

# Evaluating Information Technology Investments - A Survey of Kenyan Commercial Banks

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*This study attempts to provide empirical evidence on the current state of practice in Kenyan banking institutions in evaluating IT investments ex ante. Results of the survey show that the most popular investment appraisal techniques used in such evaluation in Kenyan banks are cost-benefit analysis, technical arguments, risk analysis, competition, payback period and return on investment, while the least popular are the Internal Rate of Return, computer-based techniques and Net Present Value. The fundamental conclusion of this research is that in the banking industry, the level of usage of sophisticated techniques that integrate financial and strategic analysis to appraise IT investment is low compared to the usage of "traditional" appraisal techniques that focus on the financial return of an investment. Results of this study will help to establish banking industry-wide benchmarks and best practices in IT investment evaluation, thereby assisting IT executives to make more informed decisions for future investments.*

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## INTRODUCTION

IT investments have had a tremendous impact on firms by reducing costs, improving product quality and increasing value to customers, thus enabling the firms to gain competitive advantage. Griffiths and Remenyi (2003) found that among firms in financial services, information technology expenditure consumes an ever increasing portion of operating costs. Yet with regard to planning for the implementation of these technologies, IT executives struggle with the challenging issue of how to justify investment into information technology (Fasheng and Teck, 2000).

IT investments carry significant long term business implications. Assessing IT investments is thus difficult; both before the investment is undertaken, and after the new (or enhanced) systems have been acquired and implemented. Bacon (1992) emphasizes the importance of selecting appropriate criteria for IT investment decision making, as they significantly impact the effectiveness of decision making and have a consequence on projects' return on investment. In addition, the criteria used indicate whether there is an appropriate balance in utilizing both quantitative and qualitative forms of appraisal in selecting IT investments. Therefore, the development and use of appropriate justification approaches and techniques is crucial to ensuring that IT projects are evaluated for all the strategic, operational and economic benefits they can provide and for all the costs that are associated with their acquisition and operation.

This study attempts to provide empirical evidence on the current state of practice in Kenyan banking institutions in evaluating IT investments *ex ante*. The study seeks to find out whether formal appraisal techniques are used in such appraisal in Kenyan banks, and determine the level of complexity of the techniques employed. This paper also attempts to establish whether the choice of appraisal techniques adopted during IT investment appraisal is affected by the firm's size and level of investment in IT.

The results of this study will help to establish banking industry-wide benchmarks and best practices in IT investment appraisal that can be applied across other service industries, thereby assisting firms to make more informed decisions for future investments.

## LITERATURE REVIEW

Bacon (1992) defines an IT capital investment as "any acquisition of computer hardware, network facilities, or pre-developed software, or any "in-house" systems development project, that is expected to add to or enhance an organization's information systems capabilities and produce benefits beyond the

short term” (pp. 335). Grembergen (2001) defines IT investment appraisal as “the weighing up process to rationally assess the value of any acquisition of software or hardware which is expected to improve the business value of an organisation’s information systems” (pp. 3). Although there is potential for appraisal of an IT investment to be carried out at five different stages of the project, namely feasibility, development, implementation, post implementation and in routine operations, in practice, the most critical appraisal takes place prior to acquisition or development when the costs, benefits, risks and value of the proposed investment are assessed (Simmons, 1994).

Methodologies developed by scholars to support IT investment decisions have been designed for consumption by business executives, and concentrate on predicting the potential return on IT investments (Ward, et al., 2007). Formal appraisal techniques can be grouped into the following four classifications: the economic approach, the strategic approach, the analytical approach and the integrated approach. Some of the techniques detailed in Table 2.1 have been discussed substantially in existing literature, and used by some scholars in case studies and exploratory studies to analyse IT investments. Some have been developed further to incorporate new angles to accommodate advances in technology and changes in market dynamics.

