ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
SCHOOL OF COMMERCE

Impact of Implementing Business Intelligence Project: The Case of Commercial Bank of Ethiopia

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A Research Project Work Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Master of Arts in Project Management

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Statement of Declaration

I, **Amanuel Eyasu**, hereby declare that the thesis entitled on: **"Impact of Implementing Business Intelligence Project: The Case of Commercial Bank of Ethiopia"** has been conducted by me under the guidance and supervision of Solomon Markos (PhD). I also declare that all materials and sources used for this project research have been accredited appropriately. I am also declaring that this work had not been submitted for the award of any academic Degree or Diploma Program in this or any other institution

Amanuel Eyasu

Signature _____

Date_____

Statement of Certification

This is to certify that **Amanuel Eyasu** has carried out this research project work on the topic entitled **"Impact of Implementing Business Intelligence Project: The Case of Commercial Bank of Ethiopia"** under my supervision. This work is original in nature and it is sufficient for submission for the partial fulfillment for the requirements of the award of Masters of Art in Project Management.

Solomon Markos (PHD)

Signature: _____

Date**:** _____

Addis Ababa University

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Abstract

Over the last decade the rapid change in the Banking Industry has resulted in a greater need for business intelligence to aid strategic decision making. A key aspect of strategic planning is strategic decision making, the quality of which is enhanced by the use of business intelligence. Business intelligence is widely known system for accomplishing enormous advantages to banks that have adopted it. Therefore, commercial bank of Ethiopia has introduced this new information system solution named Oracle Business Intelligence from Oracle Company. The main objective of the study is to assess the impact of Implementing Business Intelligence Project in the Bank. The study adopted descriptive research design. Using a census survey method, data was collected from 37 business intelligence project implementation participants and users in Management Information System and program Management office departments of the Bank. Data collected from target group by means of questionnaires and interviews. Beside 6 interview questions, questionnaires with items of 38 were distributed and collected with a response rate of 82%. The collected data was analyzed using SPSS (Statistical Package for the Social Sciences) version 20. Presentation, interpretation and discussion also made using table, frequency, percentage and mean to get ample findings. The researcher has used descriptive research method. 17 items were used for assessing the benefits by customizing from previous research that proposed number of benefits and were grouped into four categories,7 items were used for assessing the critical success factors,6items were used for assessing challenges during implementation and 8 items were used for assessing challenges of using the Business Intelligence system. The finding showed that almost all the benefits assessed have been achieved helping the bank to remain competitive. Committed management support and sponsorship was the most successful critical factor during the implementation while Sustainable data quality and integrity was the least successful factor. Less interest on the system from part of managers and clients were the most challenging ones on the implementation. Poor data quality and Sluggish response time of the system to user requirements were major challenges while using BI. The study recommends data cleaning should be done consistently and Tables and Views in the data warehouse should be optimized to mitigate the Sluggish response time issue of the system.

***Key words**: Business Intelligence (BI), Impact, BI benefits, BI critical success factors, BI challenges, CBE*

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Acronyms and Abbreviations

CBE	- Commercial Bank of Ethiopia
AAU	-Addis Ababa University
MIS	-Management Information Systems
PMO	-Program Management Office
BI	-Business Intelligence
SPSS	-Statistical Package for Social Sciences
ETL	- Extract, Transform and Load
DSS	- Decision Support System
NBE	- National Bank of Ethiopia
ATM	- Automated Teller Machine
POS	- Point of Sell
ERP	- Enterprise Resource Planning
IT	- Information Technology

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

"The banking industry has changed dramatically for the past 25 years" (Molyneux, and Wilson, 2010). Technological advancements in the area of telecommunications and information technology have continued to revolutionize the banking industry. The delivery of financial services has experienced major changes during the past few years. A feature of the banking industry across the globe has been increasingly becoming turbulent and competitive. Banks, aided by technological developments, have responded to the challenges by adopting a new strategy, which emphasizes on attempting to build customer satisfaction through offering better products and services and at the same time to minimize operation costs (Sohail & Shanmugham 2003).

Kandampully & Duddy, (1999) declares that in the last few years, application of information technology in business strategies has become at the very heart of the competitive process. The radical changes in the business environment forced the need for using management tools and technologies that provide comprehensive, fast, and effective use of all available data, which can ease the management of the companies (Kandampully & Duddy, 1999). Having said this, we can declare that the radical business environment changes are forcing the companies to use their available potential and resources as much as possible. They added that the competitive dominance of the companies in most markets and industries is obtained through the application of innovations. Nowadays, if a company wants to learn about its opportunities for future growth and development, on which basis a high-quality business strategy would be developed, should be able to collect all available and relevant information (Hoèevar & Jakliè, 2008). In fact, the proper use of data may change the faces of the traditional businesses, offering them great opportunities to gain advantages over their competitors (McAfee et al. 2012).

Modern banking was introduced to Ethiopia in 1905 when the bank of Abyssinia was first established in Addis Ababa under a 50-year franchise agreement with the British owned National

Bank of Egypt as per the national bank's website profile, (https://nbebank.com/, 2020). Commercial Bank of Ethiopia was incorporated as a share company on December 16, 1963 which is the former state Bank of Ethiopia as per the bank's website profile, (www.Combanketh.et, 2020). Then, as per the proclamation No. 184 of August 2, 1980, the Addis Bank and the former Commercial Bank of Ethiopia S.C were merged to form the sole commercial Bank in the country, the present day Commercial Bank of Ethiopia. Currently Commercial Bank of Ethiopia (CBE) is 100% state owned financial organization and the leading commercial Bank in Ethiopia.

The Vision of CBE is formulated as "To become a world-class commercial bank by the year 2025" & its Mission has stated as "We are committed to best realize stakeholders' values through enhanced financial intermediation globally and supporting national development priorities, by deploying highly motivated, skilled and disciplined employees as well as state-of-the-art technology. We strongly believe that winning the public confidence is the basis of our success." Generally, the Banking industry is growing relatively at a faster rate in Ethiopia than ever before. The type of services being provided has also improved and supported by modern technologies. This is due to the fact that number of banks has increased significantly and the competition among other banks becomes fierce (Rashid, et al, 2002).

CBE is the leading local bank in Ethiopia which currently purchased and implemented the new BI System called Oracle Business Intelligence Enterprise Edition to support its strategic goal, following the standard functionality of the system to the maximum possible extent. The project has been done by one of Tata technology group of India consultant called Tech Mahindra Business group and the sponsor of CBE which is the owner with proponent sub process called PMO/program management office. "Automation of the Bank's Support Processes" is focus area of the project. The project started in August 11, 2015 and it took 24 months while the plan was 1 year and 2 months. The Cost incurred for implementation was fixed 1 Million dollars for both software license & implementation. The bank has paid 400 thousand dollars for the purchase and licensing of Oracle BI from Oracle whereas the remaining 600 thousand dollars paid for implementation. The system is integrated with the core (Centralized online real-time Electronic) banking system of the bank, by which CBEs transaction, payments, settlements and taxes are

automatically monitored (CBE BI implementation Charter, 2015). The project is strongly aligned with banks current vision which is to become world class bank in 2025.

In spite of BI's significant improvement and its benefits, there are a number of challenges that companies may encounter when implementing. The main technical challenges that must be addressed to fully realize this potential are data structure, security, data standardization, data storage and transfers, managerial issues such as governance and ownership, lack of skill of data analysts, inaccuracies in data, regulatory compliance, and real-time analytics. Other challenges reported by Xue et al. (2005) which are likely to be applicable for developing countries include: lack of end- user preparedness, resistance to change, lack of user education and training, high turnover of key personnel, lack of communication and support documentation, the layer of consultants in addition to pure technological problems such as software bugs and configuration difficulties.

The commercial bank of Ethiopia (CBE) has been using BI system; however, its impact of implementing has not been determined particularly. To the best of the author's knowledge, there has been no single study conducted to examine the impact of implementing this new reporting system. The factors that lead to the stakeholders' satisfaction concerning this newly deployed BI reporting system have not been established. The objective of this paper is to identify the impact on the implementation of BI system. In order to conduct this research a review of the literature on the subject was conducted by focusing on implementation benefits, critical success factors and challenges of BI system.

1.2 Statement of the problem

Rashid et al. (2002) believes that business environment today is rapidly changing and is more competitive than ever before. Complex, analytic technologies provide information about almost anything. Not only is there more information than previously, but the information is also more precise, detailed, and comes with higher speed. Scanning and processing information in a correct and effective manner has become highly crucial in order to stay competitive. The increased volume, speed and diversity in data access create a crucial need for managing information, and there is an obvious must of timely, precise and up-to-date business information and knowledge.

Consequently, companies today are spending vast amounts of money on information technology (IT). The deployment of IT systems and services has increased tremendously the last couple of decades and companies such as IBM, Microsoft, Dell, SAP and Oracle have experienced an immense growth. However, many experts are questioning whether these investments really do lead to productivity gains for the companies applying their solutions, or if it does not. Some analysts talk about how companies today may be data-rich but at the same time they might just as well be information-poor. All the same, it is clear that BI gains are difficult to measure. Improvements such as better decisions leading to potential efficiency advances and cost savings are not easily quantified. Managers all over the world are well aware of the complex, analytic technologies that are available today for providing insight and support for business decisions.

It is reported that the use of Business Intelligence refers to certain skills, technologies, practices, and processes that are employed as part of supporting decision making in an organization. The applications of Business Intelligence technology have historical, contemporary and even predictive view points of the business undertakings of an organization. This technology contains certain unique functions that are intrinsic to the particular systems. The adoption of BI systems therefore is aimed at the support of better quality decision making within an organization. It can also be referred to as decision support system (DSS). The adoption of Business Intelligence systems is critical to the smooth and coordinated operation of each and every organization. However; it has not been fully integrated in many firms and organization. This has resulted to poor communication within the different enterprises and hence a loss of coordination and mismanagement.

Curko, Bach, and Radonic (2007) emphasized that concerns such as suppression and detection of fraud, risk management, customer management, loss prevention and product management, are some of the primary problems of financial institutions. Likewise, Ghanaian banks are facing a lot of challenges as highlighted in the Ghana Banking Survey (2014). The findings from the survey shows that Ghanaian banks are facing challenges such as: customers 'demand for improved service delivery at reasonable cost, customers' attrition, competition, legislation and regulations, technology and the performance of the domestic economy.

The implementation of Business Intelligence system in CBE have changed the previous reporting methods by automating more than 300 reports and dashboards and improved the management's

decision making process. The automated reports and dashboards are accessible by head office organs, Districts and Branches as per their granted privileges.

Beside the benefits of BI in CBE there are many challenges that degrade its efficiency. Poor Data quality in the Data warehouse is one of the main challenges with issues such as Incorrect loan classification, Same borrower with different customer record, Difficulty in classification of Foreign Currency Incoming and Outgoing as per National Bank of Ethiopia format, Same customer with different customer id and Inconsistency in Customer name spelling. In addition to that understanding Business Logic, extracting and Analyzing data from different data sources, Old Systems Data, Poor Data Management, Lack of awareness by the BI users, slow query time, database performance and Data warehouse optimization problem are some of the challenges in the implementation and usage of the system.

As BI is an area still evolving, other studies have used qualitative studies to explore in-depth to determine the specific factors to concentrate on but these are mostly case studies involving very few organizations where findings cannot be generalized. Examples of these are: identification of SME-specific determinants of Business Intelligence Systems (BIS) adoption at firm level; investigation of BI adoption in a retail chain based in Slovakia; exploration of the factors that can assist organizations to be more successful in achieving pervasive use of BI. In addition, other researchers have also proposed conceptual models, and the design, implementation and deployment of BI systems in several studies. In addition, empirical studies on adoption of BI Systems using the technological innovation adoption theories at the organizational level are few. Also, most of the existing studies have focused on a combination of industries rather than a specific focus on the banking sector.

Consequently, this study was motivated by the fact that there are limited evidence in the information systems (IS) literature when it comes to BI systems impact on organizational performance as many of the studies focused on BI applications development, and others on its adoption (Aruldoss, Lakshmi, & Venkatesan, 2014). In the context of developing countries, especially sub-Saharan Africa (SSA), specifically Ethiopia, BI systems is still in its early stages.

In addition, to the best of researcher knowledge, no study had been conducted on the Implementation of Business Intelligence in Commercial Bank of Ethiopia. The researcher tried

to search for research works on the impact of Implementing Business Intelligence in Commercial Bank of Ethiopia in different sources that offer a previously done journal articles. However, there was no any research work conducted on the impact of Implementing Business Intelligence in Commercial Bank of Ethiopia. As a result, the researcher feels that a research on the impact of Implementing Business Intelligence in Commercial Bank was found more appropriate.

This paper therefore seeks to evaluate the impact of Implementing Business Intelligence in Commercial Bank of Ethiopia. This Project work research will help Commercial Bank of Ethiopia and other companies to perceive the reality regarding BI impacts that can occur in different business fields, and is expected to fill the gaps observed.

1.3 Research Questions

The major research questions to be addressed within the domain of the study are:

- What are the benefits contributed by the implementation of Business Intelligence?
- What are the challenges faced by the implementation of Business Intelligence?
- What are the critical success factors of Business Intelligence implementation?

1.4 Research Objectives

1.4.1 General Objective

The main objective of the study is to assess the impact of Implementing Business Intelligence Project in Commercial Bank of Ethiopia.

