

**AN INVESTIGATION OF BUSINESS VALUE OF  
INFORMATION TECHNOLOGY: CASE OF KENYAN  
CAPITAL MARKETS**

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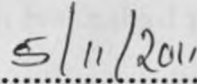
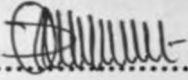
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## DECLARATION

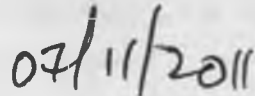
This research project is my original work and has not been to any other institution of learning for the award of an academic certificate.



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## DEDICATION

**To my dear mum for the moral and material support that made my academic dream come true.**

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## ABSTRACT

Investing in information technology is an important activity that most organizations strive to perform. Several organizations continue to invest in large scale IT systems. Many however companies become so focused on IT that have lost sight of their core goals set in their corporate strategies; this has eventually led to IT systems being bottomless holes that pull their companies resources. Indeed IT investments have been a sad tale for some companies, for example the near collapse of Interstate Bakeries' financial reporting system which contributed to a loss in market value of one-third in a single day. Clearly, IT investments are about so much more than just implementing an IT solution and calling it a day. Therefore there is need to carry out measurements so as to ensure that the objectives of the IT projects realized. It is imperative to utilize business performance metrics in the pre- and post-implementation phases for result comparison so as to determine IT business success. This study therefore sought to establish the business values realized by organizations through investments in information technology. The study consequently sought to answer three major questions viz: which tools are used to measure the impact of IT in organizations? What is the relationship between IT investments and business performance? Finally, what are the challenges that hinder the measurement of business value of IT investments by firms in the capital markets? The study adopted the exploratory design and data was collected using questionnaires and interviews and data was analyzed using frequencies, percentages, means, and standard deviation and correlation analysis. The findings of the study indicated that TQM and balance score card were the most used tools in measuring the impact of IT by organizations .Consequently there existed a negative relationship between IT investments and business performance and finally the findings revealed that valuation of non monetary benefits, difficulty in obtaining information from the user departments and incorporation of uncertainties like obsolescence of technology were the major challenges affecting efforts to evaluate the business value created by IT investments by firms. The study finally concluded that although investments in IT enable the organizations to cut on costs and improve efficiency, the net benefits realized by organizations do not warrant such investments. In this regard the study recommends that before organizations commit shareholders fund in investing in IT infrastructure it should carry a baseline study and build a case to demonstrate the business value and tangible benefits that the investment will reap.

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## **LIST OF ABBREVIATION**

<b>ATS</b>	<b>Automated Trading System</b>
<b>BSC</b>	<b>Balance Score Card</b>
<b>CBK</b>	<b>Central Bank of Kenya</b>
<b>CDS</b>	<b>Central Depository System</b>
<b>CDSC</b>	<b>Central Depository and Settlement Corporation</b>
<b>CMA</b>	<b>Capital Markets Authority</b>
<b>CSCS</b>	<b>Central Securities Clearing System</b>
<b>DvP</b>	<b>Delivery Verses Payment</b>
<b>EVA</b>	<b>Economic value added</b>
<b>GOK</b>	<b>Government of Kenya</b>
<b>ICT</b>	<b>Information Communications</b>
<b>IPO</b>	<b>Initial Public Offering</b>
<b>IS</b>	<b>Information Systems</b>
<b>IT</b>	<b>Information Technology</b>
<b>NSE</b>	<b>Nairobi Stock Exchange</b>
<b>NYSE</b>	<b>New York Stock Exchange</b>
<b>OFS</b>	<b>Offer the Counter Trading</b>
<b>PIBO</b>	<b>Public Infrastructure Bond Offer</b>
<b>PSC</b>	<b>Privatization Steering Committee</b>
<b>ROI</b>	<b>Return on Investment</b>
<b>TQM</b>	<b>Total Quality Management</b>
<b>USE</b>	<b>Uganda Stock Exchange</b>

# CHAPTER ONE: INTRODUCTION

## 1.1 Background of the Study

Information Technology, or IT, is the study, design, creation, utilization, support, and management of computer-based information systems, particularly software applications and computer hardware. Evaluating the value of information technology on an organization is an important exercise that most organizations strive to perform. Several organizations continue to invest in large scale IT systems and therefore there is need to carry out measurements so as to ensure that the objectives of the IT projects are finally realized. It is imperative to utilize business performance metrics in the pre- and post-implementation phases for result comparison so as to determine IT business success (Aro, 2005).

Hollington (2003) sought answers on the best methodology that can be used to measure the value of IT. She affirmed that the metrics can be easily systemized, tracked, and reported on to promote the "performance of IT" as an organization, but do there is need to demonstrate the value that IT contributes to the business. Therefore it is imperative to make a clear distinction between performance measures and value measures.

Harris et al (2008) reiterates that a business must obtain all the information technology it needs at the best possible price considering the use of time and other resources. Many companies become so focused on IT that they lose sight of their core goals set in the corporate strategy, this eventually ends up having their IT systems being bottomless holes that pull their companies resources. Instead a business should ideally, define the role IT should play in enabling your firm reach its goals, what its budget, and how to adapt its systems to competitive realities. The sole objective of management should be to build a robust but

supportive IT function with contained costs. The use of information technology, provided it is done in accordance with the business needs where resources utilized match the expected payoffs from the project, may lead to better firm performance through increased scale and scope economies, customer value, firm operational efficiency and organizational effectiveness by providing opportunities for competitive advantage (Sward, 2006).

The business value of IT refers to the organizational performance impacts of information technology at both the intermediate process level and the organizational-wide level, and comprising both efficiency impacts and competitive impacts (Melville et al, 2004). Karimi (2010) observes that the business value of IT refers to the impact on business performance at intermediate process and financial profitability levels. Business performance evaluation tools are used in the pre- and post-implementation stages for result comparisons in order to ascertain creation of IT business value. Some of the measurement metrics used in the evaluation include the Return on Assets, Net Present Value, Return on Investment and Economic Value Added

However, measuring the business value of IT is a resource-intensive exercise, but on the other hand, is also a vital goal (Kohli & Devaraj, 2004). Evaluation of IT entails a broad time frame, beginning at pre-investment strategy formulation and continuing during investment and ending after post-investment. Realizing value also requires additional investments or process changes, such as training, process redesign, and skilled people, to complement the IT investment. An organized measurement process to evaluate the business value of IT addresses the demands for greater accountability as the size of IT investments increases.

On the flipside when new information technology is first introduced, managers tend to adopt the technology first and then try to figure out what to do with the new information and cope

with the business and organizational implications. Such an approach is recognized as woefully inadequate (Reynolds, 1995). The new technology is more powerful, more diverse, and increasingly entwined with organization's critical business processes.

When planning to introduce an information technology, managers need to consider answers to questions like, why is it that for many companies, there has been little improvement in profits and productivity growth to show for their investment in information technology. Should information technology be considered strategic in nature and fundamental to achieving the goals of the organization or simply as a means to improve efficiency?

Some of the challenges experienced when undertaking IT business value evaluation include cases where the primary objective does not first address the business goals and challenges. Starting with technology and working backwards to business utility often results in proper but non-fruitful projects (Wald and Marsden, 2003). There is also the issue of not recognizing that not all business goals can be achieved through technology alone. It requires a combination of process redesign (including organization, metrics, and procedures) as well as technology (new or updated applications) may be necessary. Creative focus on business goals can help in defining initiatives to achieve them. Another key challenge is the failure to realize that project benefits cannot always be completely or accurately quantified. When choosing among competing initiatives designed to achieve multiple goals, independent evaluation of the goal value and the initiative's impact on that goal may help in comparing the value of projects. Analyzing your entire technology project portfolio may reveal something broader in your business that needs to be changed. Be alert for underlying structural issues (in IT infrastructure, organizational design, and/or business/IT alignment) that may contribute to multiple business problems. Continually monitoring critical business success metrics and re-

evaluating your project alignment process based upon them. Business models change and project prioritization criteria should change accordingly

### **1.1.1 Kenyan Capital Markets**

The capital market is part of the financial market that provides funds for long-term development. This is a market that brings together lenders (investors) of capital and borrowers (companies that sell securities to the public) of capital. Capital market intermediaries are individuals or firms that participate in the capital markets activities mainly in provision of specialized services to the various stakeholders. In the case of the Kenyan Capital Markets the market players include the capital markets Authority came into existence in 1990 when the Government of Kenya realized the need to design and implement policy reforms to foster sustainable economic development for an efficient and stable financial system (Ngugi, 2003). The specific core objective, it set out to enhance the role of the private sector in the economy, reduce the demands of public enterprises on the exchequer, rationalize the operations of the public enterprise sector to broaden the base of ownership and enhance capital market development. The major role of the CMA is to ensure that there is fair play in the market by ensuring that all the intermediaries adhere to the laid down operations regulations. CMA therefore conducts surveillances to ensure that the regulations are being adhered to and keep reviewing the systems and operations guidelines of all the licensed intermediaries.

The Nairobi Stock Exchange (NSE) existence traces back to 1951, where Estate Agent by the name of Francis Drummond established the first professional stock broking firm. The year 1988 saw the first privatization through the NSE, of the successful sale of a 20% government stake in Kenya Commercial Bank. There has been increased activity in the NSE over the last

eight years prompting the Kenyan government to prevail the CMA to adopt a demutualization scheme of the exchange. With buoyed levels of activity there has been need to continue upgrading the systems used in running the NSE operations over time.

There are fifty (50) listed companies in the NSE. The listed companies are grouped in array of nine (9) categories according to their core activities in the economy. These companies are obligated to operate within the CMA and NSE framework so as to continue being listed; this is in terms of financial reporting and handling of shareholder affairs.

The Central Depository and Settlement Corporation (CDSC) came into existence after a proposal was made to install the Central Depositing System (CDS) in 1995 following a feasibility study which identified the urgent need for CDS to achieve two critical issues. The two issues were the need to establish an enabling legislation to ensure best practice and the need to acquire the best technology. Installation of a CDS was aimed at enhancing liquidity and efficiency in the trading system by reducing the period of delivery and settlement.

There are eight investment banks and nine stockbrokers who are members of the NSE. These institutions intermediate between investors who are lenders of capital and listed companies who borrow funds in the market. These firms have a responsibility to all the investors who go through them to transact.

There are ten Registrar firms in the Kenyan capital market. These firms provide investor relations activities on behalf of listed companies. They handle the day to day investor activities e.g. payment of dividends, update of shareholder details, process corporate actions like bonus issues and provide investor returns to CMA on behalf of the listed company.

## 1.2 Statement of the Problem

In, many cases managers cannot ascertain the value created by IT projects implemented by companies' (Muganda, 2001).As in any valuable undertaking, it is important to understand the justification behind an IT investment initiative. Why should a company invest in a certain information technology? What outcome is the organization striving to attain in the investment? What are the strategic goals it wishes to accomplish? Correctly answering these questions is the significant first step that should be managed before embarking on the choice and the decision to invest in IT. The greatest reason businesses fail to realize the intended payoffs from information technology investments is their lack of effective process for planning, implementing and evaluating the payoffs. The aim of this research is to ascertain the impact of ICT investments in creating a business value and how the value can be measured.

Williams (2003) observes that Organizations around the world have felt the glory of effective IT investments and the sting of inadequate ones. By connecting separate aspects of its supply chain (which enabled the reduction of inventory levels), IBM reportedly saved US \$12 billion. While on the other hand an IT investment has been a sad tale for other companies, for example the near collapse of Interstate Bakeries' financial reporting system contributed to a loss in market value of one-third in a single day. Clearly, IT investments are about so much more than just implementing an IT solution and calling it a day.

There have been other related studies on business value of IT carried out in Kenya, Muganda (2001) carried out a research on Investigation of business value of E-Commerce on selected firms in Kenya. Ngugi(2003) too carried out a comprehensive research on the Nairobi Stock Exchange highlighting how technology has enhanced liquidity in the capital markets. Karimi (2010) too carried out a study on the investigation of business value of Enterprise Planning



Systems. There has not been any research carried out specifically in the entire capital markets context, where the value of information technology is evaluated. This study therefore seeks to bridge the identified gap of investigating the relationship between IT investments undertaken by capital markets players and business performance.

Many managers today believe that it is critical for IT organizations to adopt metrics and measures of information technology's value as part of their approval development and implementation process (Sward, 2006). The literature review gives an impression that well-managed and controlled IT-enabled business investments offers organizations with considerable opportunities to generate value. It is worthwhile to note that: while IT-enabled business investments can bring great benefits, business managers need to understand IT investments are no longer just about executing IT solutions. Business value of IT is attained by what organizations do with IT rather than by the technology itself.

