through BI and Bank Performance

	N	Min	Max	Mean	Std. Dev
Through the CM system we have a formal system for identifying which of the potential customers are more valuable and this has greatly helped in improving bank performance	91	1.00	6.00	3.1648	1.16680
The CM gave the bank the ability to cross-	91	1.00	6.00	3.846	1.76335

sell and up-sell, which improved bank performance by generating more money.				2	
To calculate the price of winning back a lost consumer, we have a mechanism in place.	91	2.00	5.00	3.879 1	.78649
The CM has availed channels for communication (feedback) with clients and this has improved the overall customer management capabilities	91	2.00	5.00	4.417 6	.66776
Customer satisfaction outcomes reveals remarkable achievement of CM towards customer management portfolio	91	3.00	5.00	4.527 5	.63841
Through the CM system we have a systematic process for re-establishing a relationship with valued inactive customers	91	3.00	5.00	4.472 5	.62076
Through the CM system we provide individualized incentives for valuable customers if they intensify their business with us	91	2.00	5.00	4.329 7	.74617
An IS that produces timely, accurate data enables managers to continually evaluate performance, better predict cash needs, and anticipate and respond to crises rapidly	91	3.00	5.00	4.648 4	.58450
Valid N (listwise)	91	**Grand**	**Mean**	**4.1672**	

Source: Research data, (2021)

The data are aggregated, as shown by a grand mean of 4.1672. Where is the scale from 1 to 5? A grand mean of 3 indicates broad consensus, but a mean of > 2.9 indicates broad dissent. It can be deduced that the majority of respondents agreed that communication management via the BI elements tested does have a relationship with bank performance at the Top Eleven Commercial Banks at the NSE ranked by their Net Worth as per the Cytonn's (2019) report branches in Mombasa County Kenya. This point of view is in line with that of Radda (2015), whose research revealed that CRM has an impact on an organization's performance as a whole and distinguished between three different types of CRM systems: operational, analytical, and collaborative.

4.5.3 Data Management through BI and Bank Performance

The link between data management via BI and bank performance at the NSE rated by their net worth as per Cytonn's (2019) report branches in Mombasa County, Kenya, was asked of the respondents. A Likert scale of 1-5 was used to grade their responses on data management through BI parameter assertions and their responses are summarized in table 4.09 below whereby:

$5 = \text{Strongly Agree}, 4 = \text{Agree}, 3 = \text{Neutral}, 2 = \text{Disagree}, 1 = \text{Strongly Disagree}$

Table 4.9: Data Management through BI and Bank Performance

	N	Min	Max	Mean	Std. Dev
Macro-Economic Data Management capabilities have enabled efficient information flow and the performance of	91	1.00	5.00	4.1758	1.02841

company					
Data quality has been improved through the Macro-Economic Data Management capabilities and this has expedited speedy and accurate decisions by the management	91	1.00	5.00	3.7692	1.04432
Targeted campaign management and advertisement through Macro-Economic Data Management capabilities has been significantly beneficial for the bank	91	3.00	5.00	4.4505	.68741
Macro-Economic Data Management capabilities has enabled data flexibility which is very key in information flow for the management	91	2.00	5.00	4.4945	.67286
Through Macro-Economic Data Management capabilities, the bank has expanded the range of financial services to suit targeted population and this has increased sales revenue	91	3.00	5.00	4.4725	.67232
Financial statistics, forecasts, and events through the Macro-Economic Data Management capabilities have enable managers to uncover insights and opportunities faster	91	1.00	5.00	4.2418	.95848

The IS coined for data management has allowed managers to produce reliable, standardized reports which follow accounting industry and national standards.	91	1.00	5.00	4.0989	.85706
The current data management system technology has helped find practical solutions to making partnerships work and grow number of options for reaching their customers	91	2.00	5.00	4.2198	.82734
Valid N (listwise)	91	**Grand**	**Mean**	**4.2403**	

Source: Research data, (2021)