1.4.2 Specific Objective

The specific objectives of the study are:

- To identify the benefits encountered during and after the implementation of Business Intelligence project in CBE.
- To identify the challenges faced during and after the implementation of Business Intelligence project in CBE.

- To describe the critical success factors of Business Intelligence project implementation in CBE.

1.5 Significance of the Study

Commercial Bank of Ethiopia (CBE) as leader bank, to compute, to hold the current market share and to achieve its 2025 mission is highly participating in the introduction of new technologies. Some of the technologies deployed are Core banking system, ERP (Enterprise Resource Planning), Automated Teller Machine (ATM), Internet and Mobile banking, Point of Sell (POS) terminal, CBE Birr, BI (Business Intelligence) and other different information technology services. These activities of the bank are expected to continue for foreseeable future. This study has variety of importance for different bodies concerning information availability and decision making issues. It provides basic information on the key challenges, critical success factors and benefits of BI implementation as well as provides the possible solutions for alleviating the major challenges. This study is expected to contribute for the Bank by informing the stakeholders about BI implementation challenges and benefits.

Furthermore, the study is also expected to increase awareness on the challenges, critical success factors and benefits of Business Intelligence implementation and therefore, the outcomes from the study can be helpful to CBE and other companies in the country that are planning to implement or using the Business Intelligence reporting system.

1.6 Scope of the Study

The focus of the study is to assess the challenges, critical success factors and benefits of implementing Business Intelligence system covering only CBE which is applied to data warehouse, BI analytics, BI Publisher, BI Interactive dashboards, BI delivers and BI scorecards features. This study tried to show the benefits related with the System and identify the challenges for the better usage of the BI features. Due to time constraint and the sensitivity of the detail information required the research is limited to the challenges , critical success factors and benefits of implementing Business Intelligence project which covers only the Head office department even though the system is deployed to all districts and branches of the bank. The

respondents were selected from Program Management Office (PMO) and Management Information Service (MIS) departments. Descriptive research design was applied and, questionnaires and semi structured interviews used as instrument to collect primary data. Mixed approach was used to answer the research questions.

1.7 Limitation of the Study

This study confronted certain shortcomings either in its scope, features of the technology and source of information. The research focuses on the challenges, critical success factors and benefits of adopting BI decision support system with customer perspectives, and therefore findings are restricted to CBE. The research focused on the general overview of BI features such as data warehouse, BI analytics, BI Publisher, BI Interactive dashboards, BI delivers and BI scorecards, and therefore did not pay detailed attention to the other specific components such as data mining and data visualization. Further, BI tools (software) and selection procedure for the case were not considered in this research, and does not focus on any particular technical aspect or specific DSS software.

1.8 Organization of the Study

The research paper contains five chapters. Chapter one contains background of the study, background of the organization, problem statement, research questions, objectives of the study, scope, limitation and significance of the study. Chapter two is dedicated to review related theoretical and empirical literatures on the topic. Chapter three is about the research design and methodology that includes research design and approach, sources of data, population of the study, method of data analysis, validity and reliability analysis, and the ethical consideration of the research. Chapter four provides data presentation, analysis and discussion of the study results. Chapter five consists of conclusion and recommendation on the basis of the research findings and suggestion for further research.

1.9 Definition of key terms

Project: a temporary endeavor undertaken to create a unique product or service, temporary means that the project has a definite ending point, and unique means that the product or service differs in some distinguishing way from all similar products or services (PMI, 2013).

Implementation: is the process that turns strategies and plans into actions in order to accomplish strategic objectives and goals.

Business Intelligence (BI): a system that provides analyzed information of management concern regarding the current and future world in which the company operates. Greene (1966)

BI benefits: the benefits obtained within organizations from the applicability of BI systems. Antia & Hesford (2007)

BI critical success factors: are crucial areas where everything has to function properly to ensure success of BI implementation for business. Yeoh & Koronios (2010)

BI challenges: are troubles and obstacles that need to be solved throughout the design, implementation, and use of BI. Yeoh & Koronios (2010)

CHAPTER TWO: REVIEW OF RELATED LITERATURE

The purpose of this chapter is to give detailed information about the business value, maturity levels, implementation Phases, benefits, critical success factors and challenges of Business Intelligence by reviewing theoretical, conceptual and empirical literatures conducted so far. Moreover, review of related literatures helped to adopt best methods and approaches for Business Intelligence implementation. As Creswell (2013) defined literature review is a piece of recap of journal articles, books and other documents that define the past and the current state of information on specific research study. Therefore, review of related literatures enables the researcher to discover existing knowledge in this specific area.

2.1 Theoretical Literature Review

2.1.1 Business Intelligence

Wieder et al. 2(012) noted that Business Intelligence was among the hottest mouthpieces in the information technology industry. Banks today acquire data on better granularity and big volumes, so the real information management challenge has changed from collecting enough data to efficient analysis and usage (Chaudhuri et al., 2011). Data found in an enterprise appears to be distributed around various operating systems. Data sources from external Information structure is often not compatible with and without proper definition of how it can be used, resulting in a lack of overall view of the subject matter of interest (Hovi et al. 2009). The dispersed, fragmented information is integrated, analyzed and accessed throughout the organization using BI systems to support operational and strategic decision making (Hovi et al. 2009).

Gilad and Gilad (1988) said the BI's organizational function is in charge of facilitating the BI development. They added that while BI can also be considered a casual activity conducted by all workers who use the information to meet their own needs, an organizational role should be incorporated and handled as a structured, organized operation closely linked to strategic administration. Thus, a permanent BI method can be maintained, less data is likely to get lost,

duplicates can be reduced and, above all, data in different forms can be incorporated into a cohesive strategic planning whole from different sources (Choo 2002).

Hervonen (2010) proposed five different BI maturity Levels of organizations shown in table 2.1 below that assess the degree to which BI has spread in an enterprise and how widely it is used in organizations. The table displays five levels which will be discussed further in section 2.1.3 below and the proportion of organizations that the author has investigated operating at a given level. Centralized BI activities can help an organization make the transition from limited situational BI to a more constructive strategic and universal BI, which often provides immediate intelligence to their business.

Table 2.1: Levels of BI maturity in Organizations

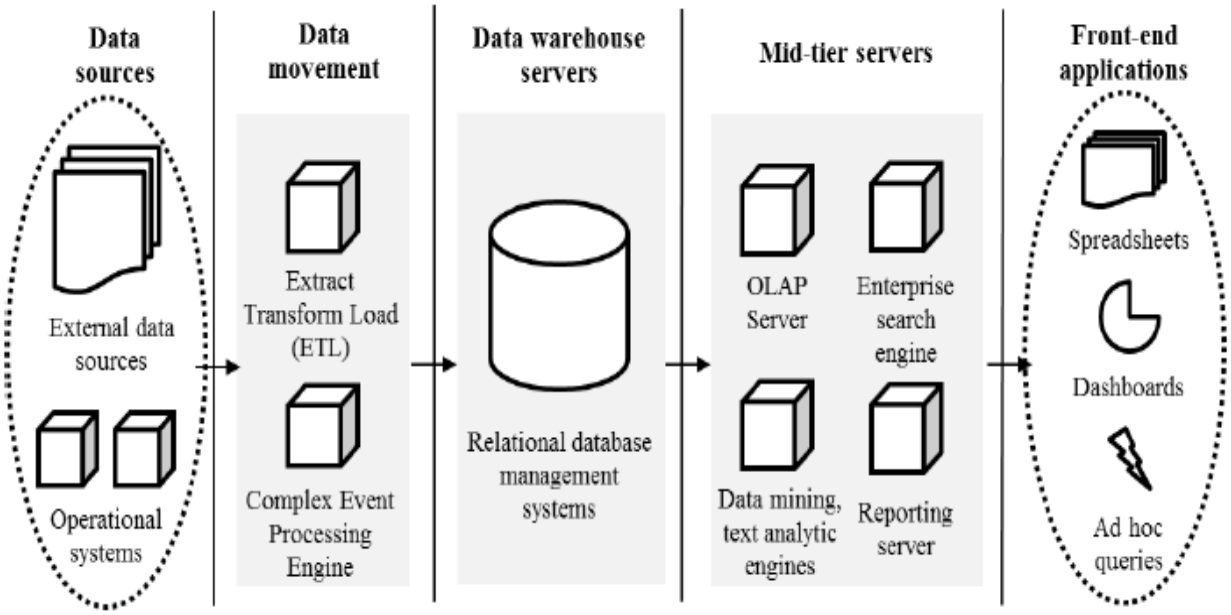
Five levels of maturity	% of organizations
1. Unknown – scattered spreadsheets in use	6 %
2. Tactical BI – Information unified and ad hoc queries	82 %
3. Focused BI – Focused BI solution for a business function	
4. Strategic BI – Strategic goals drive BI solutions	12 %
5. Pervasive BI – BI becomes part of business infrastructure and business portals	

Source: Hervonen, 2010

Greene (1966) declares BI's end result to be analyzed information of management concern regarding the current and future world in which the company operates. There are two significant consequences of that concept. The first one is recorded information is analyzed which means analyzing and analyzing valuable information for users, not just any bulk data. The other concept is that BI mainly involves the management to which the information is reported.

A typical BI architecture shown in Figure 2.1 was illustrated by Chaudhuri et al . (2011). Hovi et al . (2009) limit their concept of BI to data access and analysis, and address data warehousing as a different operation that includes the ETL process and data warehouse design and implementation. A broader definition of BI is the access of the systems and includes solutions for data warehousing as well as data view and analysis. From this description, the technologies executing the BI process are a data warehouse and other BI software, thus both the organizational and technological needs of BI are taken into consideration. Hovi et al . (2009)

Figure 2.1: BI architecture



Source: Chaudhuri et al., 2011

2.1.2 The business value of Business Intelligence

The three universal purposes for which BI is implemented are explained by Ramakrishnan et al . (2012). The first purpose is that they want an organization to gain insight. Market competitive pressure is growing confusion, and the authors argue that BI systems are quickly becoming a requirement for an company to cope with the increasingly volatile business climate. They added second and third BI values associated to the coherence of information on an entity. The authors state that BI provides a sole report of truth for an organization and may also make easy organizational transformation. Organization data is constantly evolving, particularly as companies get bigger. Having a sole report of truth facilitates the communication between employees when all have access to the same information. The understandable business concept of numbers, calculations, and expressions also enhances data quality and saves time to analyze better. (Ramakrishnan et al. 2012)

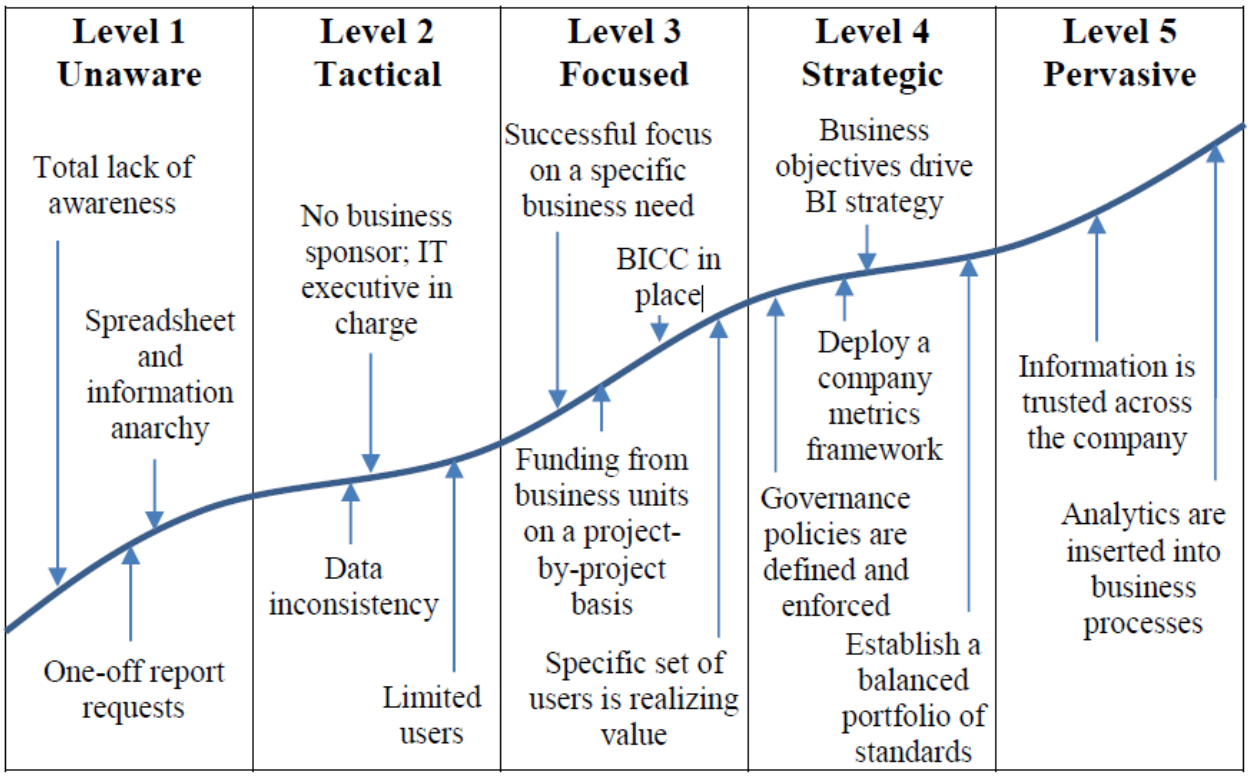
2.1.3 Business Intelligence Maturity levels