An organization needs to make some judgment of information value in order to judge appropriate investment levels. After such a balancing act management must feel that it has achieved value for money and it is not all certain that all organizations feel they have. Doubts about lack of value for money may not just be a perception, since a 1992 city university business school survey showed that 82 percent of IS projects returned very few real business benefits while a 1993 KPMG peat Marwick survey of building societies found that, although they were all investing in IS ventures only 40 percent felt that they were getting value for money (Robson, 1997)

This study intends to establish the importance of measuring the business value created by IT in achieving the firm's corporate strategy. The research study addressed the following

research questions, how can business value created by information technology be measured so as to determine its contribution in firm's business processes, products and overall business value? Is there a relationship between IT investments and business performance?

### **1.3 Research Objectives**

The broad objective of the study was to establish the benefits that a business can derive by adopting the measurement of business value created by IT. The study encompasses the measurement of tangible and non-tangible business value created by IT to business organizations.

The specific objectives of the study were to:

- i. Investigate the tools used by companies to measure impacts of IT in the organization.
- ii. Determine the relationship between IT investments and business performance.
- iii. Establish the challenges hindering measurement of business value of IT Investments by firms in the Kenyan capital markets.

### **1.4 Value of the Study**

Having an elaborate IT Payoff measurement system with very clear metrics serves as a mechanism for monitoring and insuring "the conversion effectiveness" of IT assets into business results (Kohli & Devaraj (2004). Measuring business value will enable managers to capitalize on organizational resources, creating an IT measurement process, and taking corrective action when an IT investment does not yield the planned payoffs. An organized measurement process of business value of IT, demands for greater accountability as the size of IT investments increases. Being able to extract business value from IT investments will

demonstrate to stakeholders the need to make the investment. This study will be benefiting various stakeholders in the following ways;

- i. It will enable managers to be able to measure and monitor business benefits created by investing in IT. This value is evaluated based on a myriad of yardsticks e.g. customer requirements, business and technical risks, strategic position and alignment, expected income, cost of the investment, and quantification of competitive edge created. Each IT project is given a numerical score for each criterion and the weighted totals are summed to give a single quantitative number for its business value. Weightings are assigned based on each criterion's importance given the ongoing business strategy and operating environment. Additionally the study will enable managers develop a new theoretical framework of the IT project selection process. This framework will enable an organization to place a different structure and emphasis on its traditional project management methods. The result of this is more informed project selection decisions, as higher quality information is available for decision-making at an earlier stage within the selection process.
- ii. It will provide IT companies and practitioners a basis of which they can market and price their products to today's business customer who is well informed and very knowledgeable. They should be able to demonstrate how their products generate value to the firm and be able to measure its impact on the organization. Business organizations today strive to cut costs and become more responsive to the needs of stakeholders hence IT organizations and practitioners should develop IT enterprise architectures and at the same time establish measurable standards in both performance and value.

iii. The study will also form a basis for interested researchers, scholars and operations management practitioners to research on and add to the body of knowledge on measurement of business value of IT.

## CHAPTER TWO: LITERATURE REVIEW

### 2.1 Business value of IT

The term “Business value of IT” refers to the impact of IT on organizational performance, which is usually evaluated using intermediary process-level procedures as well as firm-level measures that represent both financial and operational metrics. Systems that integrate internal processing for the firm with that of its customers create value for the customer by increasing operating efficiencies (Jelassi & Figon, 1994) or convenience and flexibility (Peffer & Santos, 1995). Advances in networking, processing, and decision analysis have allowed firms to lower their customers' costs. For example, electronic transactions reduce clerical errors; enhances billing speed, and effectively lowers transaction costs e.g. through the use of M-pesa dividend platform to pay shareholders dividends.

IT investment valuing methods should be expanded to include accounting and market measures of the firm performance and process measures (Dehning and Richardson, 2004). The dynamic capabilities theory provides a valid framework to analyze the impact of IT on organizational performance due to its focus on resource attributes and its relevance for measuring IT and non-IT resources (Peteraf and Barney, 2003; Wallace & Wheeler, 2002). Improvements in firm capabilities, in turn, lead to improvements in business process performance as well as firm level measures such as turnover volumes. It is envisaged it is research study that the impact of IT-enabled dynamic capabilities on improvements in business process performance is measured by studying their impact on project outcomes, such as reduction in project turn-around time, the relevant cost, and opportunity costs. IT represents a special avenue which businesses can use to realize business value. Other areas of interest usually include the impact of IT driven models on firm financial measures, such as

gross margins and return on assets (Bharadwaj, 2000). The conceptual model seeks to develop mechanisms of measuring the value of IT investments in the overall business performance.

## **2.2 Measurement of Business Value**

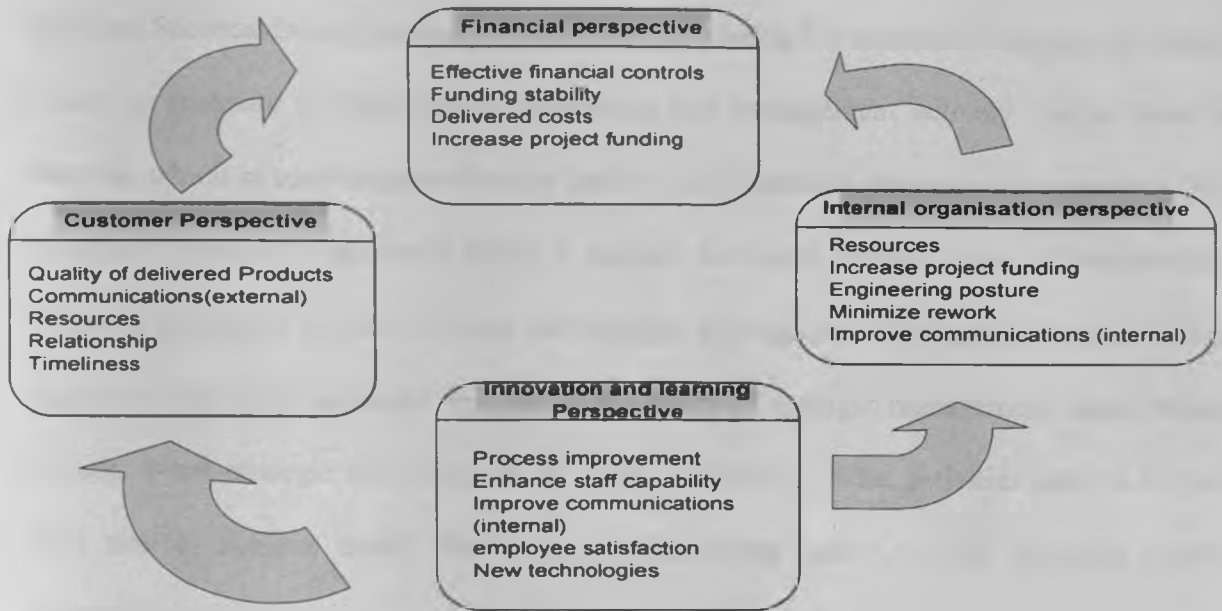
Measuring business value created by IT is the next frontier for information technology offerings and applications. Realizing value for investments in IT for organizations has proven to be a difficult task to achieve. Measurement procedures and tools are required so as to standardize the process. Business performance evaluation tools are required to be exploited in the pre- and post-implementation stages for result comparisons in order to ascertain creation of IT business value. For this study the measuring metrics selected include the Balanced Score Card, Total Quality Management, Return on Investment and Economic Value Added.

### **2.2.1 Balanced Score Card**

Companies have now shifted from industrial age competition to information age competition. It is no longer tenable for companies to run a sustainable competitive advantage just by rapidly deploying new technology into physical assets or even by having an excellent management of financial assets and liabilities. The balanced scorecard is a tactical planning and management method that is used extensively in business and industry, government bodies, and nonprofit making organizations worldwide to align business activities to the vision and strategy of the organization, improve internal and external communications, and monitor organization performance against strategic goals. It was invented by Robert Kaplan and David Norton in 1992 as a performance measurement framework that added strategic non-financial performance measures to traditional financial metrics to give managers and executives a more balanced view of organizational performance.

In addressing some of the weaknesses of previous management approaches, the balanced scorecard approach provides a clear prescription as to what companies should measure in order to 'balance' the financial perspective (Kaplan & Norton, 1996). The balanced scorecard doubles up as a management system (hence it is not only a measurement system) that enables organizations to clarify their vision and strategy and translate them into action. It offers feedback on both the internal business processes and external outcomes in order to constantly improve strategic performance and associated results. When fully deployed, the balanced scorecard transforms strategic planning from an academic exercise into the nerve center of an enterprise. Balance score card (BSC) was developed to communicate the multiple, linked objectives that companies must achieve to compete on the basis of capabilities and innovation. The balanced score card translates mission and strategy into objectives and measure organized into four perspectives: financial, customer, internal business process and learning and growth as depicted in the diagram 2.2.1.

**Fig. 2.1: The Sub-goals to Balanced Scorecard**



**Source: Kaplan and Norton, 1996**

Balanced score card retains the traditional financial measures. With Balanced Score Card, company executives can measure how their business units create value for current and future customers, how they can build and enhance internal capabilities through investment in people, systems and procedures necessary for improving future performance. This approach captures the critical value creation activities performed by skilled, motivated and organizational participants. While retaining via financial perspective, an interest in short term performance, the balanced score card clearly reveals the value drivers for superior long term financial and competitive performance.

By utilizing the Balanced Scorecard metric an organization is set to reap the following benefits: It enhances Operational Control: Operational control involves asking questions like; What process are we monitoring? What facets of the process do we want to measure? What is considered to be best practice? The other purpose of this approach is to help managers



monitor and control the delivery of a pre- defined set of activities (Kaplan and Norton, 1996). Balanced Scorecards help prevent organizations “drowning” in measures. Technology makes it easy to measure all the aspects, demanding that management actively choose what to measure, which in turn demands that the teams reach consensus about what is important. The Balanced Scorecard framework offers a holistic but more focused view of performance. Balanced Scorecard can also be used for Strategic Management: Management needs to seek answers to the four questions that are at the heart of strategic management issues which include: What strategic outcomes are we trying to achieve? What activities need to happen right now to achieve them? Are these activities being done? Are we achieving results targeted?

The purpose of this metric of Balanced Scorecard is to help managers agree and then articulate the strategic destination and road map for their organization, and monitor the activities required for their achievement. The purpose of the Balanced Scorecard therefore shifts from tracking performance of a process, to monitoring whether or not objectives have been set, and the extent to which the planned actions to achieve them are working. Management teams using Balanced Scorecard primarily use it to support decision making about the interventions needed by them to ensure that their strategic goals are successfully achieved. In a survey conducted by the US Institute of Management Accountants' members in 2006, the results of which included: 88% of members from organizations regularly using the Balanced Scorecard reported improvements in operating performance; and 66% stated that they also achieved increase in profits (Lipe et al, 2002).

## 2.2.2 Total Quality Management

Invented by statistician Edwards Deming TQM is a management philosophy which focuses on continuous improvement approach to doing business through a new management model. The TQM framework evolved from the continuous improvement methodology with a clear focus on quality as the main dimension of business operations. Antonsen and Jorgensen (1997) summarize that under TQM, emphasizing the quality of the product or service predominates. TQM enlarges past arithmetical process control to clinch a wider scope of management activities of how we manage people and organizations by focusing on the entire process, not just simple measurements.

TQM is a comprehensive management system which has multifaceted functions like; Focusing on meeting owners'/customers' needs by providing quality services at a cost that provides value to the owners/customers, driving the quest for continuous improvement in all operations, recognizing that everyone in the organization has owners/customers who are either internal or external, viewing the organization as an internal system with a common aim rather than as individual departments acting to maximize their own performances and focusing on the way tasks are accomplished rather than simply what tasks are accomplished

Cox (1995) reiterates that continuous improvement is not a fad but a necessary part of management's obligation to properly run its company. Gone are the boom days when quality did not matter due to the volume of work available and the ease of obtaining work. The attitude of construction managers and contractors was simply to add it to the bill, because the owner will pay for it. In other words, in those boom days  $\text{Cost plus Profit equaled Price}$ . Now, however, the new attitude is  $\text{Price minus Cost equals Profit}$ . Owners are now demanding higher quality work, and at a lower cost. The framework is depicted in diagram 2.2.2.

Fig: 2. 2: TQM Framework

## The TOM System



Source: Deming, 1986

In attempting to keep pace with the new attitude, a quality management system that helps keep costs down is well worth implementing. Total Quality Management means that the organization's culture is defined by and supports the constant attainment of customer satisfaction through an integrated system of tools, techniques, and training. This process entails the continuous improvement of organizational processes, hence resulting in high quality products and services.

The TQM framework takes cognizance of the fact that the customer makes the ultimate determination of quality, top management provide leadership and support for all quality initiatives, prevention variability is the key to producing high excellence, quality goals are a moving target, thereby requiring a commitment toward continuous improvement, improving quality requires the establishment of effective metrics and the organization needs to use data and facts not just opinion.