A summary of the replies has been provided for your convenience in the form of table 4.09, which may be viewed above. These responses indicate that the majority of respondents were in agreement that data management through BI does have an influence on bank performance at the NSE ranked by their net worth as per the Cytonn, (2019) report branches in Mombasa County Kenya, as shown by the grand mean of 4.2403, which indicates that the majority of respondents were in agreement that data management through BI does have an influence on bank performance at the NSE ranked by their net worth according to Cytonn, (2019) report branches in Mombasa County Kenya. Using a Likert scale that has a range from 1 to 5, where a grand mean of less than 3 suggests that there is general agreement while a mean of more than 2.9 indicates that there is considerable disagreement. According to Cytonn's (2019) study of bank branches in Mombasa County, Kenya, it is possible to draw the conclusion that, according to the respondents, management via BI does have an effect on bank performance at the NSE rated by their net worth. This is the finding that can be made possible by the fact that it is possible to draw this conclusion. Previous research lends credence to the conclusions reached by Buhasho et al. (2018) in their investigation of the relationships between business intelligence, organizational competence, complementary resources, and company performance. According to the findings of that research, there is an increase in business value created when BI skills are used to enhance both operational and strategic business operations. The results of the preceding research provide credence to the conclusions of the study conducted by Buhasho et al., (2018). The TOE model, according to Tornatzky and Fleisher (1990), emphasizes the importance of information technology and is widely recognized as a crucial instrument for boosting a country's economy's competitiveness. This provides a vote of confidence for the use of data

management through BI in the process of improving bank performance. This was done as a way to show our appreciation to Tornatzky and Fleisher (1990), who highlighted the fact that the TOE model places an emphasis on the significance of information technology in their work.

4.5.4 Information Security through BI and Bank Performance

It was also inquired of the respondents, if in their view Information Security management via BI and Bank Performance in the bank do really have a relationship with one another, whether or not this was the case. A Likert scale of 1-5 was used. Where;

$5 = \text{Strongly Agree}, 4 = \text{Agree}, 3 = \text{Neutral}, 2 = \text{Disagree}, 1 = \text{Strongly Disagree}$

Their responses are summarized in table 4.10.

Table 4.10: Information Security management through BI

	N	Minimum	Maximum	Mean	Std. Deviation
Information security management through the BI system has enabled the bank to manage its assets and liabilities in a coordinated manner thereby improving the overall organization performance	91	1.00	5.00	4.0989	1.00061
Operation risk assessment through the BI system has significantly improved	91	1.00	5.00	3.4396	1.22210

the overall the organization performance					
Customer investment analysis through the Asset Management system in the BI system has aided the overall customer investment portfolio	91	1.00	5.00	3.3407	1.11773
Asset Management system capabilities has improved the overall efficiency of asset liability management towards organization performance	91	2.00	5.00	4.2637	.86712
I would definitely say that the Investment arrangement analysis through the BI system has played a role in the overall banks profitability	91	2.00	5.00	4.1429	.93774
Information security management platform in the bank has helped reduce fraud levels and improve risk management	91	1.00	5.00	3.9670	1.02687
Information security management platform in the bank has helped in reducing operation cost significantly, improved efficiency of internal processes and increased staff productivity	91	2.00	5.00	3.7912	.82350

The information system instituted has significantly raised customer satisfaction outcomes and improve operations efficiency	91	1.00	5.00	4.4176	.71594
Valid N (listwise)	91	**Grand**	**Mean**	**3.9412**	

Source: Research data, (2021)

The vast majority of respondents were of the opinion that there is without a doubt a relationship between information security management via BI areas that were reviewed and the performance of banks. The descriptive analysis that is provided in Table 4.10, which can be seen up above, allows for the derivation of this conclusion. Using a Likert scale with a range from one to five, where a grand mean of less than three indicates general agreement while a mean of more than 2.9 shows widespread dissent. The grand mean of 3.9412 indicates that it is feasible to compute that the management of information security achieved via business intelligence has an influence on the performance of banks, as evidenced by the value. The previous findings support those of Tewamba et al., (2019), who argued that, given that the benefits of information security management through BI outweigh the drawbacks, data-rich Business Intelligence and CRM systems are a relief to an organization's data security. This is because the benefits of information security management through BI outweigh the drawbacks. These writers founded their case on the premise that the benefits of managing information security using BI exceed its downsides.

