A SURVEY OF USER SATISFACTION IN CORPORATE INFORMATION TECHNOLOGY THE CASE OF THE KENYA SHELL

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DECLARATION

This Thesis is my original work and has not been submitted for a degree in any other university

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The Thesis has been submitted with my approval as the University Supervisor

Sign _____ Date 4.10.02

Julius Kipngetich

Dedicated to my daughter Rosemary Mueni and my wife Mary Mwithiga

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ABSTRACT

This study work was designed to re-evaluate the strategic realignment of current Information Technology investment and operationally realized objectives within Kenya Shell. Its was geared towards rationalizing investment in Information Communication and Technology (ICT), equipment and maximizing their business value to Kenya Shell, with the help of the Balanced Score card, as developed by Robert S. Kaplan and David P. Norton (Kaplan & Norton 1996).

The specific objectives were:

- To investigate which factors are considered important in measuring Information Technology user satisfaction within Kenya Shell
- To assess the impact, these measures have in furnishing the IT management with the necessary feedback to improve the productivity, quality and competitiveness of the IS department and hence the entire organization.
- To demonstrate the use of the balance score cord in Information Technology user satisfaction measurement and management
- To understand how the management views the IT and IT services so as to identify areas of potential improvement or areas that need additional research.

The research population consists of Shell staff hosted in Kenya and assigned a computer for user. Kenya Shell had 150 employees spread among its offices in Head Office Nairobi, Industrial Nairobi, Mombasa, Nakuru, Eldoret and Nakuru.
The above population was stratified in the following format

- East African Hub Management Team
- Kenya Shell Line Managers
- Kenya Shell Supervisors
- Rest of Kenya Shell Staff.

The data collected was then analyzed using factor analysis, cluster analysis and descriptive statistics. Emphasis in this analysis was to gather and filter information that was used by the Balanced Score card in the evaluation and integration of strategic management in Information Technology execution and investment.

This paper recommends a company specific Balanced Score Card implementation and the need for prudent measurement practice as a prerequisite to Information Technology strategic management within Kenya Shell.

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1.1 The Background of the Research Project

This research project work is a follow up of a similar unpublished work by Kipngetich (1991). It seeks to use modern advances and thinking in the field of corporate Information Technology, and as Lamb (2001), puts it, "Information Technology (IT) has moved closer towards the centre of Business than it has ever been before. Information Technology is now 'the business' as Information becomes a key commodity for many enterprises" .

Over the years private and public institutions have embraced the bandwagon of computerisation, with the perceived hope of improving efficiency and effectiveness. The strategic goal of these computerisation projects has been to overcome competition. Kenya Shell, for example has over the last six years transformed the IT function into a fully fledged department supporting more than 250 computers all internetworked and running among other applications, an Enterprise Resource Planning application (ERP). The ERP is an integral part of Kenya Shell internal business process.

Over the years, Shell has also redesigned the regional IT infrastructures among other countries (Kenya, Uganda, Tanzania, Ethiopia, Sudan and Mauritius), such that all now report to a Regional IT manager. This has greatly harmonised policies and procedures as well have leveraging investments.

In this research project, the researcher endeavours to re-evaluate the strategic realignment of the current Information technology investment and the operationally realised objectives. It is geared towards rationalising investments in Information Communication Technology (ICT), equipment and maximising their business value to organisations, with the help of the Balanced Score Card as developed by Robert S. Kaplan and David P. Norton (Kaplan & Norton 1996). This study is necessitated by what Kipngetich (1991) puts as "managers remain, in worrying numbers, sceptical about the paybacks of information technology". Myers (1997) also observes "Information Systems (IS) managers are under increasing pressure

to justify the value and contribution of IS expenditures to productivity, quality and competitiveness of the organisation. IS assessment is not well established and previous studies show that more research is needed".

1.2 The Shell Group of Companies

Shell operates in more than 135 countries worldwide. Shell companies find, produce, transport, refine and sell oil, gas and petrochemicals and some are involved in the research and development of other sources of energy. Shell is a group of locally based companies, serving their customers. The common features are:

- A degree of ownership by an alliance between two Parent Companies Royal Dutch Petroleum Company and The "Shell" Transport and Trading Company
- The same set of business principles
- A commitment to health, safety and the environment.

There are over 1,700 active companies in the Shell Group, most of which are connected to one of five business areas:

- Exploration and Production
- Oil Products
- Chemicals
- Marketing

1.2.1 Shell in Kenya

Kenya Shell Ltd. / BP Kenya Ltd. is a 50:50 owned joint venture between the Shell Petroleum Company - UK and BP International Limited-UK. It is managed by Shell. The companies have operated in Kenya since the beginning of this century. Kenya Shell, which is the market leader in the oil industry in Kenya is involved in the marketing & supply of petroleum products in the East African region. It markets its products through various

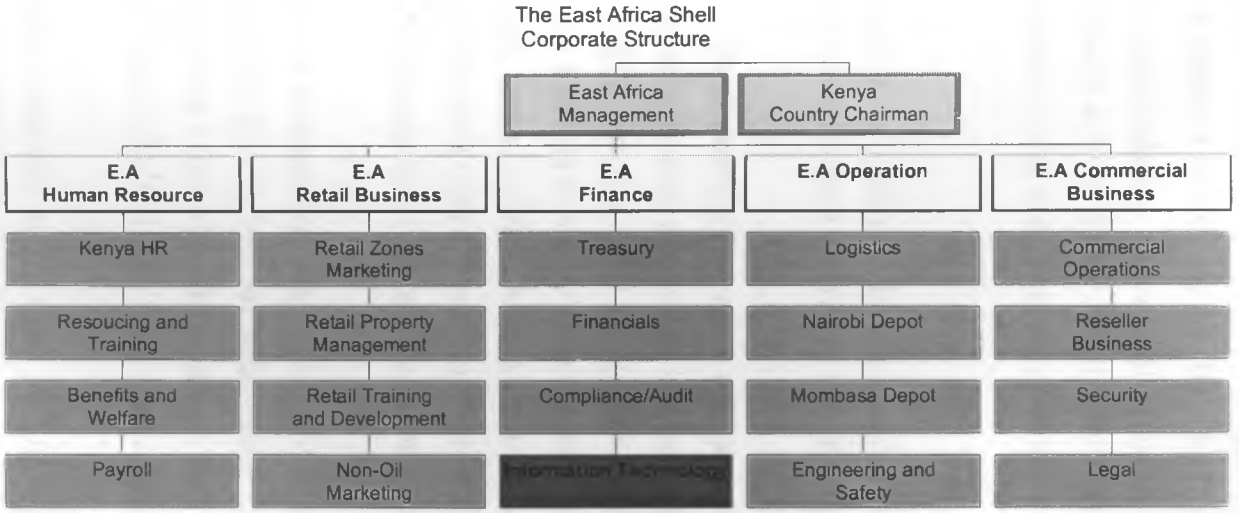
channels of trade namely:

- Retail stations
- Reseller depots
- Airport/airfields refuelling facilities and marine.

Kenya Shell offers a wide range of products namely: motor gasoline, gas oil, fuel oil, lubricants, LPG gas, aviation gas, bitumen and Convenience products through the convenience stores on the retail network.

In order to support its business processes Kenya Shell is now part of Shell East Africa business hub. A portfolio of oil business interests, aimed at standardising and rationalising resources within the East African region. The following top management structure supports the said regional structure.

Management Structure



1.3 Current Computerisation at Kenya Shell

1.3.1 Milestones to Current Infrastructure

The history of computerisation in Kenya Shell is closely related to the Shell global strategy. The Shell Group of companies started using VAX mainframe computers in Shell London Office late 1970s. During this time the top management did not have confidence in any automation project. Indeed the world round did not have a fully successfully automation story. This state was further compounded by the fact that computers were very expensive.

Early 1980s IBM pioneered projects in computerisation, especially in United States of America, which clearly demonstrated the power of modern computing.
During this period all operating Shell companies were advised to draw plans (in line with Shell Global) to modernise and automate business processes. Kenya Shell installed a VMS system ran; General Ledger, Receipting process, Payment process and the Payroll system. These systems were housed in a single computer room that served as a data centre as well as data processing centre. Finance and accounts users were connected by NCR dump terminals to the mainframe computer. For once computer personnel become 'very important' people.
In the period after 1990s a wave of change was sweeping through all commercial companies. This saw the emergence of such ideas as the business process re-engineering (BPR) through information technology.
In the last half of 1990s, Kenya Shell made heavy investments in IT Infrastructure.
The current IT Infrastructure now supports more than 350 networked computers. These are spread across the country

In the following section, I attempt to give a brief of a major computerisation project that Kenya Shell undertook as part of its business process re-engineering. The project entailed installation and commissioning of an Enterprise Resource Planning (ERP) application called JD Edwards.
The summary highlights the major problems the application was to address, the final deliverables and lessons learnt.
The objective for the inclusion of this summary is to shed light in the diverse areas that Information technology has penetrated in the internal business processes of Kenya Shell. And hence heighten the need for actual implementation and execution of the final submissions of this research project.

1.3.2 The JDE Implementation

JD Edwards is a medium-to-large range Enterprise Resource Planning software that was identified by the Shell Corporate office for Kenya operations. Extensive market research was conducted to match the business needs of Kenya Shell and the capabilities of JD Edwards. During the business analysis process the following were important points raised.

i. Analytical ledger: The Finance department will need to implement analytical ledger so as to provide analysis by cost centres and to record inventory purchases, pre-paids before the actual payment documents are received from the supplier. Most management reports will be based on the Analytical ledger.
ii. Data Integrity – Data clean up and initialisation: During the business analysis most managers expressed concern on the accuracy of existing data. They was also need to decide the amount of historical data to be initialised in the new system. Key decisions were to be made about the opening balances for the suppliers and customer files to be imported into the accounts payable and accounts receivables. Inventory items and balances were also to be entered.
iii. Separation of duties: Separation of accounting duties needed to be carefully evaluated and recommendations made. For example the person who receives payment on invoicing is also responsible for

invoices the client. The necessary internal controls were to be implemented while setting up JD Edwards security.

iv. Fixed assets: Assets were maintained on fixed asset register in Ms Excel spreedsheet, hence it was almost impossible to integrate the assets valuation with the inventory program for company wide valuations. It was expected that all assets will be captured into the system first in work-in-progress section of General Ledger, then after the project completion, be assetized in the fixed assets module.

v. Taxes: The system will need to capture and manage the following taxes: Custom duties, Excise tax, VAT, road maintenance levy and petroleum maintenance levy.

vi. Sales and Marketing department: Extensive reports on different market segments and products were required to place the marketing representatives above competition. This was to be achieved by using appropriate customer identification codes and the analytical ledger. In addition to the above reports, select number of reports were also needed by the government on a regular and periodic basis.

vii. Credit control: The analysis found out that customers have not been set to a standardised credit limit. In order to enforce credit control and standardised credit limits a company policy and corresponding procedure will be published and implemented for all market segments. An important report called "Aging Report" for the customers was found to be invalid, as a result of non standard credit limits.

viii. Accounts payable: The business analysis team recommended the following, in an effort to enforce collection of Accounts Receivables.

