CONTRIBUTION OF INFORMATION TECHNOLOGY IN BUSINESS PROCESS REENGINEERING

THE CASE OF KENYA POWER AND LIGHTING COMPANY LTD

A PROJECT

BY

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To my dear mother, Esther, and loving wife, Martha.

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APPROVAL OF PROJECT REPORT

DECLARATION

This project report is my own original work and has not been submitted in any other university registration

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This report has been submitted with our approval as university supervisors

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ABSTRACT

Information Technology (IT) as applied to Business Process Reengineering (BPR) at KPLC was implemented at the height of demands for better services at the giant KPLC. The company took up the challenge and converted it into an opportunity and has realized its intended objectives according to this research. The contribution of IT in Business Process reengineering has been established in this research and never before has service delivery been so efficient with available real time, on line information as the case now at KPLC. Specific panel data was collected and analyzed by statistical tools, both descriptive and the student **t** test statistic, which attested to the improvement of the speed and efficiency of general service delivery for most of the performance indicators under consideration. Many Service providers, and other utilities, where customers come first, and speed of service delivery a key indicator, will find, from this research and others conducted elsewhere, that IT enabled BPR is the answer to their success and survival.

TABLE OF CONTENTS

Dedication.....i
Acknowledgements.....ii
Declaration.....iii
Abstract.....iv
Table of contents.....v
List of Tables.....vii
List of Figures.....ix
List of Abbreviations.....x

CHAPTER ONE

INTRODUCTION
1.1 Background.....1
1.2 Application of IT to BPR at KPLC.....4
1.2.1 Intergrated Customer Service.....5
1.2.2 Design and Construction System.....6
1.3 Problem statement.....6
1.4 Objectives of the study.....7
1.5 Hypotheses.....7
1.6 Significance of the study.....8
1.7 The scope of the study.....8
1.8 Definition of terms.....9

CHAPTER TWO

LITERATURE REVIEW
2.1 Business Process Reengineering.....10
2.1.1 Process.....12
2.1.2 Fundamental.....12
2.1.3 Radical.....13
2.1.4 Dramatic.....13
2.2 Theoretical framework.....15
2.3 Conceptual framework.....17
2.4 The role of information technology in Reengineering.....18

CHAPTER THREE

RESEARCH METHODOLOGY
3.1The research design.....25
3.2 Population.....25
3.3 Sampling design.....26
3.5 Data collection.....28
3.5.1 Source of Data.....28

3.5.2 Type of data collected.....28
3.5.3 Data collection method.....29
3.6 Data analysis and presentation.....30

CHAPTER FOUR

RESULTS AND DISCUSSION
4..1 Data extraction and Organization.....31
4.2 Customer data analysis.....32
4.3 Staff data analysis.....39
4.4 Student t test on staff data before and after 1997. 44
4.5 Student t test on customers data..... 46

CHAPTER FIVE

SUMMARY AND RECOMMENDATIONS
5.1 Summary.....49
5.3 Conclusions.....50
5.2 Limitations of the study.....50
5.4 Suggestions for further research.....51

BIBLIOGRAPHY 52
APPENDICES

LIST OF TABLES

Table 1 Similarities between TQM and BPR.....14

Table 2 Strategic impact of existing system.....21

Table 3 Resource allocation priorities.....22

Table 4 Changes brought by IT.....24

Table 5 Customer distribution.....27

Table 6 Frequency distribution of time to get bills after meter reading before 1997 and after 1997 32

Table 7 Frequency distribution of time to resolve complaint made by telephone before 1997 and after 1997.....33

Table 8 Frequency of distribution of time to resolve complaints made by personal visits before 1997 and after 1997.....34

Table 9 Time taken to resolve complaints made by writing through post office.....35

Table 10 Frequency distribution of accuracy of bills before 1997 and After 1997.....36

Table 11 Frequency distribution of time for emergency response Before 1997 and after 1997.....37

Table 12 Frequency distribution of time taken to reconnect services After payment.....38

Table 13 Construction and metering.....39

Table 14 New customers applications processed per day.....40

Table 15 Waiting time.....41

Table 16 Quotation and design time 42

Table 17 Time taken to open customer file.....43

Table 18 Staff paired t test results.....44

Table 19 Customer paired t test results.....46

LIST OF FIGURES

Figure 1 Contribution of Information Technology to Business Process Reengineering.....17

LIST OF ABBREVIATIONS

BPR	Business Process Reengineering
DCS	Design and Construction System
ERB	Electricity Regulatory Board
ICS	Integrated Customer Service
ISP	Institutional Strengthening Project
IT	Information Technology
KENGEN	Kenya Electricity Generating Company Ltd
KPLC	Kenya Power and Lighting Company Ltd
TQM	Total Quality Management

CHAPTER ONE: INTRODUCTION

1.0 Background

Sometime in 1991, the Bretton Woods institutions (International Monetary Fund and World Bank) suspended and withheld financial assistance to Kenya, citing among other things, massive corruption and poor political and economic governance. This followed a near collapse of most social services (roads, power, water etc) and any others that relied on such funding.

Structural Adjustment Programs (SAPs) were immediately put into place to help revive the economy, but it was imperative that there be a radical public sector reform especially the parastatals (Financial Times, May 10th 1994). In 1990 the State Corporation Act was amended so as to enhance the accountability, economic and financial development of the parastatal sector. In 1991, the Parastatal Reform Commission was formed (Kenya Parastatal Reform Action Plan, 1991), to regulate the corporate and economic governance of state parastatals.

For donor aid to resume the donor community put up conditions, which the Kenyan Government had to meet, and these were, inter alia:

- The sale of Telkom Kenya,
- The restructuring of the power sub sector, to allow for private sector participation in power generation,

- Restructure Kenya Power and Lighting Company (KPLC) to be more efficient and customer focused.

  In 1996, the government of Kenya went ahead and initiated the separation that saw the creation of KENGEN (Kenya Electricity Generating Company), which was charged with the responsibility of operating existing government owned generating facilities formerly managed by the larger KPLC

  On the other hand KPLC was charged with the responsibility of buying power in bulk from all generating companies and distributing it to the customers. This also saw the creation of a regulator, the Electricity Regulatory Board (ERB) to moderate the operating relationships between these stakeholders, viz, the KPLC, KenGen, IPPs and the Customers.

KPLC was hence charged with the delicate responsibility of distributing power to the Kenyan public, and found it prudent to refocus its attention and critically analyse its tasks and processes to ensure they meet customer expectations.

Prior to this, KPLC operating systems were manual, too much paper work, poor and often unreliable inter Regional communication across this geographically spaced utility and information retrieval was a very tedious task. Crucial operations that touch directly on the customer were all manually handled and complaints of meter reading errors, consequent inflated bills, and the long time it took to resolve such cases in dispute was doing the KPLC a lot of damage. The customer base also continued to grow at a rate of approximately 3% per annum,

as industry and ordinary customers realised the convenience of use of the more cleaner and environment friendly electric power, and more customers continued being connected to the grid through the government funded Rural Electrification programme.