Gartner declared a popular business intelligence and project management maturity model to assist organizations know how established they are with respect to BI and how developed they should be in the help of business goals. Gartner’s model of maturity is made up of five levels of maturity which are presented in figure 2.2 below. (Rayner & Schlegel 2008)

Unaware or unknown is Gartner's first level maturity model. This is also seen as disorder of information, as lack of interior management leads to non consistent data across divisions, incorrect understanding of data and anonymous metrics of data and reports. Tactical is Gartner's second level maturity model since a limited number of directors and senior managers use data to drive strategic decisions. Focused is Gartner's third level maturity model as the company attains its first success and the BI-related benefits and senior management begin to work more on engagement. The challenge in this level is to broaden the progress across BI to enterprise-wide and increase the user base reach. Fourth is the strategic level, because organizations with administration sponsorship have established a specific business approach for BI production at

this stage. In this level organizations have challenges on responding to varying business requirements by adding alertness into BI. (Rayner & Schlegel 2008)

Figure 2.2: Maturity levels in Gartner's maturity model



Source: Rayner & Schlegel, 2008

Pervasive is Gartner's fifth level maturity which is the top stage of BI. At this point BI is ubiquitous in the company and the whole organizational culture as well as part of the business cycle. The challenge in this level is maintaining the tactics updated as client requests and technology is developing. (Rayner & Schlegel 2008)

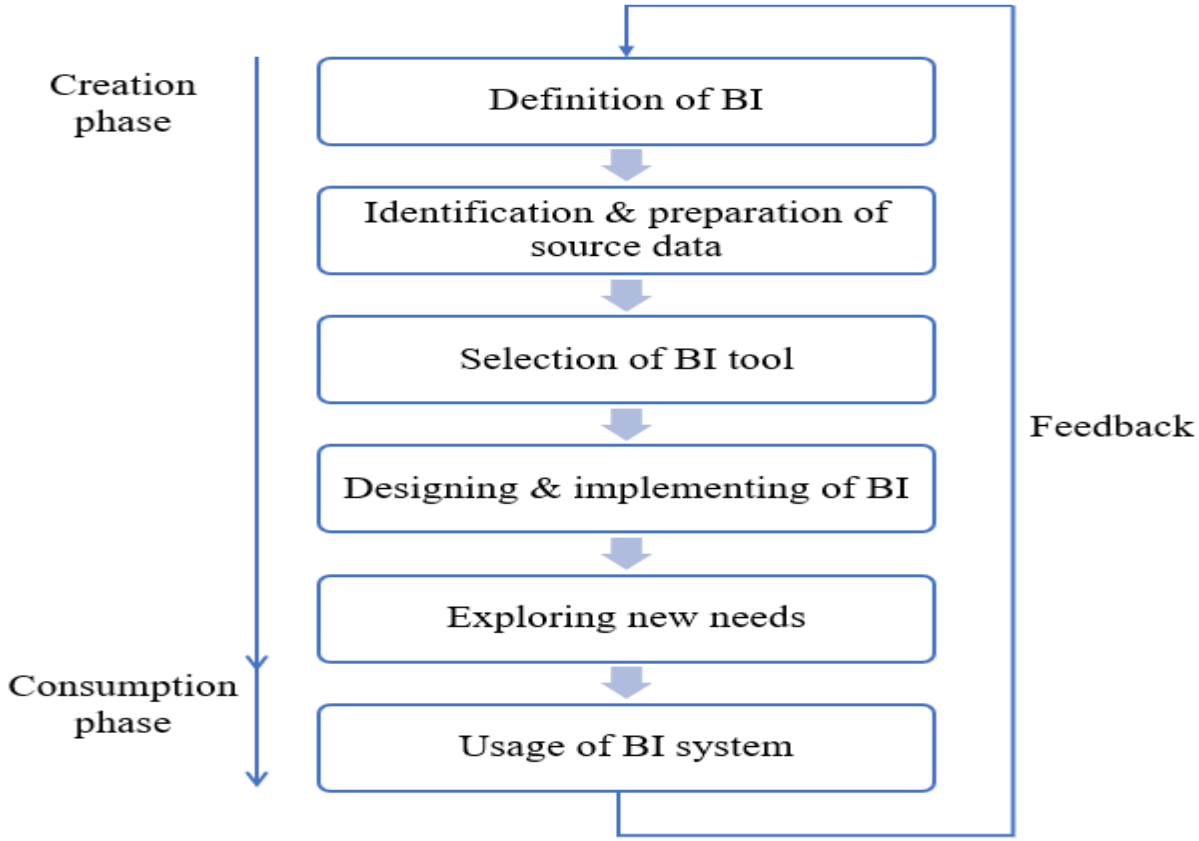
2.1.4 Phases of Business Intelligence implementation project

Since users have a major impact on the performance of implementing BI, Olszak & Ziemba (2007) recommended splitting the implementation practice into two major iterative phases which are creation and consumption of Business Intelligence. The first is associated with developing

the BI system whereas the second is related to end user appliance. There are five stages in the creation phase shown in figure 2.3 below. (Olszak & Ziemba 2007, 139-140)

Definition of BI is the first point of the creation process which involves determining the strategies for the development of BI systems (Olszak & Ziemba 2004, 143). The next point deals with the identification and preparation of the source data (Olszak & Ziemba 2004, 143).

Figure 2.3: Phases of the BI implementation project



Source: Olszak & Ziemba, 2007

The third stage of the BI implementation project is the selection of suitable BI system (Olszak & Ziemba 2004, 143). The principle of this stage is to choose the BI tool which meets the requirements of the organization which are defined in the earlier stages. (Gangadharan & Swami 2004, 141). Designing and implementing of BI is the fourth stage (Olszak & Ziemba 2004, 143). The last stage of the development process is the exploration and discovery of new informative needs (Olszak & Ziemba 2004, 143). After the development of the BI system, the practical use of the BI system begins and Olszak & Ziemba (2007) calls this phase a process of utilization.

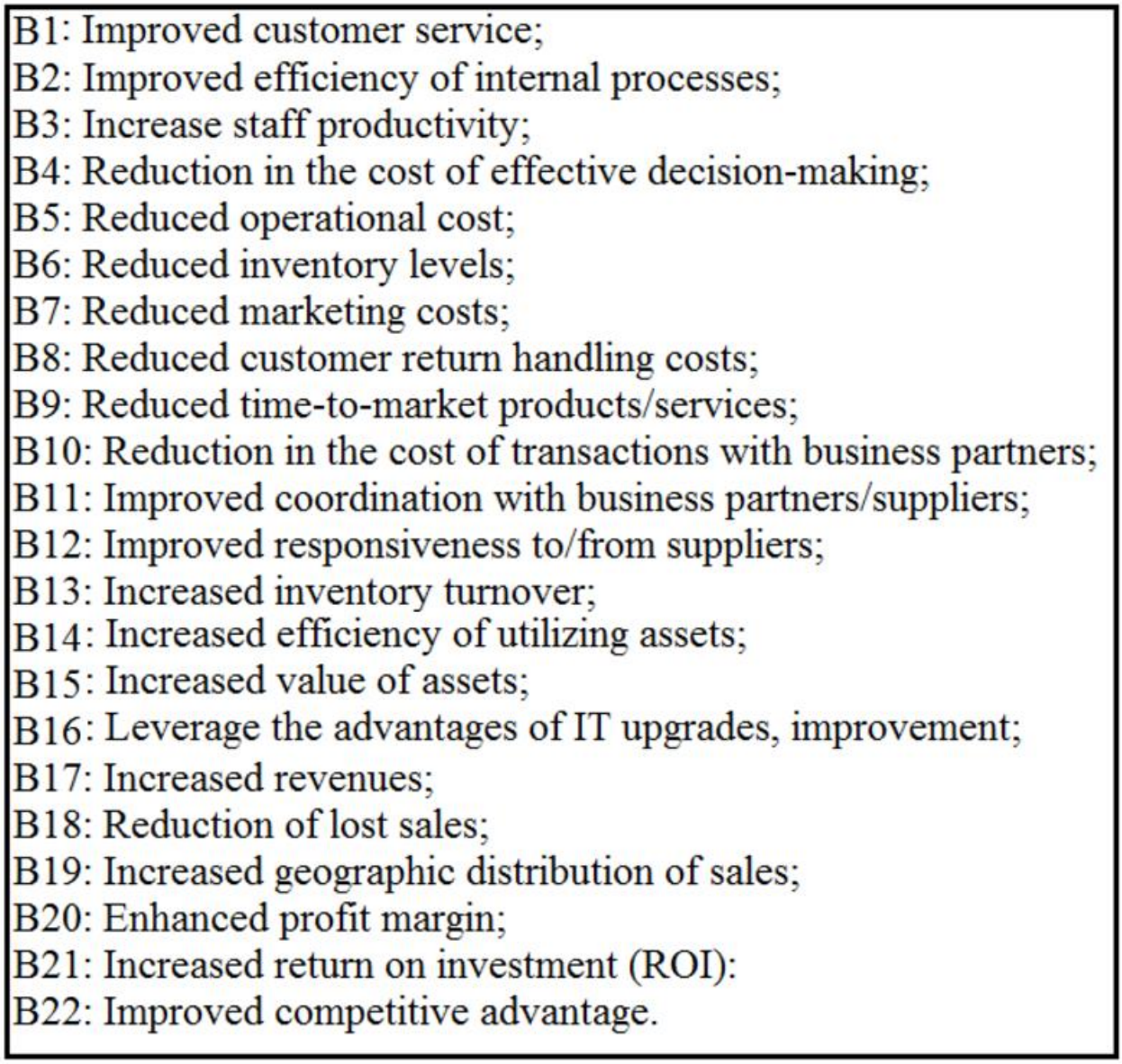
2.1.5 Benefits of Business Intelligence

The Business Intelligence system organizes and presents information in a way the users could have insights from its use, which could help in future when actions should be taken. In the process of making a literature review about the topic "Benefits of Business Intelligence" there are wide range of benefits given by different authors.

Elbashir et al. (2008) suggested twenty-two benefits shown in Figure 2.4 that could be achieved by the use of BI systems and divided those twenty-two benefits into four groups of benefits organizational, business partner relation, internal process efficiency, and customer benefits. However, for the purpose of this research, I have used seventeen out of twenty-two benefits originally included in Elbashir et al.'s (2008) research, as I thought that five of the benefits are either similar to the other benefits or hard to be assessed from respondents working in a banking industry. Rouhani et al. (2012) argue that the implementation and use of BI systems requires a lot of resources, and often it is very hard to define precisely the benefits that can be obtained from its use.

Antia & Hesford (2007) reveals that Due to the increasingly high applicability of BI systems within organizations, the benefits obtained from the use of BI systems can be numerous. Antia & Hesford (2007) argue that a number of studies indicate the existence of variety of benefits that can be obtained from the use of BI systems, but according to Elbashir et al. (2008), most of them are not validated with empirical data collected through research. Finally, I have grouped these seventeen benefits included in this research into four categories, and that is in align with how Elbashir et al. (2008) categorized them in their research.

Figure 2.4: Benefits from the use of BI systems



Source: Elbashir et al. , 2008

2.1.5.1. Organizational Benefits

Elbashir et al. (2008) have categorized the following benefits under the group of Organizational Benefits:

- Increased revenues/services provided
- Reduction of lost sales/lost services provided

- Increased geographic distribution of sale/services provided
- Enhanced profit
- Increased return on investment (ROI)
- Improved competitive advantage

2.1.5.2. Business Partner/Supplier Benefits

Business partner relation benefits group comprise benefits that are coming as a result of improved business partner relations such as good coordination and reduction in costs of transactions which are of big importance for organizations (Elbashir et al. 2008).

- Improved coordination with business partners/suppliers
- Reduction in cost of transaction with business partners/suppliers

2.1.5.3. Internal Process Efficiency

Internal process efficiency benefits group contains benefits that come as a result of better organization functionality. Those benefits can be internal processes efficiency improvement, staff productivity enhancement, effective decision-making cost reduction and decreased operational costs (Elbashir et al. 2008).

- Increased efficiency of utilizing assets
- Leveraged the advantages of IT upgrades, improvements, and/or new developments in back-end IT systems
- Improved internal processes efficiency
- Increased productivity of staff
- Reduction in effective decision-making cost
- Reduction of operational costs

2.1.5.4. Customer Satisfaction

Elbashir et al. (2008) expressed, the customer satisfaction benefits are benefits that come from better understanding of the customers and that understanding can result in decreasing of customer return handling costs, decreasing of marketing costs and decreasing of the time needed to supply products or services to the market.

