

The enabling role of Information and Communication Technology in Business Process Re-engineering: The Case of Kenya Commercial Bank

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By

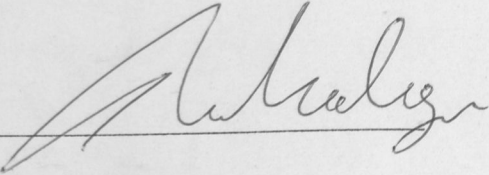
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A management research project submitted in partial fulfillment of the
requirement for the degree of Master of Business Administration, faculty of
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DECLARATION

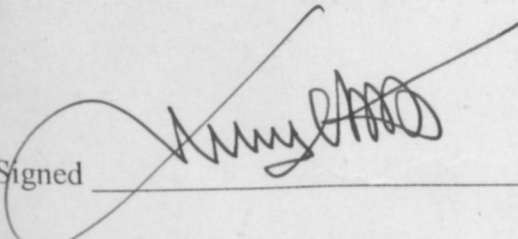
This management research project is my original work and has not been presented for a degree in any other university

Signed 

Date 14/11/2003

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This management research project has been submitted for examination with my approval as the university supervisor

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DEDICATION

To my wife Judy Muchiru, and my children Henry Magu and Ephantus Maina for their patience, support and encouragement. Without them, this would not have been possible. I love you and always will.

Mr. Julius Kariuki of the University of Nairobi for unwavering guidance, interesting and helpful discussions on various Information and Communication Technology topics and for acting as my supervisor for this project.

Dr. Tony Githira, the Director Information Technology at Kenya Commercial Bank for useful comments and assistance in reviewing the proposal and questionnaire.

All the people that participated in the survey, and took valuable time out of their schedules to answer the comprehensive questionnaires. Many thanks also to those who additionally participated in the interviews and openly discussed the issues involved.

My employer Kenya Commercial Bank Limited.

The entire Kibiga family and more so my father, who I would like to single out for the inspiration, financial support and encouragement he tirelessly gave me throughout the MBA program.

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ABSTRACT

As new software is implemented and new electronic markets are embraced, processes must of necessity undergo radical changes. Lessons of reengineering can be applied to these process changes. The primary objective of this study was to examine the role of information and communication technology in business process re-engineering.

To facilitate the research, a case study was undertaken. The study was done at Kenya Commercial Bank covering selected projects that were implemented in the period 1995-2002. Data was collected using questionnaires, which were either personally administered by the researcher or sent via email through the company intranet.

The study results pointed out that currently the external environment is the single most important factor that needs to be considered at Kenya Commercial Bank while undertaking Business process re-engineering. The study results also brought out the significance of information technology in business process reengineering. The study results should however not be divorced from the limitations cited and should only be used as an aid by management while considering business process reengineering.

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1 INTRODUCTION

1.1 Background

Financial institutions in Kenya inherit a unique mix of traditions and cultures from their diverse parentage and heritage. As resources and public expectations continue to shift and change, there is a compelling need now more than ever to challenge the unwritten traditions, norms and paradigms and to ask penetrating questions about what modern Financial Institutions in Kenya ought to be and what they are strategically positioned to contribute now and in the future. To this end these institutions have embraced the use of Information and Communication Technology.

Information Communication Technology was in the past viewed as an automation tool for existing business processes. ICT developments were specifically driven by existing business needs, it is now widely recognized that this will very often only result in high investments and increased operating costs but not in the anticipated improvements in performance. Today, the central premise is that ICT is a lever for designing processes and therefore should not be simply overlaid on the existing organizational structure. Instead of treating the existing business processes as a constraint in the development of an optimum ICT infrastructure, the basic logic of the processes itself is questioned.

The evolution of the information-processing paradigm over the last four decades to build intelligence and manage change in business functions and processes has generally progressed over three phases:

- Automation: increased efficiency of operations,
- Rationalization of procedures: streamlining of procedures and eliminating obvious bottlenecks that are revealed by automation for enhanced efficiency of operations; and,

- Re-engineering: radical redesign of business processes that depends upon information technology intensive radical redesign of workflows and work processes.

Over the years, development in information and communication technology (ICT) has played a significant role in the way we do business. Business entities have had to evolve their practices to cope with changes in information and communication technology. Those institutions that successfully tap the powerful synergy resulting from the merger of technology and business strategy to transform their organizations are likely to experience an unparalleled competitive advantage, while the negative consequences for organizations that fail to act or whose efforts are unsuccessful will be far more significant than in the past.

Financial institutions in Kenya, whether public or private, destined to thrive, will of necessity be, institutions that are constantly learning and changing. These will be the institutions that maximize the use of knowledge and information, and deploy it faster and to better advantage than their competitors. Successful organizations will be characterized by their ability to use information better, learn faster, be dynamic rather than static, and foster innovation while managing risks. All of these outcomes will require significant organizational transformations in the institutions.

Due to its long history, mixed parentage and its sheer size, KCB has over the years adopted cultures, structures and procedures which at times act as impediments in the current competitive environment. Major technological changes have taken place in Kenya Commercial Bank since 1995. This period has seen a deliberate effort to computerize hitherto manual processes like cheque clearing, automated cash dispensing technologies being adopted, Credit and Debit card systems being introduced amongst other initiatives. These new technologies have of necessity required changes to current processes in order to accommodate these emerging technologies. To this end KCB has undertaken to re-engineer some of its functions as highlighted in chapter three. As part of the re-engineering exercise, a proposal in the form of a board paper or a business case is

presented to the board of directors and/or the executive committee of the bank highlighting the project objectives, financial implications and the necessary time frames.

According to Hammer & Champy (1993) business process re-engineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed. In order to achieve these performance measures, Business Process Reengineering can be looked at as the re-alignment of organizational resources in a bid to address deficiencies in existing systems, structures, style, skills, shared-values, staff and skills necessitated by internal or external environmental changes.

1.2 Statement of the problem

Kenya Commercial Bank processes are closely guide by the operations manual. These processes have been adopted over time with refinements once in a while to cater for specific changes. Most of the processes were designed to take advantage of technology that existed at the time the processes where introduced. It is not uncommon to find that where technology exists it has been superimposed on previously existing work processes rather than adapting business processes to take advantage of technological opportunities.

The gap between the current and the envisaged environment is quite significant, in identifying the primary reasons for the gap; cognizance of the following issues is imperative:

- i. Extreme dependence on paper, to accomplish tasks.
- ii. Insufficient automated support, which has led to numerous workaround and standalone systems.
- iii. Inaccurate data due to the systems' inability to force data accuracy which fosters a lack of vested interest on the users' parts to ensure correct data entry.

- iv. Information is entered and re-entered in different systems causing efficiency-robbing redundancy.
- v. Manual systems have successfully circumvented shortcomings in the system and the cost of manual processing is a hidden cost.
- vi. Inability to re-deploy resources prevents use of cross-division staff to meet temporary needs and causes increased cost in hiring temporary staff.
- vii. Economies of scale have not been used fully to the organizations advantage.
- viii. Many readily available, mainstream technology applications have not been deployed.
- ix. Symptoms of problems with the IT infrastructure are well recognized, but identifying the root cause has proven more elusive.
- x. A small IT staff is stretched to the limit trying to meet the needs of the organization.
- xi. Comfort with the status quo provides little incentive for change.

In a number of instances we have seen middling returns on information and communication technology investments as business entities try to map existing business processes onto new information and communication technology systems. This is often a case of square pegs in round holes.

1.3 Objectives of the study

The study has two main objectives.

- i. Examine the role of business process re-engineering in the implementation of information and communication technology projects.

- ii. Document approach to changes in Information Systems at Kenya Commercial Bank, in the period 1995 – 2002.

1.4 Significance of the study

The proposed research will provide an academic analysis of a subject of considerable commercial interest (BPR); it will make a contribution to both theory and practice.

- i. To the business community, this research project will bring out the potential benefits of Business Process Re-engineering and also highlight likely frameworks that they can adopt
- ii. Assist professional and regulatory societies in the IT and finance sectors in formulating guidelines that concern implementation of industry wide information systems
- iii. For academicians and researchers, the findings will update the existing body of knowledge on BPR and give a basis for further research

2 LITERATURE REVIEW

2.1 An overview of Kenya Commercial Bank (KCB)

The history of Kenya Commercial Bank dates back to 1896 when its predecessor, the National Bank of India, opened a branch in Mombasa. In 1958 Grindlays Bank of Britain merged with the National Bank of India to form the National and Grindlays Bank.

In 1970, the Government of Kenya acquired 60% shareholding in National and Grindlays Bank and renamed it the Kenya Commercial Bank. In 1976, the Government acquired 100% of the shares to take full control of the largest commercial bank in Kenya. The Government has over the years reduced its shareholding in the Bank to the current 35% with the public owning the remaining 65%.

A wholly owned subsidiary, Savings and Loan (K) Ltd. was acquired in 1972 to provide mortgage finance.

In 1997, another subsidiary, Kenya Commercial Bank (Tanzania) Limited was incorporated in Dar-es-salaam, Tanzania, to provide banking and financial services and to facilitate cross-border trade within the East African region.

Since incorporation, KCB has achieved tremendous growth to emerge as a leader in Kenya's banking and financial sector. In 1970, the bank had 32 full-time branches, of which 25 were located in rural areas, five in Nairobi and two in Mombasa. Today, the KCB Group has the widest network of outlets in the country, comprising 95 full-time branches and 35 satellite branches all of which represent over 55% of the total banking outlets in Kenya. Of the total outlets, 80% are located in the rural areas, with representation in all administrative districts.

All branches provide a whole range of retail banking and financial. In recognition of the need to strengthen the interdependence between domestic and external economies, KCB

has continued to expand working arrangements with banks in other countries. Today, it has over 400 correspondent banks throughout the world.

Kenya Commercial Bank has a work force in excess of 3500 employees with an annual income of over of Ksh7.5 Billion and an asset base in excess of Ksh60 Billion.

Since inception, the Kenya Commercial Bank Group has endeavored to provide quality and customer friendly services geared towards meeting the ever-changing customer needs.

2.2 Business Process Re-engineering

The concept of reengineering traces its origins back to management theories developed as early as the nineteenth century. The purpose of reengineering is to "make all your processes the best-in-class." Frederick Taylor suggested in the 1880's that managers use process methods to discover the best processes for performing work, and that these processes be reengineered to optimize productivity. BPR echoes the classical belief that there is one best way to conduct tasks. In Taylor's time, technology did not allow large companies to design processes in a cross-functional or cross-departmental manner. Specialization was the state-of-the-art method to improve efficiency given the technology of the time.

In the early 1900's, Henri Fayol originated the concept of reengineering: To conduct the undertaking toward its objectives by seeking to derive optimum advantage from all available resources. Although the technological resources of our era have changed, the concept still holds.

At the heart of reengineering is the notion of discontinuous thinking-of recognizing and breaking away from the outdated rules and fundamental assumptions that underlie operations. Unless we change these rules, we cannot achieve breakthroughs in performance by only reducing waste or automating existing processes. It is therefore imperative that we challenge old assumptions and discard the old rules. From this

approach it is clear that this kind of change is an ongoing, iterative process itself requiring strong commitment and vision from senior management.

Most organizations have been through at least some form of reengineering. There have been many benefits of these initiatives however; the drawbacks cannot be overlooked. These drawbacks include reduced creativity, fear of risk-taking, introspective focus rather than outward focus and many others.

2.3 Information Communication Technology in BPR

Business Process Re-engineering (BPR) is a powerful change phenomenon and an approach that has made radical and fundamental changes to the way organizations conduct business (Davenport and Stoddard, 1994). The purpose of these changes is to redesign the existing business processes and implement new ones with the objective of cost reduction and improved efficiency and effectiveness, including profitability, customer satisfaction, return on assets, growth, and market share. Because of the pervasiveness of changes, organizations undertaking BPR must redesign not only their business processes, but also their products, assets, culture, thought patterns, behaviors, and/or technology spanning across functional areas. Many researchers even contended that the larger the scope of process change, the greater the potential for radical performance improvement (Kanter, R. M., Stein, B.A., and Jick, T., 1994). Thus, process changes at the inter-organizational dimension (across organizations) would augment organizational productivity and competitiveness better than process changes at the inter-functional (across functional areas) and intra-functional (within a functional area) dimensions.

IT departments which include all Information Systems functions have served an increasingly important role in many organizations to proactively shape new competitive strategies to improve the operational or managerial work processes. The successful management of IT departments in such endeavors is inextricably linked with the effective management of a number of processes associated with the planning, development,

acquisition, implementation, and control of an organization's Information Technology systems.

In the current context of the increasing recognition of IT as a strategic resource, the leadership of the ICT function in an organization could be viewed as a powerful, and perhaps critical, element in affecting the success of BPR. Clearly, the purpose of BPR is the transformation of business process; and the strategic application of IT by ICT function can make a powerful impact on a business as it is transformed. Achieving the benefits of reengineering demands active commitment and participation from the ICT function. The BPR process needs careful planning, as there are risks inherent in undertaking the far reaching and fundamental changes associated with reengineering. To address these risks and enable the strategic values of IT, the strategic role of ICT function in BPR must be recognized (Andrews and Stalick, 1994). Thus, evaluating the link between the role of IS function and its impact on BPR is an important issue in MIS research.