*Table 1 Taxonomy of IT Investment Appraisal Approaches*

Classification	Appraisal technique
<b>ECONOMIC APPROACHES</b> (ratio based)	Gut feeling
	Payback
	Return on Investment (ROI)
	Cost Benefit Analysis (CBA)
	Net Present Value (NPV)
Economic approach (discounting techniques)	Internal rate of Return (IRR)
Economic approach (future value technique)	Real option pricing theory
<b>STRATEGIC APPROACHES</b>	Technical importance
	Competitive advantage
	Critical success factors
	Application portfolio approach
<b>ANALYTICAL APPROACHES</b> (portfolio)	Non numeric
	Scoring models
	Computer based techniques
	Fuzzy logic
<b>ANALYTICAL APPROACHES</b> (other)	Risk analysis
	Value analysis
<b>INTEGRATED APPROACHES</b>	Multi-attribute utility theory
	Scenario planning and screening
	Information economics
	Balanced scorecard

Adapted from Irani *et al.* (1997)

Although firms have adopted a more complex approach to evaluating IT investments, they are not utilizing these sophisticated techniques developed by academicians as a means of improving justification

decisions (Small, 2006). This phenomenon may be attributed to the difficulty in understanding and applying these techniques, which continue to evolve along different paths and are extremely difficult to complement or otherwise synthesise, even where attempts are made to do so.

In addition to these formal approaches, researchers have found that managers often rely on methods which do not fall within the boundaries of formal investment appraisal methodologies, thus making decisions based on their personal feelings about potential investments. Such decisions are based on 'acts of faith', 'blind faith' (Weill and Olson, 1989) or 'gut instinct' (Bardhan et al., 2004). These methods have often been "used" in very complex decisions, or due to the lack of adequate guidelines for evaluating investments (Weill and Olson, 1989).

There is not one "best" method for justifying IT projects (Simmons, 1994; Ward and Griffiths, 1996). Consequently, managers have been found to use multiple methodologies when analysing investments to overcome the limitations of using a single technique.

## **RESEARCH METHODOLOGY**

This is a cross-sectional study on the appraisal techniques employed by banking institutions when evaluating potential capital investments in IT. The target population of this study is banking institutions in Kenya. The Kenyan commercial banking system is dominated largely by commercial banks and a small number of non-bank financial institutions which concentrate mainly on mortgage finance, insurance and other related financial services. The Kenyan commercial banking sector has only 41 financial institutions. Due to the size of the banking industry, the whole population on banking institutions was included in this study. Thus, no sampling procedures were conducted. It has been noted that in comparison to similar studies conducted elsewhere, the size of the population in this study is small.

A questionnaire was used to collect information for this study. The correspondence containing the questionnaire and a cover letter was addressed to top-level corporate managers heading the Information technology function in the institution, usually referred to as the Head of Information technology, or the General Manager - Information Technology at most banks. The head of the IT function was identified as the most suitable person to comment on the IT investment appraisal process of IT project acquisition decision making process in the bank.

Respondents were supplied with a comprehensive list of appraisal techniques grouped according to the appraisal approach they adopted i.e. economic, strategic, analytical and integrated, and asked to indicate specific techniques they have used in their analyses. The questionnaire also asked respondents to indicate other techniques they have used that are not included in the list provided.

For each of the approaches, banks were awarded a score of 1 if they used the approach and 0 if they did not. The survey results provided the percent of companies that use a given IT investment appraisal technique.

## **RESEARCH FINDINGS**

### **Profile of Survey Respondents**

Out of the 41 questionnaires hand-delivered to the banking institutions, a total of 25 responses were obtained. During the survey, telephone calls were made to the IT executives to encourage them to complete the questionnaire. Five banking institutions opted not to participate in the survey, in most cases due to corporate policy. The response rate was 60.97%. Analysis of non-response using ANOVA tests revealed that there were no statistical differences, at the 5% level of significance, between the respondents and non-respondents with respect to total asset distribution. Thus, it was concluded that the achieved sample was representative of the banking industry population.

### **Appraisal approaches**

Respondents were asked the following question:

Excluding routine maintenance work, which of the following criteria do you use in making the basic go-ahead decision on systems development projects and computer hardware or software facilities?

For each of the approaches, banks were awarded a score of 1 if they used the approach and 0 if they did not. The survey results in answer to this question provided the percent of companies that use a given IT investment appraisal technique, as shown in Table 3.3. All respondent banks in the survey used more than one approach to make a decision regarding the feasibility of an IT project. This might be indicative of the difficulty of justifying the investment in IT on the basis of one technique or approach.

100% of responding institutions indicated that they used at least one of the economic techniques to appraise potential IT projects. Most institutions used more than one financial technique to appraise their investments. The most popular economic technique is the Cost Benefit Analysis (CBA) method (92%), while Internal Rate of Return (IRR) ranked the lowest (0%). Ratio based techniques were found to be very popular, with 100% of the respondents using them to evaluate IT projects. Besides CBA, Payback Period and Return on Investment were both used by 60% of the responding institutions. Only 8% of banking institutions use at least one of the discounting techniques. Net Present value is used by 8% of the banks, while IRR is used by none of the responding banks. Overall, the limited use of discounting techniques raises questions as to the extent of the use of cash flows to appraise potential projects.