Most information crucial to company operations and of legal nature were stored in the microfilms, whose processing equipment also became obsolete as some were being replaced in the market by the more versatile scanners. Service delivery to customers of all cadres was thus compromised as manual systems became more unreliable and customers demanded better services.

To be able to respond to this challenges, KPLC commenced a massive Re-engineering exercise under the auspices of a department that was formed and named, the Institutional Strengthening Project, (ISP), by the end of 1996. This process, which describes the efforts in process and tasks improvement by use of IT, is termed as Business Process Reengineering (BPR). KPLC and other modern organisations must simply think about IT and BPR so that they can effectively accommodate varying issues, among them:

- Customers, who now know their rights and demand for services that reflect fair value for their money.

- Competitors, who are on the look out to take advantage of new opportunities created especially by technological advancements, who could drive others not equally prepared out of business,
- Change, to which organisations must continue to adapt and prepare for, especially that related to technology.

Towards this end, KPLC had to invest large financial resources in information Technology (IT) and also in appropriate staff training so as to facilitate the reengineering programme, which was undertaken almost exclusively by her own staff, albeit with minimal external oversights.

1.2 Application of Information Technology to Business Process Re-engineering at Kenya Power and Lighting Company

The Institutional Strengthening Project (ISP) team and a small group of consultants from Union Fenosa-Spain, critically analysed the work processes and tasks that various sections and departments perform. They analysed workflows, existing structures and infrastructure, existing challenges, strengths, skills etc. They used all inputs and information on work procedures from existing employees, who were the users of the systems then, and who made valuable contributions in foras arranged by ISP.

Arising out of these, appropriate IT systems were developed, but for the purpose of this research, we shall briefly look at the following:

1.2.1 Integrated Customer Service (ICS).

This is the system concerned with the management of existing customers, and general customer service. Processes relating to this function were carried out manually before 1996. Prior to this period, meter readings were carried out by use of bound meter sheets. This would be sent by courier service every evening, to the Central office in Nairobi for punching and processing. This method was prone to delays, errors due to clerical mistakes in recording and processing. The process would take upto 14 days before a bill is produced and sent to a customer. Customer complaints were addressed long after one or so months due to unavailability of information.

The current system is automated and readers use electronically programmed hand held sets for readings. The readings are downloaded at the local office server, electronically transmitted to the main server and an account billed within two days. Human errors are completely minimised, bills are sent on time, and complaints are handled faster though the on-line services at the commercial offices countrywide.

1.2.2 Design and Construction System (DCS)

This is the system concerned with new supply applications. Prior to BPR, the system was all manual and customers had to go through a bureaucracy before they obtain a quotation, pay and their job executed.

This has been improved by IT through the use of on-line designs and approvals for all profiles. It now takes about 30 days from application to connection, compared to about 90 days before the process, unless there are other legal impediments. Tasks formerly carried out by many employees were merged and other unnecessary routines discarded.

1.3 Problem Statement

As better standards of living, envisaged commercial and industrial growth are being embraced (especially for job creation), KPLC, being the sole distributor of electrical energy necessary for this, is faced with a challenge of providing an efficient, albeit cost effective power supply to customers. Efforts to achieve this were initiated through company restructuring, and a comprehensive Business Process Re-engineering, through the Institutional Strengthening Project. This saw the company invest large sums of money towards the acquisition of the

appropriate IT and training of staff. The contribution of IT has not so far come out clearly as a key player in the BPR success.

Therefore the problem can be stated as;

Despite carrying out the Business Process Re-engineering at KPLC, it is not clear how effective the contribution of Information Technology in the Business Process Re-engineering exercise is.

1.4 Objectives.

The main objective of the Research was:

To determine how Information Technology has contributed to the overall success of BPR and improved customer service delivery at KPLC.

Specific Objectives were

1. To explore the extent to which IT and BPR has contributed to better customer services in billing quality and faster complaints resolution.
2. To determine whether or not, the IT enabled BPR has resulted into faster electricity connection times for new customers.

1.5 Hypotheses

1. IT has significantly contributed to better billing quality and customer care at

KPLC.

2. IT has significantly contributed to faster new customer connection at KPLC.

1.6 Significance of the Study.

This study has not been undertaken before in the institution. Therefore this information can provide a framework of analysis of the benefits of IT to organisations experiencing similar changes.

This study is useful to:

(i). Firms that operate public services and intend to improve their customer service delivery by understanding and appreciating the role played by IT in BPR;

(ii). Scholars who may wish to further research in the relatively new areas of IT and BPR;

(iii). Customers to understand the processes that their service providers and utilities are involved in to be able to improve services to their ever changing needs and expectations.

1.7 Scope of the study

The study picked commercial and industrial electricity customers within Nakuru town and its environs. This Zone has four sub zones, and the respondents were

chosen using stratified sampling as discussed in Chapter three. Nakuru town and its environs, was chosen for convenience purposes and to save on costs that go with data gathering. The study also covered KPLC staff involved in new applicants processing.

1.8 Definition of terms

Business Process Reengineering (Hammer and Champy,1993): The radical rethinking of business processes to achieve dramatic improvement in critical contemporary measures of performance such as cost, quality, and speed.

Information Technology: A collection of products and services that turn data into useful, meaningful, accessible information, and consist of computer hardware, software and connectivity, through communication links.

CHAPTER TWO: LITERATURE REVIEW

2.1 Business Process Re-engineering

Business Process Reengineering (BPR) is a management process used to redefine the mission statement, analyse the critical success factors, redesign the organisational structure, and re engineer the critical processes in order to improve customer satisfaction.

Grover, Fiedler and Teng (1994), defines BPR as "the critical analysis and radical design of existing business process to achieve breakthrough improvements in performance measures". Hammer and Champy (1993) define BPR as "the radical rethinking of business processes to achieve dramatic improvement in critical contemporary measures of performance such as cost, quality and speed". Reengineering is not "downsizing". According to Hammer and Stanton (1995). They define reengineering as rethinking work from the ground up in order to eliminate work that is not necessary and to find better ways of doing that, which is desired. Reengineering is not restructuring, it is all about how work is done but not how organization is structured.

Hammer and Champy (1993), "A company that cannot change the way it thinks about information technology cannot reengineer. A company that equates

technology with automation cannot reengineer. Information technology plays an important role in business reengineering, but one that is easily miscast, modern, state of the art information technology is part of any reengineering effort, an essential enabler, since it permits companies to reengineer business processes. The misuse of technology can block reengineering altogether by reinforcing old ways of thinking and old behaviour patterns.

The fundamental error that most companies commit when they look at technology is to view it through lens of their existing processes. They ask, "How can we use these new technological capabilities to enhance or streamline or improve what we are already doing?" Instead they should be asking, "How can we use technology to allow us to do things that we are not already doing?" One of the hardest parts of reengineering lies in recognizing the new, unfamiliar capabilities of technology instead of its familiar ones. This makes it hard to assess and estimate the contributions of such technologies.

