



**ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES**

**ASSESSMENT OF IMPLEMENTATION OF POWER
ENERGY PREPAYMENT SERVICE SYSTEM: CASE
OF ETHIOPIAN ELECTRIC UTILITY (EEU)**

BY

AMSALU AMNIE

**May, 2016
ADDIS ABABA, ETHIOPIA**

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**A THESIS SUBMITTED TO ST.MARY'S UNIVERSITY,
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Acronyms

Company- The Ethiopian Electric Utility

EEU- Ethiopian Electric Utility

EELPA -Ethiopian Electric Light & Power Authority

EEPCO- Ethiopian Electric Power Corporation

EEP- Ethiopian Electric Power

CSC –Customer service centers (districts)

Power Prepayment metering system is the system of payment for energy utility before usage of power with quality service providing.

SERVQUAL- The most popular service quality measure for different service industries called SERVQUAL (Patrick A.et al. 1996)

SPSS- Statistical Package for the Social Sciences

Abstract

Ethiopian Electric Utility (EEU) is state owned monopoly that transmits, distributes, maintains and sales electric power nationwide. Ethiopian Electric Utility (EEU) or former EEPCO (Ethiopian Electric Power Corporation) has been undergoing various continued utility management practices.

One of the major improvements, as part of the transformation, is the implementation of power Prepayment (Metering) System, over that of the postpaid metering service. The postpaid metering service system had been forcing the company to follow lengthy service processes. That is; reading the postpaid meter, generating postpaid bill, and collecting money was long process. In order to support the realization of its long term strategic vision of providing quality electric service and being competitive in an energy sector, EEU has to improve the service provision.

The study tried to show about the acceptability and perception of customers, the challenges of implementing power energy prepayment metering system over that of post payment, finally the benefits of prepayment system, and the management's strategy. The researcher aimed to assess and analyze the existing practice (quality) of prepayment customer service both from the employees' and the company's perspectives, and thereby proposed possible marketing strategies that are capable of improving the customer service quality for the subsequent adoption of prepayment service.

The research used both qualitative and quantitative approach in a descriptive format. The results or findings of the study showed some challenges which the EEU and customers are facing. Some of the challenges are in adequate voltage, Ethio telecom network, inaccessibility of vending units in Sundays and holidays, etc... The study also showed the perceptions of customers about the prepayment metering system. Finally the study recommended some possible actions to be taken by the company. These recommendations will be applied to solve the problems which were clearly stated in this research.

CHAPTER ONE:

1. Introduction

The introductory part of this study includes brief back ground of the study. This is followed by highlights of the companies profile and the relevance of power energy metering system in the ever changing world power utility and service delivery, particularly in Ethiopian Electric Utility. This section also explains the problems of study, objectives of the study, the research questions, significance, scope, and the organization's challenges and resistance about the implementation of energy meters and application in general.

1.1 Background of the Study

In the Ethiopian Electric Utility, electricity revenue is collected in two ways: postpaid and prepaid. Sales are made either in cash or on credit. Adoption of prepaid billing system in revenue collection eventually witnessed the company's shift towards a pre-paid system where customers are required to purchase electricity in advance (Obura, et al., 2012). Hence, costs associated with revenue collection are likely to be reduced or eliminated altogether.

In a dynamic and constantly changing business environment, providing a superior service quality, through an adequate and a strong focus on customer (Chiara G., 2007), is one of the key factors enabling firms to gain a lasting competitive advantage in winning the market. For reason this, nowadays marketers, according to R. Ladhari (2011), are trying to focus more on a continuous monitoring and evaluation of service quality, involving various innovative offerings and service developments, which have a direct influence on customers' service experiences. This is because, better service quality increases perceived service value and satisfaction, and; improves the service provider's customer retention and financial performance.

Providing a quality service is therefore about meeting and even, depending on the company's capability, and excelling customers' expectation. In other words, it is the difference between expectation prior to the service encounter and the actual perceived

service that the company provides, that makes it to be reliant on the customers' satisfaction/service experience. (Grönroos, 2008) Thus, companies in various service industries have to be able to measure the actual service quality in order to take any corrective measures in relation to improving both the technical and functional qualities, such as by introducing new and innovative product/service features, revisiting the established relationship, etc. Therefore, this study has assessed and analyzed the challenges, perceptions and acceptability of the new system by customers, benefits of service system, and strategies that company should follow.

1.2 Background of the Company

According to EEU's website (www.et.gov.EEU)/corporation history, Electric Power was introduced to Ethiopia during Minilik II in the late 19th Century. Around the year 1898 the first power generator was installed to provide electric power to the palace. In addition to the diesel power generator, the first water power generation plant namely Aba samuel was constructed on the Akaki river in the year 1912 by Minilik II to supply electric power to major roads & the public around the palace and small factories.

The effort of the government to expand the electric power supply to the public was hindered because of the Italian invasion of the country in the year 1936. The Italian company called Coneil overtook the diesel generator and distribution system that was owned by the government. In the year 1941 a public organization called Enemy property Administration was established and retook all the generation and distribution system of the electric power in the country.

Shewa Electric Power replaced the former company in the year 1948 and managed to increase power supply to other administrative regions in addition to Shewa. In order to represent the country as a whole, Shewa Electric was replaced by "Ethiopian Electric light and Power" in the year 1955 and Board of Directors was appointed by the government to supervise the company. Then, after eight months of age, the Ethiopian Electric light and Power with the Ethiopian Electric Light and Power Authority (EELPA) was established.

The purpose of the change in name was the new company to engage in the business of production, transmitting, disturbing and selling of electric energy to the public and carry on any other lawful business. Board of Directors was assigned by the government and its electric power production capacity was 35 GWH with 12500 customers.

In order to accommodate new changes in the country, by regulation No. 18/1997, the Ethiopian Electric light and Power Authority was transformed to the Ethiopian Electric Power Corporation (EEPCO) by reorganizing its functions in order to accommodate policy and economic changes. The purpose of EEPCO was to reorganize the former authority on the principles of commercialization and decentralization.

In 2013, the Ethiopian Electric Power Corporation has been divided into two separate companies namely; the Ethiopian Electric Utility and the Ethiopian Electric Power. This study was focused on the Ethiopian Electric Utility because all the customers are getting service from this company.

The current annual electricity production capacity of the utility is about 2400 MW and the number of customers is more than 2.5 million. Among this, about 251,188 customers are using prepayment system. Although the utility has been increasing the number of customers by more than 20% annually, this does not mean that the utility has met the demand for electric power. The utility has a plan to increase the number of customers to double by 2017. To achieve this plan, the government is constructing mega hydro, wind and geothermal electric power generation plants in different parts of the country. The company (EEU) is doing its duty with about 12978 permanent employees totally. ([EEU report, 2014/15](#))

1.3 Problem Statement

Prepayment system has been getting a continued confrontation from the customers even if the company kept on using different promotional tools and marketing strategies in order to increase the number of (early) adopters, such as providing the meter and its accessories free of charge for those wishing to change the older meter, as well as retain those who have tried the new service through better management of its relationship with

existing customers. As a result of this most customers have less confidence in the company, based on their past relationship, especially following after the implementation of the new billing system. At a time there was a record of high number of customer complaints in its history (EEPCO report 2009/2010). In addition, those who adopted the new prepaid metering system service are often heard presenting their service which creates the system lacks consistency in delivering right services of right quality in the right quantity and time. Specifically power supply fluctuation and inadequate voltage that can affect the workers' full service provision as the customers need. In addition to that the company prepaid system is being affected by Ethio- Telecom networking system, as (EEU/Western Addis Ababa region districts complaints record report, 2013/14). Due to the challenges mentioned above, the implementation of energy prepayment system in some areas is still under quotation. These and other challenges in the company in relation of customers prompted the researcher to do his research on this topic.

1.4 Objectives of the Study

1.4.1 General Objective

The general objective of the study was to make an assessment and analysis of customers' perception, acceptability and challenges in implementing power prepayment customer service system over that of the Conventional (post paid metering) customer service in the process of improving the company's customer service quality and thereby proposed some possible recommendations for the subsequent improvement.

1.4.2 Specific Objectives were to:

- ❖ Assess the existing challenges of power prepayment service delivery process system.
- ❖ Assess what type of marketing strategy must be suited in order to overcome the existing challenges of customer services(with the implementation of prepayment customer services)
- ❖ Assess the trend (customer growth) in using energy prepayment system.
- ❖ Assess the perception and acceptability of customers towards prepayment service.

- ❖ Find out the benefits of prepayment metering system to the company.
- ❖ Make appropriate recommendations for the successful implementation of the prepayment metering system.

1.5 Research Questions

To investigate the stated problems intensively and extensively, the study had to answer the following basic research questions:

- What are the existing challenges in implementing prepaid energy metering system in relation to providing an adequate and quality service that the company is aiming to provide?
- What type of marketing strategies best suit in order to overcome the existing challenges of customer service (with the implementation of energy prepayment customer service)?
- How is the trend (customer growth) towards using energy prepayment system?
- How is customers' perception and acceptability towards energy prepayment system?
- What are the benefits of prepayment metering system to the company?

1.6 Significance of the Study

The outcomes of this study will help the concerned parties, including the decision-makers in the company to identify the current problems in the company and take the corrective measures. More over this study will be used as a reference material for students and other interested groups who seek to conduct an in depth study on power prepayment services in the company. In addition to that the study will help the researcher to get knowledge in this area and to have deep insight for conducting further research.

1.7 Scope of the study

This study was limited to the assessment and analysis of power prepayment services in EEU customers. In terms of geographic scope, the research was limited to western Addis Ababa region only. This is because of time and budget limit. Besides, the researcher believed that the selected region can represent the whole population as the characteristics of the system in one region are the same as the others. In western Addis Ababa region there are 10 district customer service centers or vending stations which are using energy prepayment system. The research study covered all the districts as stratified proportion (Customer data base, December 2015)

1.8 Definition of Terms

1.8.1 Definition and Functions of Meters

Electric meters measure the amount of electric current supplied to a shop, house or any other source including machines. The electricity board has different terms and conditions for installing various electric meters depending on their usage. These meters help in measuring the amount of electricity being utilized by various sections of society, and therefore, should not be tampered with. Electricity cannot be stored in large amounts, and hence, needs generators to produce it. Electric meters are designed to reduce power consumption during peak hours and also control the power supply to different consumer sections. Electric meters are broadly classified into two categories – electromechanical meters and electronic meters. Further, they can be of various types such as numeric display meters, standard meters, variable rate meters, prepayment meters, electromechanical meters, etc.