- Tracking of customers who have presented Kenya Shell with 'guarantee' for payment from a bank and the 'guarantee' expiring date.
- New customers probation periods and their expiring dates
- Tracking transport (track and drivers) numbers
- Monitoring special contracts prices and their expiring dates.
- The new system was to find ways (possibly through customisation) of providing the above reports.

ix. Engineering department: Material warehouse. The company operates a manual card system introduced in 1960s. The warehouse was found to contain a lot of unrecorded and obsolete material.
There was thus an urgent need to sort out the materials and record them on electronic format.
The new system will have to find ways of integrating the data capture forms at the warehouse. These forms include Material Out form, Material In form, Stock Request form and the Local Purchase Order.

ix. Project control : There is a tremendous need to track project costs on both the building and the maintenance of petrol stations.
x. Operations : This department is responsible for importing crude, refined products and handling all transport. Its is also responsible for all associated inventory items, tracking the supply and availability of products. The business analysis team stressed the need to track the products movements from the refinery through the pipeline and up to the depots. The value of the product will be adjusted at times. In addition to the original costs of the product all associated shipping charges, demurrage, insurance, refinery fees will be added. This adjusted product value will need to be captured in the system at the depots.

1.3.3 The JDE Solution to the Business

After an implementation period spanning 2 years, the following were the key deliverables:
The system allowed the use of multi-company set-ups, where these multi companies accessed a common database. The above was made possible by the General ledger set-up, that supported processing and reporting by multi company transactions.
The installation of the analytical ledger was accomplished by the use of four-digit codes, in addition to the general ledger account code. The code facilitated the generation of reports needed in business controls and reviews.

1.3.4 Lessons learnt in the JD Edwards Project Implementation (and which can be applied to any ERP implementation project)

- Develop an appropriate decision-making framework as early as possible; consensus decision-making does not work for ERP projects.
- Recruit recognised departmental leaders to participate in both the selection and the implementation processes.
- Pay attention to project management and planning.
- Do not underestimate the amount of hardware needed to provide the level of performance users expect from a modern enterprise application.
- Understand the proper role for consultants in your culture.
- Get external advice from peers.
- Be sceptical of vendor promises about release dates of new versions, future features, field support, and software quality.
- Be realistic about the life cycle costs and benefits of customising an ERP application.
- Make realistic compromises; the best can be the enemy of the good.
- Develop a special office environment for the project team.
- Be serious about training.
- Communicate broadly about the complexity of the implementation process.
- Convert data early and often for testing and

demonstration purposes.

- Do not overlook information security and access control.
- Phase in the modules; beware of the "big bang" approach.
- Realise that integrated systems are a mixed blessing.
- Recognise that many ERP projects are late and over budget.
- Understand that even steady-state cost savings are difficult to achieve.
- Under promise and over deliver.
- Understand your company's ability to absorb change.
- Plan on how to retain the valuable staff that the project will develop.
- Recognise that the project will never be completely finished.

1.4 An overview of Concepts and Working Definitions

The balanced scorecard (BSC) is a recently developed strategic management system that should allow businesses to drive their strategies based on measurement and follow-up. These measures are divided into four domains:

- financial achievements
- customer orientation
- effectiveness and efficiency of internal processes
- and innovation and learning.

Here BSC is applied to the evaluation of IT projects and the IT function as a whole. Also, the relationship with more traditional IT/IS-evaluation methods like Capital Budgeting and Information Economics is pointed out. The evaluation of the IT function, as with the evaluation of IT investments, remains the subject of many academic and business discussions. In IT issues-studies - where managers are asked what they find important in corporate information technology - we always find this subject under the name "Measurement of IT effectiveness and productivity".

There has been considerable public interest across the world on the subject of the real magnitude and value of IT to organisations, this can be attributed to

◊ IT is increasingly becoming crucial to achieving organisational and strategic goals.

◊ Investments in IT are also never ceasing to grow, and business managers worry about the fact that the benefits of these investments might not be as high as initially expected. The industry likes to call this phenomenon the "IT investment-paradox", or the "IT Black Hole". Large sums are invested in IT, and seem to be swallowed by a large black hole without rendering many returns.

Is IT Investment a Productivity Paradox?

Paul Strassman initiated the debate about computers and productivity. He demonstrated with extensive data that investments in computer systems do not have a positive impact on productivity or profitability (Strassman 1997a, 1997b, and 1990). Since then the productivity paradox has captivated nu merous authors, pros and cons. Further research has sharpened the picture and the most recent results indicate that the "con"-side is winning, i.e. the

paradox is about to be solved.

Several explanations are offered. First, the data used to study the issue has been collected on a macro level; it is highly aggregated and therefore does not capture the reality very well. Second, it would be quite comprehensible that the productivity impact of a new technology takes some time to materialise. In the initial investment stage performance may even drop, but that can't yet be taken as a proof of the fact that the technology itself is useless. Since IT affects the very core of enterprises, the way they co-ordinate their activities with information, it is natural that it takes some time for it to find the appropriate applications. The essential unit of analysis should not be economy, not even an industry, but a corporation.

Looking at the corporate level, it is plausible that investments are not done with increased competitiveness in mind, but simply to stay in the race. If one competitor starts to invest in IT and receives some benefits from it, an "IT arms race" will be initiated. Following the Porterian model (Porter 1980) of competitive advantage it is obvious that a generally available technology will not for long provide sustainable advantage. As the performance of all competitors increase, none is able to command a price premium. In the end benefits go to customers, often in the form of qualitative improvements in products and services, that are hard to capture by productivity statistics.

According to the Porterian model advantages are not produced by generic solutions with off-the-shelf products but by customisation and application to particular processes. The question thus remains how to evaluate and assess the impact of IT on business processes. The fundamental principles here are:

- Firstly, that technology by itself is not doing anything; therefore causal modelling is not appropriate. Instead, enabler-effect models should be used. An Enabler-Effect Map (EEM) allows managers in co-operation with IT specialists, to analyse the ramifications of IT investments in their business. The model consists of two beacons and a set of map symbols. On a broad perspective EEM can be described as a tool for measuring and managing qualitative and quantitative benefits of IT utilisation. According to the model, all benefits that IT enables are created through

improved control information. Such a logical chain can be interrupted at various points if certain requirements are not fulfilled. Therefore enabler-effect models can account for poor decisions or insufficient supporting conditions at any point in the chain.

- Secondly, it will not be possible to produce a sufficient set of conditions explaining a benefit in advance; only a list of necessary conditions can be identified.
- Thirdly, there is no direct link from IT to the bottom line. The effects pass through various operational process indicators. Therefore the benefits of IT should be measured in operational terms close to the interface between operational and financial indicators. A model of the operational indicators following performance measurement models, such as the Balanced Scorecard (Kaplan & Norton 1996), is necessary.

1.5 Problem Definition

Information Technology (IT) managers are under increasing pressure to justify the value and contribution of IT expenditures and investments to the productivity, quality and competitiveness of the organisation (Myers 1997). IT performance measurement is not well established and recent studies show that more research is needed.

> "A basic strategy for developing a useful Information Technology (IT) is that the system must be directed towards satisfying the perceived needs of its intended users" (Kipngetich 1991)

Information Technology is treated as the answer to improved corporate productivity and ultimately better competitive position for most organisations. While this expectation may have some merit, it lays a heavy burden on IT Managers who often lack the tools they need to decide if they are accomplishing the right activities. It is often difficult to differentiate the role of IT function in business performance and those of other factors. While other companies use weak 'surrogate' measures of IT effectiveness that hides the true value of IT.

User Satisfaction of corporate information Technology has proven difficult to define and measure. Further evidence of this is provided by what has

come to be called the productivity paradox: the value of cost of purchasing a computer system has consistently gone down while the power has consistently gone up. Some researchers have suggested that assessing the value of the IT infrastructure is perhaps the biggest single problem for the 90s.

The IT function within Kenya Shell is running out of credibility and users (especially senior managers) are no longer willing to give IT the benefit of the doubt. Kenya Shell users have come to realise they are paying big money for technology that is not optimally used to satisfy their needs as computer users.

Hence there is a need to objectively evaluate the needs of the end-user and determine factors that they consider important.

1.6 Research objective

The objectives of this research are

- To investigate which factors are considered important in Information Technology user satisfaction within Kenya Shell
- To assess the impact, that factors have in furnishing the IT management with the necessary feedback to improve the productivity, quality and competitiveness of the IS/IT department and hence the entire organisation.
- To demonstrate the use of the balance score card in Computer/IT user satisfaction measurement and management
- To understand how the management views IT and IT services so as to identify areas of potential improvement or areas that need additional research.

1.7 Importance of this research

Perhaps the most obvious reason that this research is important is that it allows the individual users to communicate directly to IT management about their needs. This, in turn, assures the IT department that the quality standards they establish actually reflect the voice of the users and not just the company line.

This paper explores;

- The management view on the performance of IT department
- What factors of measures considered important in IT user satisfaction

It is the hope of the researcher that this paper will assist IT managers within the Shell Group of companies in developing a comprehensive set of IT assessment measures that will provide them with the guidance necessary to develop a strategic IT framework.

"These assessment systems have the potential to furnish the feedback required to enhance the quality and productivity of the IS/IT function and thereby, the organisation"(Myers 1997).

Chapter 2
Literature Review

2.1 Performance Measurement Through Benchmarking

Bench marking is the systematic analysis of ones owns performance, against that of another organisation with an overall goal of improving performance by learning from the experience of others. Bench marking is a continuous process of measuring products, services and processes against those of industry leaders or the toughest competitors. This results in a search for best practices, those that will lead to superior performance, through measuring performance, continuously implementing change and emulating the best.