2.4 BPR concepts

Despite the popular tendency to lump a wide range of change methodologies under umbrella terms such as Business Process Reengineering (BPR), Business Process Redesign, Total Quality Management (TQM), Business Transformation, , Quality Function Deployment (QFD), Continuous Process Improvement Model (CPI Model), and Process Change Management, there are very distinct differences in the approaches embodied in these terms.

A survey conducted in Norway indicates that the major consulting firms have BPR-like concepts as part of their portfolios. However, since BPR at a certain time got a negative connotation, none of them label openly what they do as BPR. For instance, Anderson Consulting in the early 1990's named their BPR version "value driven reengineering", later changed to "Business integration", which they say focus on "the holistic organisation". Despite the variation in names, there are striking similarities in the elements of the concepts, most of which we know from the BPR literature.

According to the Norway survey the different varieties of BPR concepts are summarized in the table below.

Company	Ernst & Cap Gemini	Anderson consulting	Deloitte & Touche	Mc Kinsey	PwC	KPMG	
BPR concept	Business Process Innovation	Process Development	Business Integration Value driven reengineering (early -90)	Enterprise transformation Process improvement BPR	Core Process redesign	Enterprise Wide Performance Improvement	BPT Business Performance Integration

Table 1. BPR concepts in "big" consulting companies (1995).

A quick overview would yield two fundamentally different strategies: Process Improvement and Process Innovation. These are as advocated by Hammer & Champy (1993) and Davenport (1993).

A process is "a structured, measured set of activities designed to produce a specified output ... a specific ordering of work activities across time and place, with a beginning, an end, and clearly identified inputs and outputs." (Davenport, 1993). A business process can therefore be defined as a collection of tasks that together create value for a customer. Subsequently, Business Process Reengineering (BPR) can be said to be the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed.

Hammer & Champy (1993), emphasis the following points:

- i. Organise around outcomes, not tasks
- ii. Have those who use the outcome of the process perform the process
- iii. Subsume information processing work into the real work that produces the information
- iv. Treat geographically dispersed resources as though they were centralised

- v. Link parallel activities instead of integrating their results
- vi. Put the decision point where the work is performed, and build control into the process
- vii. Capture information once and at the source

Business Process Re-design is "the analysis and design of workflows and processes within and between organizations" (Davenport, 1993).

The proponents of this approach Davenport & Short lay a lot of emphasis on the following points:

- i. Develop the Business Vision and Process Objectives
- ii. Identify the Processes to be Redesigned
- iii. Understand and Measure the Existing Processes
- iv. Identify IT Levers
- v. Design and Build a Prototype of the New Process

The above strategies are broadly similar with the main difference being that Hammer & Champy advocate for radical change while Davenport (1993) advocates for incremental change.

New process implementation relies upon the comprehensive design of a diverse set of behavioral, technical and managerial factors, including: business procedures, organization structure, accountabilities, measurement systems, management processes, key relationships (both internal and external), staff and skill profiles, work design and workflows, geographic or facility design and IT infrastructure. These are the individual building blocks from which new process logic is realized, and represent the tangible

organizational components commonly found in techno-structural or holistic approaches to organization development (Andrews and Stalick, 1994).

Many companies begin business process improvement with a continuous improvement model. This model attempts to understand and measure the current process, and make performance improvements accordingly.

2.4.1 Continuous Process Improvement – TQM – Kaizen

The least invasive type of change strategy available to organizations is one of continuous improvement, which operates under the principle that excellence can be achieved by making a large number of small or incremental improvements continuously over time. The goal is to please both internal and external customers by improving the quality of both processes and outcomes. Work teams and individuals are encouraged and empowered to suggest and implement improvements using a structured set of tools and techniques to correctly identify and define both problems and solutions.

This management approach originated in Japan in the 1960's where it is known as Kaizen (Imai, 1986), which means continuous improvement of products, services, customer support, relationships, systems etc. that involves everyone within the organization. Although there is no directly equivalent word in English, the culture of Kaizen is most closely approximated in the precepts of Total Quality Management (TQM), which gained widespread visibility in the United States in the last two decades. However, the term "Kaizen" does have one major advantage over TQM in that while there is often very little agreement over what how to define or measure terms like quality, there is very little disagreement with the concept that anything can be improved.

The figure below illustrates the basic steps in process improvement. You begin by documenting what you do today, establish some way to measure the process based on what your customers want, do the process, measure the results, and then identify improvement opportunities based on the data you collected. You then implement process improvements, and measure the performance of the new process. This loop repeats over

and over again, and is called continuous process improvement. You might also hear it called business process improvement, functional process improvement, etc. This method for improving business processes is effective to obtain gradual, incremental improvement.

Document As-Is Process	Establish Measures	Follow Process	Measure Performance	Identify and Implement Improvements
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Figure 2: Continuous Process Improvement Model

2.4.2 Innovation – Redesign – Re-engineering

Companies have sought out methods for faster business process improvement, moreover, companies want breakthrough performance changes, not just incremental changes, and they want the changes now. Because the rate of change has increased for everyone, few businesses can afford a slow change process.

Procedure Redesign is the least "invasive" of the discontinuous change strategies because while it may involve streamlining of work flow, automation of activities, or improved information dissemination, it does not necessarily require replacing current processes or organizational structures. Procedure redesign is broader in scope than process improvement, often spanning multiple, cross-functional departments and/or organizations. Although it does not typically require organizational changes, it may well require installation or modification of major information systems. While broader in scope than process improvement, process redesign with its emphasis on improving existing procedures is often narrower in scope than value-stream reinvention, which focuses on replacement of existing processes. Used strategically, procedure redesign can be very effective.

In an effort to adjust quickly to the environment, some reengineering models assume the current process is irrelevant and endeavor to start afresh. Such a clean slate perspective enables the designers of business processes to disassociate themselves from today's

process, and focus on a new process. In a manner of speaking, it is like projecting yourself into the future and asking yourself: what should the process look like? What do my customers want it to look like? What do other employees want it to look like? How do best-in-class companies do it? What might we be able to do with new technology?

Such an approach is pictured below. It begins with defining the scope and objectives of your reengineering project, then going through a learning process (with your customers, your employees, your competitors and non-competitors, and with new technology). Given this knowledge base, you can create a vision for the future and design new business processes. Given the definition of the "to be" state, you can then create a plan of action based on the gap between your current processes, technologies and structures, and where you want to go. It is then a matter of implementing your solution.

Scope Project	Learn from others	Create to-be process	Plan transition	Implement
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Figure 3: Radical Reengineering Model

In summary, the extreme contrast between continuous process improvement and business process reengineering lies in where you start (with today's process, or with a clean slate), and with the magnitude and rate of resulting changes.

Over time many derivatives of radical, breakthrough improvement and continuous improvement have emerged that attempt to address the difficulties of implementing major change in corporations. It is difficult to find a single approach exactly matched to a particular company's needs, and the challenge is to know what method to use when, and how to pull it off successfully such that bottom-line business results are achieved.

	Improvement	Innovation
Level of Change	Incremental, gradual, constant	Abrupt, radical, discontinuous
Intended Result	Small, steady improvement	Breakthrough, quantum leap improvement
Starting Point	Existing process	Clean Slate
Frequency of change	One-Time/Continuous	One-time
Time Required	Short (up to 2 yrs)	Long(as long as 5-10 years)
Participation	Bottom-up	Top Down
Skills Required	Effective Work Teams & Groups	Strong, innovative individual leadership
Impact on Employees	Typically supportive, skill building	Dramatic changes, innovative excitement
Resistance to Change	Lower	Potentially high, requiring active program to overcome resistance
Primary Enabler	Statistical Control	Information Technology
Type of Change	Cultural	Cultural/Structural
Change Management	Implementation of Kaizen culture	Skilled planning & change management
Typical Scope	Narrow, Within Functions	Broad. From Cross Functional to Enterprise wide.
Investment	Low initial investment, significant long term investment to sustain	Large initial investment
Return on Investment	ROI potentially difficult to compute, typically high long term paybacks	Shorter term, high ROI
Risk	Low to Moderate-Usually no danger of major failure	Higher risk of major failure

Table 2. Incremental Vs Radical Change (Hammer & Champy, 1993)

Over the last 10 years several factors have accelerated the need to improve business processes. The most obvious is technology. New technologies (like the Internet) are rapidly bringing new capabilities to businesses, thereby raising the competitive bar and the need to improve business processes dramatically.

Another apparent trend is the opening of world markets and increased free trade. Such changes bring more companies into the marketplace, and competing becomes harder and harder. In today's marketplace, major changes are required to just stay even. It has become a matter of survival for most companies.

In a small business the owner does everything. As the business grows he or she has to employ functional specialists to which the owner delegates certain aspects of running the business. Over time these functions expand to a point where they become departments, and often barriers are erected (often physical) between departments. As documents, materials and information flow between departments, delays start to occur as they pass from in-tray to out-tray to in-tray again. Often defensive systems such as date stamping and countersigning start to emerge as one department blames another for a mistake or delay. Procedures emerge. Paper work and meetings grow in an attempt to counteract these difficulties to an extent where it is actually very difficult to co-ordinate activities and get things done. It is at this point that the objectives of the organization can actually be in conflict with the organization and procedures. According to Davenport, BPR is driven by a business vision, which implies specific business objectives such as Cost Reduction, Time Reduction, and Output Quality improvement amongst other business objectives. In order to fulfill these business objectives they prescribe a five-step approach.

Identify the Processes to be Redesigned: Most firms use the High- Impact approach which focuses on the most important processes or those that conflict most with the business vision. Lesser number of firms use the Exhaustive approach that attempts to identify all the processes within an organization and then prioritize them in order of redesign urgency.

Understand and Measure the Existing Processes: For avoiding the repeating of old mistakes and for providing a baseline for future improvements.

Identify IT Levers: Awareness of IT capabilities can and should influence process design.

Design and Build a Prototype of the New Process: The actual design should not be viewed as the end of the BPR process. Rather, it should be viewed as a prototype, with successive iterations. The metaphor of prototype aligns the BPR approach with quick delivery of results, and the involvement and satisfaction of customers.

2.4.3 BPR failure and success factors.

Even the most ardent protagonists of BPR, such as Hammer & Champy, quote BPR failure rates from 50% up to 80%. Many theories have been put forth on why BPR projects fail. The following is a summary from Hammer & Champy (1993):

Factors contributing to BPR failures

Without expounding we can mention the following issues as the most prevalent reasons for BPR initiative failures.

- i. Trying to fix a process instead of changing it
- ii. Not focusing on business processes
- iii. Ignoring everything except process redesign e.g. reorganisation, reward system, labour relationships, redefinition of responsibility and authority
- iv. Neglecting people's values and beliefs [need to reward behaviour that exhibits new values and behaviour]
- v. Be willing to settle for minor results

- vi. Quitting too early
- vii. Placing prior constraints on the definition of the problem and the scope for re-engineering effort.
- viii. Allowing existing corporate cultures and management attitudes to prevent Reengineering from getting started. e.g. consensus, short term goals, bias against conflict.
- ix. Trying to make Reengineering happen from the bottom up
- x. Assigning someone who doesn't understand Reengineering to lead the effort.
- xi. Skimping on the resources to Reengineer
- xii. Burying Reengineering in the middle of the corporate agenda.
- xiii. Dissipating energy across a great many Reengineering projects.
- xiv. Attempting to Reengineer when the CEO is 2 years from retirement
- xv. Failing to distinguish Reengineering from other business improvement programs e.g. quality improvement, strategic alignment, right-sizing, customer-supplier partnerships, innovation, empowerment, etc.
- xvi. Concentrating exclusively on design and technology while forgetting implementation.
- xvii. Trying to make Reengineering happen without making anyone unhappy.
- xviii. Pulling back when people resist making Reengineering changes

Factors contributing to BPR Success

According to the proponents of BPR especially Hammer & Champy (1993) the following are positive preconditions for BPR success:

- i. Senior Management Commitment and Sponsorship
- ii. Realistic Expectations
- iii. Empowered and Collaborative Workers
- iv. Strategic Context of Growth and Expansion
- v. Shared Vision
- vi. Sound Management Practices
- vii. Appropriate People Participating Full-Time

2.5 McKinsey's Model

In order to establish the effect BPR efforts have had on Kenya Commercial Bank in the period 1995 – 2002 we shall use the McKinsey's 7s Model. The focus of the McKinsey approach is on primary, customer value adding processes and the necessary changes of organizational variables to establish these processes.

