A SURVEY OF BENEFITS AND CHALLENGES IN ELECTRONIC BILLING AND PAYMENT IN THE KENYA POWER AND LIGHTING COMPANY LIMITED

BY

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DECLARATION

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Signed ..... Date

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This research project has been submitted for examination with my approval as the university supervi sor.

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DEDICATION

This report is dedicated to My Wife Mrs Eleanor Naserian Nchoe and children Rose Seremon Nchoe, Melody Masitan Nchoe and Joseph Saruni Nchoe for their never ending motivation and for their prayers which saw me through my MBA studies.

AC KNOW LEDC;M E N T

I take this opportunity to express my sincere thanks and gratitude to the following people whose contributions have been invaluable and made this report a success;

To begin with is my supervisor Mr. Joel K. Lelei who guided me throughout the research and was easily available.

To all my friends for being resourceful companion and fellow MBA students for sharing academic and social issues.

Also, the entire staff of the Kenya Power and Lighting Company, whose contributions helped me a lot.

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May the Almighty bless you all.

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ABBREVIATIONS

ASP:	**Application Service Provider**
CHP:	**Check Free Hosting Provider**
CIO:	**Chief Information Officer**
E-billing:	**Electronic Billing**
EBPP:	**Electronic Bill Presentation and Payment**
EDI:	**Electronic Data Interchange**
EIP:	**Electronic Invoice Presentment**
E-payment:	**Electronic Payment**
GSM:	**Global System for Mobile communications**
IBM:	**International Business Machines**
ICT:	**Information and Communication Technologies**
IFX:	**Interactive Financial Exchange**
KPLC:	**Kenya Power and Lighting Company**
OFX:	**Open Financial Exchange**
R & D:	**Research and development**
SAPs:	**Structural Adjustment Programmes**
SMS:	**Short Message Service**
SPSS:	**Statistical Package for Social Sciences**
WAN:	**Wide Area Network**
XML:	**Extensible Markup Language**
XSL:	**Extensible Style sheet Language**
TELKOM:	**Telecommunications Company of Kenya**
POSTA:	**Postal Cooperation of Kenya**

ABSTRACT

The purpose of this study was to investigate through a survey the electronic billing and payment system at Kenya Power and Lighting Company. The basis of the problem regarding electronic billing and payment system that the research study aimed to explore was discussed based on two research objectives; to establish the benefits realized with the launch electronic billing and payment, and to assess challenges in the implementation of electronic billing and payment in KPLC.

Data was collected using questionnaires. The target population of the study consisted of electricity customers (superficially domestic consumers) and KPLC employees from Nairobi regions. Judgmental sampling was used to select the respondents who were customers but the respondents employees were selected on random basis. A sample size of 400 customers and 100 employees of KPLC were selected. Data were analysed using frequency, percentage and factor analysis.

The research study found that there exists a link between ICT and business performance. As such, E-Billing should be adopted and implemented effectively by KPLC due to the numerous benefits that are realized. The key benefits that the system has managed to tackle: reduced long queues in the banking halls reduced operating costs, improved corporate image of the company, ease of bill payment and facilitation of collaboration between companies and its business partners. The challenges that were established included: limited information from the system, long time to get connected to the system and get the requested information, limited financial options available for payment and inadequate evidence or documentation for legal redress were present.

To ensure that more benefits are realized and challenges are addressed KPLC should employ appropriate strategies to inform and educate its stakeholders on the use of the system and the benefits that are realized as a result of the new system thereof. There is need for the organization to be very prompt and updated with both the internal and external environmental factors that affects the organization, so as to provide quality e-billing services

and curb any arising challenges. The system should be upgraded to provide detailed and adequate information to the users. Information should be provided to the uses on request, such as alert on disconnection of electricity and file for bills and payment details.

CHAPTER ONE: INTRODUCTION

1.1 Background

Companies have been forced to change the way they conduct business in order to respond to the recent changes taking place both at the global, regional and at the national level. This is inevitable as businesses that are quick to adopt to change are most likely to survive in future. As Peters, (2003) states, "If you don't like change, you're going to like irrelevance even less"

Some of the changes witnessed in Kenya are introduction of Structural Adjustment Programmes (SAPs), restructuring, cost cutting, diversification and the adaptation of Information and Communication Technologies (ICTs). In Information and Communication Technology, the changes are rapid. The Kenya Power and Lighting Company (KPLC) has identified ICTs as tools for adapting its businesses processes to the changing internal and external environment.

The rapid changes in ICT are creating a wide array of new business opportunities and challenges. One of the opportunities is electronic billing (e-billing) and electronic payment (e-payment). The business needs of KPLC customers are changing as consumers embrace new technologies. The Company has embarked on a massive expansion process through the Rural Electrification Programme funded partly by development partners such as IMF and World Bank. The additional number of consumers has created constraints in the KPLC network leading to black- outs and a drop in the quality of service.

In order to address these challenges. KPLC introduced ICTs to modernize its business operations in 1995 (Ombui. 2003). Some of the benefits realized include fast, timely processing of information for decision making, reduction in costs, and improved customer service. In addition to this, the Company introduced the e-billing concept to its customer's service in 2006. This has been branded as E-Bill and Easy - Pay for electronic billing and electronic payment respectively. The Company has realized benefits and experienced challenges in the process of implementation and application of e-billing and e-payment (Abwao, 2002).

1.1.1 Electronic Billing and Payment System

E-billing and e-payment systems are part of e-business. Electronic Business (e-business) may be defined broadly as any business process that relies on an automated information system (Kerr. 2000). Electronic business methods enable companies to link their internal and external data processing systems more efficiently and flexibly to work more closely with suppliers and partners and to belter satisfy the needs and expectations of their customers. Today, this is mostly achieved using web based technologies and mobile applications (www.mobilein.com).

Electronic payment and presentation is referred to as E-billing which is an electronic delivery and presentation of financial statements, bills, invoices and related information which typically focuses on business to consumer billing and payment (Whaling, 2000). It is also defined as the sending of bills and invoices to customers by electronic mail or mobile short message service (SMS) and payment of bills by e-mail or mobile SMS. On the Internet, electronic billing is defined as a process that enables bills to be created, delivered, and paid over the Internet (tech encyclopaedia). The service has applications for many industries, from financial service providers to telecommunications companies and utilities (Kerr, 2000).

E-billing is also a system which enables the supplier to generate and submit electronic bills to its customers rather than using the conventional paper bills. It allows the customer to electronically view and save his/her bill as well as make payments electronically (Barto, 2001). There are two types of e-billing, namely, Electronic Invoice Presentment (EIP) and Electronic Bill Presentation and Payment (EBPP). With EIP, consumers are typically delivered an electronic invoice in a certain format - either an e-mail, a document in acrobat format attached to an email or an SMS to respective mobile phones. Consumers can view bills of this nature online, but when time comes to pay an invoice delivered via EIP. consumers must respond to the invoice the same way they would to a traditional paper bill by making payments through the mail or via telephone. In EIP. consumers are left to organize and keep track of their invoices on their own computers/phones (PayAnyBill, 2000).

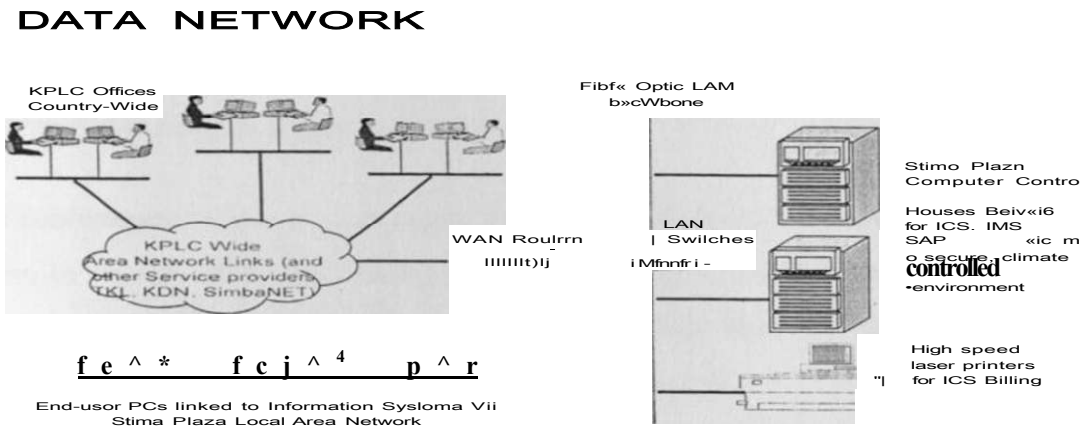
EBPP is a more robust solution. EBPP enables retail customers and corporate accounts accessing multiple lines of service to immediately understand and track current and past charges. With

EBPP, consumers are either e-mailed a link to a means of locating the resource that is hosted by a company specializing in EBPP or sent SMS on the procedure to follow (webopedia.com). Clicking on the Internet link enables consumers to both view and pay their bills electronically. Companies that offer EBPP also typically provide access to invoice history so that past bills can be tracked and viewed as needed by customers. Many of the bigger players in Electronic billing will offer EBPP solutions as well as to E1P (PayAnyBill. 2000). Due to the convenience that E-bill and Easy-Pay offers to consumers of large organizations, it has become a viable, convenient and cost effective means of serving the customer. In Kenya large organizations such as KPLC, Posta, Telkom, Safaricom, and Nairobi Water have recently adopted this type of technology.

1.1.2 Kenya Power and Lighting Company

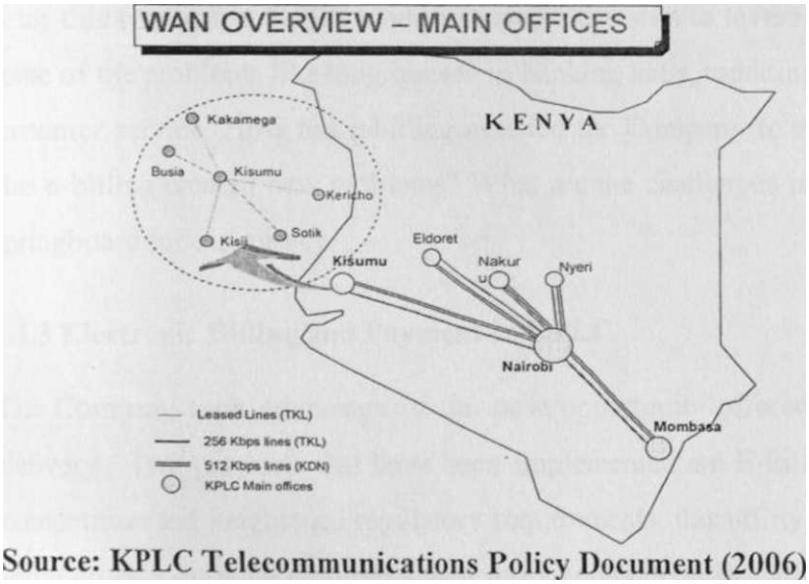
KPLC is a limited liability company incorporated in Kenya to provide the transmission and distribution of electricity in the country. The company has segmented its customers into Industrial, Commercial and Domestic categories. It has also four business areas based on the geographical and demographical customer base. The company is faced with high operating costs leading to high tariff increases, long queues in the banking halls, high number of complaints, and poor customer service and many black outs. The company has 1 million customers who are served using the KPLC wide area network. A data network was installed by KPLC as shown in Figure 1.1 and Figure 1.2. Data networks through Electronic Data Interchange (EDI) have enhanced the efficiency of e-billing and e-payment.

Figure 1.1: KPLC Data Network



Source: KPLC Telecommunications Policy Document (2006)

Figure 1.2: KPLC Wide Area Network



Source: KPLC Telecommunications Policy Document (2006)

KPLC aims to grow its business by connecting 150,000 new customers per year as required by the Government (KPLC Annual Report, 2007). This will worsen the current bad customer service. It is for this reason that the company adopted ICT as a key enabler in resolving some of these challenges. KPLC took strong initiatives to automate most of its business processes using relatively latest ICT so as to be effective and efficient in delivery of electricity services to the

public and remain competitive in the Kenyan market (Atebe, 2001). As part of this process, a data network and WAN thus were installed by KPLC as shown in Figure 1.1 and 1.2 respectively. Within the network, users are able to access the KPLC network and carry out transactions such as billing queries, payments, customer applications for new supply connections reporting power outages and customer care.

As a continuation of this modernization program, the company launched the electronic billing system in January 2006. This facility is meant to enhance bill payments and reduce the long queues in the banking halls, enable the customers to query their bill balances using the mobile phone and receive other services through the SMS and e-mail.

The recent rapid changes which have taken place in Kenya with the introduction of mobile phone operators has spurred growth and facilitated the implementation of e-billing. The growth in the number of internet and mobile users and the reliability of the internet and mobile has encouraged many users to access services using the mobile phone and internet (www.information.org.ke). It is for this reason that KPLC made a strategic decision to leverage this new opportunity to solve some of the problems like long queues in banking halls, reducing operating costs, and improving customer service. How has e-billing assisted the Company to resolve some of these problems? Has e-billing created new problems? What are the challenges in its implementation? This is the springboard for our survey.

1.1.3 Electronic Billing and Payment in KPLC

The Company took advantage of the new opportunity offered by ICT to improve its service delivery. Two products that have been implemented are E-bill and Easy-pay. Faced with new-competition and heightened regulatory requirements, this utility needed to answer billing queries more quickly, provide customers with more complete billing information and improve efficiency of customer service calls. Electronic Bill Presentation and Payment (EBPP) system is expected to become an increasingly attractive alternative as KPLC continues to search for ways to reduce operational costs. However, the extent to which EBPP will be adopted will depend entirely on user acceptance and diligence to actually pay for bills in a timely and preferably electronic fashion. Some of the barriers that are expected from adoption of this new technology are low

computer literacy among KPLC consumers, high cost of internet services, high cost of computer hardware and software and lack of training. The company has not done enough advertising and therefore customers may not be aware of this new technology.

Table 1.1: Monthly E-Bill Statistics in KPLC

MONTHLY E-BILL STATISTICS		
MONTH	NO. OF E-BILL QUERIES	
	EMAIL	SMS
Jan-07	26.793	193,171
Feb-07	19,599	179,619
Mar-07	21,018	212,349
Apr-07	24,565	228,590
May-07	28,819	249,428
Jun-07	22,756	202,799
Jul-07	21,728	215,223
Aug-07	23,891	207,280
Sep-07	21,852	223,220
0ct-07	19,658	235,459
Nov-07	23,647	219,918
Dec-07	12,576	190,699
Jan-08	33,526	290,104
Feb-08	34,743	268,106
Mar-08	31,256	268,113
Apr-08	26,842	289,256
May-08	25,925	292,048
Jun-08	26.763	248.384
Jul-08	20,412	316.774
Aug-08	17,322	372,460
Sep-08	35,533	380,236
0ct-08	28,679	380,981
Nov-08	26,477	364,189.
Dec-08	25,030	389,809
Jan-09	29,539	450,619
Feb-09	26,702	382,690
Mar-09	30,301	510,285

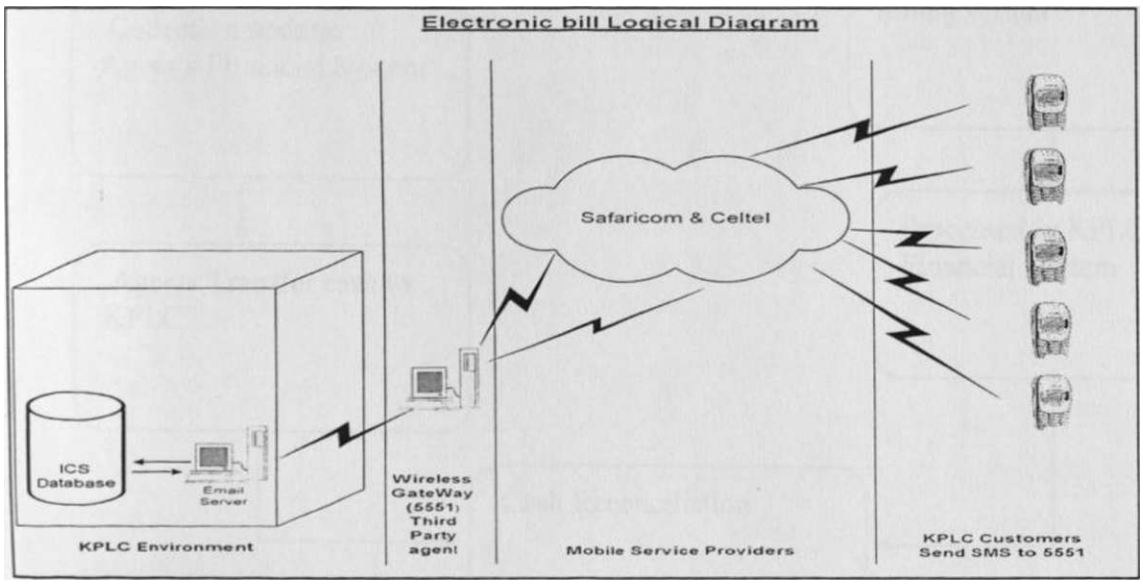
Source: KPLC Commercial Statistics on E-bill (2009)

EBPP as implemented by KPLC can be categorized into two systems namely E-Bill and Easy-Pay. The trend of number of customers querying the KPLC system using their mobile phones SMS option and internet mail to access their bills is as shown in table 1.1 above

E-Bill

The E-Bill, as implemented in KPLC works as shown in Figure 1.3. Customers can request for their current electricity bill by sending an e-mail or by simply sending SMS with their electricity account number, to KPLC billing system. As shown in Figure 1.3, the system will automatically query the database and send back the bill immediately through e-mail or SMS to the client within a period of less than 5 seconds. The e-bill system is available 24 hours a day, 7 days a week, and 365 days a year and therefore offers utmost flexibility to customers (www.kplc.co.ke). Despite the introduction of E-bill services the detailed electricity bill will continue to be dispatched through the postal address.