2.1.1 Types of benchmarking

There are four basic types of bench marking

- **Internal :** a comparison of internal operations
- **Competitive:** Specific competitor to competitor comparison for a product or function of interest.
- **Functional:** Comparisons to similar functions within the same broad industry or to industry leaders.
- **Generic:** Comparison of business processes or functions that are very similar, regardless of the industry.

Bench marking helps the organisation to understand its own operations because of the detailed analysis that has to be carried out. Ideally performance will be compared with organisations known to be the best in a class of activity in question. From such analysis the best practices can be identified and translated into use in the organisation.

Comparison can be made directly with a competitor **(Competitive bench marking)** or with the best external practitioner of the activity regardless of the industry in which they operate.

Bench- marking establishes the desire to achieve continuous improvements and helps to develop a culture in the firm in which one admits mistakes and adopts or makes changes.

It will be noted that the above measures of performance are mainly **financial indicators** of performance. They have a major short- coming in that they can result to exploitation of some variables. For instance the organisation may aim at high profits at the expense of the research and customer development. The end result is that the company's future is jeopardised.

To address the above shortcoming, other methods of measuring performance have been advanced which includes;

2.2 Balanced-score card (BSC)

This is a popular approach in a current management thinking, which consists of a variety of indicators both financial and non-financial. It focuses on four different perspectives.

- The Customer
- Internal Perspective
- Innovation and Learning
- Financial Perspective

2.2.1 The Customer

Balanced score card demands that managers translate the general mission statement on customer service, such "to be number one in delivering value to customers," into specific measures that reflect the factors that really matter to customers.

The questions to address here are;

- Who are our customers?
- What do existing and new customers value from us?
- Customers' concerns tend to fall into four categories
    - Time
    - Quality
    - Performance
    - Service
- Lead-time measure the time required for the company to meet its customer's need.
- Quality measures the defect level of incoming products as perceived and measured by the customer.
- Combination of performance and services measures how the company's products or service contribute to creating value for its customers.

2.2.2 Internal Perspective

What must we excel at so as to achieve our financial and customer objective? It aims at improving internal processes and decision making. The internal measures for the balanced scorecard should stem from the business processes that have the greatest impact on customer satisfaction – factors that affect cycle time, quality, employee skills and productivity.

Companies should also attempt to identify and measure their company core competencies. The critical technologies needs to ensure continued market leadership.
Companies should decide what processes they must excel at and specify measures for each.

2.2.3 Innovation and Learning

The question to address here is "can we continue to improve and create value?"
This perspective considers the business capacity to maintain its competitive position through the acquisition of new skills and development of new products.

2.2.4 Financial Perspective

How do we look to shareholders? How can we create value for shareholders?
Financial performance measures indicate whether the company's strategy, implementation and execution are contributing to bottom-line.
Typical financial goals have to do with profitability, growth and shareholders value.
It is necessary that the boundaries of individual responsibility are made as clear as possible (e.g. Are individuals responsible for cost alone or does their responsibility extend to profit (i.e. sales and costs) or even investment performance?)
The elements within the individuals responsibility should as far as possible be controllable by that person.
There are inevitably many averages and interdependencies that need to be carefully managed.
The key question always is whether the measures used are the most appropriate, fair and useful way of assessing performance in relation to the critical success factors identified.

2.3 Performance measurements in IT Investment

In order to be able to evaluate IT/IS-investments, many methods and techniques have been suggested over the years.

More traditional methods focus on financial measures that have long been known:

◊ the "return on investment" (ROI),

◊ the "net present value" (NPV),

◊ the "internal rate of return" (IRR) and

◊ the simple and popular "payback time" (PB).

These methods suggested the paradox that we mentioned above, and urged researchers to search for alternative ways of evaluating IT related investments.

Another approach to the problem is called "information economics" (IE) (Parker et al., 1988 and 1989). This method allows one to account for more intangible benefits like a better customer service or a higher degree of competitiveness. It also separates the benefits and risks into two domains (a business domain and a technological domain) and evaluates these domains jointly.

And now, the BSC found its way to evaluating IT and its investments. Kaplan and Norton (1992, 1993 and 1996a,b) proposed this method in order to evaluate a company's progress from four different perspectives: the financial perspective, the perspective of internal processes, the client's perspective and the innovative perspective. This model can also be applied to IT investments and to the IT function because it connects the strategic link with the operational IT functions. The lack of this link is closely related to the emergence of the IT productivity paradox, that this paper seeks to resolve.

In this paper a framework is developed for evaluating IT/IS based on the BSC-technique. This evaluation is confronted with two kinds of tasks.

One task lies in trying to assess the contribution of a specific information system or project.

The other focuses on assessing the general IT function. It deals with crucial questions like: how good is our corporate information technology, how can

we measure this function and how can we improve it? In this paper, we will try to take a closer look at these questions.

2.4 Information Economics

In essence, the information economics method is a scoring technique whereby value and risk categories are attributed to a score between 0 and 5. For a value category (marked with a '+'-sign), 0 would signify 'no positive contribution', and a 5 would refer to a 'large positive contribution'. For a risk category (marked with a '-'-sign) 0 would mean 'no risk' and a 5 would signal a 'large risk'. Each of these categories is assigned a weight. By adding the weighed scores of the value categories and subtracting the weighed scores of the risk categories, one can calculate the total score of each project. Note that these categories have an indicative, not an exhaustive meaning.

Table 2.4

New Information Economics (Parker, 1996)

TRADITIONAL ROI (+)		
+ value linking (+) + value acceleration (+) + value restructuring (+) + innovation (+)		
= ADJUSTED ROI	+ BUSINESS VALUE	+ IT VALUE
	• Strategic match (+) • Competitive advantage (+) • Competitive response (+) • Management information (+) • Service and quality (+) • Environmental quality (+) • Empowerment (+) • Cycle time (+) • Mass customization (+)	• Strategic IT architecture (+)
	• Business strategy risk (-)	• IT strategy risk (-) • Definition uncertainty (-) • Technical risk (-)
	• Business organization risk (-)	• IT service delivery risk (-)
= VALUE (business contribution)		

Example

Table 2.4.1

	Business Domain						Technology Domain				Project Score	
Factor	ROI	SM	CA	MI	LI	OR	SA	DU	TU	IR	Value	Risk
Score	4	2	0	4	0	3	4	2	1	3		
Weight	10	5	5	2	1	5	2	2	2	2	66	27

Information Economics Scorecard for a New Payroll System

The payroll system received a low score (2) on strategic match because, although the system allowed the organization to manage its resources more efficiently, it did not contribute significantly to the organizational goals. The payroll system received a 3 on the organizational risk factor because the personnel department did not make adequate plans to integrate the new payroll system into its operations.

Each and every company should adapt these categories to its own needs and specifications. The value of this method lies with the fact that the scores are assigned by all parties involved: the users only score risks and values in the corporate domain, and the IT specialists only score the IT related categories. This way, the business contribution of the project can be assessed jointly, and consensus can be reached on the evaluation of a specific project. areas. 'Value acceleration': a'Value linking': incorporates the benefits and costs in other (functional) typical example are the interest savings due to an accelerated cashing of invoices. 'Value restructuring': refers to the efficiency and effectiveness of the employees: does the new system free up more time to execute their own job? 'Strategic IT architecture' assesses the degree to which the project fits into the IT plan. 'Business strategy risk' and 'IT strategy risk' respectively refer to the degree of risk in terms of how well the company/IT department succeeds in achieving its strategic objectives. 'Definitional uncertainty' indicates the degree of risk in terms of how clearly the functional requirements and specifications have been agreed

upon. 'Technical uncertainty' provides a measure for the risk associated with dependence on new, immature technologies. 'Business organisation risk/IT service delivery risk' scores the degree of risk in terms of how well the company/the IT department will be able to adapt to the changes invoked by the project.

2.5 The Balanced Score Card method and its Application

The inventors, Robert Kaplan and David Norton, developed the method in three articles published in the *Harvard Business Review* (1992, 1993 and 1996a). Their idea was that traditional financial measures (like the ROI, for example) should be supplemented with operational measures concerning customer satisfaction, internal processes and the ability to innovate. These three measures would assure future financial results, and drive the organisation towards its strategic goals while keeping all four perspectives in balance. Kaplan and Norton undoubtedly knew the theories behind business (process) re-engineering ,where stress is the importance of quantitative goals and measures to drive the strategy. All these measurements (evaluations) are framed in a strategic management system that drives improvement and that allows to prepare for the future. To do this, the method uses a three-layered structure:

- the mission: management first states a mission (e.g. "to become our customers' most preferred supplier")
- the objectives: the mission is translated into objectives (e.g. "to provide our customers with new products")
- the indicators: the objectives can be measured through well-chosen indicators (e.g. "percentage of turnover generated by new products")

See an example of a fully formatted BSC template below, table 2.5

BSC-approach (Kaplan and Norton, 1992)

CUSTOMER PERSPECTIVE **How do the customers view the company?**	FINANCIAL PERSPECTIVE **How do the shareholders view the company?**
Mission To deliver the best added value to the customer *Objectives* • new products • partnership with customer *Measures* • percentage of new products of total turnover • joint development efforts	*Mission* Assure added value for shareholders, both in the short and long run *Objectives* • survive • prosper *Measures* • ROI and cash flow • market share
INTERNAL BUSINESS PROCESS PERSPECTIVE **How can the company improve its internal operations to improve the service to customers?**	**LEARNING AND GROWTH PERSPECTIVE** **What should the company do to remain successful in the future?**
Mission Efficiently produce and deliver products and services *Objectives* • excellence in production • excellence in deliveries Measures • cost price per unit • average throughput time for orders	*Mission* Innovate, improve and learn to the maximum *Objectives* • technological leadership • product focus *Measures* • Time necessary to develop a new generation of products • number of old products compared to number of new products