Bank Performance

In this section, we analyzed the responses to the dependent variable, which was "Bank Performance," so that we could determine whether or not the various business intelligence capabilities elements, such as credit processing management through the BI, information security, data management, and communication management through the BI, which were discussed in the study, have any influence on bank performance at all. A Likert scale of 1-5 was used. Where;

$5 = \text{Strongly Agree}, 4 = \text{Agree}, 3 = \text{Neutral}, 2 = \text{Disagree}, 1 = \text{Strongly Disagree}$

Their responses are summarized in table 4.11 below:

Table 4.11: Bank Performance

	N	Minimum	Maximum	Mean	Std. Deviation
Return on assets (ROA, %) in our bank is well above the banking sector average.	91	1.00	5.00	3.7363	.94086
We consider our relations with our customers to be excellent because we maintain genuine partnerships with them through the BI system	91	2.00	5.00	4.2637	.86712
The BI system has enabled us to strongly involve our customers in our research and development processes thereby improving the bank performance	91	3.00	5.00	4.3626	.50589

The BI system has significantly the customers retention rate thereby improving the overall revenue of the bank	91	1.00	5.00	4.2418	.95848
The BI platform by the bank has significantly reduced operation cost thereby improving the organization performance	91	3.00	5.00	4.5055	.58450
The BI platform by the bank has significantly improving the efficiency of internal processes thereby improving the organization performance	91	3.00	5.00	4.3626	.50589
I can attest that the BI system has significantly boosted sales revenue and reduced the overall operation cost	91	1.00	5.00	4.2418	.95848
It is true that, the BI system as instituted has significantly increased profitability and return on investments	91	2.00	5.00	4.3077	.64450
Valid N (listwise)	91	**Grand**	**Mean**	**4.2528**	

Source: Research data, (2021)

using a Likert scale ranging from 1 to 5, where a grand mean of less than 3 indicates widespread consensus while a mean of more than 2.9 indicates widespread opposition. It is conceivable to get at the conclusion that the business intelligence capacity aspects of information security, data management, and communication management via the BI were most certainly significant on the performance of the bank. The grand mean was

4.2528, which served as evidence for this point. The findings of this research lend credence to the findings of a study that was conducted by Buhasho et al., (2018). That study indicated that business value is produced when BI skills are implemented to enhance operation and strategic business processes. The findings of this research provide credence to those findings.

Inferential Statistics

Inferential statistics is the branch of statistics that deals with drawing inferences, generating generalizations, making predictions, and making estimations based on the outcomes of sample data (Mugenda & Mugenda, 2003). (Mugenda & Mugenda, 2003). Inferential statistics is a branch of statistics that makes inferences about populations based on data acquired from such groups. First, the researchers examined to determine whether the linear regression assumptions were true by completing a verification check. The following is a collection of the various insights that were acquired concerning the nature of the data that was collected:

4.6.1 Normality Test

The Kolmogorov-Smirnov (K-S) tests were employed to perform the normality test in order to establish that the sample data was drawn from a population with a normally distributed distribution. The two sample Kolmogorov-Smirnov test is a nonparametric test that examines the cumulative distributions of two data sets. This was the foundation for utilizing the Kolmogorov-Smirnov (K-S) statistic (1, 2). The dependent variable and the independent variable will both be treated here. The Kolmogorov-Smirnov statistic also enables a speedy check to detect the degree of normality in the data, and it does so by comparing it to the mean and standard deviation (Mugenda & Mugenda, 2003). A relative indication of normality may be obtained from the value; as the value moves further away from zero, it becomes evident that the data does not follow a normal distribution. If the significance value is larger than 0.5 in the Kolmogorov-Smirnov statistic test, then the data in question is deemed to have a normal distribution, as stated by Mugenda & Mugenda (2003). According to the findings of the research, all of the variables, including credit processing management, information security, data management, communication management through the BI, and bank performance, had Kolmogorov-Smirnova Sig. values that were greater than 0.05, indicating that the data followed a normal distribution. These observations are described in table 4.12.

Table 4.12: Tests of Normality

	Kolmogorov-Smirnov[a]		
	Statistic	df	Sig.
Credit Processing Management (CPM)	.080	91	.197
Information Security (IS)	.155	91	.051
Communication Management (CM)	.109	91	.110
Data Management (DM)	.087	91	.085
Bank Performance (BP)	.121	91	.102

a. Lilliefors Significance Correction

Source: Research data, (2021)

4.6.2 Linearity Test

Linearity testing was done to verify the direction, linearity, and true strength of each association. This was required to find any deviations from linearity that would have an impact on correlation. This was required in order to detect any linearity violations. Because these models contain a constant unit of change (slope) of the dependent variable in exchange for a constant unit change in the independent variable, the values that are predicted by linear models are those that follow a straight line. The Pearson's product moment correlation coefficient was used to establish whether or not the variables are linear.