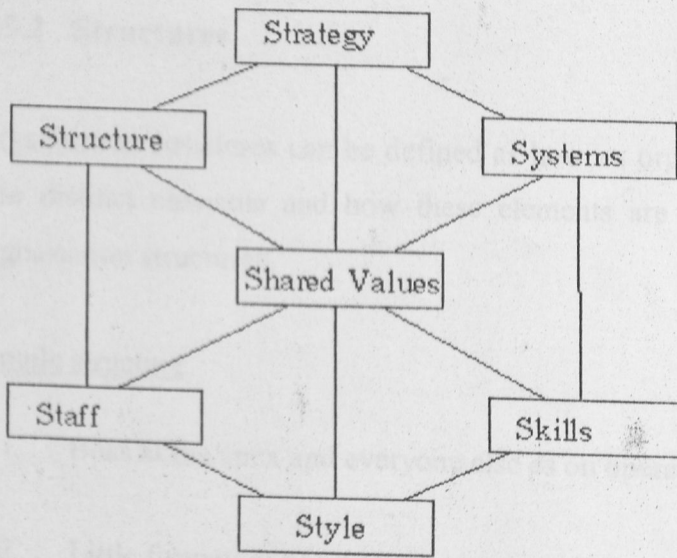


Figure 4: McKinsey's seven S diagram (Henley, 1991)

The seven components of the Mckinsey model are strategy, structure, systems, shared values, staff, style and skills. If these aspects of a corporation are evaluated it is possible to arrive at a conclusion on whether a business reengineering initiative was effective.

In order to understand this model we need to define the various components.

2.5.1 Systems

They are the processes, methods, procedures, rules, techniques, technology, manuals, etc. that ensure that work is undertaken efficiently and accurately. They are the instructions that guide staff and management in their daily tasks. All the BPR definitions either explicitly or implicitly refer to these attributes of Systems. Very often, new processes are enabled by new technology.

At KCB the operations manual closely guides systems, it is the reference point for all systems.

2.5.2 Structures

Organisation structures can be defined as how an organisation breaks down its activities into distinct elements and how these elements are co-ordinated. We can identify six organisation structures.

Simple structure

- i. Boss at the apex and everyone else as an operator(s)
- ii. Little formation of middle management
- iii. Direct Supervision by the owner
- iv. Applies in small organisations
- v. Dependant on the skill of the owner/manager
- vi. Information Systems tend to be unplanned

Machine Bureaucracy structure

- i. Is the classic organisation structure
- ii. Enormously efficient
- iii. It runs according to standardised procedures.
- iv. Can create tensions from the top down, in terms of decision making.
- v. Centralised decision making and information systems

Professional Bureaucracy Structure

- i. Is governed by plans and rules, has a large operating core
- ii. Suited to complex but stable environment
- iii. Has rules but no plans
- iv. Staff are relatively autonomous and powerful in decision making sense
- v. Universities and hospitals are some examples

Divisionalised form

- i. A large organisation that requires multi-speciality
- ii. Work is done by autonomous units, insular divisions that can behave as small organisations in themselves
- iii. The apex plays a large role, as do middle managers
- iv. Prone to miscommunication through the middle line
- v. Tension often exists between head-quarters and divisions, especially with respect to information systems and their use
- vi. Each division will focus on a particular market

Adhocracy Structure

- i. Suited to complex and unstable environment
- ii. It has few rules and many plans

- iii. Remains flexible to 'best fit' the working environment
- iv. Authority structures are loose and ambiguous
- v. Basic administrative information systems but advanced work-related systems

(Henley, 1991)

Process organisations introduce a new form of organisation that aims to break away from many of the above traditional types, particularly the bureaucracies and divisional forms. Hammer & Champy recommend "a move to much flatter structures organised around the processes", whereas Davenport recommends "a multidimensional matrix structure, with process responsibility as a key dimension". To achieve this, Johansson et al (1993) states: "the new organisation must accommodate a balance between functional expertise and process involvement" and goes on to say it is essential to remove functional barriers. Andrews & Stalick (1994) emphasise "even the boundaries between your customers and your suppliers and you must be redefined."

2.5.3 Staff

Henley defines Staff as "the quality and quantity of people employed" but also adds the management issues of "motivation, reward systems, the structure of jobs and team work" (Henley, 1991).

BPR has certainly become associated with down-sizing and right-sizing, and in such circumstances it is difficult for employees to have the confidence to redesign themselves out of the process.

2.5.4 Skills

Skills is defined as "The competences the organisation needs in its people in order to perform difficult tasks to a high standard" (Henley 1991). The word 'empowerment' is

invariably associated with BPR. Hammer & Champy talk about the "New World of Work" where "jobs change from simple tasks to multi-dimensional work". This means "job preparation changes from training to education, from rule following to exercising judgement" and "managers change from supervisors to coaches" and "executives change from scorekeepers to leaders". (Hammer & Champy 1993).

2.5.5 Strategy

Johnson & Scholes (1993) define Strategy as:

"the direction and scope of an organisation over the long term: ideally, which matches its resources to its changing environment, and in particular its markets, customers or clients so as to meet stakeholder expectations"

Johnson & Scholes go on to characterise strategic decisions as being "complex in nature ..., involve a high degree of uncertainty, ... involve major changes ...".

BPR drivers are of a strategic nature and include Customers; Competition; Cost; Technology; Shareholders; Politics; Economics, Legislation, and Regulation". Hammer & Champy talk about the "three Cs: Customers, Competition and Change". Davenport (1993) advocates a "Process Vision" that is driven by "Business Strategy".

BPR decisions, like Strategy decisions, are complex and involve a high degree of uncertainty ("[BPR] is a complex undertaking and carries significant risk" (Carey, 1993), and as noted under Systems and Structures, BPR involves major change.

2.5.6 Shared Values

These are the basic values and mission of the organisation. As Henley puts it: "they rise above profit targets and growth objectives by relating the goals of the firm to deeper human needs and principles". Andrews & Stalick (1994) assert that in "successful

reengineered business operations, individual belief systems become aligned with the stated beliefs of the organisation".

Reengineering entails as great a shift in the culture of an organisation as in its structural configuration. Reengineering demands that employees deeply believe they work for their customers, not for their bosses"

(Hammer & Champy, 1993)

2.6 Case Studies

2.6.1 Unga Limited

This was a case of how things can go wrong during a re-engineering initiative.

In 1996 business process re-engineering saw the National mills corporation divided into three groups namely Milling operations, animal feeds and edible oils and cereals. Teams were established which were to identify issues raised by both internal and external customers. The primary objectives of the BPR were to focus on quality, cost, service delivery and reduced time for order fulfillment. The resolution of all process owners was to listen to the voice of the customer and make them satisfied. A vision was developed.

However a few management fundamentals were ignored with disastrous results.

- i. The main change agent, instead of remaining as a consultant, so as to bring objectivity to the exercise was employed as the managing director.
- ii. The re-engineering and restructuring effort was not effectively communicated to the staff leading to demoralization.
- iii. Some of the processes were not well analyzed leading to poor design. Insufficient testing and prototyping left a deficiency in the number of drivers after retrenchment leading to a distribution crisis.

- iv. Due to poor analysis of market dynamics Unga limited ended up with a huge stock of expensive inputs.

2.6.2 BPR at Cigna Corporation

We can use this case study at Cigna to get insights into well-executed business process re-engineering initiatives.

CIGNA a leading provider of insurance and related financial services undertook re-engineering activities between 1989 and 1993. CIGNA completed over 20 reengineering initiatives.

Reengineering at CIGNA started with a new chairman stepping into a troubled environment. In 1988, CIGNA's income had fallen nearly 11 percent from the previous year. As part of a new corporate strategic planning process initiated by the chairman, the new chief information officer (CIO) launched a review of how well the systems organization was supporting the strategic direction of the business. The study revealed that sophisticated applications were layered onto an old organization without changing the underlying processes and without the desired impact on the business.

The Cigna experience brought out ten useful lessons.

- i. *Diffuse and leverage learning from each project.* Facilitate the sharing of lessons learned from one project to another.
- ii. *Learn from failure.* To succeed in BPR, one must be willing to accept failure and to learn from it.
- iii. *Foster commitment and ownership at all levels.* Senior management and front line employees need to be 100% committed to the initiative.

- iv. *Exploit "clean slate" opportunities.* Be ready to implement new designs unencumbered by legacy facilities, systems, processes, or employees.
- v. *Tailor reengineering to the characteristics of the environment.* Management should assess whether a top-down radical change program or more of a consensus-driven mode should be adopted in light of the characteristics of the organization.
- vi. *Ascend to higher forms of reengineering over time.* Re-engineering focus should with time shift from operationally driven efforts to initiatives where the goal is to increase shareholder value.
- vii. *Move with speed.*
- viii. *Communicate truthfully, broadly, and via multiple forums.* It is important for those who will be affected by reengineering to understand how the effort will unfold and how it will affect them as individuals.
- ix. *Select the right people.*
- x. *Focus - most of all - on a mindset change.*

2.7 Summary

BPR then is "the fundamental rethinking and radical redesign of business processes" that results in "dramatic improvements" especially in meeting customer needs and other external strategic demands. Using McKinsey's organisational model it was shown that a full BPR programme impacts 6 of 7 of the organisational dimensions, and that it is driven by the 7th element, Strategy.

The operations manual is the reference point for all systems at KCB. The manual documents each and every process. New systems are adapted with very few changes to

the manual preferred. The structure at KCB can best be described as falling into the category of divisionalised form. Work is done by autonomous and specialized units, which are quite powerful in their decision-making e.g. KCB Card center, Savings and Loans, IT department etc.

A re-branding exercise, which is still in progress at KCB, is emphasizing the significance of shared values. It is aimed at creating a shared vision within the organization. The greater goal of this exercise is a cultural shift. This is a key ingredient in successful BPR initiatives as brought out by the Cigna case study.

KCB has a division whose sole responsibility is strategic planning. This division plays a guiding role and also harmonizes tactical plans within autonomous divisions in order to achieve the corporate strategy.

3.2 Research design

One can infer then, that a full BPR programme will involve significant organisational change.

3.3 Population of study

The population of the study consisted entirely of Kenya Commercial Bank employees.

3 RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the methods used in the collection of data or information pertinent to answering the research question. It is divided into research design, population of study, sampling plan, data collection and finally data analysis.

It is my postulation that: -

Business Process Re-engineering if used properly, is a significant factor for successful implementation of information systems.

3.2 Research design

Research design can be classified as Experimental, Survey, Case Study, Archival Analysis & Historical Designs (Wanjohi, 2002). In this research an exploratory **case study design** will be used. This will be a longitudinal study of radical change initiatives undertaken at Kenya Commercial Bank in the period covering 1995 to 2002. Similar exploratory case studies undertaken include the Cuban missile crisis, which was conducted in 1971.

3.3 Population of study

The population of the study comprised entirely of Kenya Commercial Bank employees. Three areas were focused on: -

1. Business units, which have implemented information systems in the period 1995 to 2002. This include: -
 - i. Central Clearing Centre (Cheque and electronic payments)
 - ii. ATM Centre – Visa certification and debit card system

- iii. Card Centre – Proprietary and major card acquiring
- iv. Trade finance – Eximbills system
- v. Treasury - ITMS
- vi. Swift center – Swift system
- vii. Human Resource department – HR system
- viii. Finance department – General ledger system

2. IT division, a major stakeholder in these projects.

3.4 Data Collection

3. Strategic Planning department, which has a role of harmonizing the various system Implementation initiatives so as to be in tandem with the corporate strategic plan.

From the three areas of interest above the target population was as tabulated below.

Department	Population
Central Clearing Centre	42
ATM Centre	18
Card Centre	25
Trade finance	17
Treasury	30
Swift center	8
Human Resource department	39
Finance department	33
IT Division	82
Strategic planning	4
Total Population	298

Table 3. Research Population

3.4 Data Collection

The primary instrument for data collection in this research was a questionnaire. Primary data was collected by use of a questionnaire.

A self-reporting, structured and undisguised questionnaire (appendix B) made up of some closed and open-ended question was administered. The questionnaire was sent to the target population largely through email and also through the KCB internal mail routing center. Some of the questions were based on previous studies done but were enhanced to suit the changes and circumstances cited in the literature review. Section A of the questionnaire gave general information on the business unit and the project under investigation. Section B sought information on change management and business process re-engineering issues. Section B combined closed-ended and 5 scale likert-type questions.

Interviews were used to seek further clarification and to solicit information from the executive management.

Secondary data was collected from KCB internal documents and reports and also from documents and magazines in the public domain.

Structured questions were used to generate quantitative data and statistical analysis while open-ended questions were used for providing qualitative data for the purpose of recording attitudes and suggestions regarding the use of Business Process Re-engineering.

3.5 Data analysis

Data analysis and findings will be presented in the form of tables, proportions and graphs.

Descriptive statistic will be used to analyze closed – ended questions. Answers to open ended questions will be tabulated to reflect their frequency with a further discussion for a better understanding of the given responses.

Statistical analysis tools like SPSS will be used to analyze the data. Factor analysis will be done to establish the relative significance of various variables. The objective will be the reduction of the observed variables to a small number of latent factors. The underlying assumption will be that amongst the observed variables affecting the role of information technology, as an enabler of business process reengineering is a number of latent factors that is there exist a number of unobserved latent variables (or "factors") that account for the correlations among the observed variables, such that if the latent variables are held constant, the partial correlations among the observed variables will become zero.

Table 1. Research Population and response rate

Out of the 200 participants targeted, 116 responded giving an overall response rate of slightly above 50%.

The following is a highlight of the demographic analysis of the respondents

4 DATA ANALYSIS AND INTERPRETATION

Quantitative research was covered by questionnaires that were sent to the target population comprising of KCB staff members as highlighted below. Completed questionnaires were edited for completeness and consistency. The data in the first part of the survey is presented in terms of proportions and mean scores. The second part of the questionnaire is analyzed by use of factor analysis.