2.6 The Need for Balanced Score Card

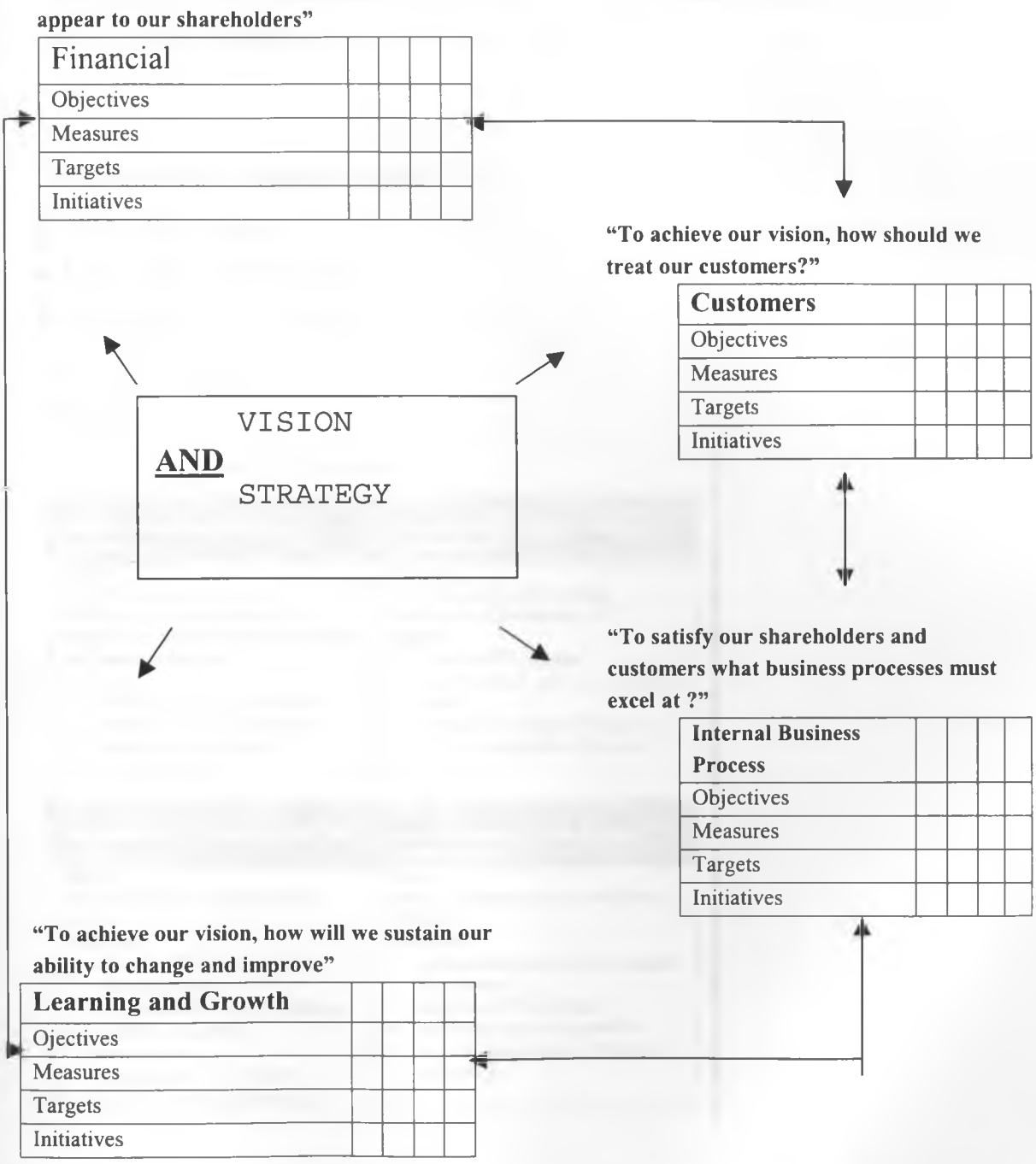
The BSC provides executives with a comprehensive framework that translates a company's vision and strategy into a coherent set of performance measures. Many companies have adopted mission statements to communicate fundamental values and beliefs to all employees. The mission statements addresses core beliefs and identifies target markets and core products.

Mission statements should be inspirational. They should supply energy and motivation to the organisation. But inspirational mission statements and slogans are not sufficient. As Peter Senge observes "many leaders have personal visions that never get translated into shared visions that in turn galvanise the organisation. What has been lacking is a discipline for translating individual vision into shared vision".

The BSC translates mission and strategy into objectives and measures, organised into four perspectives; financial, customer, internal business process and learning and growth. The BSC provides a framework, language to communicate mission and strategy, it uses measurements to inform employees about the drivers of current and future success. By articulating the outcomes, the organisation desires and drivers of those outcomes, senior executives hope to channel the energies, the abilities and the specific knowledge of the people throughout the organisation towards achieving the long-term goals.

Diagram 2.6

Using the Balanced Score Card as a Strategic Management Systems



2.7 Evaluation of corporate information technology with the BSC

This general BSC-framework can easily be translated to the more specific needs of the evaluation of an IT function.

The proposed perspectives are :

- User-orientation
- Corporate contribution
- Operational excellence
- Future orientation

Table 2.7

BSC for the IT function

USER ORIENTATION **How do the users view the IT department?**	CORPORATE CONTRIBUTION **How does management view the IT department?**
Mission To be the preferred supplier of information systems and to exploit business opportunities maximally through information technology *Objectives* • preferred supplier of applications • preferred supplier of operations • partnership with the users • user-satisfaction	*Mission* To obtain a reasonable business contribution of investments in IT *Objectives* • Control of IT expenses • sell IT products and -services to third parties • business value of new IT projects • business value of the IT function
OPERATIONAL EXCELLENCE **How effective and efficient are the IT processes?**	**FUTURE ORIENTATION** **Is IT positioned to meet future challenges?**
Mission Efficiently deliver IT products and -services *Objectives* • efficient software development • efficient operations • acquisition of PCs and PC-software • problem management • training users • management of IT personnel • use of communication software	*Mission* Develop opportunities to answer future challenges *Objectives* • permanent training and education of IT personnel • expertise of IT personnel • age of the applications portfolio • research into emerging information technologies

These differ from the general ones, mostly because the IT department is an internal service supplier. The users are its clients, and the contribution is to be considered from management's point of view.

This BSC-evaluation for IT can be compared to the more general management evaluation. It discuss the critical success factors of the IT

function and indicate that a measure like "system availability and downtime" can be considered to be such a factor.
Each of these perspectives have to be translated into corresponding metrics and measures that assess the current situation. These assessments have to be repeated periodically, and have to be confronted with the goals that had been set beforehand. Hereafter, an overview of some generic IT measures will be presented. These measures are generic, because each corporate mission and each corporate set of objectives requires its own specific measures.
The presented framework integrates different approaches and adds an important dimension: the evaluation becomes more dynamic and strategic since measures are tracked and traced over time, and explicitly integrated in the strategic management of the IT department. In this way, added value can be created for the company.

2.7.1 Measuring corporate contribution

It is important to distinguish two kinds of IT evaluation: the short term financial evaluation and the long term oriented evaluation of IT projects and the IT function itself.

Table 2.5.1

Corporate Contribution	Mission To obtain a reasonable business contribution of investments in IT	Objectives ♦ Control of IT expenses ♦ Sell IT products and Service to third parties ♦ Business value of new IT projects ♦ Business value of the IT function

Control Of IT Expenses

% within budget or above budget		
Allocation of the different budget items		
IT budget as a % of turnover		
IT expenses per staff member		

Sell To Third Parties

Financial benefits stemming from selling products and service		

Business Value Of New IT Projects

Financial evaluation based on ROI, NPV, IRR, PB		
Business evaluation based on Information Economic		

Business Value Of the IT Function

% of the development capacity engaged in strategic projects		

"Control of IT expenses" and "Sell to third parties" are definitely focused on short-term evaluations. "Business value of new IT projects" and "Business value of the IT function" are measures that require a more prolonged time frame.

The traditional financial perspective is worried about the control of the IT budget and the benefits that are possibly coming from the sales of IT products and -services to third parties.
A popular financial metric undoubtedly is the IT budget expressed as a percentage of turnover. The comparison to other companies in the industry may give useful indications. But these hints have to be interpreted with care: higher or lower IT expenses may be caused by company-specific reasons. A critical attitude towards these figures is absolutely necessary even if the percentage is at the same level as the industry average. In addition, variations from 1% to 8% of turnover have been known to occur, depending on the IT intensity of the industry.
IT projects must generate value for the company. Value is a much broader concept than benefits. When implementing a new marketing database for example, the substantially lower amount of programmer-intervention necessary to execute an ad-hoc-query, will certainly generate (a maybe modest amount of) direct benefits. But the real value of such a project lies with the marketing-department: will the salespeople integrate the database into their approaches and consequently achieve a higher turnover? Value therefore implicates risk.
IT benefits have traditionally been measured by quite simple,financial measures like the return on investment and/or the payback period. The ROI is the ratio of average annual net benefits of a project and the invested amount of money. The payback period is even simpler to calculate: it results in a period of time that indicates how long an investor will have to wait for the project to repay its initial investment. These types of financial measures limit themselves to the financial benefits, and do not incorporate values. The method of information economics (Parker et al., 1988 and 1989) fills exactly this leap hole.

2.7.2 Measuring user orientation

When we refer to the user, we have set our thoughts primarily on the end user, the internal customer of the IT department. Secondarily, this user could also be the company's customer in the case of an inter-organisational system. The user orientation and the measurement of the customer satisfaction were also heavily focused by the BPR-change methodologies. The balanced score card now hands the techniques to measure this dimension and manage accordingly.
The metrics regarding user orientation have three items to focus on: to be the preferred supplier for applications and operations, the partnership with the users and the user satisfaction.

Table 2.7.2

User Orientation	Mission To be the preferred supplier of Information systems and exploit business opportunities maximally through Information Technology	Objectives: ♦ Preferred supplier of applications ♦ Preferred supplier of operations ♦ Partnership with users ♦ User satisfaction

♦ Preferred supplier of applications

	%	No. of Applications	Total No. of applications
% of applications managed by IT			
% of applications delivered by IT			
% of in-house applications			

♦ Partnership with Users

Index of users involvement in generating new strategic applications		
Index of user involvement in developing applications		
Frequency of IT Steering Committee meetings		

◆ User Satisfaction

Index of user friendliness of application		
Index of user satisfaction		
Index of availability of applications		
Index of functionality of application		
% of application development and operations within the Service Level Agreement (SLA)		

The percentages of the applications that are managed and delivered by the IT department are heavily dependent on the company-specific situation. When a company sets the ratio of internal versus external development, it makes a strategic choice. In making such a choice, it will take into account other factors like wanting to keep part of the development capacity in house for strategic, highly competitive projects. This remark also goes for outsourcing computer operations.
Surveying clients (users) should play an important role in the evaluation of the IT function as a whole. Especially important customers need to be involved in such surveys. If the department would lose an important customer, detailed research into the reasons behind this loss would certainly be required. The indexes resulting from the user surveys, are most important and must be treated with care. It is also imperative to distinguish between objective and subjective measures. The indexes resulting from surveys are evidently subjective measures, as opposed to most other measures that you will find here. Subjective measures can be completed with a compliance audit, evaluating the user involvement.

