



ST. MARY'S UNIVERSITY  
SCHOOL OF GRADUATE STUDIES

Assessment of Information Technology Investment and  
Non-Financial Measure of Performance in Case of  
Commercial Bank of Ethiopia

By; Belay Ayele

JUNE, 2017

ADDIS ABABA, ETHIOPIA

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Measure of Performance in Case of Commercial Bank of Ethiopia

BY

Belay Ayele

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DEPARTMENT OF ACCOUNTING AND FINANCE



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**CERTIFICATION**

This is to certify that the thesis prepared by Belay Ayele, entitled: Assessment of Information Technology Investment and Non-Financial Measure of Performance in Case of Commercial bank of Ethiopia And submitted in partial fulfillment of the requirements for the degree of Master of Science in Accounting and Finance complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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\_\_\_\_\_  
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**Advisor**

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**External Examiner**

\_\_\_\_\_  
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**Saint Marry University, 2017**

## DECLARATION

I, the undersigned, declare that this thesis is my original work; prepared under the guidance of Abebaw Kassie (PhD) All source of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

Belay Ayele

Name

\_\_\_\_\_

Signature

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## ENDORSEMENT

This thesis has been submitted to Saint Marry University, School of Graduate Studies for examination with my approval as a university advisor.

Abebaw Kassie (PhD)

Advisor

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Signature

**Saint Marry University, 2017**

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## ACRONYMS\ABBREVIATIONS

<b>CBE</b>	Commercial bank of Ethiopia
<b>DB</b>	Development Bank
<b>DSS</b>	Decision- Support Systems
<b>ECS</b>	Electronic Communications Systems
<b>EIC</b>	Ethiopian Insurance Corporation
<b>EDP</b>	Electronic Data Process
<b>ESS</b>	Executive Support Systems
<b>IS</b>	Information System and
<b>IDT</b>	Innovation Diffusion Theory
<b>IST</b>	Information System Technologies
<b>IT</b>	Information Technology
<b>KBIS</b>	Knowledge-Based Information Systems
<b>MIS</b>	Management Information Systems
<b>MPIT</b>	Management of the Productivity of Information Technology
<b>NB</b>	National Bank
<b>TQM</b>	Total Quality Management
<b>TPS</b>	Transaction Processing Systems



## ABSTRACT

This study considered information system performance of non-financial explicitly. Instead, the implicit assumption was made that IT investment (or use) influences organizational (or sector) performance. Furthermore, Preliminary surveys and literatures on information system investments suggests a high increase on the level of investment, while there appears to be a lack of concrete empirical research on the area. In an attempt to explore the extent of this presumption, this research investigates the current state of IS investment and its process within commercial bank of Ethiopia several theories and empirical outcomes were proposed to explain the investment pattern, IT techniques and IT relationship on non- financial performance and post investment perception of IS adopters by the study subjects. To this end, the results of the study showed that information system investments are justified by information system with the investment pattern focusing mainly on transaction processing systems (86.7%), management information systems (78.8%) and communication systems (84.8%). Adding to this findings, the study showed the degree of perception investors have on the relative advantage brought by the system and the compatibility of the system with the organizations setting, in doing so the respondents showed a positive perception that was revealed with a mean value of 4.08 and 4.06, respectively: on a 1 to 5 scale where higher value represents higher agreement. Based on this findings, recommendations were made for a several composition of professionals on IS investment justification process.

*Key Words: Information System, Information Technology, Non-financial Technology Investment*

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## CHAPTER ONE-INTRODUCTION

### 1.1. Background of the Study

In recent years, the utilization of information technology has considerably increased in service industries, particularly, the banking industry. Which by using Information Technology related products such as internet banking, electronic payments, security investments, and information exchanges managed to deliver high quality services to client with less effort (Berger, 2003).

Today's, investment level in information technology industry has increased significantly that these investments in 2003 have been three times of any other type of investments (Adkinson et al., 2004).

Information technology can be considered as a way for the progress of the economy, where an open economy and suitable markets became a requirement of development for the transition to a knowledge society encourages innovation, creativity and scientific research through responding to the evolution in information technology (Teece,1986). For prompt, according to (Al Ghad newspaper, issue of 13.10.2012) the spending of the United States in communications and information technology ranges between 45 and 55% of the total spending, besides that the size of investment is more than \$400 billion in the Middle East, where the estimated investment size in Kingdom of Saudi Arabia is more than \$53 billion annually, while in Jordan is estimated about \$18.3 million for the 2010. This is a clear indication of the local, regional, and international interest in investment in information technology.

Accordingly the IT Technology about the bank industry, the basic functions of banking has remained the same but the way in which banking services are provided has altered (Rangarajan, 2011).

(Rangarajan, 2011) itemized the evolution of technology adoption in banking as follows: first, it started off with computerization of a few key functions and departments in major branches through adoption of what the author called advanced ledger posting machines. These systems were designed to take care of the accounts related functions of the banks which were at the heart of banking operations and which had assumed great significance in terms of the need for accuracy and control. Second, the next progress is towards branch automation. This enabled



setting up of “Single Window Service” facilities which were focused on the customers. Third, there is the emergence of network based operations which were aimed at providing interbank connectivity. Fourth, an important stage in the evolution of the user friendly technology arrived with the deployment of ATMs and the adoption of Core Banking Solution which radically transformed the way banking is done by bankers and customers. The introduction of these various technology products has had a beneficial impact on both banks and customers.

It assists customers to validate their account numbers and receive instruction on when and how to receive their Chequebooks, credit and debit cards, Communication Technology deals with the Physical devices and software that link various computer hardware components and transfer data from one physical location to another (Laudon and Laudon,2001) the other ones first removal of the distances and hence placement of the previously separated computers in one World Wide Web, and second computerization of the telecommunication systems that create new capacities in transmitting audio and video because of two dimensional convergence provides human with new tools and instruments for gathering, storing, processing, organizing, transmitting and displaying information ( Mellat-Parast & Lester ,2007).

(Brynjolfsson and Hitt, 2000) indicates that information technology contribute significantly to firm level output. They determine that information technology capital contributes an 81% marginal increase in output, whereas non information technology capital contributes 6%. Likewise they illustrate that Information System professionals are more than twice as productive as non- information system professionals. Ordinarily, recent literatures showed that the relationship concerning information technology and banks’ performance have two encouraging outcomes. Firstly, information technology can bring down the operational costs of the banks (the cost advantage). For instance, internet technology facilitates and speeds up banks procedures to accomplish standardized and low value-added transactions such as bill payments and balance inquiries processes via online network. Consequently, this technology will helps banks concentrating their capitals on exceptional, high- value added transactions such as personal trust services and investment banking via branches. The second encouraging outcome is that information technology can promote transactions between customers within the same network (the network effect) (Farrell and Saloner, 1985; Economides and Salop, 1992). Researchers and practitioners have agreed to the fact that traditional analysis focused only on financial or

technological aspects is not complete. Different substitute methods have been suggested to complement evaluation of IT investment.

More specifically the advantages are claimed to be demonstrated, either through increasing revenues at marginal cost, or through reducing costs at marginal changes in revenue, with both enhancing operating profits (Mashhour & Zaatreh, 2008). In light of such studies, this study tries to assess the adoption of information technology investment through the use of methods recommended in past studies by taking the case of Commercial Bank of Ethiopia.

## **1.2. Statement of the Problem**

Information technology is an integral and fundamental part for supporting, maintaining and growing a business. With this knowledge, companies are making huge investments in the field of information technology. Gartner (2010) reports that in spite of the rapidly declining economy, currently the expenses made on information technology at the global level in 2010 reaches 3.4 Trillion, compared to 2009 it has an increase of 4.6%, this is while a large part of the investment made on information technology does not have a guarantee of high return.

In the same trend, information systems and corresponding investments on information system technologies has been given paramount attention by business in Ethiopia. In this regard, being a leader in the national GDP contribution (NBE, 2014), the service sector in general and the banking industry in specific is notable. Affirming this fact (Locher, Mehlaui, & Wild, 2004) suggested that; information technology and information systems play an important role in banking business. Development, production and distribution of banking services are not feasible without the permanent use of IT.

Despite this long established believe, (Standish Group, 2006) reports that around 67% of all the information technology projects have been unsuccessful or face problem and challenge in justifying the investments made. Companies make large and huge investments on information technology and put themselves at high levels of risks. Hence, organizations should constantly review their investment returns.

In this regard, the productivity paradox as (Brynjolfsson, 1991) explains, while computing-power and investment in information systems increases, the resulted productivity, especially in the service sector has stagnated. Which resulted in a strongly established believe, that information

system investments do not increase productivity, and even if they do they cannot be individually identified from a company's financial performance. As a remedy, non-financial assessment methods have been offered by different scholars. To this end (Abdel-Maksoud et al, 2005) suggested a model involving five non-financial performance measures: customer satisfaction, product quality, on-time delivery, efficiency and utilization and employee morale.

Non-financial performance measures such as customer satisfaction, product quality, or employee turnover are especially relevant in cases where market-based performance measures showing the total firm value are not available. This is true for the division of a firm, or when the firm is not listed on a stock market. Then, the director or owners of the firm can only use accounting-based and non-financial data for performance evaluation and management compensation.

The examination of the performance measurement systems literature showed that many management accounting scholars (Malina and Selto, 2001; Laitinen, 2002; Drury, 2004; Elg and Kollberg, 2009) asserted on incorporating non-financial performance measures as an essential part of management information system

Some of the researchers are believed on the components of non-financial disclosure. For example customer satisfaction took much interest. (Ittner, Larcker, & Meyer, 1997), found a statistically significant positive relationship between customer satisfaction and a company's future financial performance. (Lambert, 1998) also points out a positive relationship between customer satisfaction and future financial performance. (Anderson, Fornell, 2004) found a positive relationship customer satisfaction and shareholder value. However, (Mavrinac and Seisfeld, 1997) found out that institutional investors treat customer satisfaction as a rather non-significant factor.

As result, the researches argued that only financial information is not adequate to portray the corporate value of the company (Arvidsson, 2011; Milost, 2013).

To the contrary, a studies conducted locally proves short of this wider understanding. These studies tend to focused on financial assessment techniques. To this end, (Dagne, 2010) studied the practice of six private banks on information technology investments and the relationship between their IT capital with that of the firm's corporate value. Though the study had contributed to the subject matter, it failed to show what actual evaluation process the banks followed in

relation to both economic and strategic evaluation approaches, stating that no appraisal mechanism has been followed. In addition, the study only considered economic appraisal approaches and disregards the multitude of approaches available in the literatures. In addition, the study considered IS investments made on the period pre 2010, a period regarded as low IS investment period when compared to the subsequent five years, where the banking industry has made enormous investments in the area. Other studies made by (Nigussie, 2015) considered the impact of IS on banks performance, and tried to identify the challenges faced whereas (Kubie, 2010) tried to show efficiency of service delivery through information system. Despite their daring contribution for the area, both studies left out the investment process along with any investment justification process made by the firms.

Therefore, this study in contrary to previous studies, will contribute to our understanding of IT investments through the use of non- financial measures with respect to the Commercial Bank of Ethiopia. Theoretical and empirical works available in the area were reviewed and employed to give the assessment process a more balanced outlook. With this, it was attempted to address the gap not yet filled by previous studies, and further investigates the issues which were considered shallowly.

### **1.3. Research Questions**

This study, based on the preceding problem statement, answers the following research questions.

- What are the types of information technology investments made by the commercial bank of Ethiopia?
- What is the Information System Investment Added values Assessment on Commercial Bank of Ethiopia?

### **1.4. Objectives of the Study**

#### **1.4.1. General Objective**

The general objective of this study is to assess the level of perception of users on information technology investment made by the Commercial Bank of Ethiopia.

#### 1.4.2. Specific Objectives

- To assess the type of information system investment made by CBE?
- To assess voluntariness of information technology in CBE?
- To assess relative advantage of using information technology in CBE?
- To assess Compatibility aspect of information technology with work style in CBE?
- To assess image use of information technology in CBE?
- To assess over all information technology to get information ease to use in CBE?
- To assess result Demonstrability of information technology are apparent in CBE?
- To assess visibility of information technology in CBE?
- To assess Trainability information technology in CBE?

#### 1.5. Significance of the Study

The primary significance of this study contributed to the shortage of empirical researches in the area of IT investment and their effects in performance and productivity. With this study will add significance contribution on the area within Ethiopia. In addition this study enables stakeholders (public financial institution) such as; banking organizations, software providers and technology consulting firms' to add would cover study of investment made on non-performance information technology investments as stated on title and present the fact. Hop that, the study will get interested stakeholders' attention who are willing to go further for study on similar but different business sectors pertaining information technology system investment and decision. It will also have a great contribution for bank administrators and information technology department to improve their awareness especially in the banking and its significance goes to other banks or financial institutions for the reference purpose to their technological improvement programs. Finally, methods and techniques applied in the research also enhance the researchers' know-how.

#### 1.6. Scope of the Study

The study's target population is Commercial Bank of Ethiopia. This is due to the fact that, according to (NBE, 2016) the bank constitutes 56% of market share of Commercial Banks in Ethiopia.