The word "correlation" refers to the connection that exists between two separate variables (Mugenda & Mugenda, 2003). In contrast to a correlation that is strong or high, which denotes that there is a substantial link between two or more variables, a correlation

that is weak or low shows that the variables are merely indirectly connected. The number -1.00 denotes a perfect negative correlation, whereas the value +1.00 denotes a perfect positive correlation. A result of 0.00 in a test between two variables means there is no association between the two variables (Mugenda & Mugenda, 2003).

The most popular correlation coefficient is the Pearson R correlation coefficient, sometimes referred to as the linear or product-moment correlation. The two variables under examination are both assumed to be measured using at least interval scales for the sake of this study. Take the covariance of the two variables and divide it by the sum of their standard deviations to get the coefficient. You are then given the coefficient. The Pearson correlation approach is used in this inquiry to determine the relationships between the research variables. Using Pearson's correlation, it is possible to gauge how linearly two variables are related. The range of the value is +1 to -1. A correlation of 1 between two variables shows that they have a totally positive linear connection (Mugenda & Mugenda, 2003).

Table 4.13: Bivariate Correlations Analysis

		CPM	IS	CM	DM	BP
CPM	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	91				
IS	Pearson Correlation	.325**	1			
	Sig. (2-tailed)	.002				
	N	91	91			

CM	Pearson Correlation	.148	.637**	1		
	Sig. (2-tailed)	.161	.000			
	N	91	91	91		
DM	Pearson Correlation	.361**	.133	.027	1	
	Sig. (2-tailed)	.000	.208	.799		
	N	91	91	91	91	
BP	Pearson Correlation	.444**	.508**	.518**	.318**	1
	Sig. (2-tailed)	.000	.000	.000	.002	
	N	91	91	91	91	91

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Research data, (2021)

Where;

CM - (X_1) Communication Management

CPM - (X_2) Credit Processing Management

DM - (X_3) Data Management

IS - (X_4) Information Security

BP - Bank Performance

The study's conclusions indicate that there is a reasonably strong linear relationship between bank performance and all of the independent variables, namely credit processing management, information security, data management, and communication management through the BI, with Pearson's r values of 0.444, 0.508, 0.518, and 0.318, respectively. Credit processing management, information, and the Pearson's r values for all relationships between the independent variables are Sig (2-Tailed) values.

4.6.3 Collinearity Diagnostics

In the study, tolerance and the variance inflation factor were examined to determine multicollinearity (VIF). The tolerance value is a commonly used indicator of collinearity in statistical software, including SPSS. A low tolerance value means that the independent variables already present in the equation are almost perfectly combined linearly in the variable under consideration. The variable in question shouldn't be included in the equation that describes regression as a result. All of the factors that affect the linear connection need to be kept within a small margin of error. Cooper and Schindler (2010) suggested that any tolerance value above 3.0 calls for further research.

A metric called the Variance Inflation Factor (VIF) examines the impact collinearity has on the variables that are part of a regression model. The Variance Inflation Factor, or VIF, is frequently equal to 1/Tolerance and is neither smaller than 1 nor greater than 1. Values of the VIF greater than 10 are frequently considered to be signs of obvious multicollinearity issues, but in less reliable models, values greater than 5.0 may be cause for concern (Cooper and Schindler, 2010). Cooper and Schindler (2010) state that multicollinearity is likely to be a problem if VIF values are high for any of the model's variables. When the VIF values are high, this is the situation. The research's conclusions showed that each of the test categories had a VIF that was below 3.0. As a result, multicollinearity issues for the variables that were the focus of the investigation were unfounded.

Table 4.14: Collinearity Statistics Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	Credit Processing Management (CPM)	.789	1.268
	Communication Management (CM)	.589	1.699
	Data Management (DM)	.867	1.154
	Information Security (IS)	.539	1.856

a. Dependent Variable: Bank Performance (BP)

Source: Research data, (2021)

4.6.2 Multiple Regression Results

A regression analysis was carried out taking into consideration the fact that all of the presuppositions concerning the collinearity, linearity and normality diagnostics had been satisfied. To be more explicit, a regression analysis procedure was carried out in order to discover how the business intelligence abilities under examination influenced the overall performance of the bank. The outcomes of the inquiry are summarized in table 4.15, which may be viewed below;

Table 4.15: Multiple Regression Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df 1	df 2	Sig. F Change
1	.67	.453	.427	.30731	.453	17.799	4	86	.000