2.7.3 Measuring operational excellence

It concerns primarily the measurement and improvement of the two basic processes of the IT department: the development of new information systems and the computer operations. We also focus on other processes like

PC supply, problem management, user education, management of IT staff and their usage of efficient communication channels.

Table 2.7.3

Operational Excellence	Mission Efficiently deliver IT products and services	Objectives ♦ Efficient software development ♦ Efficient operations ♦ Acquisition of PC's and PC software ♦ Problem management ♦ Training users ♦ Management of IT personnel ♦ Use of communication software

Efficient Software Development

% of changes and adjustment made throughout different development stages		
No. of function points per person per month		
Average number of days late in delivery software		
Average unexpected budget increase		
% of code that is reused		
% of maintenance activities		
Visible and invisible backlog		

Efficient Operations

% unavailability of the mainframe		
% unavailability of network		
Response times per category of users		
% of jobs done within set times		
% of reruns		
Average times between system failure		
Ratio operational costs/installed MIPS		

Acquisition of PC and PC software

Average lead times for deliverable		

Problem Management

Average answer times of Help Desk		
% questions answer within set time		
% of solutions within SLA		

User Education

% of users that already received education (per technology/application)		

Quality index of education		
% of users that already received education (per technology/application)		
Quality index of education		

Managing IT Staff

Number of people hours that can be charged internally and externally		
% of people hours that are charged on projects		
Satisfaction index of IT		

Use of Communication Software

% of IT staff that can access groupware-facilities (inter and intranet)		
% of IT staff that effectively use groupware facilities		

IT should deliver high-quality service to its users and do this at the lowest possible cost. This can only be achieved by optimally managing the process and can be improved by following up the operational measures displayed in the above Table. The measures should not only be followed through time, but should also be compared to industry standards and averages. Therefore it is important to use standardised measures like e.g. function points. Function point analysis is a widely used output metric that measures the number of inputs, outputs, inquiries and files used in an application. The results of this analysis can be used to calculate the number of function points written by a programmer in a specific unit of time.
This way, function points will have to be used when benchmarking programming productivity, because they are an accepted, standardised way of measuring programmer productivity.

2.7.4 Measurement future orientation

As an addition to measuring the performances of today, we also need to measure the performances of the future. The measurement of the IT department 's future opportunities has to do with preparing the staff for the future, preparing the applications portfolio for the future and putting effort into researching new emerging technologies.

Table 2.7.4

Future Orientation	Mission Develop opportunities to answer future challenges	Objectives ♦ Permanent training and education of IT personnel ♦ Expertise of IT personnel ♦ Age of the application portfolio ♦ Research into emerging information technologies

Permanent Education of Staff

Number of education days per person		
Education budget as a % of total IT budget		

Expertise of the IT Staff

Number of years of IT expertise per staff member		
Age pyramid of the IT staff		

Age of the Application Portfolio

Number of application per age category		
Number of applications younger than 5 years		

Research into Emerging Technologies

% of budget spent on IT research		

The ability to deliver high quality IT services within 3 to 5 years has to be prepared today. IT has to assess future trends and anticipate them. The fact that unanticipated evaluations can probably be dealt with through extensive external (often high priced) support, can be of some comfort. Of course, the better solution is that internal people are well educated for the future so that the right expertise can be found in-house.

2.8 Applying the IT balanced scorecard

In building a company-specific IT balanced scorecard, the following steps are proposed:

◊ Presentation of the concept of the IT balanced scorecard technique to top management and IT management;

◊ Data-gathering phase where information is collected on the following items: corporate and IT strategy, (traditional) IT metrics already in use for performance measurement;

◊ Developing the company-specific IT balanced scorecard inspired on a "standardised" model as presented in this paper and based on the Kaplan and Norton (1996b) principles.

Following Kaplan and Norton (1996b) three principles have to be complied with in order to develop an IT balanced scorecard that is more than a group of isolated and eventually conflicting strategies and measures:

- build in cause-and-effect relationships

- include sufficient performance drivers
- linkage to financial measures.

A strategy is a set of assumptions about cause and effect. If *cause-and-effect relationships* are not adequately built in the balanced scorecard, it will not translate and communicate the company's vision and strategy. Cause-and-effect relationships can be illustrated as follows: if we guarantee "zero" defects (operational excellence perspective), then we will meet user expectations better (user orientation perceptive), and then we will enhance the support of business processes (business contribution perspective).

A well built balanced scorecard needs a good mix of outcome measures and *performance drivers*. Outcome measures like programmers' productivity *(number of function points per person per month)* without performance drivers like IT staff education *(number of educational days per person)* do not communicate how the outcomes are to be achieved. And performance drivers without outcome measures may enable to achieve short term operational improvements, but will fail to reveal whether the operational improvements have been translated in enhanced financial performance. An IT department may invest significantly in employee training in order to improve employee productivity. If, however, there is no outcome measure for employee productivity (e.g. function points), IT management cannot measure whether its strategy is effective.

Table 2.8

Examples of IT outcome measures and performance drivers

OUTCOME MEASURES	PERFORMANCE DRIVERS
• Index of user satisfaction	• Average response time of help desk
• % of the development capacity engaged in strategic projects	• Frequency of IT Steering Committee meetings
• % of changes and adjustments made throughout different development phases	• Educational budget as % of total IT budget

Outcome measures are more or less generic (user satisfaction, productivity, employee satisfaction), whereas performance drivers are more company-specific and are revealing company strategy.

The IT balanced scorecard must retain a strong emphasis on *financial outcomes*. "A failure to convert improved operational performance into improved financial performance should send executives back to the drawing board to rethink the company's strategy or its implementation plans" (Kaplan and Norton, 1996b).

Further, it is a must to keep in mind continuously that measurements are not enough and that they must be used and acted upon by management: the balanced scorecard is not only an operational but in essence a strategic management system. The following steps to implement effectively the IT balanced scorecard as a strategic management system are (Kaplan and Norton, 1996b):

- Clarifying and translating vision and strategy, and attention to both the cause-and-effect relationships and the performance drivers;
- linking strategy to team and individual goals, and eventually linking employee compensation to the balanced scorecard measures;
- linking strategy to resource allocation, and determining stretch targets and priority setting;
- strategic feedback, and collecting and reviewing performance data about the strategy and defining new strategic initiatives or adjusting existing strategy.

2.9 IT for Shell Performance Management Dashboard and Scorecard

The table below shows a standardised policy framework for performance measures and follow-ups.
This table is used to interpret scores in different functional sections within Kenya Shell
The highest score is 5.0 and the lowest is 0.

Table 2.9

Metric	Weigh t	Below	Threshol d	On	Above	Exceeding
Agreed service level for operation	2.5	<60%	>60%	>70%	>75%	>80%
Agreed level of customer satisfaction	2.5	3.3	3.6	3.8	4.0	4.3

Note:
Customer satisfaction includes averages of the following surveys –

- Top leader – Performance, Reputation, Economic Buyer
- Projects - All
- On going engagements - Large
- Help Desk

Averaged score is out of 5

CHAPTER 3

Research Methodology

3.1 Population size

The research project targeted Shell staff hosted in Kenya, who have been assigned a computer.
Kenya Shell had approximately 150 employees, spread among its offices in Head office Nairobi, Industrial Area Nairobi, Mombasa, Nakuru, Eldoret and Kisumu.
The research population was stratified in the following format :

- East African Hub Management Team
- Kenya Shell Line Managers
- Kenya Shell Supervisors
- Rest of Kenya Shell Staff.

Each of the above groups was analysed to draw out all their IT satisfaction characteristics.

3.2 Research Design

A cross-functional research design was used based on survey questionnaires administrated for data collection. Internal data from the Finance, Information Technology and Human Resources department was also be gathered.
Major emphasis in this research design exercise was to be able to gather and filter information that aids the Balanced Score Card framework in the evaluation and integration of strategic management in Information Technology execution and investment.

3.3 Data collection Technique

Since the Electronic Mail (email) system in Kenya Shell was a formal means of communication amongst all users of computers, the target population size was reached through email. Questionnaires were sent to all the email addresses within the Kenya Shell Electronic internal post office. It is important to mention here that the maintenance of internal email address book is closely monitored by the Information Technology and Human Resource department, so as to ensure compliance with the physical presence of Kenya Shell staff members.

3.4 Data Analysis Techniques

The data collected was analyzed by the use of Factor analysis/principal component analysis and Cluster analysis, so as to uncover the underlying dimensions.

To ensure that the dimensions were un-correlated and thus distinct, the principal component solution was orthogonal rotated using the varimax rotational method. This process had the advantage of improving interpretability of the resulting factors.

The use of cluster analysis provided an empirical scheme for classifying the different population strata. The K-Means Clustering method was used. In this method, 4 (K = 4) different clusters of greatest possible different distinctions will be produced for further analysis.

The researcher used SPSS computer software package.

Chapter 4

4.0 Data Analysis and Conclusions

Data in this study is summarized and presented in terms of proportions, frequency tables, cross tabulation derived from factor analysis, cluster (K-Means) analysis and descriptive statistics for selected questions.

4.1 Factor Analysis Solution

A total of 81 factors were reduced to 14 using factor analysis, with eigen value cut-off of 1.0. Factor analysis is concern with homogeneity of items and was carried out variable by variable to determine which variables can be grouped together.
All values less than 0.35 were ignored from the analysis. With the number of cases less than 100 and a target significance of 0.05 alpha, a value less that of 0.35 is considered insignificant. (Churchhill, 1991)
Table 4.1

Extraction Method: Principal Component Analysis.