4.1 Survey participants

The following table shows the response rate by KCB Divisions.

Department	Population	Reponses	Response rate (%)
Central Clearing Centre	42	12	28.57%
ATM Centre	18	8	44.44 %
Card Centre	25	12	48.00 %
Trade finance	17	5	29.41 %
Treasury	30	14	46.67 %
Swift center	8	6	75.00 %
Human Resource department	39	21	53.85 %
Finance department	33	13	39.39 %
IT Division	82	23	28.05 %
Strategic planning	4	2	50.00 %
Total Population	298	116	38.93 %

Table 4. Research Population and response rate

Out of the 298 participants targeted, 116 responded giving an overall response rate of slightly below 39%.

The following is a highlight of the demographic analysis of the respondents

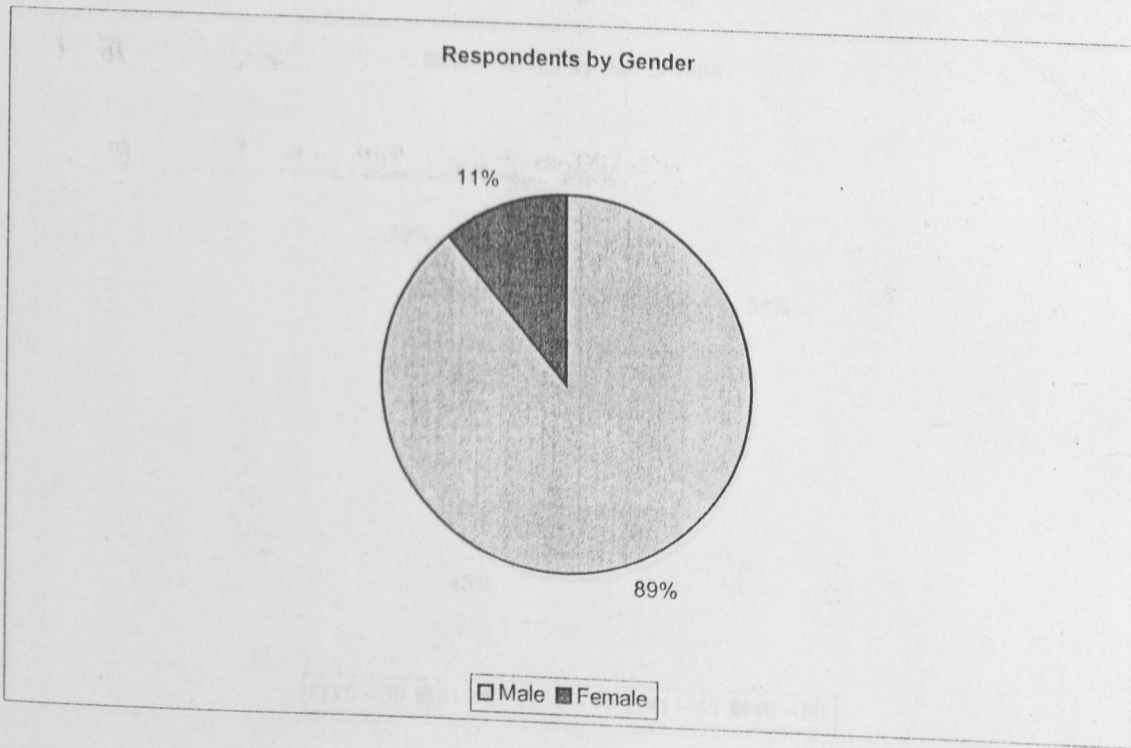
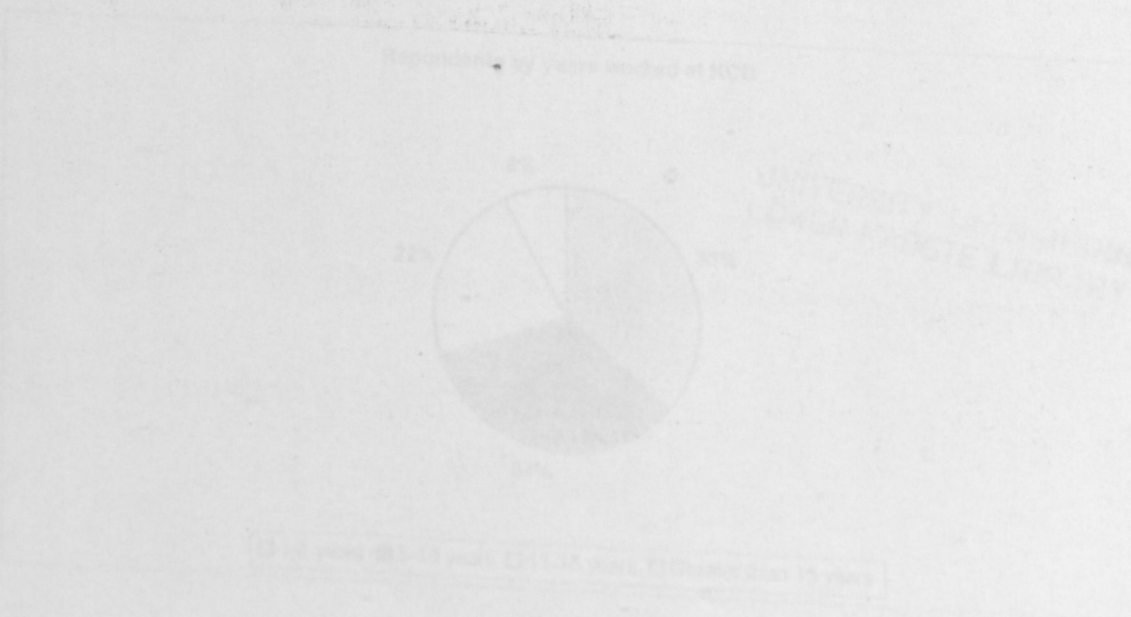


Figure 5. Respondents by gender

13 females and 103 males responded to the questionnaire. This gave an overall percentage response rate of 11% and 89% respectively.



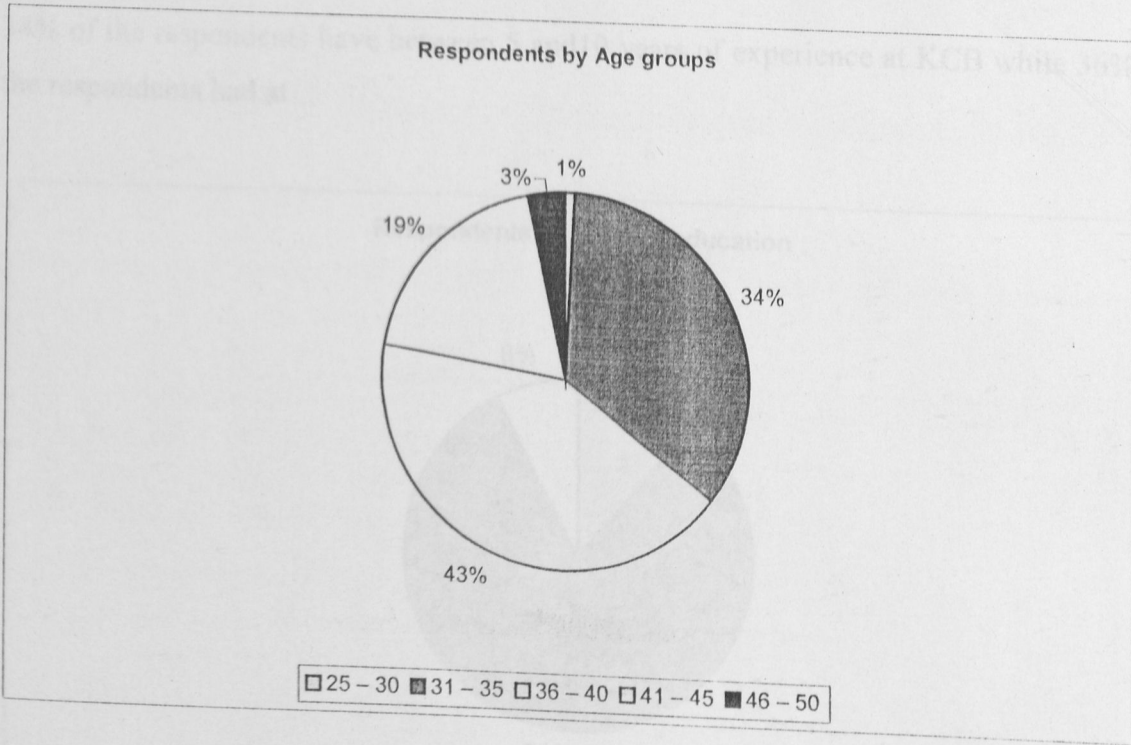


Figure 6. Respondents by age groups

Only 1% of the respondent were in the 25-30 years age bracket. 34% of the respondents were between 31 and 35 years. The vast majority 43% was in the 35-40 year bracket.

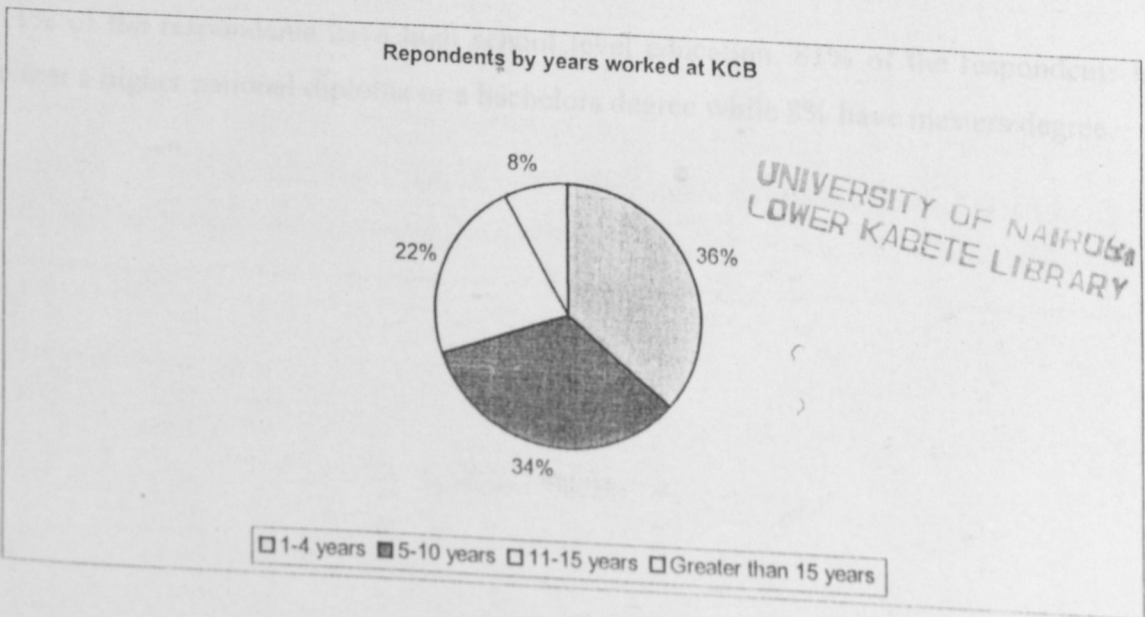


Figure 7. Respondents by years worked at KCB

34% of the respondents have between 5 and 10 years of experience at KCB while 36% of the respondents had at

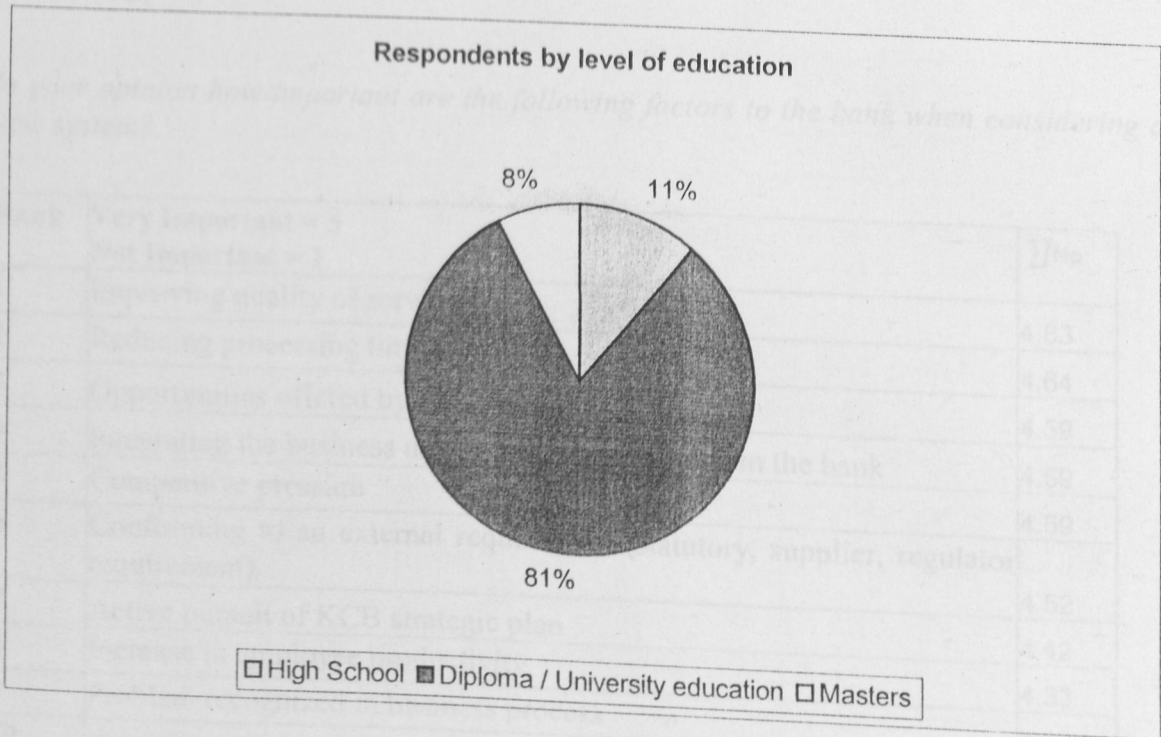


Figure 8. Respondents by Level of education

11% of the respondents have high school level education. 81% of the respondents had either a higher national diploma or a bachelors degree while 8% have masters degree.