1.8.2 Types of Electric Meters

Numeric Display Meters – The numeric display meters display the reading in a numeric form. The first five numbers should be read in these meters starting from left to right. **Electromechanical Induction Meter or Standard Meter** – The most commonly used electric meter is electromechanical induction meter or standard meter that operates by counting the revolutions of an aluminum disc. It measures the electricity in kilowatt-hours. In this case, the units are charged at the same rate throughout the day. The

electric energy being used is directly proportional to the number of revolutions of the disc. These types of meters are generally used on single phase alternating current (AC) supply.

Prepayment Electric Meters – The prepayment electric meters accept tokens or prepaid cards to get electricity supply. The customer has to pay the charges for the power supply in advance. One can also top-up the amount for extending the period of electric supply or when the balance over the supply is automatically cut off by a relay in the electric meter.

Solid State Electric Meters – The solid state electric meters can be read automatically and their power displayed on an LCD screen. They calculate and show the exact value of the electricity consumed rather than its amount. The rate of the unit consumed varies according to the time and day of the week. They can also record, supply and load parameters such as power factor, reactive power, maximum demand, etc. Such types of meters use the remote meter reading technology.

Electronic Meters – The latest electronic meters are based on automatic meter reading or remote meter reading technologies. They use GSM, GPRS, Bluetooth, etc. to transfer the information related to power consumption. They store the usage profiles and the load requirements of a consumer and process it accordingly. Electric meters also help in detecting energy theft or any attempts at meter tampering with the help of their inbuilt automatic sensors.

Smart Meters:- Smart meters are the latest in energy meter technology: instead of simply providing a total of energy consumption in your home like many conventional meters, smart meters can provide you with detailed information on how and when you used your energy. They also communicate with the electricity company, sending and receiving information so that no one need come out to read your bill and the energy supplier does not need to estimate your bill. There are many ways to get a smart meter reading. These include using a monitor, online monitoring and looking at your bills (UK Power Limited, 2012).

1.8.3 Definition and Types of Prepaid Meters.

A Prepayment Meter is an easy way to pay for your gas and electricity. It allows you to pay for your energy supply before you use it. If you would like to pay for your gas and electricity in this way, it can be easily fitted into your home, providing it is safe and practicable to do so.

A Prepayment meter will charge for any gas or electricity as you use it. It may also be used to recover any outstanding debt from you at an agreed weekly rate. Some electricity Prepayment Meters may also take a weekly amount to cover fixed unit charges as part of our two-tier pricing structure. When we install a Prepayment Meter, we will provide you with details of our gas or electricity charges. Where there are any additional charges in connection with your Prepayment Meter, we will always tell you what they are beforehand.

According to UK Power Limited (2012), Prepayment meters work in exactly the same way as their name would suggest; instead of paying for your electricity after you have used it, you pay before. UK Power Limited (2012) also noted that, there are two main types of prepayment meters.

The first, standard prepayment meters may either display one or two readings and these should simply be read as above like other meters.

The second type is meters connected to the Pay-point network. This system works by accepting tokens, usually in the form of plastic keys which can be bought and then your supply _topped up‘.

According to Measurement Canada (2006), Prepayment metering is the trade measurement of electricity or gas which is required to be purchased by a consumer in advance of the consumption of electricity or gas. Generally, in a prepayment application, a consumer must prepay for electricity or gas in order to activate their load through the meter. The types of prepayment applications for electricity and gas may vary and can range from a simple advance monetary payment for electricity or gas to the pre-purchase of a fixed quantity of electricity or gas. In principle, under a prepayment application, the

consumer may not receive a subsequent bill as payment is made in advance for electricity or gas. The terms and conditions for prepayment are established by the electricity and gas contractors (also referred to in the industry as suppliers or energy providers), and are subject to regulation. The design, construction, performance, installation and usage of meters intended for prepayment applications are subject to regulation in most countries.

Prepayment Electric meters now come in various types. Among them are:

1.8.4 Integrated Single Phase (ISP) Electronic Meter

The Integrated Single Phase (ISP ED) meter is a compact, two wire, keypad-based prepayment electricity meter in a housing compatible with the ESKOM standard common base electricity dispenser socket(Meter Mate, 2012).

This meter is most suited to new reticulation and is directly and easily interchangeable with common base prepayment meters from other approved manufacturers using the common base configuration. User interaction with the meter and access to meter information (such as a low credit warning, energy consumption, and load contactor status) are available using the keypad and LCD display.

The ISP ED meter is based on the ESKOM Specification, which calls for a prepayment meter that can be fitted into a standard, plug-in common base. This concept ensures simple installation and replacement procedures.

The meter is keypad based, fully STS compliant and supports the 20 digit STS encryption algorithms. The meter has a wide range of information registers which can easily be accessed by pressing the information button on the keypad and then entering the number of the register.

The plug-in-base, which also conforms to ESKOM's specifications, allows the commissioning of the meter to be separated from the installation of the wiring, thereby adding flexibility and installation convenience.

1.8.5 The Integrated Three Phase (ITP) meter

The Integrated Three Phase (ISP) meter is a four-wire 100 Amp per phase, keypad-based prepayment meter in a compact BS housing. The meter is suitable for residential, commercial and light industrial environments. The meter also features a dedicated diagnostic indicator which shows the status of communication to the optional remote customer interface unit (CIU).

The meter has two parts, the prepayment meter and the customer interface unit. The meter is connected to the customer interface unit by a two core communications wire up to a distance of 130 meters. It operates independently of the customer interface unit and is usually installed in a secure, locked enclosure outside the consumer's home. The customer interface unit is compact with a user-friendly keypad and display. An optional local keypad and display can be fitted to the meter at the time of manufacture. The meter also features a dedicated diagnostic indicator which shows the status of communication to the customer interface unit.

The meter contains all critical metering, token decryption and load control functionality. It operates independently and is immune to any form of tampering on the Customer Interface Unit.

The meter is usually installed outside the home in a secure, locked enclosure which should not be accessible to the consumer. This facilitates easy inspection by the utility at any time and reduces the opportunity of fraud by tampering.

1.8.6 The Split Single Phase (SSP) Meter

This is a compact, two wires, keypad-based prepayment electricity meter which comprises two parts, the Energy Management Unit (EMU) and the Customer Interface Unit (CIU). User interaction with the meter and access to meter information (such as a low credit warning, energy consumption, and load contactor status) are available using the keypad and LCD display on the CIU.

The meter consists of two parts namely, the CIU and the EMU. The CIU is the customer's only interface with the meter, and is a compact unit with a user-friendly

keypad and display. It is usually installed in a convenient location in the consumer's home - remote from the EMU, and is connected to the EMU with a pair of communications wires.

The EMU contains all critical metering, number decryption and load control functionality. It operates independently and is immune to any form of tampering on the CIU interface. The EMU is usually installed in a secure, locked enclosure, typically a pavement kiosk or pole-mounted equivalent. It is outside the consumer's home to facilitate easy inspection by the utility at any time and to reduce the opportunity of fraud by tampering. As an option, the EMU can be supplied with its own LCD display and keypad, which allows the utility to view important meter parameters without the need for an interrogation tool.

CHAPTER TWO:

2. Literature Review

In this section, different sources of literatures, which were used for the subsequent analysis of the empirical findings, are reviewed, discussed, compared and contrasted with respect to (customer) service quality and some other important points in the application of energy prepayment system.

2.1 The Technology and Economics of Prepaid Electricity

Prepayment systems refer to the outlay made by a consumer for using a good service before consumption. In the case of electricity, the distinctive feature of the prepayment system is the reversion of the conventional commercialization system: whereas in the latter consumers hold a consumption credit because they pay for their energy bills periodically and after consumption, in the prepayment system such credit is not available because the purchase and payment of energy are made prior to consumption. Thus, prepaid systems allow users to consume energy only when they have credit in electricity account, as supply is discontinued when such credit is exhausted (Kwan et al, 2002). A Prepaid Energy Meter enables power utilities to collect electricity bills from the consumers prior to its consumption. The prepaid meter is not only limited to Automated Meter Reading [AMR] but is also attributed with prepaid recharging ability and information exchange with the utilities pertaining to customer's consumption details (Southgate et al, 1996).

The prepayment technology was initially developed in South Africa in the late 1980s with the objective of supplying energy to a large number of low-income and geographically dispersed users. The system was initially geared to minimizing the difficulties arising from users irregular incomes and to overcoming the limited development of the infrastructure required for the dispatch and reception of credit slips. By the late 1990s, prepayment systems were very popular in India and in some OECD countries (Estache et al., 2000), and had probably reached their highest development in Great Britain (Waddams et al., 1997). In Argentina, prepayment meters were firstly

introduced in 1993, when Energía Mendoza Sociedad del Estado (EMSE) put a few running in small shops at the Mendoza Bus Central Station. The experience was soon extended to other communities in the country.

From a technological point of view, the prepayment system consists of three well differentiated components. The first is a service meter installed at the unit where energy will be consumed, such as a household dwelling or a store. In general, these meters are of the —two-gang type and consist of a user's interface unit and a current measuring set. The interface unit is a device installed inside the building, which allows the user to —interact with the meter. The metering unit, on the other hand, is the intelligent component that stores credit and consumption information and it makes up the element that either clears or switches off electricity supply. The second component of the system is the so-called credit dispensing unit, which is the vending machine where consumers can purchase electricity credit. In general, these sales outlets are located at the utility's commercial offices as well as in stores with long opening hours. The third component is the supporting device that links the various sales outlets to the utility's management system.

The way the system works for the user is simple. The user purchases energy at the sales outlet and, as part of the operation, receives a credit slip and a supporting device that identifies the operation, which may be a voucher with an identification code or another with a magnetic support. The user then utilizes the device to add on her new consumption credit, either by entering a code or inserting the magnetic medium into the interface unit, which in both cases will be possible only if the device identification matches that of the meter.