Lack of inductive thinking about technology is not only confined to the lay man. Earlier on people thought that the greatest potential for the telephone lay in reducing the loneliness of the farmer's wife. Thomas Edison once said he thought the value of the phonograph, which he invented, was its capability to allow, "dying 'gentlemen' to record their last wishes". The contribution of technology sometimes is misconstrued and in most occasions not linked to the business process success even if it played a part in the reengineering process.

Hammer and Champy (1993), define reengineering as 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. BPR has to do with beginning all over again.

In the foregoing definition it is worth to expound on the four key words mentioned; these are, processes, fundamental, radical and dramatic.

2.1.1 Processes

A business process is a collection of activities that takes one or more kinds of input and creates an output that is of value to the customer (Hammer and Champy, 1993). An example of a process is that of order fulfilment which takes an order as its input and results in delivery of their ordered goods. The delivery of the ordered goods to the customer is the value that the process created. Other processes are undertaken in utilities, providing services like water, power, etc. The complete cycle of delivering a service by a supplier to the customer and related tasks is a process.

2.1.2 Fundamental

People must ask the most basic questions about their companies and how they operate, namely:

- Why do we do what we do?
- Why do we do it the way we do?

Asking these fundamental questions forces people to look at the tacit rules and assumptions that underlie the way they conduct their businesses. Often, these rules turn out to be obsolete, erroneous, or inappropriate.

2.1.3 Radical

Radical redesign refers to getting to the root of things; not making superficial changes but reinventing completely new ways of accomplishing work and tasks.

2.1.4 Dramatic

This word refers to the fact that reengineering is about making quantum leaps in performance and not marginal or incremental improvements (Hammer and Stanton, 1995).

Grover, fiedler and Teng (1994), defines BPR as "critical analysis and radical design of existing business processes to achieve breakthrough improvements in performance measures. They also note that in recent years, increased attention to business processes is largely due to total quality management (TQM). They conclude that TQM and BPR share a cross-sectional orientation.

Davenport (1993) drew the following similarities between TQM and BPR.

Table 1: Similarities between TQM and BPR

	TQM	BPR
Level of change	Dramatic	Radical
Starting point	Existing processes	Clean slate
Frequency of change	One time, continous	Long time, Long
Time required	Short	Long
Participation	Bottom-up	Top-down
Typical scope	Narrow	Broad
Risk	Moderate	High
Primary enabler	Statistical control	Information Technology
Type of change	Cultural	Cultural or structural

Source: Davenport (1993).

Previous research projects (unpublished) in this field at the University of Nairobi, includes that of Thiga J, (1999); Business Process Reengineering a case of KPLC Institutional Strengthening project; and Munyiri S. R, (2000); A survey of the use of Business Process Reengineering in the Kenyan Pharmaceutical manufacturing Industry.

They both have concluded that BPR has had a direct impact in the way firms, especially service providers do business and that the applications of BPR with appropriate IT results into improved efficiency.

2.2 Theoretical Framework

Modern state of the art information technology is part of any reengineering effort. Information Technology influences reengineering, innovation and simplification of processes and tasks. Distance and time can all be shrunk towards zero by use of appropriate technology and efficient communication networks.

Organisational memory as exemplified by a common database can be maintained over time, contributed to and from all parts of the organisation, and made available to a wide variety of authorised users.

IT and BPR changes the nature and degree of interelatedness within an industry and organisation. It is about rejecting conventional wisdom and perceived assumptions of the past as embodied by Adam Smith's industrial paradigm. At the heart of reengineering lies the idea of discontinuous thinking, which involves inventing new approaches to process structure that bear little or no resemblance to those of previous eras.

BPR first came into prominence in 1990. Since its realisation it has attracted attention of both management practitioners and scholars. Hammer and Champy (1993) note that organizations conducted business in a certain way for many years. When rapid and strong changes occurred, they found themselves unable to cope with the new conditions.

Peter Drucker, (1969), cites lack of changes in structure of most large organisations in step with the impressive growth in the economy and technologies. One explanation given for the growth of BPR and it's emerging popularity is that it offers a mechanism to make the changes necessary to fit the emerging competitive environment in which they operate, (Technology Foresight, 1995).

BPR and IT therefore share a commonality in that their success is complimentary and depends largely on identification and design of efficient and effective business systems, which are customer focused. They suggest that businesses cannot survive by just working harder within the existing organisational structures. They must be networked across functions and designed around business processes rather than functional hierarchies (Drucker, 1993; Davenport and Short, 1990)

A key factor alongside the development and adoption of BPR is the application of IT. For his work on Total Quality, Ferrie, (1995), used the concept that for

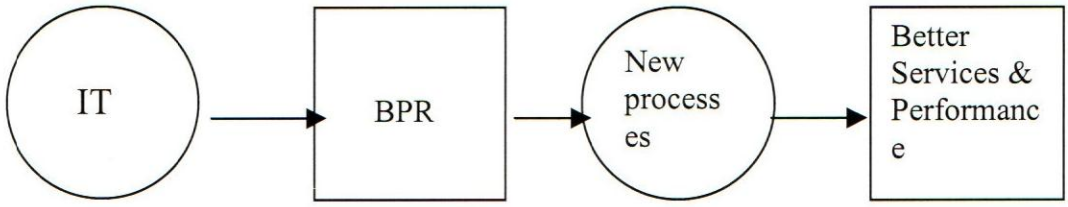
business success which could be measured in terms of growth in value for the shareholders, the three essential ingredients which must be combined, and meshed together by means of IT were Products/services, processes, and people. BPR is therefore a process and tasks oriented, rather than activity oriented program.

2.3 Conceptual Framework

The concept behind IT and BPR is about examining where an organisation is, in respect to service delivery to its customers, where it wants to be, and how to get there.

IT enabled BPR will phase out manual, tedious processes that are both unreliable and inefficient due to difficulties inherent in information retrieval and sharing.
The model below indicates the framework and concept of IT in BPR and the resultant improved services using a simple flow chart.

Fig 1: Contribution of IT to BPR



Source: Author

2.4 The Role of Information Technology in Reengineering

Information Technology has important general-purpose power and ability to manipulate processes and tasks and is therefore considered an 'information Engine'. *It can do to business what the steam Engine did during the industrial* revolution. (Jones M, 1997).

Co-ordination of tasks and processes take up most of an organisation's time and resources, especially with Service organisations and geographically located utilities. Investment in a sound IT system hence comes in handy and effectively reduces the effects of both distance and time to near zero.

Information Technology (IT) is an enabler of reengineering and not the driving force (Simsion G. C, 1994). Motivation for reengineering has to come from the business itself (Hammer and Champy, 1993). A company should not equate IT to automation. Reengineering unlike automation is about innovation. It's all about exploiting the latest capabilities of technology to achieve entirely new goals. The real power of technology is not that it can make the old process work better but that it enables organizations to break old rules and create new ways of working, that is, reengineer.