The study is framed to assess of information technology investments by commercial bank of Ethiopia. In doing so, due to the lack of other type of banking business in the industry like retail banking (retail banking proved to domestic and loan banking service) only commercial banks are

considered in the study. In addition, to the study mainly on analyzing to assess of Information technology Investment and Added values Assessment on Commercial Bank of Ethiopia for the year 2016. The study covers four districts of the banks and in sub-branch in districts, which was allow it in covered Addis Ababa and surrounding regions. This was result in addressing the city which has the largest branch distribution of the bank. The respondents purposively selected by one branch managers or districts, one assistance manager or districts and one IT manager or officer.

Furthermore, the study focuses on both; the operation ability or monitoring and productivity of information technology investments on the employee's for the different types of information technologies in the bank's activity to use in different sight technological access right proved the company effected on products.

### **1.7. Limitation of the Study:**

The study here outlines some of the difficulties and obstacles as follows:

The study is applied on commercial bank of Ethiopia and therefore the dissemination results will be limited to them.

### **1.8. Organization of the study**

The study is arranged in to five chapters, the first chapter introduces the paper by outlining the study background, the problem statement, the study objectives, and the scopes of the study. Whereas, the second chapter contains the detailed theoretical and empirical literature review s made on the study area. The third chapter contains the methodology of the study, where the study design, the target population, data collection and analysis methods were described in detail. The fourth chapter is dedicated to the presentation of the study result along with the corresponding interpretation and analysis. The fifth chapter of the study provides conclusions and recommendations. Finally, the study will contain two peripheral sections, bibliography section, which is arranged in the APA style, and annex section which contains relevant documents and data, used and referred in the study.

## CHAPTER TWO-LITRATURE REVIEW

### 2.1 Review of Theoretical Literature

This section contains a list of theoretical references made in the study area in order to build proper level of benchmark reference in designing the study. In doing so, the concepts; IT and its evolution,

#### 2.2.1 Information technology

Information technology simply refers to as the gathering, storing, manipulating and transferring information. It is the automation of process, controls and information production using computers, telecommunication, software and ancillary equipment such Automated Teller Machine and Debit Cards. It is a term that generally covers the harnessing of electronic technology for the information needs of a business at all levels. (Laudon and Laudon, 2001) assert that information and communication technology deals with the physical devices and software that link various computer hardware components and transfer data from one physical location to another. (Harold and Jeff, 1995) contend that financial service providers should modify their traditional operating practices to remain viable in the 1990s and decades that follow. They claimed that most significant shortcomings in the banking industry today is a wide spread failure on the part of senior management in banks to grasp the improvement of technology and incorporate it into their strategic plans.

In this regards, Information is like the blood which is circulating in the body of an organization and gives life to it. Information can feed the decision making process regarding the structure, technology and innovation and also information is like the life vessel that connects an organization to the suppliers of raw materials and customers. Information technology development such as computers and telecommunication devices has transformed the nature of so many office tasks and works. The networks of work from home and becoming automated have made possible the minimization of some departments and reducing the number of employees in an organization. From these phenomena (information technology) it can be deduced that large organizations become smaller and inclination toward more flexible and smaller organization become stronger (Damianides, 2004).

On the other hand, information technology (IT) is the bedrock for national development in a rapidly changing global environment, and this challenges us to devise bold and courageous initiatives to address a host of vital socio-economic issues such as reliable infrastructure, skilled human resources, and other essential issues of capacity building. In addition, many banks have installed up-to date modern computers that will enable them achieve communication and multimedia connection on the extranet, Intranet and internet. As Gates (1995) put it, the personal computer has already had a huge effect on business. But its greatest impact will not be felt until the PC's inside and outside a company are intimately interconnected".

### **2.2.2 The Evolution of Information Technology**

Information technology has brought enormous changes, challenging how organizations are structured and how businesses are run. Information technology is continually evolving, breaking new barriers, defining new horizons, and bringing new dimensions to our lifestyle. Information technology can simply be defined as a systematized body of tools, techniques and infrastructure for generating, collecting, storing, processing and transmitting information and data. During the late 1950s and throughout the 1960s, business data is processed through punched card equipment, electronic accounting machines, and massive mainframe computers with far lower capabilities than today's microcomputers. The data processing function, then, the responsibility of the electronic data processing (EDP) department. In 1970s the advent of primitive multi-user networks as terminals got connected to the massive mainframes. It is also the beginning of database management systems that came as a response to the challenges posed by large volume of business data. This is the foundation era of information system (IS), Management Information Systems (MIS), and Decision Support Systems (DSS). All processes were centrally handled using applications software that were developed with the third generation of programming languages. The next decades witnessed the fusion of telecommunications and networking technologies for business deployment. This ushered in distributed data processing, office information systems (OIS), and personal computers (PCs). Prominent among the goals of business enterprises at this time is improvement in the quality of products and services, hence, investments in total quality management (TQM) characterized the strategy of the leading organizations of the 1980s. In the 1990s, advances in technology made possible many innovations in programming languages that even the most optimistic of technology enthusiasts would have thought impossible only a few



years earlier. Perhaps the greatest IT innovation of today is the information superhighway. With the full integration of telecommunications and computer technology have come now new but distinct technologies such as the internet, groupware and multimedia. Today, as we move into the new millennium, the new competitive weapon is networks and the velocity of data throughput in intranets and extranets, and around the world, through the internet. The total breakthrough in information technology emerged in the mid-1990s. This period is the era of information super highway which organizations use to expand business frontiers by using the new technologies to exploit opportunities. Today's business environment is very dynamic and it undergoes rapid changes as a result of technological innovation, increased awareness and demands from customers. Business organizations, especially the banking industry of the 21st century operates in a complex and competitive environment characterized by these changing conditions and highly unpredictable economic climate. Information technology is at the center of this global change curve.

(Laudon and Laudon, 1991) contend that managers cannot ignore information systems because they play a crucial role in contemporary organization. He pointed out that the entire cash flow of most fortune five hundred companies is linked to information system. Therefore, this study provides the basis that application of information technology concepts, techniques, policies and implementation strategies to banking services will become a subject of fundamental importance and concerns to all banks and indeed a prerequisite for local and global competitiveness. Information technology affects how managers decide, how they plan and what product and services are offered in the banking industry. It has continued to change the way banks and their corporate relationship are organized worldwide and the variety of innovative contend that financial services providers should modify their traditional operating practices to remain, viable in the 1990s and the decades that follow.

### **2.2.3 Nature and Objective of Information System Investments**

(Gunasekaran, et al, 2001) state that, there has been a rising trend in IT expenditure over the last two decades ( Bechmark Research,1997) which corresponds to the mass of IT products now available in the market. Such new products pose in ever increasing problem to managers, as they constantly have to invest and justify their decisions to update software and hardware to keep abreast of their competitors.

With this, (Gunasekaran, et al., 2001) further states, together with the rising expenditure trends managers are faced with the problem of having to constantly: (1) Identify what their competitors are doing with IT, (2) Determine whether or not they can remain competitive with or without IT; and (3) Evaluate how the adoption of IT can improve their performance and/or competitiveness.

Hence, asserts that, careful and correct IT investment (or project selection) decisions are an economic and competitive necessity. In elaborating this, (Carlyle, 1990) as cited by (Gunasekaran, et al., 2001) states that, increasing financial and competitive pressures can necessitate companies to cut costs and force them to scrutinize their IT operating and capital budgets more carefully, so as to allocate limited resources among competing projects in the best way possible.

In this regard a careful look at the process of IS investment is appropriate. In doing so, (Khakasa, 2009) states that, there is no uniform definition of or understanding of what constitutes an IS investment, and not all investments are of capital nature. However, taking the definitions offered by (Schneider & Valacich, 2009; Laudon & Laudon, 2011) above, it would be an investment made on the technological elements of an organization Information System. Accordingly, (Bacon, 1992) defined IS/IT investment as “any acquisition of computer hardware, network facilities, or pre-developed software, or any “in-house” systems development project, that is expected to add to or enhance an organization’s information systems capabilities and produce benefits beyond the short term”.

Further elaborating the definition of (Bacon, 1992), IS/IT investment is an acquisition or development of technological elements of an information system, in this commitment, the basic objective of the firm is to enhance an organizations information system through the deployment of a technologically advanced IST/IT. In addition (Bacon, 1992) tells us that a benefits gained through such investments is expected to be realized in the long term.

(Irani & Love, 2008) explained this nature and scope of technology investment decision-making by labeling the process as “complicated and ever-changing”. The reason for this is that there has been a continuous expansion of the boundaries surrounding the evaluation domain often grounded in the changing impact that IT offers through its advancement. The change in such boundaries is in part attributable to new technology (increased, scope, functionality and flexibility) and its impact (in human and organizational terms) on developing a new

organizational IS infrastructure, juxtaposed with the many interacting socio-technical dimensions that support an organization.

Hence, (Irani & Love, 2008) conclude that, investment decision-makers not only need to have the skill to evaluate the nuts and bolts of the technology sought but also need the foresight to assess its impact on the future of the organization and the people that rely on and use the system. Such impact may lie, in terms of the integration links, with existing and future systems, benefit realization, stakeholder exploitation, cost management (direct and indirect) and risk minimization.

#### **2.2.4 Major Types of Information Systems in Organizations:**

##### **I. Transaction Processing Systems:**

Transaction processing systems (TPS) are the basic business systems that serve the operational level of the organization. Transaction processing systems are a computerized system that performs and records the daily routine transactions necessary to conduct business. Examples are sales order entry, hotel reservation systems, payroll, employee record keeping, and shipping system (which keeps track of the money paid to employees). Managers need (TPS) to monitor the status of internal operations and the firm's relations with the external environment. (TPS) are also major producers of information for the other types of systems. (for example, the payroll system supplies data to the company's general ledger system, which is responsible for maintaining records of the firm's income and expenses and for producing reports such as income statement and Balance sheets (Hamilton and Anderson, 2003).

##### **II. Management Information Systems:**

Management information systems (MIS) serve the management level of the organization, providing managers with reports and often online access to the organization's current performance and historical records. Typically, MIS are oriented almost exclusively to internal, not environmental or external, events. (MIS) are computer- based information systems, primarily serve the functions of planning, controlling, and decision making at the management level. Generally, they depend on underlying transaction processing systems for their data. (Tom et. al, 2005).

### III. Decision- Support Systems:

Decision support systems (DSS) are computerized systems that serve the management level of the organization and help managers make decisions .Although (DSS) use internal information from (TPS) and (MIS), they often bring information from external sources, such as current stock prices or product prices of competitors. (French, 2007).

### IV. Executive Support Systems:

Executive support systems (ESS) are computer- based information systems which serve the strategic level of the organization, and help senior managers to make decisions. (ESS) are designed to incorporate data about external events, such as new tax laws or competitors, but they also draw summarized information from internal (MIS) and (DSS). Questions (ESS) assist in answering include the following: in what business should we be? What are the competitors doing? What new acquisitions would protect us from cyclical business swings? Which units should we sell to raise cash? (Vandenbosch and Higgins, 1995).

### V. Knowledge-Based Information Systems:

Alavi and Leidner (2006) one of the most practical and widely implemented applications of artificial intelligence in business is the development of expert systems and other knowledge-based information systems. Expert systems (ES) are knowledge- based information system (KBIS) that uses its knowledge about a specific, complex application area to act an expert consultant to end users. These systems provide answers to questions in a very specific problem area by making humanlike inferences about explain their reasoning process and conclusions to a user.

### VI. Office Automation System

Anderson and Segars (2001) are computer-based information systems that collect, process, store, and transmit electronic messages, documents, and other forms of communications among individuals, work groups, and organizations. These systems can increased the productivity of managerial end users and other professional and staff personnel by significantly reducing the time and effort needed to produce, and receive business communications.

Word processing: is the use of computer systems to create, edit, revise, and print text material. Word processing involves manipulating text data (Characters, words, sentences, and paragraphs) to produce information products in the form of documents (letters, memos, forms, and reports).

Computer graphics: Most people find it difficult to quickly and accurately comprehend numerical or statistical data that is presented in a purely numerical form (such as rows or columns of numbers).

## VII. Electronic Communications Systems

Adams and Todd (2003) Electronic mail, voice mail, and facsimile allow organizations to send messages in text, video, or voice form or transmit copies of documents and do it in seconds, not hours or days. Such systems involve the transmission and distribution of text and images in electronic form over telecommunications networks, thus reducing the flow of paper messages, letters, memos, documents, and reports.

Teleconferencing: is an important form of electronic meeting systems which involve the use of video and audio communications to allow conferences and meetings to be held with participants who may be scattered across a room, a building, a country, or the globe. Reducing the need to travel to and from meetings should save employee time, increase productivity, and reduce travel expenses and energy consumption.

### **2.2.5 Information Technology in Businesses and Banking**

Over the past years, organizations all over the world have invested significantly in information systems (IS). It is widely believed that investment in information systems will enable firms cut costs and compete strategically and effectively (Butler & Gray, 2006). Accordingly, (Robson, 1997) states that, despite the expected large outlay, risky financial institutions are one of the largest investors in IS.