The measuring unit then clears consumption of the amount of energy purchased and also displays, in real time, the available credit remaining for consumption. The meter switches off when credit is exhausted, and it switches on again only when the device corresponding to a new purchase is inserted.

From an economic perspective, the reversion of the commercialization system as implied by prepaid meters translates into changes in the cash flow of the utility and in

consumers' behavior. In the case of the firm, prepayment systems may result in a decrease in metering, billing and disconnection and reconnection costs. The fact that payment is made prior to consumption implies both a significant improvement in the collection of revenues and a reduction of working capital. Moreover, prepaid systems may constitute a way to provide more flexible payment options to users with minimal or unreliable income streams without increasing transactional costs to the firm. From the consumer's perspective, prepayment systems may result in a better understanding of how much energy is being consumed, inducing more control of energy use and budget management (Tewari and Shah, 2003). However, these apparent improvements are not cost free: not only the change from conventional to prepaid electricity imply a change in consumption habits, which may reduce the utility of consumers, but also it may result in too few electricity consumption or in the self-disconnection of poorer groups of consumers.

2.2 Customer Experience

Nowadays in global competitive environment, the customer experience factor plays an increasingly significant role in determining the success of any service offerings. In the previous years, the growing attention on the customer resulted in an increased focus on Customer Relationship Management (CRM). More recently, as the number of contact points between companies and their customers increased, such attention revealed the fundamental importance of monitoring the many experiences that originate from those contact points. (Chiara G., 2007, pp. 395)

Marketers, therefore, underline the critical role service quality plays in the customer's service experience. For instance, researchers demonstrate that better service quality increases perceived service value and satisfaction; improves the service provider's customer retention and financial performance; and also enhances a firm's corporate image (Nguyen and Leblanc, 1998). In addition, researchers also investigated the drivers of perceived service quality such as demographic factors (the effect of culture and personal values). (Ladhari et al. 2011)

Customer experience generally "originates set of interactions from between a customer and a product, a company, or part of its organization, which provoke a reaction. This

experience is strictly personal and implies the (rational, customer's emotional, physical and spiritual"). (Asubonteng,et. Al 2007)

2.3 Customer Service and Service Quality

Service: is a process (Grönroos, 2007) involving a series of intangible activities which, most of the cases, take place in interactions between the customer and service employees - and/or physical resources or goods and/or systems of the service provider - which are provided as solutions to the customer's problems.

It is also generally characterized by, as commonly understood in marketing, such as its intangibility, variability (heterogeneity), inseparability and perish ability. Service is intangible in the sense that it couldn't be touched, smelled, etc. using the senses of our body except experiencing it in the process of value creation; inseparability refers to the fact that it can't be separated from the service provider, as opposed to product offerings; variability on the other hand is to mean that it is highly variable(heterogeneous) throughout its production and delivery process, under the influence that both the customer and the service provider exert (Grönroos, 1990) ; and perish ability denotes that it is specifically designed to satisfy the needs and wants of a customer at a certain point in time after which it can no longer be stored or reclaimed to be reused by the customer.

Service Quality: refers to (Patrick et. al 1996, pp. 62), the "difference between customers' expectations for service performance prior to the service encounter and their perceptions of the service received." Service quality theory (Oliver, 1980) predicts that clients will judge that quality is low if performance does not meet their expectations and quality increases as performance exceeds expectations. Accordingly, customers' expectations serve as the foundation on which service quality will be evaluated by customer. In addition, as service quality increases, satisfaction with the service and intentions to reuse the service increases.

2.4 Customer Satisfaction

Customer satisfaction is a compelling issue because in the service industry customer retention is more important than attracting new customers. Retaining customers has a stronger impact on company profit than does attracting new customers. Therefore, companies, so as to maximize profits in the long term, should strive for zero defection through customer satisfaction.

There is an increasing tendency to view satisfying customer as going beyond providing just a technically superior product or service, i.e., defect reduction and continuous improvement programs. Quality is also as such defined by the customer's perception, not by the service provider. However, it should also be born in mind that even if the first person who is considered as a customer is the buyer (end user), there are several other people who need to be considered as customer for the reason that their involvement in the production and distribution of the service or product, or project (Ireland, 1992) affects the quality of the service.

2.5 Customers' Behavior and Marketing Strategies

Fishbone developed a "multi attribute attitude model" to better explain and understand the way customers behave in relation to the introduction of new product. The model is used to predict the behavior and attitude of customers by focusing on their beliefs towards multiple products and/or brand attributes. It is understood that that the 'evaluations of salient beliefs cause over all attitude', i.e., customers prefer to like products with 'good' attributes and dislike products with 'bad' attributes. (Peter and Olson, 2008)

The model further explains that the strength of the customers' brand or product belief is affected by customers' past experiences where belief about product attributes/consequences to be stronger when based on actual uses of the product. Therefore, beliefs based on direct experience tend to have greater impact on the overall attitudes toward a product thus marketers try to induce potential customers to actually use the products (eg. Providing free trials of prepayment meter...). Whereas, unlike to

experience based beliefs, beliefs from mass advertising or conversations with sales person tend to be weaker.

2.6 Relationship Marketing: Customer Oriented Approach to Marketing

An emphasis has been given (Szmigin 2003, pp. 79), to “understanding the importance of customer behavior with a focus on relationship marketing, i.e., analysis of relationship with in the social context, which makes the relationship very complex, and thereby making the customer as an active participant. It is vital to consider customers as in insiders-making them actively engage as this would help in better understanding consumers.” This will subsequently strengthen and make the relationship mutually beneficial.

2.7 Innovation and Customers

According to (Szmigin, 2003), innovation as well as the way producers and suppliers engage themselves with consumers-innovation as a relationship issue- are key to the challenge of marketing theory and practices in today’s business. Therefore, in order to be successful, innovative suppliers need to forge relationship with appropriate customers by broadening it to embrace the active customers, unlike to the continued treatment of customers as passive.

This would enable customers to have says on the product which ultimately leads to benefit the customers in getting the right product, which is tailored toward their needs, tastes and preferences, and the business, in terms of making the innovation commercially successful. Customer behavior involves, Peter and Olson (2008), ‘interaction and exchange’ showing that relationship is key for better understanding and subsequently devise an effective marketing strategy. It is also argued that there has been fundamental shift in the meaning of innovation for the reason that customers are no longer focused on only the functional attributes of new product but on other aspects (of value) too. This reinforces, as explained earlier from that of Peter and Olson, the idea that consumer behavior is very dynamic and needs to be continuously reviewed.

Equally to understanding the people's differences, characteristics of different adopter categories, it is also important to analyze innovation differences as to why one innovation is accepted over the other. An examination of the different relationships between different people or adopter categories and the innovation differences might in turn lead to a deeper understanding of reactions and responses in the marketplace.

2.8 Adoption and Resistance of an Innovation

Time is considered relevant in understanding the behavior of customers, because they do organize, use, create, lose and plan their time. Relating time and innovation, Isabella (2003, P. 104) by referring to Rogers and Shoemaker's definition, was considered as "the degree to which an individual is relatively earlier in adopting an innovation than other members of the system."

Peter and Olson (2008) too have shown the role of time, by using an adoption curve, along with the percentage of adoption (diffusion over time) where the curve shows the adoption process characterized by an upward increasing curve. In the beginning, there are innovators with 3-5% adoption rate, early adopters with 10-15%, early majority and late majority with up to 34% each and finally the laggards of 5-6% adoption. Therefore, unlike to the critics made by different authors, time is important for the success of innovation as it also guides marketer which strategy and at what time to follow.

However, it shall be acknowledged the qualities, suggested by Rogers, of innovation (relative advantages, simplicity, observe ability, compatibility, trainability) are equally, and even more important factors of influencing the degree of adoption.

Customers creativity reveals a wide forms of resistance, some highly proactive and some possibly unconscious. According to a study result taken from Midgley and Dowling (2003, pp.111), despite the fact that most individuals are interested in the particular innovations, the dominant act of behavior was to reject adoption.

There are three scenarios of rejection, i.e. 1) symbolical rejection of innovation on the basis of the available information that it is not for them-example reading a good review of a given film but opting not to watch it because it is a violent, 2) Symbolically accepting

the idea (innovation) but unable to move to the trial stage for some other reasons (example a student favoring a store card but unable to own it due to his income) and 3) Symbolically accepting the idea but postponing the trial till an appropriate time or situation.

Generally, non-adoption can be explained either by rejection (consumers have processed the information needed to make the decision not to adopt) or postponement (not wishing to adopt at a particular time because of the need for more information or more time to process the information they have).

Resistance, as Szmigin (2003) referred to Rams' suggestion, becomes less threatening to marketing if it is not perceived as the opposite of adoption and needs to be effectively designed as a normal customer process. This makes the success of innovation to rest on how it is flexible to modification.

Customers also feel about "the comfort of the status quo", i.e. comfort with the existing consumption(situation) which is also termed as habit(strength) and less motivation to change this habit especially if the innovation is more of discontinuous type, as explained above.

2.9 Review of Empirical Studies in Energy Prepayment Service System

According to Seyoum Akele(2012), studied on "Customer Service Quality Electric Power Corporation (EEPCO)," some of the factors were responsiveness, Reliability, Assurance and Empathy. The results revealed that attitudinal and perceived behavioral control factors rather than social influence played a significant role in influencing the intention to adopt the prepayment system. In particular, perception of relative advantage, compatibility, trial ability and risk towards using the energy prepayment system were found to influence intentions to adopt the system. In addition to that the researcher found some challenges of hard ware components and Ethio telecom network problems.

Another study conducted by Ronald Ontomwa(2014) on "EFFECT OF PREPAID ELECTRICITY BILLING ON REVENUE COLLECTION COSTS AT KENYA POWER COMPANY." The results revealed that there was a significant negative relationship

between number of prepaid meters under prepaid billing system and revenue collection costs. The study result was implied that with more installation of prepaid meters under prepaid billing system, the revenue collection costs were reduced.

Another study was conducted in Ghana, (Quayson-Dadzie John, 2012) on “CUSTOMER PERCEPTION AND ACCEPTABILITY ON THE USE OF PREPAID METERING SYSTEM IN ACCRA WEST REGION OF ELECTRICITY COMPANY OF GHANA.” According to the study conducted, the researcher concluded that the majority of the respondents thought that the use of prepaid meters were not acceptable because of the numerous problems associated with it. Factors among such problems were issues concerning cost of installation, friendliness of the prepaid meter and durability and reliability.