It is important to view the role of IT from a different perspective with regard to BPR. It's necessary for one to think inductively rather than deductively (Hammer and Champy, 1993). Deductive thinking involves defining problems, seeking and evaluating different solutions to the problems. On the other hand inductive thinking is the ability to first recognize a powerful solution and then seeking the problems it might solve, problems that the company probably does not even know it has.

Simsion G.C (1994), suggest five steps that organizations can take to exploit the strategic opportunities that IT creates. They suggested on five steps to be followed.

(a) Assessing information intensity of each link in each of the company's value chains. Higher intensity implies greater opportunity. If customers or suppliers of a firm are highly dependent on information, or if the service or product is mainly information related, then intensity is high and strategic opportunity is likely to exist.

(b) Determine the role of IT in the industry structure. An organization needs to know how buyers, suppliers and competitors might be affected by and react IT. New strategies may be necessary to retain industry position in some circumstances.

(c) Identify and mark the ways in which IT can create competitive advantage. An organization must analyze how particular links of the value chain might be affected by IT links that represent high cost or critical areas of business activity are targets for the information services manager to focus his or her efforts.

(d) Investigate how IT might spawn businesses. The following factors may provide opportunities for spin-off businesses:

- *Excess computer Capacity*
- Large corporate database
- Special strength in some aspect of IT.

In investigating spin-off businesses, organizations should ask themselves the following three questions:

- What information generated (or potentially generated) by the business could be sold?
- What information – processing capacities exist internally to start a new business?
- Does IT make it feasible to produce new items related to the organizations' current products?

(e) Develop a plan for taking advantage of IT. To take advantage of strategic opportunities that IT presents. One must have a plan that assigns priorities to the

strategic investments that the organization needs to make. The process of making such a plan should be business driven rather than technology driven.

Jones M, (1997), observes that company executives have a duty to carry out a competitive analysis and also assess IT fits in their companies. Towards this goal he produces a matrix that aids them in understanding where a company fits in. The matrix is shown in Figure 1 below in addition a table is attached overleaf to show resource allocation priorities.

Table 2: Strategic Impact of existing Systems

	Low	High
Low	Support	Turnaround
High	Functional	Strategic

Source: Jones, M (1997)

Table 3: Resource Allocation Priorities

Status quo (IT industry) ↓ / Goal of IT expenditure	Growing highly competitive industry	Relatively stable industry known ground rules	Static or declining industry
Rehabilitate and maintain system	1	1	1
Experiment with new technology	2	3	3
Attain competitive advantage	2	2	3
Maintain or regain competitive party	2	3	4
Define return on investments	3	3	4

Source: Jones M, (1997).

Assuming that the change is not dramatic as to revolutionize the industry's overall performance. Note that the numbers indicate the relative attractiveness of the investment with 1 having the highest priority.

In brief IT has changed competition in three ways:

(i) Industry structure and rules of competition have changed.

(ii) Organizations have outperformed their competitors by using IT.

(iii) Organizations have created new businesses by using IT.

Industry structure and rules of competition have changed back because technology has a disruptive power. That is it has the ability to break the rules that limit how we conduct our work. This makes IT critical to companies that are looking for a competitive advantage. Such companies hence need to rethink inductively about technology during the reengineering process.

Table 4 illustrates some of the rules changed by these disruptive information technologies. Hammer and Champy (1993) note that companies successful in BPR already know what rules they wanted to break even when the technology was not at hand yet.

Table 4: Changes brought by IT

Old rule	Disruptive Technology	New Rule
Only experts can perform complex work	Expert systems	A generalist can do the work of an expert
Information can appear in only on place at one time	Shared databases	Information can appear simultaneously in as many places as it is needed.
Businesses must choose between centralization and decentr\alization	Telecommunication Networks	Business can simultaneously reap the benefits of centralization and decentralization
Managers make all decisions	Decision support tools (database access, modelling software)	Decision-making is part of everyone's job
Field personnel need offices where they can receive, store, retrieve, and transmit information	Wireless data communication and portable computers	Field personnel can send and retrieve information whenever they are
The best contact with a potential buyer is personal contact	Interactive video disc	The best contact with a potential buyer is effective contact

Source: Hammer and Champy, 1993

CHAPTER THREE: METHODOLOGY OF ANALYSIS

3.1 Research Design

The research intended to demonstrate the contribution of IT in Business Process Reengineering at the KPLC, and the resultant improvement of customer service delivery, as perceived by the customers, and staff of KPLC in the target population.

This research, being descriptive in nature, was conducted using a survey and questionnaire administration.

3.2 Population

The target population consisted of electricity customers within Nakuru town and its environs, who operate commercial and industrial business enterprises during the study period. The population also consisted of selected management groups and employees in the departments of Customer Service (ICS), Design and Construction (DCS) who use the various IT systems for customer care (for existing customers) and new customer creation (new applicants) respectively.

3.3 The Sample Design

Sampling methods were used given that the customers' population was large. For the purpose of this study commercial and industrial customers, operating within Nakuru municipality were used to capture the perception of the effect of IT on BPR and their opinions on corresponding customer service levels.

Stratified sampling was used to obtain samples from the four sub zones at random, so that the sample picked gives a fair representation of the target population. Since the population of members of staff involved in the exercise directly is small, all operational staff and section heads were included in the sample.

The sampling frame was the computer database at KPLC, within the Nakuru zone. Geographically stratified sampling was applied where Nakuru zone was divided into four (4) sub zones, sub zones one, two three and four. This zone had the following customer distribution;

Table 5: Customer distribution

Sub Zone	1	2	3	4	Total
Industrial	72	36	15	44	167
Commercial	463	6336	1502	6621	14921
Total	535	6672	1517	6665	15088

Source: KPLC computer database

This research was only limited to respondents from commercial and industrial category, whose total number of customers is 15088.

Sub Zone 1 had a population of 535, (4%.) used 4 No respondents

Sub Zone 2 had a population of 6372, (42%) used 42 No respondents

Sub Zone 3 had a population of 1517, (10%), used 10 No respondents

Sub Zone 4 had a population of 6665, (44%) used 44 No respondents

A random sample procedure was used to pick the 100 respondents from among commercial and industrial customers, using the above distribution per sub zone on pro rata basis, and 25 respondents from operational and customer service staff in

the Nakuru office of KPLC. This sample selection type by strata helped to give a fair view, representative of the whole population, and was considered large enough for the purpose of this research and financial constraints inherent in data collection.

3.4 Data Collection

3.4.1 Source of data

Data collected from the respondents was primary data, captured by the way of a questionnaire, structured in a way that the respondents perception of improved service levels or otherwise could easily be established. Data captured using questionnaires was from operational staff who were involved in preparing and managing the new customer applications, before and after reengineering, and was meant to capture reduction in waiting times for new services.

Data in respect to all this was measurable, and was on time taken for certain actions in the processes. It was in hours, days, weeks or months as the speed of service delivery was measured.