In this regard, (Garbage and Silber 1978) assert that, the past 25 years have witnessed a vast reductions in the cost of information technology, where between the years 1995 and 2005, the computing power of the average personal computers increased tremendously, while the price declined. Consequently, (Garbage and Silber 1978) state that, the introduction of telecommunications into banking markets dates to 1846 when the telegraph reduced stock price

differentials between New York and regional stock markets. At the same time, a revolution in telecommunications reduced the cost of transmitting data by a high margin since 1990. Such cost reductions have made it less expensive to acquire, store, transmit, and transform data into information.

Due to this advancement in the technology,(Mashhour & Zaatreh, 2008) states that, enormous changes in the services of the financial institution has taken place. The distinctive delivery of banking services in retail markets was to change with the use of commercial computer power. For commercial banking worldwide, these advances in IT have resulted in dramatic productivity gains. One early example was the introduction of the automatic teller machine (ATM), which first appeared in the United States in 1968. The introduction of ATMs made the distribution of some banking services more efficient.

Hence (Mashhour & Zaatreh, 2008), who has done an extensive study on Jordanian banks IS investment effectiveness, state that IT has developed the competition between financial institutions. Many new banking innovative strategies emerged from a new or enhanced banking information systems, which include e-banking, smartcard system or enhancement of other payment card system. Accordingly, (Mashhour & Zaatreh, 2008) asks, in this complex environment, how can information technology investments create value for the financial services organizations? In answering this, (Mashhour & Zaatreh, 2008) refer to, (Read et al, 2001) whom stats that “At its simplest level, value is created by generating revenues from the delivery of products and services to customers that exceed the cost of the delivery process”. Thus, impact of information technology on value creation can happen either through increasing revenue at marginal cost, or through reducing costs at marginal changes in revenue of the business.

### **2.2.6 Financial Performance Measures of IT**

To evaluate the business value of IT, the financial performance of the organization should be assessed. Typically, measures to assess the financial performance of an organization include return on investment ratios like return on equity (ROE), return on assets (ROA), earnings per share (EPS), return on sales (ROS), and return on investment (ROI). Evaluate the financial performance of an organization. In addition to the common financial ratios, more specific IT investment ratios may be used to assess the business value of IT. These are common measures

used by firms that are members of Computerworld's Premier 100 (Sethi, Hwang and Pegels, 1993). Computerworld developed an index to rate the overall effectiveness of IT organizations. The index uses five IT investment measures: (1) IT budget as a percentage of revenue; (2) Market value of an organization's IT equipment as a percentage of revenue; (3) Percentage of IT budget spend on IT staff; (4) Percentage of IT budget spend on IT staff training; (5) Number of personal computers and terminals as a percentage of total employees. The IT investment ratios, as well as the financial performance ratios may be tracked overtime and be compared to benchmark ratios of other competitors and industry averages. This type of analysis assists organizations in determining the financial performance of IT. Assessing the financial performance of IT may not necessarily result in an overall number that can be used to measure the performance of IT. The knowledge gained from assessing the financial performance of IT can be used to gauge the business value of an IT investment or the overall business value of IT. (Marc J. Schniederjans, Jamie L. Hamaker, 2004)

### **2.2.7 Business Performance Measures of IT**

Business performance is the result of the execution of business processes and the allocation of resources to business processes. Business performance depends on how well a business allocates its resources to business processes and how well it performs its business processes. In these situations the role of IT is to support business processes. As a result, IT may be viewed as contributing to the business performance of an organization indirectly by supporting the business processes that contribute to its business performance. It may be most appropriate to assess business performance with both financial and non-financial indicators. The "balanced scorecard" may be a very practical way to measure the business performance of IT and incorporate both financial and non-financial measures. The balanced scorecard method is a performance measurement tool that allows organizations to assess the performance of the business as whole, individual departments within the organization and specific projects. It is developed by Kaplan and Norton and is initially presented in the Harvard Business Review (Kaplan and Norton, 1992). The balanced scorecard provides a balanced representation of financial and non-financial performance through four perspectives (1) the customer Perspective (2) the internal business perspective (3) the innovation and learning perspective (4) the financial perspective. (Marc J. Schniederjans, Jamie L. Hamaker, 2004).

### **2.2.8 Firm Performance**

Firm performance is a multidimensional construct that consists of four elements (Alam, Raza 2011): (i) customer-focused performance, including customer satisfaction, and product or service performance; (ii) financial and market performance, including revenue, profits, market position, cash-to-cash cycle time, and earnings per share; (iii) human resource performance, including employee satisfaction; and (iv) organizational effectiveness, including time to market, level of innovation, and production and supply chain flexibility.

Traditionally, firms have used accounting measures such as earnings, return on assets or return on investment to reward managers. Recent evidence indicates that firms are increasingly using non-financial performance measures such as customer satisfaction and product quality in the contracting process within firms (Nagar and Rajan, 2001). The reason for the use of non-financial measures in compensation contracts is that they provide information incremental to accounting measures in rewarding and motivating managers. Accounting performance measures do not capture all the dimensions, therefore non-financial performance measures may provide incremental information beyond accounting measures (Banker and Datar, 1989).

Dogan Gursoy (2009) in his research Employee productivity, customer satisfaction, and financial performance: An empirical examination he examined the relationship between employee productivity and customer satisfaction. They also showed the impact of both company financial growths using service profit chain framework as the assumption. Basically, this research explores the following important relationships: (1) the customer satisfaction and financial performance has direct relationship. (2) There is a direct relationship between employee satisfaction and financial performance and other study found a positive relationship between investment in information technology and market performance (market value) of the company, as well as between them and the financial performance of the company (Bharadwaj, et al, 1999).

### **2.2.9 Non-financial Measurements**

IT\IS investment justification has proven to be a complex issue. And scholars have attributed this fact to the many intangibles and non-financial benefits inherent in the implementation process of IS. In contrary to this, (Gunasekaran, et al., 2001) made a case for the justification of IT by arguing that managers must embrace various appraisal techniques such as IT budgeting, IT investment



management, IT project planning, investment budgeting, payback period performance metrics and return on investment (ROI).

Accordingly, a multitude of studies are conducted by different authors, ( Mashhour & Zaatreh, 2008; Irani, 2002). Most of this studies stressed on the lack of adequate empirical research in the area and the downsides of independent IS/IT investment evaluation methods, regardless of the fact whether the methods are applied in combination of one another or not. With this they offer a practical framework of evaluation that is specifically designed for specific organizations.

In this regard, (Frisk, et al., 2014) explained that, a feature of the extensive literature on multi-stakeholder, multi-criteria IS evaluation is that much of it is conceptual in the sense that it is not well grounded in empirical research. In this he used Information Economics of (Parker & Benson, 1988) as a good example, which he claimed is discussed in the context of an imaginary company. The approach essentially evaluates scores and ranks IT investments by: the potential positive and negative impacts it has, through the use of a series of predefined criteria classified into; business (ROI, strategic match) and technical (technical uncertainty, infrastructure risk).

Accordingly, (Frisk, et al., 2014) proposes, the value dials approach as a proper empirical approach. The approach is based on the combination of dialogical action research methodology with the elements of the Delphi method and the BSC in order to develop an evaluation framework for a given organization, in a given environment and looking at a given project. Here, (Frisk, et al., 2014) explains that, the method is a form of dynamism that enables the contextual construction of the business value constructs (referred in the study as, value dials) by which the implicit construct will be measured. It is, in effect, an adaptation and operationalization of (Peffer and Dos Santos, 2013) ideas. With this, a value dials approach is designed to address (1) linkages between different types of performance and (2) perceived benefits that are dependent on the respective stakeholders. Furthermore, the research addresses the question ‘How can we yield a comprehensive, consistent and precise understanding of the multifaceted construct “IS business value?”’ which is part of the six research thrusts of (Schryen, 2013).

In a similar work (Gunasekaran, et al., 2001) states that companies that used traditional approaches to justify the implementation of IT indicated a degree of uncertainty about how to measure the full impact of their investment. And further states, that there is no ‘best’ appraisal technique that addresses ‘all’ project considerations And argues that the reason for this is that strategic investments in IT are aggregates of complexity, and notably different from each other.

Essentially, each investment displays its own characteristics, and offers a range of benefits and costs. Conversely, each appraisal technique that can be used also displays its own characteristics, and has its own set of limitations (Irani, Ezingard, & Grieve, 1997; Peppard & Ward, 1999; Hares & Royle, 1994).

Therefore, (Gunasekaran, et al., 2001) asserts that, the development of an ‘all embracing’ generic appraisal technique for justifying IT expenditure that takes account of the wide variety of IT related implications, may be considered too rigid and complex for use. Which they substantiate based on (Parker & Benson, 1988), in that they state that, most CEOs are not comfortable with the current tools and techniques used to justify their investments in IT, because they lack the preciseness of definition in the financial methods used.

Therefore, concludes (Gunasekaran, et al., 2001), the apparent inability of traditional modes of financial analysis to justify certain investments has led to a growing number of managers and observers to call for a moratorium in their use. Consequently, as a remedy to this, (Gunasekaran, et al., 2001) a conceptual survey and findings from a complementing case study has proposes a model that can be used to determine the effectiveness of implementing IT at the strategic, tactical and operational levels, with a capability of determining intangible and non-financial benefits.

In a more hands-on evaluation of IS investment, (Mashhour & Zaatreh, 2008) conducted a concrete practical study on the effectiveness of Information technology in the banking sector of Jordanian banks. In the study, they ask, in this complex environment, how can information technology investments create value for the financial services organizations.

In an attempt to answer their question, they engage the concept by referring to (Read et al, 2001) who states that “at its simplest level, value is created by generating revenues from the delivery of products and services to customers that exceed the cost of the delivery process”. And further claim that, several frameworks have been proposed to guide the choice among IS evaluation methodologies by (Stone, 1990). The frameworks included defining objectives and measures, considering qualitative effects from IS, and considering and integrating differing evaluative viewpoints. Form such, the framework of MIS as a contingency model and efficiency models of (Allen et al, 2006 & Gupta and Collins, 1997) pointed out different aspects of efficiency measurements.

Here the major assessment tool adopted by (Mashhour & Zaatreh, 2008), was the tool designed to measure perception on adopting information technology. The tool was developed by (Moore & Benbasat, 1991). The instrument developed by these authors discusses user's perception of adopting \IS innovation.

In this, instrument developments (Moore & Benbasat, 1991) have conducted an extensive study of existing measurement tools. Following that, being convinced that the exiting measurements are not comprehensive enough with the each lacking completeness, they have undergone through a rigorous instrument development process. Based on these instruments, (Mashhour & Zaatreh, 2008) designed a survey that was intended to assess the effectiveness of IT investment in Jordanian banks. In the instrument of (Moore & Benbasat, 1991) they have identified 8 assessment variables. The variables were developed based on the works of various scholars, (Rogers, 1883; Ronal, 1987; Hurt & Hubbard, 1987; Larcker & Lessig, 1980,; Tornatzky & Klien, 1982). Each of the scholars has proposed one or more of the variables, lacking completeness. Accordingly, (Moore & Benbasat, 1991) developed a complete list of variables for assessing perceptions on IT innovation adoptions.

### **2.2.10 Innovation – Diffusion Theory**

Innovation Diffusion Theory (IDT) by Rogers (2003) has been employed in studying individuals' technology adoption. The main goal of IDT is to understand the adoption of innovation in terms of four elements of diffusion including innovation, time, communication channels, and social systems. IDT also states that an individual's technology adoption behavior is determined by his or her perceptions regarding the relative advantage, compatibility, complexity, trialability, and observability of the innovation, as well as social norms.

Since the late 1980s, research on technology adoption focusing on exploring the determinants of users' intentions to accept and use new technology have produced a number of theoretical models, among which innovation diffusion theory (IDT) is generally regarded as one of the most influential models. Based on Rogers' contributions to the field of innovation diffusion research, IDT proposes that it is the potential adopters' perceptions of an innovation's characteristics that impact the diffusion rate, not experts' predictions or assessments of the characteristics that

matter. His identified five general characteristics of innovations that numerous diffusion studies have shown to have consistently influenced adoption, namely:

Relative advantage a degree to which an innovation is perceived as being better than its precursor. Compatibility a degree to which an innovation is perceived as being consistent with the existing values, needs and past experiences of potential adopters. Complexity a degree to which an innovation is perceived as being difficult to understand and use. Observability a degree to which the results of an innovation are observable to others Trialability a degree to which an innovation may be experimented with before adoption.

Moore and Benbasat (1991) adapted the characteristics of innovations presented in their research on measuring perceptions of information technology adoption and introduced several constructs that served as additional factors influencing adoption and use, which include.

Results demonstrability: tangibility of the results of using the innovation, including their observability and communicability, Image a degree to which use of an innovation is perceived to enhance one's image or status in one's social system, Visibility a degree to which one can see others using the system in the organization, Voluntariness of use a degree to which use of the innovation is perceived as being voluntary, or of free will. Result demonstrability and visibility are two sub-components of observability that have been demonstrated empirically to be separate constructs (Moore & Benbasat, 1991). Adoption is a decision to make full use of an innovation as the best course of action whereas rejection is a decision not to adopt an available innovation.