	Initial Eigenvalues			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.725	14.62	14.62	4.212	9.157	9.157
2	5.809	12.629	27.249	4.017	8.733	17.89
3	3.831	8.328	35.577	2.984	6.488	24.378
4	3.144	6.835	42.412	2.96	6.434	30.812
5	2.715	5.903	48.315	2.696	5.861	36.672
6	2.254	4.9	53.215	2.628	5.714	42.386
7	2.127	4.624	57.838	2.57	5.586	47.972
8	2.07	4.5	62.339	2.498	5.431	53.403
9	1.677	3.645	65.984	2.327	5.059	58.462
10	1.541	3.349	69.333	2.153	4.681	63.143
11	1.479	3.215	72.548	2.128	4.627	67.77
12	1.386	3.014	75.561	2.063	4.484	72.254
13	1.167	2.536	78.097	2.062	4.483	76.738
14	1.095	2.38	80.478	1.72	3.74	80.478
15	0.982	2.136	82.613			
16	0.904	1.966	84.579			
17	0.791	1.719	86.298			
18	0.705	1.532	87.83			
19	0.627	1.363	89.194			
20	0.612	1.331	90.524			
21	0.543	1.18	91.704			

22	0.484	1.053	92.757			
23	0.405	0.88	93.637			
24	0.391	0.85	94.488			
25	0.338	0.735	95.222			
26	0.307	0.667	95.89			
27	0.264	0.573	96.463			
28	0.236	0.512	96.975			
29	0.217	0.473	97.447			
30	0.186	0.403	97.851			
31	0.174	0.377	98.228			
32	0.136	0.296	98.524			
33	0.114	0.247	98.772			
34	0.107	0.233	99.004			
35	8.74E-02	0.19	99.194			
36	6.80E-02	0.148	99.342			
37	6.03E-02	0.131	99.473			
38	5.45E-02	0.118	99.591			
39	4.77E-02	0.104	99.695			
40	3.56E-02	7.73E-02	99.772			
41	3.23E-02	7.01E-02	99.843			
42	2.37E-02	5.16E-02	99.894			
43	1.73E-02	3.76E-02	99.932			
44	1.65E-02	3.59E-02	99.968			
45	8.98E-03	1.95E-02	99.987			
46	5.92E-03	1.29E-02	100			

Final Varimax Rotated Factor Matrix

Rotating the above factors (14) makes interpretation less obscure. The table below is presented such that the factors stand out by the columns. The varimax rotation of the original axis attempts to clean up the factors in the factor-loading table. The values in the columns are 'forced' towards 0 or 1. These tend to produce loadings that are more interpretable. Varimax is a popular orthogonal rotation scheme.

Table 4.1.1

	Factors													
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Q1	-0.2	0.2	0.15	-0.2	-0.4	0.18	-0.1	-0.2	-0.3	0.16		0.3		0.47
Q2	0.22			-0.2	0.19	0.18	-0.3	0.61	-0.2	-0.1	-0.3	0.26		0.1
Q3			0.44	0.11	-0.2	0.31	-0.2		0.53					
Q4		0.27			0.54	-0.2		-0.3	-0.4	0.17		0.13	0.26	-0.1

Q5	0.22	-0.8					-0.1			-0.1	0.23			
Q6	0.23				0.26				-0.1	-0.2	0.56	0.3	0.29	0.13
Q7		0.75	0.18		-0.1	0.13				-0.1	0.13			
Q8	0.43	0.1		-0.1	-0.2	-0.1	0.11			-0.2	0.12	-0.1		0.67
Q9	0.2	0.19	-0.1	0.41	0.2	-0.1	-0.3	0.48	0.22	0.14		0.27		0.22
Q10	-0.4	0.16	0.34		0.3		-0.3	0.37	0.18	0.13	0.39		-0.1	
Q11					0.1	-0.1	0.14	0.84		0.23				
Q12				0.14	0.78		0.16	0.19	0.18	0.2				
Q13		-0.2			0.75	0.19		0.11		-0.2		0.18		-0.1
Q14	0.31			0.18	0.61	-0.4			-0.2	0.26	0.27			
Q15								0.16				0.87		
Q16	0.26	0.29		-0.2			0.5	0.1		0.16	-0.3	0.18	-0.2	0.26
Q17	-0.1	0.26	0.49	0.19	-0.2		0.17	-0.1	0.21	-0.4	-0.1		-0.1	-0.1
Q18						0.11					-0.2		0.75	
Q19			0.81	0.11					-0.2					-0.2
Q20	0.19			0.29		-0.1	0.13	0.17	0.11	0.78				0.11
Q21	0.66		-0.1			0.12	0.4			0.43				
Q22	0.29					0.13	0.84						0.12	
Q23		-0.2	0.21	-0.1	-0.2	0.16	0.41	-0.2		-0.4	-0.2	0.24	-0.4	
Q24	0.4	0.18	-0.3	0.45	-0.2	0.29	0.11		0.18	0.22	0.16	0.15	0.25	-0.2
Q25		-0.2	0.34	-0.4	-0.2	0.29	0.13	0.17	0.2	-0.1	-0.1	-0.2	0.29	0.15
Q26	0.19	-0.6	0.23	-0.3	-0.1	0.2	0.1	-0.2	0.27				-0.2	
Q27	0.22	0.18		0.17			0.62	-0.1		0.16	0.19		-0.2	
Q28	0.39	0.2	0.28		0.12	0.31	0.34		-0.2	-0.1	0.14	0.31	-0.3	

Q29	0.74	-0.2	0.33	0.1			0.36							
Q30	0.32	-0.1	0.71	-0.2		0.19		-0.2	0.26		-0.1	-0.1		0.1
Q31			0.23				-0.1				-0.8		0.2	
Q32		0.17	0.31	-0.3	-0.3	0.15	0.11		-0.2	0.19	0.17	-0.6		
Q33	0.83					-0.1	0.12	0.15						
Q34			0.13					-0.1	-0.2	-0.2				-0.7
Q35		-0.1	0.13	0.53	-0.2			-0.1			-0.2	-0.2	-0.6	0.19
Q36	-0.1		-0.1	0.71	0.45			0.11	-0.1	0.1			-0.2	-0.1
Q37		0.27		0.29		0.82				-0.2			0.13	
Q38			0.18			0.82	0.23	-0.1	0.14			-0.1		0.1
Q39		0.31	0.51	-0.3		0.42	-0.1	-0.4			-0.3		0.14	0.16
Q40	0.66	0.38				0.4	0.11	-0.1	0.17	0.13		-0.1		0.14
Q41	0.13			0.79	0.11	0.14	0.14		-0.1	0.1	0.16		0.16	
Q42	-0.4	0.18	0.42	0.49	0.33		0.15	-0.1	0.19	0.11		0.14	0.18	
Q43					0.17				0.89					0.12
Q44	0.3		0.41			0.16		-0.4	0.45	0.19		-0.1	0.27	0.19
Q45	0.55	0.59	-0.1	0.12		0.32			0.15	0.12	0.12			
Q46	0.53	0.72		0.13		0.23				0.13				

Extraction Method : Principal Component Analysis. Eigen Value of 1.0 and above Values less than 0.30 were ignored as insignificant at alpha 0.005
Rotation Method: Varimax with Kaiser Normaliation. Rotation converged in 30 iterations

Table 4.1.2
Factor Analysis Solution and Balanced Score Card Relationship

	Questions Related	Balanced Score Card Category
Factor 1	21,24,28,29,40,45,46	Internal Process
Factor 2	5,7,40,45,46	Innovation and Growth
Factor 3	3,17,19,30,39,42,44	Internal Process
Factor 4	9,24,25,25,35,36,41,42	Innovation and Growth
Factor 5	12,13,14,36	User Perspective
Factor 6	37,38,39,40,	Innovation and Growth
Factor 7	15,21,22,23,27,29	Internal Process
Factor 8	9,10,11	Corporate Perspective
Factor 9	3,43,44	Innovation and Growth
Factor 10	43,44,	Innovation and Growth
Factor 11	20,21	Internal Process
Factor 12	15	User Perspective
Factor 13	18	Internal Process
Factor 14	8	Corporate Perspective

Cross tabulation of factor analysis components (14) and the four perspectives of Balanced score card
Table 4.1.2

	Corporate Contribution	User Perspective	Internal Process	Innovation and Growth
Factor 1				
Factor 2				
Factor 3				
Factor 4				
Factor 5				
Factor 6				
Factor 7				
Factor 8				
Factor 9				
Factor 10				
Factor 11				
Factor 12				
Factor 13				
Factor 14				

4.2 Cluster (K-Means) Analysis Solution.

This procedure attempts to identify relatively homogeneous groups of cases based on selected characteristics, using an algorithm that can handle large numbers of cases. However, the algorithm requires one to specify the number of clusters. In this study the number of clusters selected was four.

Table 4.2

Number of Cases in each Cluster

Cluster	1	43
	2	7
	3	8
	4	23
Valid		81
Missing		0

Notes	Represents
Cluster 1	Rest of KSL
Cluster 2	E.A Hub mgmt
Cluster 3	KSL Line Mgmt
Cluster 4	KSL Supervisors

Table 4.2.1

Corporate perspective

Final Cluster Centers

	Cluster			
	1	2	3	4
Q1	4	3	4	4
Q2	3	3	3	4
Q3	3	2	3	3
Q4	4	4	4	3
Q5	4	3	4	4
Q6	4	5	4	4
Q7	4	4	3	4
Q8	4	4	3	4
Q9	3	4	3	3
Q10	3	2	3	2
Q11	3	4	3	3
mean	3.545	3.455	3.364	3.455
				3.455

Table 4.2.2
User perspective

Final Cluster Centers

	Cluster			
	1	2	3	4
Q12	4	4	3	2
Q13	4	4	4	3
Q14	4	5	4	4
Q15	4	4	4	4
mean	4	4.25	3.75	3.25
				3.813

Table 4.2.3
Internal Process perspective

Final Cluster Centers

	Cluster			
	1	2	3	4
Q16	4	4	3	4
Q17	3	3	3	3
Q18	3	3	3	3
Q19	3	2	2	2
Q20	4	4	3	3
Q21	4	5	3	4
Q22	4	5	3	4
Q23	3	3	4	4
Q24	4	5	3	4
Q25	4	3	3	4
Q26	4	2	4	4
Q27	4	5	4	4
Q28	4	4	3	4
Q29	4	4	3	4
Q30	4	2	3	4
Q31	4	2	3	4
Q32	4	3	3	4
Q33	4	5	4	4
Mean	3.778	3.556	3.167	3.722
				3.556