### 2.2.3 Return on Investment (ROI)

Every project plan must have some type of economic justification to provide top management and shareholders with financial information. It will help them know that they are doing the

right thing by implementing the program. A popular economic calculation for the benefits of an investment is Return On Investment (ROI). ROI is a calculation of the most tangible financial gains or benefits that can be expected from a project versus the costs for implementing the suggested program or solution.

ROI is represented as a ratio of the expected financial gains (benefits) of a project divided by its total costs. As a formula it appears as:  $ROI = (\text{net benefits} / \text{total cost})$ . In the equation, net benefits equals total benefits minus total cost. It is the incremental financial gain (or loss). Alinean (2002) observes that ROI ratio should be greater than zero is necessary for a program to be economically attractive. Calculating the ROI on various options will help to ensure that you select the most cost effective technology. Historically, ROI has been applied to large public works projects with societal benefits that are more difficult to quantify than “hard” technology costs.

Given the time value of money, a shilling is worth more today than it will be tomorrow. To account for this economic fact, future costs and benefits need to be “discounted” in order to calculate today’s value. The discount factor is also known as the cost of capital. Generally, the selected discount rate should be less than the Prime Rate. The Prime Rate is the interest rate charged by banks to their most creditworthy customers.

Phillips and Stone (2002) pointed out that ROI is one of the commonly used measurements metric among many business firms especially the small and medium enterprises. Some of the benefits derived from using ROI as a measurement metric include: simplicity in application, the simplicity of using return on investment is evident by its easy to apply formula, expressed simply as average earnings divided by average investment. Compared to other calculation-heavy metrics, such as net present value or internal rate of return, ROI does not go through

multiple-year cash flow discounting maneuvers that often use non-intuitive equations. But the simple concept of ROI encourages managers to focus on earnings in relation to assets used, which at the end benefits a company's bottom line. For investment projects that do not have constant changes in capital outlays during investment years, one thing that the ROI formula does fail to include, using ROI leads to the same accept or reject decision as other comprehensive measures but with considerably less effort (Seitz and Ellison, 2005).

ROI is consistent with common business practice; return on investment is consistent with many management reward systems that use ROI as a performance metric, which better reveals direct investment results expected of managers. It has been observed by industry analysts that using ROI discourages management from employing excessive investment in operating assets. Other investment measures may help make more educated decisions, but ROI aligns business decisions better with managers' personal financial interests.

Uniformity with other business measurement metrics, return on investment is also a measure favored by investors when judging how effective management has been in utilizing company assets they have invested in. Concepts of net present value and internal rate of return are best understood within the academic community and seldom conveyed in a company's financial reports to investors. However, ROI is a tool for making business decisions by companies and for analyzing investment results by investors. No other measures have the advantage and serve the dual purpose as well as return on investment (Phillips and Stone, 2002).

ROI can be used for effective communication; projections from ROI forecasting can be used to communicate and to justify the value of an investment against competing priorities.

Management may be less willing to risk a pilot study and a potentially neutral or negative evaluation. ROI forecasting is a relatively low cost, low risk approach.

Although the return on investment is widely used in evaluating performance, it is not a perfect tool Noreen (1999). The method has drawbacks like; focusing only on increasing ROI may not be enough. Managers may not know how to increase ROI; they may increase ROI in a way that is inconsistent with the company's strategy; or they may take actions that increase ROI in the short run but harm company the long run (such as cutting back on the research and development). This is why ROI is best used as part of a balanced scorecard, a manager who takes over a business segment typically inherits many committed costs over which the manager has no control. These committed costs may be relevant in assessing the performance of the business segment as an investment but make it difficult to fairly assess the performance of the manager relative to other managers and finally If management evaluates investment decisions only based on return on investment (ROI) they may reject investment opportunities that are profitable for the whole company but that would have a negative impact on the manager's performance evaluation.

#### **2.2.4 Economic Value Added**

Economic Value Added approach can also be described as Residual Income approach. This approach was developed so as to mitigate against limitations and dysfunctional actions created with using a ratio to evaluate the performance of a project. The concept has been widely used after Stewart published his book on the quest for value in 1991. Similar concepts were also discussed by Drucker when he authored his book on managing for results in 1964 Easton, Harris and Ohlson (1992) suggested that Economic Value Added (EVA) is an

increasingly popular corporate performance measure one that is often used by companies for evaluating performance. Like other performance metrics, EVA attempts to cope with the challenge that exists between the need to come up with a performance measure that is highly co-related with shareholders wealth, but at the same time somewhat less subject to the excessive focus on financial metrics.

EVA is a technique useful in changing organizational behavior and in driving the decision-making process in a manner that maximizes value to the business (Bharat, 2001). Most businesses want to grow, and grow rapidly, and several scenarios are possible. In a sustainable growth condition, for example, the business is generating sufficient cash to re-invest. Some of the benefits derived when using EVA to evaluate performance include: EVA is closely comparable to Net Present Value. It is closest in spirit to corporate finance theory that argues that the value of the firm will increase if you take positive NPV projects hence motivating managers to increase the value of the firm. It also mitigates the challenges associated with approaches that focus majorly on financial metrics. These approaches may lead firms turning away good projects to avoid lowering their financial performance. EVA makes top managers responsible for a measure have more control over the return on capital and the cost of capital are affected by their decisions rather than one that they feel they cannot control. This will lead to managers owning up to the role of judicious management of resources. To implement this approach managers or business owners must specify an additional parameter, the risk-adjusted cost of capital for the project which is then multiplied by the projects net investment benefit son as to obtain a capital charge for the project. Economic Value Added takes cognizance of elements like; economic profit and measure of value added. Calculation reflects the idea that

firm must earn enough to cover the cost of debt and the opportunity cost of equity before it even begins to create value.

Although EVA is extensively used in evaluating performance, it is not also a faultless tool. The method is subject to drawbacks like; EVA is poor in periodizing the returns of a single investment. It underestimates the return in the beginning and overestimates it in the end of the period. Some growth phase companies or business units have a lot of new investments. Such growth phase companies are likely to have currently negative EVA although their true rate of return would be good and so their true long-term shareholder wealth added would be positive (Glasser 1996). Secondly EVA seems to push the creation of value for shareholders to a secondary level. Only earning higher rate of return than the cost of capital in the long run can do this. The fact that the required good financial performance is not expected now but only in the future is not a reason to leave out financial measures. Therefore periodic financial performance measures are always important no matter what business field the company operates at.

It certainly holds also more generally that EVA does not in itself provide managers with sufficient information. Financial measures tell them the outcome of many different decisions. They usually hide the causes of good or bad profitability. The good and bad performance of individual processes is rarely evident in financial performance measures. Some other measures pinpoint the current situation of critical success factors much better. Therefore every company should use many measures in estimating how their plans are going and strategic goals are reached.

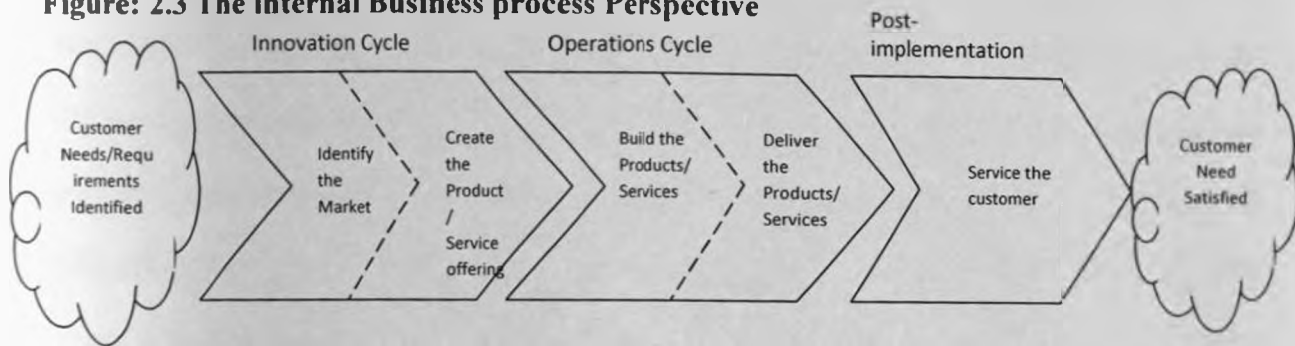


## **2.3 Need for measuring IT business value**

Any business executive who is interested in delivering sound results to shareholders must be able to explain what IT is doing in the business, why it's doing it, the department's value to the company, and how that value can be maintained. In October 2001 McKinsey Global Institute published a study on the growth of productivity in the United States between the years 1995 and 2000. This was deemed to be the first disciplined attempt to look at the correlation between IT investments and productivity by industry sector (Brown and Hagel, 2003). This study revealed that only six out of 59 industries had a positive correlation between IT investments and productivity. The company should be able to maximize the business value of the entire portfolio of IT services by judiciously selecting and prioritizing all IT operational expenditures and investments. Specifically, IT performance management is crucial for a number of reasons. First is in aligning IT to company overall performance. This is the ability to demonstrate and communicate that IT services bring real value to the company's overall monetary performance. The performance must be visible and measurable. Secondly is to ensure existence of business processes and IT alignment. The company should ensure that IT budget is directed toward the prioritized needs of the business. That is, IT must be doing the right things, and IT plans must match and support the major objectives outlined in the corporate strategy of the organization. It is also critical so as to for IT efficiency and effectiveness to be enhanced. When IT spends, value has to be derived from this spending. Not only must IT be doing the right things for the business, it must also be doing them as effectively and efficiently possible. It is also imperative in gearing towards General business success; IT needs to support business operational needs and critical strategic challenges. The

diagram 2.3 depicts the process manager are ought to undertake before accepting an IT investment.

**Figure: 2.3 The internal Business process Perspective**



**Source: R.S Kaplan and D.P Norton Linking the Balanced Scorecard to strategy, California management review (Fall 1996), p63.**

Appraising, maximizing, and monitoring the financial payback from investments in IT are critical elements of a prudently-run organization. Yet despite the many benefits and increasing board-level attention, these continue to be extremely difficult tasks that, if left undone, can have potentially devastating results to the company (Williams, 2003). Today's managers need to understand that when they make an IT investment, what they are actually doing is instituting IT-transformation into the culture of the organization. IT investments are quickly turning out to be the proverbial dual-edged sword, they can elevate competitive advantage and create valuable efficiencies, but at the same time they can cause costly disruption and destruction to the company through hemorrhage of funds invested without getting any meaningful return. The motivation of a company to invest in any IT investment needs to be driven by the need to satisfy a certain demand of the customer and this has to be done with concerted efforts to ensure that there is a complete reconciliation between what the firm is capable of doing and what the market requires.

## 2.4 Evaluating IT Value using a Business Case

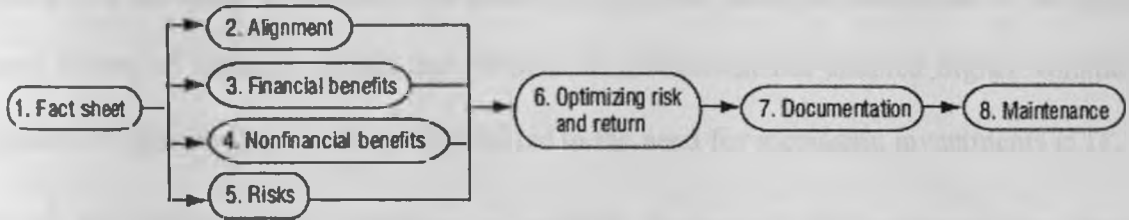
For an organization to maximize the return on IT-enabled investments the preparation of formalized business cases formulation application of metrics which can be used to measure the returns is highly desirable, these metrics include tools such as internal rate of return, net present value, and payback period. Some professional especially those from IT background will consider having a comprehensive business case an unnecessary bureaucratic hurdle, but it has actually turned out to be one of the most valuable tools available to management and a vital component in the quest for creating business value. The business case is an operational apparatus that needs to be reviewed and reevaluated continually to prop up the continuing implementation and completion of a project or plan, including the realization of right gains.

When adopting a business case a number of concepts must be considered: This include first ensuring that things are done right, What is proposed for what business outcome, and how the projects within the program contribute to the achievement of the overall business strategy must be very clear. Secondly it is important to ensure that things are done in the right way, management and operational mechanisms have to be put in place to maximize chances of success. It is also imperative to get things done well, application of defined practices in the optimal way and monitoring them to ensure that they remain effective in the long-run is key. Finally confirming whether the benefits are forthcoming is vey key, how will the benefits are delivered, determining the value of the project should also be considered.