Innovation Diffusion Theory is regarded as one of the most important theories on the process of the adoption, use and acceptance of Technological Innovation. The theory's main goal is to explain how the process of innovation diffusion and use takes place in organizations, based on individual and group behavior and attitude towards the innovations introduced into the social context in which they exist (Moore & Benbasat, 1991). Studies on Diffusion Theory have spotlighted technological innovations, and particularly those introduced by Information Technologies and Systems. For the purposes of this study, the approach is associated with technological innovation in education. An innovation's perceived attributes are important to explain its usage rate, which comprehends a five-stage decision-making flow: initial awareness of an innovation; formation of an attitude toward the innovation; decision whether to accept or

reject the innovation; implementation of the new idea; and, finally, confirmation of the decision to adopt the innovation (Huff & Mcnaughton, 1991).

According To Moore and Benbasat (1991), an innovation's perceived characteristics have consistently influenced the adoption and use of innovations, studies show different measures of the predictive power of attributes, and some findings reveal that not all attributes influence adoption, as the differences depend on the innovation and on the period in which are applied. It is therefore advisable not to exclude any attributes from the model (He et al., 2006).

The Relative advantage attribute reflects the degree to which an innovation is perceived as better than its precursor, that is, better than the one it replaces. Relative advantage is represented by the rate of benefits expected from the use of an innovation. Several studies have introduced constructs associated with the acceptance of technological innovation and indicated the positive influence of relative advantage on adoption and use. (Venkatesh et al, 2003, Compeau; Meister; Higgins, 2007

Compatibility is the degree to which the adoption of an innovation is perceived as consistent and coherent with the potential adopters' existing values, practices, needs and experience with previously produced ideas, or with the needs of the individuals in connection with innovation. An idea that is not compatible with a social system's values and norms a seldom be adopted as easily as a compatible innovation would. (Moore & Benbasat,1991). Agarwal and Prasad (1997) and Plouffe et al . (2001) find a positive influence of compatibility on the intent to use a technology. A user that regards an innovation as compatible with his or her working style exercises direct influence on use intensity (Compeau; Meister; Higgins, 2007).Other studies indicate that compatibility is strongly related with relative advantage. (Karahanna et al,1999, Moore & Benbasat, 1991). Holak and Lehmann (1990) argue that familiarity with an innovation and the compatibility between its operation and the preferred way of carrying out a certain activity influence the individual's acceptance of an innovation.

The ease of use attribute as Complexity, reflecting the degree to which an innovation is perceived as difficult to understand for the purposes of use by potential adopters. New ideas that are simple to understand and absorb are more quickly adopted by the members of a social system, while those that require developing new knowledge and understandings, and regarded as more complex, are more slowly adopted Moore and Benbasat (1991) exchanged the complexity

attribute as proposed for the 'Ease of Use' attribute, in order to determine the level to which an innovation is perceived as easy to use. These study tests the Ease of Use attribute. In the study developed by Campeau; Meister and Higgins (2007) ease of use did not positively influence intensity of use. According to the authors, their results are not compatible with other studies that find a relationship between ease of use and use intensity mediated by relative advantage.

The Trialability attribute is defined as the degree to which potential adopters may try an innovation prior to adoption (trialability period). The ability to test an innovation can make it significant to the individual and it will usually be adopted more quickly than innovation that cannot be tried in advance. An innovation that can be tried, and which an individual can test and find out whether or not will operate according to his or her needs as a used involves less uncertainty, as it enables learning by doing (Moore & Benbasat, 1991). Technology adoption difficulties may be supported by professional training, which is regarded as a phase in the adoption process because lacking or insufficient training may create resistance to the technological innovation (Dong , 2007).The trialability attribute enables testing the innovation, which may influence the use of a technology

Visibility (observability) indicates the degree to which an innovation's results can be observed by an organization, which is, become visible to potential users. The easier it is for individuals to perceive an innovation's results, the greater the odds that such individuals will adopt the innovation in question (Rogers, 1983). Therefore, users need to be informed and made aware of and sensitized to the benefits of a given technology. In the communication process, it is crucial for the message to be understood and for the recipient to be able to provide feedback. According to He et al; (2006) the more visible an innovation's results, the faster its adoption and implementation will be, that is, an innovation's observability as perceived by individuals is positively related with the innovation's adoption index. Within the context of their study, Moore and Benbasat (1991) adapted the original attribute of observability to visibility, which is the term this study will use. Within this context, the visibility attribute provides for the observability of an innovation's results.

Image reflects the degree to which using an innovation is perceived as an improvement to an individual's image or a social system's status (Moore & Benbasat, 1991). argues that individuals are more likely to adopt innovations when they perceive image improvement. Social and political

motivations are factors that influence individual behavior. The user's distinguished profile, increased prestige and social status directly influence the intensity of the use of a technological innovation (Plouffe et al, 2001). However, Venkatesh and Davis (2000) pointed out that the perceived image positively influences relative advantage and adoption for use.

Joining the constructs observability and communicability, which initially identified, became the category Result Demonstrability, indicating the degree to which the results from the use of an innovation are tangible (Moore & Benbasat, 1991). Venkatesh and Davis (2000) observed a direct relationship between demonstrable results and perceived utility. They argued that individuals form more positive perceptions of a system of the relationship between use and performance is easily detected. In this sense, Holak and Lehmann (1990) offer that the familiarity that emerges from an innovation's compatibility with its preferred mode of operation makes it easier for an individual to recognize its benefits and communicate it to others in terms of the perceived results of its use. It makes sense, therefore, to evaluate the influence of the Result Demonstrability on the use of technological innovation.

## 2.2 Review of Empirical Studies on Assessment of Information Technology and Non-Financial Measure of Performance

- Negative relationship several studies made on the services sector has reported disappointing productivity of IT capital. For example, Roach (1988) reported that massive investments in IT have failed to boost national productivity growth. Roach cited statistics indicating that output per production worker grew by 16.9% between mid-1970s and 1986, while output per information worker decreased by 6.6%. In a study on the American manufacturing industries, Berndt and Morrison (1994) found that each dollar spent on high-tech capital (computers, instruments and telecommunications equipment) increased measured output by only 80% on the margin. There is a statistically significant negative relationship between productivity growth and the high-tech intensity of capital investments.
- No relationship Turner (1985) conducted a survey of 58 mutual savings banks and found no significant relationship existed between bank performance and IT investment. Similarly, Strassmann (1990) also reported disappointing evidence in several studies. In particular, he found that there is no correlation between IT and return on investment in a

sample of 38 service sector firms. He concluded that there is no correlation between spending for computers, profits and productivity. Another study by Loveman (1994) also concluded that investments in IT showed no net contribution to total output. Using the Management of the Productivity of Information Technology (MPIT) database, most of the elasticity estimates of IT investments were not statistically distinguishable from zero. Similarly, Strassmann (1997) examined the "financial records of 66 US companies and found little evidence for any productivity improvement despite 10 years of computerization.

- Positive (or mixed) relationship Many studies have actually revealed mixed "findings whereby only certain, if not all, elements of positive relationship between IT investment and "firm performance were found. For the purpose of categorization, such studies are classified under this section. Bender (1986) examined the insurance industry and concluded that total information processing expense is significantly related to the reduction of total operating expenses. In a study of primarily perceptual performance measures, (Northrop, Kraemer, Dunkle and King (1990) studied the payoffs from computerization in governmentor generations and found that majorpayoffs occurred in the areas of availability of information, efficiency of operational performance and interaction with the public. Similarly, a study by Harris and Katz (1991) revealed that "firm performance is linked to the level of IT investment intensity. Weill (1992) also found positive relationship between IT investment and "firm performance in the manufacturing sector. Findings revealed that heavy use of transactional IT investment is significantly and consistently associated with strong "firm performance. Heavy use of strategic IT is found to be neutral in the long term and associated only with relatively poorly performing "firms in the short term. Informational IT investment is found to have a neutral effect on performance.

(Berger, 2003; Shao and Shu, 2004; Camanho and Dyson, 2005). When studying the effects of IT in the US banking sector, the find that this production function approach might have simplified the IT effects in the banking sector, by presenting a mixture of IT effects on both demand and supply sides. Specifically, in most banking or other service industries in general, IT is first expected to reduce banks' operational costs {supply side). For example, internet helps banks to conduct standardized, low value-added transactions



through the online channel, while focusing their resources into specialized, high value-added transactions through branches. Second, IT can facilitate transactions among customers within the same network (demand side). For example, stock exchanges and derivatives exchanges feature a network effect. As the number of buyers and sellers on an exchange increases, liquidity increases, and transaction costs decrease. This then attracts a larger number of buyers and sellers to the exchange.

Despite these two seemingly positive effects, some studies have recorded that the mixture of the two results can be non-positive. For example; Shu and Strassmann (2005) studied 12 banks operating in the US for the period of 1989-1997 in a production function approach. They found that although IT has been one of the most marginal productive factors among all inputs, there is no conclusive evidence on the relation between investment in IT and banks' profits.

The NRC industry analyses identified many areas in which IT improved industry performance without increasing industry profitability or, in some cases, measured industry productivity. In banking IT has enabled huge transaction growth and opened the way for a vast array of new products and services? from individually tailored loans and mortgages closed in 15 minutes to international "interest rate swaps" and "instant access" to cash or loans in any world market. No major bank could operate with the hand-kept records of the past? Or successfully compete without the information on capital markets made available by IT. (James Brian Quinn, 2004)

Typically, researchers have defined their unit of analysis as the firm, and measured IT investment (or use) and some measure of financial firm performance (e.g., expenses over income, return on net worth, sales growth). Unfortunately there has been little consistency in definition of what IT includes (Bakopoulos 1985)

The research indicated a weak relationship between the individual IT investment measures and individual organizational performance measures. When grouped, however, the correlation increased significantly. In particular, the organizational performance measures sales by employee, sales by total assets, market value to book value, return on investment, and return on sales were related to the IT investment measures number of PCs and terminals as a percentage of total employees, IT budget as a percentage of revenue, percentage of IT budget spent on IT staff training, and estimated IT value as a percentage of revenue, indicating that these should be considered for measuring IT investment effect. The organizational performance measure growth

in revenue and IT investment measure percentage of IT budget spent on staff were not significantly related to other measures and therefore were not indicated to be useful for investigating possible effects of IT investment on organizational strategic and economic performance. (Mo Adam Mahmood and Gary J. Mann Source: Journal of Management Information Systems, Vol. 10, No. 1 (Summer, 1993), pp. 97-122

Other studies found no relationship. In a study of 58 banks, Turner concluded that "unexpectedly no relationship is found between organizational performance and the relative proportion of resources allocated to data processing (Turner, 1985). In a study of 165 branches of a California bank, (Lucas 1975a) found that the use of the information system "did not explain a great deal of variance in performance." In another study of a ready-to-wear clothing manufacturer, (Lucas, 1975b) found there is a "weak association between performance and the use of the computer system.(Strassmann1985), in his study of service sector firms, found no significant relationship between high performing firms and IT investment. In a macro-level study of the service sector Roach concluded quite simply massive investments in IT have failed to boost national productivity growth in the present decade.

Here the major assessment tool adopted by (Mashhour & Zaatreh, 2008), was the tool designed to measure perception on adopting information technology. The tool is developed by (Moore & Benbasat, 1991). The instrument developed by this author discusses user's perception of adopting \IS innovation.

In this instrument development, (Moore & Benbasat, 1991) have conducted an extensive study of existing measurement tools. Following that, being convinced that the exiting measurements are not comprehensive enough, with an each lacking completeness, they have undergone through a rigorous instrument development process. Based on this instrument, (Mashhour & Zaatreh, 2008) designed a survey that was intended to assess the effectiveness of IT investment in Jordanian banks.

In the instrument of (Moore & Benbasat, 1991) they have identified 8 assessment variables. The variables were developed based on the works of various scholars, (Rogers, 1883; Ronal, 1987; Hurt & Hubbard, 1987; Larcker & Lessig, 1980,; Tornatzky & Klien, 1982 ). Each of the scholars has proposed one or more of the variables, lacking completeness. Accordingly, (Moore

& Benbasat, 1991) developed a complete list of variables for the assessment perceptions on IT innovation adoptions.

Out of the available variables, (Mashhour & Zaatreh, 2008) used the relative advantage variable to determine IT relative advantage. In doing so, they used the variable in combination with other assessment variables adopted from the works of (Idowu et al, 2002). The variables used in (Mashhour & Zaatreh, 2008) study as indicated by (Moore & Benbasat, 1991) is much related with “compatibility” variable, however was not used in not included in their study. This variable, based on the sorting exercise, proved it is a separately item worth consideration together with relative advantage variable as there exists a strong correlation with the relative advantage variable.

The variables indicated by (Moore & Benbasat, 1991).

The respective variables and the specific survey items indicated by (Moore & Benbasat, 1991), the below;

*Table 1-IT investment assessment survey variables*

No	Variables	Contents of the variables
1	Voluntariness	My Boss Does not require me to use Information Technology.
		Although it might be helpful, using Information Technology is certainly not Compulsory in my work.
2	Relative Advantage	Information Technology have decreased the task execution time of users.
		Information Technology have Increased the quality of Work I do.
		Information Technology have Increased the ease of doing my work.
		Using Information Technology enhances my effectiveness on the work
		Using Information Technology gives me greater control over my work.
3	Compatibility	Using Information Technology is compatible with all aspects of my work.
		Using Information Technology fits into my work style.
	Image	People in my organisations who use Information Technology have high profile.
		Excelling in Information Technology is a symbol ability for my organisation.
5	Ease of use	I believe it is easy to get Information Technology to do what I want it to do.
		Overall, I believe that Information Technology is easy to use.
		Learning to operate Information Technology is easy for me.
6	Result Demonstrability	I would have no difficulty telling others about the result of using Information Technology.
		The results of using Information Technology are apparent to me.
7	Visibility	It is easy to observe others using Information Technology.
		In my Organisation, One sees Information Technology on Many Desks.
8	Trial-ability	Before deciding to use Information Technology applications, I was able to properly try them out.
		I was permitted to use Information Technology on trial basis long enough to see what it could do.