2.10 Research Gape

The contributions of this study are listed as follows:

- The acceptance of the energy prepayment system is new topic in Ethiopia and so it is useful to conduct this study, whose result could be used to improve the service quality in energy sector.
- The power energy prepayment service system has been studied in developed countries, few in developing countries and it has not yet been investigated more than one in Ethiopia.
- Helping the top management of the EEU to identify the challenges and the benefits for the adoption of the service system, as well as to encourage the general acceptance of new technological innovations in Ethiopian context.
- This study would help other researchers who are interested to conduct further study in adopting the power energy prepayment system.

The concept of prepaid system is relatively new in Ethiopia. From the foregoing discussion above, several studies on the global stage have been carried out in reference to prepaid billing. However, no researches have been done in Ethiopia to show the efficacy of such as a system as shown in the review of literature above. Evidently, majority of global literature have concentrated on the qualitative aspects of prepaid, such as opinion and perceptions of the prepaid users and acceptability of the prepaid

system, quantitative aspects of prepaid billing system have not been adequately explored. Hence no such research has been done on the effect of prepaid billing on revenue collection costs at all. Therefore, the researcher seeks to invite other researchers to assess the effect of prepaid billing on revenue collection costs at Ethiopian Power and disclose any link that may exist between these parameters.

In this study the researcher emphasized how consumers and employees of energy provider see the prepayment system. Therefore, the views of consumers and employees of energy providers must also be critically examined in this study.

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.1. Research design

This study used both secondary and primary data sources. Secondary data were collected from existing literature while primary data were collected from employees and customer. The researcher distributed questionnaires, conducted interviews and focus group discussions (FGD) to collect the data from customers using both qualitative and quantitative methods. Qualitative data were gathered through (interviews and FGD?) while quantitative data were collected using (structured questionnaires). The collected data were analysed using (descriptive statistical methods?) to analyse using computer software called SPSS.20

3.2 Research population

The customer of Ethiopian Electric Utility (EEU) is very wide which covers the whole population; due to this the researcher used western Addis Ababa region from four regions found in Addis Ababa. This region is wider than other regions which includes ten (10) District customer service centers. Stratified sampling method was used for the study. It was taken that, western Addis Ababa region within these Districts, has about fifty seven thousand and two (57002) total customers who are using prepaid system. From this number of customers, 52,856 were domestic and, 4,146 were general customers. (Customer data base, December, 2015. The researcher has taken representative sample population to conduct this research as shown in the next section.

3.3. Sample size and sampling scheme

In collecting primary data, Stratified sampling method was carried out, and aimed at accommodating the views and responses of those customers who are having a deviating demographic profile than the general customers such as in income, education, age and settlements. Besides, some related questionnaires were also distributed to specifically selected employees with the help of key-informants of the company. Thus, the respondents were both new and experienced, those who have a thorough knowledge and experience working with the prepayment customer service, so as to have a deeper and better understanding of the subject. This is because the company is characterized by

high employee turn-over as well as job rotation that it might be unrepresentative and illogical to apply a random sampling for all of the customer service centers. Some structured interviews were also administered to management team in order to know the strategic issues such as service improvement and promotion strategies.

The qualitative application of SERVQUAL, with the help of the service dimension/attributes, was used to compare perceived service against expected service and thereby determine the quality of power prepayment service provision in the company.

Finally, empirical findings were presented with the help of respondents' opinions and views from which analysis and discussion of the empirical findings were forwarded.

The Yamane's simplified formula was used to calculate the sample size for the study by using 95% level of confidence and 5% error (level of precision). It is defined as:

$$n = \frac{N}{1 + N(e)^2}$$

Where: n—is the sample size

N ---is total population

e= the level of precision

$$n = \frac{57002}{1 + 57002(0.05)^2}$$

$$n = 397$$

Extra six respondents were participated additionally.

Total6+397=403

A survey was done to analyze the perception of people towards system in western Addis Ababa region. The Population was consisted of strata, customer service centers: No.01, 02, 03, 04, 05, 06, (07-was not yet implemented), 08, 09, 10, &11. The total population number was 57,002. The sample size of each stratum by applying proportionate

stratified sampling, the sample size included with contingency was 403 total respondents of customers.

Solution: Total population, N=57,002

Formula for Population in the strata of n1is, $n1 = N1/N \times n$

Table 1: summary of each stratum

No.	Customer service centers	Population(N)		Proportion no.(n) proposed	Real data taken
		Domestic	Genera 1		
1	CSC No.01-Mexico	2464	276	21	19
2	CSC No.02- Abnet	4638	829	42	38
3	CSCNo.03- B/Gabriel	6354	571	53	49
4	CSC No.04-Ayertena	10766	758	89	82
5	CSC No.05-Kolfe	3290	100	26	23
6	CSC No.06-Merkato	1363	358	13	13
7	CSC No.08-Betel	5844	440	48	43
8	CSC No.09-karakore	11298	699	92	86
9	CSC No.10-Sebeta	6283	97	49	45
10	CSC No.11-Alemgena	556	18	4	5
	Total	52856	4146	437	403

Therefore, the sample size that was chosen from the districts for the study consists of 403 respondents of western Addis Ababa region residential (domestic) and non-residential (general) customers. The industrial establishments were left out because their installed load capacities were too large for the installation of prepaid meters and hence do not use prepaid meters.

3.4 Method and Instruments of data collection

The methods of data collection for this study included survey, key informant interviews (KIIs) and document review. The data collection instruments were questionnaire, interview guide, and document analysis guide.

Since each instrument had its own exclusive importance, questionnaire was selected to be filled by the sampled customers and employees of the utility. Questionnaires were distributed to all 420 customers and 22 employees in the sampled service centers of the Western Addis Ababa region in order to assess their views the challenges and as to how energy prepayment service system affected the operations and customer satisfaction. However, among 420 distributed questionnaires 403 respondents of customers were returned their responses. On employees side from 22 questionnaires 20 respondents were filled and returned.

In addition to the questionnaires, document review and KIIs were held to cross validate findings. The KII was addressed some sensitive items which are related with the promotion, future direction and the improvements of the service. Document review was also enriching both the qualitative and quantitative data collected.

3.5 Methods of Data analysis

This chapter presented the output of data analysis. The presentations are in the form of tables, charts, and texts. The data analysis of this study is done using both qualitative and quantitative methods for the purpose of achieving the objective of the study. The presentation is made according to the objectives of the study. The analysis below is done based on returned questionnaires distributed to respondents. The background information of respondents is deemed necessary because the ability of the respondents to give satisfactory information on the study variables greatly depends on their background. of sampled respondents from customers has been presented below as categorized into; gender, age, education levels, marital status, family size, years of using prepaid meter, and tariff category in customer side; while categorizing employee, age, gender, marital status, education level and length of service years in the organization were included.

For the quantitative data, SPSS software was applied and simple descriptive statistics such as percentage, charts, graphs etc were used to analyze such data. On the other hand, qualitative data was analyzed using content analysis technique. Content analysis

was the process of extracting desired information from a text by systematically and objectively identifying specified characteristic of the text (Smith, 2000 as quated in Hoyle et al, 2002).

More specifically, analysis of qualitative data was carried out on the bases of the following procedures recommended by Cresswell (2003):

- The data was read a number of times to identify points that were significant for the study
- Thematic contents were formulated based on the major project questions
- List out the emerging theme titles on a separate sheet in to find connection between them.
- A master list of themes were produced and ordered coherently. The relevant information was organized under each theme and was analyzed.

3.6 Reliability

This involves the extent to which the researcher was measuring some attributes in a repeatable way (Betz and Walish, 1995). Among other factors, reliability of case study research appears to be affected seriously by the researchers' bias and by interviewees' response without proper understanding of the questions (Hoyle, et. al. 2002). While the researcher's bias might be inevitable, in this research maximum effort has been made to avoid all these and other problems. For example, the researcher was tried to put clear instructions at the beginning and be sure that all questions were answered based on proper understanding of respondents. Moreover, ethical considerations including anonymity were helpful in this regard.

It referred the extent to which the data actually measured the specific phenomenon that the researcher was claiming to study. So in this study, the researcher tried to secure validity by precisely defining major concepts, matching the items to the research questions, triangulating data sources, etc.

3.7 Ethical Issues

Ethics as applied to research generally refer to considerations to protect and respect the

rights of participants and other parties associated with the activity (Reynolds, 1982). Similarly, ethical issues of this research had been given special attention starting from problem identification up to interpretation stage using the ethical guide lines specified by Cresswell (2003). Respondents were informed clearly about the purpose of the study, the right to participate voluntarily, the right to ask questions including personal address of the researcher, the right to get the copy of the study, and the right to have their privacy respected; the right not to respond to question that they didn't want to respond too. On top of these, every necessary care had been taken not to put participants at risk of social, psychological, physical and economic harm. Still, due attention was given to the possibility of harmful information that might be disclosed during data analysis process. The last but not least, the researcher was dreadfully careful about duly acknowledging all materials and sources

CHAPTER FOUR: FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents analysis on the data collected for the study. It relates to determining customer perception and acceptability on the use of prepaid metering systems, factors customers consider before accepting prepaid meters and EEU managements' strategies in promoting the use of prepaid meters. The socio-demographic characteristics of respondents are first analyzed to help understand customers' perception and attitudes in accepting prepaid meters. Additionally this chapter also presents the findings of the challenges and managements' strategies aligned with the objectives of the research.

4.2 Socio-Demographic Characteristics of Customers

The socio-demographic characteristics such as Sex, Age, level of education, years of using prepaid meters, tariff class, marital status and family size of the customers were considered in the study.

4.2.1 Sex of Respondents

Table 2: Sex of Respondents

Sex	Frequenc y	Percentage
Male	282	70.00
Female	119	29.5
Missing	2	.5
Total	403	100

Source: primary data

The study found that out of the 403 respondents of customers used for the study, 70.00% were males whilst 29.5% were females. This implies that more male customers are using the prepaid meters than females. The details are presented in table 2 above.