	3[a]

Source: Research data, (2021)

The results show that the four components of capabilities of BI all account for about 0.453% of BI against the performance of banks listed at NSE based on their net worth as documented by Cytonn's (2019) report in the County of Mombasa. The results support Wade and Hulland's Dynamic Capabilities hypothesis, which was created (2004). These authors hypothesized that information systems resources may exhibit many of the traits of dynamic capabilities, and as a consequence, they might be especially helpful to companies functioning in fast changing environments in order to enhance their financial performance. This notion is supported by the outcomes. Additionally, Shavazi et al (2013). Study showed that BI integration in CRM was a powerful predictor of all indicators of financial performance including monetary among other related growth, learning and internal process metrics. It is abundantly clear from the study's findings—which determined that capability of BI account for about 45% of bank performance—that this just confirms the findings of earlier studies. However, when one takes into account the study's specific parameters and the current dynamics of the banking industry, this conclusion is strengthened.

Table 4.16: Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.724	4	1.681	17.799	.000[b]
	Residual	8.122	86	.094		

	Total	14.845	90

Source: Survey Research data, (2022)

The study made use of ANOVA to evaluate the model's relevance. The model estimated statistically significant in modelling the capabilities of BI against the performance of banks listed at NSE based on their net worth as documented by Cytonn's (2019) report in the County of Mombasa, as shown by Table 4.16's *p*-value of .000. At a 5% level of significance, the F critical value is 2.70. The fact that F derived (17.799) is more than the values of critical F indicates that the whole model is important. Table 4.17 lists the coefficients for the different regression models.

Table 4.17: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.978	.399		2.449	.016
	Credit Processing Management (CPM)	.252	.084	.269	2.998	.004
	Communication Management (CM)	.266	.074	.373	3.587	.001
	Data Management (DM)	.137	.062	.189	2.209	.03

					0
Information Security (IS)	.148	.102	.158	1.450	.151

Source: Survey Research data, (2022)

Employee performance is at 0.978 after taking into account the business intelligence capacity components examined. According to the study's data, the researcher discovered that, at 26.6%, communication management via business intelligence (CM) had the greatest impact on bank performance, followed by credit processing management (CPM) at 25.2% and information security (IS) at 14.8%. The study also found that, with a coefficient of 13.7%, Data Management through BI (DM) had the least impact on bank performance at the NSE assessed by their net worth in accordance with Cytonn's (2019) report branches in Mombasa County, Kenya. Despite this, as their P-values were less than 0.05, the business intelligence skills portions of Data Management (DM), Credit Processing Management (CPM), and Communication Management (CM) were significant factors in relation to bank performance. The *p*-value of 0.151, which was larger than 0.05 and indicated that Information Security through BI (IS) was insignificant at 5%, is one way that the t statistics assists in determining the level of significance of each of the variables contained in the model. The research discovers that the t values are significantly below -0.05 or above +0.05 as a guide to useful predictors. The final model was created using the research's results;

$$\mathbf{Y = 0.978 + 0.266X_1 + 0.252X_2 + 0.137\ X_3 + 0.148X_4 + \varepsilon}$$

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMENDATIONS

5.1 Introduction

A summary of the study, conclusion, and some suggestions related to the findings of the study reported in the preceding chapter are covered in this section. The goal of the study was to ascertain if there is a relationship between a business intelligence system's capabilities and the degree of success attained by commercial banks in Mombasa County, Kenya. The summary, conclusion, and suggestions were related to the research questions as well as the conclusions that came from the data processing, analysis and interpretation.

5.2 Summary of the Major Findings of the Study

The goal of this study was to ascertain whether or not business intelligence system capabilities are used by commercial banks in Mombasa County, Kenya, and how well those banks perform. The results of a regression analysis show that variations in the three discussed Business Intelligence System Capabilities explain roughly 45.3% of the variations in the performance levels displayed by banks operating in the County of Mombasa. The main objective of this study was to ascertain whether or not there is a plausible correlation between the level of financial performance of commercial banks in the County of Mombasa, and the management of credit processing through the BI system. A P-value of 0.004 for this hypothesis indicated that there is a substantial correlation between the financial strength and performance of the banks operating in the County of Mombasa, and the management of credit processing carried out via the BI system. The study's results also shown that managing credit processing via the BI system is always a crucial factor in reference to bank performance. The fact that 1=0.252 was reached and that it was the model variable with the second-highest degree of effect

serves as evidence for this. The research's results also show a strong correlation between the two factors, suggesting that increasing investments in the management of processing of credit via the BI system will always boost commercial banks' performance in Mombasa County.