3.4.2 Type of Data collected

The hypothesis to be tested is about the speed of service delivery, attributed to the use of IT and data to be collected was panel data, based on time taken for KPLC to render specific services, in hours, days, weeks or months.

This data was captured through questionnaires to ensure comparability, increment in speed and accuracy. The questionnaire was structured and multiple choice in nature and applied the five-point limit scale, the likert scale that is best suited for measurement of attitudes. It was easy to construct and administer, as respondents readily understood how to use it.

There were two parts of the questionnaire.

Part A was on general information about the customer, and also the opinion statements intended to establish the extent to which the respondents perceived the speed of service delivery, and accuracy in billing quality, before and after 1997, the year BPR was implemented, based on the Likert scale.

Part B was on the operational staff of KPLC, who process new applications and serve customers on a daily basis from the time of application through to metering and same gave their opinion on the improvement or otherwise of the service connection times for new customers before and after 1997.

3.4.3 Data collection method

For the purpose of this research, the questionnaire and a letter of introduction to the respondent, indicating the purpose of the research, and some instructions were

dropped and picked later from the respondents, after 14 days, using their known physical addresses already in the KPLC customer databases. This was after pre testing the questionnaire on about 10% of the target respondents.

For KPLC staff, this was handed to them directly.

3.5 Data Analysis and Presentation

Descriptive statistics was used to summarize the data. This included percentages and frequencies, which was used to establish the number and proportion of respondents responding positively or negatively so as to make logical conclusions on the population the sample represents. The hypothesis was then tested by student ***t*** statistic comparing results from the observed in terms of means difference

CHAPTER 4: RESULTS AND DISCUSSIONS.

This study aimed to explore the extent to which IT and BPR has contributed to better customer services in billing quality and faster complaint resolution. The study also aimed at determining whether or not the IT enabled BPR has resulted into faster electricity connections for new customers. In this chapter the research hypotheses put in Chapter one are therefore investigated in depth. Data extracted from the questionnaires were analyzed by use of descriptive statistics that is the mean and mode and also the student **t** test.

4.1 Data extraction and organization

Data about new customer application processing, construction and metering, waiting time, time taken to open anew customer's file and quotation design time were extracted from the questionnaires and organized in terms of frequencies. Data on time taken to resolve complaints made by customers in writing through the post office, by personal visit, by telephone, time taken for customers to receive bills after meter reading, accuracy of the bills, time taken to reconnect services after payment, and time taken to resolve emergency breakdown cases were extracted and organized in the same way, both before and after BPR in 1997.

4.2 Customers Data Analysis

Response from the customers before 1997 and after 1997 is as indicated in the following tables.

Table 6: Frequency distribution of time to getting bills after meter reading before 1997 and after 1997

Weeks	Frequency before 1997	Valid percentage	Frequency after 1997	Valid percentage
>4	1	1	3	3
3-4	70	70.3	1	1
2-3	21	20.8	13	12.9
1-2	7	6.9	36	35.6
<1	1	1	47	47.5

Source: Field data.

Table 6 shows that time taken to receive bills after meter reading improved from 3-4 weeks to 1-2 weeks before and after 1997 respectively, which is a clear indication of service improvement in this area through an IT enabled BPR in the meter reading and billing cycles.

Table 7: Frequency distribution of time to resolve complaint made by telephone before 1997 and after 1997

Days	Frequency before 1997	Valid percentage	Frequency after 1997	Valid percentage
>14	6	5.9	1	1
5-14	8	7.9	1	1
2-5	76	76.2	5	5
1-2	9	8.9	28	27.7
<1	1	1	65	65.4

Source: Field data

Table 7 shows the frequency distribution of time to resolve complaints made by telephone. From this table, it can be deduced that there is a reduction of complaints resolution time from 2-5 days before 1997 to one day or less. This reduction in time to customer's complaints resolution is attributed to the on-line IT systems enabling users to have access to customers current and historical data and any other relevant information.

Table 8: Frequency distribution of time to resolve complaints made personal visit before 1997 and after 1997

Days	Frequency before 1997	Valid percentage	Frequency after 1997	Valid percentage
>14	76	76	1	1
5-14	12	12	45	45.5
2-5	3	3	51	50.5
1-2	8	8	1	1
<1	1	1	2	2

Source: Field data

Table 8 is a tabulation of the time taken to resolve complaints made by personal visit, before and after 1997. From the frequencies on this indicator, most customers, 51%, responded that their complaints were resolved between 2-5 days, and another 45% responded to 5-14 days. This indicates a better service than that observed before 1997, where 76% responded to over 14 days. This is also attributable to faster information retrieval in the integrated ICS.

Table 9: Time taken to resolve complaints made by writing through post office

Days	Frequency before 1997	Valid percentage	Frequency after 1997	Valid percentage
>30	3	3	2	2
21-30	23	20.7	27	26
14-21	46	45.5	46	45.5
7-14	23	22.8	23	24.5
<7	5	7	2	2

Source: Field data

Table 9 is a tabulation of the observed time taken to resolve complaints by writing through the post office before and after 1997. Values obtained for this indicator are predominantly 14-21 days, indicating a mode of 45 for both. There is therefore no significant improvement between the times it takes to resolve complaints through this method before and after 1997.

Table 10: Frequency distribution of accuracy of bills before 1997 and after 1997.

Accuracy	Frequency before 1997	Valid percentage	Frequency after 1997	Valid percentage
Not accurate	77	76.2	1	1
Don't know	3	3	3	3
Slightly accurate	19	18.8	19	18.9
Accurate	1	1	77	76.1

Source: Field data

Table 10 tabulates responses to perceived accuracy of bills sent out to customers, before and after 1997. The general observation is that bills were perceived to be more accurate after 1997 as compared to before 1997, a fact attributed to the fact that meters for this category of customers are the modern electronic types with IT software to enable self reading by customers who wish to monitor and control electricity costs. Further, the meter readings are done electronically and similarly transmitted. This is as opposed to the old electromechanical meters and manual systems used before BPR.

Table 11: Frequency distribution of time for emergency response before 1997 and after 1997

Hours	Frequency before 1997	Valid percentage	Frequency after 1997	Valid percentage
>6 hrs	67	66.3	1	1
4-6	8	7.9	71	71.2
2-4	21	20.8	15	14.9
1-2	3	3	12	11.9
<1	1	2	1	1

Source: Field data

Table 11 tabulates observed frequencies relating to time taken to respond and resolve an emergency breakdown. It indicates an improvement in this indicator as it suggests that it takes a shorter time, of 4-6 hours on average, to attend to and resolve emergency related breakdowns as compared to over 6 hours before 1997. This improvement is as a result of IT enabled incidence management software, which facilitates faster fault location as compared to the old methods where cumbersome patrols and inspections had to be conducted.