4.2 Questionnaire response

To facilitate analysis the questionnaire answers have been summarized and ranked and descending order.

In your opinion how important are the following factors to the bank when considering a new system?

Rank	Very Important = 5 Not Important = 1	Σ No
1	Improving quality of service	
2	Reducing processing time	4.83
3	Opportunities offered by new technology	4.64
4	Integrating the business unit to other systems within the bank	4.59
5	Competitive pressure	4.59
6	Conforming to an external requirement (statutory, supplier, regulator requirement)	4.59
7	Active pursuit of KCB strategic plan	4.52
8	Increase in employee productivity	4.42
9	Problem recognized in business process	4.33
10	Extending the functions of an existing system	4.32
		3.6

Table 6. Factors while considering a new system (II)

Improving the quality of services stands out as the most important factor when considering a new system. Active pursuit of the KCB strategy ranks 7th while extending the functions of an existing system is the considered the least significant factor when undertaking re-engineering exercise.

The following stakeholders are involved in project implementation at KCB.

Rank	Very Important = 5 Not Important = 1	Σ No
1	Senior management	
2	IT Division	3.85
3	Target users	3.69
4	Marketing division	3.03
5	Human resources department	2.89
6	Customer service	2.77
7	Shareholders	2.56
8	Customers	1.99
		1.72

Table 7. Stakeholder involvement

From the survey results, senior management are involved in most projects that are undertaken by the bank. However customers are rarely involved in the projects. The IT department is involved in 70% of the business process reengineering projects.

The following tenets are practiced during project implementation.

Rank	Very Important = 5 Not Important = 1	Σ No
1	A pilot group for testing the new scenario is usually established before the new system is implemented?	
2	An 'as is' (current state) analysis is done before embarking on a new system?	3.64
3	A strategy is defined on how to reach the 'to be' (target) situation outlined in the vision?	3.08
4	A shared vision with every project. e.g. "we want to have the most innovative products".	2.89
		2.87

Table 8. Tenets practiced during implementation

A shared vision is only espoused in 57% of the projects undertaken at KCB. A strategy on how to reach the desired situation is defined in 58% of all projects undertaken. An 'as is' analysis is carried out only 60% of the cases.

Changes required in a typical business unit to successfully implement an information system at KCB.

Rank	Very Important = 5 Not Important = 1	Σ No
1	Cultural changes (e.g. change in communication techniques to a more open communication and collaboration culture)	4.81
2	Reengineering/Redefinition of processes (e.g. approaches, workflow changes)	4.48
3	Empowering of people / teams	4.36
4	Changes in the organisational model	4.19

Table 9. Changes required in order to successfully implement projects

The respondents felt strongly that many changes needed to be effected in order to facilitate project implementation. All changes suggested in the questionnaire scored well over 80% as depicted in the table above. The respondents felt strongly that their needs to be a change in the communication modes adapted during project implementation. The survey also indicates strongly that it is necessary to redefine the processes and workflow when implementing projects at KCB.

Organizational change management techniques used during project implementation at KCB.

Rank	Very Important = 5 Not Important = 1	Σ No
1	Aligning and mobilising team leaders	3.3
2	Facilitate learning/skill building (to acquire new behaviour)	3.19
3	Coaching of people involved	2.97
4	Establishing a concept to regularly communicate with people involved	2.94
5	Establishing a (shared and motivating) vision	2.92
6	Vocal and visible support of senior management (Walking the talk)	2.81
7	Hiring, promoting, developing employees who can implement the vision	2.72
8	Feedback (i.e. through employee survey, customer inquiry)	2.66
9	Empowering people/teams to act on the vision defined	2.65
10	Planning, realizing and celebrating short term wins (to build confidence)	2.62
11	Changing reward systems to support the change initiative	2.6
12	Institutionalise new approaches	2.59
13	Establishing a sense of urgency	2.49
14	Dealing with resistance	2.45
15	Early involvement of people being affected	2.36
16	Build a critical mass for change: buy-in and stay-in (Winning mass support)	2.3
17	Create an atmosphere of openness and trust	2.12

Table 11. Change management techniques

Aligning and mobilizing team leaders scored highly while other change management techniques scored poorly with an average of 50%. An atmosphere of openness and trust was ranked the lowest with most respondents indicating that they felt that there was little openness and trust during project implementation.

Effectiveness of channels of communication used at KCB during project implementation.

Rank	Very Important = 5 Not Important = 1	Σ No
1	e-mail	3.65
2	Internal newsletter	3.6
3	Workshops	3.35
4	Video	3
5	Intranet (Web site, internal web pages)	2.72
6	Notice Board	2.47

Table 12. Communication channels

Email was rated as the most effective mode of communication amongst project staff. However this has its limitations, as email penetration is not 100% within KCB. The use of the corporate intranet to propagate project information ranked very low with an effectiveness rating of 54%.

Areas of emphasizes during information system related training at KCB.

Rank	Very Important = 5 Not Important = 1	Σ No
1	Software training (Functionality)	3.61
2	Skill building regarding the information system vision (new process training)	3.24
3	Communication Training	2.88
5	Training in team development, team working	2.88
6	Training in conflict management, group dynamics	2.78

Table 13. Project related training

Emphasis on training during business process reengineering projects mostly targets software functionality. This appears to be at the expense of training in communication, team building and conflict management.

The following are the main challenges (problems) during project implementation phase.

Rank	Very Important = 5 Not Important = 1	Σ No
1	Organisational politics	4.42
2	Time for implementation needed, longer than expected	4.11
3	Budget needed, higher than expected	4.1
4	Organisation and procedures are not adapted to the new situation (technological and organisational integration on different levels)	4.03
5	Technological limitations (performance/missing functionality)	3.89
6	Focus too much on technological aspects, too little focus on people	3.88
7	Resistance of middle management to change	3.85
8	Barriers between departments	3.84
9	Resistance of users to change	3.8
10	Not enough support from senior management	3.7
11	Project does not have appropriate priority	3.69
12	Scope not well defined, project is oversized	3.6
13	Not enough resources available (e.g. Technical expertise within KCB)	3.05
14	Availability of people from implementation team	2.66
15	Intercultural problems (i.e. language barriers)	2.15

Table 14. Main challenges during project implementation

The main challenge in business project reengineering at KCB was cited as organizational politics with a on overwhelming 88%. Implementation time was also seen as a big hinderance to project success. At 43% Intercultural barriers were seen as offering the least challenge during business process reengineering.

The services offered by the IT division can be rated as.

Rank	Very Important = 5 Not Important = 1	Σ No
1	The staff has knowledge to answer my questions.	3.39
2	The quality of work performed is excellent.	2.91
3	My work is performed at the time promised.	2.89
4	I have no doubts about the services I will receive	2.89
5	The services are improved continuously.	2.89
6	The staff shows a sincere interest in resolving my problems.	2.81
7	My work is performed right the first time.	2.76
8	The staff is consistently polite, considerate, and friendly.	2.71
9	The department offers comprehensive and effective training.	2.66
10	The staff keeps me informed on the status of the work.	2.65
11	The staff tells me exactly when services will be performed.	2.61
12	The staff finds out my needs and tries to fit their services to my needs.	2.59
13	The staff is never too busy to respond to me promptly	2.56
14	My problems are addressed quickly.	2.56
15	The staff is interested in what I say and listen to me.	2.55
16	The department procedures are up-to-date and easy for me to follow.	2.32
17	The department makes me aware of all rules and regulations affecting my work	2.29
18	The department insists on error-free records.	2.09

Table 15. IT Division effectiveness

According to most of the respondents the IT division possesses the requisite knowledge to address most issues. However the division scored 50% on most of the other issues. According to the survey members of the department do not show an overwhelming desire to deliver error free services.

To what extent are the following performance improvements realized from project initiatives at KCB

Rank	Very Important = 5 Not Important = 1	Σ No
1	Improved throughput	3.42
2	Customer satisfaction	3.22
3	Employee productivity	3.22
4	Improvement in quality	3.15
5	Reduction in costs	2.98

Table 16. Performance improvement

68% of the respondents felt that the projects implemented at KCB resulted in performance improvement. Only 58% of the respondents felt that the projects resulted in cost reduction.

To what extent are the following negative effects of project implementation felt at KCB

Rank	Very Important = 5 Not Important = 1	Σ No
1	Costly	3.73
2	Decrease in employee morale	3.19
3	Disruption of business	2.8

Table 17. Negative effects of BPR

Increased costs were cited as the biggest negative effect of BPR with a score of 75%. Decrease in employee morale was also indicated as a major negative consequence of BPR. BPR was also seen to cause disruption in 58% of the business units where BPR was undertaken.

Cross tabulation Level of Education / Years worked at KCB (%)

	1-5 Years	5-10 Years	10-15 Years	15+ Years
High school	2	8	17	73
Bachelors	32	38	19	11
Masters degree	62	23	13	2

Table 18. Cross tabulation Level of Education / Years worked at KCB

From the above cross tabulation it can be deduced that a vast majority of the respondents with high school education have worked for the bank for longer period than the respondents with a bachelors degree or masters degree. 62% of the respondents with a master's degree have worked for the bank for less than five years.

4.3 Factor analysis

Factor analysis was used in analyzing section II of the questionnaire. A total of 95 likert-type statements participated in the factor analysis. The table below shows the statements participating in the factor analysis with the respective descriptive statistics.

According to table 119 (appendix) Improving quality of service, has a mean of 4.85, which indicates most respondents, viewed it as very crucial. Cultural change in communication style had a mean of 4.81, this implies that most respondents thought that their needs to be a cultural shift in the way information is passed on during project implementation.

Questions 63,62,57, 56, 55 had a mode of 5. This implies most of the respondents agreed on resistance to change, barriers between departments, time for implementing projects as the major hindrances in business process re-engineering projects.

Due to the large number of statements, standard deviation has been used to narrow down the participating statements from 95 to 36. Statements with high standard deviations have been removed leaving those with low standard deviations, as this is a good indicator of

The following table shows statements selected for the factor analysis.

Question No.	Variable No.	Statement	Standard Deviation
1	1	Improving quality of service	0.379378
2	2	Reducing processing time	0.690262
3	3	Opportunities offered by new technology	0.494649
4	4	Integrating the business unit to other systems within the bank	0.494649
5	5	Competitive pressure	0.494649
6	6	Conforming to an external requirement (statutory/ supplier/ regulator requirement)	0.71051
7	7	Active pursuit of KCB strategic plan	0.496087
8	8	Increase in employee productivity	0.702869
9	9	Problem recognized in business process	0.654073
10	10	Extending the functions of an existing system	0.811647
11	11	Senior management	0.713282
13	12	Target users	0.647716
18	13	Customers	0.889008
23	14	Cultural changes (e.g. change in communication techniques to a more open communication and collaboration culture)	0.393729
24	15	Reengineering/Redefinition of processes (e.g. approaches/ workflow changes)	0.691347
25	16	Empowering of people / teams	0.827742
26	17	Changes in the organisational model	0.60309
27	18	Aligning and mobilising team leaders	0.806925
28	19	Facilitate learning/skill building (to acquire new behaviour)	0.752524
40	20	Dealing with resistance	0.834818
41	21	Early involvement of people being affected	0.76501
42	22	Build a critical mass for change: buy-in and stay-in (Winning mass support)	0.830535
43	23	Create an atmosphere of openness and trust	0.828693
45	24	Internal newsletter	0.743574
52	25	Communication Training	0.374766
54	26	Training in conflict management/ group dynamics	0.7934
57	27	Budget needed/ higher than expected	0.681561
58	28	Organisation and procedures are not adapted to the new situation (technological and organisational integration on different levels)	0.678377
60	29	Focus too much on technological aspects/ too little focus on people	0.876308
61	30	Resistance of middle management to change	0.55217
66	31	Scope not well defined/ project is oversized	0.670876
85	32	The department procedures are up-to-date and easy for me to follow.	0.828856
87	33	The department insists on error-free records.	0.834541
89	34	Customer satisfaction	0.7371
93	35	Costly	0.595019

Table 20. Variables used in the factor analysis

Correlation matrix is the basis for generating factors. The correlation matrix attached in the appendix, shows that variables 1 (improving quality of service), 29 (Focus on technology and little focus on people), 31, 10, 18 and 9 have a positively high correlation with the other variables. Variables 25 (Communication training), 19 (Facilitates training/skill building), 12, 33, 6 and 23 have a low correlation with the other variables..