The research findings revealed that Information Security through BI systems, which are a part of the capability of BI has a strongly positive relationship with the financial performance of the commercial bank as evidenced by the fact that 2 = 0.148, with regard to the study's second goal, which was to ascertain whether or not Security of the information through BI systems affect the financial strength and performance of the banks operating in the County of Mombasa. Information security through BI systems is not a significant influence in the financial strength and performance of the banks operating in Mombasa County, Kenya, as shown by the variable's p-value of 0.151. Additionally, this variable has the second-lowest influence in the model. However, it is evident that the success of banks in Mombasa County, Kenya, does not significantly depend on security of information via the BI systems.

The financial strength and performance of the banks operating in the County of Mombasa, was the focus of the third part of the research, which aimed to evaluate whether or not there is a correlation between data management achieved by BI systems and the success of those institutions. The results of the research indicated that data management carried out by BI systems did, in fact, have a positive association with the financial strength and performance of the banks operating in the County of Mombasa, as shown by the value 3= 0.137, which was derived from the equation. In contrast, the results of the study suggested that management of data using BI systems for commercial

banks is not a major element in terms of the performance of commercial banks in Mombasa County, Kenya. This was the conclusion reached by the researchers. This was indicated by a *p*-value of 0.030, and the variable was the one inside the model that had the least degree of effect overall.

Regarding the fourth aim, which was to determine whether or not there is a correlation between the financial strength and performance of the banks operating in the County of Mombasa and the management of communication carried out via the BI system, we found that there is such a correlation. This was determined by finding out whether or not there is a correlation between the two. The study findings suggest that there exists, in point of fact, a favorable and insignificant association between the financial strength and performance of the banks operating in the County of Mombasa and communication management carried out by means of a BI system. This was discovered by looking at the findings of the study. This was proved by the fact that 4 = 0.252 and the P-value was equal to 0.004, with the variable representing communication management being the model of the second strongest capability in linking the variables.

5.3 Recommendations for Policy

The study findings suggest that the following courses of action to be undertaken in light of the information offered earlier: Commercial banks should always see their capacities for business intelligence as an essential predictor for both their own performance and the development of an edge over their competitors. The research suggests that commercial banks should make investments and put into practice components of their business intelligence skills in order to enhance their rankings. This recommendation comes in

light of the limited resources that are now accessible. According to the results of the study, priority should be given to credit processing and communication management through BI. This is because these two areas displayed the greatest relevance and a good correlation with the overall performance of the bank. BI stands for business intelligence.

Concerning the relationship that exists between information security offered by the business intelligence systems and the performance of banks, the research suggests that while investments in information security provided by BI systems should not be ignored, other aspects of the capability of the BI used in the banking industry should be given higher priority. This is because the performance of banks is directly related to the level of information security provided by BI systems. In light of the favorable findings about the relationships, the research reaches the conclusion that a substantial investment had to be made in the management of communication through the BI system. This is due to the fact that an increase in more individualized communication management achieved via the usage of the BI system will always result in commercial banks exhibiting improved performance.

5.4 Limitations of the Study

Due to the fact that a descriptive correlational research strategy was used to carry out the study, the scope of the examination could only be limited to the pre-existing link between the variables. As a direct consequence of this, the researchers were unable to reach any conclusions about the probable causal linkages that do exist between the variables that were assessed. The study not only relied on the results of the multiple regressions to get over this constraint, but it also used a bivariate correlation to

investigate the degree of correlation that existed among the variables so as to establish the extent and the direction of relationship existing between them. This was done so that the strength of the link that existed between the variables could be determined, which was the purpose of doing this.

Second, the results of this study were acquired with the assistance of one key informant. This limited the capability of the study to get adequate data and information from other sources. The response was derived from the respondent's own self-reported statistics, which also contained the individual's perceptions, instead of absolute figures. Further, even if the responses to each item was derived from research that had been carried out in the past, it is still possible that not all of the opportunities that may have been taken into consideration were considered. The research project tested the validity and reliability of the method for data gathering, and it also devised an acceptable number of questions that were sufficient and relevant to give a response for each research item in order to find a solution to the problem. This was done so that the problem could be mitigated.