Figure 1.3: Electronic Bill Logical Diagram



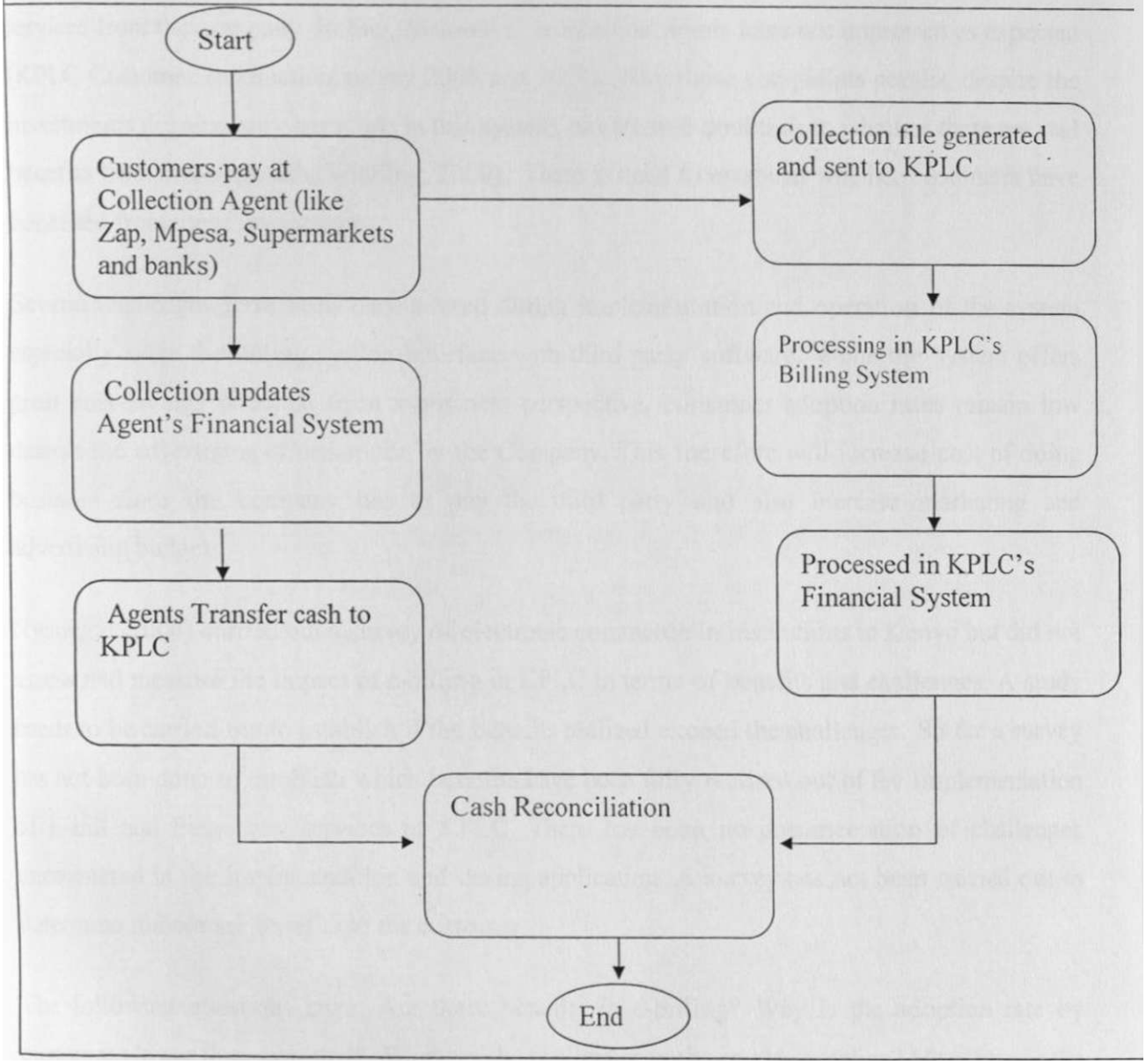
Source: KPLC IT E-Bill Document (2009)

Easy-Pay

Easy-Pay is a brand for all payments made from external agents to KPLC, as shown in Figure 1.4. KPLC first appoints collection agents such as banks, supermarkets, mobile networks (M-Pesa and ZAP). Figure 1.4 illustrates how a KPLC customer makes payments to these agents. The agents then submit the collection to KPLC at the end of the day with the corresponding customer account number. This amount is sent to KPLC electronically. Electricity application

payments can also be made through Easy-Pay. This service has really made payments to KPLC flexible with the introduction of mobile payments modes where a customer a can pay bills from anywhere within the country at any time of the day or night through mobile phones.

Figure 1.4: Easy-Pay Logical Diagram



Source: KPLC Easy-Pay Documentation (2009)

1.2 Problem Statement

KPLC implemented E-Bill and Easy-Pay to improve operating efficiency, to improve customer billing dispatch and increase customer satisfaction and revenue collection. Despite the implementation of these ICT systems, there are still complaints from customers related to services from the company. In fact, customers' satisfaction levels have not improved as expected (KPLC Customer satisfaction survey 2008 and 2009). Why these complaints persist, despite the investments the company has made in this system, has created doubts as to whether there are real benefits from this approach (Whaling, 2000). There is need to establish whether customers have benefited from these investments.

Several challenges have been encountered during implementation and operation of the system especially since the billing system interface with third party software. While the system offers great cost-savings potential from a business perspective, consumer adoption rates remain low despite the advertising efforts made by the Company. This therefore will increase cost of doing business since the company has to pay the third party and also increase marketing and advertising budget

Nyangate (2006) carried out a survey of electronic commerce in institutions in Kenya but did not assess and measure the impact of e-billing in KPLC in terms of benefits and challenges. A study needs to be carried out to establish if the benefits realized exceed the challenges. So far a survey has not been done to establish which benefits have been fully realised out of the implementation of E-bill and Easy- pay services in KPLC. There has been no documentation of challenges encountered in the implementation and during application. A survey has not been carried out to determine if there are benefits to the customer.

The following questions arise: Are there benefits in e-billing? Why is the adoption rate by customers lower than expected? What are the challenges in the implementation? How easy is the adaptation and use by customers? What are the benefits realized? What are the challenges encountered by customers? This is the basis for this study.

1.3 Objectives of the Study

The general objective of the study was to investigate electronic billing and payment in KPLC

The specific objectives of this study were:

1. To establish the benefits realised with the launch electronic billing and payment in KPLC
2. To establish challenges faced in the implementation of electronic billing and payment in KPLC.

1.4 Importance of Study

The study has many benefits to a wide range of organizations.

To the organization

The findings of the survey may be used by KPLC to make appropriate decisions towards putting in place policies that will guide the company in enhancing e-bill and easy-pay. The survey may also bring out the challenges experienced by customers in adopting this new technology. For the company to remain competitive and satisfy customer needs effectively and efficiently.

To the Academics

Future researchers and scholars may use the survey as a source of reference for further research in the same area. The ICT sector innovations and inventions depend a lot on the surveys carried out in such areas.

To Consultants in ICT

The output of this study will be a valuable resource to consultants. Consultants need resource materials when serving their clients. In such a fast changing new area this is not readily available. This study will bridge this knowledge gap.

To the Government

The Government is investing resources in e-government. The Teams a fiber optic project cost $130 million to connect Kenya to the international digital super highway. The project began and is due in Mombasa by the middle of June this year (CIO East Africa).These investments are expected to realign business processes with the ICT and improve service delivery. But will they achieve this? The results of this study will be a reference that will be applied by Government executives in their pursuit of service delivery.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

ICT has evolved from stand - alone legacy systems to complex networks connecting customers to suppliers and businesses. Hence, in this dynamic environment, ICT has become a key business enabler (Robson, 1997). IT allows businesses to address and accommodate global customers, vendors, suppliers and customers on a common ground. Evolution of ICT has enabled enterprises to be proactive and re-align their business processes to strategy. Anticipating change, managing, and gaining a competitive advantage in the market place is the one of the issues faced by management. The Internet revolution has helped companies to implement change in a cost - effective manner (Weaver, 1999). However, although information systems are creating many exciting opportunities for both businesses and individuals, they are also a source of new problems, issues, and challenges for managers (Laudon and Laudon, 2000).ICT is the link between strategy, plans and vision with the processes for the organization and KPLC should take this into account.

2.2 Electronic Bill Presentment and Payment

Electronic Bill Presentment and Payment (EBPP) is the electronic presentation of statements, bills, invoices, and related information sent by a company to its customers, and corresponding payment for goods or services. The Internet provides billing companies and their customers with new methods to deliver and access billing information (Wayner, 1997). Billers moving forward with EBPP must decide what role(s) they want to play in the overall process. Once roles are defined, it is easier to identify which model is most appropriate for the biller's EBPP strategy. Although EBPP is composed of just four key building blocks; initiating the service, presenting the bill, paying the bill, and serving customer issues; there can be a multitude of permutations of who performs each element. In addition, billers and others may choose to play more than one of the defined roles. The current EBPP industry has evolved into several models that are helping to clarify these roles (Doculabs, 1999).

According to EDocs (2001), Service Initiation (including enrolment and activation) is the process that the Customer goes through to sign up for the EBPP service. It includes enrolment with the EBPP service provider and service activation with the biller. Service initiation also establishes service expectations, creates routing directions for bills and payments, establishes the authenticity of participants, and populates the database that will be the foundation for the EBPP service. The customer visits the biller's website to begin the service initiation process for EBPP. The biller's EBPP website or web pages provide the customer with additional information about the offering, typically covering issues like: - security, impact to existing paper bill, fees charged, if any, payment procedures and frequently asked questions.

2.2.1 Electronic Bill Presentment

KPLC has branded the Electronic bill presentment as *E-bill.* KPLC offers the customers various options for bill presentment. The options include: Customers querying for the electricity bill balances through mobile phones, Customers requesting for their electricity bills through email and KPLC automatically sending the bills to customers through email and SMS when bills are generated.

2.2.2 Electronic Bill Payment

KPLC has branded the Electronic bill presentment as *Easy-Pay.* KPLC offers the customers various options for bill payments. The options include:

a) Banks; where customers pay electricity bills at any of the appointed financial institutions and then money and records of collections are sent to KPLC electronically by the banks.
b) Supermarkets; where customers pay electricity bills at the tills as they continue with their normal shopping. The supermarket then sends record of the collections electronically to KPLC and the money transferred to KPLC's financial institution electronically.
c) Mobile Networks; where customers pay electricity bills through their mobile phones. The money is then transferred to the mobile networks trust account, which then transfers it to the KPLC's financial institution electronically and the customer's account in KPLC is updated.

2.3 EBPP Technology Requirements

There are three separate approaches to implementing EBPP within an organization. There are:

a) Internal hosting: An internal billing system, along with an internal payment and presentment solution
b) Hybrid hosting: An internal billing system with a hosted, external payment and processing system and
c) External hosting: A complete, externally hosted system.

Within each of the above approaches, the biller evaluates the range of products and technologies capable of supporting it. Each approach could dictate the use of a solution customized to interface with a particular back-end legacy system, or the use of a packaged solution to expedite the implementation process (IBM Global Services, 2000).

2.4 Benefits of EBPP

With the use of E-bill, transcription errors, as well as duplicate bills, fees and expenses are eliminated (EDocs, 2001). Further since the bills are submitted electronically rather than snail-mailed, the payment cycle, in theory, is shortened. Further still in this marketing-driven day and age, E-billing certainly can be used to attract new clients and strengthen ties with existing clients. E-bill supports reporting and benchmarking to analyze data for trends, analysis and metrics.

The new technology will enable the company to achieve its targets with minimal additional expenses. This is expected to translate into better customer service. The Company has branded E-bill and Easy - pay. This branding has made it easy for customers to recognize the company's products and services The Company has launched an aggressive marketing campaign to sell the products to its customers (www.kplc.co.ke). Electronic billing allows KPLC to create an invoice electronically and deliver it on a Web site or via e-mail. The resulting bills are not only more interactive than paper versions, but also faster and cheaper to generate (Sanders, 2004).

E-Billing will reduce long queues in the banking halls of KPLC. reduce operating costs, improve the corporate image of the company and facilitate collaboration between KPLC and it's business partners. It will also introduce KPLC staff to new technology, enhancing human capital within the Company. According to Radecki and Wenninger (1999), E-bill enables customers to validate, audit and control their bills and approve the invoices online. .

Convenience offered through EBPP is attractive to customers. In some cases, clients will pay their invoices electronically as well. Those that use e-billing can count on standardization of work and cost types used for billing, which helps them conduct statistical analyses on work performed on similar matters by multiple firms. The service offered to the customer has improved as a result of this new product. The customer has now more options and he can choose the service more convenient to him. They save time as they don't have to spend time in endless queues at the KPLC banking halls. Loyalty to the brand and to the company develops as a result of an improved service. With E-BPP, customers may realize the following benefits (Robertson, 2000): Direct control over the timing and amount of the payment; A savings on the cost of checks, postage and envelopes; Simplify bill payment processing and record retention; Centralize and streamline all bill payment functions and storage on their computer; Review bills and make payments when they want, 24 hours a day and Reduction or elimination of paper filing and storage.

The introduction of EBPP in KPLC has been emulated by other service providers like Telkom Kenya, Posta, and Nairobi Water Company. They have recently benchmarked with KPLC and adopted similar strategies. In this way the bill payer, the enquirer and the utility service providers can develop standards that will improve the level of customer service in Kenya (Nyangate, 2006).

EBPP enables retail customers and corporate accounts accessing multiple lines of service to immediately understand and track current and past charges. With EBPP, consumers are either e-mailed a link to a means of locating the resource that is hosted by a company specializing in EBPP or sent SMS on the procedure to follow (webopedia.com). Clicking on the Internet link enables consumers to both view and pay their bills electronically. Companies that offer EBPP

also typically provide access to invoice history so that past bills can be tracked and viewed as needed by customers. Many of the bigger players in Electronic billing will offer EBPP solutions **as** well as to EIP (PayAnyBill, 2000). Due to the convenience that E-bill and Easy-Pay offers to consumers of large organizations, it has become a viable, convenient and cost effective means of serving the customer. In Kenya large organizations such as KPLC, Posta, Telkom, Safaricom, and Nairobi Water have recently adopted this type of technology. Though the benefits are expected, they may not be realised as explained by productivity paradox.

2.5 Productivity Paradox

Productivity is the fundamental economic measure of a technology's contribution. With this in mind, CEOs and line managers have increasingly begun to question their huge investments in computers and related technologies. The productivity paradox in information technology is that investment in IT does not seem to be reflected in increased productivity. There is a host of possible explanations, but little consensus on which are responsible, or even on whether the paradox still exists - if it ever really did. The basic promise of technology is more efficiency and thus greater productivity. However, the links between more technology and more productivity have historically been weak. As the Nineties progressed, we were told that that had all changed. Technology has reached critical mass within organizations, the reasoning went, and now we were finally seeing a surge in technology-fueled productivity.

According to Leslie and Stephanie (1988) the 'IT Productivity Paradox' is the concept that, despite massive investment and resourcing by companies and organizations worldwide in their IT systems, there still seem to be little pay-off. Information systems can no longer be viewed as a support service for a business - information technology now has a lead role to play in the strategic planning processes of any organization. As we move further and further into a technology-based working environment, a critical question is how the value of IT can be measured and evaluated.

The key to understanding the productivity paradox is the methods of IT measurement used. Improved measurement can not only reveal that IT has often been more productive than is

believed, but can also focus in on ways in which benefits can be improved across the IT systems **life-cycle.** Critical areas where improved assessment is essential include development, and better **risk** analysis; sourcing, including IT outsourcing: and infrastructure, including transforming an organization's IT architecture (Leslie and Lester, 1988).The way technology is deployed within an organization determines the degree of realization of benefits. This closely relates to diffusion.