Initial Community Estimates are Squared Multiple Correlations.

Variable	Community Estimates as percentages
1	98.924
2	99.177
3	99.095
4	99.095
5	99.095
6	73.239
7	98.832
8	90.797
9	98.307
10	96.56
11	96.487
12	81.641
13	83.687
14	99.032
15	98.75
16	98.454
17	98.014
18	96.158
19	90.366
20	95.063
21	95.672
22	92.304
23	91.112
24	92.053
25	91.057
26	96.986
27	94.241
28	97.593
29	98.065
30	92.062
31	97.532
32	90.554
33	93.683
34	93.08
35	96.044

Table 22. Community Estimates as percentages:

Community is the proportion of the variables' variation to the total variation that is involved in the factors. Variable 6, 12, 13, 19, 32 and 8 rank low in terms of their contribution to the factors. This reinforces the correlation matrix since variables 6, 12 and 19 are common in both tables with low rankings.

4.3.1.1.1 Roots (Eigenvalues) Extracted:

Eigen Root	Eigenvalue	% of trace in each root
1	25.682	73.376
2	4.242	12.119
3	1.726	4.932
4	1.378	3.939
5	0.504	1.439
6	0.298	0.85
7	0.267	0.763
8	0.223	0.637
9	0.153	0.437
10	0.121	0.346
11	0.097	0.278
12	0.068	0.194
13	0.051	0.147
14	0.042	0.119
15	0.024	0.068
16	0.021	0.059
17	0.015	0.044
18	0.014	0.041
19	0.013	0.036
20	0.01	0.03
21	0.009	0.025
22	0.007	0.021
23	0.007	0.02
24	0.006	0.017
25	0.005	0.015
26	0.005	0.014
27	0.004	0.011
28	0.003	0.009
29	0.003	0.007
30	0.001	0.003
31	0.001	0.002
32	0	0
33	0	0
34	0	0
35	0	0

Table 23. Roots (Eigenvalues) Extracted

PLOT OF EIGENVALUES EXTRACTED



... follow how well each of the factors fit the data from all the respondents
Factor 1 scores 25.68. This explains 71.32% of the variation. Factor 2 explains 12.12%
of the variation while factors 3 and 4 account for 5% and 4% respectively.

Eigenvalues indicate how well each of the factors fit the data from all the respondents. Factor 1, scores 25.68. This explains 73.38% of the variation. Factor 2 explains 12.12% of the variation while factors 3 and 4 account for 5% and 4% respectively.

	Factor 1	Factor 2	Factor 3	Factor 4
1	0.951	0.027	0.29	-0.008
2	0.928	0.020	0.30	0.001
3	0.953	0.011	0.24	0.157
4	0.953	0.011	0.24	0.157
5	0.953	0.011	0.24	0.157
6	0.253	0.674	0.592	0.58
7	0.949	0.07	0.234	0.168
8	0.540	0.124	0.732	0.230
9	0.807	0.023	0.353	0.176
10	0.887	0.309	0.225	0.267
11	0.908	0.211	0.253	0.191
12	0.067	0.075	0.184	0.107
13	0.404	0.59	0.263	0.41
14	0.957	0.024	0.271	-0.01
15	0.91	0.207	0.365	0.181
16	0.939	0.021	0.242	0.21
17	0.91	0.14	0.35	-0.009
18	0.893	0.139	0.310	0.211
19	0.815	0.203	0.056	0.347
20	0.751	0.259	0.482	0.377
21	0.889	0.2	0.215	0.253
22	0.727	0.142	0.227	0.080
23	0.203	0.722	0.430	0.733
24	0.44	0.294	0.75	0.204
25	0.056	0.38	0.067	0.06
26	0.756	0.294	0.516	-0.003
27	0.543	0.054	0.766	0.242
28	0.835	0.182	0.246	0.038
29	0.867	0.194	0.232	0.072
30	0.488	0.121	0.805	0.140
31	0.637	0.210	0.246	0.235
32	0.004	0.372	0.192	0.642
33	0.027	0.372	0.056	0.246
34	0.505	0.420	0.081	0.130
35	0.923	0.140	0.255	0.110

Table 25: Varimax Rotated Loadings

No. of iterations := 25

Varimax Rotated Loadings with 115 cases.

	Factor 1	Factor 2	Factor 3	Factor 4
var1	0.951	-0.027	0.29	-0.008
var2	0.928	-0.026	0.36	0.001
var3	0.953	0.011	0.24	0.157
var4	0.953	0.011	0.24	0.157
var5	0.953	0.011	0.24	0.157
var6	0.253	0.071	0.592	0.56
var7	0.949	0.07	0.234	0.168
var8	0.549	0.121	0.732	0.239
var9	0.907	0.075	0.353	0.176
var10	0.867	0.303	0.225	0.267
var11	0.906	0.211	0.252	0.191
var12	0.062	0.876	0.184	0.107
var13	0.404	0.66	0.263	0.41
var14	0.957	-0.024	0.271	-0.01
var15	0.91	0.007	0.365	0.161
var16	0.939	0.021	0.242	0.21
var17	0.91	0.138	0.35	0.099
var18	0.893	0.138	0.318	0.211
var19	0.015	0.883	0.056	0.347
var20	0.751	0.054	0.492	0.377
var21	0.889	0.2	0.215	0.283
var22	0.727	0.142	0.227	0.569
var23	0.203	0.222	0.438	0.793
var24	0.44	0.268	0.75	0.304
var25	0.005	0.95	0.067	0.06
var26	0.756	0.364	0.516	-0.008
var27	0.543	0.054	0.766	0.242
var28	0.933	0.189	0.248	0.088
var29	0.867	0.194	0.232	0.372
var30	0.468	0.181	0.805	0.148
var31	0.897	0.233	0.246	0.235
var32	0.604	0.303	0.192	0.642
var33	0.027	0.372	0.096	0.888
var34	0.505	0.439	0.681	0.139
var35	0.923	0.146	0.255	0.149

Table 25. Varimax Rotated Loadings

Factor 1 is loaded heavily by variables 13, 3, 4, and 5. The questionnaire statements corresponding to these variables are:

- i. To what extent are customers involved in project implementation
- ii. How important are opportunities offered by new technology when considering a new system?
- iii. How important is integrating the business unit to other systems within the bank when considering a new system?
- iv. How important is competitive pressure to the bank when considering a new system?

Factor 2 is heavily loaded by variables 25, 19, 12, and 13. The questionnaire statements corresponding to these variables are:

- i. To what extent is communication training emphasized during information system related training?
- ii. How often is learning and skill building used as an organisational change management technique during project implementation at KCB?
- iii. To what extent are the target users involved in project implementation?
- iv. How important is competitive pressure to the bank when considering a new system?

Factor 3 is heavily loaded by variables 30, 27, 24, and 8. The questionnaire statements corresponding to these variables are:

- i. Is resistance of middle management to change a challenge during project implementation phase?
- ii. Is "Budget needed/ higher than expected" a challenge (problems) during project implementation phase?
- iii. How effectively used are internal newsletters as a communication channel
- iv. How important is Increase in employee productivity to the bank when considering a new system

Factor 4 is heavily loaded by variables 33, 23, 32, and 22. The questionnaire statements corresponding to these variables are:

- i. The IT division insists on error-free records
- ii. How often is creating an atmosphere of openness and trust used as an organisational change management technique during project implementation at KCB?
- iii. The IT division department procedures are up-to-date and easy for me to follow.
- iv. How often is building critical mass for change: buy-in and stay-in (Winning mass support) used as a change management technique during project implementation at KCB?

5 SUMMARY AND CONCLUSIONS

The objective of this study was to explore the role of information and communication technology in business process re-engineering.

5.1 Conclusions

5.1.1 Conclusions on survey participants

Ten KCB business units were used as the factor analysis test cases. According to the survey respondents, each of these business units had undergone through a business process re-engineering exercise in the period covering 1995-2002. 43% of the respondents were in the 36-40 year age group. 34% of the respondents have worked at KCB for between 5 and 10 years, with a good majority of them having served in more than one business unit. Over 91% of the respondents had above high school education.

5.1.2 Conclusion of the factor analysis

From the survey, improving the quality of services came out as the single most important factor when considering a new system, while organizational politics was cited as the biggest challenge when implementing a new system at Kenya Commercial Bank. According to the survey findings customer involvement in KCB projects is very low with an involvement rate of 34%. A shared vision is only espoused in 57% of the projects undertaken at KCB.

The correlation matrix indicates a strong relationship between too much focus on technology at the expense of people, a poorly defined scope, organizational culture and implementation challenges. The correlation matrix formed the next stage of the factor analysis that deals with generating the factors.

The final varimax rotation brought out four significant factors.

- i. Factor one is greatly influenced by variables touching on customers, technology, systems integration and competition. Three of these variables are external environment factors. Systems integration is itself driven by availability of technology which re-emphasises the influence of the external environment on factor one. These variables scored poor averages, which indicates that KCB needs to address external environment issues when undertaking business process re-engineering.
- ii. Internal communication, learning, skill building, internal capacity development, and target user involvement heavily loaded factor two. These factors revolve around change management. From the survey analysis these variables have a negative influence on the success of business process initiatives at KCB as they scored poorly in their respective categories.
- iii. Factor three draws its influence from resistance of middle management to change, budgetary issues, effectiveness of internal newsletters as a mode of communication and employee productivity. These variables relate to style of implementation. At the planning level it is imperative that budgetary issues are addressed and effective communication methods are put in place.
- iv. Factor four is influenced by variables that touch on organization readiness. In the survey, organization readiness can be seen through issues relating to atmosphere of openness, building critical mass for change and IT division procedures.

Each of the four factors had strong influence from Information and Communication Technology variables.

5.2 Limitations of the study

Not all participants targeted were able to return their completed questionnaires in time. Their input would have enriched this survey. Given the expansive geographical coverage

of KCB, proximity was a constraint where face-to-face interviews with some respondents would have further enriched this survey.

As with all research, the research had a number of limitations. In the questionnaire, respondents were required to cast their minds back in time in order to answer many of the questions. The ability of the respondents to recall past events could potentially lead to errors. The study also relied on respondent perceptions. Using a survey and perceptual measures is problematic because it introduces the potential for bias.

5.3 Recommendations for further research.

As this study lays the foundation for further work in the area of IT-enabled business process re-engineering, it provides several useful study opportunities for future research. The results suggest that it might be useful to develop a number of comprehensive models. Thus, future research can extend this study to include additional factors such as organizational maturity, IS sophistication, etc, and test a variety of such factors. The survey can be expanded to cover other financial and non-financial institutions.

APPENDIX

QUESTIONNAIRE

Division/Department

Business Unit (Section)

(Please feel free to skip any question)

Section A

1.1 Name (Optional)

Kenya Commercial Bank

IT Division,

7th Floor Kencom House

Nairobi

Dear Colleague,

.Ref: Letter of introduction

I am a postgraduate student in the faculty of commerce, University of Nairobi. I am undertaking a research in 'The role of Information and Technology in Business process re-engineering: The case of Kenya Commercial Bank'. I am appealing for your assistance in completing the attached questionnaire.

The information provided will be treated in strict confidence.

Your assistance will be highly appreciated.

Yours sincerely,

Tom Kahigu

(KCB IT Division/MBA Student)

QUESTIONNAIRE

1.7 How many years have you been employed at KCB?

Less than 1 year

1-4 years

Division/Department

5-10 years

Business Unit (Section)

(Please feel free to skip any question)

1.8 How long have you been at your current posting?

1 Section A

5-10 years

1.1 Name (Optional)

Greater than 15 years

1.2 Gender

Male	
Female	

1.3 Age (Years)

18 - 24	
25 - 30	
31 - 35	
36 - 40	
41 - 45	
46 - 50	
50 +	

1.4 Education Level

High School	
Diploma / University education	
Other (Specify)	

1.5 Have you had any banking training? Yes/No

1.6 On a scale of 1 - 5 how do you rate your IT expertise?

5 - Radical 1 - Incremental

	5	4	3	2	1
--	---	---	---	---	---

1.7 How many years have you been employed at KCB?

Less than 1 year	
1-4 years	
5-10 years	
11-15 years	
Greater than 15 years	

1.8 How long have you been at your current posting?

Less than 1 year	
1-4 years	
5-10 years	
11-15 years	
Greater than 15 years	

1.9 How many sections of KCB have you worked in? _____

2.1 What was the scope of the project?

Within one business unit	
Covering more than one business unit	

2.2 If the project had failed how high were the business risks involved?

5 - Very High - 1 - Low

	5	4	3	2	1
--	---	---	---	---	---

2.3 What type of processes did the project focus on re-engineering?

Core	
Support	

2.4 How were the processes to be reengineered selected?

Those already in trouble	
Available across company	

2.5 What is the level of awareness of Business Process Re-engineering in the Business Unit?

5 - Very High - 1 - Low

	5	4	3	2	1
--	---	---	---	---	---

2 **Section B (Please relate to a project you have been involved in, within the last 7 years)**

2.1 **Project Name (Optional)**

2.2 **What was the project starting point?**

An existing point (Improvement of existing system)	
A clean slate (A new system)	

2.3 **Who initiated the project?**

Senior level management	
Middle level management	
Other members of staff	

2.4 **What was the scope of the project?**

Within one business unit	
Traversing more than one business unit	

2.5 **If the project had failed how high were the business risks involved?**

5 – Very High 1 – Low

	5	4	3	2	1
--	---	---	---	---	---

2.6 **What type of processes did the project focus on re-engineering?**

Core	
Support	

2.7 **How were the processes to be reengineered selected?**

Those already in trouble	
Trouble seen coming	

2.8 **What is the level of awareness of Business Process Re-engineering in the Business Unit?**

5 – Very High 1 – Low

	5	4	3	2	1
--	---	---	---	---	---

2.9 On a scale of 1 – 5 how do you rate changes that were required in other business units as a result of changes in your unit?