**Table 2 Usage and Application of a Given IST Investment (Project Selection) Criterion**

Classification	Appraisal technique	No of banks using the technique	% of banks using the technique
	Gut feeling	6	24
<b>ECONOMIC APPROACHES</b> (ratio based)	Cost Benefit Analysis (CBA)	23	92
	Payback period	15	60
	Return on Investment (ROI)	15	60
	Net Present Value (NPV)	2	8
	Internal rate of Return (IRR)	0	0
<b>STRATEGIC APPROACHES</b>	Technical importance,	23	92
	Competitive advantage	16	64
	Critical success factors	13	52
	SWOT analysis	13	52
	Application portfolio approach	10	40
<b>ANALYTICAL APPROACHES</b>	Risk analysis	19	76
	Value Analysis	7	28
	Scoring models	4	16
	Computer Based techniques	1	4
<b>INTEGRATED APPROACHES</b>	Balanced scorecard	14	56
	Information economics	10	40
	Scenario planning and screening	8	32

Of the strategic techniques used, technical arguments are used by 92% of responding banks, followed by Competitive Advantage (64%), and Critical Success factors (CSF) and SWOT analysis, both used by 52% of the institutions. The Applications Portfolio approach was used the least, by 40% of the respondents.

Cao et al. (2006) describe the Applications Portfolio as a new approach which is implemented by “fitting” systems into an overall strategic structure. Thus, the limited use of this technique may be attributed to its newness as an IT investment appraisal technique.

Both the analytical and integrated approaches are used the least during IT investment appraisal among Kenyan banking institutions. Of the analytical techniques, the most prevalent technique is Risk Analysis, which is being used by 76% of the respondents. The least used techniques are the computer based techniques (4%). Among the techniques that adopt an integrated approach, the Balanced Scorecard is the most popular, being used by 56% of respondents. Information economics is used by 40% of respondents.

Small and Chen (1995) explain that as a result of the limitations inherent in traditional investment appraisal techniques, many companies are often forced into an ad hoc approach to the justification process. In the Kenyan banking sector, executives in 24% of responding banks rely on their gut feeling when appraising potential IT investments.

## **DISCUSSION AND CONCLUSIONS**

### **The Usage of IT Investment Appraisal Techniques**

Ratio-based techniques, especially the Payback Period and Cost Benefit Analysis are utilised heavily among responding banks. The high usage of these techniques is probably best explained because of their simplicity (Ballantine and Stray, 1998). However, IT executives should be cautioned about relying much on these techniques. Payback ignores medium- and long-term cash flows, and too much stress on their use can operate against proposals for new technology. CBA, on the other hand, entails the use of artificial surrogate measures for intangible benefits, whose subjective nature may affect the overall valuation of the potential project, leading to an unsound decision.

The reasons for the less widespread use of both NPV and IRR are possibly due to a combination of factors. These might include the educational backgrounds and experience of the individuals carrying out the appraisal, the number of respondents who are unfamiliar with the techniques and the fact that the organizational policy may dictate that a particular technique be used. Alternatively, however, it might be that both NPV and IRR are simply perceived not to be appropriate for appraising investments in IT.

Strategic approaches have been found to be more popular than economic approaches for appraising potential IT projects in Kenyan banks. The utilisation of technical arguments is highest among responding banks. Technical arguments focus on the internal operational efficiencies that would result from acquiring information technology. The degree of usage of technical arguments to justify an investment is not surprising as such requirements are a necessity in most IT projects. For example, a firm can invest in new upgraded computer hardware because the current hardware cannot cope with increasing information processing needs. However, firms should be cautious when using technical requirements to approve an IT project by ensuring that overall, IT investment decisions are not driven by technical system requirements, but strategic objectives. Bacon (1992) refers to such a scenario as "the tail ... wagging the dog", in which case, according to Parker and Benson (1988), IT investments are effectively decided by “technology managers” and not “business managers”.