Table 12: Frequency distribution of time taken to reconnect services after Payment

Hours	Frequency before 1997	Valid percentage	Frequency after 1997	Valid percentage
>24	25	24.8	2	2
10-12	3	3	5	5
6-10	66	66.2	85	84.5
1-6	5	5	7	6.5
<1	1	1	1	1

Source: Field data

Table 12 above, is a frequency tabulation of time taken to reconnect services after payments. The data here indicates a significant difference between the two periods under considerations. The 66% and 85% of respondents agreed that their services are reconnected between 6 to 10 hours before and after 1997. However, this indicator has a larger percentage of respondents supporting this time range after 1997, indicating that IT and BPR has had a significant influence.

4.3 Staff Data Analysis

This data is summarized in tables 13,14,15,16 and 17 below.

Table 13: Construction and metering.

Days	Frequency before 1997	Valid percentage	Frequency after 1997	Valid percentage
>45	4	16	2	8
30-45	13	52	2	8
15-30	3	12	3	12
5-15	3	12	14	56
<5	2	8	4	24

Source: Field data

Table 13 indicates frequency tabulation of time taken for a new customer application to be constructed and connected to supply through metering as perceived by the staff that manage this indicator. It indicates that the construction and metering time has reduced from 30 to 45 days before BPR to 5 to 14 days after BPR.

Table 14: New customers applications processed per day.

No of application processed per day	Frequency before 1997	Valid percentage	Frequency after 1997	Valid percentage
>50	3	12	3	12
30-50	4	16	2	8
20-30	1	4	16	64
10-20	9	36	3	12
<10	8	32	1	4

Source: Field data

Table14 shows the number of new customers processed per day for a sample size of 25. Before 1997 the number of new customers processed was between 10-20 applications, and between 20 and 30 per day after BPR, an indication that there has been an increment in the number of new customers applications processed per day due to the IT enabled DCS system.

Table 15:Waiting time

Days	Frequency before 1997	Valid percentage	Frequency after 1997	Valid percentage
>30	13	52	5	20
28-30	6	24	2	8
21-28	1	4	12	48
14-21	1	4	3	12
<14	4	16	3	12

Source: Field data

Table 15 shows the observed waiting times between application and final connection to supply. This was observed to be over 30 days before 1997 and between 21 and 28 days after 1997. This indicates better connection times and more customers being connected, and is attributable to application of IT and BPR in the DCS System.

Table 16: Quotation and design time

Days	Frequency before 1997	Valid percentage	Frequency after 1997	Valid percentage
>30	13	52	3	12
21-30	6	24	1	4
14-21	1	4	3	12
5-14	4	16	15	60
<5	1	4	3	12

Source: Field data

Table 16 shows the observed frequencies on the time taken from a new application and quotation to a customer. This indicator shows that there is a significant reduction of this time from over 30 days to between 5 and 14 days, and is directly attributed to an IT enabled BPR in the DCS.

Table 17: Time taken to open customers file

Minutes	Frequency before 1997	Valid percentage	Frequency after 1997	Valid percentage
>50min	17	76	4	16
30-45min	2	6	3	12
30-40 min	2	6	3	12
20-30min	2	6	5	20
10-20min	2	6	10	40

Source: Field data

Table 17 is a tabulation of observed frequencies of the time it takes to open a new customer file in the front office, before and after 1997. It can be seen that time taken to open a customer's file before 1997 is over 50 minutes having a frequency of 17 out of 25, and 10 to 20 minutes after 1997. This time reduction is attributed to the IT enabled BPR at the front office DCS.

4.5 Student t Test on Staff Data Before and after 1997

Student t test was performed to establish if means of the observations from Data extracted from the staff respondents have got any significant difference

Table 18: Paired sample t test results.

N = 25 at 95% confidence level

	t	df	Sig. (2-tailed)
Pair construction and metering -Construction metering after 1997	-17.041	24	.000
Pair application processed per day after 1997-new customers applications processed per day	15.094	24	.000
Pair quotation design time-quotation Design time after 1997	-16.707	24	.000
Pair time taken to open new customers File –time to open a new customers file after 1997	-17.503	24	.000
Pair waiting time-waiting time after 1997	-11.438	24	.000

Source: SPSS Output Results

Tests done to establish if there is a significant difference between timings before 1997 and after 1997 for the customers indicate that there is a significant difference between timings in construction and metering before and after 1997, the computed t = -17.04 and the critical t =2.064.

The computed **t** statistic for new customers applications processed per day is 15.094 which indicates that there is no significant difference between applications processed before 1997 and after 1997.

For quotation design time, t = -16.707 and the calculated t = 2.064 and the the decision is to fail to reject the hypotheses. This therefore implies that there is a significant difference between the timings before and after 1997.

The indicator on time taken to open new customers file the calculated t =- 17.503 and the critical t is 2.064. The decision is therefore to fail to reject the hypotheses, which therefore implies that there is a significant difference between the timings of this indicator in these two periods.

Waiting time t test indicate that the calculated t =- 11.438 and the critical t =2.064.The statistical decision is therefore that we fail to reject the hypotheses, which implies that there is a significant difference in timings before and after 1997 for this indicator.

Generally from this test we can conclude that there has been a significant change in timing before and after 1997 for most of the measured indicators. From the observed frequencies, it can be seen that reduction in time taken to render services has improved due to IT enabled BPR systems.

Table 19:Customers t test Results and discussions

N = 100 at 95% confidence level

	t	df	2-tailed
Pair 1 Accuracy of bills after 97-Accuracy of bills before 97	23.307	99	.000
Pair 2 Time to resolve complaint by personal visit before 97-time to resolve complaint made by personal visit 97	-1.442	99	.152
Pair 3 Time taken to reconnect services after payment –time taken to reconnect services after payment before 97	4.42	99	.000
Pair 4 Time taken to resolve complaint Made by writing and post office-Time taken to resolve complaint made by writing and post office before 97.	25.060	99	.000
Pair 5 Time to emergency response after 97-time to emergency response before 97.	14.890	99	.000
Pair 6 Time to resolve complaint made By telephone before 97-time to Resolve complaint made by Telephone 97	-17.765	99	.000
Pair 7 Time to restore services after 97-Time to restore services before 97	4.871	99	.000

Source: SPSS Output Results.

The t test results for accuracy of bills before 1997, as computed is 23.207 and the critical t =12.706. The statistical decision is therefore to reject the hypotheses,

which implies that there is no significant difference in the means of time before and after 1997.

Time taken to resolve complaints made by personal visit before and after 1997 has a calculated t of -1.442 and a critical t of 12.706, which implies that there is a significant difference in time taken before and after 1997 in resolving customer complaints.

t calculated for time taken to reconnect services after payment is t = 4.242, and the critical t=12.706. The statistical decision is therefore that we fail to reject the hypotheses, implying that there has been a significant change in timing for this indicator.

Time taken to resolve complaints made by writing through Post office before and after 1997 has a computed t=25.06 and a critical t of 12.706, which leads to the decision that we reject the hypotheses. This implies that there is no significant difference in these timings for this indicator.