In the last stage of the investigation, the only employees that were taken into consideration were those who had taken part in the survey as responders. As a consequence of this, it is probable that the results cannot be generalized to include all of the employees working in the banking business in Kenya. In addition, the selection of the sample may make it challenging to extrapolate the findings to the entire population.

5.5 Suggestions for Further Research

In light of the fact that this study was carried out only head offices of the commercial banks operating in Mombasa County Kenya, it is possible to undertake similar studies in other commercial banks in Kenya so as to compare the findings from those financial institutions.

In summary, the study findings suggest that the four facets of a company's business intelligence capabilities that were investigated throughout the course of the study are accountable for 45.3% of the variation in the results. As a result, it is of the highest significance to explain the remaining variance, and it is possible that more study will be undertaken on studies that may explain other determinants, such as management information technology expertise.

Appendix I: Letter of Introduction

Dear Respondent,

As part of my requirements for the course that I am undertaking, I am required to conduct a research study. This research is being conducted purely for academic purposes. Any information you provide for the purposes of this study will be treated with utmost confidence and anonymity and will only be used for academic purposes.

Thank you.

Appendix II: Questionnaire

SECTION A: **GENERAL INFORMATION**

1. Gender

☐ Male ☐ Female

2. Age

☐ < 25 Years ☐ 25-35 Years

☐ 36-45 Years ☐ 66-50 Years

☐ Above 50 Years

3. Which of the following best describes your highest level of education?

☐ O-Level ☐ Certificate/ Diploma

☐ Undergraduate ☐ Post Graduate

4. How long is your work experience at the bank?

☐ Below 2 Years ☐ 2-4 Years

☐ 4-6 Years ☐ 7-9 Years

☐ 10-12Years ☐ Over 13 Years

SECTION B: CREDIT PROCESSING MANAGEMENT AND BANK PERFORMANCE

4. Kindly indicate the level of your agreement or disagreement with the following items on a scale where 5= strongly agree and 1= strongly disagree. Place a tick against the option that best represents your opinion.

Credit Processing Management (CPM)		**1- SD**	**2**	**3**	**4**	**5 - SA**
1	Credit risk profiling through the BI process has mitigated the overall credit risk by creditors of					

	the bank					
2	The application of BI in credit processing has increased significantly the efficiency of internal processes for the bank in loan processing					
3	Default rate monitoring level through the BI system is very successful and has significantly reduced default rate.					
4	The BI system has significantly improved data mining and knowledge retrieval which of great importance to the management					
5	Segmentation of clients through the BI system has significantly improved the revenue of the bank					
6	The BI platform has granted the bank capacity to offer decision support services in situations where different variables are at play.					
7	Delivery technologies such as ATMS and POS networks have greatly improved operation efficiency					
8	Technology integration in devices e.g. mobile phone loan applications to stimulate payments through electronic systems as well as mobile banking systems in general have been a success for the bank					

5. **(b) In my view, Credit Processing Management through BI significantly aids the financial performance of the bank.**

☐ Yes ☐ No

Explain……..

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SECTION C: COMMUNICATION MANAGEMENT THROUGH THE BI (CM) AND BANK PERFORMANCE

6. Kindly indicate the level of your agreement or disagreement with the following items on a scale where 5= strongly agree and 1= strongly disagree. Place a tick against the option that best represents your opinion.

Communication Management (CM)		**1- SD**	**2**	**3**	**4**	**5 – SA**
1	Through the CM system a formal system has been enacted that identifies potential clients and their relative value and this has greatly helped in improving bank performance					
2	The CM has enabled up selling and cross selling abilities within the bank and this has enhanced the bank performance through increased revenues					
3	We have put in place a system that is able to determine and estimate the cost of building and enhancing relationships with customers whose					

	accounts are not active.					
4	The CM has availed channels for communication (feedback) with clients and this has improved the overall customer management capabilities					
5	Customer satisfaction outcomes reveals remarkable achievement of CM towards customer management portfolio					
6	Through the CM system we have a systematic process for re-establishing a relationship with valued inactive customers					
7	Through the CM system we have developed a systematic process of re-establishing the relationship with the dormant customers more efficiently.					
8	IS generates more accurate and timely data that makes it possible for the bank managers to evaluate the bank's performance continually and predict their cash needs more accurately and to anticipate and confront any possible crises more rapidly.					