*Adopted from;* (Moore & Benbasat, 1991)

The above variables have undergone through a robust development process that included identifying, sorting, grouping and performing a series of consistency and reliability tests. Thus, by using the variables developed in this manner there were used to collect the perception of the target study subjects to determine the success of an IS\IT investment in Jordanian banks by (Mashhour & Zaatreh, 2008).

In the study, the authors have used the respective variables to test their hypothesis that claims “*Information systems provide a competitive advantage to the banking industry*”. In doing so they considered the individual mean and the group construct mean of the results.

### **2.2.1** Regional Experience

Size effect (broaden market share): related to introduction of new Branch banking, geographical and regional expansion, including installing networks, use of core banking system, installing new ATM machines (serve as a branch by itself), and other related infrastructure investment used in order to enrich bank services to its customers by spending huge amount of money described in its asset investment particularly during this competition era. Surprisingly, this was also not productive as expected as possible instead even if the size of the bank gets large performance is not significant as expected. (kebede, 2015)

The influences of ICT were assessed from a perspective of three influences and each one is given a value: positive, negative and no influence. The outcome shows the major factors with positive influence are efficiency of business processes, quality of customer service and enhancement of consumer and competitors’ image of the bank. Contrary to the common understanding about the effect of ICT in reducing business cost, reduction of operational cost was the leading negative influence factor. According to the result, it seems the influence of ICT has not been yet utilized around staff and staff development since the results include most of staff related factors under no influence: productivity of employees, staff development, and training, motivation of staff and ease of organizational structuring and restructuring. (Yohannes, 2010)

### 2.3 Summary of Literature Review

The number of topics related to the effect of information technology investment non- financial in banking sector definition improvement and argued. As the literature review indicates that several researches have been conducted on banking, especially on Nigerian banks but in Ethiopia, no direct researches in this area of study have been conducted. Therefore, this research will seek to fill the research gap created on the assessment of information technology investment on non-financial performance of commercial bank of Ethiopia.

## CHAPTER THREE-RESEARCH METHODOLOGY

### 3.1. The Research Design

The study adopted descriptive research designs. The objective of descriptive research, according to (Robson, 2002) is “to portray an accurate profile of persons, events or situations”. In similar previous studies (Mashhour & Zaatreh, 2008; Small, 2006 Bacon, Ballantine & Stray, 1999; 1992) examining IT investments; cross-sectional survey has been a popular research method. Hence, this study also employed a similar cross-sectional survey research design.

The research design helps the data collected from this study to be compared with findings documented in past researches.

### 3.2. Population and Sampling Method

#### 3.2.1. Population

Target population was all banks that engage in commercial banking activities and registered by National Bank of Ethiopia. Consequently, commercial bank of Ethiopia those, out of the 17 commercial banks as of 2016, were selected for the study. The population of the study consists of respondents from districts and city branches located in Addis Ababa and surrounding regions. In this study the respondents are branch manager or districts, assistance manager or districts and IT manager or officer’s study of CBE, The size of the target population under investigation is 165. According to crano and brewer (2002), sampling is the process of selecting sufficient number of elements from the population, so that a study of the sample and an understanding of its properties or characteristics would make it possible for us to generalize such properties or characteristics to the population elements.

The bank has a total of more than 30,000 employees as of June 30, 2016 (CBE, 2016), from the semi-annual progressive report of 2016/17 CBE. Have 14 District and 1185 branches located all over the country. Employees in 10 districts were excluded from the study being unreachable part of the population. Among the branches in four districts and it self the districts.546 employees are involved the remaining staffs were excluded in this study.

Furthermore, as part of the industry, it is spearheading IT investments with the aim of modernizing its services to its client base in Ethiopia as.

### **3.2.2. Sampling Techniques**

The sampling technique that is employed is purposive sampling technique; purposive sampling will allow the researcher to choose the samples based on a personal judgment supported by knowledge about the sample frame and information about the purpose or objective of the research (Bailey, 1978). Researcher excludes the 10 districts under the study. Among the branches and districts, the study selected four districts 165 employees are involved and the remaining staffs were excluded in this study.

The study targeted employees that are involved in information technology investment mainly due to their level of awareness in the assessment of non –financial performance measuring of CBE and therefore understanding items in the questionnaire. Due to the similar characteristics among employees of the organization, the researcher believes that the selected four districts shall represent the entire population

Purposive sampling can be very useful for situations where you need to reach a targeted sample quickly and where sampling for proportionality is not the primary concern. With a purposive sample, you are likely to get the opinions of your target population. And simple random sampling technique was utilized for employees of Commercial Bank of Ethiopia.

### **3.2.3. Sample Size**

The target population of the study is Information technology users within the Commercial Banks of Ethiopia. Hence, employees in the different hierarchy of the Bank were selected as appropriate study subjects. The study covers the four districts of the banks, which will allow it in covering Addis Ababa and surrounding regions. This will result in addressing the city which has the largest branch distribution of the bank.

Random sampling technique was used in selecting the sample size. In this study, three types of respondents i.e. district managers or branch managers, branch assistance managers or district assistance managers, and IT managers or officer's employees are under the study. Sample size for all respondents is used based on J. Carvalho's (1984), table of determining sample size. A sample size of 165 out of 546 employees' has been used based on the above method.



*Table 2-for determining sample size*

Population	Sample size		
	Low	Medium	High
51 – 90	5	13	20
91 – 150	8	20	35
151 – 280	13	32	50
281-500	20	50	80
501-1,200	32	80	125
1,201-3,200	50	125	200
3,201-10,000	80	200	315
10,001-35,000	125	315	500
35,001-150,000	200	500	800

Source: J. carvalho, (1984)

Therefore a total number of 165 respondents have been selected in order to assessment of information technology investment and non-financial measure of performance in CBE.

### **3.3. Data Type and Collection Methodology**

#### **3.2.4. Data Type**

To accomplish the stated objectives the researcher used primary data. However, the data source of the study is primary data indicated perception of users on the Information system investments operational ability and monitoring ability level of perception of users on that are collected from the study subjects in a survey form. The goal of surveying is to investigate the investment of information systems at the Commercial bank of Ethiopian and to evaluate the contribution of investments for the bank's operation. To achieve this goal, the research focused on a tested instrument that was used by (Moore & Benbasat, 1991; Khakasa, 2009).Development of the instrument carried out item creation whose purpose was to create pools of items for each perceived characteristics of innovating (PCI) by identifying items from existing scales and described sort the items into separate categories based on similarities and differences among items. The items could then be examined and any inappropriately worded or ambiguous items

could be eliminated. Secondary data has been used only as a complementary data to provide insight in to the industry when required, other than this only primary data has been used.

### **3.2.5. Collection Methods**

The data collection Methods employed in the study was is a survey questionnaire. The survey questionnaire employed is arranging into two sections, which are arranging in two; types of information technology acquired based on the purpose and perception response survey. Accordingly, the correspondence containing the questionnaire is addressed to each district divided proportionately.

This questionnaires gathered information on three major details, (1) The institution and the role of the respondent (2) the type of IS acquired, (3) the perception of users on the value brought by the system. The third section of the survey collects data as to the degree of perception and level of agreement in a standard 5 point Likert scales that ranged from 1= Strongly Disagree, 2 = Disagree, 3 = Neutral, 4= Agree to 5 = Strongly Agree.

Indicated to previous study made use of the survey's statistical distribution, in that, the effect of using information systems on banks competitiveness was measured using the average score of the survey response made in regards to IT impact on banks, in the survey a likert scale was used that with "1" and "7" standing for "extremely agree" and "extremely disagree" respectively. In this way a higher score in these questions indicates that information systems provide a competitive advantage for banks. The descriptive statistics indicates that the mean score for effectiveness of information systems on Jordan banks is 5.68 with a standard deviation of 1.184, in a scale of 1 to 7. Based on the testing result, the study concludes that information systems has a positive impact on Jordan banks, and does so at a very high degree of confidence (at least 99.9%).

Whereas, (Mashhour & Zaatreh, 2008) based on a research that is based on a descriptive study made based on a frame work survey to evaluate, (1) Information systems competitive Advantage to the banking industry (2) The effectiveness of information systems and its impact on Jordanian banks, (3) The association between the use of information systems and customer satisfaction.

About this study enough to survey a likert scale was used that 1 to 5 indicated the questions of commercial bank of Ethiopia assess information technology non-performance investment

measure it is not need a very high degree scale the study by Ordinal value of likert scale responses *Adapted from* (Moore & Benbasat, 1991)

### 3.4. Method of Data Analysis

The study employed descriptive research design. Thus the collected data is analyzed using explanatory statistics to appropriate statistical analyses such as frequencies and descriptive analysis were used based on the respective objectives of the study. The analyzed data is presented using tables and Statistical Package for Social Sciences (SPSS) Version 21 software is also used to analyze the collected data.

After collecting and sorting the relevant data using the data collection tools, quantitative responses were sorted, coded, computed, and analyzed using MS-Excel-2010.

Respondents were supplied with a comprehensive list of information technologies and appraisal techniques and it is ask to indicate specific techniques they have used in their appraisal process. Data have been collected by using the Likert’s scale, where it is process by reducing each response value in to ordinal level.

*Table 3- Ordinal value of likert scale responses*

Scale Value	Salve value
Strongly Agree	5
Agree	4
Neutral	3
Disagree	2
Strongly Disagree	1

*Source; Adapted from* (Moore & Benbasat, 1991)

### 3.5. Reliability of the Research

As stated by “Hair et al., (2007) reliability indicates the extents to which a variables or set of variables is consistent in what it is intended to measure” (Cited by Siddiqi; 2011:20). Reliability analysis used to measure the consistency of a questionnaire. There are different methods of reliability test, for this study Cronbach’s alpha is considered to be suitable. Cronbach’s alpha is the most common measure of reliability. For this study the Alpha coefficient for the overall scale calculated as a reliability indicator is 0.889. All the alpha coefficients for the scales were presented on the following table. As described by Andy (2006) the values of Cronbach’s alpha

more than 0.7 is good. The alpha values in this study are far from 0.7 and which are; therefore it had very good reliability for the questioners.

*Table 4. Reliability Measure*

No.	Indicators	Number Items	Cronbach's Alpha
1	Voluntariness	2	0.736
2	Relative Advantage	5	0.875
3	Compatibility	2	0.888
4	Image Voluntariness	2	0.787
5	Ease of use	3	0.816
6	Result Demonstrability	2	0.717
7	Visibility	2	0.809
8	Trainability	2	0.838
	Overall	20	0.889

*Adopted from; (Moore & Benbasat, 1991)*

## CHAPTER FOUR-DATA PRESENTATION AND ANALYSIS

The previous chapter presented the research methodology applied to meet the objective of the study. This chapter presents the results and analysis of the findings as well as discussion of results. The chapter is organized in to four sections. Section 4.1 general profiles, then Section 4.2 Type of Information System Technology Investment and 4.3 Reliability of the Research, Finally, section 4.4 Added values assessment on Voluntariness, Relative advantage, Compatibility, and Image voluntariness

### 4.1. General Profile

Table 3.working experience of Respondents

In Years	Frequency	Percent	Valid Percent	Cumulative Percent
<= 3 Years	67	40.6	40.6	40.6
4 to 5 Years	46	27.9	27.9	68.5
6 to 10 Years	44	26.7	26.7	95.2
Greater than 10 Years	8	4.8	4.8	100.0
Total	165	100.0	100.0	

Work experience helped with regard to expectation and perception of CBE Information technology investment and adoption in different perception on operation activity for high in all cases.