Table 4.2.4

Innovation and Growth perspective

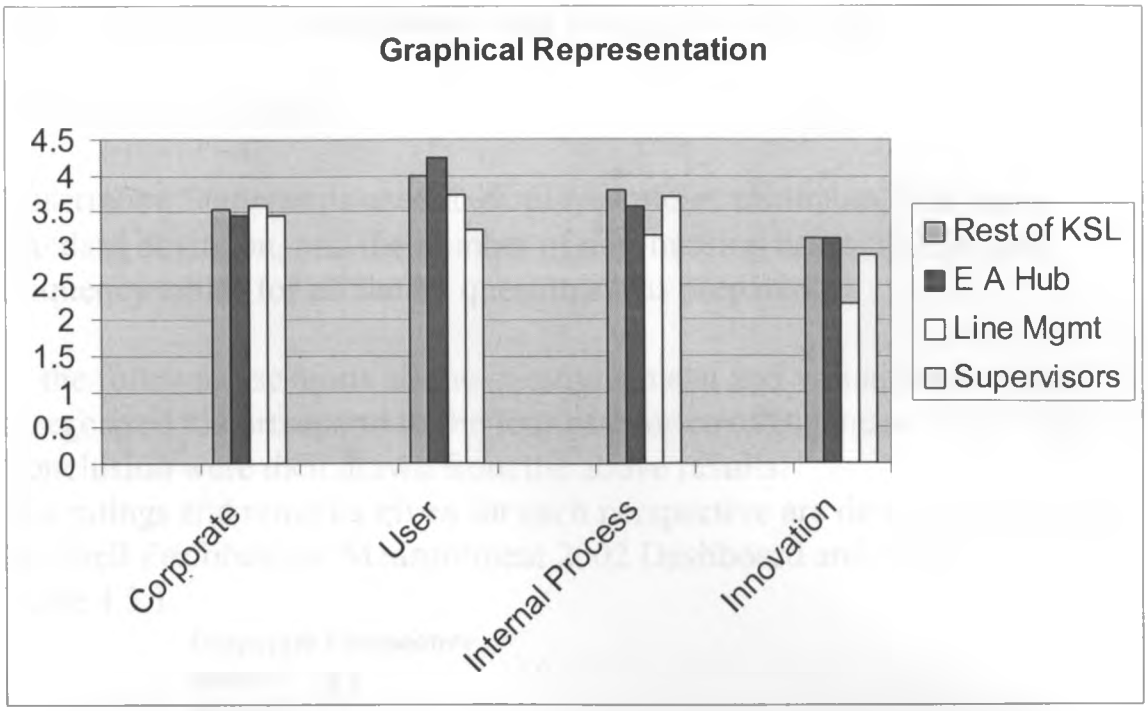
Final Cluster Centers

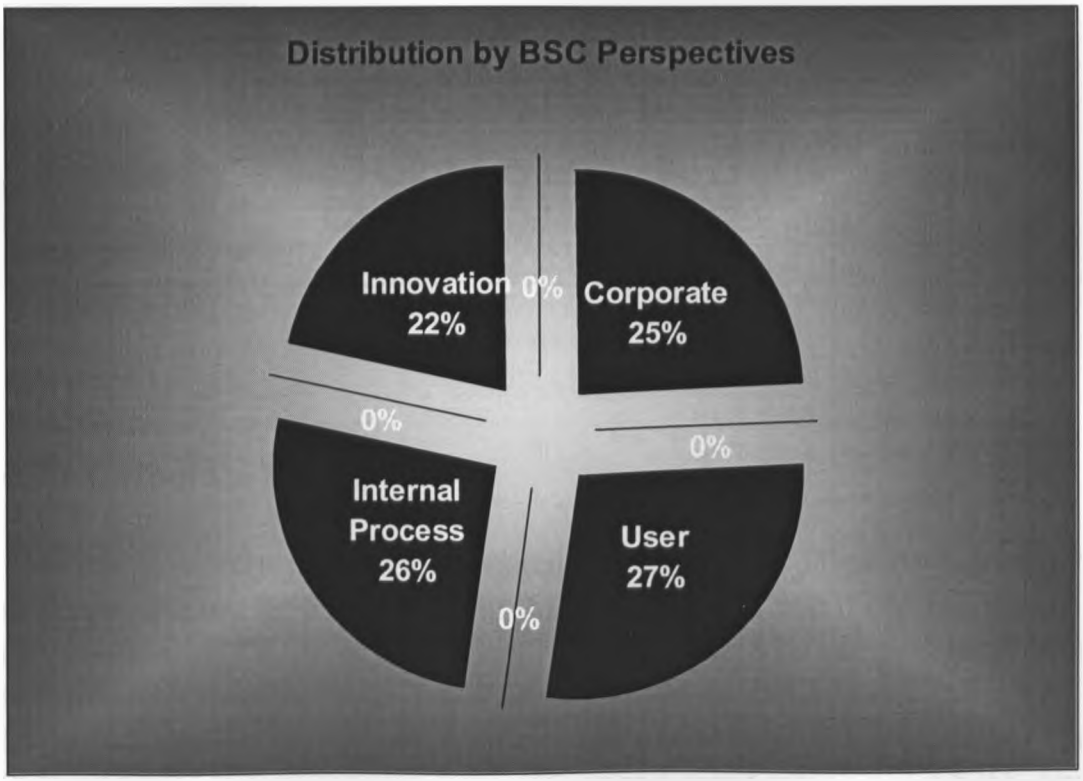
	Cluster			
	1	2	3	4
Q34	4	4	3	4
Q35	3	2	3	3
Q36	2	3	2	1
Q37	2	3	2	3
Q38	3	2	2	3
Q39	3	1	2	3
Q40	3	4	2	4
Q41	3	4	2	2
Q42	3	2	2	1
Q43	4	3	3	3
Q44	4	3	2	3
Q45	3	5	2	4
Q46	4	5	2	4
Mean	3.154	3.154	2.231	2.923
				2.865

Cross tabulation of the four cluster centers and the four perspectives of the Balanced Score Card

Table 4.2.5

	Cluster Centers				
BSC Category	Rest of KSL	E A Hub	Line Mgmt	Supervisors	Mean
Corporate	3.55	3.46	3.6	3.46	**3.5175**
User	4	4.25	3.75	3.25	**3.8125**
Internal Process	3.78	3.56	3.17	3.72	**3.5575**
Innovation	3.15	3.15	2.23	2.92	**2.8625**
					3.4375


Graphical Representation
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Corporate
User
Internal Process
Innovation
Rest of KSL
E A Hub
Line Mgmt
Supervisors


Distribution by BSC Perspectives
Innovation 22%
0%
Corporate 25%
0%
0%
Internal Process 26%
User 27%
0%

4.3 Analysis and Conclusions from Descriptive Statistics

Descriptive Statistics

Descriptive Statistics is used to displayed mean, minimum, maximum, standard deviation, and the number of non-missing cases. In this study frequency tables for all the 81 questions was prepared.

In the following sections all the questions mean and variance have been categorized to correspond to the four categories of Balanced Score Card. Conclusion were then drawn from the above results.
The ratings and remarks given for each perspective are derived from the 'IT for Shell Performance Measurement 2002 Dashboard and Score card'.
Table 4.3.1

Corporate Perspective
mean = 3.4
var = 0.4
Ratings **Good**
Remarks **Carefully and continuously evaluate status**

		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
N	Valid	81	81	81	81	81	81	81	81	81	81	81
	Missing	0	0	0	0	0	0	0	0	0	0	0
Mean		3.7	3.5	3.3	3.6	3.6	4	3.7	3.8	3	2.5	3.3
Std. Deviation		0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.9	0.6
Variance		0.3	0.5	0.4	0.3	0.4	0.3	0.3	0.4	0.4	0.7	0.4

4.3.1 Corporate Perspective

This perspective represents the management view of IT performance. The management are held as agents to the shareholders and therefore their objectives include the achievement of a reasonable business contribution from IT investments.
In this survey the general corporate mean score was found to be 3.4 (with a 0.4 variance), which is within the prescribed score rating of GOOD. This translates to the effect that management has 68% approval for all IT investments, with manageable variance (or degree of risk) of 0.4. This encourages the IT management team to initiate careful and continuous measures that will sustain this trend and hopeful achieve VERY GOOD target.

Key Exceptional points from Statistics

1.58% of the staff are not satisfied with management's choice of ERP (Enterprise Resource Planning) software, JD Edwards, the ERP is either not well implemented or is not suited for Kenya Shell. Refer to Question 10, on the questionnaire.

2.It is imperative to mention that over 85% of all staff felt that IT has top management approval, this is fundamental pillar for IT future operations and strategies. Refer to Question 6, on the questionnaire.

Table 4.3.2

User Perspective
mean = 3.6
var = 0.6
Ratings **Good**
Remarks **Carefully and continuously evaluate status**

		Q12	Q13	Q14	Q15
N	Valid	81	81	81	81
	Missing	0	0	0	0
Mean		3.2	3.6	4	3.7
Std. Deviation		0.9	0.7	0.7	0.7
Variance		0.8	0.5	0.4	0.5

4.3.2 User Perspective

When referring to the user, the primary concern was the internal customer of the IT department. Metrics or measures regarding user orientation have three items to focus on: to be the preferred supplier for applications and operations, partnership with users and user satisfaction.
From the above statistics user perspective score of 3.6 mean and variance of 0.6 was a GOOD rating. It implies that users were 72% happy with IT operations and its delivery of services.

Key Exceptional points from Statistics

1. A variance of 0.6 shows the subjectivity levels of measuring user satisfaction. This may at times call for careful and even personal evaluation.
2. About 72% of all users felt that computers installed for their use were suitable for their needs, a clear testimony that IT had a good measure of PC/Computer specification for its users.