2.6 Diffusion

The traditional economic analysis of diffusion focuses on describing and forecasting the adoption of products in markets. In particular, the question which factors influence the speed and specific course of diffusion processes arises (Weiber 1993). Traditional diffusion models are based on similar assumptions. Generally, the number of new adopters in a certain period of time is modeled as the proportion of the group of market participants that have not yet adopted the innovation. Based on this fundamental structure, three different types of diffusion models are most common (Lilien/Kotler 1983, 706-740, Mahajan/Peterson 1985, 12-26). The exponential diffusion model (also external influence model or pure innovative model) assumes that the number of new adopters is determined by influences from outside the system, e.g. mass communication. The logistic diffusion model (also internal influence model or pure imitative model) assumes that the decision to become a new adopter is determined solely by the positive influence of existing adopters. Although technology may be deployed, without adoption of the new system, there would be no benefits.

2.7 Adoption

According to Mwithiga (2002), the need to focus on the future has been the driving force for the adoption of information and communication technology systems in many companies. Efficiency and effectiveness, customer service, easier and convenient accounting data storage and retrieval have also been cited as reasons for adoption.

Abwao (2002) is of the view that in Kenya, the main reasons for adoption of information and communication technology systems by locally owned small and medium companies are centered

on: Efficiency of internal operations, Increased speed of transaction processes, Need to handle more transactions faster, Increased complexity of transactions, especially accounting and book keeping, Convenience of accounting data storage and retrieval; Need to improve customer service in order to meet and exceed the increasing customer expectations and Demands by the financing institutions, mainly banks, donors, and micro finance institutions to adopt technology in operations.

2.8 Challenges of EBPP

(a) Lack of Incentives for Consumers

Consumers appear reluctant to use EBPP until more of their bills are available electronically. Industry analysts agree that consumer adoption would grow more rapidly if EBPP services were offered for free or at a fee lower than current costs associated with check payments. Barto (2001), one approach may be to price paper presentment and payment more directly so as to encourage consumers to utilize electronic alternatives. An alternative potential solution may be to attract consumers to adopt electronic payments through financial incentives.

(b) Lack of Incentives for Financial Institutions

EBPP could result in lost revenue for financial institutions operating retail lockboxes (the service of financial institutions processing remittance information from a post office box and depositing them directly into an account) and check-processing operations. Some institutions struggle with the inherent conflict of reducing check revenue when promoting electronic payment usage (Roth, 2001). Furthermore, current pricing policies for electronic and check payments may discourage the use of electronic payment alternatives. However, pressure from EBPP providers has resulted in financial institutions entering the market place either directly with more user friendly and less costly EBPP options or by partnering with consolidators. In addition, service providers are targeting financial institutions by offering network switches that utilize open architecture for settlement of EBPP transactions (Teri, 2000).

(c) High initial implementation Costs

The initial costs associated with implementation of e-billing programs for high-volume billers

are estimated to very high (Kerr and Litan, 2000). High implementation costs and the need to operate multiple, complex, billing systems concurrently have likely discouraged biller adoption. The lack of standards and the uncertainty surrounding future EBPP solutions introduce additional disincentives for billers considering participation.

Kerr and Litan (2000) asserts that while 32 percent of all large volume billers (greater than 250,000 bills a month) are presenting electronically, adoption rates drop considerably for small to medium-sized billers for both electronic presentment and payment.

(d) Lack of Standards for Enrollment

The multitude of models, payment options, and providers require consumers to use various cumber some, inconsistent enrollment methods to establish EBPP services. The method of enrollment may vary depending on the biller and/or the model. The fragmented enrollment process has historically been a major barrier for the traditional ACH direct payment product. Elizabeth (2000) asserts that the direct payment enrollment process, the onus is typically on the consumer to contact each biller to enroll, change, or cancel automatic deductions. This same type of problem is apparent in the initial EBPP enrollment process, where the burden is again on the consumer to search for billers offering EBPP services.

The pay-anyone model tries to alleviate this burden by allowing consumers to initiate payments online to anyone regardless of how the bill is received. While this model begins to address some of the barriers to EBPP, it also appears to introduce paper payments into the process. Kirstin (1996) argues that the lack of universal message standards for data exchange continues to hamper growth in EBPP. Several standards have been introduced over the last few years, including OFX and IPX. Industry adoption has been slow, and participants continue to use different formats for the exchange of presentment data, hindering interoperability between various provider and biller systems (EDocs, 2001).

(e) Security and Privacy Concerns

Consumers are concerned about the security and privacy of the financial information required for

the EBPP process. Gartner Group surveyed consumers and determined that of Internet users who do not pay bills online, 52 percent are concerned about privacy and 48 percent are concerned about security and fraud (Barto, 2001). Some security and privacy concerns regarding electronic data transfer for bill presentment include data confidentiality and integrity, billing statement issuer authentication and nonrepudiation of statements (Whaling. 2000). Specifically, the issues include the protection of the data that is transferred between biller. service provider, and consumer from being read or modified: verification that the billing statement received by the consumer was sent from the biller or service provider; and proof of the exact contents of the billing statements.

(0 Legal Issues

When the EBPP provider is a financial organization, this raises a number of legal and regulatory considerations that might not be relevant to a typical commercial provider. The question of which states or country's laws control an Internet relationship is still developing (Spiotto and Mantel, 2000). States have adopted different consumer protection laws, which may be applicable to EBPP services. Consumers may be exposed to differing protection rights and liabilities. The dispute resolution process may vary depending on the players, models, and payment options. The current legal and regulatory environment is still primarily designed for a paper environment (www.pc.gov).

2.9 Knowledge Gap

E-billing, although not quite the norm, is catching on in the consumer market. Adoption can be attributed, in part; to subscribers growing accustomed to online conveniences at the office and seeking them out at home (Barto, 2001). Due to the widespread use of internet and fourth-generation tools, today's users are assuming more of a leadership role in articulating the adoption, development and implementation of information technology innovations (Brynjolfsson, 2000). However, users often take a very narrow and limited view of the problem to be solved and may overlook important technology issues or alternative information system solutions.

Mwithiga (2002) indicates that the use of technology will be the only way that companies will **satisfy** their customers. There has been no documentation of challenges encountered in the implementation and during application. A survey has not been carried out to determine if there **are** benefits to the customer. This project was to determine the benefits and challenges in the implementation and adoption of e-billing and payment system at KPLC.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The chapter outlines the overall methodology used in the study. This includes the research design, population of the study, sample size, sample frame, data collection methods, research procedures and data analysis and presentation.

3.2 Research Design

The study used a cross-sectional survey approach. Cross-sectional survey enabled the researcher to gather information on the benefits and challenges of E-bill and Easy pay at a single point in time. According to Mugenda and Mugenda, (1999) the cross sectional survey is a method, which enables the researcher to summarize and organize data in an effective and meaningful way. They provide tools for describing collections of statistical observations and reducing information to an understandable form. The survey was carried out in Nairobi where E-bill and Easy pay were currently in high use by the customers.

3.3 Population

The population of study consisted of electricity customers and KPLC employees from Nairobi Region.

3.4 Sample Population

The total population of the entire KPLC customers is over 1.3 Million. The sample size was determined using statistical population surveys whereby:

$N=Z^2 * pq / d^2$

Where N = desired minimal sample size (where pop> 10,000)

Z = Standard normal deviation which is equal to 1 at 95% confidence level.

P= Proportion of the target population estimated to have a particular characteristic being measured. In this case it is estimated to be 0.5.

q = 1 - P

d = the level of statistical significance set which in this case is 0.05.

$N = 1.96^2 \times 0.5 \times 0.5/0.05^2$

= 384

The study used convenience sampling for respondents who where PLC customers. The respondents were selected on a judgmental basis. In this, the researcher could stop the customer in the banking hall, or when they are in the queue in the hall to give the responses as per the questionnaire.

To get the employees sample the Human Resource Records was used and there were a total of 6,400 KPLC employees. In respect of the employees only ICT and Marketing departments were interviewed, a daily register from the head of the two departments was used to randomly sample 100 respondents.

3.5 Data Collection

This study used a questionnaire as the principal instrument for data collection which was used to both the customers and KPLC employees. The questionnaire was administered by the researcher and assisted by two research assistants through direct interaction with the respondents.

The target customers were those who were queuing in banking hall. The customer's questionnaire has three sections. Section A was for background information of the customers, Section B was for the issue of benefits of E-bill and Easy-pay and Section C was for the challenges faced by customers while using these services. To get the right respondents, the

researcher would ask a customer if he or she had ever used E-bill or Easy pay and if the respondent answered, the interviewer would proceed with the interview, otherwise, the interviewer would move to the next customer.

The employees were interviewed by the researcher and their questionnaire was structured in the following way. Section A was for background information, Section B for benefits of E-billing and easy pay implementation and Section C for the challenges faced by staff after implementation of the system. Employees from ICT and Marketing departments were interviewed because they were directly concerned with the design and implementation of the e-bill and easy pay systems. The researcher used the daily register from the head of department and judgmentally picked 50 from both the KPLC departments.

3.6 Data Analysis and Presentation

The questionnaire was coded in respect to questions for ease of electronic data processing prior to the commencement of the fieldwork. After tabulation, the data was coded to facilitate statistical analysis. The Statistical Package for Social Sciences (SPSS) computer package was used to analyze the data. Descriptive statistics such as means, standard deviation and frequency distribution enabled the researcher to meaningfully describe the distribution of measurements.

In Section A of both the questionnaires (of customers and KPLC employees) which contains background information, analysis was carried out using frequency and percentage. For Section B and C of both the questionnaires, factor analysis was performed to determine the key benefits and challenges to the e-billing and electronic payments.

CHAPTER FOUR: DATA ANALYSIS AND PRESENTATION OF FINDINGS

4.1 Summary of responses from the selected respondents

A total of 400 questionnaires were distributed to KPLC customers in the two main banking Hall within the town and the results were considered a success since survey managed to target the full number of sampled population. The study also interviewed some employees from the company to establish their views of the benefits and challenges implementation of the system. The study got feedback from 100 employees from the ICT and the marketing departments.

4.2 Demographic Information

The demographic data were collected concerning the gender, age, education level, employment status, usage of electricity. These data were important because they indicated the background information of the respondents and their basic understanding of the customers which was important to understand the extent of usage of the system.

4.2.1 Gender

This section of study sought to establish the gender of employees and customers respondents. Respondents indicated their gender as follows.

Table 4.2.1 Gender

	Employees		**Customers**	
Gender	Frequency	Percent	Frequency	Percent
Male	55	55.0	243	60.8
Female	45	45.0	157	39.3
Total	**100**	**100.0**	**400**	**100.0**

There was gender disparity in both the KPLC employees and customers respondents. Table 4.2.1 shows that 55% of the employees and 61% of the customers were males. Meanwhile, 45% of the employees and 39% of the customers were females.

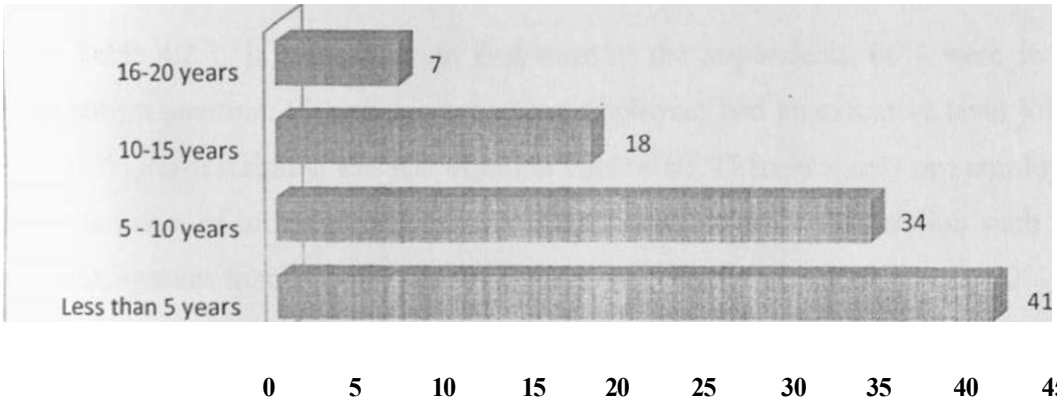
4.2.2 Duration of Employee work at KPLC

This section of the study was aimed at establishing how long the employees of KPLC had worked for the company. Results are presented in Table 4.2.2 and Figure 4.2.2.

Table **4.2.2 Duration of Employee work at KPLC**

Duration of work at KPLC	**Frequency**	**Percent**
Less than 5 years	41	41.0
5-10 years	34	34.0
10-15 years	18	18.0
16-20 years	7	7.0
Total	**100**	**100.0**

Figure 4.2.2 Duration of Employee work at KPLC



From the study, it was revealed that, majority of the respondents, 41%, had worked for a period of not exceeding five years. Thirty four percent had worked for the company for between five and ten years. Meanwhile, a proportion of 15% had worked for a period of between ten and fifteen years. The employees who had worked in the company for a longer duration, between sixteen and twenty years, constituted the minority, 7%.

4.2.3 Job Description

This section of the study sought to find out the various job descriptions of the employees in the organization. The results are as displayed in Table 4.2.3.

Table 4.2.3 Job Description

Job **Description**	**Frequency**	**Percent**
Executive managers	1	1.0
Middle level management	66	66.0
Executive level	16	16.0
Union stable staff	13	13.0
Marketing Assistant	2	**2.0**
Systems Administrator (Intern)	1	**1.0**
Trainee Engineer	1	**1.0**
Total	**100**	**100.0**

From Table 4.2.3, it was found out that most of the respondents, 66% were in middle level management position. Sixteen percent of the employees had an executive level job description, while 13% job description was that of union stable staff. There was only one employee in the top job description of an executive manager. There were other job description such as marketing assistant, systems administrator (intern), and trainee engineer, each constituting 2%, 1%, and 1% respectively.

4.2.4 Respondents' opinion on the importance of the use of electronics media to pay hills

This section of the study was aimed at establishing the respondents' opinion on the importance of the use of electronic media to pay bills. **The** findings are presented in the Table 4.2.4.

Table 4.2.4 Respondents' opinion on the importance of the use of electronics media to pav hills

Importance of the use of electronics media to pay bills	**Employees**		**Customers**	
Extent of the importance of the use of electronics media to pay bills	Frequency	Percent	Frequency	Percent
Very important	76	76.0	210	52.5
Important	22	22.0	168	42.0
Less important	**1**	1.0	18	4.5
Least important	**1**	1.0	4	1.0
Total	**100**	**100.0**	**400**	**100.0**

It was disclosed that majority of KPLC staff, 76% and customers, 53% were of the opinion that the use of electronics media to pay bills was very important. This was followed by employees. 22% and customers, 42% who viewed the use of electronics media to pay bills as important. A proportion of 1% of the employees and 4% of the customers stated that the use of electronics media to pay bills was less important. Still 1% each of both the employees and customers indicated that the use of electronics media to pay bills was either least important. This depicted the high significance attached to the use of electronics media to pay bills.

4.2.5 Level of education

This part of the study sought to establish the qualifications of the respondents in terms of their level of education. The results are as depicted in Table 4.2.5.

Table 4.2.5 **Level of Education**

Level of **education**	**Employees**		**Customers**	
	Frequency	**Percent**	**Frequency**	**Percent**
Primary level	0	0.0	12	3.0
Secondary	0	0.0	109	27.3
University/college	100	100.0	279	69.8
Total	**100**	**100.0**	**400**	**100.0**

The qualifications of the respondents in terms of their level of education showed that all the 100 staff of KPLC were University/College graduates, as compared to the 70% of the customers with **the** same level of education. Twenty seven percent of the customers had their level of education up to secondary level and only 3%, a minority up to primary level. However, none of the employees had a lower or even a higher level of education.

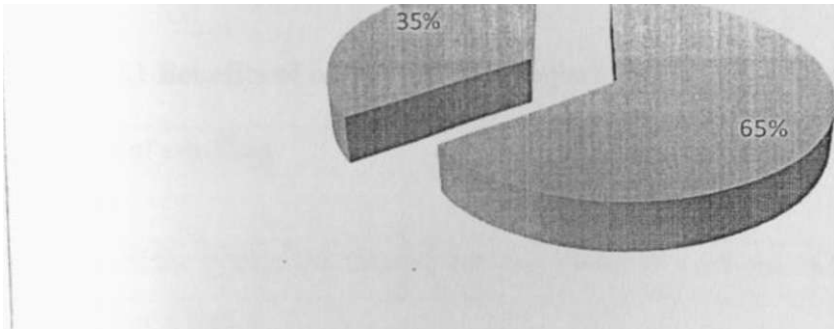
4.2.6 Customers' Employment Status

The customer respondents were asked to state their employment status. The feedback is as presented in Table 4.2.6 and Figure 4.2.6.