4.2.2 Age of Respondents

Table 3: Ages of Respondents

Ages of Respondents	Frequency	Percentage
18-30	159	39.5
31-45	183	45.4
46-60	53	13.2
Above 60	5	1.2
missing	3	0.7
Total	403	100

Source: primary data

The analysis on the age of respondents indicated that the majority of the customers (45.4%) were between the ages of 31-45 years. This is followed by customers in the age group of 18-30 years which constitute 39.5%. Customers with the age group of above 60 years were found to have the least representation of 1.2%. The details are presented in table 3 above.

4.2.3 Level of Education of Respondents

Table 4: Level of Education of Respondents

Level of Education	Frequency	Percentage
Reading and writing	46	11.5
primary	35	8.8
secondary	140	35.1
diploma	92	23.1
first degree	79	19.8
others	7	1.8
missing	4	
Total	403	100.00

Source: primary data

The study found that the level of education of respondents was generally high in the study area. It was found that as high as 35.1% of the respondents have Secondary level education and this is followed by 23.1% of those who have diploma level of education, with only 8.8% having primary school. 19.8% of the respondents however had first degree education level. This indicates that the majority of prepaid customers have completed secondary school. The detail is illustrated in table 4 above.

4.2.4 Years of Using Prepaid Meters

Table 5: Duration of Usage of Prepaid Meters by Respondents

Duration	Frequency	Percentage
Less than one year	87	22.0
1-3years	184	46.5
4-6years	77	19.4
Above 6years	48	12.1
Total	396	100.0
Missing	7	
Total	403	

Source: primary data

The years of using prepaid meters was conducted and the responses were that 46.5% have used prepaid meters between 1-3 years, 22.0% have also used prepaid meters for less than a year. A smaller percentage (12.1%) has used prepaid meters for over six (6) years. The details are presented in table in table 5 above.

4.2.5 Tariff Class of Respondents

Table 6: Tariff class of Respondents

Tariff Class of Respondents	Frequency	Percentage
Residential(Domestic)	350	86.8
Non-residential(Commercial)	25	6.2
Using both tariff types	26	6.5
Missing	2	.5
Total	403	100

Source: primary data

The study found that 86.8% of the respondents were in the residential tariff category and the non-residential or commercial tariff category of respondents made up of 6.2%. Some 6.5% of the customers are using both commercial and domestic type at the same time. The study indicates that majority of prepaid customers were domestic. The details are presented in table 6 above.

4.2.6. Marital Status of the Respondents

Table 7: Marital Status of the Respondents

Marital status of the respondents	Frequency	Valid Percent
Single	138	34.7
Married	238	59.8
Separated	14	3.5
Widowed	8	2.0
Total	398	100.0
Missing	5	
Total	403	

Source: primary data

The study found that 59.8% of the customers are married, 34.7% of the respondents were single (unmarried). The smallest number under marital status is 2% which is widowed. The details are presented in table 7 above.

4.2.7 Family Size of the Respondents

Table 8: Family Size of Respondents

	Frequency	Valid Percent
two	81	23.1
three	52	14.9
four	116	33.1
five and above	101	28.9
Total	350	100.0
missing	53	
Total	403	

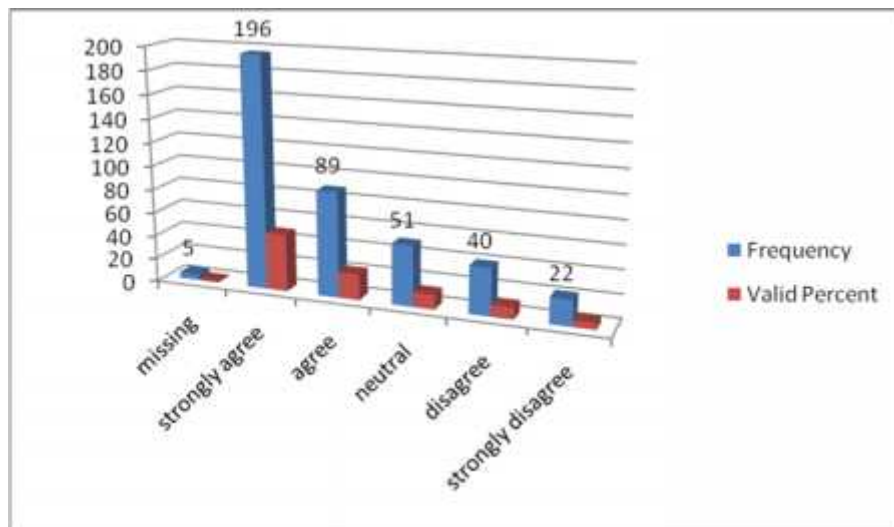
Source: primary data

The study found that 33.1% of the customers respond that their family size was four in number. From the study again 28.9% of the respondents were with the family size of five and above. This indicates that the prepaid system contains more family members using single meter. The details are presented in the table 8 above.

4.3. Factors of the Perception and Acceptability of Customers Towards Prepayment Service System.

4.3.1 The Reliability Of Prepaid Service System

Figure 1 : The Reliability of Prepaid Service System



The study found that from 403 respondents about 196 strongly agreed that the system is reliable, followed by 89 of the respondents who agreed, and about 22 respondents who strongly disagreed with the system. From the characteristics of the reliability, about 285 respondents either strongly agreed or agreed. This indicates that the system is reliable. The details are presented in bar diagram above.

4.3.2 Durability of Prepaid Meters

Table 9: Durability of Prepaid Meters

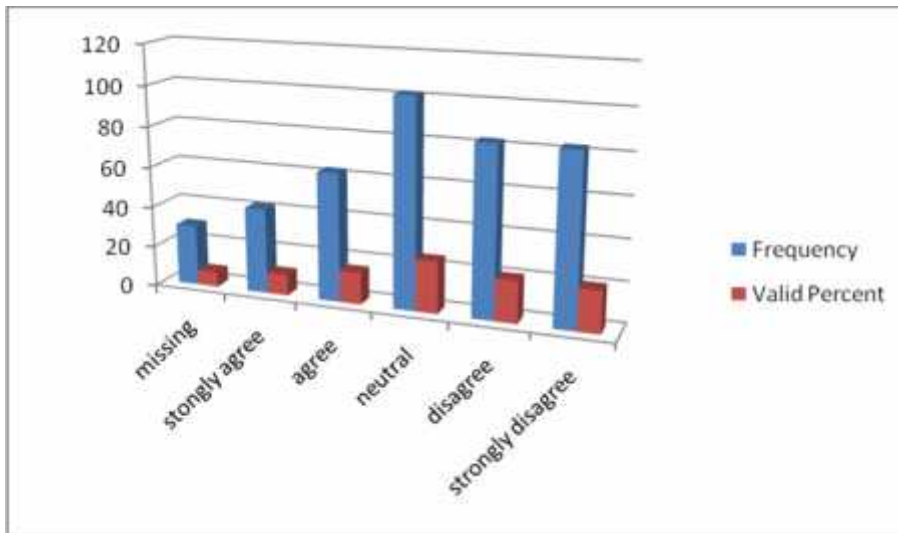
	Frequency	Valid Percent
missing	18	4.5
strongly agree	107	26.6
agree	126	31.3
neutral	81	20.1
disagree	50	12.4
strongly disagree	21	5.2
Total	403	100.0

Source: primary data

From the research study among 403 respondents except 18 missed, 31.3% agreed and 26.6% strongly agreed. The smallest numbers with 5.2% of the respondents were strongly disagreed. This indicates that the prepaid metering system is durable that since altogether 57.9% of the respondents strongly agreed or agreed with durability. The details are presented in table 9 above.

4.3.3 Characteristics of Cost of Installation

Figure2: Cost of Installation is Free or with less cost



According to the study, the acceptance of the prepayment system regarding the cost of installation from 403 respondents except 7.4% missed, about 25.3% were in neutral condition which means they are not decided to agree or disagree. But the study found 41.2% all together either disagreeing or strongly disagreed that the installation is free or has less cost. The study implies that the majority of the respondents believe that the installation cost is not free or does not have less cost. The details are presented above in bar chart.

4.3.4 Characteristics of Accessibility of Vending Station

Table 10: Accessibility of vending station

	Frequency	Valid Percent
strongly agree	124	30.8
agree	95	23.6
neutral	81	20.1
disagree	49	12.2
strongly disagree	40	9.9
missing	14	3.5
Total	403	100.0

Source: primary data

Out of 403 respondents except 13 missed 124(30.8%) strongly agreed or 23.6% agreed. The smallest number is 9.9% which is strongly disagreed. From the study the researcher can conclude that the vending station to purchase the energy is easily accessible. The detail is presented in the following table

4.3.5 Acceptance of the System Around the Respondents Village

Table 11: Acceptance of the System Around the Respondents Village

	Frequency	Valid Percent
strongly agree	127	31.5
agree	91	22.6
neutral	63	15.6
disagree	39	9.7
strongly disagree	53	13.2
missing	30	7.4
Total	403	100.0

**Source: primary data,
March 2016**

The study found that 31.5% of the total respondents strongly agreed or 22.6% agreed. This means that about 54.1%, which is more than the average have accepted the system comfortably. The detail is presented above the table.

4.3.6 Acceptance is Because of No Choice

Table 12: Acceptance is Because of No Choice

	Frequency	Valid Percent
strongly agree	121	30.0
agree	62	15.4
neutral	78	19.4
disagree	69	17.1
strongly disagree	51	12.7
missing	22	5.5
Total	403	100.0

Source: primary data, March 2016

The study found that out of 403 respondents except 22 missed 121(30%) and 15.4% altogether 45.4% either strongly agreed or agreed that the acceptance is because of not having alternatives. The study implies that the system should be improved. The detail is presented above table 12.

4.3.7 Characteristics of Queuing at Vending Station

Table 13: Queuing at Vending Station

	Frequency	Valid Percent
missing	15	3.7
strongly agree	76	18.9
agree	84	20.8
neutral	127	31.5
disagree	55	13.6
strongly disagree	46	11.4
Total	403	100.0

Source: primary data, March 2016

Out of 403 respondents except 15 missed about 127 (31.5%) remained undecided, following 20.8% of the respondents who agreed. Therefore the study indicates that the majority of the respondents were either neutral or in favor waiting long time at vending station. The table above 13 shows the detail.