The development of a business case occurs through an eight-step process which entails building a fact sheet with all the relevant data, analyzing the data, particularly with respect to strategic alignment, performing a financial benefits analysis, Performing a nonfinancial benefits analysis, Performing a risk analysis. This in the end results in: development of an

appraisal of the risk and the return of the investment represented by structured recording of the previous steps' results and documentation of the business case which will be maintained by review of the business case during program execution, including the entire lifecycle of the project results. The process is can be conceptualized as shown in diagram 2.4.

**Figure 2.4 Steps of business case development**



**Source: IT Governance Institute ,USA, 2005**

Experience has proved that the quality of a business case, the processes involved in its creation, and its continued review throughout the economic lifecycle of an investment can dramatically increase the value achieved.

It is imperative to measure the business value of IT in the firm. Several other researchers have examined the benefits of adoption of ICT in third world as well as first world capital markets. Such studies agree that ICT makes capital markets more efficient for example (Mahonney,1997) describes the securities markets as where information technology innovations often lead to changes in the way securities transactions are negotiated, executed, cleared and settled. In a study on stock market development in sub-Saharan Africa, (Yartey and Adjani,2007) proposed that the adoption of a robust electronic trading system and a central depository system among others are key panacea for addressing the widespread problem of liquidity as these stock exchanges seek regional integration.

## 2.5 Adoption of ICT in Capital Markets

Globally majority of the capital markets players have adopted information technology to protect the market share by providing trading capacity, increased trading efficiency, and better utilization of labor and reduced demands for physical space (Lucas et al, 2002). A successful capital market infrastructure is a key New York Stock Exchange resource, and IT plays a crucial role in market operations. The second proposition, based on extensions to the resource based theory of strategy, is that the NYSE's IT investment has enabled higher volumes of transactions processing, which in turn has led to the need for increasing investments in IT.

Porter and Millar (1985) provided a working framework for analyzing the strategic significance of information technology, while Johnson, Ives and Beath(1986) focus on strategic advantage from inter-organizational systems. Clemons and Weber (1990) examined the 1986 Big Bang reforms of the London Stock Exchange, and observed that IT and the Exchange's new screen-based market were a strategic necessity. Clemons and Weber (1990) and Clemons (1991) present a framework for evaluating strategic IT investments.

The New York Stock Exchange offers a model example to demonstrate the need for adopting an elaborate IT framework in an organization where the investment is commensurate to the output as it has faced increased competition from the computer-based Nasdaq, the regional exchanges such as the Chicago Stock Exchange, and from Alternative Trading Systems (ATs), and ECNs (Electronic Communication Networks), which are based on network technology and online computer systems to match buyers and sellers. Yet, the NYSE has maintained much of its share of trading volume in NYSE-listed issues- above 80 percent since 1988.

Information and communication technology (ICT) revolution in the Nigerian Capital Market began in the year 1997 after the establishment of the Automated Trading System (ATS). This is a system that enables dealers trade through a network of computers connected to a server using the queuing system. Thus stockbrokers, investors and dealers have equal access to information for purchase and sale of securities and can execute transactions through a network of computers even from remote locations during the Exchange's trading hours. This has enabled more participants to trade daily boosting liquidity and creating opportunities for price discovery (Adebajo, Elike & Muoghalu,2009). The ATS eliminated price manipulation, which was prevalent during the call over system and also reduced transaction cycles.

## **2.6 Challenges facing IT business value Evaluation in firms**

Kohli & Devaraj (2004) observes that measurement of business value of IT in organizations needs to be carried out right from the conception of the idea to the final project implementation and monitoring. Most organizations today recognize the need for project portfolio selection and management processes. These processes use a mix of evaluation criteria to determine which projects the organization should commit resources to in order to gain the best business results. These evaluation criteria often include such measures as: increase in revenue or market share, expected cost savings and quantifiable productivity improvements, improved customer service, and financial requirements Potential projects are evaluated and scored against the portfolio selection criteria, and selected projects are managed against those criteria to ensure the original business case is being fulfilled.

Coming up with the business value measures for the IT projects is not always as easy as it sounds. This needs to be managed by responding to issues like "What business problem is the company trying to solve If the business case for the project does not already define the

measurable outcomes of the project, the company must work out the business area so as to identify what these measures will be, so that measures can put in place in order to reflect the contribution to the business success (Hollington, 2003).

Evaluation metrics don't really reflect the business value IT is delivering. The measures must be based on business results, not IT performance results. Peter Waterhouse (2008) notes that one of the key challenges in developing the metrics is that these measures of business results will change as the project portfolio the company is continues to change. For some projects, on-time delivery may be the most important aspect of delivering business value. In other projects, quantifiable cost savings or an increase in revenue may be appropriate. For each project, relevant business measures must be defined.

Therefore, the company must include measures of success that are both performance-based (like the traditional measures) and business-focused. Yes, there will be tactical measures put in place to ensure that the business measures can and are being achieved, but the tactical measures are the means to the end, not the end in themselves.

## **2.7 Adoption of ICT in the Kenyan Capital Markets**

In November 1991, share trading moved from coffee-house to floor based open outcry system. Every licensed stockbroker was required by law to maintain with the Stock Exchange an irrevocable bank guarantee by a commercial bank for KShs 1.5 million which could be used to settle any inter-broker or inter- party claims arising from day to day unsettled trades executed. Additionally the NSE was required to maintain another level of compensation which is paid by buyers and sellers of securities at a rate of 0.01% of the consideration. The fund was to be used in cases where the bank guarantees are not sufficient.

This trading system according to market participants did not guarantee that the prices obtained by buyers and sellers are best since all buying and selling interests did not get exposed to one another. With this kind of trading system, trading took place on Mondays to Fridays between 10.00 a.m. and 12.00 noon except for public holidays or any other closures approved by the Board of Directors of the NSE.

The system operated in a way that Potential buyers and sellers contacted stockbrokers directly or through authorized agents and consented their buying or selling orders. For the Foreign institutional investors they were supposed to have a current custodian account with a Kenyan bank. The stockbrokers on the other hand through their authorized dealers took the investors orders to the trading floor where transactions were executed using open outcry auction.

The manual system of clearing and settlement lengthens the financial transaction period presented unforeseen challenges where transfers were usually affected within a week or two following transactions. Such a long period implied that investors lost a lot of time in between the actual sale and its confirmation, which could adversely affect the liquidity and efficiency of the stock market. Lack of a central depository system was therefore seen as inhibiting the liquidity of the stock market.

The proposal to install the Central Depositing System (CDS) was made in 1995 where it was aimed at enhancing liquidity and efficiency in the trading system by reducing the period of delivery and settlement. This, it was hoped, would facilitate electronic transfer of ownership without the physical movement of such certificates, minimizing systemic risk and the settlement period and ultimately increasing trading volumes. This evolutionary process was characterized by a shift in trading system from a periodic auction system to a continuous trading system. The evolutionary process of trading system also indicates a shift from manual



to electronic and centralized settlement clearing. Garman (1976) observes an evolutionary pattern in adoption of trading system for the US stock market in response to growth in trading volume; this saw a shift from periodic to continuous trading system. Amihud *et al* (1997) notes the tendency for emerging markets to shift from periodic to continuous trading in the revitalization process argued that a trading system that enhances efficiency in the price discovery process, provides liquidity at low costs, and has no excess volatility is more desirable for the development of the stock market (Amihud, *et al* 1990, and Bessembinder and Kaufman, 1997). Ngugi (2003) observes that high liquidity enhances long-term investment by reducing the required rate of return and by lowering the cost of capital to the issuers of securities. A historical perspective approach is used to track the developments in the firm's infrastructure and strategy plan.

A school of thought led by authors like Shiller (1989), Summers (1988) and Porteba and Summers (1988) would argue that capital markets have become excessively volatile since the adoption of computer assisted trading strategies as the latter increase short-term price volatility and risks. There is also an argument that very few investors have access to online trading and monitoring systems. Few actually own computers and have easy access to the live NSE data so as to monitor the tradings. Majority of the Kenyan Stockbrokers and Investment banks do not have a platform where investors have access to a system that sends orders to them for automated execution. Investors are also wary that ICT driven capital market operation are fraught with fraud and manipulation, which mostly affect individual investors. A case in point relates to the sale of shares without authorization of the stockholders, a practice that is given impetus by greed and dishonesty of some market participants. It can be

argued that surveillance problems and the lack of proper enforcement of penalties by the legal system make the adoption of a fast-paced ICT system dangerous to investors.

## **2.8 Summary**

Recognizing information technology (IT) impacts on organizations can prove to be difficult to perform (Aro, 2005). As highlighted in the literature review several researches have engaged in performing the task. Due to the intricate nature of IT and business organizations, varied results have been obtained. The topic requires further study as several organizations are currently implementing large scale IT systems for business performance improvement. The research objective is to distinguish IT impacts on the business as a whole, which correlates to organizational performance.

The focus is on the set objectives for an IT business project and its outcomes. Factors such as goal setting and monitoring implementation to ensure realization of benefits need to be paid special attention to. Measurement procedures and detail should also be considered. The mentioned factors determine IT business value. Business performance metrics are required to be utilized in the pre- and post-implementation phases for result comparisons in order to determine IT business success. There have been other related studies on business value of IT carried out in Kenya, Muganda (2001) carried out a research on Investigation of business value of E-Commerce on selected firms in Kenya. Ngugi(2003) too carried out a comprehensive research on the Nairobi Stock Exchange highlighting how technology has enhanced liquidity in the capital markets. Karimi (2010) too carried out a study on the investigation of business value of Enterprise Planning Systems. There has not been any research carried out specifically in the entire capital markets context, where the value of information technology is evaluated. This study therefore sought to bridge the identified gap

by investigating the relationship between IT investments undertaken by capital markets players and business performance.

## 2.9 Conceptual Framework

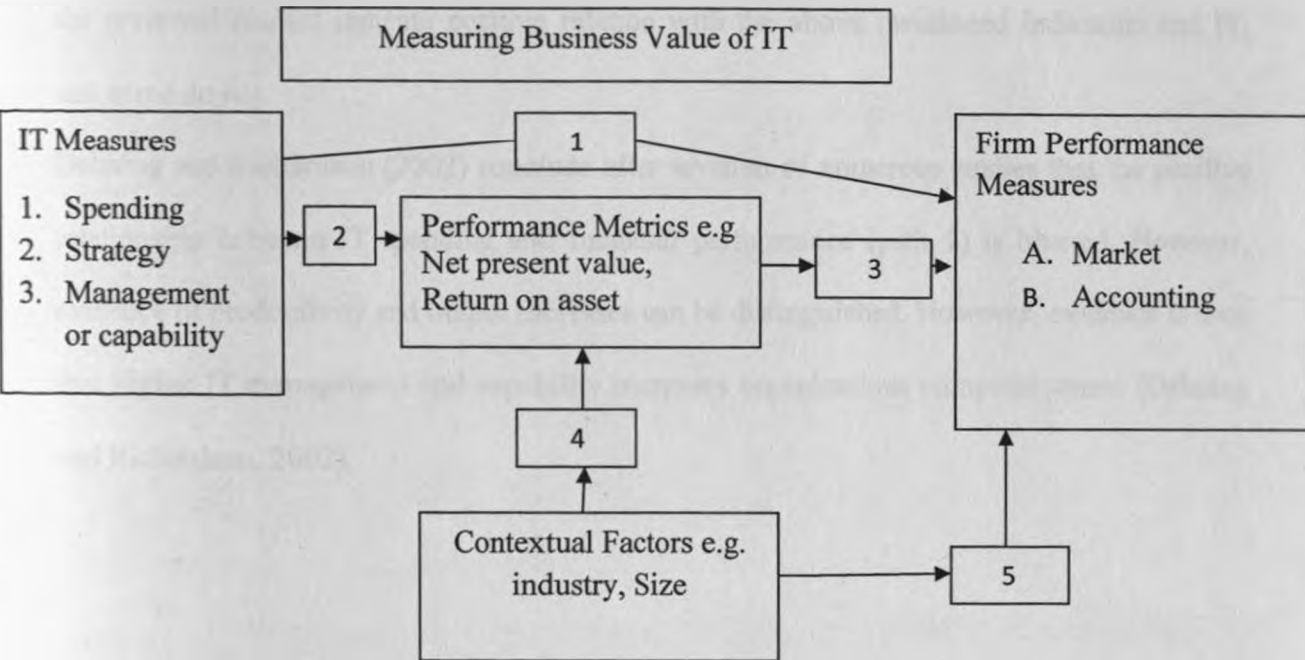


Figure 2.5 conceptual framework, Source: Dehning and Richardson, 2002)

The framework by Dehning and Richardson (2002) exemplifies IT effects on business performance and thus on overall organizational performance both directly and indirectly.