7. (b) Do you think Communication Management through BI as instituted by the bank boosts in anyway the bank performance?

☐ Yes ☐ No

Reasons…….

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SECTION D: DATA MANAGEMENT (DM) AND BANK PERFORMANCE

8. Kindly indicate the level of your agreement or disagreement with the following items on a scale where 5= strongly agree and 1= strongly disagree. Place a tick against the option that best represents your opinion.

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Data Management (DM)		**1- SD**	**2**	**3**	**4**	**5 - SA**
1	Macro-Economic Data Management capabilities have enabled efficient information flow and the performance of company					
2	Data quality has been improved through the Macro-Economic Data Management capabilities and this has expedited speedy and accurate decisions by the management					
3	Targeted campaign management and advertisement through Macro-Economic Data Management capabilities has been significantly beneficial for the bank					

4	Macro-Economic Data Management capabilities has enabled data flexibility which is very key in information flow for the management					
5	Through Macro-Economic Data Management capabilities, the bank has expanded the range of financial services to suit targeted population and this has increased sales revenue					
6	Financial statistics, forecasts, and events through the Macro-Economic Data Management capabilities have empowered bank managers to discover opportunities and insights faster.					
7	The IS coined for data management has permitted the management to offer standardized and more reliable reports that conform to the national and accounting standards.					
8	The current data management system technology has helped craft solutions that are crucial in forging partnerships and design several options to reach out to their customers.					

4. (b) I strongly believe that, the Data Management through BI by the bank has enhanced the financial performance of the bank.

☐ Yes ☐ No

Explain…….

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SECTION E: INFORMATION SECURITY THROUGH BI (IS) AND BANK PERFORMANCE

9. Kindly indicate the level of your agreement or disagreement with the following items on a scale where 5= strongly agree and 1= strongly disagree. Place a tick against the option that best represents your opinion.

Information Security through BI (IS)		**1- SD**	**2**	**3**	**4**	**5 – SA**
1	Information security management through the BI system has enabled the bank to manage its assets and liabilities in a coordinated manner thereby improving the overall organization performance					
2	Operation risk assessment through the BI system has significantly improved the overall the organization performance					
3	Customer investment analysis through the Asset Management system in the BI system has aided the overall customer investment portfolio					
4	Asset Management system capabilities has improved the overall efficiency of asset liability management towards organization performance					

5	I would definitely say that the Investment arrangement analysis through the BI system has played a role in the overall banks profitability					
6	Information security management platform in the bank has helped reduce fraud levels and improve risk management					
7	Information security management platform in the bank has helped in reducing operation cost significantly, improved efficiency of internal processes and increased staff productivity					
8	The information system instituted has significantly raised customer satisfaction outcomes and improve operations efficiency					

SECTION F: BANK PERFORMANCE (BP)

10. Kindly indicate the level of your agreement or disagreement with the following items on a scale where 5= strongly agree and 1= strongly disagree. Place a tick against the option that best represents your opinion.

Bank Performance(BP) **(Non-Financial performance)**		**1- SD**	**2**	**3**	**4**	**5 - SA**
1	Return on assets (ROA, %) in our bank is well above the banking sector average.					
2	In this bank, customer relations is considered to be good since it helps in establishing solid partnership with its customers through the BI system.					
3	The BI system has enabled the bank to engage customers in the development of new products					
4	The BI system has significantly increased the customers retention rate thereby improving the overall revenue of the bank					
5	The BI platform by the bank has significantly reduced operation cost thereby improving the organization performance					
6	The BI platform by the bank has significantly improving the efficiency of internal processes					

	thereby improving the organization performance					
7	I can attest that the BI system has significantly boosted sales revenue and reduced the overall operation cost					
8	It is true that, the BI system as instituted has significantly increased profitability and return on investments					

9. (b) In your opinion, can the nature of business intelligence system adopted by a commercial bank impact on its financial performance?

☐ Yes ☐ No

Explain……...

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Appendix III: List of Top 11: Banks at the NSE ranked by company worth

1. Equity Bank
2. Kenya Commercial Bank (KCB)
3. Co-operative Bank
4. Standard Chartered
5. Barclays Group Kenya
6. I & M Holdings
7. CFC Stanbic Holdings
8. Diamond Trust Bank (DTB)
9. NCBA Bank Kenya Plc
10. National Bank of Kenya (NBK)
11. Housing Finance Group (HF Group)

Source; Yellow Pages, (2020)