Time for emergency response has a computed t of 14.890 and a critical t of 12.706; hence the decision is to reject the hypotheses. This implies that there is no significant difference in the means of the timings.

Time taken to restore services has a calculated t of 8.741 and a critical t of 8.741. The decision is fail to reject the hypotheses. This implies that there is a significant difference between these timings for this indicator.

Time taken to resolve complaints made by telephone was tested and the calculated t =17.765 and the critical t =12.706 .The Statistical decision is hence to reject the hypotheses. This implies that there is no significant difference between the means of these timings.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS.

5.1 Summary

Contribution of IT to BPR has been found to be a key factor in the revolution of modern business practice, and a major factor in corporate performance improvement especially in the services industry. A service company or department will be deemed to be efficient depending on the time it takes to serve its customers, both existing and new.

In this research, some performance indicators that directly impact on the customers, both existing and new have been examined, details and the results analyzed by descriptive method of analysis, and the t test. These results show a favorable trend towards attributing better service delivery to the period after BPR as compared to before. The reduction in time used in service provision is mainly as a result of the introduction of new technology, through business process reengineering and appropriate IT software. Generally it can be seen that IT has significantly contributed to better billing and service quality at KPLC.

5.2 Conclusions

From the foregoing statistics, it is generally evident that service quality levels as observed for both categories of respondents is better after the implementation of Business Process Re-engineering as compared to before.

The obvious reason for this is the bold move made by this company to invest and implement the Business Process Reengineering through the auspices of ISP.

Introduction of IT and BPR at KPLC has therefore been key to improved customer service delivery.

5.3 Limitations of the study

(a) The research did not exhaust all IT enabled BPR systems existing in KPLC but was limited to those that are specifically described in the research objectives.

(b) The research was limited to Nakuru and environs, and the results may not necessarily apply to other zones outside Nakuru.

5.4 Suggestion for further study

(i) Future researchers can look at BPR and the organizational culture. This is because large sums of resources are invested in BPR and the scale of the

changes introduce significant risks. Inappropriate cultural change actions will harm both the organization and their employees, and this calls for increased knowledge of the scope of cultural change in parallel with BPR in order to minimize risks and make the changes more effective.

(ii) Researchers can also look at factors hindering IT enabled BPR in Kenya. Though most firms may embrace the idea of venturing into this process, the resources required coupled with a complete reengineering of the business processes are immense. Most of them will have to conduct a cost benefit analysis to justify venturing into this process.

REFERENCES:

Andrews and Stalick, 1994, Quality Management Journal, No 3

Davenport, T H, 1993: Process Innovation: Reengineering work through Information Technology. Havard Business School Press

Davenport, T. H and Short, J. E (1990), The New industrial Engineering:Information Technology and Business Process Redesign. Sloan Management Review

Drucker,F P, 1993, A Turnaround Primer. The Wall Street Journal

Drucker, F. P, 1969, The age of discontinuity: guidelines to our changing society, Heinemann,London

Economic Survey 1981

Ferrie J, 1995, M.D Rolls Royce, Paper on Business processes, a natural approach, Warwick University.

Grover V, Fiedler K, Teng J, 1994, Exploring the Success of Information Technology Enabled Business Process Reengineering. IEEE Transaction on Engineering Management, Vol. 41

Hammer Michael & Champy James, 1993, Reengineering the corporation, Nicholas Brearly Publishing

Hammer Michael, Reengineering work, 1990 , Havard Business Review, July/Aug

Hammer Michael & Steven Stanton, 1995, The Reengineering Revolution Handbook,

Jill Hussey & Roger Hussey,1997, Business Research, Palgrave

Jones M, 1997, Transforming Organizations with Information Technology. Elsevier Science, B.V

Kenya's Parastatal Reform Action Plan, 1991

KPLC Business process manuals, Jan 2001

Munyiri S.R, 2000, A survey of the use of Business Process Reengineering in the Kenyan Pharmaceutical manufacturing Industry. UON(unpublished).

Olive M Mugenda, and Abel G Mugenda, 1999, Research Methods

Simsion G. C (1994), Business Process Reengineering: Information Systems opportunities and Challenges. Elsevier Science B.V.

Thiga J, 1999, Business Process Reengineering: A case of KPLC Institutional Strengthening Project. UON(unpublished)

Technology Foresight, 1995, 'Progress through partnership'

APPENDICES

APPENDIX 01

rom: *John Ombui*
ent: 20 January, 2003 11:37 AM
o: Bilha Gachoki
ubject: DRAFT MBA PROJECT PROPOSAL

ONTRIBUTION OF IT
TO BPR

Good morning, Bilha,
How was your weekend?
As required by company policy, please receive and peruse a draft proposal of a project I intend to undertake, for your necessary guidance/input as necessary.
This proposal and the project will be purely for academic purposes and no company documents/Information, beyond what is stated herein will be given out whatsoever.
Kindly advise as necessary.

APPENDIX 02

From: David Wamiti
Sent: 23 January, 2003 9:57 AM
To: John Ombui
Cc: *Bilha Gachoki*
Subject: MBA PROJECT PROPOSAL

Good morning John.
This is to inform you that your request pertaining to the MBA Research Project has been approved.
Once completed, please provide us with a copy for the Executive Library. We shall also, at a later stage, discuss how the findings will be shared with relevant colleagues.
We wish you every success in this undertaking.

APPENDIX 03

TO WHOM IT MAY CONCERN

Dear sir/madam

RESEARCH PROJECT QUESTIONNAIRE

I am an MBA student of Egerton University and conducting a research on the impact of the recent computerisation in KPLC to the general customer service delivery.
I am kindly requesting you to take sometime and answer the questions in the attached questionnaire.

This information will be treated in confidence and will only be used for purely academic purposes.

Thank you for your assistance.

Yours truly,

John M Ombui,

12/02/2003

PART A

1. Do you have an account with KPLC ?
(1)YES (0)NO

2. If the answer to the question is YES how many years have you operated this electricity Account?
(1)0-5
(2)6-10
(3)11-15
(4) 15 -20 yrs
(5) Over 20 yrs

3. What is the nature of your business
(1)Retail Shop
(2)Supermarket
(3)Manufacturing Industry
(4)Workshops
(5)Others (specify)----------

4. Were you operating this account before 1997?
(1)YES (0)NO

5. **If YES, Before 1997,**
How often was your electricity Meter being read ?
(1) Monthly
(2) Bi monthly
(3) Quarterly
(4) Yearly
(5)Never Read

6. Were you able to know approximately what date of the month your meter was being read?
(1)YES (0)NO

7. Were you able to know that your meter has actually been read?
(1)YES (0)NO

8. After how long were you getting your bills after meter reading ?
(1) Less than one week
(2) Between one and two weeks

(3) Between two and three weeks
(4)Between three and four Weeks
(5)Over four weeks