4.3.8 The Level of Satisfaction of the Service

Table 14: The Level of Satisfaction of the Service

	Frequency	Valid Percent
missing	10	2.5
strongly agree	90	22.3
agree	90	22.3
neutral	116	28.8
disagree	46	11.4
strongly disagree	51	12.7
Total	403	100.0

Source: primary data, March 2016

The study found that out of 403 respondents except 10 missed about 116(28.8%) neutral with the satisfaction of the system in general. About 44.6% of the total respondents were either agreed or strongly agreed with the satisfaction of prepaid service system. This indicates that the majority of the customers are satisfied with the service provision of the EEU. But the satisfaction level is not as such very attractive. The detail is presented above table 14.

4.4. Rating of Opinions for those Customers Shifted from Postpaid to Prepaid Billing System

4.4.1 Follow up of Customers in Energy Consumption

Table 15: Follow up of Customers in Consuming the Power

	Frequency	Valid Percent
strongly agree	167	56.4
agree	65	22.0
neutral	33	11.1
disagree	13	4.4
strongly disagree	18	6.1
sub total	296	100.0
missing	107	26.6
Total	403	100.0

Source: primary data, March2016

From the study illustrated above table; among 296 respondents except 107 which were not shifted from postpaid, 56.4% strongly agreed and 22.0% agreed, in sum 78.4% of the customers are following up or controlling their consumption day to day. This indicates that customers are taking care about consumption and it contributes saving the power. The detail is presented above with the table 15.

4.4.2 Encouraging Colleagues to use the System

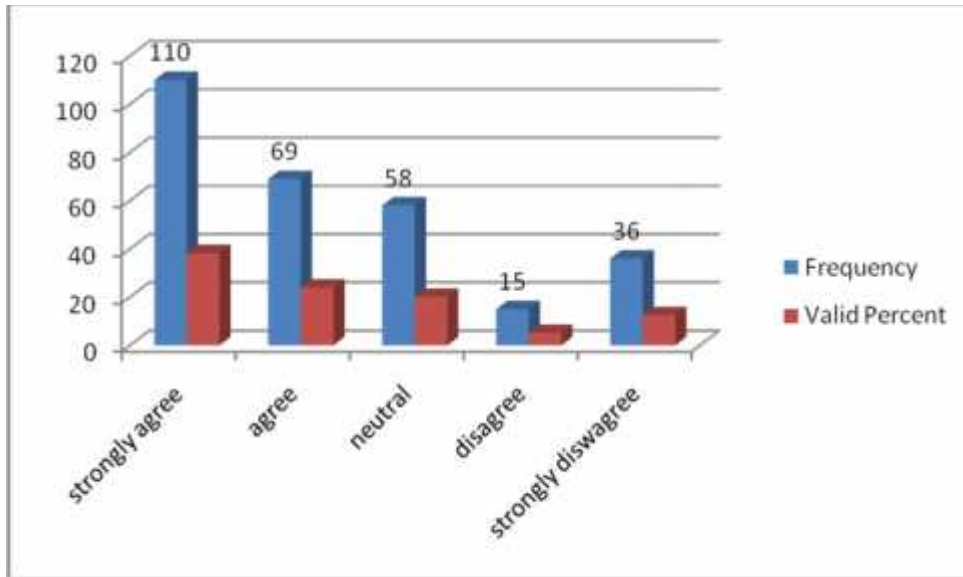
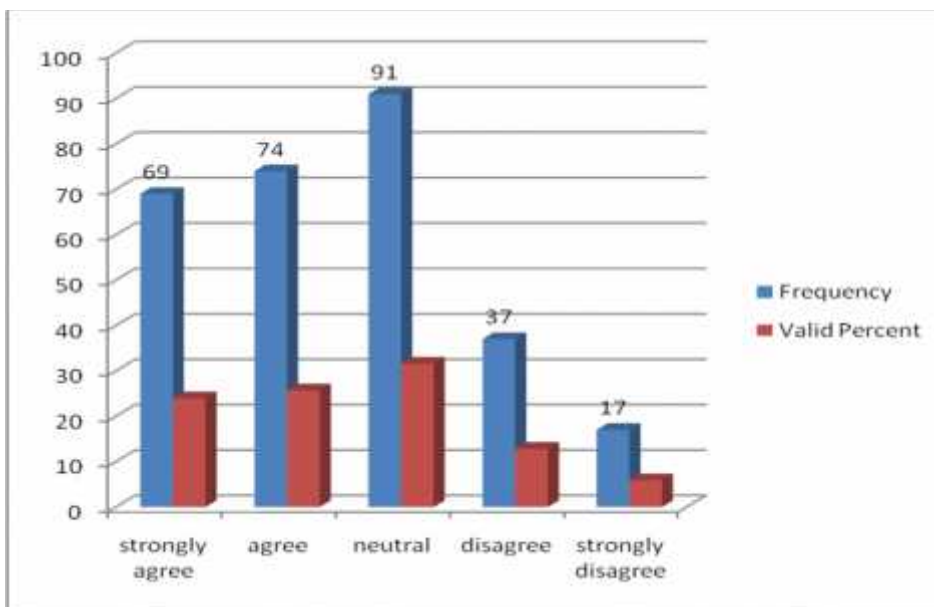


Figure 3: Encouraging Colleagues to use the System

The study found that among 288 respondents which have shifted their system from postpaid about 110 strongly agreed followed about 69 who agreed. So that 179 respondents altogether are encouraging their colleagues to use the system. The detail is presented above by bar chart 4.4.2

4.4.3 Using less Power by those who have shifted to the System

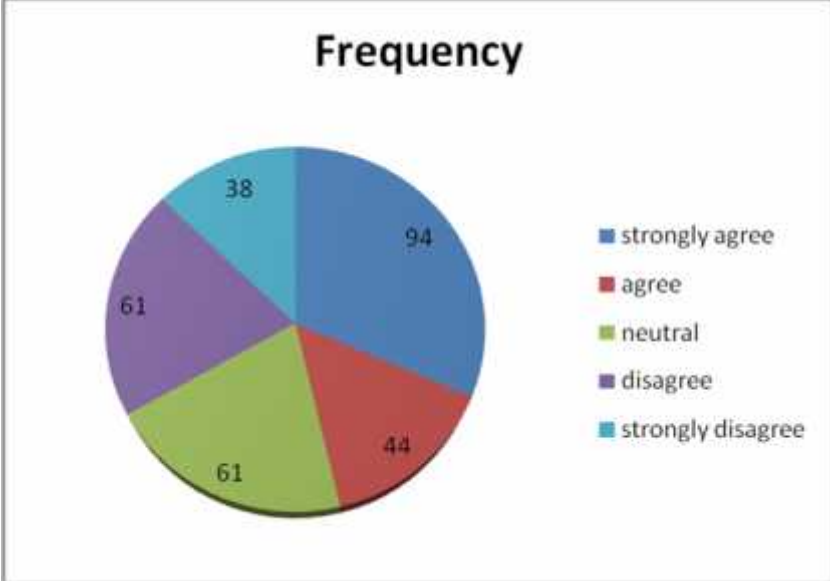
Figure 4: Using less Power by those who have Shifted to the System



The study found that out of 288 respondents who have shifted from postpaid 91(31.6%) were neutral while 74 and 69 altogether 143(49.7%) either agreed or strongly agreed that they use less power since they shifted to prepaid system. The detail is presented above on the bar chart above.

4.4.4 Characteristics of Blackout since they Shifted to the System

Figure5: Blackout since they Shifted to the System



The research study found that among 298 respondents who have shifted from postpaid system 94(31.5%) strongly agreed and 44(14.8%) agreed altogether 46.3% either strongly agreed or agreed that they are experiencing with frequently power blackout regarding in prepaid metering system. The detail is presented above by pie diagram.

4.4.5 Accessibility of Vending Stations

Table 16: Accessibility of vending stations

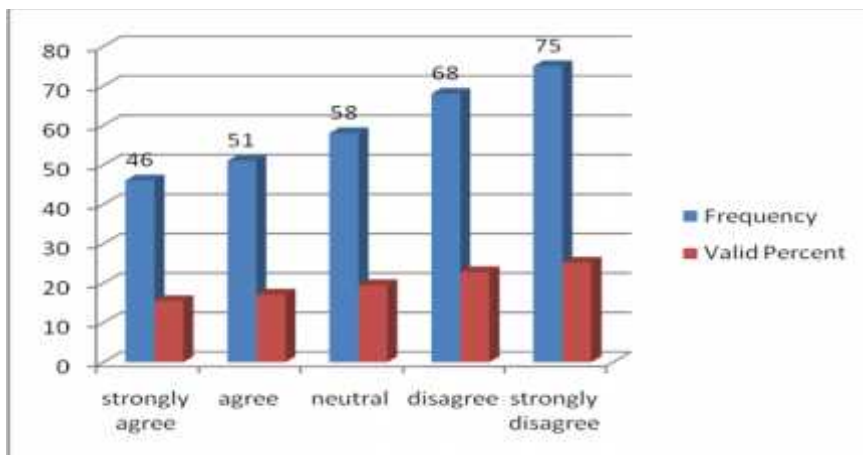
	Frequency	Valid Percent
strongly agree	60	22.6
agree	53	20.0
neutral	50	18.9
disagree	42	15.8
strongly disagree	60	22.6
subtotal	265	100.0
missing	138	
Total	403	100.0

Source: primary data, March 2016

With regard to the accessibility of vending stations, the majority of respondents i.e. 42.6% either agreed or strongly agreed. About 38.4% of the respondents were strongly disagreed or disagreed that the accessibility of vending station is very difficult. Therefore the research study indicates that even though the majority has agreed with accessibility, EEU has to increase the vending stations in order to increase the quality of service. The detail is presented above table 16.

4.4.6 The Frequency of Blowing Housing Appliance

Figure6: The Frequency of Blowing Housing Appliance



The study found that Out of 298 respondents shifted from postpaid 143(48%) either strongly disagreed or disagreed with the frequency of blowing housing appliance. Therefore the study indicates that the system is user friendly. The detail is presented above On the bar chart.