64% of responding banks consider competition to be a priority while appraising IT investments. This indicates that IT is considered significant in today’s competitive business environment. Firms may be investing in IT to improve their competitive standing among other firms that have invested in similar technologies, for example the deployment of Automatic Teller Machines, which is now considered to be a fundamental capital investment for any banking institution.

While the adoption of a strategic approach to IT investment appraisal is beneficial for firms as illustrated in literature, there are downsides to the exclusive use of these methods. Powell (1992) argues that firms

that adopt the strategic perspective to IT investments devote less effort in appraising projects due to competition or “perceived competition”. In a different survey of the use of Decision Support Systems in accounting, Powell (1992) found that firms adopted the new technology for the sake of corporate image, so as not to be seen as lagging behind their competition.

Generally, analytical techniques are not as widely used as either economic or strategic techniques. However, Risk Analysis is conducted by 76% of responding banks, ranking third in popularity after CBA and technical analysis. IT executives acknowledge that conducting a risk analysis of IT investments is important. However, they find that models developed for risk analysis are difficult to understand and apply.

Like analytical techniques, integrated techniques are not widely used. The integrated approach combines somewhat subjective strategic approaches with formal structure found in economic approaches, and is considered the most sophisticated approach to investment appraisal. The Balanced Scorecard is the most popular among these techniques. Bricknall et al (2007) found that this technique is usually employed in its simplest form where the process can be just one or two steps. This technique may be more popular than the Scenario Planning and Screening or Information Economics because many executives have been exposed to it, and are now challenged to apply it in business decision making.

It is important to note that the limited use of integrated techniques does not imply that firms are not considering both tangible and intangible factors in their IT investment appraisal. Due to the limitations of each economic and strategic appraisal technique, firms are using various combinations of these techniques in their assessment, where management formally or informally assign weights to each tangible and intangible factor under consideration. In this survey, 100% of firms are using multiple techniques selected from both the economic and strategic classifications. The use of a hybrid of appraisal techniques may substitute for the use of integrated techniques like the balanced scorecard. However, the information generated from such analysis may not be as comprehensive or equivalent to that of analysis using the balanced scorecard or information economics, as according to Small (2006), weights assigned to tangible and intangible factors are generally not measured for consistency. Furthermore, the assumption of linear additivity of the weighted scores may not be accurate.

From this discussion, one fundamental problem is apparent: the limited use of the more sophisticated techniques within the banking sector. More research needs to be undertaken, to ascertain what barriers discourage the use of sophisticated techniques.

### ***Limitations and further research***

Findings could have been influenced by the data collection method. Firms were asked to submit information consistent with the definitions that were specified in the questionnaire. Respondents may have understood the definitions of the techniques differently. Findings may also have been influenced by prestige bias where respondents indicate that they use the appraisal techniques so that they can be seen to use the techniques.

The findings in this article could be strengthened and expanded by replicating the study at a different point in time and in other industries. In addition, many of the subjective interpretations of the data made in this paper could be strengthened with formal data.

### ***CONCLUSION***

In this paper new empirical evidence has been presented on current practice in appraising potential IT investments. The taxonomy of IT investment appraisal approaches developed by Irani et al., (1997) was

used as the main reference of the survey. This survey, performed between July and September 2008, aimed at assessing the state of practice of IT investment appraisal in the banking sector in Kenya.

The fundamental conclusion of this research is that in the banking industry, the level of usage of sophisticated techniques that integrate financial and strategic analysis to appraise IT investment is low compared to the usage of “traditional” appraisal techniques that focus on the financial return of an investment. This conclusion study underlines the importance of further developing and spreading knowledge on how to analyse potential IT investments using formal techniques.

Firms that fail to recognize the importance of conducting a rigorous appraisal of IT investments before acquisition and implementation are very likely not to leverage the benefits of these technologies, or may experience the failure of their IT projects. In addition, inefficiencies in decision making and resource deployment will prevail. Thus, firms that seek to use information technology must be willing to think carefully through the appraisal processes and be willing to take advantage of methods developed for IT appraisal.

Methodologies of IT investment appraisal developed are numerous, suggesting that the field is already a little crowded and that a 'new' method would be likely to add little (Powell, 1992). Academics and practitioners should collaborate to investigate how currently available techniques might be employed and possibly amended to overcome some of the difficulties business executives encounter when applying these techniques to IT appraisal. Business and IT executives should also be encouraged to make a deliberate effort to understand and formally use investment appraisal techniques while developing business cases for potential IT investments.

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