5 – Big changes 1 – No changes

	5	4	3	2	1
--	---	---	---	---	---

2.10 Is your business unit involved in other change initiatives (project) or is one anticipated soon?

Yes	
No	

If yes please explain _____

Improving quality of service					
Integrating the business unit to other systems within the bank					
Extending the functions of an existing system					
Active pursuit of RCB strategic plan					
Opportunities offered by new technology					
Conforming to an external requirement (statutory, supplier, regulatory requirement)					
Competitive pressure					
Problem recognized in business process					
Other (Please specify)					

2.11 To what extent are the following involved in project implementation?

	Very Often	Often	Occasionally	Seldom	Never
Senior management					
Project users					
IT Division					
Customers					
Shareholders					
Competitive division					
Customer service					
Human resources department					
Other (Please specify)					

3 Section C (KCB in General)

3.1 On a scale of 1 – 5 how can you describe changes in IT systems that have occurred at KCB in the last 7 years?

5 – Radical(Rapid) 1 – Incremental

	5	4	3	2	1
--	---	---	---	---	---

3.2 In your opinion how important are the following factors to the bank when considering a new system?

5 = Very important 1 = Not important	5	4	3	2	1
Reducing processing time					
Increase in employee productivity					
Improving quality of service					
Integrating the business unit to other systems within the bank					
Extending the functions of an existing system					
Active pursuit of KCB strategic plan					
Opportunities offered by new technology					
Conforming to an external requirement (statutory, supplier, regulator requirement)					
Competitive pressure					
Problem recognized in business process					
Other (Please specify)					

3.3 To what extent are the following involved in project implementation?

	Very Often	Often	Occasionally	Seldom	Never
Senior management					
Target users					
IT Division					
Customers					
Shareholders					
Marketing division					
Customer service					
Human resources department					
Other (Please specify)					

3.4 How frequently are the following tenets practiced?

	Very Often	Often	Occasionally	Seldom	Never
A shared vision with every project. e.g. "we want to have the most innovative products".					
An 'as is' (current state) analysis is done before embarking on a new system?					
A strategy is defined on how to reach the 'to be' (target) situation outlined in the vision?					
A pilot group for testing the new scenario is usually established before the new system is implemented?					

3.5 What changes are required to successfully implement an information system in a typical KCB business unit?

5 = Very important 1 = Not important

	5	4	3	2	1
Reengineering/Redefinition of processes (e.g. approaches, workflow changes)					
Cultural changes (e.g. change in communication techniques to a more open communication and collaboration culture)					
Empowering of people / teams (e.g. ATM center has direct access to debit card merchants)					
Changes in the organisational model (e.g. removing of layers of hierarchy to more flatter structures)					
Other (Please specify)					

3.6 In your opinion how often are the following organisational change management techniques used during project implementation at KCB?

	Very Often	Often	Occasionally	Seldom	Never
Early involvement of people being affected					
Establishing a concept to regularly communicate with people involved					
Establishing a (shared and motivating) vision					
Create an atmosphere of openness and trust					
Planning, realising and celebrating short term wins (to build confidence)					
Aligning and mobilising team leaders					
Coaching of people involved					
Build a critical mass for change: buy-in and stay-in (Winning mass support)					
Vocal and visible support of senior management (Walking the talk)					
Dealing with resistance					
Facilitate learning/skill building (to acquire new behaviour)					
Feedback (i.e. through employee survey, customer inquiry)					
Establishing a sense of urgency					
Empowering people/teams to act on the vision defined					
Institutionalise new approaches					
Hiring, promoting, developing employees who can implement the vision					
Changing reward systems to support the change initiative					
Others (Specify)					

3.7 In your opinion, how effectively are the following channels of communication used in KCB projects?

5 = Very effective 1 = Not effective

	5	4	3	2	1
Workshops					
Intranet (Web site, internal web pages)					
Notice Board					
e-mail					
Internal newsletter					
Other (Please specify)					

3.8 In your opinion, to what extent are the following areas emphasized during information system related training at KCB?

	Very Often	Often	Occasionally	Seldom	Never
Software training (Functionality)					
Skill building regarding the information system vision (new process training)					
Communication Training					
Training in team development, team working					
Training in conflict management, group dynamics					
Others (Please specify)					

3.9 At KCB what are the main challenges (problems) during project implementation phase?

5 = Very important 1 = Not important

	5	4	3	2	1
Not enough support from senior management					
Barriers between departments					
Focus too much on technological aspects, too little focus on people					
Resistance of middle management to change					
Scope not well defined, project is oversized					
Resistance of users to change					
Time for implementation needed, longer than expected					
Not enough resources available (e.g. Technical expertise within KCB)					
Project does not have appropriate priority					
Technological limitations (performance/missing functionality)					
Organisation and procedures are not adapted to the new situation (technological and organisational integration on different levels)					
Availability of people from implementation team					
Budget needed, higher than expected					
Intercultural problems (i.e. language barriers)					
Organisational politics					
Others (Please Specify)					

3.11 In your opinion to what extent are the following performance improvements realized from project initiatives at KCB (please tick)

3.10 How would you rate the services offered by the IT division?

5 = Strongly Agree 1 = Strongly Disagree

	5	4	3	2	1
The department offers comprehensive and effective training.					
The department makes me aware of all rules and regulations affecting my work					
The quality of work performed is excellent.					
My work is performed right the first time.					
My work is performed at the time promised.					
The staff is never too busy to respond to me promptly					
My problems are addressed quickly.					
The staff shows a sincere interest in resolving my problems.					
The staff has knowledge to answer my questions.					
The staff is consistently polite, considerate, and friendly.					
I have no doubts about the services I will receive					
The staff tells me exactly when services will be performed.					
The staff keeps me informed on the status of the work.					
The staff is interested in what I say and listen to me.					
The staff finds out my needs and tries to fit their services to my needs.					
The department procedures are up-to-date and easy for me to follow.					
The department insists on error-free records.					
The services are improved continuously.					
Others (Please Specify)					

3.11 In your opinion to what extent are the following performance improvements realized from project initiatives at KCB (please tick)

5 = High 1 = Low

	5	4	3	2	1
Reduction in costs					
Improved throughput					
Improvement in quality					
Customer satisfaction					
Employee productivity					
Others (Specify)					

3.12 To what extent are the following negative effects of project implementation felt at KCB (please tick)

5 = High 1 = Low

	5	4	3	2	1
Disruption of business					
Decrease in employee morale					
Costly					
Others (Specify)					

3.13 If you were to carry out a project today, what would you do differently?

.....

Date

Thank you very much.

Tables

Question No.	Questionnaire Statement	Mean	Mode	Standard Deviation
1	Improving quality of service	4.83	5	0.379378
2	Reducing processing time	4.64	5	0.690262
3	Opportunities offered by new technology	4.59	5	0.494649
4	Integrating the business unit to other systems within the bank	4.59	5	0.494649
5	Competitive pressure	4.59	5	0.494649
6	Conforming to an external requirement (statutory/ supplier/ regulator requirement)	4.52	5	0.71051
7	Active pursuit of KCB strategic plan	4.42	4	0.496087
8	Increase in employee productivity	4.33	5	0.702869
9	Problem recognized in business process	4.32	4	0.654073
10	Extending the functions of an existing system	3.6	3	0.811647
11	Senior management	3.85	4	0.713282
12	IT Division	3.42	4	1.203495
13	Target users	3.32	3	0.647716
14	Marketing division	2.74	3	1.20119
15	Human resources department	2.49	2	1.122013
16	Customer service	2.41	3	0.950913
17	Shareholders	2.53	4	1.297954
18	Customers	1.75	2	0.889008
19	A pilot group for testing the new scenario is usually established before the new system is implemented?	3.34	4	1.13416
20	An 'as is' (current state) analysis is done before embarking on a new system?	2.54	2	1.230489
21	A strategy is defined on how to reach the 'to be' (target) situation outlined in the vision?	2.72	3	1.199717
22	A shared vision with every project. e.g. "we want to have the most innovative products?."	2.89	3	1.00669
23	Cultural changes (e.g. change in communication techniques to a more open communication and collaboration culture)	4.81	5	0.393729
24	Reengineering/Redefinition of processes (e.g. approaches/ workflow changes)	4.48	5	0.691347
25	Empowering of people / teams	4.36	5	0.827742
26	Changes in the organisational model	4.19	4	0.60309
27	Aligning and mobilising team leaders	3.15	3	0.806925
28	Facilitate learning/skill building (to acquire new behaviour)	3.53	3	0.752524
29	Coaching of people involved	3.01	3	0.926461
30	Establishing a concept to regularly communicate with people involved	2.57	3	0.953049
31	Establishing a (shared and motivating) vision	2.52	3	0.99222
32	Vocal and visible support of senior management (Walking the talk)	2.49	4	1.180902
33	Hiring/ promoting/ developing employees who can implement the vision	2.52	3	0.99222

Question No.	Questionnaire Statement	Mean	Mode	Standard Deviation
34	Feedback (i.e. through employee survey/ customer inquiry)	2.52	3	0.909631
35	Empowering people/teams to act on the vision defined	2.48	3	0.944563
36	Planning/ realising and celebrating short term wins (to build confidence)	2.36	3	0.966157
37	Changing reward systems to support the change initiative	2.58	4	1.142847
38	Institutionalise new approaches	2.76	3	0.925325
39	Establishing a sense of urgency	1.92	2	0.912809
40	Dealing with resistance	2.22	3	0.834818
41	Early involvement of people being affected	1.83	2	0.76501
42	Build a critical mass for change: buy-in and stay-in (Winning mass support)	2.27	3	0.830535
43	Create an atmosphere of openness and trust	2.29	3	0.828693
44	e-mail	3.36	4	1.197219
45	Internal newsletter	3.96	4	0.743574
46	Workshops	3.05	5	1.553665
47	Video	3	3	0
48	Intranet (Web site/ internal web pages)	2.35	2	1.291716
49	Notice Board	2.44	3	0.971096
50	Software training (Functionality)	3.28	4	1.201977
51	Skill building regarding the information system vision (new process training)	2.9	4	1.059166
52	Communication Training	3.17	3	0.374766
53	Training in team development/ team working	3.16	4	1.0073
54	Training in conflict management/ group dynamics	2.82	3	0.7934
55	Organisational politics	4.1	5	1.338937
56	Time for implementation needed/ longer than expected	3.91	5	1.203059
57	Budget needed/ higher than expected	4.46	5	0.681561
58	Organisation and procedures are not adapted to the new situation (technological and organisational integration on different levels)	4.03	4	0.678377
59	Technological limitations (performance/missing functionality)	3.68	4	1.118755
60	Focus too much on technological aspects/ too little focus on people	3.88	3	0.876308
61	Resistance of middle management to change	3.85	4	0.55217
62	Barriers between departments	3.51	5	1.338003
63	Resistance of users to change	3.54	5	1.260561
64	Not enough support from senior management	3.07	4	1.549621
65	Project does not have appropriate priority	3.5	3	1.126112
66	Scope not well defined/ project is oversized	3.6	3	0.670876
67	Not enough resources available (e.g. Technical expertise within KCB)	2.93	2	1.513545
68	Availability of people from implementation team	2.52	2	1.37409
69	Intercultural problems (i.e. language barriers)	2.39	2	1.475197

Question No.	Questionnaire Statement	Mean	Mode	Standard Deviation
70	The staff has knowledge to answer my questions.	3.09	4	1.049549
71	The quality of work performed is excellent.	2.36	2	1.12575
72	My work is performed at the time promised.	2.35	2	1.111647
73	I have no doubts about the services I will receive	2.67	4	1.212859
74	The services are improved continuously.	2.64	3	1.28204
75	The staff shows a sincere interest in resolving my problems.	3.07	4	1.252775
76	My work is performed right the first time.	2.21	2	1.046566
77	The staff is consistently polite/ considerate/ and friendly.	2.46	2	1.142869
78	The department offers comprehensive and effective training.	2.73	3	1.316983
79	The staff keeps me informed on the status of the work.	2.46	3	1.034813
80	The staff tells me exactly when services will be performed.	2.4	3	1.071587
81	The staff finds out my needs and tries to fit their services to my needs.	2.65	4	1.175293
82	The staff is never too busy to respond to me promptly	2.79	4	1.114855
83	My problems are addressed quickly.	2.24	2	1.051241
84	The staff is interested in what I say and listen to me.	2.95	3	0.904962
85	The department procedures are up-to-date and easy for me to follow.	2.05	3	0.828856
86	The department makes me aware of all rules and regulations affecting my work	2.06	2	1.056379
87	The department insists on error-free records.	2.24	3	0.834541
88	Improved throughput	2.98	4	1.29082
89	Customer satisfaction	3.48	3	0.7371
90	Employee productivity	3.19	3	1.169039
91	Improvement in quality	3.11	3	1.145664
92	Reduction in costs	3.05	3	0.947631
93	Costly	3.73	4	0.595019
94	Decrease in employee morale	2.83	4	1.469142
95	Disruption of business	2.38	3	0.929953