This framework distinguishes various metrics used to distinguish IT business impacts. Path 1 explains the relationship between the three general IT measures towards firm performance. Path 2 explains the relationship between the three general IT measures towards process measures, which act as intermediate measures towards overall firm performance, thus path 3. reviews the contextual factors in their framework, which affect both process measures and firm performance measures.

Dehning and Richardson (2002) observed that several studies examining paths 1 and 2 of the proposed framework. Financial indicators used in their study include return on assets (ROA), return on equity (ROE), return on sales (ROS), cost of goods sold (COGS), and selling, general and administrative costs (SG&A). The results they acquired highly varied. Some of the reviewed studies indicate positive relation with the above mentioned indicators and IT, and some do not.

Dehning and Richardson (2002) conclude after revision of numerous studies that the positive relationship between IT spending and financial performance (path 1) is blurred. However, evidence of productivity and output increases can be distinguished. However, evidence is seen that higher IT management and capability increases organizations competitiveness (Dehning and Richardson, 2002).

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.0 Introduction**

IT, organizational strategy and business value are inter-linked together. IT should be integrated into organizational strategy and managed properly in order to achieve business value from it. Therefore, IT success should be measured closely in relation to the strategic goals, which have been set for it. The goals and plans should include intermediate phases affecting individual processes, as business value and set strategy may be acquired through processes. Measurement occurs when concentrating on only financial improvements after IT integration as many factors influence profit. Process improvements against set goals are the main focus. Moreover, measurement at the process level facilitates the achievement of the overall goals (Mooney et al, 1996.)

### **3.1 Research Design**

The primary objective of the study was to investigate the business value created by IT and how it can be measured. The research adopted the exploratory research design. The research relied on survey approach. The approach was based on the fact that IT has a direct impact on processes and through them an indirect impact on organization performance. The view of direct and indirect IT impacts is consistent with the model by Dehning and Richardson (2002).

### **3.2 Population of Study and Sampling**

The population of study consisted of sixty eight (68) firms involved in capital markets activities. Because of the large scale investment of IT resources by all the selected companies in the past four years it is considered satisfactory since all the companies will have the necessary experience on IT investment.



### 3.3 Sampling

Stratified sampling technique was employed. The respondents were drawn from the following categories ranging from Regulatory bodies e.g. the Capital Markets Authority, Depository Banks, Investment Banks and Stockbrokers, Listed Companies, Registrars and approved institutions. The researcher intended to reach 60 respondents from the 33 selected companies as shown in the table 3.2. These were the people best placed to provide the required information.

**Table 3.2: The Population**

Category	Population	Sample	%
Listed Companies	50	15	30
Regulatory Bodies	1	1	100
Investment banks and Stockbrokers who are members of NSE	17	7	41
Depository Banks	14	5	36
Approved Institutions	2	2	100
Registrar Firms	10	3	30
Total	92	33	36

### 3.3 Data collection Method

In this research both qualitative and quantitative data were deemed to be the most appropriate. Primary data was collected using structured questionnaire that was completed by the respondents. These questionnaires consisted of both open ended and closed ended questions and were administered through interviews .Drop and pick method was employed in questionnaire administration. The questionnaire was simplified as much as possible to enable the respondents have a clear meaning of the questions hence respond accurately.

The questionnaire was divided into four parts. The first part (A) consisted of questions aimed at obtaining general information about respondents and the company. Part B consisted of

information on measurement of business value of IT investments, benefits of management, Part C consisted of information on whether measurement of business value of IT leads to performance and value improvement of the firm and how the benefits are identified and planned and Part D highlighted the challenges faced by companies in carrying out the evaluation.

### **3.4 Data Analysis**

Analysis of the data was carried out in a series of steps where the complete questionnaires were corrected for completeness and consistency, checked for errors and any omissions and then coded. The quantitative data captured in the questionnaire was analyzed using descriptive statistics like frequencies, percentages, mean, modes, variance and standard deviation. To establish whether measuring business value of IT results to performance improvement or value improvement or both mean, standard deviation and percentages were used in the analysis. Content analysis was used to analyze qualitative information collected in the survey. This was used to support the results of quantitative analysis and draw conclusions.

## **CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND INTERPRETITION**

### **4.1 Introduction**

This chapter presents analysis and findings of the study as set out in the research methodology. The results are presented on business value of information technology in companies in Kenya with a special focus on the Kenyan capital markets. The data was gathered exclusively from questionnaire as the research instrument. The questionnaire was designed in line with the objectives of the study. To enhance quality of data obtained, Likert type questions were included whereby respondents indicated the extent to which the variables were practiced in a five point Likert scale.

### **4.2 Response Rate**

Out of the targeted 70 respondents, 32 respondents responded by completing the questionnaire thus a achieving a response rate of 53.33%. The response was considered statistically sufficient for further analysis.

#### **4.2.1 General Description of the Respondents**

The study sought to establish the distribution of the respondents in terms of gender, age bracket, and level of education and length of employment/working in the organization.

#### **4.2.2 Distribution of the Respondents by Gender**

The distribution of the respondents' gender across the organizations analyzed. Consequently the results were tabulated in Table 4.1



**Table 4.1: Gender of the Respondents**

Gender	Frequency	Percent
Male	26	81.3
Female	6	18.8
<b>Total</b>	<b>32</b>	<b>100.0</b>

Source: Survey Data, 2011

From the study results presented in table 4.1 above, an overwhelming majority of the respondents were male as shown by 81.3% while a small proportion constituting of 18.8% of the respondents were female.

### 4.2.3 Age Brackets of the Respondents

The study equally sought to establish the age brackets of the respondents. This served to ensure the researcher determine the validity of the responses received- that only valid responses were taken into account during analysis consequently ensuring quality control and ethics in the research process. The results of the analysis was depicted in Table 4.2

**Table 4.2: Age in Years**

Age Brackets (in years)	Frequency	Percent
26-35 Years	23	71.9
46-50 Years	5	15.6
50 and Above	2	6.3
Below 20 years	1	3.1
20-25 Years	1	3.1
<b>Total</b>	<b>32</b>	<b>100.0</b>

Source: Survey Data, 2011

As shown in table 4.2, majority of the respondents (shown by 71.9%) were aged between 26 and 35 years, 15.6% were aged between 46 and 50 years, 6.3% were aged 50 years and above, while 3.1% of the respondents were aged between 20-25 years and below 20 years respectively.

#### 4.2.4 Highest Level of Education

The respondents were requested to indicate their highest level of education. This was meant to ensure that only responses from respondents with adequate level of education and with an understanding of the research concepts were taken into consideration during analysis- for reliability purposes. The findings were presented in Table 4.3

**Table 4.3: Level of Education**

Level of Education	Frequency	Percent
Undergraduate degree	19	59.4
Masters Degree	10	31.3
College education	3	9.4
<b>Total</b>	<b>32</b>	<b>100.0</b>

Source: Survey Data, 2011

From the results depicted in table 4.3 above, majority of the respondents (59.4%) were holders of undergraduate degrees, 31.3% of them had attained post-graduate degrees, while 9.4% of the respondents had a college education as their highest level of education. The responses were therefore considered reliable given that the greater percentage of respondents has a strong academic background.

#### 4.2.5 Number of Years worked in the Organization

The respondents were requested to indicate the length of time they had worked in the organization. This was meant to gauge the depth of knowledge about the organization in relation to the variables that were being studied. The results of the analysis were the presented in Table

4.4

**Table 4.4: Number of Years worked**

<b>Duration of Service</b>	<b>Frequency</b>	<b>Percent</b>
Over 10Years	22	68.8
Between 6 and 10 years	9	28.1
Below 5 years	1	3.1
<b>Total</b>	<b>32</b>	<b>100.0</b>

**Source: Survey Data, 2011**

From the analysis in Table 4.4, majority of the respondents (68.8%) had worked in the organizations for a period of more than 10years, 28.1% of them had been working in the organization for a period of between 6 and 10 years, while 3.1% of them had served in the organizations for less than 5 years. The analysis consequently demonstrated that the respondents had adequate understanding and hence the findings of the study were considered valid.

### **4.3 Information Technology in Organizations**

The purpose of this study was to investigate the business value of information technology in organizations where the specific objectives were to investigate the tools used by companies to measure the impacts of IT in the organizations, to determine the relationship between IT investments and business performance and to establish the challenges hindering measurement of business value of IT investments by firms in the Kenyan capital markets.

To establish the respondents understanding of the business value of IT the study found out that: Majority of the respondents consider competitive advantage enhanced by IT that leads to increased firm value. Other respondents indicated that business value of IT is the value added to human resource through investment in IT in terms of cost cutting and improved efficiency, the terms of competitive advantage by IT investments to the firm, the benefits accrued form investing in IT projects, the ability of IT investments to meet the business strategic goals hence

leading to improved firm value and the increased real and potential value of the firm following the investment in IT.

The study further equally sought to establish the extent to which various categories of IT applications can be described as fulfilling in the organizations. A scale of 1 to 5 was provided where 1= least fulfilling and 5= most fulfilling. Table 4.5 below shows the results on IT applications as fulfilling in the organization.

**Table 4.5: IT applications as fulfilling in the organization**

<b>IT applications in the organization</b>	<b>Mean</b>	<b>Std. Deviation</b>
IT provides key operational process which are essential for everyday operations	5.00	0.000
IT is of strategic importance to the organization	4.97	0.177
IT is used to develop processes which may become important in the future	4.72	0.924
IT provides a support role which is not critical to everyday operations	1.28	0.813

**Source: Survey Data, 2011**

As shown by Table 4.45 majority of the respondents described that IT provides key operational process which are essential for everyday operations, IT is of strategic importance to the organization and is used to develop processes which may become important in the future as the most fulfilling IT applications in the organizations as shown by mean scores of 5.0000, 4.97 and 4.72 respectively. The respondents also described that IT provides a support role which is not critical to everyday operations as the least fulfilling application of IT in the organizations as shown by a mean score of 1.28.

Consequently the study sought to establish the existence of a process to monitor and realize the benefits of information technology investments in organizations. The results of the analysis were as depicted in Table 4.6

**Table 4.6: Existence of a process to monitor and realize the benefits of IT investment**

Response	Frequency	Percent
Yes	10	31.3
No	22	68.8
<b>Total</b>	<b>32</b>	<b>100.0</b>

Source: Survey Data, 2011

Analysis of the response revealed that 68.8% of the organizations do not have a process to monitor and realize those benefits that an IT investment should give, 31.3% of organizations have a monitoring process for realizing those benefits. These results are as depicted in table 4.6 above.

**Table 4.7: Existence of a monitoring process to realization of intended benefits**

Response	Frequency	Percent
Yes	13	40.6
No	19	59.4
<b>Total</b>	<b>32</b>	<b>100.0</b>

Source: Survey Data, 2011

The researcher sought the respondents' opinion on whether there is anyone responsible for monitoring and realizing those benefits. As table 4.7 above shows, majority of the respondents (59.4%) were in disagreement while 40.6% of them were for the idea that there is anyone responsible for monitoring and realizing those benefits.

**Table 4.8: Existence of follow-up of the benefits of IT investment**

<b>Evaluation of benefits of IT investment</b>	<b>Frequency</b>	<b>Percent</b>
Yes	14	43.8
No	18	56.3
Total	32	100.0

**Source: Survey Data, 2011**

From the results depicted in table 4.8 above, 56.3% of the respondents indicated that there is no evaluation and/or follow-up of those benefits that an IT investment should give as compared to 43.8% of the respondents who indicated that there were evaluations and/or follow-ups of those benefits that an IT investment should give. The evaluations or follow-ups of the benefits of IT ensures that the organizations do end up achieving the set goals of the investments, there are committees set up to renew the entire IT project being implemented. The committee ensures that the desired benefits are achieved and that the evaluations or follow-ups of the benefits of IT are intended to ensure that the company gets to reap the fruits of the investment. It also ensures that the program is completed within schedule.

#### **4.5 Tools for Measurements and Managing Business Value of IT investment**

The study sought to determine the benefits that the companies perceive are provided by IT. In this regard the respondents indicated that IT investment enabled the organizations to cut on costs, improved efficiency, improved decision making, reduce turnover, it has revolutionalized the market, it has led to reduced turn-around time in trading and settlement, it has also led to reduced cases of fraud and increased liquidity in the market, it is also a major driver of growth and it is also key in delivering efficiency, efficiency in data processing, sharing of resources, creation of new services and products, customer satisfaction and cost management.

In a scale of 1-5 where 5 was the highest and 1 the least, the respondents were requested to rate the extent to which they thought IT was actually delivering the benefits to the organizations. The analysis of the responses shown in Table 4.9 below indicates majority of the respondents felt that IT delivers various benefits to the organizations to a moderate extent as shown by a mean score of 2.54.