4.5 Demographic Characteristics of Employees

The study included those employees who are working directly with the prepaid system. Those employees are either prepaid system operators or those installing Meters and maintenance groups. Therefore below their sex, age, education level, marital status and work experience with system are included in questionnaire

4.5.1 Sex of Employees

Table 17: Sex of Employees

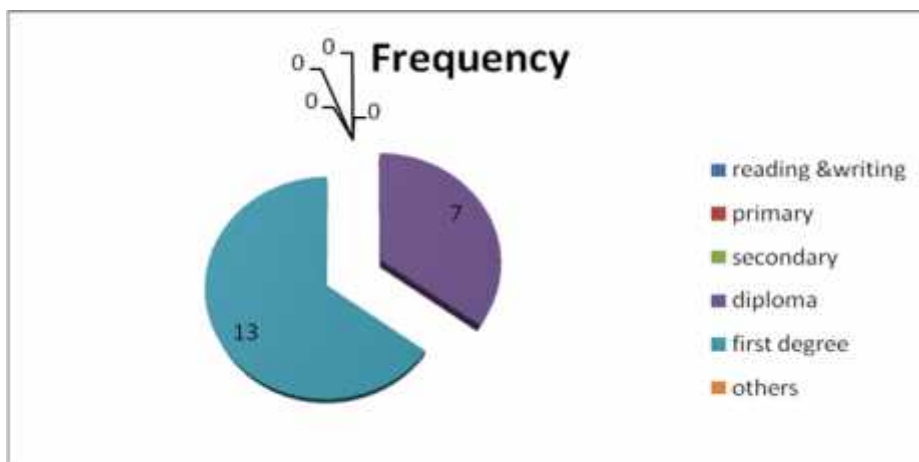
sex	Frequency	Valid Percent
female	3	15.0
male	17	85.0
Total	20	100.0

Source: primary data, March 2016

From 20 employees there were about 17(85%) males and 3(15%) females. This indicates that there were more males than females who are working in meter installation or in System operation. The detail is presented above the table 4.5.1.

4.5.2 Education Level of Employees

Figure 7: Education Level of Employees



From the study out of 20 employees 13(65%) are first degree holders, followed (35%) who graduated in diploma. So that the employees engaged in prepaid system have minimum qualification of diploma. The detail is presented by Pie chart above.

4.5.3 Marital Status of the Respondent Employees

Table 18: Marital Status of the Respondent Employees

marital status	Frequency	Valid Percent
single	7	35.0
married	13	65.0
Total	20	100.0

Source: primary data, March 2016

The study found that from the respondent employees, 65% were married and 35% were single. The detail is indicated above the table 4.5.4

4.5.4 Work experience of employees

Table19: Work experience of employees

work experience	Frequency	Valid Percent
1-3years	10	50.0
4-6years	4	20.0
above 6yrs	6	30.0
Total	20	100.0

Source: primary data, March 2016

From the study out of 20 respondents of employees 10(50%) have 1-3 years of work experience and followed 6(30%) with their work experience of above 6 years. This indicates that the company has both experienced as well as fresh human resources engaged in the system. The detail is presented above table 4.5.5

4.6 Factors of Challenges in Implementation of Prepayment System

From the following characteristics of the objectives of challenges the findings of the Study is presented below.

4.6.1 prepaid meter hard ware components failure due to improper fixing

Table 20: hard ware components failure due to improper fixing

	Frequency	Valid Percent
strongly agree	7	35.0
agree	4	20.0
neutral	2	10.0
disagree	6	30.0
strongly disagree	1	5.0
Total	20	100.0

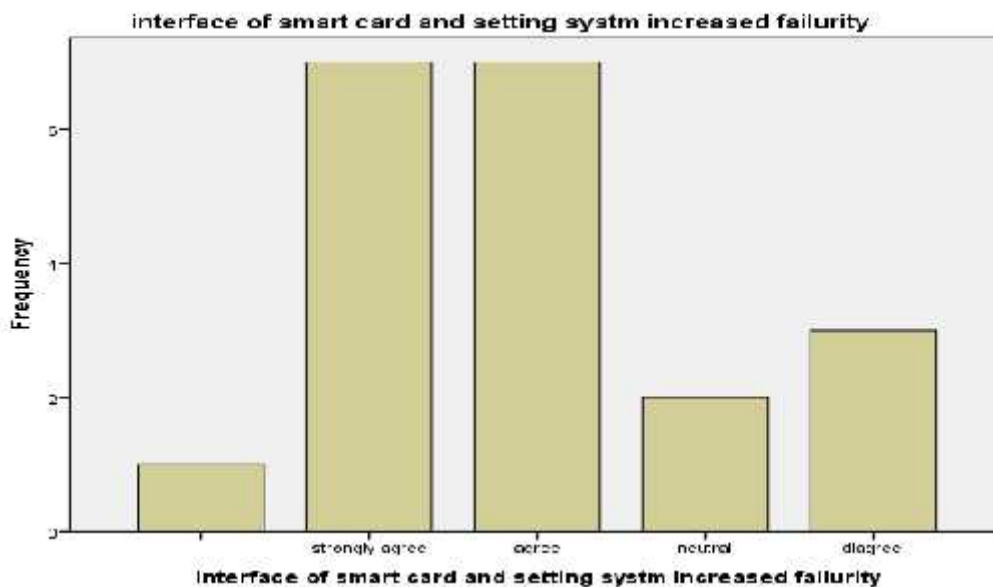
Source: primary data, March 2016

The study found that 55% of the respondents of the employees either strongly agreed or agreed that the prepaid meter hard ware components can be failed due to

Improper fixing of meters and the like. The detail is presented above the table 4.6.1

4.6.2 Improper Handling or Improper Interface of Smart Card

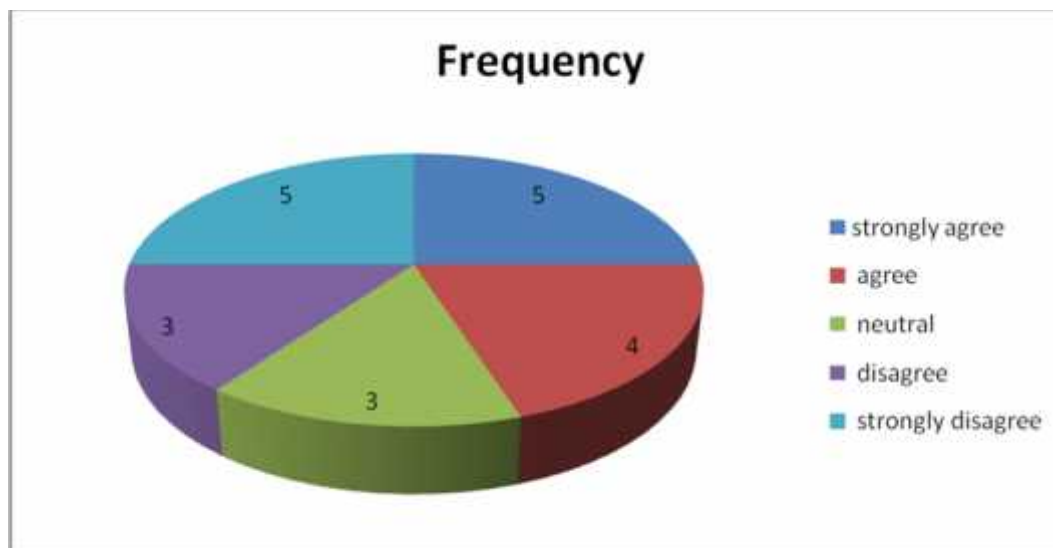
Fig.8:



As illustrated above by bar chart, about 70% of the respondents both strongly agreed and agreed that the failure of smartcard is due to improper Handling and improper interfacing or setting.

4.6.3 Possibility of Fraud of Energy or Tariff by Customers

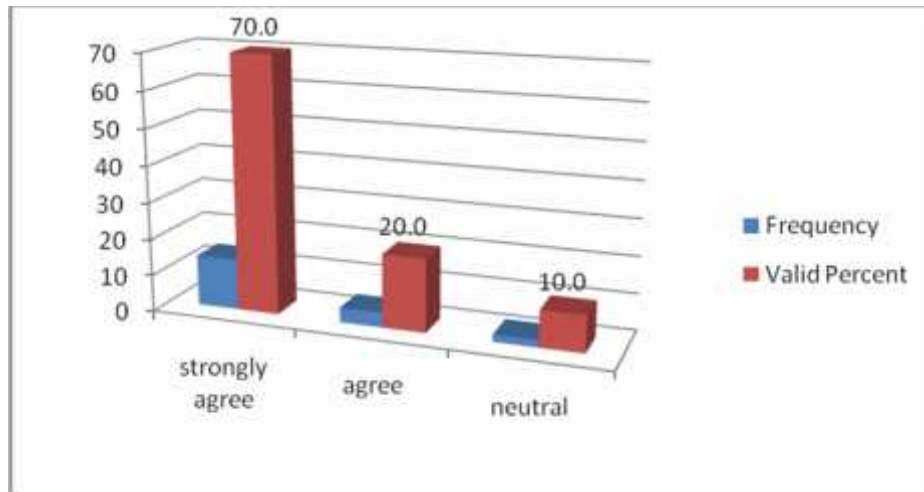
Figure 9: Possibility of Fraud of Energy or Tariff by Customers



The finding of the study indicates that 45% of the respondents either strongly agreed or agreed with the possibility of fraud; following 40% disagreed or strongly disagreed. This means that more than the averages of the respondents believe with the possibility of fraud either in tariff or energy theft. The detail is presented above by pie diagram

4.6.4 Ethio Telecom Network Problem

Figure 10:



As indicated above by bar chart, the study found that from 20 respondents of the employees 70% strongly agreed and 20% agreed with the problem of Ethio telecom network. No respondents disagreed with the problem. This indicates that the prepaid system is being highly affected by networking.