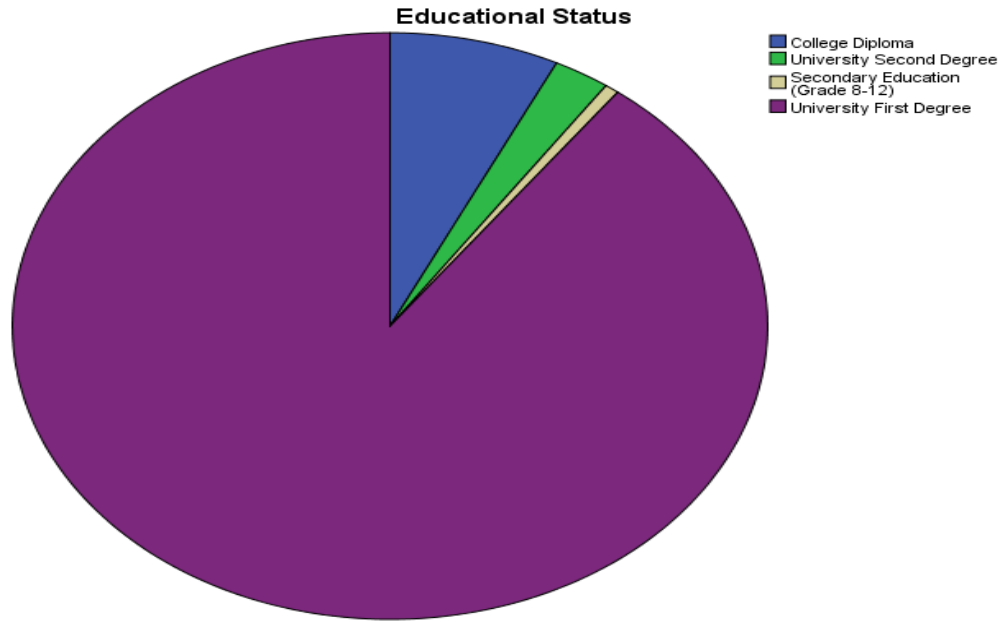


Figure 1. Education status of Respondents

From the above graph 4.2 almost most of the employees had first degree and diploma holders, but small number of employees' had secondary education from grade 8 to 12 and a little bit small number of employees had second degree holders. The education back ground it was need to the respondents easy understand the question and accordingly the status mean the education and the study raised questions and more back ground education to gotten vital information based on the study. Finally the right respondents have got information technology investment system and which made type of information technology investment (ITI) research questions and the first part of the survey questionnaire was intended to obtain respondent-characterization Most (approximately 89.7%) qualified first degree and 2.4 % master's degree.

## 4.2. Information system Investment Added values Assessment

Table 4.2.1: Type of Information System Technology Investment

No.	Information System Type	Yes	No
1	Transaction Processing systems (TPS)	143(86.7)	22(13.3)
2	Management information system (MIS)	130(78.8)	35(21.2)
3	Decision support systems (DSS)	111(67.3)	54(32.7)
4	Executive support systems (ESS)	110(66.7)	55(33.3)
5	Expert Systems (ES)	113(68.5)	52(31.5)
6	Communication systems (CS): (i.e E mail, Voice- mail, fax)	140(84.8)	25(15.2)

*Source; own compilation of research data (2016)*

The study conducted on the types of information system investments revealed that commercial bank of Ethiopia invest in specific kinds of information system technologies. These specific kinds of information system technologies are Transaction Processing systems (TPS) is the most type of investment type , secondly Communication systems (CS): (i.e E mail, Voice- mail, fax)investment type, thirdly Management information system (MIS) investment type, however on Decision support systems (DSS) and Executive support systems (ESS) were the least investment type Information System Technology.

As is evident in the above summary of the study survey, of the respondents 78.8% of the commercial bank of Ethiopia enjoy the management information systems (MIS) which are information system technologies that serve the functions of planning, controlling, and decision making for casting and decision the product activity, and provide manager with reports to the organization's current performance and historical records. And 86.7% of these banks have the transaction processing systems (TPS), which is an information system technology that performs and records the daily routine transactions necessary to conduct business, and help managers to monitor the status of internal operations and the firm's relations with the external environment. This indicates that the two systems (MIS) and (TPS) are used to a very high extent.

The result also shows that 67.3% of the Commercial bank of Ethiopian has decision support systems; the decision support systems are computerized information systems which support decisions through providing the information that helps all employees to solve the problems; and

identify; evaluate and choose the best alternative solutions. Furthermore, such systems present managers with the ability of predicting the results of the alternatives that will be used in the solution.

In addition to the above information system technologies, 84.8% of the commercial banks of Ethiopia acquire the communication systems. Communication systems are computer-based information systems that collect, process, store, and transmit electronic messages, documents, and other forms of communications among individuals, work groups, and organizations efficiently.

The above results, the survey has shown that commercial bank of Ethiopian have invested in two kinds of specific information system technologies, executive support systems (ESS) of the respondents 66.7%, expert systems (ES) of the respondents 68.5. The two systems are; tools for the helps managers to make decisions at the strategic level and applications of artificial intelligence in businesses operation to better intelligence, respectively and also Decision support systems (DSS) the respondents 67.3%.

Accordingly, the results gained in this study have been compared with results of studies conducted elsewhere. In doing so, (Abdelhak & Dalel, 2008) in their study of computerized information systems investment in Jordanian banks, showed that (88.6%) of the Jordanian commercial banks enjoy the (MIS) and (82.1%) of these banks have (TPS) indicating that the two systems (MIS) and (TPS) are used to a very high extent. This result, despite the relative difference in the frequency, shows a high degree similarity with the result gained in this study in terms of result percentage size.

The difference in the percent's of the types of information system investments was expected, because such systems differ according to the investment needed for their bank, and the experiences and skills required for usage, which differ among the commercial bank of Ethiopia according to the size percentage indicates that the two systems (MIS) and (TPS) are used to a very high extent this implies which is an information system technology that performs and that serve the operational level of the bank . A transaction processing system is a computerized system that records and process the day to day routine transactions necessary to conduct bank, and bank, providing managers with reports and often online access to the organization's current



performance and historical records. Typically, MIS are oriented almost exclusively to internal, not environmental or external.

Moreover, (Abdelhak & Dalel, 2008) showed that (64.3%) of the Jordanian commercial banks have (DSS). This also confirms with the result gained in this study with a reasonable percentage size. Here, their study also showed that (97.3%) of the Jordanian commercial banks have acquired communication systems (E- mail, voice mail, fax), this result showed a relatively slight difference from the result gained in this study, which showed that only 67.3%. This indicates that, commercial bank of Ethiopia invest less than on communication systems than Jordanian commercial banks.

The decision support systems (DSS) are computerized information systems with support decisions through providing the information that help managers to solve the problems; and identify; evaluate and choose the best alternative solutions. Furthermore, such systems present managers with the ability of predicting the results of the alternatives that will be used in the solution and also commercial bank of Ethiopia acquire the communication systems (E- mail, voice mail, fax) the reason for such percent goes to the fact that these systems found within the communication systems are highly developed, therefore they are costly.

Here, a major difference is present in regards to executive support systems (ESS) and expert systems (ES). (Abdelhak & Dalel, 2008)Have learned that (61.4%) Jordanian commercial banks have invested on executive support systems and (40.7%) invested on expert systems (ES).

Provide different information about the internal and external environment of the bank; as well as the critical success factors, which is needed by the managers in the process of decision- making. Through the above percent, we conclude that the Jordanian commercial banks have (ESS) to a high extent. Through the individuals answers, we conclude that (40.7%) from the Jordanian Commercial banks enjoy the expert systems which are computerized information systems, in which the experts nourish the computers with the knowledge required for conducting some conclusions and inferences; and presenting suggestion and solutions for the problems in a certain field because such solutions will be identical to the solutions provided by human experts. The percent shows that the expert systems (ES) is found moderately, that was expected; because the use of such systems even by developed countries has been only recently; and this can be

explained by the fact that the expert systems (ES) are the most modern computer applications and they require a great amount of capital and experts.

Here, a major difference is present in regards to executive support systems (ESS) of the respondents 66.7%, expert systems (ES) of the respondents 68.5%). These two information system technologies, however, were acquired by all of the respondents in this study. This indicates that commercial bank of Ethiopia are lagging behind in regards to systems that focus on tools for the managers to make decisions at the strategic level and systems that make intelligent process. Percent result shows that make decisions at the strategic level and applications of artificial intelligence in bank operation to better intelligence or moderate.

### 4.3. Information system Investment Added values Assessment

Table 4.4.1 Added values assessment on Voluntariness, Relative advantage, Compatibility, and Image voluntariness

No.	Variables	Scale						
		SD	D	N	A	SA	MEAN	S.D
	<b>Voluntariness</b>							
10	My Boss Does not require me to use Information Technology.	50(30.3)	31(18.8)	42(25.5)	34(20.6)	8(4.8)	2.51	1.252
11	Although it might be helpful, using Information Technology is certainly not Compulsory in my work.	35(21.2)	40(24.2)	32(19.4)	47(28.5)	11(6.7)	2.75	1.261
	<b>Relative Advantage</b>							
12	Information Technology have decreased the task execution time of users.	17(10.3)	18(10.9)	27(16.4)	63(38.2)	40(24.2)	3.55	1.256
13	Information Technology have Increased the quality of Work I do.	9(5.5)	9(5.5)	25(15.2)	60(36.4)	62(37.6)	3.95	1.114
14	Information Technology have Increased the ease of doing my work.	9(5.5)	6(3.6)	15(9.1)	71(43.0)	64(38.8)	4.06	1.057
15	Using Information Technology enhances my effectiveness on the	9(5.5)	4(2.4)	11(6.7)	82(49.7)	59(35.8)		

No.	Variables	Scale							
		SD	D	N	A	SA	MEAN	S.D	
	work						4.08	1.009	
16	Using Information Technology gives me greater control over my work.	8(4.8)	3(1.8)	16(9.7)	78(47.3)	60(36.4)	4.08	0.984	
	Compatibility								
17	Using Information Technology is compatible with all aspects of my work.	8(4.8)	9(5.5)	19(11.5)	89(53.9)	40(24.2)	3.87	1.001	
18	Using Information Technology fits into my work style.	10(6.1)	6(3.6)	21(12.7)	80(48.5)	48(29.1)	3.91	1.052	

Where SD = strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = strongly agree  
MEAN= Mean and S.D = Standard Deviation

From table 4.4 Voluntariness scale is developed to measure the strongly disagree to which an improvement is perceived, the employees strongly disagree and agree about the supervisors does not require employees to use information technology and on average having neutral to this end the respondents were asked to reflect on questions mean (Mean = 2.51, S.D = 1.252) According to Best, (1977) the score from 1.81-2.61 is lower, about this idea not prove require information technology in common understanding . taking the ordinal value of the likert scale, as provided in Table-4.4.1, response between disagree and agree, favoring more towards agree from the other side of using Information Technology is certainly not Compulsory in employees work had on average neutral idea and (Mean = 2.75 and S.D = 1.261). The results of the survey showed a group constructs an average response agree (mean 2.63).According to Best, (1977), from 2.62-3.41 is average/moderate. It implies that Using the mandatory for at the work to use Information Technology although it is useful, unless is not using Information Technology in to mandatory at the CBE where they work.

From the relative advantage side most of the employees agree and strongly agree on average also agree and homogeneous understanding about Information Technology have decreased the task execution time of users (Mean = 3.55, S.D = 1.256), According to Best, (1977), the score from

3.42-4.21 is good/high and average mean greater than 3 was considered as high throughout the study (Best and Khan 1995).

And Information Technology have increased the quality of work employees do (Mean = 3.95, S.D = 1.114), average mean greater than 3 was considered as high throughout the study (Best and Khan 1995) or According to Best, (1977), the score from 3.42-4.21 is good/high.

Information Technology have increased the ease of doing employees work (Mean = 4.06, S.D = 1.057), average mean greater than 3 was considered as high throughout the study (Best and Khan 1995) or According to Best, (1977), the score from 3.42-4.21 is good/high.

Using Information Technology enhances employees effectiveness on the work, and Using Information Technology gives employees greater control over my work (Mean = 4.08, S.D = 0.984). An average mean greater than 3 was considered as high throughout the study (Best and Khan 1995) or According to Best, (1977), the score from 3.42-4.21 is good/high.

The result of the survey showed a group construct mean of 3.94, taking the ordinal value of the Likert scale, as provided in Table-4.4.1. Hence the study result of this survey was compared with similar studies conducted elsewhere, in the comparison (Rogers, 1983) and (Karahanna, Straub, & Chervany, 1999) and more the relative advantage scale is developed to measure the degree to which an improvement is perceived as being better than its precursor. To this end the respondents were asked to reflect on questions. The result of the survey showed a group construct mean of 3.94, taking the ordinal value of the Likert scale, as provided in Table-4.4.1, shows an average response between agree and strongly agree, favoring more towards strongly agree. Hence the study result of this survey was compared with similar studies conducted elsewhere, in the comparison (Rogers, 1983) reported a group construct mean of 4.1, on 1 to 7 scale, showing a difference with this study. However, the result confirms with the expectation stated by (Moore & Benbasat, 1991) claim of diffusion theory, which specifies that adopters should have more positive perceptions of information systems than non-adopters, hence, commercial bank of Ethiopia being adopters of IS, showed a high degree of positive perception. This implies that Relative advantage is degree to which using IT innovation is perceived as being better than using its predecessor, nature of the innovation determines what specific type of relative advantage is important to users usefulness of relative best predictor of adoption and usage Enables to do things faster gives greater control over work (e.g.: better interaction with

and control of Information Technology ) improves the quality of work, in general using the advantageous to work makes it easier to do work.

From the compatibility point of view more employee scale is developed to measure the degree to which an improvement agree and on average had also agree and harmonized sympathetic idea about Using Information Technology is compatible with all aspects of employees work (Mean = 3.87, S.D = 1.001) average mean greater than 3 was considered as high throughout the study (Best and khan 1995) and According to Best, (1977), the score 3.42-4.21 is good/high. And Using Information Technology fits into employees work style (Mean = 3.91, S.D = 1.052), An average mean greater than 3 was considered as high throughout the study (Best and khan 1995) and According to Best, (1977), the score from 3.42-4.21 is good/high.