**Table 4.9: Delivering the Benefits of IT to the Organizations**

Statement	Mean	Std. Dev.
IT is actually delivering these benefits to the organizations	2.54	1.501

Source: Survey Data, 2011

The study examined the various measurements that were used in the organizations. These tools of measurement surveyed were the Balance Scorecard (BSC), Total Quality Management (TQM), Return on Investments (ROI) and Economic Value Added (EVA) among others and the results presented in Table 4.10 below. A scale of 1 to 5 was provided where 5 was the highest and 1 the least.

#### 4.5.1 Balance Score Card

The respondents were required to assess each dimension of the balance scorecard (using a Likert scale of 1-5) as applicable to their organizations as a measurement tool to realize the I.T investment. The findings of the of the analysis were captured in Table 4.10

**Table 4.10: Balance Scorecard (BSC)**

<b>Balance Scorecard</b>	<b>Mean</b>	<b>Std. Dev.</b>
Whether the measurement tool used was linked to the vision of the company where by relying on the measurement, the managers come to agreement on the metrics they will use to operationalize the expected vision	3.69	1.120
Whether the tool communicate and link the strategy of the entire organization where it is disseminated up and down the organizational chart, and the strategy becomes a tool available to everyone	3.09	1.118
The tool enables the company to receive feedback and support learning. By supplying a mechanism for strategic feedback and review, the tool helps an organization foster a kind of learning often missing in the company: the ability to reflect on inferences	2.84	1.394
Whether the tool support business planning where the company separates procedures for strategic planning and budgeting	2.78	1.362

**Source: Survey Data, 2011**

From the results in Table 4.10, majority of the respondents indicated that the measurement tools used are much linked to the vision of the company where by relying on the measurement, the managers come to agreement on the metrics they will use to operationalize the expected vision as shown by a mean score of 3.69, the tool moderately communicate and link the strategy of the entire organization where it is disseminated up and down the organizational chart, and the strategy becomes a tool available to everyone as shown by a mean score of 3.09. The respondents also indicated that the tool moderately enable the company to receive feedback and support learning. By supplying a mechanism for strategic feedback and review, the tool helps an organization foster a kind of learning often missing in the company: the ability to reflect on inferences as shown by a mean score of 2.84, and that the tool moderately support business planning where the company separates procedures for strategic planning and budgeting as shown by a mean score of 2.78.



## 4.5.2 Total Quality Management

The respondents also assessed various aspects of TQM (using a Likert scale of 1-5) as applicable to their organizations as a measurement tool to realize the I.T investment. The findings of the of the analysis were as depicted in Table 4.11

**Table 4.11: Total Quality Management (TQM)**

Total Quality Management	Mean	Std. Dev.
Whether the tool geared towards ensuring the quality of service and product, where the system requires the extending of operation process to suppliers and sub-contractors	4.72	.772
Whether the tool focus the primarily to achieve Quality; Where the quality policy is set towards the customer	4.53	.915
Whether the tool utilizes statistical models to monitor, quantitatively analyze the results as well as factors affecting the quality, consider the reasons and take appropriate prevention methods	4.31	1.330
Whether the tool require the participation of high and middle level managers	3.94	1.585
Whether the tool is based on the principle "do correctly at the very beginning", in researching and designing to minimize economic cost	3.81	1.401

Source: Survey Data, 2011

Table 4.11 represents the study findings on various aspects of TQM. Majority of the respondents indicated that the tool geared towards ensuring the quality of service and product, where the system requires the extending of operation process to suppliers and sub-contractors, the tool focus the primarily to achieve quality where the quality policy is set towards the customer, the tool utilizes statistical models to monitor, quantitatively analyze the results as well as factors affecting the quality, consider the reasons and take appropriate prevention methods, the tool require the participation of high and middle level managers and the tool is based on the principle

"do correctly at the very beginning", in researching and designing to minimize economic cost as shown by mean scores of 4.72, 4.53, 4.31, 3.94 and 3.81 respectively.

### 4.5.3 Return on Investments (ROI)

The researcher examined the usage of Return on Investment as a measurement tool to realization the benefits from I.T investments. This was done by requesting the respondents to assess the various aspects of ROI (using a Likert scale of 1-5) as applicable to their organizations. The findings of the of the analysis were depicted in Table 4.12

**Table 4.12: Return on Investments (ROI)**

Return on Investments	Mean	Std. Dev.
Whether the tool act as performance measure which is linked to share holder value creation in all directions	3.09	1.802
Whether the tool is useful in providing business knowledge to everyone	2.63	1.792
Whether IT is an efficient method for communicating to investors	2.59	1.794
Whether the tool transform the accounting information into economic quality which can be easily understood by non financial managers	2.38	1.773
Whether measurement carried out using tangible financial gains that can be expected from an investment verses the cost used in implementation	2.22	1.791

**Source: Survey Data, 2011**

Analysis of the findings as depicted in table 4.12, indicated that the tool moderately act as performance measure which is linked to share holder value creation in all directions as shown by a mean score of 3.09, it is useful in providing business knowledge to everyone as shown by a mean score of 2.63, IT is an efficient method for communicating to investors as shown by a mean score of 2.59, the tool transform the accounting information into economic quality which can be easily understood by non financial managers as shown by a mean score of 2.38 and that measurement carried out using tangible financial gains that can be expected from an investment verses the cost used in implementation as shown by a mean score of 2.22.

#### 4.5.4 Economic Value Added (EVA)

The respondents assessed the usage of EVA as a measurement tool for realization of benefits in IT investments (using a Likert scale of 1-5) with specific reference their organizations. The findings were presented in Table 4.13.

**Table 4.13: Economic Value Added (EVA)**

<b>Economic Value Added</b>	<b>Mean</b>	<b>Std. Dev.</b>
Whether the tool transcends the base levels of cross-industry technology and business benefits to show vertical industry and business process specific benefits from the investment under consideration	2.84	1.526
Whether measurement is carried out using a residual income approach so as to ascertain the value of the investment	2.69	1.615
Whether measurement is carried out using tangible financial gains computed to represent future value at the present time that can be expected from an investment verses the cost used in implementation	2.66	1.619
Whether the tool defines business value along the three key dimensions of how much, how soon, and how certain	2.06	1.585
Whether the tool provides an accurate representation of business value, appeal to the shared decision making model, be believable, and capture the total investment	2.00	1.606

**Source: Survey Data, 2011**

As indicated in table 4.13 , the respondents reiterated that the tool moderately transcends the base levels of cross-industry technology and business benefits to show vertical industry and business process specific benefits from the investment under consideration as shown by a mean score of 2.84, measurement is moderately carried out using a residual income approach so as to ascertain the value of the investment as shown by a mean score of 2.69, measurement moderately is carried out using tangible financial gains computed to represent future value at the present time that can be expected from an investment verses the cost used in implementation as shown by a mean score of 2.66, the tool defines business value along the three key dimensions of how much, how soon, and how certain to a lesser extent as shown by a mean score of 2.06 and that the tool provides an accurate representation of business value, appeal to the shared decision

making model, be believable, and capture the total investment also to a lesser extent as shown by a mean score of 2.00.

**Table 4.14: Tools of Measurement and Managing Business Value of IT investment**

<b>Tools of Measurement</b>	<b>Mean</b>	<b>Std Dev</b>
Total Quality Management	4.262	1.2006
Balance Scorecard	3.100	1.2485
Return on Investments	2.582	1.7904
Economic Value Added	2.450	1.5902

**Source: Survey Data, 2011**

To achieve the first objective investigation of the tools used by companies to measure the impact of I.T in the organizations), the researcher ranked the extent to which the various tools of measurement and managing business value of IT investment are used in the companies using the average mean scores where a mean less than 1.5 represents least extent, less than 2.5 shows little extent, less than 3.5 shows moderate extent, less than 4.5 shows great extent and a mean score greater than 4.5 showing very great extent. From the study findings as depicted in Table 4.14 above, total quality management was used to a great extent as shown by a mean score of 4.262, balance scorecard was also used to a moderate extent as shown by a mean score of 3.100 as well as Return on Investments shown by a mean score of 2.582, while Economic Value Added was used to a little extent as shown by a mean score of 2.450.

On the underlying issues that drive the organizations' investment in IT, the respondents quoted on issues like the need to compete effectively and manage costs, effective and efficient data processing, sharing of resources, the need to cope with dynamic market and keeping up with the competitive laws against rivalry, the need to drive the exchange to operate like other established exchanges in the world and the issues are driven by the need to cope with changing business environment and the need manage costs.

**Table 4.15: Presence of Processes to Ensure IT Projects Link to Business Objectives**

<b>Response</b>	<b>Frequency</b>	<b>Percent</b>
Yes	12	37.5
No	20	62.5
<b>Total</b>	<b>32</b>	<b>100.0</b>

Source: Survey Data, 2011

To establish whether the organizations have a process to ensure that IT projects are linked to business objectives, the researcher sought the respondent's opinion on the same. From the results in table 4.15, majority of the organizations do not have a process that ensures that IT projects are linked to business objectives as indicated by 62.5% of the respondents, while only 37.5% of them have a process that ensures that IT projects are linked to business objectives.

The respondents were also required to briefly outline the process that ensures that IT projects are linked to business objectives. They outlined that the organizations carry out a post implementation evaluation so as to compare the impact with stated objectives. They also indicated that through use of computer systems, the organization is able to give the clients reliable information with regards to what they are enquiring, this is done fast and with accuracy. The organizations also have work plans dealing with mechanisms of what are aimed at ensuring the benefits are accrued.

On the types of benefits considered when planning IT projects, the study found that customer satisfaction, cost management, accuracy of data processed, effectiveness and efficiency of work and automation process are the main types of benefits considered when planning IT projects.

**Table 4.16: Inclusion of Intangible Benefits in Organization's IT Project Appraisal Process**

Response	Frequency	Percent
Yes	28	87.5
No	4	12.5
Total	32	100.0

Source: Survey Data, 2011

On whether the whether the organization includes intangible benefits in its IT project appraisal process, table 4.16 shows that 87.5% of the respondents unanimously contradicted with the statement, while 12.5% of them were in agreement that the organizations include intangible benefits in its IT project appraisal process.

**Table 4.17: Aspects of the Current Processes**

Current Process	Mean	Std. Dev
Whether the company identifies all available benefits for a project	1.91	.296
Whether the company adequately quantifies the relevant benefits	1.78	.420
Overstates the benefits in order to get approval	1.09	.296

Source: Survey Data, 2011

The study findings as presented in table 4.17 show that the companies identify all available benefits for a project to a lesser extent shown by a mean scores of 1.91, the companies adequately quantifies the relevant benefits to a lesser extent shown by a mean scores of 1.78 and the current process overstates the benefits in order to get approval to a lesser extent shown by a mean scores of 1.09.

On how the organizations ensure that IT projects will deliver benefits to all relevant users, the study established that users are involved in the projects, system development lifecycle is adhered to, the organizations include users in the implementation process stage, the organizations manage their expectations by ascertaining the customers' requirements and the organizations also take up

the responsibility of first addressing the needs of the users, ensuring that all the users are involved during the implementation stage.

**Table 4.18: Whether the organization prepares a benefits delivery plan**

Response	Frequency	Percent
Yes	13	40.6
No	19	59.4
<b>Total</b>	<b>32</b>	<b>100.0</b>

Source: Survey Data, 2011

The study further established that majority of the organizations do not prepare benefits delivery plans as indicated by 59.4% of the respondents, while only 40.6% of them prepare benefits delivery plans. These results are depicted in table 4.18 above.

**Table 4.19: Conducting of Formal Post-Implementation Project Reviews**

Response	Frequency	Percent
Yes	14	43.8
No	18	56.3
<b>Total</b>	<b>32</b>	<b>100.0</b>

Source: Survey Data, 2011

Table 4.19 above shows that 56.3% of the organizations do not conduct any formal post-implementation project reviews, while 43.8% of the organizations conduct any formal post-implementation project reviews.

The study also sought to establish the factors considered in formal implementation of project reviews. In a scale of 1-5, respondents were required to indicate the extent to which each of the factors is considered. The responses were analyzed and results were the n captured and tabulated ted in Table 4.20

**Table 4.20: Factors Considered in Formal Implementation Project Reviews (in %)**

Factor	Highest considered	Much considered	Moderately considered	Less considered	Least considered	Not Applicable
Technology conformance	37.5%	0%	6.25%	0%	0%	56.25%
Project management effectiveness	31.25	12.5	0	0	0	56.25
Benefits delivery	25	9.375	3.125	0	6.25	56.25

Source: Survey Data, 2011

According to the analysis in Table 4.20 on the factors considered in formal implementation project reviews shows that benefits delivery, project management effectiveness and technology conformance are not applicable as shown by 56.25% of the respondents in each case. Further, 37.5% of the respondents indicated that technology conformance is highest considered, as well as 31.25% of them who indicated that project management effectiveness and 25% of them also indicated that benefits delivery are also highest considered.