Table 4.2.6 Customers' Employment Status

Employment status	**Frequency**	**Percent**
Yes	262	65.5
No	138	34.5
Total	400	100.0

Figure 4.2.6 Customers' Employment Status



The study revealed that majority of the customer respondents, 65.5% were employed as compared to 34.5% who were unemployed.

4.2.7 Purpose for Electricity

This section of the study was aimed at establishing the customers' purpose for electricity. The findings are as presented in Table 4.2.7.

Table 4.2.7 Purpose for Electricity

Purpose for electricity	Frequency	Percent
Domestic use only	339	84.8
Commercial purpose	33	8.2
Both Domestic and Commercial use	28	7.0
Total	**400**	**100.0**

The study found that most respondents, 84.8% used electricity for domestic purposes, followed by 8.2% who used electricity for commercial purposes. Seven percent of the respondents stated that they used electricity for both domestic and commercial purposes.

4.3.1 Benefits of e-billing by Employees

This part of the study was carried out with an aim of identifying the benefits of e-billing by employees. The response given was as follows.

Table 4.3.1 Benefits of e-billing by Employees: Descriptive Statistics

Benefits of **e-billing**	**Mean**	**Std. Dev**
The use of the system has reduced the long queues in banking halls.	1.8687	.77824
The system is fast	1.9800	1.01995
The system is secure	2.0100	.77192
The system has made easy distribution of customer payment points	2.0100	.91558
The system provides a convenient way of viewing customer information on line	2.2100	.86683
The system makes it easy for data retrieval	3.0606	1.09526
The use of the system has led to reduced paper work	3.1700	.90224
The system provides an effective service delivery	3.2700	1.06439
The use of the system has reduced the number of complaints from customers using it.	3.4300	1.13511
The system facilitates ease of handling customer complaints	3.4300	.96735
Use of system reduces operational costs	4.3600	.95685
The system provides an efficient service delivery	4.4600	.77824

The study found that there were different benefits realized on implementation of E-billing payment system. Most respondents agreed that the benefits of e-billing included reduced long queues in banking halls represented by mean of (1.87), and the system being fast (1.98) as a key benefits. Still, the system being secure (2.01) and easy distribution of customer payment points (2.01) followed in the benefit rank. However, the respondents disagreed that e-billing system brought with it an efficient service delivery (4.46), reduced operational costs (4.36), ease of

handling customer complaints (3.43) and reduced number of complaints from customers using **the** system (3.43).

Table 4.3.2 Benefits of E-billing and easy pay

1	Strongly Agree		Agree		Neither agree/Disagree		Disagree		Stro igly Disa gree		No lies lonse	
	F	%	F	%	F	%	F	%	F	%	F	%
The system facilitates ease of handling customer complaints	16	16.0	35	35.0	34	34.0	14	14.0			1	1.0
1 The system provides a convenient way of viewing customer information on line	24	24.0	39	39.0	29	29.0	8	8.0				
The system provides an effective service delivery	24	24.0	36	36.0	28	28.0	7	7.0	4	4.0	1	1.0
The use of the system has reduced the number of complaints from customers using it	13	13.0	44	44.0	26	26.0	1	1.0	1	1.0		
The system makes it easy for data retrieval	26	26.0	43	43.0	24	24.0	5	5.0			2	2.0
Use of system reduces operational costs	22	22.0	34	34.0	22	22.0	18	18.0	2	2.0	2	2.0
The system is secure	26	26.0	50	50.0	21	21.0	j	3.0	-	-	-	-
The system has made easy distribution of customer payment points	34	34.0	38	38.0	21	21.0	7	7.0				
The system provides an efficient service delivery	30	30.0	42	42.0	17	17.0	4	4.0	3	3.0	4	4.0
The use of the system has reduced the long queues in banking halls	34	34.0	47	47.0	15	15.0	3	3.0			1	1.0
The system is fast	26	26.0	55	55.0	14	14.0	5	5.0	-	-	-	-
The use of the system has led to reduced paper work	27	27.0	44	44.0	12	12.0	13	13.0	3	3.0	1	1.0

From the table, most respondents, 34%, each, strongly agreed that the use of the system had reduced the long queues in banking halls, as well as made easy distribution of customer payment points, whereas 30% strongly agreed that the use of the system provided an efficient service delivery. Meanwhile, a proportion of 55% agreed that the system was fast. 50% agreed that the system was secure and 47% agreed that the system had reduced the long queues in banking halls. A section of the respondents neither agreed nor disagreed on the benefits of e-billing. Thirty four percent were indifferent on whether the system facilitated the ease of handling customer complaints, followed by 29% who were not sure whether the system provided a convenient way

of viewing customer information online and 28% who were indifferent on whether the system provided an effective service delivery. Those who disagreed that the use of e-billing system reduced the operational costs constituted 18% while 14% represented those who disagreed that the system facilitated ease of handling customer complaints. Still, 4% strongly disagreed that the system provided an effective service delivery. Four percent of the respondents gave no response on the system providing an efficient service delivery.

4.3.2 Benefits of e-billing by Customers

This segment o the study was done so as to determine the benefits of e-billing by customers. The findings are illustrated below.

Table 4.3.3 Benefits of e-billing by Customers: Descriptive Statistics

Benefits of e-billing by Customers	Mean	Std. Dev
The time I spent at the banking hall is reduced with to the use of the e-bill and easy pay	2.40	.773
The system gives me immediate response of account statement	2.47	.762
The system make it easy for me to pay bills	2.62	.869
The system is easy to use	2.63	.879
The system make me feel in control of my payments	2.75	.893
The system gives me accurate bills	3.00	.911
The system is reliable	3.09	1.029
The system assures me of confidentiality in electricity bill and payment	3.09	.944
The system response time is acceptable	3.10	.925
When interacting with the system, the system gives clear information of payment	3.19	.984
The system provides a sure way of receiving bills	3.21	.934
I have reduced cost when I used the system	3.33	.981
The system offers convenient way of seeking electricity bills	3.64	1.035
The system provides acceptable disconnection alerts	3.73	1.055
The system enables me to obtain financial billing information	3.83	1.030
It is easier to maintain file for bills and payment documents with the system	3.87	1.116
The system avails a 24/7 service	3.91	1.136
1 feel more secure that my account will be updated with my payment when 1 use the system	3.95	.971

The study found out that there were different benefits realized on implementation of E-billing **payment system** as indicated by the customers. Most customers agreed that there was reduced **time spent** at the banking hall due to the use of the e-bill and easy pay (2.40), followed by **immediate** response to queries on customers account statements (2.47). However, they were **neutral** that the system made it easy to pay bills (2.62) and system being easy to use (2.63). The **respondents** disagreed that e-billing brought with it more security when account is updated with **payment** when the system is used (3.95), availability of a 24/7 service (3.91), ease of maintaining **file for bills** and payment documents with the system (3.87), and the ability of obtaining **financial** billing information (3.83).

I able **4.3.4: Benefits of e-billing by Customers**

	Strong y Agree		Agree		Neither Agree/Disagree		Disagree		Strongly Disagree		Missing Response	
	F	%	F	%	F		F	%	F	%	F	%
The system provides acceptable disconnection aiens	82	20.5	124	310	110	275	57	14.3	22	5.5	5	1.3
The time 1 spent at the banking hall is reduced with to the use ofthee-bill and easy pay	162	40.5	156	39 0	41	10.3	23	5.8	14	3.5	2	0.5
I have reduced cost when i used the system	130	32.5	148	37.0	67	16.8	36	9.0	11	2.8	8	2.0
It is easier to maintain file for bills and payment documents with the system	140	35.0	112	28.0	84	21 0	46	11.5	10	2.5	8	2.0
The systems make me feel in control of my payments	148	37.0	143	35.8	65	16 3	30	7 5	10	2.5	4	1.0
The system assures me of confidentiality in electricity bill and payment	136	34.0	124	31.0	97	243	32	8.0	7	1.8	4	1.0
1 feel more secure that my account will be updated with my payment when 1 use the system	143	35.8	136	34.0	87	21.8	19	4.8	7	1.8	8	2.0
The system gives me immediate response of account statement	143	35.8	161	40.3	65	16.3	24	6.0	4	1.0	3	.8
The system gives me accurate bills	142	35.5	148	37.0	78	19.5	22	5.5	4	1.0	6	1.5
The system offers convenient way of seeking electricity bills	153	383	140	35.0	72	18.0	22	5 5	4	1.0	9	2.3
The system enables me to obtain financial billing information	159	39.8	142	355	75	18.8	3	8	4	1.0	10	2.5
The system provides a sure way of receiving bills	151	37.8	130	32 5	79	198	30	7.5	3	8	7	18
The system avails a 24/7 service	163	40.8	114	28.5	82	20.5	26	6.5	3	.8	12	3.0
The system is reliable	158	39.5	149	37.3	69	17.3	14	3.5	3	8	7	1.8
The system response time is acceptable	161	40.3	142	35.5	68	17.0	21	5.3	2	.5	6	1.5
The system makes it easy for me to pay bills	200	50.0	150	37.5	33	8.3	9	2.3	2	.5	6	1.5
The system is easy to use	197	49.3	146	36.5	46	11.5	6	1.5	1	.3	4	1.0
When interacting with the system, the system gives clear information of _payment	154	38.5	151	37 8	68	17.0	17	4.3			4	1.0

The **study** found out that, most customers. 50%. strongly agreed that the system made it easy for **customers** to pay bills, whereas 49**.3%** strongly agreed that the system was easy to use. Further. **40.8%** strongly agreed that the system availed a 24/7 service and another 40**.3%** strongly agreed **that the** time spent at the banking hall had reduced with to the use of the e-bill and easy pay. **Meanwhile,** a proportion of 40.3% agreed that the system gave customers immediate response of **account** statement, 39% agreed that the time spent at the banking hall had reduced with to the use **of the e-bill** and easy pay and 37.8% agreed that when interacting with the system, it gave clear information of payment.

Some of the customers neither agreed nor disagreed on the benefits of e-billing. A segment of **27.5%** was indifferent on whether the system provided acceptable disconnection alerts and **24.3%** were indifferent on whether the system assured customers confidentiality in electricity bill **and** payment. Meanwhile, those who disagreed that the system provided acceptable disconnection alerts constituted 14.3% while 11.5% represented those who disagreed that it was easier to maintain file for bills and payment documents with the system. In addition, 5.5% strongly disagreed that the system provided acceptable disconnection alerts and 3.5% strongly disagreed that the time customers spent at the banking hall had reduced with the use of the e-bill **and** easy pay. Three percent of the customers gave no response on the system availing a 24/7 service.

4.4 Challenges of the e-bill and easy-pay

The rapid changes in ICT are creating a wide array of challenges that arise in the process of implementation and application of e-billing and e-payment.

4.4.1 Challenges of the e-bill and easy-pay by Employees

One of the objectives was to establish the challenges of the e-bill and easy-pay as experienced by the employees of KPLC. The results are as shown in Table 4.4.1.

Table 4.4.1: Challenges of the e-bill and easy-pay by Employees: Descriptive Statistics

Challenges of the e-bill and easy-pay	Mean	Std. Dev
Reliability of the new system	2.8300	1.01559
There is inadequate time for the system implementation	3.0900	1.12744
The system is complex to implement.	3.1500	1.12654
There is inadequate employee learning on the system	3.1700	1.06453
learning on how to use new system is not easy	3.4500	1.14922
Its difficult in using the technology	3.6263	1.11966
It takes time to get connected to the system and get the requested information	4.0000	1.08297
There is a provision of limited information from the system	4.0400	1.19642
The system has made it difficult to train support staff	4.1500	1.20918
There is lack of Institutional/ Company Support	4.2100	1.17207
The system is a challenge to the skilled staff	4.5354	1.11196

The study revealed that there were several challenges that were faced by the staff when implementing the e-bill and easy-pay. Most respondents were neutral to the fact that the challenges including reliability of the new system represented by mean of (2.83), inadequate time for the system implementation (3.09) and the system is being complex to implement (3.15) as a key challenges. In addition they disagreed, the system being a challenge to the skilled staff (4.53), lack of Institutional/ Company Support (4.21) and the system making it difficult to train support staff(4.15).

Table 4.4.2: Challenges of the c-bill and easy-pay by Employees

	Strongly Agree		Agree		Neither agree/Disagree		Disagree		Strongly Agree		No Response	
	F	%	F	%	F	%	F	%	F	%	F	%
It's difficult in using the technology	4	4.0	14	14.0	20	20.0	38	38.0	23	23.0	1	1.0
The system is a challenge to the skilled staff	2	2.0	14	14.0	27	27.0	31	31.0	23	23.0	3	3.0
learning on how to use new system is not easy	8	8.0	17	17.0	16	16.0	40	40.0	19	19.0		
There is lack of Institutional/ Company Support	5	5.0	20	20.0	29	29.0	29	29.0	15	15.0	2	2.0
There is a provision of limited information from the system	6	6.0	18	18.0	44	44.0	18	18.0	12	12.0	2	2.0
There is inadequate employee learning on the system	7	7.0	24	24.0	24	24.0	35	35.0	10	10.0		
The system is complex to implement	10	10.0	19	19.0	27	27.0	34	34.0	10	10.0		
It takes time to get connected to the system and get the requested information	8	8.0	20	20.0	41	41.0	20	20.0	9	9.0	2	2.0
The system has made it difficult to train support staff	5	5.0	17	17.0	33	33.0	36	36.0	7	7.0	2	2.0
There is inadequate time for the system implementation	8	8.0	22	22.0	29	29.0	35	35.0	6	6.0		
Reliability of the new system	6	6.0	37	37.0	31	31.0	20	20.0	6	6.0		

The study revealed that most employees, 10% strongly agreed that the system was complex to implement. A proportion of 8 %, each strongly agreed that there was inadequate time for the system implementation, learning on how to use new system was not easy, and that it took time to get connected to the system and get the requested information. Moreover, 37% agreed that reliability of the new system was a challenge, followed by inadequate employee learning on the system, 24% and inadequate time for the system implementation, 22%. Majority of the employees, 44% neither agreed nor disagreed that there was a provision of limited information

from the system. Also, 41% were indifferent on whether it took time to get connected to the system and get the requested information.

A section of the respondents disagreed that there were challenges facing e- billing. This was confirmed when 40% disagreed that learning on how to use new system was not easy, followed by 38% who denied that it was difficult in using the technology, and 36% disagreed that the system had made it difficult to train support staff. Still, a proportion of 23%, each, strongly disagreed that there was difficulty in using the technology and that the system was a challenge to the skilled staff. I lowever, 3% gave no response on the aspect that the system was a challenge to the skilled staff.

4.4.2 Challenges of the e-bill and easy-pay by Customers

This part of the study was done so as to find out the challenges of the e-bill and easy-pay as experienced by the customers of KPLC. The results are as shown Table 4.4.3.

Table 4.4.3: Challenges of the e-bill and easy-pay by Customers

Challenges of the e-bill and easy-pay by Customers	Mean	Std. Dev
The system does not provide adequate detailed information	2.38	1.285
The system create poor company-customer relationships	2.43	1.215
The system does not provide me with sufficient information	2.66	1.189
The system does not provide adequate evidence for legal redress	2.87	1.179
Response by the system to request is slow	3.08	1.225
Accuracy of information that I receive from the system is low	3.63	.151
The system is not easy to use	3.84	1.348
The system posses security challenges to payment	3.95	1.288
The system makes it not easy to reverse payment once they have been updated	4.04	1.224
There is unacceptable delay in connecting to the system for service	4.29	1.187
The system posses security challenges to bill information	4.33	1.159
It's not easy to leam how to use the system	4.40	1.197
Initial system implementation cost are high	4.58	1.247
The system leads to reduce personal touch/contact with company	4.58	1.206
Financial option available for payment are limited	4.62	1.194
The system presents information in a format that is difficult to understand	4.78	1.173
Possibility of payment going to wrong account increase with the use of the system	4.98	.169

The study revealed that there were several challenges that were faced by the customers while using the e-bill and easy-pay. Most customers were neutral that the challenges included the inability of the system to provide adequate detailed information represented by mean of (2.38), poor company-customer relationships created by the system (2.43), and failure of the system to provide customers with sufficient information (2.66) as main challenges. However, they strongly disagreed that the challenge included the there was a possibility of payment going to wrong account with the use of the system (4.98) and that the system presented information in a format that was difficult to understand (4.78).