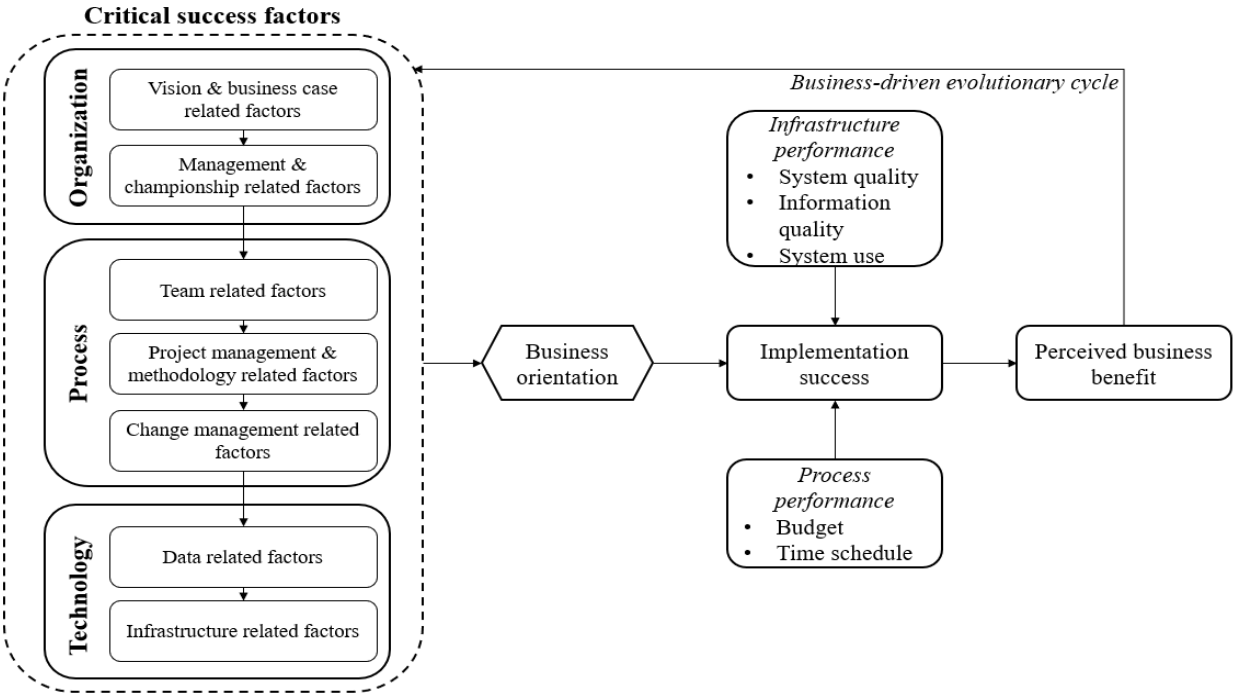
- Improved customer service
- Reduced marketing costs
- Reduced time to market products/services

2.1.6 Critical success factors of Business Intelligence Implementation

Yeoh & Koronios (2010) notes, effective implementation of the BI involves leveraging limited resources and concentrating on factors that have the greatest effect on implementation performance which are called critical success factors. Throughout academic research, critical success factors are described as the crucial areas where everything has to function properly to ensure success for business. Yeoh & Koronios (2010)

Critical success factors categorized by Yeoh & Koronios (2010) into three dimensions: organization, process and technology. Such dimensions shown in figure 2.5 below were first presented in Wixom & Watson 's research (2001), which dealt with the empirical analysis of the factors influencing the performance of data warehouse.

Figure 2.5: Framework of critical success factors



Source: Yeoh & Koronios, 2010

2.1.6.1. Organizational dimension

Boyton, Ayscough, Kaveri & Chiong (2015) stated that organizational factors are linked to management dedication and leadership, arrangement of BI project goals with organizational objectives and organizational culture. Boyton et al . (2015) suggests that the aim of a clear vision is to ensure that the BI project is connected to the company's strategic goals while a well-established business case identifies the potential benefits of implementing the BI. Management and championship considerations contribute to the procurement from management of dedicated support for the operation of the BI, also called management support or sponsorship (Boyton et al . 2015, 315).

2.1.6.2. Process dimension

"Process improvement have a significant role in all types of IS projects" (Boyton et al . 2015). (Boyton et al . 2015) suggested Setting goals and requirements, planning the project to implement the BI and managing changes from a process angle are critical factors for victorious implementation of the BI. (Boyton et al . 2015) noted Business-centric championship and balanced team structure ensure execution is consistent with company needs rather than IT expectations. They also declared that factors related to project management and methodology relate to the implementation of BI project by a business-driven and iterative development approach with a narrow scope and separate budget. Yeoh & Koronios (2010) also states that while a business-centered champion and an iterative approach play a significant role in user adoption, user-oriented change management like user and management training has a crucial impact on implementation success.

2.1.6.3. Technological dimension

Yeoh & Koronios (2010) indicates that while technical factors have a lesser effect on implementation performance compared to organizational and process-based factors, factors related to infrastructure and data contribute to effective implementation. A business-driven, scalable and flexible structure is seen as a critical success factor as it allows for BI system extensions and adjustments when information needs evolve (Olszak & Ziemba 2007, 142). Data quality and integrity are additional technology-related success factors which have a notable effect on implementation success (Yeoh & Koronios 2010). Particularly the data quality of the

source systems is critical for the effective implementation, because data quality affects the quality of management reports and ultimately the decision results (Yeoh & Koronios 2010).

2.1.7 Business Intelligence Implementation challenges

Application of BI systems in business practice is correlated not only with more benefits and advantages but also with other obstacles, challenges and risks. Businesses can run into many troubles and obstacles that need to be solved throughout the design, implementation, and use of BI. Technology is not the only key role, but also important factors, such as individuals, procedures, and management style and company culture. These factors often characterize a huge problem and can interrupt or stop attempts and efforts in companies to implement successful BI solutions. (Yeoh & Koronios 2010, 25)

García & Pinzón (2017, 48) reported that the failure rate of BI implementation projects today ranges from 70 % to 80 %, whereas the ordinary failure rate for IT projects ranges from 25 % to 40 %. In scholastic study the reasons for the failures are hardly ever discussed, despite the particularly high rate of failure (Boyton et al . 2015, 310). The previous section identified crucial factors for success in implementing BI and lack of these variables would contribute to the failure of the implementation (Yeoh & Koronios 2010, 25).

In one of his studies, Eckerson (2002) outlined the major challenges to BI. He distinguishes the challenges to BI implementation challenges and challenges to the usage of BI solutions. The challenges to Implementation and Use of Business Intelligence identified are listed below.

Challenges of BI implementation:

- The difficulty and time required for learning the BI tools
- Costs to receive a BI license
- Additional expenses associated with the management of the BI project
- The Managers lack of interest
- Costs needed to help and train users of the program
- Solutions lacking interest from users

Challenges of using BI:

- Users prefer to use other instruments or methods
- Incorrect Data or report
- Too demanding BI tools
- Slow system response time to user demands
- Lack of Manager Support
- So many reports and dashboards of the system
- The system lacks usable capabilities
- Inadequate checking and controlling instruments

2.2 Empirical Literature Review

Different researchers made assessment on the values and effects of Business Intelligence on different organizations internationally including in some African countries. But there are no any researches conducted in Ethiopia specifically on Business Intelligence.

Owusu (2017) investigated the post-adoption effects of BI systems empirically on the organizational performance of Ghanaian banks. This was done through the BSC. The findings revealed that, indeed, BI systems adoption impacted the organizational performance of Ghanaian banks positively as the four dimensions of the BSC, i.e. learning and growth, internal business process, customer and finance were all found to be significant with BI Systems adoption. BI systems adoption was found to have a direct positive significant relationship with learning and growth, internal business process and customer performances. However, the findings showed that BI systems adoption does not have a direct significant relationship with finance performance but rather through an indirect positive significant relationship with learning and growth, internal business process and customer performances. The study contributes to the body of knowledge with the provision of empirical evidence through a PLS-SEM approach concerning the benefits of BI systems which have been mostly anecdotal. This will help enrich the IS literature most importantly with this empirical evidence which is coming from a developing country where there are dearth of research concerning the phenomenon under investigation. Practically, this study has shown that the adoption of BI systems can have both financial and nonfinancial effects on organizational performance. This has provided an insight to managers and policymakers that in evaluating the effects on an IT/IS such as BI systems, they should take a comprehensive approach and consider both the financial and non-financial aspects due to the intangibility of some of the benefits. In addition, it is recommended that bank managers should also encourage the use of BI systems in all their operations which with time can translate to the financial gains of the organization.

Daniel (2014) undertook a survey on Strategic Value of Business Intelligence Systems and the findings show that the Business Intelligence (BI) systems at Equity Bank add strategic value. The study concluded that BI systems are significant investments needing to be recognized by organizations to remain competitive. It is however important to ensure that institutions that

choose to invest in the BI systems consider the challenges involved. The study also revealed training and education as core to the operation of Business Intelligence (BI) systems and for that reason the study concluded that adequate and relevant training of staff is necessary in running of the BI systems. To address the challenges arising from use of BI systems the study concludes that it is important to consider system integration; it is important to ensure the adopted system is compatible with the existing system and software. Finally the study concludes that it is important to have correct budgetary allocations to overcome the challenges of cost overrun.

Sujitparapitaya et al. (2012) discussed ten variables in the technological, organizational and environmental factors that influence adoption of BI in private and public institutions of higher education (IHE) in USA. Data was collected through a survey method from 243 senior administrators of institutional research and information technology units at both two-and four-year institutions. Their results showed that organization structure, institution size, absorptive capacity, organizational legitimacy, stakeholder support, perceived costs, and perceived complexity are significant determinants of BI adoption in IHE and that executive support, competitive advantage, and perceived benefits have no significant effect on the adoption.

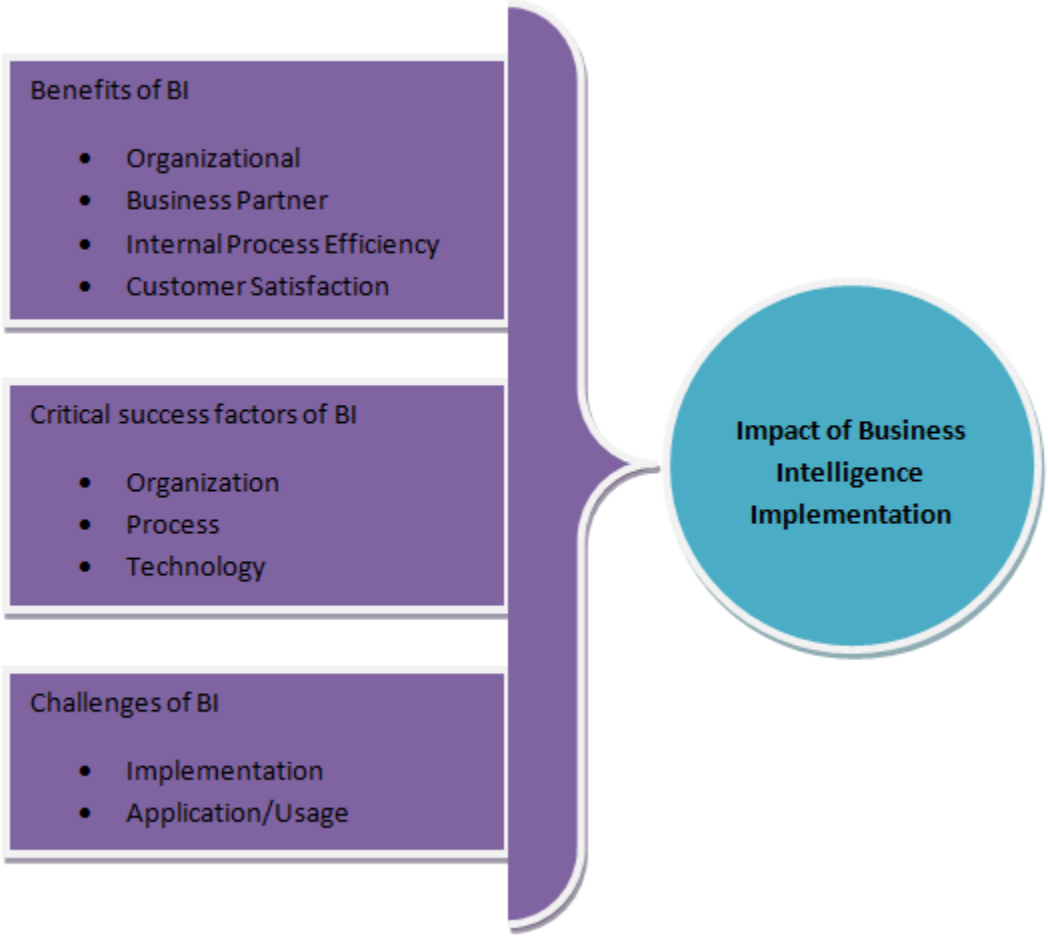
Malladi (2013) observed the factors associated with extent of organizational adoption of Business Intelligence & Analytics (BIA) using the Technology-Organization-Environment framework. Data was collected from 358 firms across North America through a survey. His results indicate an organization's perceived benefits, technology sophistication in terms of data infrastructure and organization sizes are positively associated with the extent of BIA adoption. Also, the results revealed that firms in knowledge-intensive industries are likely to more extensively adopt BIA but the lack of industry standards hinders adoption.

All the papers emphasize that the adoption of BI systems impacted organizational performance in many positive ways. However, there are integration, data quality and budget issues during the implementation of Business Intelligence systems. Therefore, necessary actions should be deployed on system integration, data quality and budgetary allocations to overcome the challenges of cost overrun.

2.3 Conceptual Framework

Business Intelligence Project implementation impact assessment conceptual framework is shown below.

Figure 2.6: Conceptual Framework



Source: Own compilation

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This part of the paper is devoted to describe the research methods and procedures that were used for acquiring and analyzing the required data to answer the research questions. Accordingly, this part discusses the research design and approach, target population, sources of data, the data collection methods, method of data analysis, the validity and reliability, and the ethical considerations for the study.