Table 4.3.3

Internal Process
mean = 3.6
var = 0.5
Ratings **Good**
Remarks **Carefully and continuously evaluate status**

		Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30	Q31
N	Valid	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		3.7	3.4	3.2	2.6	3.5	4.1	4.2	3.5	3.9	3.6	3.6	4.1	3.6	3.5	3.5	3.6
Std. Deviation		0.6	0.6	0.6	0.6	0.8	0.7	0.8	0.7	0.7	0.7	0.9	0.7	0.6	0.7	0.8	0.8
Variance		0.4	0.3	0.3	0.4	0.7	0.5	0.6	0.5	0.4	0.4	0.9	0.5	0.4	0.5	0.6	0.7

4.3.3 Internal Process

Internal process also referred, as operational excellence is concern primarily with the measurement and improvement of two basic processes of the IT department: the development and maintenance of information systems (especially ERP, JD Edwards and Email systems) and computer operations. Rating of 3.6 (mean) and 0.5 variance is GOOD and needs to be carefully maintained with deliberate measures aimed at improving the score to VERY GOOD.

Key Exceptional points from Statistics

1. Results from Questions 21,22, and 33 show that more than 80% of staff were of the opinion that : i) Its is relatively easy (84%) to access information stored on the computer servers. ii) Email system has made their operations 87% faster and effective. iii) 92% of all staff felt that data (personal or otherwise) is safe within the company's servers (H:\, W:\ drives).

These are essential percentages for the core IT infrastructure within Kenya Shell; they are testimony that IT does improve internal processes for the entire company's operations.

Table 4.3.4

Innovation and Growth
mean = 3
var = 0.7
Ratings **Average**
Remarks **Drastic Operational measures needed**

		Q34	Q35	Q36	Q37	Q38	Q39	Q40	Q41	Q42	Q43	Q44	Q45	Q46
N	Valid	81	81	81	81	81	81	81	81	81	81	81	81	81
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		4.1	2.9	2.1	2.5	2.6	2.5	3.3	2.5	2.3	3.5	3.3	3.5	3.6
Std. Deviation		3.3	0.9	1	0.8	0.5	0.9	0.7	0.9	0.9	0.8	0.7	1	1.1
Variance		0.3	0.8	0.9	0.6	0.3	0.8	0.6	0.7	0.9	0.6	0.6	1	1.2

4.3.4 Innovation and Growth Perspective

This measure is also called future orientation and entails measuring the preparedness of staff for the future. It looks at levels of user and IT technical training, operations and strategies related to internet technologies and effort put in researching for new emerging technologies.
A mean score of 3.0 is classified as AVERAGE and calls for drastic operational measures to restore the rating to GOOD finally VERY GOOD.

Key Exceptional points from Statistics

1. It evident (refer to Question 36, on the questionnaire) that 72% of all staff felt that IT needs to initiate regular IT training programmes.
2. Question 43 shows that more than 50% of all staff do not consider the IT training strategy to be correct, while this percentage implies a change in IT training strategy be considered, the overall Innovation and Growth perspective score is AVERAGE, meaning that, what is needed is really an operational function. IT should, for example initiate regular training programmes for all staff.
3. More than 70% of all staff enjoys learning new PC software (refer to Question 34, on the questionnaire). This needs to be maintained and complimented with operational measures.

Table 4.3.5

Overal IT Performance		
	mean =	**3.4**
	var =	**0.6**
Ratings	**Good**	
Remarks	**Carefully and continuously evaluate status**	

Note: The above mean score approximates to mean value obtained in cluster analysis cross tabulation above.

4.3.5 Overall IT Performance

The overall score obtained using Balanced Score Card is a measured opinion of all the four perspectives (Corporate, User, Internal process, Innovation and Growth). The importance of this score is to attain and maintain a relatively balanced rating that is acceptable to the business. The rating of 3.4 (mean) and 0.6 (variance) was GOOD, but calls for a careful and consistent evaluation.

Key Exceptional points from Statistics

1. It is essential for IT management to cultivate management approval for its activities. The corporate score of 3.4 needs to be carefully evaluated and measures put in place to guarantee its rise.
2. The IT management and top management need to follow up comments related to Innovation and Growth Perspective.

4.4 Conclusion: Efficiency and Effectiveness

This paper proposes an evaluation framework for the IT function based on the balanced score card technique, completed with elements of information economics and business reengineering. Four evaluation domains were identified and supplied with adequate measures: business contribution, user orientation, operational excellence and future orientation of IT. The suggested framework is a strategic management tool that enables management to follow up the measures and to drive performance based on the goals that were set and agreed upon in advance. Measurement is a prerequisite to management.

It is my belief that the BSC tool can be of meaningful help for both general management and IT professionals, and that this tool can be implemented as proposed. Experience however tells us that the installation and maintenance of such a tool is difficult and requires substantial means. But in many cases, the total cost of implementing such a tool can be lower than expected, since many of the needed operational measures may already be available.

Most of the presented measures are not new at all, but are used and combined in a new way in this approach. The above BSC model presented can also be seen as based on : IT efficiency and the evaluation of IT effectiveness. Which define the primary goal of the IT function to be the development and maintenance of information systems that support corporate goals. This can be evaluated in two distinct manners:

- evaluating the efficiency of the execution of development and operations;
- evaluating the effectiveness of the users that use information systems to attain corporate goals.

The presented balanced score card evaluation of IT integrates these two evaluations. Efficiency is typically dealt with in the domain of operational excellence, while effectiveness is treated in the domains of business contribution and user orientation.

4.5 Limitations of the Study

A major limitation of this study is its inability to generate a conclusive Information Technology measure for the industry and therefore define an industry performance benchmark., this is because ;

i. It is a specific study of Kenya Shell, which is part of the Shell Group of Companies.
ii. The London Corporate head office of Shell Group of Companies drives the Kenya Shell Information Technology Strategy.
iii. Kenya Shell has been using computers for much longer than most companies in the country.
iv. The company has undergone various re-engineering and restructuring programmes over the last five years.
v. Kenya Shell is not a publicly quoted company within the Nairobi Stock market.

4.6 Suggestions for Further Research

This research can be extended and undertaken to a greater representative of the Kenyan companies, especially public quoted companies, parastatals, government ministries and agencies, universities and Non Governmental organizations.

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6.0 Appendixes

Measuring IT User Satisfaction within Kenya Shell

Questionnaire

♦ Corporate perspective

Please indicate by selecting/clicking your level of agreement to each of the following statements.

1. Shell has the best IT infrastructure

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

2. IT staff are well motivated

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

3. IT Help Desk has the right tools for their job

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

4. Kenya Shell has bought the right printers (including colour printers)

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

5. IT has too much power over other departments

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

6. IT has full support from top management

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

7. All end users justify their acquisition of S/W & H/W? (1)

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

8. IT Helpdesk is overworked

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

9. The IT business analysis capacity fits the needs of Kenya Shell

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

10. JDE is the best ERP for Kenya Shell

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

11. Kenya Shell has invested well in its network backbone links

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

♦ User perspective

Please rate IT in each of the following, in meeting your requirements / expectations :	Totally Satisfied	Satisfied	Neutral	Dissatisfied	Totally dissatisfied
1. Staff Attitude & Communication.	☐	☐	☐	☐	☐
2. Staff Availability and Ease of Access.	☐	☐	☐	☐	☐
3. Timely delivery of services.	☐	☐	☐	☐	☐
4. Solutions meet your requirements.	☐	☐	☐	☐	☐
5. Contribution of IT services / projects to your business, skills & knowledge.	☐	☐	☐	☐	☐
6. Feedback on nature and status of problems and problems resolution.	☐	☐	☐	☐	☐
7. Help Desk Services & Issues Resolution.	☐	☐	☐	☐	☐
8. Network & Email Services.	☐	☐	☐	☐	☐
9. JDE & AS/400 Services.	☐	☐	☐	☐	☐
10. Reliability of Communication Lines.	☐	☐	☐	☐	☐
11. Intranet Services (SWW & WWW).	☐	☐	☐	☐	☐
12. Desktop Services (PCs, printers, UPSs...etc.)	☐	☐	☐	☐	☐
13. JDE Reporting & Specific programs development.	☐	☐	☐	☐	☐

Please indicate by selecting/clicking your level of agreement to each of the following statements.
I would advise other companies to use JDE

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

12. I am satisfied with the printing services provided

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

13. IT responsive to your new services \ products request

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

14. The computer you are using suits your important needs

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

15. I am satisfied with the back-office services provided by IT

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

♦ Internal process perspective

Please indicate by selecting/clicking your level of agreement to each of the following statements.

16. I find computers extremely easy to use

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

17. It is easy to find solutions to problems with my computer

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

18. It is easy to raise a purchase orders for a service/product using JDE

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

19. JDE security is well implemented

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

20. Network Infrastructure security is well implemented

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

21. It is easy to get information in Network shares (H:\, W:\ etc)

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

22. The Email system has made internal processes faster and effective

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

23. JDE system has made internal processes faster and effective

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

24. The Shell Desktop Environment (SDE) set-up avails all the services I need

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

25. The notice time for any scheduled systems down time is normally appropriate and acceptable

Agree strongly ☐ **Agree somewhat** ☐ **Neutral** ☐ **Disagree somewhat** ☐ **Disagree strongly** ☐

26. I consider JDE system as the most important application in my work

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

27. I consider the email system as the most important application in my work

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

28. I think the IT support vendors are doing a good job.

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

29. MS office 97 upgrade was well co-ordinated

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

30. The IT Help Desk is rendering value added services to Kenya Shell

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

31. IT has too many changes

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

32. Systems within Kenya Shell have improved my quality of life

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

33. My personal data is saved within KSL network

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

♦ Innovation & growth perspective

Please indicate by selecting/clicking your level of agreement to each of the following statements.

34. I really enjoy learning new PC S/W

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

35. I give more computer advise to other people that I receive

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

36. IT offers regular training opportunities

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

37. I would rate the IT training as good

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

38. IT training for new applications and/or services is normally good

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

39. The Shell internally organised and facilitated training is normally good

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

40. IT training offered by external trainers is normally good

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

41. Shell has the right capacity to undertake continuos in-house training

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

42. Kenya Shell has appropriate IT training strategy

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

43. IT staff are well trained

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

44. JDE training programmes fits my current job assignment.

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

45. The Shell group has an innovative web site (SWW)

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

46. The WWW/SWW policy enhances innovation and idea generation

Agree strongly	Agree somewhat	Neutral	Disagree somewhat	Disagree strongly
☐	☐	☐	☐	☐

- What further comment can be made with respect to your satisfaction of Information and Computer/Technology services within KSL, please write any comments (positive/negative) or suggestions you have about computer usage at KSL. Feel free to add your name and telephone number if you would like someone to follow-up with you directly

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Management Structure