Table 4.4.4: Challenges of the e-bill and easy-pay by Customers

	Strongly Agree		Agree		Neither Agree/Disagree		Disagree		Strongly Disagree		Missing Response	
	F	%	F	%	F	%	F	%	F	%	F	%
The system **is not easy to use**	20	5.0	42	10.5	75	18.8	124	31.0	134	33.5	5	1.3
its not easy **to learn how to use the** system	23	5.8	44	11.0	67	16.8	141	35.3	118	29.5	7	1.8
The system **does not provide me** with **sufficient information**	34	8.5	69	17.3	82	20.5	124	31.0	90	22.5	1	.3
The system **presents information** in a format **that is difficult to** understand	29	7.3	56	14.0	91	22.8	128	32.0	85	21.3	II	2.8
Possibility **of payment going to** wrong **account increase with the** use of **the system**	56	14.0	66	16.5	76	19.0	107	26.8	83	20.8	12	3.0
Initial system **implementation** costs are high	35	8.8	50	12.5	100	25.0	125	31.3	81	20.3	9	2.3
The system **does not provide** adequate **detailed information**	43	10.8	82	20.5	77	19.3	117	29.3	80	20.0	1	.3
There is **unacceptable delay in** connecting **to the system for** service	32	8.0	63	15.8	97	24.3	125	31.3	75	18.8	8	2.0
Response **by the system to request** is slow	26	6.5	69	17.3	110	27.5	119	29.8	73	18.3	3	.8
The system **posses security** challenges **to payment**	38	9.5	71	17.8	93	23.3	122	30.5	68	17.0	8	2.0
The system **posses security** challenges to **bill information**	32	8.0	71	17.8	108	27.0	113	28.3	67	16.8	9	2.3
The **confidence i have in the** accuracy **in information that i** receive **from the system is low**	45	11.3	67	16.8	111	27.8	109	27.3	62	15.5	6	1.5
Financial **options available for** payment **are limited**	32	80	68	17.0	127	31.8	104	26.0	59	14.8	10	2.5
The system **leads to reduce** personal **touch/contact with** company	36	9.0	77	19.3	112	28.0	109	27.3	56	14.0	10	2.5
The use of the system makes it not easy to reverse payment once they have been updated	75	18.8	82	20.5	113	28.3	70	17.5	51	12.8	9	2.3
The system **create poor company-**customer **relationships**	54	13.5	91	22.8	112	28.0	103	25.8	38	9.5	2	.5
The system does not provide adequate evidence or .documentation for legal redress	64	16.0	82	20.5	115	28.8	97	24.3	38	9.5	4	1.0

The study established that, most respondents, 18.8%, strongly agreed that the use of the system **made** it difficult to reverse payment once they had been updated. Sixteen percent strongly agreed that the system did not provide adequate evidence or documentation for legal redress and 14%

strongly agreed that there was a possibility of payment going to wrong account with the use of the system. Moreover, 22.8% agreed that the system created poor company-customer relationships. Still, a proportion of 20.5%, each, agreed that the use of the system made it difficult to reverse payment once they have been updated, the system did not provide adequate evidence or documentation for legal redress and that the system did not provide adequate detailed information.

Majority of the customers, 31.8% neither agreed nor disagreed that a challenge of e-billing was **that** financial options available for payment were limited. In addition. 28.8% were indifferent on **whether** the system did not provide adequate evidence or documentation for legal redress and 28.3% indifferent on whether the use of the system made it difficult to reverse payment once **they have** been updated. Meanwhile, those who disagreed that it was not easy to learn how to use **the system** constituted 35.3% while 32.0% represented those who disagreed that the system **presented** information in a format that was difficult to understand. In addition, majority, 33.5% **strongly** disagreed that the system was not easy to use. Further, 29.5% strongly disagreed that it **was** not easy to learn how to use the system and another 22.5% strongly disagreed that the **system** did not provide me with sufficient information. Three percent of the customers gave no **response** on the possibility of payment going to wrong account with the use of the system.

4.5 Factor analysis on the Benefits realized on use of on e-billin» and easv-pay

4.5.1 Factors that customers realize on the use of e-bill and easy-pay

One of the objectives of this study was to establish benefits realized with the launch of the electronic billing and payment in KPLC. The following variables were tested.

Table 4.5.**1: Benefits Realized by customers**

Factors	Challenges
F1	Time spent at the banking hall is reduced with the use of the e-bill and easy-pay
F2	The system gives me immediate response of account statement
F3	The system make me feel in control of my payments
F4	The system is reliable
F5	When interacting with the system, the system gives clear information of payment
F6	The system make it easy for me to pay bills
F7	The system gives accurate bills
F8	The system avails a 24/7 service
F9	It is easier to maintain file for bills and payment documents with the system
1 F10	I have reduced cost when 1 used the system
F1l	The system response time is acceptable
F12	The system is easy to use
F13	The system enables me to obtain financial billing information
F14	The system provides a sure way of receiving bills
F15	The system assures me of confidentiality in electricity bill and payment
F16	The system provides acceptable disconnection alerts
F17	The system offers convenient way of settling electricity bills
i F I s -	One feels secure that my account will be updated with my payment when I use the system

The above **variables are some of the anticipated benefits the customers might gain from the** introduction **of the system. The customers where to indicate by ticking in the appreciate boxes** the degree to **which they agree with each variable as applicable to the benefits they have realized** with the use **of E-bill and E-payment.**

4.5.2 Correlation Matrix-Benefits of e-bill and easy-pay on the customers

Table 4.5.2: Correlation Matrix- Benefits of e-bill and easy-pay on the customers

Factors	FI	F2	F3	F4	F5	F6	F7	F8	F9	FIO	FII	F12	FI3	FI4	FIS	FI6	FI7	FIS
FI	1.000	.493	.402	344	.620	.694	J9I	.252	.246	.620	.296	.401	.498	JIO	.699	.700	.564	.2SI
R	.493	1.000	.404	J53	JII	.341	.404	.262	.265	.620	.306	.806	.494	.629	.696	.695	.549	.524
F3	.402	.404	1.000	.287	.251	.281	J2S	.213	.426	.253	.248	J22	.406	.512	.281	.289	.234	.215
FI	.144	JS3	.2*7	1.000	.222	.244	284	.180	.181	.215	.215	.289	.169	.226	.247	.243	.198	.186
	.620	JII	.251	.222	IOOO	.444	.238	.152	.154	.393	.188	.247	.112	.189	.432	.428	J54	.153
Ft	*I*I	.341	.281	.244	.444	1.000	.278	.175	.178	.435	.219	.283	.145	.211	.494	.489	.415	.173
	J9I	.404	.325	.284	.238	.278	1 000	.204	.428	.247	.250	J23	.191	.257	285	.283	.223	.436
	.252	.262	.213	.180	.152	.175	.204	1.000	.272	.155	.153	.423	.110	.155	.179	.173	.133	.123
F9	.244	.265	.426	.183	.154	.178	.428	.272	1.000	.159	J3I	.211	.192	.136	.180	.185	.459	.423
Fit	.(20	.620	.253	.215	.393	.435	.247	.155	.159	1.000	.193	.507	.471	.404	.670	.665	.539	J24
FII	.296	.306	.241	.215	.118	.219	.250	.153	JII	.191	1.000	.251	.149	.194	.213	.444	.181	.163
FI2	.401	.804	.322	.289	.247	.283	.323	.423	.211	.507	.251	1.000	.402	.510	.566	.562	.461	.429
	.498	.494	.406	.169	.312	.345	.193	.110	J92	.471	.149	.402	1.000	.468	.527	.528	.574	.391
	.310	.629	.512	.226	.189	.211	.257	.155	.336	.404	.194	.510	.468	1.000	.441	.436	J65	.335
FIS	.699	696	.281	.247	.432	.494	.285	.179	.180	.670	.213	.566	.527	.441	1.000	.741	.607	J76
	.700	.695	.289	.243	.428	.489	283	.173	.1*5	.665	.444	.542	.528	.436	.741	1.000	.606	J7I
	544	569	.234	.198	J54	.615	.223	.133	.459	.519	.181	.461	.574	.365	.607	.606	1.000	.609
FII	.251	.524	.215	.186	.153	.173	.436	.123	.423	.324	.163	.429	J9I	.335	.376	J7I	.609	1.000

From the correlation Table 4.5.2 it can be seen that most of the figures were highly correlated with Time spent at the banking hall is reduced with the use of the e-bill and easy-pay and these include the system is reliable at 0.344, When interacting with the system, the system gives clear information of payment at 0.62 and The system make it easy for me to pay bills at 0.694. The system gives immediate response of account statement followed in sequence and was highly correlated with the system being easy to us at 0.806.

4.5.3 **Communalities-Benefits of e-bill and easy-pay on the customers**

Communalities indicate the amount of variance in each variable that is accounted for. Small values indicate variables that do not fit well with the factor solution, and should possibly be dropped from the analysis.

Table 4.5.3: Communalities- Benefits of e-bill and easy-pay on the customers

	Extraction
The system gives me immediate response of account statement	.870
The time spent at the banking hall is reduced with to the use of the e-bill and easy-pay	.858
The system is easy to use	.795
It is easier to maintain file for bills and payment documents with the system	.790
The system offers convenient way of settling electricity bills	.790
The system assures me of confidentiality in electricity bill and payment	.771
The system provides acceptable disconnection alerts	.755
The system make it easy for me to pay bills	.680
I have reduced cost when 1 used the system	.670
I feel more secure that my account will be updated with my payment when I use the system	.651
The system enables me to obtain financial billing information	.583
When interacting with the system, the system gives clear information of payment	.569
The system provides a sure way of receiving bills	.569
The system gives me accurate bills	.487
The system make me feel in control of my payments	.475
The system avails a 24/7 service	.436
The system is reliable	.390
The system response time is acceptable	.336
Extraction Method: Principal Component Analysis.	

Table 4.5.2 shows the critical factors that customers consider to be beneficial to them starting from the highest one being system gives immediate response of account statement, time spent at the banking hall is reduced, system ease of use, It is easier to maintain file for bills and payment documents with the system, The system offers convenient way of settling electricity bills and the least factors where in order the system provides a sure way of receiving bills, when interacting with the system, the system gives clear information of payment and The system enables me to obtain financial billing information.

4.5.4 Total Variance Explained-Benefits of e-bill and easy-pay on the customers

Table 4.5.4: Total Variance Explained-Benefits of e-bill and easy-pay on the customers

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.350	40.831	40.831	3.688	20.491	20.491
2	1.644	9.132	49.963	3.413	18.964	39.455
3	1.322	7.347	57.309	2.260	12.558	52.013
4	1.160	6.445	63.754	2.113	11.741	63.754

Extraction Method: Principal Component Analysis.

Table 4.5.4 shows that four factors were considered significant for analysis, which are; system gives immediate response of account statement with it explaining 40.831% of the variance, time spent at the banking hall is reduced it explaining 9.132% of the variance, system ease of use explaining 7.347% of the variance, It is easier to maintain file for bills and payment documents with the system explaining 6.445% of the variance.

4.5.6 Scree Plot-Benefits of c-hill anil easy-pay on the customers

Figure 4.5.6: Scree Plot- Benefits of E-bill and easy-pay to customer

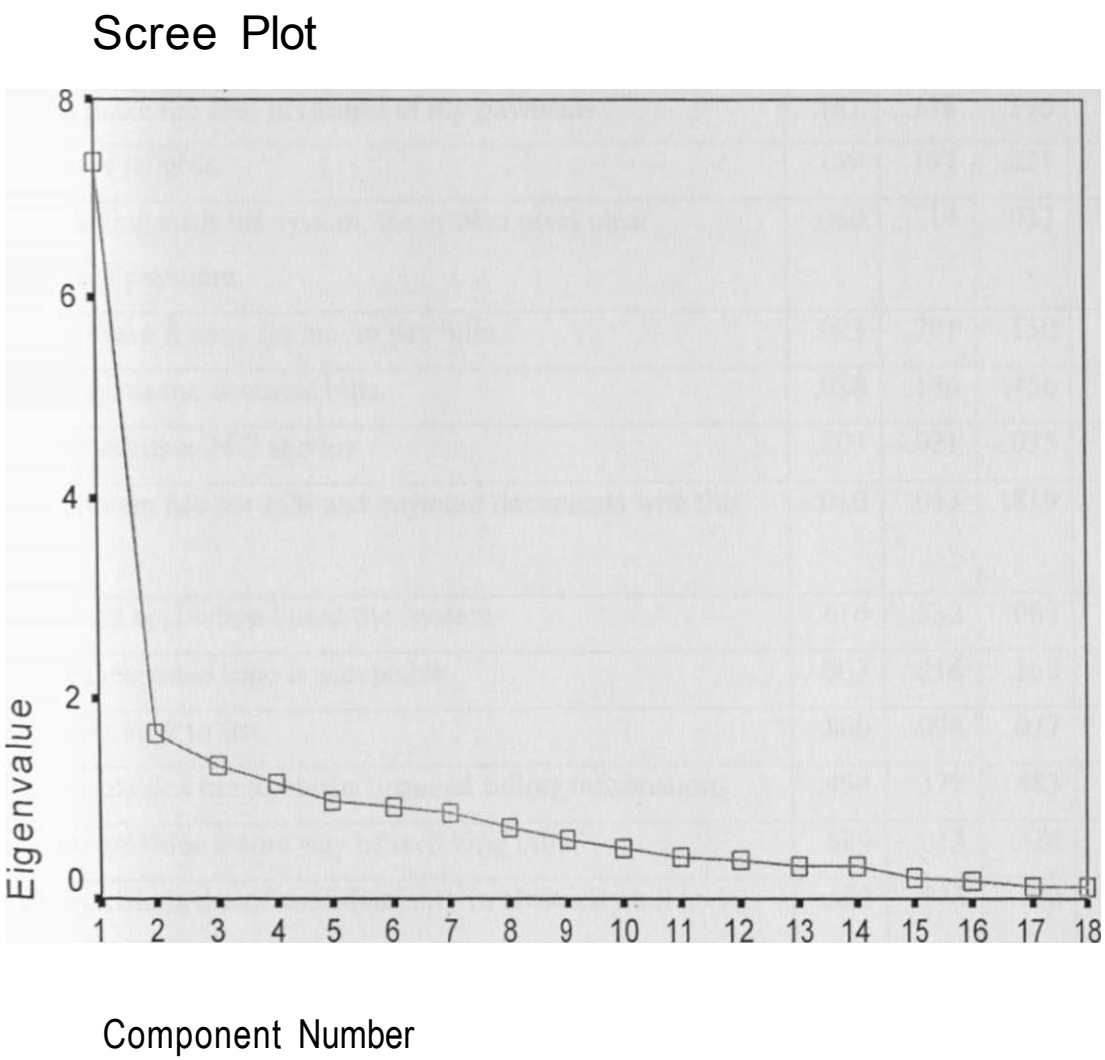


Figure 4.5.6 shows the Scree plot indicating the point of inflexion of the curve after the second component. After the seventh component the curve achieves a stable plateau. This justifies that **we could** either retain two or seven factors.

4.5.7 Rotated Component Matrix -Benefits of e-bill and easy-pay on the customers

Table 4.5.7: Rotated component Matrix - Benefits of E-bill and easy-pay to customer

	Component			
	1	2	3	4
The time spent at the banking hall is reduced with to the use of the e-bill and easy-pay	.268	.827	.125	.295
The system gives me immediate response of account statement	.830	.217	.209	.301
The system make me feel in control of my payments	.181	.148	.396	.514
j The system is reliable	.139	.197	.031	.575
When interacting with the system, the system gives clear information of payment	.060	.714	.033	.232
The system make it easy for me to pay bills	.093	.791	.150	.153
The system gives me accurate bills	.088	.166	.456	.495
The system avails a 24/7 service	.203	-.021	-.035	.628
Ease to maintain file for bills and payment documents with the system	-.010	.063	.819	.341
I have reduced cost when i used the system	.616	.532	.062	.054
The system response time is acceptable	.063	.216	.168	.507
The system is easy to use	.800	.094	.077	.373
The system enables me to obtain financial billing information	.454	.377	.483	-.035
The system provides a sure way of receiving bills	.629	.013	.326	.258
The system assures me of confidentiality in electricity bill and payment	.650	.576	.102	.081
The system provides acceptable disconnection alerts	.613	.586	.105	.160
The system offers convenient way of settling electricity bills	.440	.544	.538	-.104
1 feel more secure that my account will be updated with my payment when I use the system	.442	.054	.673	.001

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser **Normalization,** a Rotation converged in 12 iterations.

Component 1 loads highly with the following factors; the system gives me immediate response of account statement, I have reduced cost when 1 used the system, the system is easy to use, the system provides a sure way of receiving bills, the system assures me of confidentiality in electricity bill and payment, and the system provides acceptable disconnection alerts. These factors can be summarized cost efficiency of the system.

Component 2 loads highly with the factors; the time spent at the banking hall is reduced with to the use of the e-bill and easy-pay. when interacting with the system, the system gives clear information of payment, the system make it easy for me to pay bills and that he system offers convenient way of settling electricity bills. Component 2 can therefore be said to relate to time efficiency of the system.

Component 3 loads highly with the factors; it is easier to maintain file for bills and payment documents with the system, the system enables one to obtain financial billing information, and the fact that the user feels more secure that my account will be updated with my payment when I use the system. Component 3 can therefore be said to relate to financial confidence with the system.