Hence the study result of this survey was compared with similar studies conducted elsewhere; in the comparison other studies indicate that compatibility is strongly related with relative advantage ( (karahanna et al, 1999,1991,1990) and more Compatibility scale measures the degree to which an IS investment is perceived to being consistent with the existing values, needs and past expectations of the information system adopters. To this end the respondent in CBE were supplied with 2 questions in a likert scale to show their reflection on their degree of agreement with the particular questions. In a similar manner, the results were measured using the average score of the relating questions so that “1” stands for “extremely disagree” and “5” stands for “extremely agree”. In this way a score in these questions indicates that the information systems investments are compatible with values, needs and past expectations of the IS adopters. So In a similar study conducted elsewhere, (Beckett, 2007) assessed the perception of teachers who used Web CAT website course and reported that compatibility scale has 5.03 group construct mean with a standard deviation of 1.25. The study was conducted on a 1 to 7 likert scale. This result, despite the scale difference shows conformity with the result of this study, as a mean value of 5.03 represents somehow agree in the scale. This studies also conforms to the diffusion theory, which states that adopters should have a positive perception on IS than non-adopters (Moore & Benbasat, 1991).

Thus compatibility adegree to which IT innovation is perceived as consistent with the existing values, past experiences and needs of potential adopted ability to manner of working is compatible with every aspect to work (e.g.: evaluation, planning, tracking, etc.). Using the

entirely compatible with current work situation well a work flow enabled by information technology and individual's current and preferred work style by underscoring how the technology embodies prevalent value and emphasizing fit between the technologies and the mental models created through prior experiences.

Thus, in the current study CBE owners with negative feeling towards the information technology might find it difficult to adopt and use IT innovation. Expect that if IT innovation is consistent with the existing technology and high intention to adopt and use such innovation in to CBE.

Table 4.4.2: Values assessment on Ease of use, Result Demonstrability, visibility, and Trainability

Variables	Scale						
	SD	D	N	A	SA	MEAN	S.D
Image							
People in my organisations who use Information Technology have high profile.	12(7.3)	13(7.9)	31(18.8)	74(44.8)	35(21.2)	3.65	1.120
Excelling in Information Technology is symbol ability for my organisation.	11(6.7)	14(8.5)	37(22.4)	66(40.0)	37(22.4)	3.63	1.122
Ease of use							
I believe it is easy to get Information Technology to do what I want it to do.	6(3.6)	16(9.7)	29(17.6)	78(47.3)	36(21.8)	3.74	1.023
Overall, I believe that Information Technology is easy to use.	7(4.2)	15(9.1)	32(19.4)	84(50.9)	27(16.4)	3.66	0.997
Learning to Operate Information Technology is easy for me.	4(2.4)	16(9.7)	25(15.2)	95(57.8)	25(15.2)	3.73	0.918
Result Demonstrability							
I would have no difficulty telling others about the result of using Information Technology.	5(3.0)	15(9.1)	29(17.6)	89(53.9)	27(16.4)	3.72	0.949
The results of using Information Technology are apparent to me.	3(1.8)	11(6.7)	27(16.4)	92(55.8)	32(19.4)	3.84	0.876
Visibility							
It is easy to observe others using	3(1.8)	18(10.9)	39(23.6)	80(48.5)	25(15.2)	3.64	0.930

Variables	Scale						
Information Technology.							
In my Organisation, One sees Information Technology on Many Desks.	6(3.6)	14(8.5)	37(22.4)	80(48.5)	28(17.0)	3.67	0.977
Trainability							
Before deciding to use Information Technology applications, I was able to properly try them out.	5(3.0)	17(10.3)	29(17.6)	88(53.3)	26(15.8)	3.68	0.961
I was permitted to use Information Technology on trial basis long enough to see what it could do.	6(3.6)	21(12.7)	44(26.7)	68(41.2)	26(15.8)	3.53	1.021

Where SD = strongly agree, D = Disagree, N = Neutral, A = Agree, SA = strongly agree

MEAN= Mean and S.D = Standard Deviation

From the given table 4.4.2, the employees agree about People in my organisations who use Information Technology have high profile and on average all the employees having agree and homogeneous idea (Mean = 3.65, S.D. = 1.120) average mean greater than 3 was considered as high throughout the study (Best and khan 1995) and According to Best, (1977), the score from 3.42-4.21 is good/high. The point Excelling Information Technology is symbol ability for my organisation had on average agree and common understanding about this idea (Mean = 3.62, S.D = 1.122). The result of the survey showed a group construct mean of 3.6, taking the ordinal value of the likert scale, as provided in Table-4.4.2 Image construct may be significant in an Information Technology adoption. Hence the study result of this survey was compared with similar studies conducted elsewhere, in the comparison argues that individuals are more likely to adopt innovations when they perceive image improvement (Rogers, 1983).

This implies that use Information Technology high profile and excelling in Information Technology is symbol ability to status directly influence the intensity of the use of a technological innovation although, Where worker or who use the have a distinctive profile (e.g.: more communicative; attempt to interact....) is a status symbol at bank who use the greater prestige than those who do not and coworkers (where a work use the place).

scale is developed to measure the degree to which an improvement is From the point of Ease of use mainly of the respondents agree and the averages approximately also agree and homogeneous understanding about employees believe it is easy to get information technology to do what employees want it to do (Mean = 3.74, S.D = 1.023), average mean greater than 3 was considered as high throughout the study (Best and khan 1995), According to Best, (1977), the score from 3.42-4.21 is good/high, Overall, employees believe that Information Technology is easy to use (Mean = 3.66, S.D = 0.997), average mean greater than 3 was considered as high throughout the study (Best and khan 1995), According to Best, (1977), the score from 3.42-4.21 is good/high, and Learning to Operate Information Technology is easy for employees (Mean = 3.73, S.D = 0.918) average mean greater than 3 was considered as high throughout the study (Best and khan 1995), According to Best, (1977), the score from 3.42-4.21 is good/high. To this end the respondents were asked to reflect on questions. The result of the survey showed a group construct mean of 3.71, taking the ordinal value of the likert scale, as provided in Table-4.4.2, shows an average response agree , favoring more towards agree. Davis; Bagozzi and Warshaw (1989) showed that individually perceived ease of use in connection with information systems positively influence use.

This implies that degree to which an innovation is perceived as relatively difficult to understand and use absence of ease of use had a negative impact on perceptions of technology and lead to decreased adoption and usage. Study expect that if IT innovation is easy to use CBE owners would have a higher intention to adopt and use IT innovation, given the well-established rationale and empirical support for an effect of ease to use on adoption of information technology. Learning how to use? To be easy to carry out tasks, an interaction with clear and easy to understand.

In addition to the above cases, from the result demonstrability side almost most of the employees agree, approximately on average agrees and uniform understanding about employees would have no difficulty telling others about the result of using Information Technology and the results of using information technology are apparent to employee. It makes sense; therefore, to evaluate the influence of the Result Demonstrability on the use of technological innovation, providing the grounds for the study positively influences the process of adoption and use of a technological innovation (Moore & Benbasat, 1991)



Moreover from the visibility side more employees agree, approximately on average agree and common idea about information technology is easy to observe others using information technology and in commercial bank of Ethiopia, One sees information technology on many Desks. According to (He, 2006) the more visible an innovation's results, the faster its adoption and implementation will be, that is, an innovation's observability as perceived by individuals is positively related with the innovation's adoption index. Within the context of their study,(Moore & Benbasat, 1991)

More over from the above all, almost more employees agree and approximately on average agree and homogeneous understanding about Trainability of information technology such as before deciding to use Information Technology applications, I was able to properly try them out (Mean = 3.68, S.D = 0.961) average mean greater than 3 was considered as high throughout the study (Best and khan 1995),According to Best, (1977), the score from 3.42-4.21 is good/high and employees was permitted to use information technology on trial basis long enough to see what it could do and innovation that can be tried, and which an individual can test and find out whether or not will operate according to his or her needs as a used involves less uncertainty, as it enables learning by doing (Rogers, 1983; Moore & Benbasat, 1991). Technology adoption difficulties may be supported by professional training, which is regarded as a phase in the adoption process because lacking or insufficient training may create resistance to the technological innovation (Dong, 2007).the trial- ability aspect enables testing the innovation, which may influence the use of a technology.

Trialability, implies a degree to which it is possible to try using the IT innovation. it is more important for early adopters as the ability to try the technology will decrease levels of uncertainty and Increase user experience more easily the innovation can be tried, the more easily it will be adopted in addition to Opportunities to try before choosing to use the experience, it allowed to use the purposes for time enough to understand its utility and sufficient period of time before adopting it. And also The Result Demonstrability from using are evident about the implications (e.g.: results or benefits) of the use of the no difficulty explaining the results of the use and others no difficulty explaining why the use may or may not provide benefits.

About Visibility, Where they work, many employees are known to be using perceived at the bank where a work and can connect to different locations and on different computers it often see other using the work.

## CHAPTER FIVE-CONCLUSIONS AND RECOMMENDATION

In this final chapter of the study, it is tried to non-financial measure performance of information technology investment on the findings and analysis provided in chapters four. Therefore, in general term the study emphasized on main objective to analysis perception of users on the Information system investments and conclusions drawn based on the findings , recommendations and as well as future studies is provided.

### 5.1. Summary of Findings

In the study, new empirical evidence has been presented on the process of IS investments on non-financial performance measure. More specifically, survey provided an empirical evidence in regard to: what are the perceptions of IS investors post implementation.

The study also showed the pattern of IS investments, based on the type of IS resources the investments are focused on. Accordingly it was revealed that most investments are made on; (1) transaction processing systems (86.7%), more specifically core banking systems and related channels of product delivery, (2) management information systems (78.8%); intermediary tools of information provision for management consumption in the form of reports, (3) communication systems (84.8%), an electrical tool for internal communications with in the institutions, (4) decision support systems (67.3%), advanced level tool for top level management in the form of reports., Executive support systems (66.7) and Expert Systems (68.5)

Moreover, the study investigated the perception of IS investors on the performance of their investments, where Voluntariness, relative advantage, compatibility, Image, Ease of use, Result Demonstrability ,Visibility and Trainability were used as a measure of the same. To this end the study, based on a 1 to 5 scale where high score represents high agreement although Besides, the decision rules used in the analysis was an average mean less than 3 was considered as low, average mean equal to 3 was considered as medium and average mean greater than 3 was considered as high throughout the study (Best and khan 1995) or According to Best, (1977), the score from 1-1.80 is lowest, from 1.81-2.61 is lower, from 2.62-3.41 is average/moderate, from 3.42-4.21 is good/high, and 4.22-5 is considered very good. , revealed a construct group of mean in average Voluntariness (2.63), relative advantage(3.94), compatibility(3.89), Image( 3.64), Ease of use(3.71),Result Demonstrability(3.78) ,Visibility (3.66) and Trainability (3.61).

## 5.2. Conclusions

This section presents the conclusion drawn based on the findings of the study.

- ✓ As to the pattern of investment made in relation to the kinds of IS investments, it was learned that investments are focused on transaction processing systems, management information system and communication system. Whereas, indicating particular focus was given for executive support system, which provided a set of concrete information on strategic affairs of the bank.
- ✓ As to the perception of IS investors on the performance of the system post implementation, the study response showed a reasonable consistency with the diffusion theory, which states that, IS adopters are expected to have a positive perception on the performance of their system. More particularly, the respondents agree with the fact that, the IS investment provides a better performance of the banks precursors system. In addition to this the result also showed that the respondents believe the investments made are compatible with the company in terms of company strategy, business process, and employee sites.
- ✓ As to the pattern of investment add value assessment kinds of IS investments, it was learned that investments are focused on relative advantage, Compatibility, result demonstrability. Whereas, indicating particular focus was given for ease of use, visibility, image, Triability and voluntariness, which provided a set Increase user experience more easily the innovation can be tried, the more easily it will be adopted.
- ✓ Analysis of the mastery of technology variable also showed its direct and significant effect on the process of Use of the technological innovation. The variable represents knowledge of and experience with IT on 'relative advantage', 'Compatibility', 'result demonstrability', 'ease of use' and 'visibility' relative to the bank. Based on statistical evidence, the attributes: 'ease of use', 'visibility', 'image', 'trialability' and 'voluntariness', and the variable experience time positively affect use of add value information technology in findings enhance understanding of the effects of these beliefs on the formation of attitude.

### 5.3. Recommendations

Based on the findings and subsequent analysis of the study, the following recommendations further future enquiry areas.

- Significant full well that the information technology investments cannot be separated from the industry due to its immense contributions to the banking industry and based on the data analysis the researcher therefore recommends with the intent that if adopted would have positive effects on the banking industry the banks should improve more accordingly to the firm goal on its information technology investment so as to enhance its performance. It means the bank more need to improve the justification process for information system investments by focusing on two fronts: On the association of types of transaction processing systems in the justification process and management information systems techniques used for the justification.
- Executive support systems will enable the top management of the bank to acquire the proper level of strategic information with minimal effort. In turn this will lead to better strategic success to banks, by allowing the executive management to make informed proactive decisions.
- In addition to the types of information systems currently focused on by Ethiopian banks, consideration should be made towards additional IS technologies that will bring important addition to the business. These are, Executives Support Systems and Expert systems.