3.2 Research Design

The term ‘research design’ is used in variety of ways by researchers. It is referred as a master plan, blueprint, and even as a sequence of research tasks and activities. A research design is a procedural plan that is adopted by the researcher to answer questions validly, objectively, accurately and economically (Kumar, 2011).

The study adopted descriptive research design in an attempt to answer the research problem. A descriptive survey research design allows for analysis and understanding of a particular phenomenon as it exists in the present condition (Cooper and Schindler, 2008). In descriptive survey research design, objectives are predetermined allowing data collection relevant and sufficient to the study problem (C.R. Kothari, 2004). For this reason descriptive research design was preferred for this study.

Case study structure is used for this study because it enables an in-depth insight of a bounded system (e.g., activity, event, process, or individuals) based on extensive data collection (Creswell, 2013). The researcher has deployed cross-sectional type of research survey to collect data from the target population. Cross-sectional is used over longitudinal research survey as it is the most popular form of survey used in education and suitable for the researcher to collect data at one point in time Creswell (2012).

3.3 Research Approach

Different scholars defines research approaches as, plans and the procedures for research that span the steps from broad assumptions to detailed methods of data collection, analysis, and interpretation. There are three common types of research approaches; qualitative, quantitative and mixed approaches. During the data analysis stage, quantitative data can facilitate the assessment of the qualitative data and shed new light on qualitative findings. Alternatively, during the data analysis stage, qualitative data can play an important role by interpreting, clarifying, describing, and validating quantitative results, as well as through grounding and modifying (Burke et.al, 2007). Therefore, this study chosen a mixed research approach because; it helps to overcome the weaknesses inherent in each method when used alone. It also increases the credibility of the research findings.

3.4 Description of study variables

Distinction of variables is necessary in a research in order to meet the objective of the study and answer the given research question. Researchers are most interested in relationship among variables (Cooper and Schinder, 2003). Based on the nature of objective and research questions and availability of relevant information, mixed type of research approach was used. In this study, the benefits, critical success factors and challenges of BI are considered as independent variables and BI impact is considered as dependent variable.

3.5 Target population

The target population of the study was the employees from Management Information System (MIS) and Program Management office (PMO). The targeted population consists of Director Information Management, Director Project Management, Manager Data Warehouse and Business Intelligence, Manager Master Data Management, Manager Data Quality, Manager Data Science and Analytics and all employees under the Managers except office assistances who were not involved in the implementation of the project and have no access to the Business Intelligence system after completion. Hence, the number of population for the survey was Forty Five. The study used a Census survey method for the reason that the population can provide the best

information to achieve the objectives of the study. Census method is the method of statistical enumeration where all members of the population are studied. This study attempted to get the necessary information regarding the impact of Business Intelligence Implementation by trying to approach all population who were involved in Business Intelligence system project implementation and have access to the Business Intelligence system after completion to fill out the survey questionnaire.

3.6 Data Collection

This study used both primary and secondary data sources in order to meet the research objectives. Primary data was gathered to get responses to a particular problem through interviews and questionnaires which were close ended questionnaire and semi structured interview. The survey questionnaire Related to Challenges of Business Intelligence Implementation was adopted from another research work by Peter Mesároš, Štefan Čarnický & Tomáš Mandičák (2015), 'key factors and barriers of Business intelligence Implementation'. The closed ended questions have a five scored Likert Scales to provide respondents a wider range of alternatives with the statements Strongly Disagree to Strongly Agree, Not important to Very important, Very Low to Very High. Additionally, secondary data was obtained by examining various documents, including local and international newspapers, research reports, books and journal articles related with Business Intelligence system.

3.7 Data Analysis

In this study, descriptive statics was the major technique of statistical analysis through the use of Microsoft Excel spreadsheet and Statistical Package for Social Scientists (SPSS). The data collected through the aforesaid research tools was organized in a way suitable for analysis using computer software. The quantitative data collected from respondents who are working in MIS and PMO was analyzed using mean value, percentages, frequency, standard deviation and tables to address the impact of implementing Business Intelligence project in CBE. The qualitative data was gathered from interviews and analyzed separately but presented in combination with the quantitative information.

3.8 Reliability and Validity

The study used target population from MIS and PMO departments of CBE who were part of the survey based on their experience on the Business Intelligence system implemented, while their response expected to be credible which enabled the research to inference a valid conclusion. Moreover, the questionnaires were carefully designed and tested with a few members of the participants for further improvements. In this regard, feedback was gathered about the clarity of the sentences, correctness of a language and grammar, and also whether the designed instrument can fully assess the research topics prior to distributing the questionnaires. Validation was done so as to ensure if the instruments used for collecting the data enables collecting the information needed.

The study has examined the reliability of the data collected for all the constructs using Cronbach's Alpha as shown in table 3.1 below. The reliability of the questionnaire items were assessed through Cronbach's Alpha which is used for measuring the internal consistency of the study instrument. As shown in table 3.1, the Cronbach's Alpha value indicates the presence of good internal consistency among the items and considered to have adequate reliability as its value exceeds a cut-off point of 0.70 (Kline, 1999; Leary, 2012). Moreover, the reliability of data collected through questionnaires was cross checked during the session with the key informant interviews.

Table 3.1: Reliability Statistics

Variable Group	Cronbach's Alpha	No. of Items
All Variables	.861	38
Benefits of BI Variables	.893	17
Critical Success Factors of BI Implementation Variables	.852	7
Challenges During BI Implementation Variables	.835	6
Challenges of Using BI Variables	.827	8

Source: survey data, 2020

3.9 Ethical Consideration

The research was designed, reviewed and undertaken to ensure integrity and quality. Respondents was informed fully about the purpose, methods and intended possible uses of the research, what their participation in the research entails and what risks, if any, are involved. The confidentiality of information that was provided by research subjects and the anonymity of respondents were respected, research participants participated in a voluntary way, free from any coercion, and any harm to research participants was avoided. More importantly, participants were told that their participation in the interview is entirely voluntary, and that they can withdraw at any time.

CHAPTER FOUR: RESULTS AND DISCUSSIONS

4.1 Introduction

Data collected using different techniques were analyzed, presented and discussed in this chapter. A total of 45 questionnaires were distributed or availed using Google form Link to clerical staff of MIS and PMO in order to get the primary data. Each questionnaire contained 38 variables or questions for quantitative data analysis. Consequently, the given questionnaires have been collected back from 37 respondents out of 45 target population contributing to 82% response rate and due to various reasons 8 respondents haven't returned. According to Mugenda O.M and Mugenda A.G (2003) a 50% response rate is adequate, 60% good and above 70% rated very well. Moreover, to make the study more reliable, semi structured interview questions that consisted six (6) significant inquiry items have been interviewed for two directors and four managers by which qualitative data analysis has been done. As a result, their proper response has also been taking in to consideration for data presentation, analysis and interpretation.

The analysis was undertaken through descriptive statistics and the study findings are presented in the form of mean value, frequency, percentage and standard deviation. The discussion of the outcome is performed on the basis of the output obtained from Statistical Package for Social Sciences (SPSS) version 20. The questionnaire was developed by using a 5 point Likert rating scale (from 1 to 5); where 1 denoted Strongly Disagree, 2 Disagree, 3 Neutral, 4 Agree and 5 Strongly Agree for Benefits of Business Intelligence Implementation, 1 denoted Not important, 2 Less important, 3 Uncertain, 4 Important and 5 Very important for Critical success factors of Business Intelligence Implementation and 1 denoted Very Low, 2 Low; 3 Uncertain, 4 High, 5 Very High for Challenges of Business Intelligence Implementation.

This chapter is divided into five sections. The first section describes the general characteristics of the research participants in terms of their gender, age, educational level, service year and department/division the respondents working in. The second section discusses Business Intelligence practices in CBE. The third section presents the study finding regarding the Benefits

of Business Intelligence Implementation. The fourth section discusses the analysis and interpretation of the data with respect to the Critical success factors of Business Intelligence Implementation. The fifth section presents the study finding about the challenges or Barriers encountered during Business Intelligence project implementation and usage.

4.2 General Information about the Respondents

Table 4.1 below provides the general information about the employee research participants in terms of their gender, their age in years, educational level, service year and department/division of the respondents working in CBE. The responses of the participants and the implication are presented as follow.

Table 4.1: Respondents gender, age, educational level, service year and department

Variable	Description	Frequency	Percent
Gender	Male	26	70
	Female	11	30
	Total	**37**	**100**
Age Group	26 - 30 years	14	38
	31 - 40 years	16	43
	41 and above years	7	19
	Total	**37**	**100**
Educational Level	BA/BSc	32	86
	Masters Degree	5	14
	Total	**37**	**100**
Service year	4 - 9 years	11	30
	10 - 15 years	13	35
	16 - 20 years	8	22
	≥ 21 years	5	13
	Total	**37**	**100**
department/division	Management Information System	34	92
	Program Management Office	3	8
	Total	**37**	**100**

Source: Own Survey, 2020 SPSS version 20 outputs

According to the collected data, the overall staff composition of the population is highly dominated by male employees whereas the female employees are very low in number and they

are counted as 30 % of the total target group and the remaining 70 % has been covered by male employees. This implies that the organization has lack of gender diversity. Several researchers argue that woman participation in projects is still low. Among the total 37 participants regarding the age status, 43 % of the employees are between the age 31- 40 Years and the other 38 % are between 26-30 Years. However, the least 19 % of the employees are at the age of above 40 years. From the distributed questionnaires demographic information employees in the age range from 18 – 25 years was not participatory group of the respondents. This indicated that the bank didn't assigned or less assigned on the average age from 18 – 25 years in the project area. Whereas staffs that are experienced and matured in age or developed in terms of behavior and thinking from age 31-40 Years have been assigned in the project area. In other words, most of the employees at large are belonging in the productive age group that is from 26-30 Years and 31-40 Years whose summation percentage is counted as 81 %. This implies that majority of the workforce is in the young and productive age range which helps the project to be successful.

The study found it of paramount importance to determine the level of education of the respondents. The results of the findings in the above table reveal that most respondents had BA/BSc degree whose percentage is 86% while 14% had master degrees and yet there is no diploma or a Degree above master holder in the Business Intelligence Implementation area specifically. Due to the findings of the study it can therefore be concluded that the respondents had enough education to execute the roles assigned to them effectively and efficiently in regard to the implementation of Business Intelligence and that is one of the positive factors.

The study determined the number of service years of the respondents and the data was analyzed and illustrated in percentage. Based on the results most of the employees in the Business Intelligence project area have more than 10 years service year that is 70% of the respondents in aggregate. Between 10-15 years who comprised the majority accounting for 35% while 30% of the respondents indicated from 4 - 9 years which is the next higher service year group and the other 22% of the respondents are grouped from 16 -20 service years. However, the remaining 13 % of the respondents who also were the minority of the respondents have worked in the bank for more than 20 years. It can therefore be noted that most of respondents have been working from 10 -15 years in the bank. Their wide experience in the banking industry enhanced the implementation project positively.

As it was already explained in the research methodology part, the researcher has focused on Management Information System (MIS) and Program management Office (PMO) departments considering BI implementation. Accordingly, out of the 37 employees who returned the questionnaire highest number of respondents counted as 92% of the total respondents belong to Management Information System department because most of Employees who participated in the Business Intelligence project implementation have been transferred from PMO to MIS after project completion. Furthermore, 8% of the respondents were still in Program Management Office. Therefore, we can concluded that majority of the respondents were from MIS department. The availability of staffs with different role and position in the project contribute in improving project performance and help to have positive impact during the implementation.

4.3 Business Intelligence practices in Commercial Bank of Ethiopia

CBE is adopting many organizational process improvement systems, which facilitates its progressive functioning (CBE, 2020). CBE is the first bank in Ethiopia which implemented Business Intelligence system called Oracle Business Intelligence Enterprise Edition. Oracle Business Intelligence Enterprise Edition is a complete business intelligence platform that includes a full set of analytics, OLAP, reporting as well as scorecards. The bank has paid 400 thousand dollars for the purchase and licensing of Oracle BI from Oracle whereas the remaining 600 thousand dollars paid for implementation. The system is integrated with the core banking system database of the bank, by which CBE's transaction, payments, settlements and taxes are automatically monitored (CBE, 2020) and other data sources such as CBE BIRR system, Mobile Banking, Internet Banking, Switch System and Customer Relationship Management. Currently CBE is using Oracle Business Intelligence Enterprise Edition 11.1.1.9.0 in which reports and Dashboards are developed and used by Head office organs, all Districts and All Branches. The sections below describe BI tools adopted by CBE.

4.3.1 BI Answers

In the OBIEE environment, users do not have to manipulate complex database structures. Instead, users are presented with a logical view of the information that they can manipulate (Oracle, 2020). BI answers is the component of the OBI that consists of interactive charts, pivot

tables and reports that can be easily manipulated by the business users at the logical view level. It represents a new generation of Ad-hoc Reporting and Querying tool (Oracle, 2020).

4.3.2. BI Interactive dashboard

BI interactive dashboard is integrated with BI answers. Based on their roles in the organization, business users have the ability to personalize an appropriate dashboard (Oracle, 2020). This dashboard includes an interactive collection of content and applications. Personalized dashboard includes various tables and graphs, discussed in the previous section, to provide the decision maker with a well summarized view of his area of interest, thus supporting his decision making process (Oracle, 2020).