Component 4 loads highly on the following; the system make me feel in control of my payments, the system is reliable, the system gives me accurate bills, the system avails a 24/7 service and the system response time is acceptable. Component 4 can therefore be said to relate to reliability with the system.

4.5.8 Component Transformation Matrix-Benefits of E-bill and easy-pay to customer

The factor transformation matrix describes the specific rotation applied to your factor solution.

Table 4.5.8: Component Transformation Matrix-Benefits of E-bill and easy-pay to customer

Component	1	2	3	4
1	.629	.570	.391	.355
2	-.020	-.668	.563	.487
3	-.686	.418	-.044	.594
4	.364	-.235	-.727	.533

I Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser

I Normalization.

If the off-diagonal elements are close to zero, the rotation was relatively small. If the off-diagonal elements are large (greater than ±0.5), a larger rotation was applied, which is the case in Table 4.5.8.

4.5.9 Benefits realized by Employees

One of **the** objectives was to establish benefits realized with the launch of the electronic billing and **payment in** KPLC. The following variables where measured for both the employees and the customers.

Table 4.5.9: Benefits of E-bill and easy-pay to employees

F1	It **has** reduced the long queues in banking halls
F2	The system has reduced the number of complaints from customers using it
F3	The use of e-bill has led to reduced paper usage which helps conserve forests and reduces paperwork in the office
F4	The system is fast and secure
F5	Reduced operational costs
F6	Provides a clear/good return on investment
F7	The system provides an efficient and effective service delivery
F8	**Ease** of customer data retrieval
F9	Facilitates ease of handling customer complaints
F10	The system has made easy distribution of customer payment points
F11	It is a broad delivery and payment medium and it's able to gain maximum use.
F12	Number of complaints from customers using the system is low
F13	The system provides a convenient way of viewing the statement on line
F14	**Use** of system reduces operational costs

4.5.10 Correlation Matrix-Benefits of E-bill and easy-pay to Employees

Table 4.5.10 Correlation Matrix-Benefits of E-bill and easy-pay to Employees

Factors	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
F1	1 000	-079	-.069	365	104	269	033	047	-098	162	113	.035
F2	-079	1 000	.006	-095	- 119	-009	-006	-025	-.028	-095	- 123	000
F3	-.069	.006	1.000	.032	-.002	.002	-.014	-.011	.991	.000	-.024	-027
F4	.365	-.095	.032	1.000	.438	.331	.022	.167	.025	086	.078	.023
F5	.104	-.119	-.002	.438	1.000	-.056	013	.159	.026	.172	.069	033
! F6	269	-009	002	331	-.056	1 000	-.013	-.013	-.033	-035	.100	-.023
F7	.033	-006	-.014	.022	013	-013	1 000	-.002	-015	135	.007	706
F8	.047	-.025	-.011	.167	.159	-.013	-.002	1.000	.007	Oil	-.007	-.011
F9	-.098	-.028	.991	.025	.026	-.033	-.015	.007	1.000	.047	.009	-.022
1 F10	.162	-.095	.000	.086	.172	-.035	.135	.011	.047	1.000	.549	.101
F11	.113	- 123	-024	078	.069	100	007	-007	.009	549	1.000	-.004
F12	035	.000	-.027	.023	.033	-023	.706	-Oil	-.022	101	-.004	1.000

'able 4.5.10 shows that the strong correlations (above 0.5) are between, The use of e-bill has led o reduced paper usage which helps conserve forests and reduces paperwork in the office and acilitates ease of handling customer complaints at 0.991, the system provides an efficient and ;ffective service delivery and number of complaints from customers using the system is low at D.706, and between the system has made easy distribution of customer payment points and it is a broad delivery and payment medium and it's able to gain maximum use at 0.549.

4.5.11 Communalities-Benefits of E-bill and easy-pay to Employees

Communalities indicate the amount of variance in each variable that is accounted for. Small values indicate variables that do not fit well with the factor solution, and should possibly be dropped from the analysis.

Table 4.5.11: Communalities-Benefits of E-bill and easy-pay to Employees

	Extraction
The system facilitates ease of handling customer complaints	.995
The use of the system has led to reduced paper work	.994
The system provides an effective service delivery	.850
Use of system reduces operational costs	.849
The system has made easy distribution of customer payment points	.760
The system provides a convenient way of viewing customer information on line	.758
The system is fast	.738
The system provides an efficient service delivery	.707
11 The system is secure	.664
The use of the system has reduced the long queues in banking halls.	.529
The system makes it easy for data retrieval	.377
The use of the system has reduced the number of complaints from customers using it	.146
Extraction Method: Principal Component Analysis.	

Communalities in the column labeled extraction reflect the common variance in the data structure. Therefore 99.5% of the variance relating to the system facilitates ease of handling customer complaints is common variance. Similarly 99.4% of the variance relating to the use of the system leading to reduced paper work is a shared variance. Only one factor which is the use of the system has reduced the number of complaints from customers using **it** has a shared variance of 14.6% and should be dropped from further analysis.

4.5.12 Total Variance Explained-Benefits of E-bill and easy-pay to Employees

Table 4.5.12: Total Variance Explained-Benefits of E-bill and easy-pay to Employees

Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	%of Variance	Cumulative %	Total	%or Variance	Cumulative %	Total	%of Variance	Cumulative %
1	2.068	17.236	17.236	2.068	17.236	17.236	1.999	16.660	16.660
2	1.998	16.653	33.889	1.998	16.653	33.889	1.723	14.357	31.017
3	1.706	14.216	48.105	1.706	14.216	48.105	1.617	13.479	44.496
4	1.399	11.657	59.761	1.399	11.657	59.761	1.588	13.236	57.732
5	1.195	9.960	69.722	1.195	9.960	69.722	1.439	11.990	69.722
6	.949	7.912	77.633						
7	.863	7.189	84.822						
8	.712	5.931	90.753						
9	.415	3.461	94.214						
10	.397	3.310	97.524						
11	.291	2.428	99.952						
12	.006	.048	100.000						

Extraction V ethod: Principal Component Analysis.

Table 4.5.12 shows that the first five factors explains a total of 69.722% of the total variance and **this shows** their significance in the analysis. Since these five factors have all factors with eigen **values** greater than 1, they are used in further analysis. Rotation has the effect of optimizing the **factor** structure and one consequence for these data is that the relative importance of the five **factors is** equalized. For example factor one before ration accounted for 17.236% of the variance **and** after rotation it accounted for 16.660% of the variance.

4.5.13 Screc Plot-Benefits of E-bill and easy-pay to Employees

Figure 4.5.13: Scree Plot- Benefits of E-bill and easy-pay

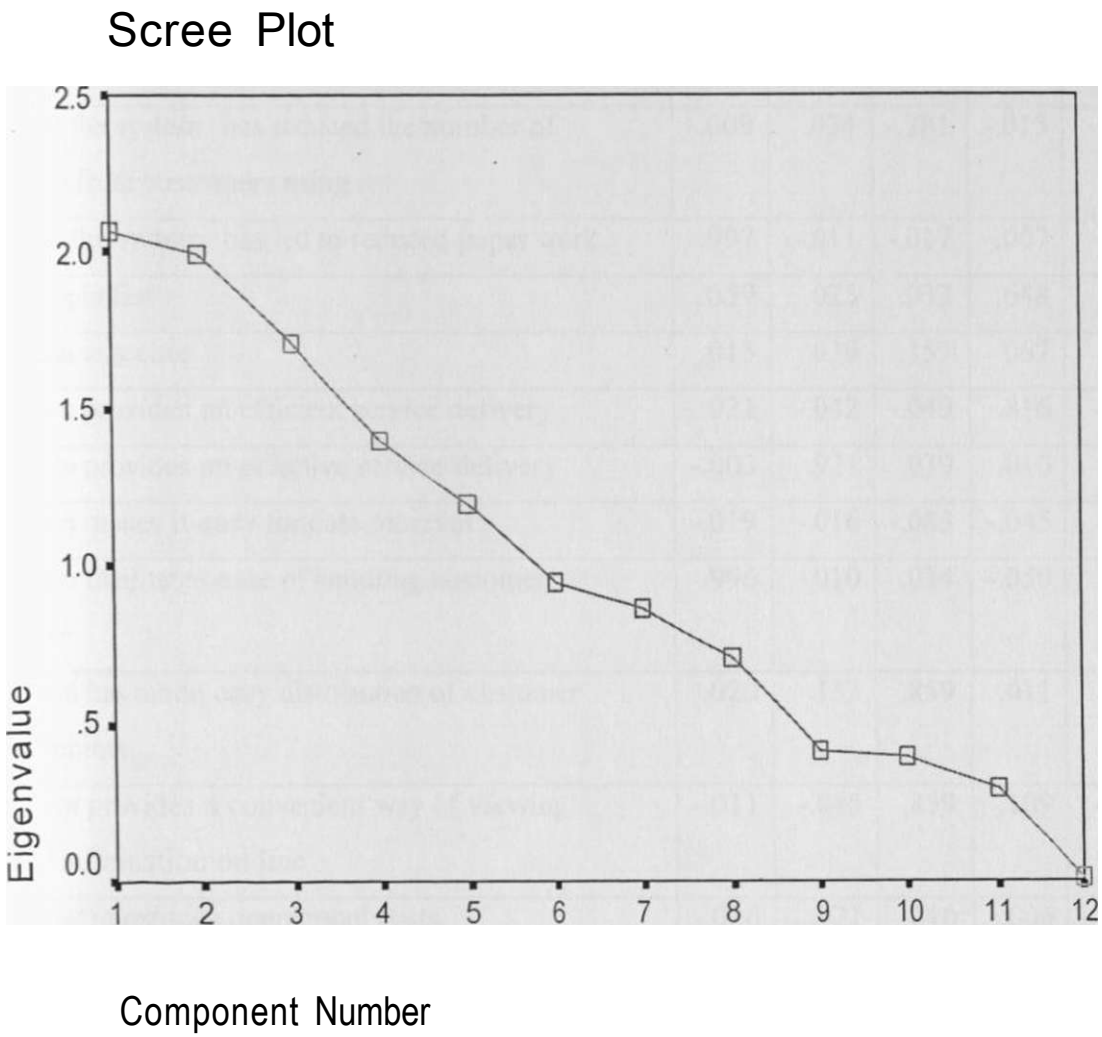


Figure 4.5.13 shows the Scree Plot with an inflexion point after the 9^{lh} component. This shows that for the benefits of E-bill and Easy-pay, we could justify the retention of the 9 components.

4.5.14 Rotated Component Matrix-Benefits of E-bill and easy-pay to Employees

Table 4.5.14: Rotated Component Matrix-Benefits of E-bill and easy-pay to Employees

	Component			
The use of the system has reduced the long queues in banking halls	.096	.044	.158	.693
The use of the system has reduced the number of complaints from customers using it	-.009	.034	-.281	-.015
The use of the system has led to reduced paper work	.997	**.011**	-.017	.007
The system is fast	.059	.025	.033	.648
The system is secure	.015	.030	.157	.067
The system provides an efficient service delivery	.021	-.042	-.049	.816
The system provides an effective service delivery	.003	.921	.039	.010
The system makes it easy for data retrieval	-.019	-.016	.083	-.045
The system facilitates ease of handling customer complaints	.996	.010	.034	-.050
The system has made easy distribution of customer payment points	.020	.132	.859	**.011**
The system provides a convenient way of viewing customer information on line	.01	-.045	.859	.109
Use of system reduces operational costs	−.016	.921	.010	.006

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization, a Rotation converged in 5 iterations.

Component 1 loads highly with the factors; the use of the system has led to reduced paper work and the system facilitates ease of handling customer complaints and can therefore be concluded to relate to utilization of the system.

Component 2 loads highly with the system providing an effective service delivery and use of system reducing operational costs and can therefore be said to relate to cost efficiency of the system.

Component 3 loads highly with the factors; the use of the system has reduced the number of complaints from customers using it. the system has made easy distribution of customer payment points and the system provides a convenient way of viewing customer information on line. All these relate to customer satisfaction.

Component 4 loads highly with; the use of the system has reduced the long queues in banking halls, the system is fast and the system provides an efficient service delivery. This looks at the time efficiency of the system.

Component 5 loads highly with; the system is secure and the system makes it easy for data retrieval. This looks at the security of the system.

4.5.15 Component Transformation Matrix-Benefits of E-bill and easy-pay to Employees

Table 4.5.15: Component Transformation Matrix-Benefits of E-bill and easy-pay to Employees

Component	1	2	3	4	5
1	-.389	.318	.510	.559	.418
2	.912	.048	.272	.177	.245
3	.067	.911	.035	-.339	-.221
4	.068	.256	-.814	.422	.297
I T	.084	.024	.038	.602	-.793

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

There are four items in which are less than ±0.05 which lie in the off diagonal of component 2 **which** can be seen when the rotation was relatively small.

4.6 Challenges faced in the use and implementation of the e-bill and easy pay-

Table 4.6.1: Challenges of use of the e-bill and easy-pav by customers

Factors	**Challenges of use of the e-bill and easy-pay by customers**
F1	The system does not provide adequate detailed information
F2	The system create poor company-customer relationships
F3	The system is not easy to use
F4	The system posses security challenges to payment
F5	The system posses security challenges to bill information
F6	Possibility of payment going to wrong account increase with the use of the system
F7	The use of the system makes it not easy to reverse payment once they have been updated
F8	The system does not provide me with sufficient information
F9	There is unacceptable delay in connecting to the system for service
F10	Response by the system to request is slow
F1l	Initial system implementation cost are high
F12	It's not easy to learn how to use the system
F13	The system leads to reduce personal touch/contact with company
r 14	The system presents information in a format that is difficult to understand
F15	The system does not provide adequate evidence or documentation for legal redress
F16	The confidence i have in the accuracy in information that i receive from the system is low
R-Fi 7	Financial option available for payment are limited

Table 4.6.2: Correlation Factors -Challenges of use of the e-bill and easy-pay by customers

F»rton 1 F1		R	F3	F4	F5	F6	F7	F8	F9	F10	F11	FI2	FI3	FI4	FI5	FI6	F17
		-.023	.001	-.044	-.009	-.017	-.017	.027	-.044	-.029	-.008	-.065	-.007	-.035	-.013	-.073	-.048
		1.000	.332	.551	.293	.400	.503	.680	.618	.403	.264	.557	-.013	.469	.692	.573	.242
n	.001	J32	1000	-376	.392	.278	.338	.485	.428	.556	.169	.184	.172	J13	.226	.385	.309
F«	-.044	.551	.376	1 000	.352	.327	.402	.376	.514	.441	.122	.298	.126	.377	.373	.466	.246
fS	-.009	.293	J92	.352	1.000	.226	.421	.395	.348	.453	.293	.148	.285	.251	.194	.316	.385
F4	-.017	.400	.271	.327	.226	1000	.300	.289	J85	.337	.081	.222	.086	.277	.280	.352	.179
	-••17	.503	J3»	.402	.421	.300	1000	.343	.621	.403	.117	.270	.III	.461	J46	.421	.220
II	.•27	.680	,4»5	J76	.395	.289	.343	1000	.439	.571	.371	.396	-.003	.327	.489	J96	-317
1 ^	-.044		.428	.514	.348	J8S	.621	.439	1000	.515	.156	.540	.149	.587	.445	.531	.283
FID	-.029	.403	.556	.441	.453	J37	.403	.571	-515	1000	.434	.219	.219	.381	.287	.464	J78
1 fw	-.008	.264	.169	.122	.293	.088	.117	J7I	.156	.434	1000	.140	.558	.353	.172	.290	JtO
ni	-.045	.557	.184	.298	.148	.222	.270	.396	.540	.219	.140	1000	-.018	.259	.406	.318	.253
FIJ	• 007	-.013	.172	.126	.215	.086	.III	-.003	.149	.219	.558	-.018	1000	.229	.016	.286	.363
1 Fw	-.035	.469	.313	.377	.251	.277	.461	.327	.587	.381	.353	.259	.229	lOOO	J23	-393	.202
hr.— r	-.013	.692	.226	.373	.194	.280	J46	.489	.445	.287	.172	.406	-.016	.323	1000	.394	.151
nt	-.073	-573	.385	.466	J1(	J52	.421	.396	.531	.464	.290	-318	.286	J93	J94	1000	.536
HI	-.048	.242	J09	.246	.385	.179	.220	.317	.283	J78	J60	.253	J63	.202	.151	.536	1000

Correlation Matrix

Table 4.6.2 shows that the strong correlations (above 0.5) are between, the system create poor company-customer relationships and the system does not provide adequate evidence or documentation for legal redress at 0.692, response by the system to request is slow and the system is not easy to use 0.556.