**Table 4.21: Steps to Review Intangible Benefits Claimed at the Justification Stage**

Response	Frequency	Percent
Yes	15	46.9
No	17	53.1
Total	32	100.0

Source: Survey Data, 2011

From the study findings as presented in table 4.21, 53.1% of the respondents indicated that the organizations do not take steps to review any intangible benefits that were claimed at the justification stage while 46.9% of them were in agreement that their organizations take steps to review any intangible benefits that were claimed at the justification stage



#### 4.6 Cost Benefit Evaluation.

The study sought to establish whether the organizations conducts some form of benefit evaluation, are the results fed back to whoever approved the project. The analysis of the findings was presented in Table 4.22

**Table 4.22: Conducting Benefit Evaluation**

Response	Frequency	Percent
Yes	22	68.8
No	10	31.3
Total	32	100.0

**Source: Survey Data, 2011**

From the study findings depicted in table 4.22 above, 68.8% of the respondents indicated that the organizations conduct some form of benefit evaluation, are the results fed back to whoever approved the project, while 31.3% of the respondents were in disagreement.

**Table 4.23: Formal Process to Transfer Lessons from Implementations to Future Projects**

Response	Frequency	Percent
Yes	10	31.3
No	22	68.8
Total	32	100.0

**Source: Survey Data, 2011**

The study sought to establish whether organizations have formal processes to ensure that the lessons learned from implementations are transferred to future projects are presented in table 4.23 above. Majority of the respondents indicated disagreement as shown by 68.8% as compared to 31.3% of the respondents who were in agreement that the organizations have formal processes to ensure that the lessons learned from implementations are transferred to future projects.

#### 4.7 Relationship between IT Investments and Business Performance

The respondents were required to indicate the various IT investments in their organizations and rate the extent to which they affect the business performance in their organizations. From the study the various IT investment projects provided included communication, accounting, and managerial, marketing, inventory control and personalized home banking projects among others. After analyzing the responses received, the various projects were categorized into for major categories: transactional projects, informational projects, strategic/ transformational projects and infrastructural projects. The projects were then analyzed and the findings captured in a correlation matrix in Table 4.24

**Table 4.24: Correlation Matrix between I.T investments and business performance**

	<b>Business Performance</b>	<b>Transactional projects</b>	<b>Infrastructural projects</b>	<b>Strategic / Transformational</b>	<b>Informational Projects</b>
<b>Business Performance</b>	1	-0.402	-0.689	-0.277	-.097
<b>Sig. P-Values</b>		0	0.978	0.007	.461
<b>Transactional projects</b>	-0.402	1	-0.027	-0.56	-.213
<b>Sig. P-Values</b>	0		0.799	0	.102
<b>Infrastructural projects</b>	-.689	-0.027	1	-.762	-.335
<b>Sig. P-Values</b>	0.978	0.799		0.56	.009
<b>Strategic / Transformational</b>	-0.277	-0.56	-0.762	1	-.123
<b>Sig. P-Values</b>	0.007	0	0.56		.335
<b>Informational Projects</b>	-.097	-.213	-.335	-.123	1
<b>Sig. P-Values</b>	.461	.102	.009	.335	

**Source: Survey Data, 2011**

The researcher thus used the Karl Pearson's coefficient of correlation ( $r$ ) to determine the relationship between IT investments and business performance. From the findings depicted in table 4.24, it was clear that there was a negative correlation between business performance and transactional projects as shown by a correlation figure of -0.402; it was also clear that there was a negative correlation between business performance and infrastructural projects with a correlation figure of -0.689, there was also a negative correlation between business performance and strategic/transformational projects with a correlation figure of -0.277 and a negative correlation between business performance and informational projects with a correlation value of -0.097. This shows that there was negative correlation between business performance and transactional projects, informational projects, strategic / transformational and infrastructural projects with infrastructural projects showing strongest negative correlation with business performance while informational projects had the weakest negative correlation with business performance.

#### **4.8 Challenges affect the efforts to evaluate business value of IT in the firm**

There exist several challenges in the measurement/ evaluation of business value created by the I.T investments. In this regard, the research sought to establish, what are these factors that affect the efforts to evaluate business value of information technology investments in the organizations? This was intended to achieve the third objective of the study the results of the were as presented in Table 4.25

**Table 4.25: Challenges affecting evaluation of IT investments in Organizations**

Challenges affecting IT in the Firm	Mean	Std. Dev
Valuation of no-monetary benefits	4.47	1.191
Difficulty in obtaining information from user departments	4.44	.878
Incorporation of uncertainties e.g. obsolescence of technology	4.44	1.268
Inadequate data for evaluation	3.94	1.366
Political interference	1.59	1.103
Lack of technical personnel to carry out the evaluation	1.56	.948
High costs incurred in the evaluation process	1.34	.653

Source: Survey Data, 2011

From table 4.25 above, the study found that valuation of no-monetary benefits affect the efforts to evaluate business value of IT in the firm to a higher extent as shown by a mean score of 4.47, difficulty in obtaining information from user departments affect the efforts to evaluate business value of IT in the firm to a higher extent as shown by a mean score of 4.44, incorporation of uncertainties e.g. obsolescence of technology affect the efforts to evaluate business value of IT in the firm to a higher extent as shown by a mean score of 4.44, inadequate data for evaluation to a higher extent as shown by a mean score of 3.94, while political interference as shown by a mean score of 1.59 and lack of technical personnel to carry out the evaluation as shown by a mean score of 1.56 affect the efforts to evaluate business value of IT in the firm to a little extent and high costs incurred in the evaluation process affect the efforts to evaluate business value of IT in the firm to the least extent as shown by a mean score of 1.34.

## **CHAPTER FIVE: SUMMARY CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Introduction**

This chapter provides the summary of the findings from chapter four, and also it gives the conclusions and recommendations of the study based on the objectives of the study. The objectives of this study were to investigate the tools used by companies to measure the impacts of IT in the organizations, to determine the relationship between IT investments and business performance and to establish the challenges hindering measurement of business value of IT investments by firms in the Kenyan capital markets. The study used employed an exploratory design and used questionnaires to collect data from thirty two respondents. Data from the study was analyzed using frequencies, percentages means, standard deviations and Pearsoninan correlation of coefficients to establish the objectives. The findings were then complied into a report.

### **5.2 Summary of the Findings**

The study found that business value of IT is the value added to human resource through investment in IT in terms of cost cutting and improved efficiency, the terms of competitive advantage by IT investments to the firm, the benefits accrued form investing in IT projects, the ability of IT investments to meet the business strategic goals hence leading to improved firm value and the increased real and potential value of the firm following the investment in IT. IT provides key operational processes which are essential for everyday operations, IT is of strategic importance to the organization and is used to develop processes which may become important in the future as the most fulfilling IT applications in the organizations. There is no process to monitor and realize those benefits that an IT investment should give, there is no one responsible

for monitoring and realizing those benefits and there is no evaluation and/or follow-up of those benefits that an IT investment should give. The evaluations or follow-ups of the benefits of IT ensures that the organizations do end up achieving the set goals of the investments, there are committees set up to renew the entire IT project being implemented. The committee ensures that the desired benefits are achieved and that the evaluations or follow-ups of the benefits of IT are intended to ensure that the company gets to reap the fruits of the investment. It also ensures that the program is completed within schedule.

The study found that IT investment enabled the organizations to cut on costs, improved efficiency, improved decision making, reduce turnover, it has revolutionalized the market, it has led to reduced turn-around time in trading and settlement, it has also led to reduced cases of fraud and increased liquidity in the market, it is also a major driver of growth and it is also key in delivering efficiency, efficiency in data processing, sharing of resources, creation of new services and products, customer satisfaction and cost management. The tools of measurement used include the Balance Scorecard (BSC), Total Quality Management (TQM), Return on Investments (ROI) and Economic Value Added (EVA) among others. Under BSC the measurement tools used are much linked to the vision of the company where by relying on the measurement, the managers come to agreement on the metrics they will use to operationalize the expected vision. On TQM, the tool geared more towards ensuring the quality of service and product, where the system requires the extending of operation process to suppliers and sub-contractors, the tool focuses on the primarily to achieve quality where the quality policy is set towards the customer, the tool utilizes statistical models to monitor, quantitatively analyze the results as well as factors affecting the quality, consider the reasons and take appropriate prevention methods, the tool require the participation of high and middle level managers and the

tool is based on the principle "do correctly at the very beginning", in researching and designing to minimize economic cost. On Return on Investments (ROI), the tool moderately act as performance measure which is linked to share holder value creation in all directions, while on Economic Value Added (EVA) the tool moderately transcends the base levels of cross-industry technology and business benefits to show vertical industry and business process specific benefits from the investment under consideration.

The study found that customer satisfaction, cost management, accuracy of data processed, effectiveness and efficiency of work and automation process are the main types of benefits considered when planning IT projects. The study established that users are involved in the projects, system development lifecycle is adhered to, the organizations include users in the implementation process stage, the organizations manage their expectations by ascertaining the customers' requirements and the organizations also take up the responsibility of first addressing the needs of the users, ensuring that all the users are involved during the implementation stage. It was clear that transactional projects which provide the information technology to process the basic, repetitive transactions of an organization, that support streamlined processes and that automate transactions have a negative correlation with business performance shown by a correlation figure of -0.402, informational projects which are used to provide the information for managing and controlling the organization through support management and financial control, decision making, planning, communication and accounting also have a negative correlation with business performance shown by a correlation figure of -0.097, as well as strategic / transformational whose goals are to gain competitive advantage, to position the firm in the marketplace, especially by increasing market share or sales with a negative correlation with business performance shown by a correlation figure of -0.277, and finally infrastructural projects

which are large and long-term investments in the IT infrastructure, focused on integration and standardization and upgrading of the existing infrastructure set to provide the ability to quickly and economically enable the implementation of new applications, whose relationship with business performance was also shown by a negative correlation figure of -0.689.

The study finally found that valuation of non-monetary benefits affect the efforts to evaluate business value of IT in the firm to a higher extent as shown by a mean score of 4.47, difficulty in obtaining information from user departments affect the efforts to evaluate business value of IT in the firm to a higher extent as shown by a mean score of 4.44, incorporation of uncertainties e.g. obsolescence of technology affect the efforts to evaluate business value of IT in the firm to a higher extent as shown by a mean score of 4.44, inadequate data for evaluation to a higher extent as shown by a mean score of 3.94, while political interference as shown by a mean score of 1.59 and lack of technical personnel to carry out the evaluation affect the efforts of IT in the firm to a little extent as shown by a mean score of 1.56 and high costs incurred in the evaluation process affect the efforts to evaluate business value of IT in the firm to the least extent as shown by a mean score of 1.34.

### **5.3 Conclusions**

The study concludes that IT investment enables organizations to cut on costs, improved efficiency, improved decision making, reduce turnover, it has revolutionalized the market, it has led to reduced turn-around time in trading and settlement, it has also led to reduced cases of fraud and increased liquidity in the market. As such the main tools of measurement involve Balance Scorecard (BSC), Total Quality Management (TQM), Return on Investments (ROI) and Economic Value Added (EVA) among others. These involve BSC tools which are much linked to the vision of the company where by relying on the measurement, the managers come to



agreement on the metrics they will use to operationalize the expected vision, TQM tool which is geared towards ensuring the quality of service and product, focusing to achieve quality where the quality policy is set towards the customer, utilizing statistical models to monitor, quantitatively analyze the results as well as factors affecting the quality, consider the reasons and take appropriate prevention methods. Return on Investments tools moderately act as performance measure which are linked to share holder value creation in all directions, while Economic Value Added (EVA) tool moderately transcends the base levels of cross-industry technology and business benefits to show vertical industry and business process specific benefits from the investment under consideration.

The study also concludes that the various IT investment projects provided include communication, accounting, managerial, marketing, inventory control and personalized home banking projects. There exists a negative correlation between business performance and transactional projects, informational projects, strategic / transformational and infrastructural projects with infrastructural projects showing strongest negative correlation with business performance while informational projects had the weakest negative correlation with business performance.

The study finally concludes that IT investments face various challenges which include valuation of non-monetary benefits, difficulty in obtaining information from user departments, incorporation of uncertainties e.g. obsolescence of technology, inadequate data for evaluation, political interference, lack of technical personnel to carry out the evaluation and high costs incurred in the evaluation process.

## 5.4 Recommendations

The study recommends that for the organizations in the capital market to realize full benefits of IT investment, they need to employ qualified personnel to oversee the formulation, implementation and evaluation of IT investment strategies. A special attention needs to be given in such tools of measurements which include Balance Scorecard (BSC), Total Quality Management (TQM), Return on Investments (ROI) and Economic Value Added (EVA) among others where most of the organizations recorded poor results. These will heavily impact the organizations with regard to operating costs, efficiency, decision making, and revolutionalization of the market, liquidity in the market, market growth, product innovations, customer satisfaction and above all their overall performance.