4.3.3. BI Delivers

BI delivers is a component of OBI that allows business activity monitoring and alerting through multiple channels such as e-mail, dashboards and mobiles (Oracle, 2020).

4.3.4. Disconnected Analytics

Oracle BI Disconnected Analytics enables full analytical functionality for the mobile professional who is disconnected from the Corporate Network (Oracle, 2020). It allows disconnected users to view analytics data, Oracle BI Interactive Dashboards, and queries. Typically, mobile users connect their personal computers to an OBIEE server and download an Oracle BI Disconnected Analytics application. Subsequently, they can disconnect their machines from the network and still able to view dashboards and queries (Oracle, 2020).

4.3.5. BI Publisher

This component is an Enterprise Reporting and Distribution tool where reports designed for MS Word or Adobe Acrobat can be delivered via printer, e-mail and fax, or published to a portal (Oracle, 2020).

4.3.6. Scorecard and Strategy management

The Scorecard part of OBIEE is built on the foundation of KPIs to allow user to define complex, multi-part strategies (Oracle, 2020). The ability to analyze KPIs in the context of strategic

business goals and objects is the key difference between scorecards and dashboards (Oracle, 2020).

4.3.7. BI Mobile

Oracle Business Intelligence Mobile allows user to view Oracle BI EE content on supported mobile devices (Oracle, 2020). BI Mobile supports the following object types:

- Dashboard
- Analysis
- BI Publisher report
- Agent-resultant report
- Scorecard

4.4 Benefits of Business Intelligence

This section is intended to present the survey results concerning the benefits stemming from the use of BI system. The findings are presented in terms of assessment of previously defined benefits with their explanations regarding their assessments. Based on questionnaires survey, the researcher was able to get confirmation about agreement of respondents using Likert rating scale regarding to the Benefits of BI in commercial Bank of Ethiopia. Let's see the analysis and interpretation of the following presented data. Then after, we would discuss as per the findings of data related to the Benefits of BI implementation in CBE. By considering their mean and Frequency and percentage value, the following table indicated the variables. As shown in the below table below, 17 statements were raised to assess the Benefits of BI. The researcher grouped these 17 benefits into four categories of Organizational, Business Partner Relation, Internal Process Efficiency and Customer Satisfaction as per the literature.

Table 4.2: Benefits of Business Intelligence

Statements	Category	Level of agreement					Total	Mean	SD
		1	2	3	4	5			
Increased services provided	Frequency	3	3	7	13	11	37	3.7	0.701
	Percent	8.1	8.1	18.9	35.1	29.7	100		
Reduction of lost services provided	Frequency	4	5	6	14	8	37	3.46	0.669
	Percent	10.8	13.5	16.2	37.8	21.6	100		
Increased geographic distribution of services provided	Frequency		3	6	15	13	37	4.03	0.843
	Percent	0	8.1	16.2	40.5	35.1	100		
Enhanced profit	Frequency	2	4	5	12	14	37	3.86	0.701
	Percent	5.4	10.8	13.5	32.4	37.8	100		
Increased return on investment (ROI)	Frequency	1	2	4	14	16	37	4.14	1.067
	Percent	2.7	5.4	10.8	37.8	43.2	100		
Improved competitive advantage	Frequency		3	8	12	14	37	4	1.048
	Percent	0	8.1	21.6	32.4	37.8	100		
Improved coordination with business partners	Frequency		1	3	16	17	37	4.32	0.854
	Percent	0	2.7	8.1	43.2	45.9	100		
Reduction in the cost of transaction with business partners	Frequency		2	1	13	21	37	4.43	0.801
	Percent	0	5.4	2.7	35.1	56.8	100		
Increased efficiency of utilizing assets	Frequency			2	15	20	37	4.49	0.747
	Percent	0	0	5.4	40.5	54.1	100		
Leveraged the advantages of IT upgrades, improvements, and/or new developments in back-end IT systems	Frequency	2	3	5	18	9	37	3.78	0.607
	Percent	5.4	8.1	13.5	48.6	24.3	100		
Improved the efficiency of internal processes	Frequency			4	17	16	37	4.32	1.084
	Percent	0	0	10.8	45.9	43.2	100		
Increased staff productivity	Frequency		2	5	17	13	37	4.11	1.222
	Percent	0	5.4	13.5	45.9	35.1	100		
Reduction in the cost of effective decision-making	Frequency		1	3	21	12	37	4.19	1.282
	Percent	0	2.7	8.1	56.8	32.4	100		
Reduced operational costs	Frequency	1	3	5	13	15	37	4.03	0.928
	Percent	2.7	8.1	13.5	35.1	40.5	100		
Improved customer service	Frequency			6	18	13	37	4.19	1.206
	Percent	0	0	16.2	48.6	35.1	100		
Reduced marketing costs	Frequency	1	2	10	11	13	37	3.89	1.004
	Percent	2.7	5.4	27	29.7	35.1	100		
Reduced time to market services	Frequency		1	7	12	17	37	4.22	0.972
	Percent	0	2.7	18.9	32.4	45.9	100		
Group Mean and Standard Deviation								4.07	0.926

Source: Own Survey, 2020 SPSS version 20 outputs, Note: 1 = strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree, 5 = strongly Agree

4.4.1 Organizational Benefits

The assessments from the questionnaire on Organizational Benefits that the company has achieved after implementing BI systems shows group mean of 3.86 and standard deviation of 0.838 which is very near to the overall average mean and standard deviation of benefits 4.07 and 0.926 respectively. From the results and depending on the business model, and the business area in which company operates, those different organizational benefits of BI have been obtained. Organizational benefits for the company have been achieved as a result of the use of BI system which, according to Ranjan (2009), analyzed data delivered from the data sources, e.g. applications, customers, etc.

The first question raised to the respondents was whether there is Increase in services provided by the bank after using BI for decision making. Around 65% of the respondents agreed and strongly agreed that there were an increase in the number of services provided by the bank, while 18.9 % of them were undecided about it. While the remaining responded equally with 8.1% disagreed and 8.1% strongly disagreed. The finding shows that by possessing business data collected and analyzed by using the BI systems a better decision can be made in order to make the better action.

In the second question the survey participants were asked if there is reduction of lost services provided. In this respect, 16.2% were undecided, however, majority of them (59.4%) were agreed and strongly agreed. Moreover, the mean response obtained in this regards was 3.46 implying that the use of BI system helped the company in high extent, because by using the BI they can detect anomalies. From the response on this benefit the finding is that the BI system can bring the reduction of lost services provided by the company.

In the third issue, participants were asked if there were increased in geographic distribution of services provided. 35.1% strongly agreed and 40.5% agreed on the specified benefit of BI, while 16.2% of them were neutral. The result shows that 8.1% of participants disagreed on the benefit of increased geographic distribution of services provided. From the result, we can conclude that the BI systems can make changes in the geographical distribution in a sense of increased penetration and availability in graphical matters.

The fourth question asked to respondents related to the organizational benefit was whether using BI system has enhanced their profit. The majority of the study participants (70.2%) agreed and strongly agreed that using BI enhanced profit of the company. Meanwhile, close to 16% of them disagreed and strongly disagreed, and 13.5% of them were not sure about the enhancement of profit in the bank. This shows that BI system has indeed increased CBE's profit in numerous indirect ways. That is predominantly through reducing costs and less time on decision making that the company has achieved this benefit.

Regarding the assessment of the increased return on investment (ROI) benefit the result shown in table above reveals that 10.8% were undecided, however, majority of them (81%) were agreed and strongly agreed. Moreover, the mean response obtained in this regard was 4.14 implying that a company could increase the return on investment when it comes to the use of BI for a better decision-making. The interview results were also in sync with the results obtained from the questionnaire, and most of the respondents said that BI could increase the return on investment but two of the respondents argue that it is very hard to say what kind of revenue and return on investment a company can get directly from using BI. They also mentioned that return on investment increases when the services provided are improved indirectly by using BI.

For the last benefit of the organizational group of benefits which is improved competitive advantage 37.8% strongly agreed and 32.4% agreed while 21.6% of them were neutral with a mean value of 4. From the response we can conclude that this benefit can be achieved with an argumentation that it comes from the availability of data. One of the interviewees said that when you know how you are doing and what you are doing wrong then you can improve and you get better competitive advantage, as well.

4.4.2 Business Partner Relation Benefits

The assessments from the questionnaire on benefits from the second group of benefits, the Business Partner Relation benefits achieved after implementing BI systems shows group mean of 4.37 and standard deviation of 0.827 which is very near to the overall average mean and standard deviation of benefits 4.07 and 0.926 respectively. From the results Business partner relation benefits are obtained from improved relations with customers by the use of BI system. Business partner relation benefits could be improved by using BI systems in a way in which the company

can use advanced analytics of the collected data (Ranjan, 2009), so that the company could predict what could be "the next step", and therefore the company can better coordinate with its customers.

Regarding the question asked if the company have improved the coordination with their business partners 49.5% strongly agreed and 43.2% agreed while 8.1% of them were neutral and 2.1% of them disagreed. From the result, we can conclude the company has improved the coordination with its business partners by accessing customer or partner data from BI and figuring out how to work with them.

When asked if the company achieved Reduction in cost of transaction with business partners the majority of the study participants (91.9%) agreed and strongly agreed. Meanwhile, 5.4% of them disagreed and 2.7% of them were not sure about the benefit of Reduction in cost of transaction with business partners. This shows that with the use of BI systems the company has tremendously reduced the costs of transaction with business partners.

4.4.3 Internal Process Efficiency Benefits

The assessments from the questionnaire on benefits from the third group of benefits, Internal Process Efficiency benefits achieved after implementing BI systems shows group mean of 4.15 and standard deviation of 0.978 which is very near to the overall average mean and standard deviation of benefits 4.07 and 0.926 respectively. From the results the use of BI systems have improved the efficiency of the internal processes as it helps in understanding what is happening inside the company. This can be done through an analysis of the assets management ratios which can give answer of how efficiently and effectively the company is using its resources in the process of revenue generation.

For the first benefit of increased efficiency of utilizing assets which is the part of Internal Process Efficiency benefit group around 94.6% of the respondents agreed and strongly agreed that there were an increase in efficiency of utilizing assets in the bank, while 5.4% of them were undecided about it there was no participant who responded disagreed and strongly disagreed. The finding form this result and interviewees shows that using BI allows them to understand their customers better, understand their services and products better and also give the company fresh view and new different directions.

The second question asked in this group of benefits was regarding the benefit of leveraging the advantages of IT upgrades, improvements, and/or new developments in back-end IT systems. In this respect, 13.5% were undecided, however, majority of them (72.9%) were agreed and strongly agreed. Moreover, the mean response obtained in this regards was 3.78 implying that that the company has achieved or experienced this benefit. From the response on this benefit the finding shows that developments in the back-end and IT systems are necessary and important in the bank.

In the third benefit of this group, participants were asked if there were improvements on the efficiency of internal processes. 43.2% strongly agreed and 45.9% agreed on the specified benefit of BI, while 10.8% of them were neutral. The result shows that no participants disagreed or strongly disagreed on the benefit regarding improved efficiency of internal processes. From the result and interviewees response, we can conclude that BI systems can improve the efficiency of the internal processes by using key performance indicators and scorecards for different units and different departments.

The fourth question asked to respondents related to the internal process efficiency group of benefits was whether using BI system has increased staff productivity. The majority of the study participants (81%) agreed and strongly agreed that using BI increased staff productivity of the company. Meanwhile, 5.4% of them disagreed, and 13.5% of them were not sure about this benefit. This shows that BI system could be the key to improving staff productivity. Moreover, interviewees added that when employee has the important information on time the company could eventually save a lot of time, resources etc., making that particular employee more productive.

Regarding the assessment of the reduction in the cost of effective decision-making benefit the result shown in table above reveals that 8.1% were undecided, however, majority of them (89.2%) were agreed and strongly agreed. Moreover, the mean response obtained in this regard was 4.19 implying BI systems can highly reduce the costs of effective decision-making.

Furthermore, the study tried to find out whether there was reduction on operational costs benefit from using BI, and the majority of the respondents (75.6%) were agreed and strongly agreed

with a mean value of 4.03. From the result, we can conclude that the company has experienced this benefit.

4.4.4 Customer Satisfaction Benefits

The assessments from the questionnaire on the fourth and last group of benefits - Customer Satisfaction achieved after implementing BI systems shows group mean of 4.1 and standard deviation of 1.060 which is very near to the overall average mean and standard deviation of benefits 4.07 and 0.926 respectively. From the results customers voice heard by service providers, trends identified more quickly and the BI systems predict the future trends through collected data more than just surface analysis. With less time delay and faster response the customers could be satisfied from the company (Elbashir et al. 2008), thus that will keep them as loyal consumers of companies' services.

The first question asked to respondents related to the Customer Satisfaction group of benefit was whether using BI system has improved customer service. The majority of the study participants (83.7%) agreed and strongly agreed that using BI improved customer service. Meanwhile, none of the respondents disagreed and strongly disagreed, and 16.2% of them were not sure about the improvement of customer service in the bank. This shows that this BI system benefit could be achieved by the use of BI systems new features around the customer feedback and reacting to customer problems very quickly.

For the second question regarding the assessment of the reduced marketing costs benefit the result shown in table above reveals that 27% of the respondents were undecided, however, majority of them (64.8%) were agreed and strongly agreed. Moreover, the mean response obtained in this regard was 3.89 implying that this company has achieved this benefit by using BI data for marketing.