The system posse's security challenges to payment and the system create poor company-**customer** relationships at 0.551. The other relationships are between the use of the system makes **it not easy** to reverse payment once they have been updated and there is unacceptable delay in **connecting** to the system for service at 0.621, the system does not provide me with sufficient **information** and the system create poor company-customer relationships at 0.68, between Initial **system** implementation cost are high and the system leads to reduce personal touch/contact with **company** at 0.558, the system presents information in a format that is difficult to understand **and the** system does not provide adequate evidence or documentation for legal redress 0.587.

The confidence I have in the accuracy in information that I receive from the system is low and **the system** create poor company-customer relationships at .573 and between financial option **available** for payment are limited with the confidence I have in the accuracy in information that I **receive** from the system is low, at 0.536.

Figure 4.6.4: Scree Plot- challenges of use of easy pay and e-bill by customers

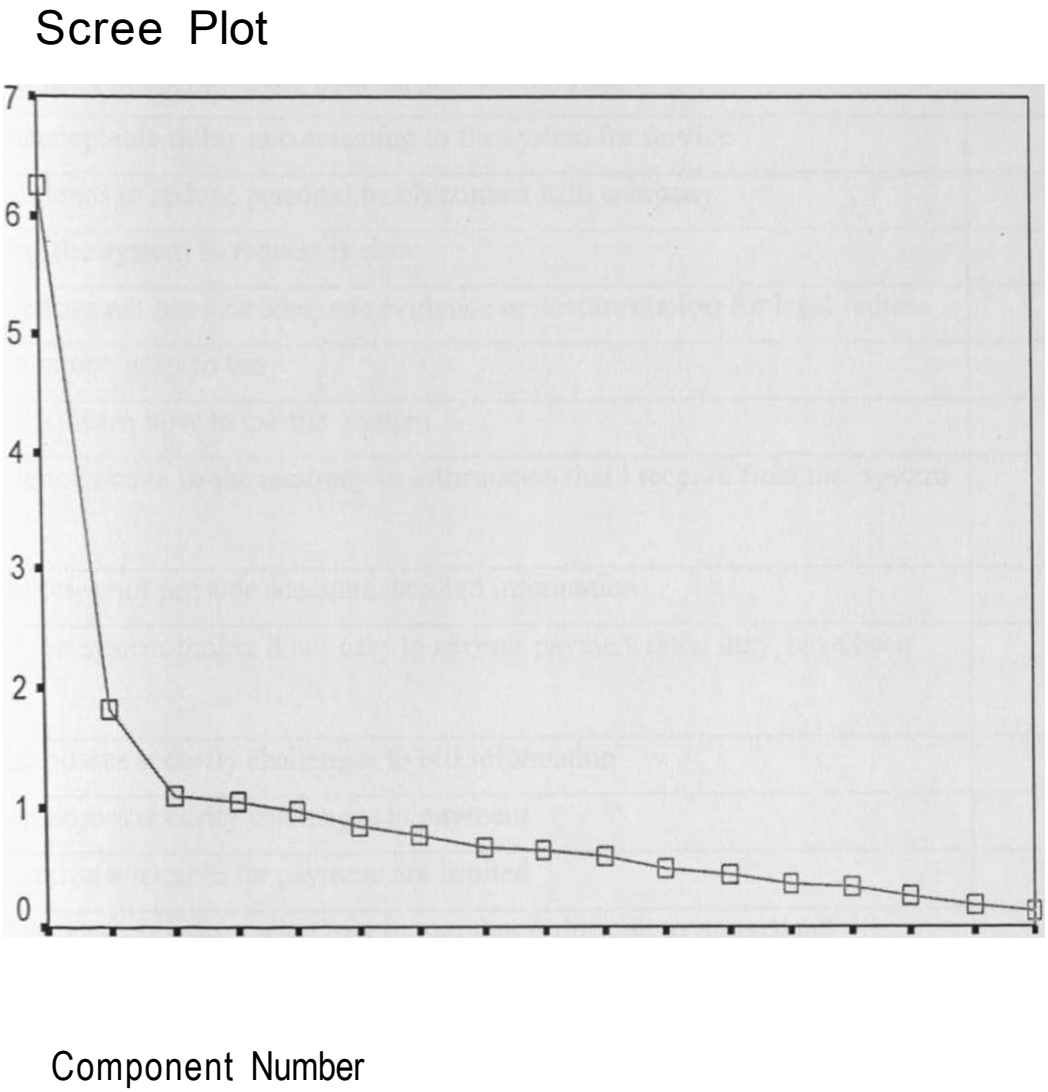


Figure 4.6.4 shows that the point of inflexion is at component 3, which implies that 3 factors could be enough to find out the challenges of e-bill and easy-pay by customers.

Table 4.6.5: Communalities-Challenges of use of the e-I>ill and easy-pay by customers

	Extraction
[The system create poor company-customer relationships	.849
[Initial system implementation cost are high	.784
The system does not provide me with sufficient information	.720
There is unacceptable delay in connecting to the system for service	.718
The system leads to reduce personal touch/contact with company	.711
Response by the system to request is slow	.642
The system does not provide adequate evidence or documentation for legal redress	.642
[The system is not easy to use	.593
1 Its not easy to learn how to use the system	.577
[The confidence i have in the accuracy in information that I receive from the system 1 is low	.577
' The system does not provide adequate detailed information	.574
The use of the system makes it not easy to reverse payment once they have been updated	.570
The system posses security challenges to bill information	.525
The system posses security challenges to payment	.508
: Financial option available for payment are limited	.490
The system presents information in a format that is difficult to understand	.444
Possibility of payment going to wrong account increase with the use of the system	.332

Extraction Method: Principal Component Analysis.

The first five factors with the highest variance to be accounted for include; The system create poor company-customer relationship at 84.9%, initial system implementation cost are high 784%, the system does not provide me with sufficient information 72.0%, there is unacceptable delay in connecting to the system for servicc at 71.8% and finally the system leads to reduce personal touch/contact with company 71.1%.

Table 4.6.6: **Total Variance Explained-Challenges of use of the e-bill and easy-pay by** customers

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	%of Variance	Cumulative %	Total	%of Variance	Cumulative %
1	6.256	36.800	36.800	3.746	22.033	22.033
2	1.835	10.796	47.597	3.091	18.182	40.215
3	1.106	6.504	54.100	2.346	13.801	54.016
4	1.058	6.222	60.322	1.072	6.306	60.322

Extraction Method: Principal Component Analysis.

From Table 4.6.6, it can be seen that only four factors had eigenvalues greater that one and they were used for further analysis. These four factors accounted for 60.322 % of the total variance.

Table 4.6.7: Rotated Component Matrix-Challenges of use of the e-bill and easy-pay by customers

	Component			
	1	2	3	4
The system does not provide adequate detailed information	-.033	-.031	-.060	.754
[The system create poor company-customer relationships	.400	.826	.072	.042
The system is not easy to use	.699	.058	.176	.265
The system posses security challenges to payment	.623	.333	.057	-.078
The system posses security challenges to bill information	.607	-.010	.359	.167
Possibility of payment going to wrong account increase with the use of the system	.523	.232	-.009	-.063
The use of the system makes it not easy to reverse payment once they have been updated	.696	.260	.018	-.132
The system does not provide me with sufficient information	.386	.594	.221	.410
There is unacceptable delay in connecting to the system for service	.655	.500	.086	-.179
Response by the system to request is slow	.638	.196	.382	.226
Initial system implementation cost are high	-.012	.231	.844	.133
It's not easy to learn how to use the system	.118	.739	.060	-.119
The system leads to reduce personal touch/contact with company	.114	-.161	.806	-.151
The system presents information in a format that is difficult to understand	.460	.356	.262	-.193
The system does not provide adequate evidence or documentation for legal redress	.198	.773	.022	.072
The confidence I have in the accuracy in information that i receive from the system is low	.488	.402	.388	-.165
Financial option available for payment are limited	.286	.142	.622	-.034

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. A Rotation converged in 6 iterations.

Table 4.6.7 shows that component 1 loaded highly with nine out of seventeen factors. This left the other three components to split in between the eight other factors. Component 4 loaded highly with only the challenge of the system not providing adequate detailed information

Table 4.6.8: Component Transformation Matrix- Challenges of use of the e-bill and easy-pay by customers

Component	1	2	3	4
1	.717	.588	.374	.022
2	-.004	-.534	.844	.054
3	.616	-.535	-.364	.449
4	-.327	.288	.124	.891

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

There were only three times that were less than ±0.05. When looking at them from an off-diagonal matrix, they were seen to lie on component 1 and component 2 where the rotation was relatively **small.**

4.7 Challenges of implementation of the e-bill and easy pay by employees

Table 4.7.1: Challenges of implementation of the e-bill and easy pay by employees

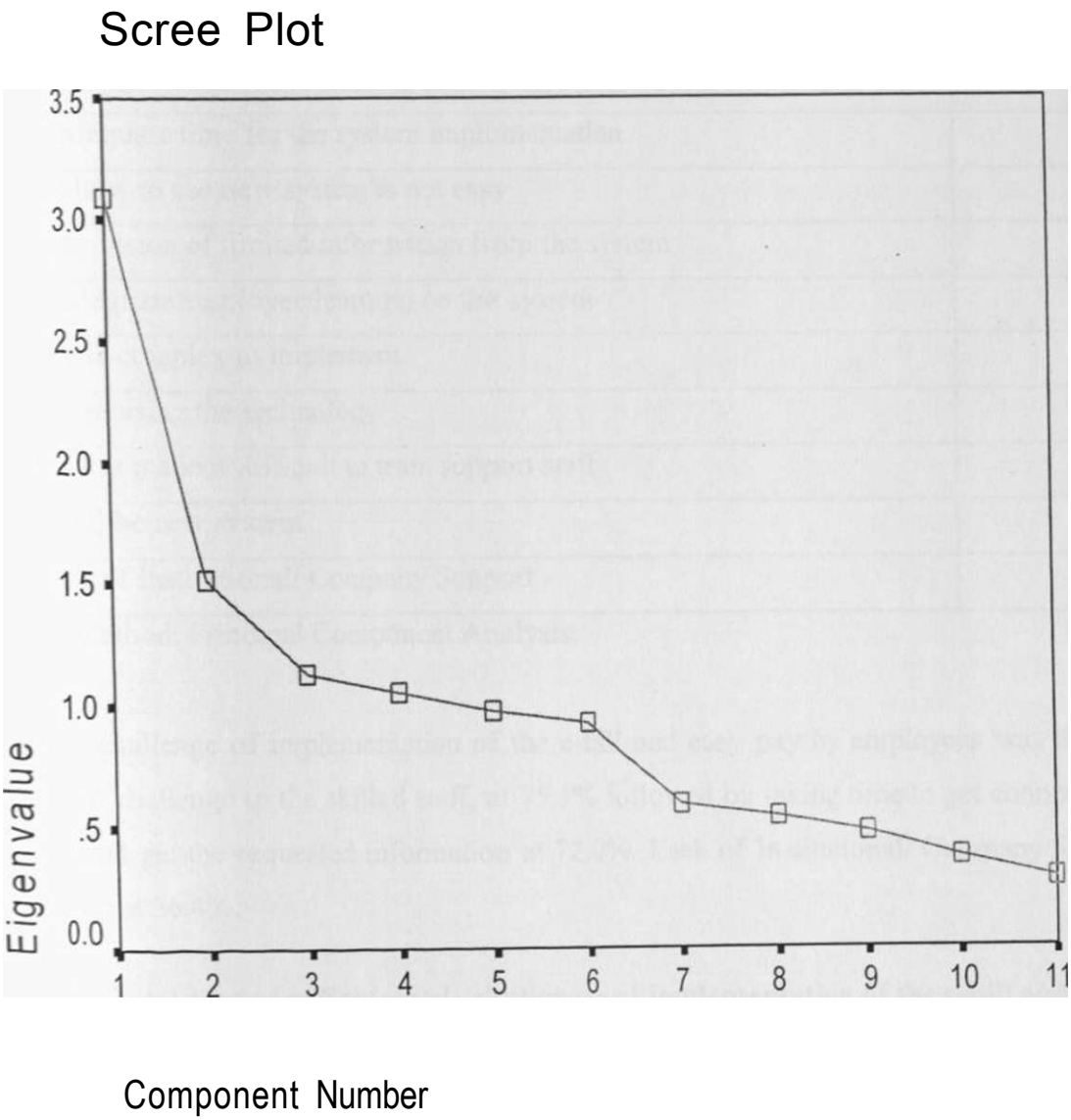
	Challenges of implementation of the e-bill and easy pay by employees
F1	The system is complex to implement
F2	There is inadequate time for the system implementation
F3	There is inadequate employee learning on the system
F4	learning on how to use new system is not easy
F5	There is lack of Institutional/ Company Support
F6	The system is a challenge to the skilled staff
F7	The system has made it difficult to train support staff
F8	Reliability of the new system
IF,	It's difficult in using the technology
FlO	There is a provision of limited information from the system
Fll	It takes time to get connected to the system and get the requested information

Table 4.7.2: Correlation Matrix-challenges of implementation of the e-bill and easy pay by employees

Factors	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
F1	1.000	.587	.498	.513	-.070	-.045	.131	.055	.427	.004	-.068
F2	.587	1.000	.601	.542	-.066	-.050	.003	.115	.491	-.050	-.118
F3	.498	.601	1.000	.406	-.206	-.201	.177	.077	.444	.003	-.069
F4	.513	.542	.406	1.000	-.105	-.032	-.020	-.041	.536	-.021	.029
F5	-.070	-.066	-.206	-.105	1.000	-.022	-.019	-.108	-.121	-.034	-.033
1	-.045	-.050	-.201	-.032	-.022	1.000	-.027	.110	.023	-.015	.490
F7	.131	.003	.177	-.020	-.019	-.027	1.000	.030	.080	-.028	-.023
' F8	.055	.115	.077	-.041	-.108	.110	.030	1.000	.057	.039	-.036
F9	.427	.491	.444	.536	-.121	.023	.080	.057	1.000	.138	.009
IF10 L	.004	-.050	.003	-.021	-.034	-.015	-.028	.039	.138	1.000	-.020
F11	-.068	-.118	-.069	.029	-.033	.490	-.023	-.036	.009	-.020	1.000

High correlations were noted between The system is complex to implement and There is inadequate time for the system implementation at .587, between There is inadequate time for the system implementation and There is inadequate employee learning on the system at .601, and between learning on how to use new system is not easy and There is inadequate time for the system implementation at 0.542.

figure 4.7.2: Scree Plot-challenges of implementation of the e-bill and easy pay by pmployees



The Scrce plot on figure 4.3.4 shows that there are two inflexion points, one on component 3 and one on component 7. This implies either three components or seven component can be used adequately for analysis.

"able 4.7.3: Communalities-challenges of implementation of the e-bill and easy psiy by *iiployees

	Extraction
["he system is a challenge to the skilled staff	.751
ft takes time to get connected to the system and get the requested information	.720
|"here is inadequate time for the system implementation	.695
learning on how to use new system is not easy	.673
fhere is a provision of limited information from the system	.649
(There is inadequate employee learning on the system	.646
The system is complex to implement	.615
Its difficult in using the technology	.599
The system has made it difficult to train support staff	.578
Reliability of the new system	.518
There is lack of Institutional/ Company Support	.364

Extraction Method: Principal Component Analysis.

The biggest challenge of implementation of the e-bill and easy pay by employees was that the system was a challenge to the skilled staff, at 75.1% followed by taking time to get connected to the system and get the requested information at 72.0%. Lack of Institutional/ Company Support closed the list at 36.4%.

Table 4.7.4: Total Variance Explained—challenges of implementation of the e-bill and easy pay by employees

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.092	28.112	28.112	3.013	27.387	27.387
2	1.521	13.828	41.939	1.532	13.928	41.314
3	1.134	10.310	52.250	1.194	10.859	52.173
4	1.059	9.632	61.881	1.068	9.708	61.881

Extraction Method: Principal Component Analysis.

"ne four challenges that had eigenvalues greater than 1 were extracted and all contributed to 1.881% of the total variance.

fable 4.7.5: Rotated Component Matrix-challenges of implementation of the e-bill and easy > ay by employees

	Component			
	1	2	3	4
'The system is complex to implement	.772	-.048	.046	.124
| here is inadequate time for the system implementation	.827	-.079	.039	.051
JThere is inadequate employee learning on the system	.722	-.195	.229	.182
l-earning on how to use new system is not easy	.801	.081	-.129	-.088
There is lack of Institutional/ Company Support	-.128	-.044	-.587	.039
The system is a challenge to the skilled staff	-.056	.857	.115	-.007
The system has made it difficult to train support staff	.045	-.081	.318	.684
Reliability of the new system	-.006	.039	.717	.049
It's difficult in using the technology	.739	.072	.144	-.162
There is a provision of limited information from the system	-.002	-.100	.358	-.715
It takes time to get connected to the system and get the requested information	-.016	.848	-.022	.011

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

a Rotation converged in 4 iterations.