Table 119. Statements in the questionnaire, Mean, Mode, Standard deviation

Connection Name	var1	var2	var3	var4	var5	var6	var7	var8	var9	var10	var11	var12	var13	var14	var15	var16	var17	var18
var1	1	0.99	0.975	0.975	0.975	0.452	0.968	0.717	0.96	0.879	0.927	0.103	0.437	0.998	0.968	0.96	0.961	0.934
var2	0.99	1	0.971	0.971	0.971	0.457	0.963	0.759	0.965	0.877	0.927	0.105	0.451	0.989	0.976	0.958	0.965	0.937
var3	0.975	0.971	1	1	1	0.481	0.982	0.723	0.97	0.915	0.959	0.137	0.529	0.976	0.989	0.998	0.962	0.95
var4	0.975	0.971	1	1	1	0.481	0.982	0.723	0.97	0.915	0.959	0.137	0.529	0.976	0.989	0.998	0.962	0.95
var5	0.975	0.971	1	1	1	0.481	0.982	0.723	0.97	0.915	0.959	0.137	0.529	0.976	0.989	0.998	0.962	0.95
var6	0.452	0.457	0.481	0.481	0.481	1	0.472	0.634	0.522	0.507	0.508	0.313	0.547	0.431	0.535	0.508	0.49	0.516
var7	0.968	0.963	0.982	0.982	0.982	0.472	1	0.758	0.991	0.951	0.959	0.18	0.553	0.969	0.97	0.977	0.974	0.973
var8	0.717	0.759	0.723	0.723	0.723	0.634	0.758	1	0.839	0.767	0.73	0.271	0.575	0.708	0.794	0.727	0.814	0.823
var9	0.96	0.965	0.97	0.97	0.97	0.522	0.991	0.839	1	0.947	0.95	0.199	0.572	0.959	0.976	0.966	0.982	0.981
var10	0.879	0.877	0.915	0.915	0.915	0.507	0.951	0.767	0.947	1	0.958	0.383	0.685	0.88	0.906	0.917	0.947	0.959
var11	0.927	0.927	0.959	0.959	0.959	0.508	0.959	0.73	0.95	0.958	1	0.319	0.634	0.929	0.951	0.96	0.956	0.945
var12	0.103	0.105	0.137	0.137	0.137	0.313	0.18	0.271	0.199	0.383	0.319	1	0.885	0.105	0.151	0.152	0.237	0.243
var13	0.437	0.451	0.529	0.529	0.529	0.547	0.553	0.575	0.572	0.685	0.634	0.685	1	0.436	0.541	0.554	0.567	0.606
var14	0.998	0.989	0.976	0.976	0.976	0.431	0.969	0.708	0.959	0.88	0.929	0.105	0.436	1	0.967	0.961	0.96	0.933
var15	0.968	0.976	0.989	0.989	0.989	0.535	0.97	0.794	0.976	0.906	0.951	0.151	0.541	0.967	1	0.988	0.967	0.953
var16	0.96	0.958	0.998	0.998	0.998	0.508	0.977	0.727	0.966	0.917	0.96	0.152	0.554	0.961	0.988	1	0.955	0.947
var17	0.961	0.965	0.962	0.962	0.962	0.49	0.974	0.814	0.982	0.947	0.956	0.237	0.567	0.96	0.967	0.955	1	0.975
var18	0.934	0.937	0.95	0.95	0.95	0.516	0.973	0.823	0.981	0.959	0.945	0.243	0.567	0.96	0.967	0.955	1	0.975
var19	0	0.009	0.081	0.081	0.081	0.274	0.15	0.259	0.186	0.404	0.273	0.753	0.696	0	0.953	0.947	0.975	1
var20	0.847	0.873	0.907	0.907	0.907	0.688	0.884	0.841	0.911	0.861	0.886	0.227	0.843	0.843	0.937	0.923	0.888	0.894
var21	0.899	0.897	0.931	0.931	0.931	0.502	0.964	0.769	0.959	0.976	0.942	0.284	0.629	0.9	0.922	0.932	0.956	0.979
var22	0.744	0.75	0.842	0.842	0.842	0.658	0.843	0.706	0.844	0.859	0.845	0.27	0.739	0.745	0.829	0.868	0.806	0.84
var23	0.326	0.346	0.425	0.425	0.425	0.725	0.45	0.636	0.498	0.55	0.517	0.364	0.66	0.299	0.473	0.466	0.441	0.507
var24	0.818	0.874	0.853	0.853	0.853	0.706	0.655	0.866	0.725	0.726	0.718	0.422	0.644	0.607	0.731	0.669	0.732	0.726
var25	0	0.005	0.051	0.051	0.051	0.172	0.094	0.183	0.104	0.305	0.237	0.794	0.678	0	0.054	0.067	0.142	0.152
var26	0.96	0.881	0.85	0.85	0.85	0.524	0.862	0.812	0.89	0.873	0.886	0.433	0.682	0.855	0.88	0.844	0.907	0.885
var27	0.723	0.769	0.736	0.736	0.736	0.706	0.741	0.962	0.819	0.724	0.726	0.249	0.572	0.722	0.809	0.743	0.799	0.795
var28	0.956	0.95	0.961	0.961	0.961	0.457	0.972	0.736	0.963	0.959	0.969	0.295	0.575	0.958	0.95	0.953	0.981	0.959
var29	0.88	0.881	0.939	0.939	0.939	0.572	0.951	0.763	0.947	0.964	0.948	0.295	0.683	0.881	0.932	0.948	0.943	0.956
var30	0.87	0.729	0.67	0.67	0.67	0.669	0.663	0.858	0.733	0.665	0.708	0.361	0.599	0.658	0.751	0.676	0.732	0.716
var31	0.918	0.915	0.955	0.955	0.955	0.53	0.966	0.75	0.959	0.958	0.963	0.328	0.715	0.919	0.946	0.958	0.95	0.951
var32	0.613	0.627	0.713	0.713	0.713	0.613	0.749	0.682	0.756	0.844	0.794	0.385	0.708	0.614	0.714	0.738	0.734	0.805
var33	0.03	0.047	0.197	0.197	0.197	0.539	0.225	0.372	0.249	0.404	0.281	0.457	0.614	0.03	0.211	0.25	0.2	0.305
var34	0.654	0.693	0.661	0.661	0.661	0.585	0.695	0.918	0.769	0.777	0.735	0.503	0.697	0.646	0.726	0.666	0.8	0.792
var35	0.949	0.947	0.974	0.974	0.974	0.491	0.964	0.781	0.953	0.923	0.977	0.266	0.622	0.949	0.965	0.972	0.952	0.939
	var1	var2	var3	var4	var5	var6	var7	var8	var9	var10	var11	var12	var13	var14	var15	var16	var17	var18

var19	var20	var21	var22	var23	var24	var25	var26	var27	var28	var29	var30	var31	var32	var33	var34	var35
0	0.847	0.899	0.744	0.305	0.618	0	0.96	0.729	0.956	0.88	0.67	0.918	0.613	0.03	0.654	0.948
0.009	0.873	0.897	0.75	0.346	0.674	0.005	0.881	0.769	0.95	0.881	0.729	0.915	0.627	0.047	0.693	0.947
0.081	0.907	0.931	0.842	0.425	0.653	0.051	0.85	0.736	0.961	0.939	0.67	0.955	0.713	0.197	0.661	0.974
0.081	0.907	0.931	0.842	0.425	0.653	0.051	0.85	0.736	0.961	0.939	0.67	0.955	0.713	0.197	0.661	0.974
0.274	0.888	0.502	0.658	0.725	0.706	0.172	0.524	0.706	0.457	0.572	0.669	0.53	0.613	0.539	0.585	0.491
0.15	0.884	0.964	0.843	0.45	0.655	0.094	0.862	0.741	0.972	0.951	0.663	0.966	0.749	0.225	0.695	0.964
0.259	0.841	0.789	0.706	0.636	0.866	0.163	0.819	0.962	0.736	0.763	0.858	0.75	0.682	0.372	0.918	0.718
0.166	0.911	0.959	0.844	0.498	0.725	0.104	0.89	0.819	0.963	0.947	0.733	0.959	0.756	0.249	0.789	0.953
0.404	0.861	0.976	0.859	0.55	0.726	0.305	0.873	0.724	0.959	0.964	0.665	0.958	0.844	0.404	0.777	0.923
0.273	0.886	0.942	0.845	0.517	0.718	0.237	0.886	0.726	0.969	0.948	0.708	0.963	0.794	0.281	0.735	0.977
0.753	0.227	0.284	0.27	0.364	0.422	0.794	0.433	0.249	0.295	0.295	0.361	0.329	0.385	0.457	0.503	0.266
0.696	0.843	0.829	0.739	0.66	0.844	0.678	0.682	0.572	0.575	0.683	0.599	0.715	0.708	0.614	0.697	0.622
0	0.843	0.9	0.745	0.299	0.607	0	0.855	0.722	0.958	0.881	0.658	0.919	0.614	0.03	0.646	0.949
0.087	0.937	0.922	0.839	0.473	0.731	0.054	0.88	0.809	0.95	0.932	0.751	0.946	0.714	0.211	0.726	0.965
0.106	0.923	0.932	0.866	0.466	0.669	0.067	0.844	0.743	0.953	0.948	0.678	0.958	0.738	0.25	0.666	0.972
0.227	0.888	0.956	0.806	0.441	0.732	0.142	0.907	0.799	0.981	0.943	0.732	0.95	0.734	0.2	0.8	0.952
0.242	0.894	0.979	0.84	0.507	0.726	0.152	0.885	0.795	0.959	0.956	0.716	0.951	0.805	0.308	0.782	0.939
1	0.203	0.326	0.326	0.488	0.409	0.837	0.347	0.18	0.241	0.346	0.243	0.3	0.527	0.639	0.531	0.185
0.203	1	0.869	0.899	0.669	0.845	0.128	0.848	0.87	0.857	0.92	0.827	0.899	0.775	0.431	0.772	0.886
0.326	0.869	1	0.859	0.532	0.693	0.205	0.849	0.73	0.952	0.973	0.656	0.952	0.853	0.382	0.749	0.927
0.326	0.899	0.859	1	0.717	0.688	0.205	0.718	0.741	0.803	0.926	0.62	0.898	0.841	0.577	0.651	0.831
0.488	0.669	0.532	0.717	1	0.723	0.306	0.463	0.631	0.406	0.603	0.633	0.534	0.79	0.804	0.592	0.472
0.409	0.845	0.693	0.688	0.723	1	0.314	0.819	0.856	0.69	0.724	0.326	0.699	0.692	0.464	0.88	0.679
0.837	0.128	0.205	0.205	0.306	0.314	1	0.415	0.113	0.184	0.217	0.237	0.267	0.331	0.401	0.459	0.177
0.347	0.848	0.849	0.718	0.463	0.818	0.415	1	0.81	0.892	0.838	0.843	0.891	0.658	0.196	0.877	0.879
0.19	0.87	0.73	0.741	0.631	0.666	0.113	0.81	1	0.725	0.753	0.871	0.756	0.632	0.333	0.881	0.723
0.241	0.857	0.952	0.803	0.406	0.69	0.184	0.892	0.725	1	0.939	0.672	0.955	0.728	0.199	0.739	0.956
0.346	0.92	0.973	0.926	0.603	0.724	0.217	0.838	0.753	0.939	1	0.672	0.963	0.862	0.449	0.748	0.932
0.243	0.827	0.656	0.62	0.633	0.926	0.237	0.843	0.871	0.672	0.672	1	0.695	0.609	0.277	0.842	0.721
0.3	0.899	0.952	0.898	0.534	0.699	0.267	0.891	0.756	0.955	0.963	0.695	1	0.79	0.328	0.742	0.964
0.527	0.775	0.853	0.841	0.79	0.692	0.331	0.658	0.632	0.728	0.862	0.609	0.79	1	0.712	0.68	0.75
0.639	0.431	0.382	0.577	0.804	0.464	0.401	0.196	0.333	0.199	0.449	0.277	0.328	0.712	1	0.382	0.22
0.531	0.772	0.749	0.651	0.592	0.68	0.459	0.877	0.881	0.739	0.748	0.842	0.742	0.68	0.382	1	0.699
0.185	0.896	0.927	0.831	0.472	0.679	0.177	0.879	0.723	0.956	0.932	0.721	0.964	0.75	0.22	0.699	1

Correlation Matrix

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