For the last benefit of the customer satisfaction group of benefits which is reduced time to market services 45.9% strongly agreed and 32.4% agreed while 18.9% of them were neutral with a mean value of 4.22. From the response we can conclude that this benefit can be achieved with an argumentation that when they know what the customer want, they can build features, and deliver quickly.

The interviewees answered most of the above mentioned benefits were gained by implementing Business Intelligence project in the bank and were the conditions that made the Bank motivated towards implementing Business Intelligence project in addition to deploying standard reporting system. Additionally, said that overall progress of BI system, it clearly brought additional benefits such as the Ease of use, Easy information sharing, rapid performing & update, increase core competencies, improved accessibility, mobility, and usability and security standards.

4.5 Critical success factors of Business Intelligence Implementation

Even if there might be various critical success factors in connection with Business Intelligence implementation project, seven major factors have been identified as important for BI success were distributed on survey questionnaire for getting confirmation about impotency ranking by thirty seven respondents based on likert scale. Most of the survey responses were with "Important" and "Very Important" ranking as can be seen from the survey results summary in table below. Here, the researcher presented the response for the questions that were asked on the implementation project if the seven performance factors were taken into account for accomplishment of BI project in commercial Bank of Ethiopia. The responses presented by categorizing them under Organizational, process and technology factors as discussed in the literature.

Table 4.3: Critical success factors of BI implementation

Success factors	Category	Level of agreement					Total	Mean	SD
		1	2	3	4	5			
Clear vision and well-establish business case	Frequency		2	6	16	13	37	4.08	0.862
	Percent	0	5.4	16.2	43.2	35.1	100		
Committed management support and sponsorship	Frequency		1	3	21	12	37	4.19	0.701
	Percent	0	2.7	8.1	56.8	32.4	100		
Business-centric championship and balanced team composition	Frequency		3	5	13	16	37	4.14	0.948
	Percent	0	8.1	13.5	35.1	43.2	100		
Business-driven and iterative development approach	Frequency		2	10	11	14	37	4	0.943
	Percent	0	5.4	27	29.7	37.8	100		
User-oriented change management	Frequency	9	11	5	7	5	37	2.68	1.396
	Percent	24.3	29.7	13.5	18.9	13.5	100		
Business-driven, scalable and flexible technical approach	Frequency	1	2	4	13	17	37	4.16	1.014
	Percent	2.7	5.4	10.8	35.1	45.9	100		

Success factors	Category	Level of agreement					Total	Mean	SD
		1	2	3	4	5			
Clear vision and well-establish business case	Frequency		2	6	16	13	37	4.08	0.862
	Percent	0	5.4	16.2	43.2	35.1	100		
Sustainable data quality and integrity	Frequency	10	12	4	7	4	37	2.54	1.366
	Percent	27	32.4	10.8	18.9	10.8	100		
Group Mean and Standard Deviation								3.68	1.033

Source: Own Survey, 2020 SPSS version 20 outputs, Note: 1 = Not important, 2 = Less important, 3 = Uncertain, 4 = Important, 5 = Very important

The assessments from the questionnaire on the critical success factors of implementing BI systems shows group mean of 3.68 and standard deviation of 1.033. From the results a successful implementation of the BI system requirements such as optimizing limited resources and focusing on the factors which have the most significant impact on the success of the implementation was considered critical.

4.5.1 Organizational factors

The study tried to assess if one of the organizational factors which is clear vision and well-establish business case was critical success factor for the project. In this respect, 16.2% of the study participants were undecided, however the majority of the respondents (78.3%) responded important and very important that clear vision and well-establish business case was critical for the implementation project with mean value of 4.08. From this result we can conclude that the vision was successful and well-communicated with clear vision especially from the company-wide perspective.

According to collected data from respondents with regard to the committed management support and sponsorship, almost all of the respondents said that it was considered successful with mean value of 4.19. Only 8.1% of the respondents were uncertain about this factor. In summary, it has taken into account and implemented the organizational factors, which are the most important factors but also the most complicated to realize.

4.5.2 Process factors

Data collected Related to business-centric championship and balanced team composition shows that 13.5% of them were neutral, while 35.1% of the responses were important and the remaining

43.2% responses were very important indicating that balanced combination of people from business side and IT side were considered.

The study sought to assess if Business-driven and iterative development approach was considered critical factor. 37.8% of the participants responded very important and 29.7% important with a mean value of 4. From the results we can conclude that the business units were involved in the planning, so the approach was quite business-driven.

Another success factor in the category of process factors is User-oriented change management and in the responses collected 24.3% responded not important and 29.7 responded less important with a mean value of 2.68. Considering the data collected user-oriented change management, the challenges related to change management in implementing the BI system were moderately successful factor. Overall the factors of the category have been reasonably effective. The project teams were balanced with business-driven approach but with challenges of change management.

4.5.3 Technological factors

In the category of technological factors, the research participants were asked if there was Business-driven, scalable and flexible technical approach and 45.9% responded very important and 35.1 responded important with a mean value of 4.16. The result indicates that most respondents feel the system was flexible and scalable enough, and most of the technical issues were resolved.

Another technological factor the study sought to investigate was whether Sustainable data quality and integrity considered critical success factor. In this regards, 27% responded not important and 32.4 responded less important with a mean value of 2.54 indicating that this was the least successful factor in the BI implementation project. The result also shows that there was data quality and system integration problem.

4.6 Business Intelligence challenges

As it has precisely described in the statement of the problem of this study paper, there might be various problems or challenges in BI project implementation due to the fact that BI project needs high integration and communication between IT and business teams. In this research paper, 37

respondents were asked six challenges encountered during Business Intelligence project implementation and eight challenges encountered while using Business Intelligence system. The analysis for the collected data is presented as follows for both categories of challenges.

4.6.1 Challenges encountered during Business Intelligence project implementation

Table 4.4: Challenges during Business Intelligence implementation

Statements	Category	Level of agreement					Total	Mean	SD
		1	2	3	4	5			
Difficulty and time needed to learn the BI tools	Frequency	14	11	3	6	3	37	2.27	1.347
	Percent	37.8	29.7	8.1	16.2	8.1	100		
The cost of obtaining BI license	Frequency	5	10	6	9	7	37	3.08	1.362
	Percent	13.5	27	16.2	24.3	18.9	100		
Additional costs associated with managing BI project	Frequency	6	8	6	8	9	37	3.16	1.444
	Percent	16.2	21.6	16.2	21.6	24.3	100		
Lack of interest on the part of managers	Frequency	1	2	4	14	16	37	4.14	1.004
	Percent	2.7	5.4	10.8	37.8	43.2	100		
Costs necessary to support and train system users	Frequency	4	5	5	12	11	37	3.57	1.345
	Percent	10.8	13.5	13.5	32.4	29.7	100		
Lack of interest from users	Frequency	2	7	7	9	12	37	3.59	1.279
	Percent	5.4	18.9	18.9	24.3	32.4	100		
Group Mean and Standard Deviation								3.3	1.297

Source: Own Survey, 2020 SPSS version 20 outputs, Note: 1 = Very Low, 2 = Low, 3 = Uncertain, 4 = High, 5 = Very High

The assessments from the questionnaire on the challenges during BI system implementation shows group mean of 3.3 and standard deviation of 1.297. From the results we can conclude that company more specifically have difficulties with the redesigning of organizational processes, management structure, measuring systems and operating business in a continually changing environment.

The first question asked to employee respondents in this group of challenges was complexity and time required to learn the BI. Majority of the participants (67.5%) responded very low and low with mean value of 2.27. The result indicates that difficulty and time needed to learn the BI tools was not big challenge during the implementation.

In the second issue, the respondents were asked if there were challenge related to cost of obtaining BI license. 16.2% of the participants were not sure, but 24.3% responded high and 18.9

responded very high. From the result we can conclude that there was a bit of challenge in the cost of obtaining BI from oracle. The interviewees have also mentioned that there were some challenges on increasing the number of users due to the price paid for oracle business intelligence license. They added that this challenge happened because the scope of the project was to avail BI system to the head office organs only, but later they needed additional license cost to avail the system to districts and branches.

Regarding the third question presented to the respondents, they were asked about challenges of Additional costs associated with managing BI project. In view of this, 21.6% responded high and low 24.3 responded very high with mean value of 3.16. The data collected shows that there was ac challenge of additional costs in the project.

The fourth aspect the study investigated if there was Lack of interest on the part of managers. 10.8% of respondents were undecided about this issue, 37.8% responded high and 43.2 responded very high with the largest mean value under this category of challenges which is 4.14. From the results we can conclude that there was resistance to change from some managers due to lack of interest.

Moreover, the research respondents were also asked whether costs necessary to support and train system users was challenge. 32.4 % responded high and 29.7 responded very high with mean value 3.57. The result indicates that the budged planned for support and training of users was not enough.

The sixth question for respondents in this category of challenges was related to lack of interest from users. The result shows that 18.9% were undecided, and 24.3% responded high and 32.4% responded very high with the second largest mean value of 3.59. Considering the result we can conclude that interest to use new technology was a challenge during the implementation.

4.6.2 Challenges of using Business Intelligence

Table 4.5: Challenges of using Business Intelligence

Statements	Category	Level of agreement					Total	Mean	SD
		1	2	3	4	5			
Users prefer other tools or methods	Frequency	8	9	3	10	7	37	2.97	1.481
	Percent	21.6	24.3	8.1	27	18.9	100		
poor data quality/Incorrect data	Frequency			4	17	16	37	4.32	0.669
	Percent	0	0	10.8	45.9	43.2	100		
Too complex BI tools	Frequency	12	14	2	5	4	37	2.32	1.355
	Percent	32.4	37.8	5.4	13.5	10.8	100		
Sluggish response time of the system to user requirements	Frequency		1	3	21	12	37	4.19	0.701
	Percent	0	2.7	8.1	56.8	32.4	100		
Lack of support from managers	Frequency	11	13	5	3	5	37	2.41	1.363
	Percent	29.7	35.1	13.5	8.1	13.5	100		
Too many reports and program files	Frequency	1	2	10	11	13	37	3.89	1.048
	Percent	2.7	5.4	27	29.7	35.1	100		
Insufficient functional capabilities of the system	Frequency	13	12	3	6	3	37	2.3	1.331
	Percent	35.1	32.4	8.1	16.2	8.1	100		
Insufficient control instruments	Frequency	11	15	2	4	5	37	2.38	1.381
	Percent	29.7	40.5	5.4	10.8	13.5	100		
Group Mean and Standard Deviation								3.1	1.166

Source: Own Survey, 2020 SPSS version 20 outputs, Note: 1 = Very Low, 2 = Low, 3 = Uncertain, 4 = High, 5 = Very High

The assessments from the questionnaire on the challenges of using BI system shows group mean of 3.1 and standard deviation of 1.166. From the results we can say that Data quality and integrity issues mostly due to disparate data source systems and these problems have a straight impact on quality of reporting and analyzing. So even though technological factors have a lower impact on the implementation success, they can also lead to the failure of the BI implementation.

The first question asked to employee respondents in this group of challenges was if users prefer other tools or methods. The participants responded 21.6% very low, 24.3% low, 27% high and 18.9% very high with mean value of 2.97. The result indicates that some of the users were comfortable with old reporting methods and resistance to the new technology BI system was a challenge.

In the second issue, the respondents were asked if there were challenge related to data quality or incorrect data. 45.9% responded high and 43.2% responded very high with the largest mean

value under this category of challenges which is 4.32. From the result we can conclude that there were incorrect reports generated from the BI system due to poor data quality in the bank data warehouse. Interviewees responded that data quality was one of the main challenges while using the BI system with some wrong summary and detail reports especially on credit and digital banking reports data. The interviewees also said that the bank tried to mitigate the challenge by organizing a task force to clean the data and preparing training to the report developers on business logic of the areas with incorrect reports.

Regarding the third question presented to the respondents, they were asked if the BI tools were too complex to use. In view of this, 32.4% responded very low and 37.8% responded low with mean value of 2.32. The data collected shows that the BI system was mostly user friendly and less complex.

The fourth aspect the study investigated if there was sluggish response time of the system to user requirements. 89.2% responded high and very high with the second largest mean value under this category of challenges which is 4.19. The interviewees added that this issue is related to data warehouse tables and views optimization problem. From the results we can conclude that there was high response time during the generation of reports using BI.

Moreover, the research respondents were also asked whether Lack of support from managers was challenge while using the system. 64.8% of the participants responded very low and low with mean value 2.14. The result indicates that the there was adequate support to the users.

The sixth question for respondents in this category of challenges was if there are too many reports and program files in the system. The result shows that 27% were undecided, and 29.7% responded high and 35.1% responded very high with the mean value of 3.89. Considering the result we can conclude that there are too many reports in the BI system in which the users did not use or unaware about the reports.

Regarding the seventh question presented to the respondents, they were asked if insufficient functional capabilities of the system were a challenge. In view of this, 35.1% responded very low and 32.4% responded low with the lowest mean value in this category of challenges which is 2.3. The data collected shows that the BI system has sufficient functionalities to enable user better decision making. Additionally, the Interviewees answered that the extent of Business

Intelligence tools customized and used in Commercial Bank of Ethiopia was at all levels including all required functionalities and features for better decision making

The final question the research respondents asked was if there was system challenge of insufficient control instruments. 70.2% responded very low and low with mean value 2.38. The result indicates that the system have enough control and administration instruments.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This study aimed at assessing the impact of Business Intelligence implementation conducted in Commercial Bank of Ethiopia under PMO and MIS departments. This chapter presents the result of findings and recommendations that are forwarded to MIS and PMO departments at Commercial Bank of Ethiopia.