I Component 1 loads highly with; the system is complex to implement, there is inadequate time for j the system implementation, there is inadequate employee learning on the system, learning on l how to use new system is not easy and it's difficult in using the technology.

[Component 2 loads highly with the system is a challenge to the skilled staff and it takes time to get connected to the system and get the requested information.

Component 3 loads highly with there is lack of Institutional/ Company Support, and reliability of the new system

Component 4 loads highly only with the system being made difficult to train support staff.

Table 4.7.6: Summary of the factor loadings- -challenges of implementation of the e-bill and easy pay by employees.

Component	1	2	3	4
1	.979	-.115	.162	.054
2	.094	.981	.155	-.071
3	-.175	-.140	.974	-.038
4	-.053	.071	.039	.995

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

From Table 4.7.6 only one item was less than ±0.05 which lied on the off-diagonal matrix of component 3.

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The general objective of this study was to investigate the benefits and challenges of electronic billing and payment in Kenya power and lighting company limited. This chapter presents the summary of key findings. It also covers conclusion and present suggestion for further research and improvement.

5.2 Summary of Findings

5.2.1 Background Information

The research findings revealed that there was gender disparity in both the KPLC employees and KPLC customers, whereby 55% of the employees and 61% of the customers were males.

On the duration of work at KPLC majority of the employees, 41% had worked for a lesser period of not exceeding five years. Thirty four percent had worked for the company for a period of between five and ten years. The employees who had worked in the company for a longer duration, between sixteen and twenty years, constituted the minority, 7%.

It was found out that most of the respondents, 66% were in the middle level management positions, and 16% had an executive level job description, while 13% job description was that of union stable staff.

It was disclosed that majority of KPLC employees, 76% and customers, 53% were of the opinion that the use of electronics media to pay bills was very important. This was followed by a proportion of employees, 22% and customers, 42% who viewed the use of electronics media to pay bills as important.

On the aspect of the qualifications of the respondents in terms of their level of education, all the 100 employees of KPLC interviewed were university/college graduates, as compared to the 70% of the customers with the same level of education. Twenty seven percent of the customers had

their level of education up to secondary level. The study further revealed that majority of the customer respondents, 66%, were employed.

Most customers, 84.8% used electricity for domestic purposes. However, 8.2% used electricity for commercial purposes and 7% used electricity for both domestic and commercial purposes.

5.2.2 **Benefits realized on implementation of E-billing payment system**

The study's findings on the benefits realized on implementation of E-billing payment system were numerous. Most employees, 34%, each, strongly agreed that the use of the system had reduced the long queues in banking halls, as well as made easy distribution of customer payment points. Thirty percent strongly agreed that the use of the system provided an efficient service delivery. Meanwhile, a proportion of 55% agreed that the system was fast, 50% agreed that the system was secure and 47% agreed that the system had reduced the long queues in banking halls.

Moreover, some employees neither agreed nor disagreed on the benefits of e-billing. Thirty four percent were indifferent on whether the system facilitated the ease of handling customer complaints, followed by 29% who were not sure whether the system provided a convenient way of viewing customer information online and 28% who were indifferent on whether the system provided an effective service delivery.

Employees who disagreed that the use of e-billing system reduced the operational costs constituted 18% while those who disagreed that the system facilitated ease of handling customer complaints constituted 14%. Still, 4% strongly disagreed that the system provided an effective service delivery. Four percent of the respondents gave no response on the system providing an efficient service delivery.

On the other hand, most customers, 50%, strongly agreed that the system made it easy for customers to pay bills and 49.3% strongly agreed that the system was easy to use. Further, 40.8% strongly agreed that the system availed a 24/7 service and another 40.3% strongly agreed that the time spent at the banking hall had reduced with to the use of the e-bill and easy pay. Moreover, 40.3% agreed that the system gave customers immediate response of account

statement, 39% agreed that the time spent at the banking hall had reduced with to the use of the e-bill and easy pay and 37.8% agreed that when interacting with the system, it gave clear information of payment.

The customers who neither agreed nor disagreed on the ability of the system to provide acceptable disconnection alerts constituted 27.5% and 24.3% were indifferent on whether the system assured customers confidentiality in electricity bill and payment.

Meanwhile, those who disagreed that the system provided acceptable disconnection alerts constituted 14.3% while 11.5% represented those who disagreed that it was easier to maintain file for bills and payment documents with the system. In addition, 5.5% strongly disagreed that the system provided acceptable disconnection alerts.

5.2.3 Challenges of the e-bill and easy-pay

The study revealed that most employees, 10% strongly agreed that the system was complex to implement. A proportion of 8 %, each strongly agreed that there was inadequate time for the system implementation, learning on how to use new system was not easy, and that it took time to get connected to the system and get the requested information. Moreover, 37% agreed that reliability of the new system was a challenge, followed by inadequate employee learning on the system, 24% and inadequate time for the system implementation, 22%. Majority of the employees, 44% neither agreed nor disagreed that there was a provision of limited information from the system. Also, 41% were indifferent on whether it took time to get connected to the system and get the requested information.

A section of the employee respondents disagreed that there were challenges facing e- billing. This was confirmed when 40% disagreed that learning on how to use new system was not easy, followed by 38% who denied that it was difficult in using the technology, and 36% disagreed that the system had made it difficult to train support staff. Still, a proportion of 23%, each,

strongly disagreed that there was difficulty in using the technology and that the system was a **challenge** to the skilled staff.

In the meantime, the study established that, most customers, **18.8%,** strongly agreed that the use **of the** system made it difficult to reverse payment once they had been updated. Sixteen percent **strongly** agreed that the system did not provide adequate evidence or documentation for legal **redress** and 14% strongly agreed that there was a possibility of payment going to wrong account **with** the use of the system. Moreover, **22.8%** agreed that the system created poor company-**customer** relationships, and **20.5%,** each, agreed that the **use** of the system made it difficult to **reverse** payment once they have been updated, and that the system **did** not provide adequate **evidence** or documentation for legal redress as **well** as the system **unable** to provide adequate **detailed** information.

Majority of the customers, 31.8% neither agreed nor disagreed that the financial options **available** for payment were limited. In addition, 28.8% were indifferent on whether the system **did** not provide adequate evidence or documentation for legal redress and 28.3% were indifferent **on** whether the use of the system made it difficult to reverse payment once they have been updated.

Further, the study established that some customer respondents disagreed that there were **challenges** facing e- billing. Those who disagreed that it was not **easy** to learn how to use the **system** constituted 35.3% while 32.0% represented those who disagreed that the system **presented** information in a format that was difficult to understand. **In** addition, majority, 33.5% **strongly** disagreed that the system was not easy to use. Further, 29.5% strongly disagreed that it **was not** easy to learn how to use the system and another *22.5%* strongly disagreed that the **system** did not provide me with sufficient information.

53 Discussions

The findings on the factors specified in the objectives of the study are discussed below.

^•3.1Benefits realized on implementation of E—billing payment system

The finding of die study is consistent with (Robson. 1997) who postulated a link between ICT **and** business. Sanders, (2004) states that E-Billing reduces long queues in the banking halls, **reduce** operating costs, improve the corporate image of the company and facilitate collaboration between companies and it's business partners. These are similar to the findings of the study on **the** benefits of e-billing. According to Radecki and Wenninger (1999), E-bill enables customers **to** validate, audit and control their bills and approve the invoices online.

Some respondents neither agreed nor disagreed on the benefits of e-billing. This is consistent with the findings of Whaling, (2000) who indicated that there is a discrepancy between the level of ICT investment and the benefits received by the customers and the company.

5.3.2 Challenges of the e-bill and easy-pay

The study revealed that most employees, disagreed or neither agreed nor disagreed that there were challenges faced as a result of using e-bill and easy-pay. Kerr and Litan (2000) asserts that while 32% of all large volume billers (greater than 250,000 bills a month) are presenting electronically, adoption rates drop considerably for small to medium-sized billers for both electronic presentment and payment.

A section of the respondents disagreed that learning on how to use new system was not easy, and that it was difficult in using the technology. These were inconsistent with the findings of Kerr and Litan (2000) who reported that 51% of consumers feel other payment types, including checks, cash, and debit cards, are easier to use as opposed to electronic technology.

5.4 Conclusions

The purpose of the study was to investigate the benefits and challenges of electronic billing and payment in Kenya power and lighting company limited.

5.4.1 Benefits realized on implementation of E—billing payment system

The study concludes that there exists a link between ICT and business performance. As such, E-Billing should be adopted and implemented effectively by KPLC due to the numerous benefits

that are realized. These includes: reduced long queues in the banking halls, reduced operating **costs,** improved corporate image of the company, ease of bill payment and facilitation of collaboration between companies and its business partners. However, due to some discrepancy **between** the level of 1CT investment and the benefits received by the customers and the company, the benefits might not be outstanding.

5.4.2 Challenges of the e-bill and easy-pay

The research study concludes that there is uncertainty among the employees as well as customers on **the** challenges faced as a result of using e-bill and easy-pay. These was reflected by the virtue **that** majority of both the employees and customers neither agreed nor disagreed that challenges **such** as; limited information from the system, long time to get connected to the system and get **the** requested information, limited financial options available for payment and inadequate **evidence** or documentation for legal redress were present. However, due to advancement in information, communication and technology, a section of the respondents disagreed that learning on **how** to use new system was not easy, and that it was difficult in using the technology.

5.5 Recommendations

The following recommendations were made based on findings and conclusions of the research **study.**

5.5.1 Recommendations for Improvement

The following are recommendations for improvement:

5.5.1.1 Benefits realized on implementation of E—billing payment system

Implementation of E—billing payment system should be properly addressed since there are numerous benefits that come with it. KPLC should employ appropriate strategies to inform and educate its stakeholders on the use of the system and the benefits that are realized as a result of the new system thereof. Further, the company should make use of incentives such as lower the payment rates so as to attract and retain customers.

5.5.1.2 Challenges of the e-bill and easy-pay

Due to uncertainty surrounding the challenges of the e-bill and easy-pay. there is need for the organization to be very prompt and updated with both the internal and external environmental factors that affects the organization, so as to provide quality e-billing services and curb any arising challenges.

The system should be upgraded to provide detailed and adequate information to the users. Further, other relevant information should be provided to the uses on request, such as alert on disconnection of electricity and file for bills and payment details.

5.5.2 Recommendations for Future Research

The study covered only 100 workforce of and 400 customers of KPLC in its Nairobi Branches. Further research study should be carried out incorporating the entire workforce in all its branches in Kenya and an increased sample of customers. This would enable a comparison of outcomes from other regions. Further, it may be useful to carry out comparable studies from other institutions that have undertaken e-payment system.

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APPENDICES

APPENDIX I: QUESTIONNAIRE TO KPLC CUSTOMERS

SECTION A: BACKGROUND INFORMATION

1. **Your Gender**

   Male [ ] **Female [ ]**

2. **Your age bracket**

   - **20 years and below [ ]** **21 -25 years [ ]** **26-30 years [ ]**
   - **31-35 years [ ]** **36-40 years [ ]** **41 -45 years [ ]**
   - **46-50 years [ ]** **51 -55 years [ ]** **Over 55 years [ ]**

3. **Your level of education**

   - **Primary level [ ]** **Secondary [ ]**
   - **University/College [ ]** **Others Please Specify.**

4. **Are you employed?**

   Yes [ ] **No [ ]**

5. **What purpose do you use your electricity for?**

   - **Domestic use only [ ]**
   - **Commercial Purpose [ ]**

6. **What is your opinion on the importance of the use of electronics media to pay your bills?**

   - **Very important [ ]** **Important [ ]**
   - **Less important [ ]** **Least important [ ]**

SECTION B: BENEFITS OF E-BILLING AND PAYMENT

Indicate by ticking in the appropriate boxes the degree to which you agree with each of the following statements as applicable to the benefits you realize with the use of E-Bill and E-Payment.

	1.Strongly Agree	2.Agree	3.Neither agree/disagree	4.Disagree	5.Strongly Disagree
The time I spent at the banking hall is reduced due to the use of the e-bill and easy-pay					
The system gives immediate response of account statements					
The system make me feel in control of my payments					
The system is reliable					
When interacting with the system the system gives clear information on payment					
The system make it easy for me to pay bills					
The system gives me accurate bills					
The system avails a 24/7 service					
It is easier to maintain file bills and payment documents					
The electronic information I receive is confidential					
I have reduced cost when I used the E-bill and E-Payment					
The response time is acceptable					
The system is easy to use					
Enables me to obtain financial billing information					
It provides a sure way of receiving bills					

[t **assures** me of confidentiality in electricity bill **and** payment					
fhe system provides acceptable disconnection **alerts**					
fhe system offers convenient way of setting **electricity** bills					
I feel more secure that my account will be **updated** with my payments					
Any other specify					

8. What other benefits have you realized in the use of E-bill and Easy-pay?

SECTION C: CHALLENGES FACED BY THE CUSTOMERS

9. Indicate by ticking in the appropriate boxes the degree to which you agree with each of the following statements as applicable to the challenges you experience with the use of E-Bill and E-Payment.

	1.Strongly Agree	Z.Agree	J.Neither agree/disagree	>4.Disagree	S.Strongly Disagree
It does not provide adequate detailed information					
It creates relationships with customers					
It is cumbersome to use					
It posses security challenge to payment					
It posses security challenges to bill information					
Possibility of payment going to a wrong account is high					
It's not easy to remove payments once they have been updated					
Fear of legal issues involved					
The system does not provide sufficient information that I require to know					
There is unacceptable delay in connecting to the system for service					
Response to requests is slow					
Initial implementation costs are high					
Not easy to learn how to use the system					
Reduced personal touch/contact with company					
Presents information in a format that is difficult to understand					
The system does not have a provision for					

adequate legal redress					
The confidence I have in the accuracy in information that I receive from the system is low					
Financial options available for payment are limited					
Any other Specify					

10. What recommendation would you give for further improvement on the E-bill and easy-pay system to KPLC?

THANK YOU FOR YOUR TIME AND COOPERATION

APPENDIX II: QUESTIONNAIRE TO KPLC EMPLOYEES

SECTION A: BACKGROUND INFORMATION

1. Your Gender

- **Male [ ]** **Female [ ]**

2. **Your level of education**

- **Primary level [ ]** **Secondary [ ]**
- **University/College [ ]** **Others Please Specify**

3. **For how long have you worked with KPLC**

- **Less Than 5 Years [ ]** **5-10 Years []** **10-15 Years []**
- **16 -20 Years [ ]** **21-25 years [ ]** **26-30 years [ ]**
- **Over 30 years [ ]**

4. **What is your job Description?**

- **Executive managers [ ]** **Middle Level Management [ ]**
- **Executive Level [ ]** **Union sable staff [ ]**
- **Other please specify**

5. **What is your opinion on the importance of the use of electronics media to pay bills?**

- **Very important [ ]** **Important [ ]**
- **Less Important [ ]** **Least Important [ )**

SECTIN B: BENEFITS REALIZED ON IMPLEMENTING THE E-BILLING AND PAYMENT SYSTEM

6. Indicate by ticking in the appropriate boxes the degree to which you agree with each of the following statements as applicable to the benefits you realize with the use of E-Bill and E-Payment.

	1.Strongly Agree	2.Agree	J.Neither agree/disagree	4.Disagree	5-Strongly Disagree
It has reduced the long queues in banking halls					
The system has reduced the number of complaints from customers using it					
The use of e-bill has led to reduced paper usage which helps conserve forests and reduces paperwork in the office					
The system is fast and secure					
Reduced operational costs					
Provides a clear/good return on investment					
The system provides an efficient and effective service delivery					
Ease of customer data retrieval					
Facilitates ease of handling customer complaints					
The system has made easy distribution of customer payment points					
It is a broad delivery and payment medium and it's able to gain maximum use.					
Number of complaints from customers using the system is low					
The system provides a convenient way of viewing the statement on line					

Use **of system reduces operational costs**					
Any other (Specify)					

7. What other benefits have you realized in the use of E-bill and Easy-pay?

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SECTION C: CHALLENGES FACED BY THE STAFF WHEN IMPLEMENTING THE E-BILL AM) EASY-PAY

8. **Indicate** by **ticking** in the appropriate boxes the degree to which you agree with each of the **following statements** as applicable to the challenges you experience with the use of E-Bill and E-**Payment.**

	1.Strongly Agree	2.Agree	J.Ncithcr agree/disagree	4.Disagree	5.Strongly Disagree
Complex to implement					
Inadequate time for implementation					
Lack of training on the new system					
Challenges of learning to use new technologies					
Institutional Support-inadequate company support.					
Challenges of skilled staff					
Difficult to train support staff					
Reliability of the new system					
Difficulty in using the technology					
Limited information from the system					
Time taken to connect and get the requested information					
Any other (Specify)					

What can you recommend for further improvement on the E-bill and Easy-pay system to KPLC Management?

THANK YOU FOR YOUR TIME AND COOPERATION