9. Were your bills then always accurate?
(1)Accurate
(2)Slightly accurate
(3)Not accurate
(4)Don't know

10. If Not Accurate, did you at any time launch a complaint on wrongful billing at KPLC?
(1) YES (0)NO

11. If YES, how did you make the complaint?
(1)Personal Visit
(2)In writing by post
(3)In writing and hand delivery
(4)By telephone
(5)In writing and personal visit

12. How long did it take for your complaint to be resolved?
by Personal visit
(1)Less than one day
(2)Between one and two days
(3)Between two and five days
(4)Between five and fourteen days
(5) Over fourteen days

13. In writing though post office
(1)Less than seven days
(2)Between seven and fourteen days
(3)Between fourteen and twenty one days
(4)Between twenty one and thirty days
(5)Over thirty days

14. In writing and Hand delivery
(1)Less than one day
(2)Between one and two days
(3)Between two and five days
(4)Between five and fourteen days
(5)Over fourteen days

15. By telephone
(1) Less than one day
(2)Between one and two days

(3) Between two and five days
(4)Between five and fourteen days
(5)Over fourteen days

16. In writing and personal visit
(1)Less than one day
(2)Between one and two days
(3)Between two and five days
(4)Between five and fourteen days
(5)Over fourteen days

17. Were you ever disconnected for non payment of your electricity bills?
(1)YES (0)NO

18. If YES, How long did it take KPLC to reconnect your services after payment?
(1)Less than one Hour
(2)Between one and six hours
(3)Between six and ten Hours
(4) Between ten and twelve hours
(5)More than twenty four hours

19. Did you at any occasion report a breakdown due to power failure to KPLC?
(1)YES (0)NO

20. If YES, how long did it take Emergency teams to respond?
(1)Less than one hour
(2)Between one and two hours
(3)Between two and four hours
(4)Between four and six Hours
(5)Over six hours

21. How long did it take to restore your services?
(1)Less than one hour
(2)Between one and two hours
(3)Between two and four hours
(4)Between four and six hours
(5)Over six hours.

If YES , after 1997 todate;

22. How often is your electricity meter being read?
(1)Monthly
(2)Bi monthly
(3)Quarterly
(4)Yearly

(5)Never read

23. Are you able to know approximately what date of the month your meter is being read?
(1)YES (0)NO

24. Are you able to know that your meter has actually been read?
(1)YES (0)NO

25. After how long do you receive your bills after meter reading?
(1)Less than one week
(2)Between one and two Weeks
(3)Between two and three weeks
(4)Between three and four weeks
(5)Over four weeks

26. Are your bills always accurate?
(1)Accurate
(2)slightly accurate
(3)Not accurate
(4)Don't know

27. If NO, have you at any time launched a complaint on wrongful billing at KPLC?
(1)YES (0)NO

28. If YES, how did you make the complaint?
(1)Personal visit
(2)In writing by post
(3)In writing and hand delivery?
(4)By telephone?
(5)In writing and personal visit

29. How long did it take for you complaint to be resolved
By personal visit?
(1)Less than one day
(2)Between one and two days
(3)Between two and five days
(4)Between five and fourteen days
(5)Over fourteen days

30. In writing though post office?
(1)Less than seven days
(2)Between seven and fourteen days
(3)Between fourteen and twenty one days
(4)Between twenty one and thirty days
(5)Over thirty days

31. In writing and hand delivery?
(1)Less than one day
(2)Between one and two days
(3)Between two and five days
(4)Between five and fourteen days
(5)Over fourteen days

32. By telephone?
(1)Less than one day
(2)Between one and two days
(3)Between two and five days
(4)Between five and fourteen days
(5)Over fourteen days

33. In writing and personal visit
(1)Less than one day
(2)Between one and two days
(3)Between two and five days
(4)Between five and fourteen days
(5)Over fourteen days

34. Have you ever been disconnected for non payment during this period?
(1)YES (0)NO

35. If YES, how long did it take KPLC to reconnect your services after payment?
(1)Less than one hour
(2)Between one and six hours
(3)Between six and ten hours
(4)Between ten and twelve hours
(5)More than twelve hours

36. Have you at any occasion reported a breakdown due to power failure?
(1)YES (0)NO

37. If YES, how long did it take the KPLC emergency teams to respond?
(1)Less than one hour
(2)Between one and two hours
(3)Between two and four hours
(4)Between four and six hours
(5)Over six hours

38. How long did it take to restore your services?
(1) Less than one hour
(2)Between one and two hours

(3)Between two and four hours
(4)Between four and six hours
(5)Over six hours

PART B

1. Which Division of KPLC are you working?
(1)DCS (2)ICS

Before 1997,

2. If in DCS ,how many new customer applications were you processing per day?
(1)Less than ten
(2)Between ten and twenty
(3)Between twenty and thirty
(4) Between thirty and fifty
(5)Over fifty

3. How long did it take you then to open a new customer file for estimates?
(1)Less than ten minutes
(2)Between ten and twenty minutes
(3)Between twenty and thirty minutes?
(4)Between thirty and forty five minutes
(5)Over forty five minutes

4. How long did the file take in design and estimates to quotation?
(1)Less than five days
(2)Between five and fourteen days
(3)Between fourteen and twenty one days
(4)Between twenty one and Thirty days
(5)Over thirty days

5. How long did it take to construction and metering after receipt of payment?
(1)Less than five days
(2)Between five and fourteen days
(3)Between fourteen and thirty days
(4)Between thirty and forty five days
(5)Over forty five days

6. What were you using then for these processes?
(1) Stand alone computers
(2)Manual paperwork
(3)Typewriters
(4) DCS
(5)None of the above

7. What was the average connection time for a new customer from application to commissioning?
(1)Less than fourteen days
(2)Between fourteen and twenty one days
(3) Between twenty one and twenty eight days
(4)Between twenty eight and thirty days
(5)Over thirty days

After 1997 and now;

8. How many new customer applications are you able to process per day?
(1)Less than ten
(2)Between ten and twenty
(3)Between twenty and thirty
(4)Between thirty and fifty
(5)Over fifty

9. How long does it take you now to open a new customer file for estimate?
(1)Less than ten minutes
(2)Between ten and twenty minutes
(3)Between twenty and thirty minutes
(4)Between thirty and forty five minutes
(5)Over forty five minutes

10. How long does the file take in designs and estimate to quotation?
(1)Less than five days
(2)Between five and fourteen days
(3)Between fourteen and twenty one days
(4)Between twenty and thirty days
(5)Over thirty days

11. How long does it take to construction and metering after receipt of payment?
(1)Less than Five days
(2)Between five and fourteen days
(3)Between fourteen and thirty days
(4) Between thirty and forty Five days
(5)Over forty five days

12. What system are you using for these processes?
(1)Stand alone computer
(2)Manual paperwork
(3)Typewriters
(4)DCS
(5)None of the above

13) What is the average connection time for a new customer, from application to commissioning?
(1) Less than fourteen days
(2) Between fourteen and twenty one days
(3) Between twenty one and twenty eight days
(4) Between twenty eight and thirty days
(5) Over thirty days.