5.2 Summary of Major Findings

The aim of this study was to evaluate the impact of Implementing Business Intelligence in Commercial Bank of Ethiopia. The specific aim of this study was to assess the benefits, challenges and critical success factors of implementing Business Intelligence in PMO and MIS departments of CBE. Out of 45 target population 37 responded which is 82% population rate. Semi-structured interview and questionnaire was used to collect primary data.

Hence, the major findings on evaluation of the impact on Implementation of Business Intelligence project in Commercial Bank of Ethiopia are stated as follow:

- Most of the respondents were belonging in the productive age group that is from 26-30 Years and 31-40 Years whose summation percentage is counted as 81 %. This implies that majority of the workforce is in the young and productive age range which helps the project to be successful.
- Organizational Benefits that the company has achieved after implementing BI systems shows group mean of 3.86 and standard deviation of 0.838. From the results and depending on the business model, and the business area in which company operates, those different organizational benefits of BI have been obtained.

- Business Partner Relation benefits achieved after implementing BI systems shows group mean of 4.37 and standard deviation of 0.827. From the results Business partner relation benefits are obtained from improved relations with customers by the use of BI system.
- Internal Process Efficiency benefits achieved after implementing BI systems shows group mean of 4.15 and standard deviation of 0.978. From the results the use of BI systems have improved the efficiency of the internal processes as it helps in understanding what is happening inside the company.
- Customer Satisfaction achieved after implementing BI systems shows group mean of 4.1 and standard deviation of 1.060. From the results customers voice heard by service providers, trends identified more quickly and the BI systems predict the future trends through collected data more than just surface analysis.
- The assessments on the critical success factors of implementing BI systems shows group mean of 3.68 and standard deviation of 1.033. From the results a successful implementation of the BI system requirements such as optimizing limited resources and focusing on the factors which have the most significant impact on the success of the implementation was considered critical.
- The assessments on the challenges during BI system implementation shows group mean of 3.3 and standard deviation of 1.297. From the results we can conclude that company more specifically have difficulties with the redesigning of organizational processes, management structure, measuring systems and operating business in a continually changing environment.
- The assessments on the challenges of using BI system shows group mean of 3.1 and standard deviation of 1.166. From the results we can say that Data quality and integrity issues mostly due to disparate data source systems and these problems have a straight impact on quality of reporting and analyzing. So even though technological factors have a lower impact on the implementation success, they can also lead to the failure of the BI implementation.

5.3 Conclusion

The main objective of the study was to assess the impact of Implementing Business Intelligence Project in Commercial Bank of Ethiopia. In this regard, the benefits encountered during and after the implementation of Business Intelligence project, critical success factors of business intelligence implementation, and challenges faced during and after the implementation were assessed by raising different issues in the form of questionnaire and interview.

Regarding the benefits encountered in the implementation of Business Intelligence project, the finding shows that the use of BI systems and tools within the organization have certainly resulted in achieving decent amount of benefits. The majority of the respondents perceive that the presence of Business Intelligence in their firm helped them remain competitive. The effective uses of applications and business processes supported by BI systems have positively influenced process level performance, the study found. Though financial performance of a firm is dependent upon several factors, the impact of BI system use can be seen first at the performance of its internal business processes, as leading indicator. From the interviews it is clear that BI acts as an accelerator, making processes more efficient and focused over time. BI can also lead to greater levels of strategy focus and clarification as iterations are completed. The role of BI across functional areas, not just within silos, became apparent from the research as a critical prerequisite for attaining a higher ROI from investments in these technologies. In order to discover its full potential, it is necessary to improve management of BI system usage and the extent of usage by getting as many users as possible to work with the system and deliver right amount of detail reports to the right people at the right time.

Based on the evaluation of critical success factors of business intelligence implementation over half of the seven crucial success factors were considered during implementation and the implementation could be deemed successful. Committed management support and sponsorship was the most successful factor. Organizational success factors were considered successful particularly during the implementation as the interviewees also felt that. Process factors were overall on more than average level since implementation projects had a fair mix of individuals from business side and IT side and the method was a little more business-driven and iterative. When considering the overall result, Sustainable data quality and integrity was the least

successful factor which is categorized in the technological factors. However, as per the interviewee's opinion there have been frequent corrections to technical problems and data quality concerns.

The finding obtained from the assessment of challenges faced during the implementation of BI shows that Managers' lack of interest and users' lack of interest were the most challenging ones. While the study observed satisfaction with the reporting capabilities of the BI system, a significant proportion of users continue to use excel to produce reports and bypass their BI system. The interviewees mentioned that, though this was convenient and expedient, the risk it poses to data integrity and the consequent impact on the quality of support to decision making and performance management are significant and cannot be ignored. Even though the data sources used are common, allowing users to access older reporting systems and tools may remove incentive to learn something new. Importantly, the motivation and opportunity to find the unknown, to dig deep and uncover a new perspective on the organization from this new intelligence systems may be lost if the firms continue to allow users to bypass their BI systems. Additionally, the high cost of software licenses and costs necessary to support and train system users often serves as a barrier to BI adoption.

Finally, on the findings related to challenges faced while using BI poor data quality and Sluggish response time of the system to user requirements were the most significant challenges. The interviewees said that making sure the data is reliable, available and ensuring that the BI system can interact with other systems at the data, application, and business process and user levels was one of their main tasks. They also added that Identify data migration and interaction with other systems were the most potent barriers to BI adoption and usage. Slow performance of the BI system due to an inadequate technical infrastructure such as low bandwidth was also mentioned as a main challenge which syncs with the data collected from questionnaires.

5.4 Recommendation

Based on the findings of the study, the following recommendations are forwarded:

- Technical documentations of data definition and system logics should be developed for all applications in the bank.
- Projects or customizations for any applications in the bank need to consider data related issues including Master data management and data quality management.
- New digital or conventional services and products development should be properly communicated to MIS department.
- Data Governance and data management policy should be developed and implemented.
- Data ownership and stewardship policies should be followed for any data related processes.
- Data life cycle management should be considered during all processes related to data.
- Based on the findings there was big challenge on the part of managers who don't have interest on BI. The bank should keep communication lines open as they conduct and roll out the system and help understand how this new system will serve them in their roles and help the business as a whole.
- Sluggish response time of the system to user requirements can be resolved by gathering feedback from users and make needed changes such as indexing tables and optimizing views that are used for reports development to decrease their response time, as the reports are consumed and used.
- The bank should upgrade the BI system to include self-service BI tool in addition to the features available. Having self-serve tool is crucial to keep fresh insights coming and make sure business data teams don't always fall into report category catalog list.
- The Business department should have ownership over BI rather than IT. Although the complexities of early BI technologies put IT in charge of many BI programs, this BI tool is more intuitive, allowing it to go straight into the hands of business users who can run the queries that matter to them. Additionally, the speed at which business users need access to data and insights derived from BI can increase dramatically since today's business users often need actionable information in real time and cannot wait for IT to generate reports.

- The Bank should determine the overall role that BI will play in driving business strategy, enhancing the business vision and specifically helping them to remain competitive in the business world.
- The Bank should ensure that their business teams are aligned with technical development teams by joint application development sessions to bring the two groups together and gain a common understanding. This will help the bank to achieve its mandate and continue with their daily business.
- Since Business Intelligence is a new idea and some of the staffs still use the traditional approach to data management and information systems, the management should build the capacity of the staff through training sessions, workshops, or seminars so that when they develop their strategy, it can be easily implemented and monitored in order to increase the performance of the organization.
- The BI system can easily lose the faith of end users if your data is determined inaccurate. Data quality and data cleansing should be done consistently because that determines the quality of the analysis and reports generated from the BI system.

5.5 Future area of research

Future scholars can use the approach of this study and extend the research to districts and branches to increase the number of participants so that they can have an adequate number of research subjects in order to come up with generalized findings and results that can be used in future by other companies and researchers.

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ANNEX

Questionnaire

ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

SCHOOL OF COMMERCE

PROJECT MANAGEMET DEPARTMENT

Dear Sir/Madam

Good day! I am a graduate student in the postgraduate program of Project Management at Addis Ababa University, School of Commerce. I am currently undertaking a research project on the topic "Benefits and challenges of Implementing Business Intelligence Project: The Case of Commercial Bank of Ethiopia" to fulfill the partial requirement for the Master's Degree program.

You are one of the respondents that have been selected to participate in this research. I would be grateful if you kindly take few minutes of your time from your busy schedule to fill out this questionnaire by reflecting on your personal experience with regard to the issues raised. Your willingness and cooperation in giving genuine information is well appreciated and the information you provide will be used for academic purpose only and will be kept in strict confidentiality.

If you would like to gain further information about this study or have a problem in completing this questionnaire, please contact me via email amanof2000@gmail.com or on my cell phone +251 973-05-41-91.

I would like to thank you in advance for your cooperation and taking the time to consider my request.

Yours Sincerely,

Amanuel Eyasu

Section I: Demographic Information

Please mark √ for the answer you have selected.

1. Gender

   ☐ Male ☐ Female

2. Age Group

   ☐ 18 – 25 years ☐ 26 – 30 years ☐ 31 – 40 years ☐ 41 and above

3. Education level

   ☐ Diploma ☐ BA/BSC ☐ Masters Degree ☐ above Masters

   Other please specify: _____

4. service year

   ☐ ≤ 3 years ☐ 4 – 9 years ☐ 10 – 15 years ☐ 16 - 20 years

   ☐ ≥ 21 years

5. Which department/division are you working in?

   ☐ Management Information System ☐ Program Management office

Section 2: Questions Related to Benefits of Business Intelligence Implementation

Please read each statement in the Second column carefully and show the extent of your agreement on the statements by putting (√) in the next column using the following rating scale (Likert Scale). The rates are: 1 = Strongly Disagree, 2 = Disagree; 3 = Uncertain, 4 = Agree, 5 = Strongly Agree

No.	Statements	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
1.	Improved customer service					
2.	Improved the efficiency of internal processes					
3.	Increased staff productivity					
4.	Reduction in the cost of effective decision-making					
5.	Reduced operational costs					
6.	Reduced marketing costs					
7.	Reduced time to market services					
8.	Reduction in the cost of transaction with business partners					
9.	Improved coordination with business partners					
10.	Increased efficiency of utilizing assets					
11.	Leveraged the advantages of IT upgrades, improvements, and/or new developments in back-end IT systems					
12.	Increased services provided					
13.	Reduction of lost services provided					
14.	Increased geographic distribution of services provided					
15.	Enhanced profit					
16.	Increased return on investment (ROI)					
17.	Improved competitive advantage					

Section 3: Questions Related to Critical success factors of Business Intelligence Implementation

Please read each Success factor in the Second column carefully and show the extent of your opinion on the statements by putting (√) in the next column using the following rating scale (Likert Scale). The rates are: 1 = Not important, 2 = Less important; 3 = Uncertain, 4 = Important, 5 = Very important

No.	Success factors	Not Important	Less Important	Uncertain	Important	Very Important
1.	Clear vision and well-establish business case					
2.	Committed management support and sponsorship					
3.	Business-centric championship and balanced team composition					
4.	Business-driven and iterative development approach					
5.	User-oriented change management					
6.	Business-driven, scalable and flexible technical approach					
7.	Sustainable data quality and integrity					

Section 4: Questions Related to Challenges of Business Intelligence Implementation

Please read each statement in the Second column of both tables carefully and show the extent of your agreement on the statements by putting (√) in the next column using the following rating scale (Likert Scale). The rates are: 1 = Very Low, 2 = Low; 3 = Uncertain, 4 = High, 5 = Very High

What is your opinion about the major challenges or Barriers encountered during Business Intelligence project implementation in Commercial Bank of Ethiopia?

No.	statement	Very Low	Low	Uncertain	High	Very High
1.	Difficulty and time needed to learn the BI tools					

2.	The cost of obtaining a license BI					
3.	Additional costs associated with managing BI project					
4.	Lack of interest on the part of managers					
5.	Costs necessary to support and train system users					
6.	Lack of interest from users					

What is your opinion about the major challenges or Barriers of using Business Intelligence in Commercial Bank of Ethiopia?

No.	**statement**	**Very Low**	**Low**	**Uncertain**	**High**	**Very High**
1.	Users prefer other tools or methods					
2.	Poor Data Quality/Incorrect data					
3.	Too complex BI tools					
4.	Sluggish response time of the system to user requirements					
5.	Lack of support from managers					
6.	Too many reports and program files					
7.	Insufficient functional capabilities of the system					
8.	Insufficient control instruments					

Finally, I'd like to say thank you a lot for your unreserved co-operation cordially.

Interview Questions

The interview questions below will be provided for two Directors and four managers related to Business Intelligence in Commercial Bank of Ethiopia.

1. What are the conditions that made the Bank motivated towards implementing Business Intelligence project?

2. To what extent are the Business Intelligence tools customized and used in Commercial Bank of Ethiopia?

3. What were the main challenges during the Business Intelligence Implementation and usage?

4. Were there any challenges related to scope, schedule and cost causing Business Intelligence project implementation failure?

5. Which Challenges the bank tried to mitigate to make the Business Intelligence project successful?

6. What kinds of benefits have the bank gained by implementing Business Intelligence project?