### 5.4. Suggestions For Future Studies

Future researchers may also investigate causes and effects of adopting different combinations the research indicated a relationship between the individual IT investment measures and individual organizational performance measures increased significantly. In particular, the organizational performance measures should be considered for measuring IT investment effect an also IT investment on organizational strategic and economic performance by focusing on relevant measures and their relationships making IT investment decisions. Considering the present constraints on the obtaining of all appropriate data, the research made a positive contribution in that direction. Some cautions should, however, be stated

regarding these conclusions. The results should be interpreted carefully because this was a survey study. A longitudinal study will be necessary in order to derive a meaningful conclusion in situations where IT investment may necessarily result in immediate benefits, May have been influenced by factors related to IT.

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# APPENDIX

## Appendix-1 column Data- A

Location of the department

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid M	55	33.3	33.3	33.3
C	55	33.3	33.3	66.7
S	55	33.3	33.3	100.0
Total	165	100.0	100.0	

Educational Status

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid College Diploma	12	7.3	7.3	7.3
University Second Degree	4	2.4	2.4	9.7
Secondary Education (Grade 8-12)	1	.6	.6	10.3
University First Degree	148	89.7	89.7	100.0
Total	165	100.0	100.0	

Transaction Processing systems (TPS).

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	143	86.7	86.7	86.7
No	22	13.3	13.3	100.0
Total	165	100.0	100.0	

Management information system (MIS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	130	78.8	78.8	78.8
	No	35	21.2	21.2	100.0
	Total	165	100.0	100.0	

Decision support systems (DSS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	111	67.3	67.3	67.3
	No	54	32.7	32.7	100.0
	Total	165	100.0	100.0	

Executive support systems (ESS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	110	66.7	66.7	66.7
	No	55	33.3	33.3	100.0
	Total	165	100.0	100.0	

Expert Systems (ES)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	113	68.5	68.5	68.5
	No	52	31.5	31.5	100.0
	Total	165	100.0	100.0	

Communication systems (CS) (i.e E mail, Voice- mail, fax)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	140	84.8	84.8	84.8
No	25	15.2	15.2	100.0
Total	165	100.0	100.0	

My Boss Does not require me to use Information Technology.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	50	30.3	30.3	30.3
Disagree	31	18.8	18.8	49.1
Neutral	42	25.5	25.5	74.5
Agree	34	20.6	20.6	95.2
Strongly Agree	8	4.8	4.8	100.0
Total	165	100.0	100.0	

Although it might be helpful, using Information Technology is certainly not Compulsory in my work.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	35	21.2	21.2	21.2
Disagree	40	24.2	24.2	45.5
Neutral	32	19.4	19.4	64.8
Agree	47	28.5	28.5	93.3
Strongly Agree	11	6.7	6.7	100.0
Total	165	100.0	100.0	

Information Technology have decreased the task execution time of users.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	17	10.3	10.3	10.3
	Disagree	18	10.9	10.9	21.2
	Neutral	27	16.4	16.4	37.6
	Agree	63	38.2	38.2	75.8
	Strongly Agree	40	24.2	24.2	100.0
	Total	165	100.0	100.0	

Information Technology have Increased the quality of Work I do.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	9	5.5	5.5	5.5
	Disagree	9	5.5	5.5	10.9
	Neutral	25	15.2	15.2	26.1
	Agree	60	36.4	36.4	62.4
	Strongly Agree	62	37.6	37.6	100.0
	Total	165	100.0	100.0	

Information Technology have Increased the ease of doing my work.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	9	5.5	5.5	5.5
Disagree	6	3.6	3.6	9.1
Neutral	15	9.1	9.1	18.2
Agree	71	43.0	43.0	61.2
Strongly Agree	64	38.8	38.8	100.0
Total	165	100.0	100.0	

Using Information Technology enhances my effectiveness on the work

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	9	5.5	5.5	5.5
Disagree	4	2.4	2.4	7.9
Neutral	11	6.7	6.7	14.5
Agree	82	49.7	49.7	64.2
Strongly Agree	59	35.8	35.8	100.0
Total	165	100.0	100.0	

Using Information Technology gives me greater control over my work.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	8	4.8	4.8	4.8
Disagree	3	1.8	1.8	6.7
Neutral	16	9.7	9.7	16.4
Agree	78	47.3	47.3	63.6
Strongly Agree	60	36.4	36.4	100.0
Total	165	100.0	100.0	

Using Information Technology is compatible with all aspects of my work.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	8	4.8	4.8	4.8
Disagree	9	5.5	5.5	10.3
Neutral	19	11.5	11.5	21.8
Agree	89	53.9	53.9	75.8
Strongly Agree	40	24.2	24.2	100.0
Total	165	100.0	100.0	

Using Information Technology fits into my work style.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	10	6.1	6.1	6.1
Disagree	6	3.6	3.6	9.7
Neutral	21	12.7	12.7	22.4
Agree	80	48.5	48.5	70.9
Strongly Agree	48	29.1	29.1	100.0
Total	165	100.0	100.0	

People in my organisations who use Information Technology have high profile

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	12	7.3	7.3	7.3
Disagree	13	7.9	7.9	15.2
Neutral	31	18.8	18.8	33.9
Agree	74	44.8	44.8	78.8
Strongly Agree	35	21.2	21.2	100.0
Total	165	100.0	100.0	



Excelling in Information Technology is symbol ability for my organization.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	11	6.7	6.7	6.7
Disagree	14	8.5	8.5	15.2
Neutral	37	22.4	22.4	37.6
Agree	66	40.0	40.0	77.6
Strongly Agree	37	22.4	22.4	100.0
Total	165	100.0	100.0	

I believe it is easy to get Information Technology to do what I want it to do.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	6	3.6	3.6	3.6
Disagree	16	9.7	9.7	13.3
Neutral	29	17.6	17.6	30.9
Agree	78	47.3	47.3	78.2
Strongly Agree	36	21.8	21.8	100.0
Total	165	100.0	100.0	

Overall, I believe that Information Technology is easy to use.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	4.2	4.2	4.2
	Disagree	15	9.1	9.1	13.3
	Neutral	32	19.4	19.4	32.7
	Agree	84	50.9	50.9	83.6
	Strongly Agree	27	16.4	16.4	100.0
	Total	165	100.0	100.0	

Learning to Operate Information Technology is easy for me.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	2.4	2.4	2.4
	Disagree	16	9.7	9.7	12.1
	Neutral	25	15.2	15.2	27.3
	Agree	95	57.6	57.6	84.8
	Strongly Agree	25	15.2	15.2	100.0
	Total	165	100.0	100.0	

I would have no difficulty telling others about the result of using Information Technology.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	3.0	3.0	3.0
	Disagree	15	9.1	9.1	12.1
	Neutral	29	17.6	17.6	29.7
	Agree	89	53.9	53.9	83.6
	Strongly Agree	27	16.4	16.4	100.0
	Total	165	100.0	100.0	

The results of using Information Technology are apparent to me.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	1.8	1.8	1.8
	Disagree	11	6.7	6.7	8.5
	Neutral	27	16.4	16.4	24.8
	Agree	92	55.8	55.8	80.6
	Strongly Agree	32	19.4	19.4	100.0
	Total	165	100.0	100.0	

It is easy to observe others using Information Technology.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	1.8	1.8	1.8
	Disagree	18	10.9	10.9	12.7
	Neutral	39	23.6	23.6	36.4
	Agree	80	48.5	48.5	84.8
	Strongly Agree	25	15.2	15.2	100.0
	Total	165	100.0	100.0	

In my Organisation, One sees Information Technology on Many Desks.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	3.6	3.6	3.6
	Disagree	14	8.5	8.5	12.1
	Neutral	37	22.4	22.4	34.5
	Agree	80	48.5	48.5	83.0
	Strongly Agree	28	17.0	17.0	100.0
	Total	165	100.0	100.0	

Before deciding to use Information Technology applications, I was able to properly try them out.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	5	3.0	3.0	3.0
Disagree	17	10.3	10.3	13.3
Neutral	29	17.6	17.6	30.9
Agree	88	53.3	53.3	84.2
Strongly Agree	26	15.8	15.8	100.0
Total	165	100.0	100.0	

I was permitted to use Information Technology on trial basis long enough to see what it could do.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	6	3.6	3.6	3.6
Disagree	21	12.7	12.7	16.4
Neutral	44	26.7	26.7	43.0
Agree	68	41.2	41.2	84.2
Strongly Agree	26	15.8	15.8	100.0
Total	165	100.0	100.0	

Working Experience in Bank

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid <= 3 Years	67	40.6	40.6	40.6
4 to 5 Years	46	27.9	27.9	68.5
6 to 10 Years	44	26.7	26.7	95.2
Greater than 10 Years	8	4.8	4.8	100.0
Total	165	100.0	100.0	

## Appendix B- Survey Questionnaire

Saint Mary's University  
School of Graduate Studies  
Department of Business Administration  
Survey Questionnaire

Dear respondent,

This survey is conducted with the intention to provide insight into the practice of Information Technology investment evaluation in the commercial bank of Ethiopia. The results of the survey will be used to develop industry-wide benchmarks on investment evaluation. Thus, results will help practitioners to make more informed decisions on future IT investments and resource commitments.

All data and information that will be gathered through this questionnaire will be used for the sole purpose of the research and remains confidential. Therefore, you are kindly requested to respond to the questions with utmost good faith, freely and to the best of your knowledge. There is no need to write your name on the questionnaire.

Thank you in advance for your time and kind cooperation..

### I. General Profile

Please use the blank space for question requiring your exact answer and for the rest of questions put a  $\surd$  or X mark in the selection box that best represents your response.

1. How long have you worked in the bank \_\_\_\_\_

2. Educational Status

Primary Education (Grade1-8)

Secondary Education (Grade 8-12)

College Diploma

University First Degree

University Second Degree

Other \_\_\_\_\_

## II. Type of Information System Technology Investments

Kindly place a (✓ or X) mark by identifying whether the specific list of information system types are acquired or not by your institution. You may use “Yes” column if the IS type has been acquired by your institution, or place a mark on the “No” column if not acquired. In addition you may specify any type of information system your firm may have invested on, in the “other if any”, section of the questioner.

No.	Information System Type	Explanatory Note	Response	
			Yes	No
3.	Transaction Processing systems (TPS).	Are the basic business systems that serve the operational level of the organization. A transaction processing system is a computerized system that performs and records the daily routine transactions necessary to conduct business. <i>Examples</i> are sales order entry system, hotel reservation systems, and payroll.		
4.	Management information system (MIS)	Serve the management level of the organization, providing managers with reports and often online access to the organization's current performance and historical records.		
5.	Decision support systems (DSS)	Decision support systems are computerized systems that serve the management level of the organization and help managers make decisions.		
6.	Executive support systems (ESS)	Executive support systems are computer-based information systems which serve the strategic level of the organization, and help senior managers to make decisions.		
7.	Expert Systems (ES)	Expert Systems are applications of artificial intelligence in businesses such as the development of expert systems and other business intelligence systems.		



No.	Information System Type	Explanatory Note	Response	
			Yes	No
8.	Communication systems (CS): (i.e E mail, Voice- mail, fax)	Are computer-based information systems that collect, process, store, and transmit electronic messages, documents, and other forms of communications among individuals, work groups, and organizations efficiently.		

9. Others, If any?

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### III. Information System Investment Added values Assessment

Please indicate your degree of agreement or disagreement with the statements provided here under, by putting  $\surd$  or X marks in the appropriate column as best represents you each column represents(1-Strongly Disagree; 2-Disagree; 3- Neutral; 4-Strongly Agree; 5-Agree).

Key: SD= Strongly Disagree; D=Disagree; N= Neutral; A= Agree; SA= Strongly Agree

No.	Variables	Scale				
		SD	D	N	A	SA
	Voluntariness					
10	My Boss Does not require me to use Information Technology.					
11	Although it might be helpful, using Information Technology is certainly not Compulsory in my work.					
	Relative Advantage					
12	Information Technology have decreased the task execution time of users.					
13	Information Technology have Increased the quality of Work I do.					
14	Information Technology have Increased the ease of doing my work.					

No.	Variables	Scale				
		SD	D	N	A	SA
	<b>Voluntariness</b>					
15	Using Information Technology enhances my effectiveness on the work					
16	Using Information Technology gives me greater control over my work.					
	<b>Compatibility</b>					
17	Using Information Technology is compatible with all aspects of my work.					
18	Using Information Technology fits into my work style.					
	<b>Image</b>					
19	People in my organisations who use Information Technology have high profile.					
20	Exceling in Information Technology is a symbol ability for my organisation.					
	<b>Ease of use</b>					
21	I believe it is easy to get Information Technology to do what I want it to do.					
22	Overall, I believe that Information Technology is easy to use.					
23	Learning to Operate Information Technology is easy for me.					
	<b>Result Demonstrability</b>					
24	I would have no difficulty telling others about the result of using Information Technology.					
25	The results of using Information Technology are apparent to me.					
	<b>Visibility</b>					
26	It is easy to observe others using Information Technology.					
27	In my Organisation, One sees Information Technology on Many Desks.					
	<b>Trainability</b>					
28	Before deciding to use Information Technology applications, I was able to properly try them out.					
29	I was permitted to use Information Technology on trial basis long enough to see what it could do.					