From the findings and conclusions, the study recommends that to ensure that there is a positive correlation between IT investments and business performance, the organizations need to re-think their IT investments by paying special attention on customer satisfaction, cost management, accuracy of data processed, effectiveness and efficiency of work and automation process since they are the main areas of business performance which correlate with the type of IT investments made. In general there has been a negative correlation between business performance and transactional projects, infrastructural projects, strategic / transformational and informational projects. More specifically, the organizations need to focus on infrastructural projects which showed the strongest negative correlation with business performance hence they are not well implemented in the organization systems thus do not contribute effectively to the overall business performance.

The study also recommends that the organizations should be more vigorous in making the right strategic decisions with regard to IT investments. This will shield the organizations which are

faced in IT investments processes. In so doing, the organizations will specifically be well placed to tack with problems such as valuation of non-monetary benefits, difficulty in obtaining information from user departments, incorporation of uncertainties e.g. obsolescence of technology, inadequate data for evaluation, political interference and lack of technical personnel to carry out the evaluation and high costs incurred in the evaluation process.

### **5.5 Recommendations for Further Studies**

This study has explored the business value of information technology in companies in Kenya with a special focus on the Kenyan capital markets. The study found and analyzed data with a focus on Kenyan capital markets which is one of the players in the financial sector in Kenya. There are other players in the financial sector in Kenya whose orientation in the sector is close to that of the Kenyan capital markets but differ in their IT investments which affects their business value and their performance altogether. This warrants the need for another study which would ensure generalization of the study findings for all the organizations in the financial sector in Kenya and hence pave way for new policies. The study therefore recommends another study be done with an aim to investigate the business value of information technology in organizations in the financial sector in Kenya.

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**UNIVERSITY OF NAIROBI**  
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DATE..... 28/9/2011 .....

**TO WHOM IT MAY CONCERN**

The bearer of this letter..... CHELIMO LAWRENCE KIBET .....


Registration No..... D61/60310/2011 .....

is a bona fide continuing student in the Master of Business Administration (MBA) degree program in this University.

He/she is required to submit as part of his/her coursework assessment a research project report on a management problem. We would like the students to do their projects on real problems affecting firms in Kenya. We would, therefore, appreciate your assistance to enable him/her collect data in your organization.

The results of the report will be used solely for academic purposes and a copy of the same will be availed to the interviewed organizations on request.

Thank you.

  
**JUSTINE MAGUTU**  
**ASSISTANT REGISTRAR**  
**MBA OFFICE, AMBANK HOUSE**

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## APPENDICES

### Appendix I: Questionnaire

#### PART A: Participant Information

##### Section A: General and Demographic Details

1. Name..... (Optional).
2. Gender      Male                                   Female
3. Please indicate the age bracket in which you fall in.  
 Below 35 years                                   20-25 Years                                   26-35 Years   
 46-50 Years                                   50 and Above
4. Kindly indicate the highest level of education have you attained?  
 Primary education                                   Secondary education                                   College education   
 Undergraduate degree                                   Masters Degree                                   Doctorate   
 Others (Indicate).....
5. How long have you been employed/ working in your organization.  
 Below 2 years   
 Between 2 and 5 years   
 Over 5 Years

1. According to you, what is the business value of IT?					
2. In the scale of 1-5 indicate which of the following categories describes IT applications as fulfilling in your organization? (where 1= least fulfilling and 5= most fulfilling)	5	4	3	2	1
a) IT provides a support role which is not critical to everyday operations	[ ]	[ ]	[ ]	[ ]	[ ]

b) IT provides key operational process which are essential for everyday operations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) IT is of strategic importance to the organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) IT is used to develop processes which may become important in the future	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### IT Investment

3. Is there a process to monitor and realize those benefits that an IT investment should give?	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
4. Is anyone responsible for monitoring and realizing those benefits?	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
5. Is there any evaluation and/or follow-up of those benefits that an IT investment should give Yes <input type="checkbox"/> No <input type="checkbox"/> and if yes, which purpose does this follow-up have?		

## PART B

### Measurement and managing business value of IT investment

6. What benefits does your company perceive are being provided by IT?					
7. In a scale of 1-5 rate the extent to which you think IT is actually delivering these benefits to your organization? (Where 5 is the highest and 1 is the least)	5	4	3	2	1
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. How widely are they used? (Where 5 is the highest and 1 is the least).	5	4	3	2	1
a) Is the measurement tool used linked to the vision of the company where by relying on the measurement, the managers come to agreement on the metrics they will use to operationalize the expected vision?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

b) Does the tool communicate and link the strategy of the entire organization where it is disseminated up and down the organizational chart, and the strategy becomes a tool available to everyone?	[ ]	[ ]	[ ]	[ ]	[ ]
c) Does the tool support business planning where the company separates procedures for strategic planning and budgeting?	[ ]	[ ]	[ ]	[ ]	[ ]
d) Does the tool enable the company to receive feedback and support learning? By supplying a mechanism for strategic feedback and review, the tool helps an organization foster a kind of learning often missing in the company: the ability to reflect on inferences and adjust theories about cause-and-effect relationships.	[ ]	[ ]	[ ]	[ ]	[ ]
e) Does the tool focus primarily to achieve Quality; Where the quality policy is set towards the customer?	[ ]	[ ]	[ ]	[ ]	[ ]
f) Is the tool geared towards ensuring the quality of service and product, where the system requires the extending of operation process to suppliers and sub-contractors?	[ ]	[ ]	[ ]	[ ]	[ ]
g) Does the tool utilize statistical models to monitor, quantitatively analyze the results as well as factors affecting the quality, consider the reasons and take appropriate prevention methods?	[ ]	[ ]	[ ]	[ ]	[ ]
h) Does the tool require the participation of high and middle level managers?	[ ]	[ ]	[ ]	[ ]	[ ]
i) Is the tool based on the principle "do correctly at the very beginning", in researching and designing to minimize economic cost?	[ ]	[ ]	[ ]	[ ]	[ ]
j) Does the tool act as performance measure which is linked to share holder value creation in all directions?	[ ]	[ ]	[ ]	[ ]	[ ]
k) Does the tool transform the accounting information into economic quality which can be easily understood by non financial managers?	[ ]	[ ]	[ ]	[ ]	[ ]
l) Is the tool useful in providing business knowledge to everyone?	[ ]	[ ]	[ ]	[ ]	[ ]
m) It is an efficient method for communicating to investors?	[ ]	[ ]	[ ]	[ ]	[ ]
n) Is measurement carried out using tangible financial gains that can be expected from an investment versus the cost used in implementation?	[ ]	[ ]	[ ]	[ ]	[ ]
o) Does the tool define business value along the three key dimensions of how much, how soon, and how certain?	[ ]	[ ]	[ ]	[ ]	[ ]
p) Does the tool provide an accurate representation of business value, appeal to the shared decision making model, be believable, and capture the total investment?	[ ]	[ ]	[ ]	[ ]	[ ]

q) Does the tool transcend the base levels of cross-industry technology and business benefits to show vertical industry and business process specific benefits from the investment under consideration?	[ ]	[ ]	[ ]	[ ]	[ ]
r) Is measurement carried out using a residual income approach so as to ascertain the value of the investment?	[ ]	[ ]	[ ]	[ ]	[ ]
s) Is measurement carried out using tangible financial gains computed to represent future value at the present time that can be expected from an investment verses the cost used in implementation?	[ ]	[ ]	[ ]	[ ]	[ ]

### Identifying and Structuring Benefits

9. What are the underlying issues that drive your organisation's investment in IT?		
10. Do you have a process that ensures that IT projects are linked to business objectives?	YES	NO
	[ ]	[ ]
11. If yes, please briefly outline this process		
12. What types of benefits do you consider when planning IT projects?		
13. Do you include intangible benefits in your IT project appraisal process?	YES	NO
	[ ]	[ ]
14. Do you believe that your current process,	YES	NO
	[ ]	[ ]
a) Identifies all available benefits for a project?	[ ]	[ ]
b) Adequately quantifies the relevant benefits?	[ ]	[ ]
c) Overstates the benefits in order to get approval?	[ ]	[ ]



**Part C: Challenges faced in evaluating IT business benefits**

22. In a scale of 1-5 indicate the extent to which the following challenges affect our efforts to evaluate business value of IT in our firm. (Where 5 is the highest and 1 is the lowest)	5	4	3	2	1
a)Political Interference	[ ]	[ ]	[ ]	[ ]	[ ]
b)Difficulty in obtaining information from user departments	[ ]	[ ]	[ ]	[ ]	[ ]
c)Valuation of no-monetary benefits	[ ]	[ ]	[ ]	[ ]	[ ]
c)Incorporation of uncertainties e.g. obsolescence of technology	[ ]	[ ]	[ ]	[ ]	[ ]
d)Inadequate data for evaluation	[ ]	[ ]	[ ]	[ ]	[ ]
e)Lack of technical personnel to carry out the evaluation	[ ]	[ ]	[ ]	[ ]	[ ]
f)High costs incurred in the evaluation process	[ ]	[ ]	[ ]	[ ]	[ ]

## Appendix ii: Study of Population

### Stockbrokers

- 1 ABC Capital Limited
- 2 Afrika Investment Bank Ltd
- 3 ApexAfrica Capital Ltd
- 4 Drummond Investment Bank Ltd
- 5 Genghis Capital Ltd
- 6 Kestrel Capital Ltd
- 7 Kingdom Securities Ltd
- 8 NIC Capital Securities Ltd
- 9 Reliable Securities Limited
- 10 Sterling Investment Bank Ltd

### Licensed Investment Banks

- 1 African Alliance Kenya Investment Bank Ltd
- 2 CFC Stanbic Financial Services
- 3 Dyer & Blair Investment Bank Ltd
- 4 Faida Investment Bank Ltd
- 5 NIC Capital Ltd
- 6 Renaissance Capital (K) Ltd
- 7 Standard Investment Bank Ltd
- 8 Suntra Investment Bank Ltd

### Regulatory Body

- 1 Capital Markets Authority (CMA)

### Approved Institutions

- 1 Nairobi Stock Exchange (NSE)
- 2 Central Depository Settlement Corporation (CDSC)

### Registrar Firms

- 1 Image Registrars Ltd
- 2 Custody & Registrar Services
- 3 Comprito Registrars
- 4 KCB Registrars
- 5 Co-op Registrars
- 6 CDS Registrars
- 7 Deloitte/Livingstone Registrars
- 8 Funguo Registrars
- 9 Haki Registrars
- 10 Sage Registrars

### Register of Listed Companies

- 1 Eaagads Ltd
- 2 Kapchorua Tea Co. Ltd
- 3 Kakuzi
- 4 Limuru Tea Co. Ltd
- 5 Rea Vipingo Plantations Ltd

- 6 Sasini Ltd
- 7 Williamson Tea Kenya Ltd
- 8 Express Ltd
- 9 Kenya Airways Ltd
- 10 Nation Media Group
- 11 Standard Group Ltd
- 12 TPS Eastern Africa (Serena) Ltd
- 13 Scangroup Ltd
- 14 Uchumi Supermarket Ltd
- 15 Hutchings Biemer Ltd
- 16 AccessKenya Group Ltd
- 17 Safaricom Ltd
- 18 Car and General (K) Ltd
- 19 CMC Holdings Ltd Ord
- 20 Sameer Africa Ltd
- 21 Marshalls (E.A.) Ltd
- 22 Barclays Bank Ltd
- 23 CFC Stanbic Holdings Ltd
- 24 Diamond Trust Bank Kenya Ltd
- 25 Housing Finance Co Ltd
- 26 Kenya Commercial Bank Ltd
- 27 National Bank of Kenya Ltd
- 28 NIC Bank Ltd
- 29 Standard Chartered Bank Ltd
- 30 Equity Bank Ltd
- 31 The Co-operative Bank of Kenya Ltd
- 32 Jubilee Holdings Ltd
- 33 Pan Africa Insurance Holdings Ltd
- 34 Kenya Re-Insurance Corporation Ltd
- 35 CFC Insurance Holdings
- 36 City Trust Ltd
- 37 Olympia Capital Holdings Ltd
- 38 Centum Investment Co Ltd
- 39 Trans-Century Ltd
- 40 B.O.C Kenya Ltd
- 41 British American Tobacco Kenya Ltd
- 42 Carbacid Investments Ltd
- 43 East African Breweries Ltd
- 44 Mumias Sugar Co. Ltd



45	Unga Group Ltd
46	Eveready East Africa Ltd
47	Kenya Orchards Ltd
48	A.Baumann CO Ltd
49	Athi River Mining
50	Bamburi Cement Ltd