4.6.5 Characteristics of Inadequate Voltage

Table 21: Inadequate Voltage

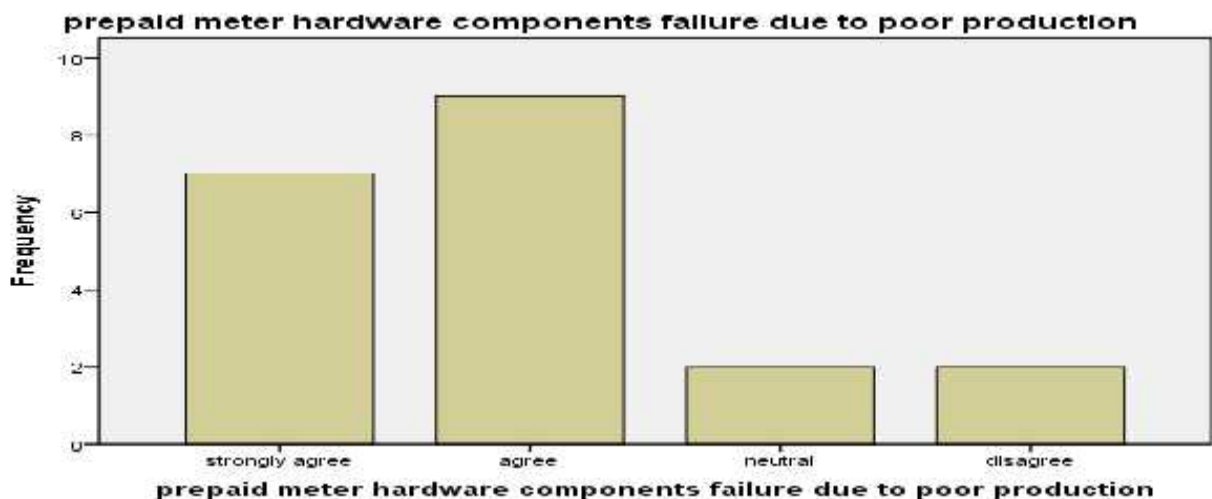
	Frequency	Valid Percent
strongly agree	13	65.0
agree	3	15.0
neutral	2	10.0
disagree	2	10.0
strongly disagree	0	0.0
Total	20	100.0

Source: primary data, March 2016

From the study illustrated above table, about 65% of the respondents of the employees were strongly agreed and 15% agreed that inadequate voltage is another big challenge which is being highly affecting the system. This means that the system can't run with under voltage. It must meet the standard of voltage range.

4.6.6 Prepaid Meter Hardware Components Failure Due to Poor Production

Figure 11: Hardware Components Failure Due to Poor Production



As the bar chart above shows 80% of the respondents strongly agreed or agreed with the failure of meter due to poor production. Therefore the study found that the quality of prepaid meters and the like are poor. The detail of the study is presented above on bar chart

4.6.7 Smart Card Failure Due to Poor Production

Table 22: Smart Card Failure Due to Poor Production

poor production	Frequency	Valid Percent
strongly agree	6	30.0
agree	4	20.0
neutral	3	15.0
disagree	4	20.0
strongly disagree	3	15.0
Total	20	100.0

Source: primary data, March 2016

The study found that 50% the employees’ respondents either strongly agreed or agreed with the failure of smartcard due to poor production. But about 35% of the respondents disagreed or strongly disagreed that failure of smart card is due to poor production. From this finding the researcher can understand that even though there are other factors, above the average of the respondents believe smart card failure is due to poor production. The detail is presented above the table 22.

4.7 Opinions about the Involvement of Employees in Implementation of Prepaid Service System

4.7.1 Employees Awareness on Benefits of Prepaid Meters

Table 23: Employees Awareness on Benefits of Prepaid Meters

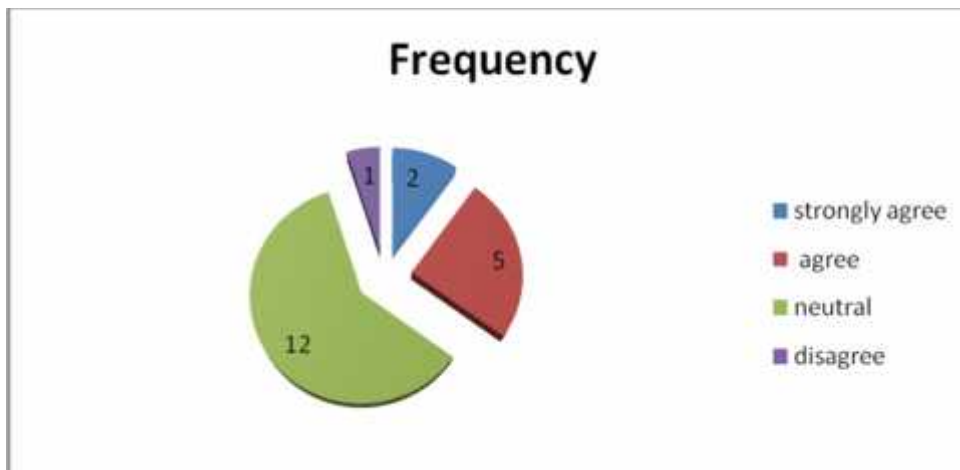
	Frequency	Valid Percent
strongly agree	8	40.0
agree	5	25.0
neutral	5	25.0
disagree	1	5.0
strongly disagree	1	5.0
Total	20	100.0

Source: primary data, March 2016

The study found that about 65% of the respondents of the employees either strongly agreed or agreed that they are conscious with the system. About 10% of the respondents strongly disagreed or disagreed. This means that the study indicated that the majority of the employees engaged with the system have awareness on how to install and how to operate the system. The detail is indicated in table 4.7.1 above.

4.7.2 Installation of Durable Prepaid Meters

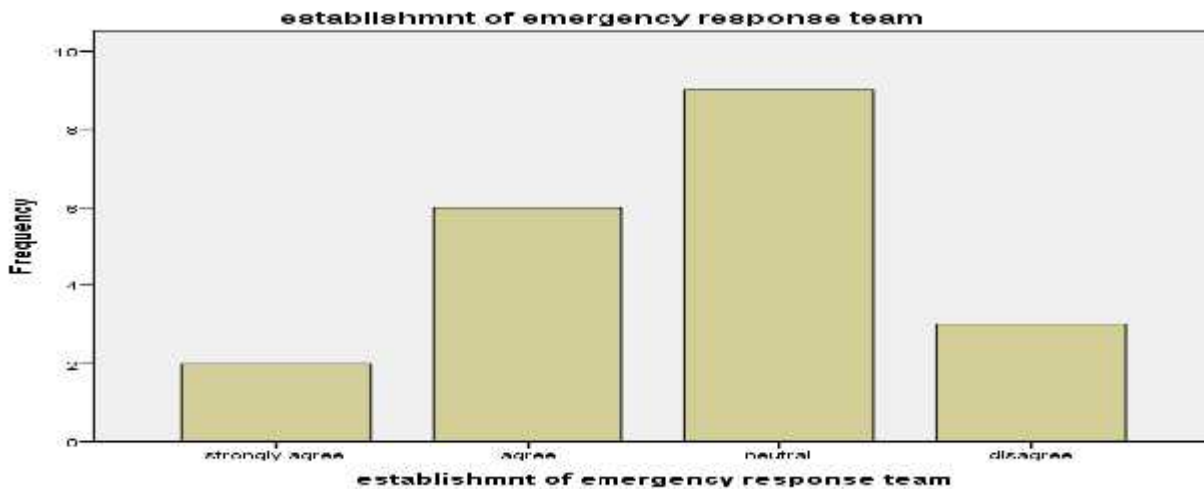
Figure 12: Installation of Durable Prepaid Meters



As illustrated in pie chart above 60% of the respondents had not decided whether the prepaid meter is durable or not. But some 35% of the respondents of the employees agreed or strongly agreed with the durability of meters. Only 5% of them had disagreed. This implies that the majority of the employees are not comfortable with the meters and the system. It needs further improvement.

4.7.3 Establishment of Emergency Response Team

Figure 13:



As illustrated above on bar chart the study found that 45% of the respondents were not sure whether there is technical emergency team or not. But about 40% either strongly agreed or agreed that there is an emergency team for any complaints regarding the prepaid metering system. There were only 15% of the respondents who disagreed with the establishment of emergency response team. This implies that the majority of the respondents of the employees do not know whether there is a team established in each customer service centers that is aimed to maintain the system to run normally and to reduce customer complain.

4.7.4 Increasing Vending Stations

Table 24: Increasing Vending Stations

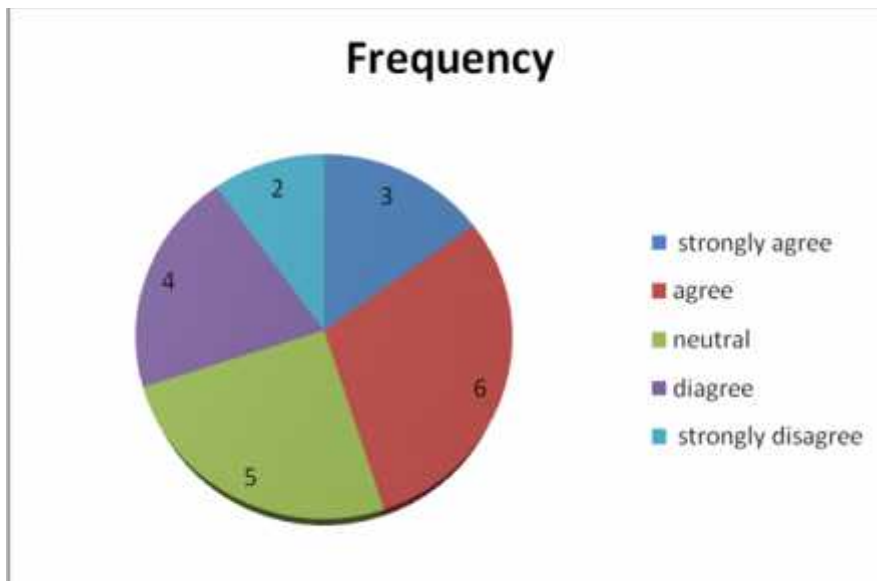
	Frequency	Valid Percent
strongly agree	7	35.0
agree	5	25.0
neutral	7	35.0
strongly disagree	1	5.0
Total	20	100.0

Source: primary data, March 2016

As shown in the table above, the study found that 60% of the respondents strongly agreed or agreed that the vending station is accessible for any customer. But some 35% of the employees were not sure whether it is accessible or not. Only 5% of them strongly disagreed with the increasing of vending stations. Therefore, the study indicates that the majority of the employees supported that the vending station is accessible to purchase energy. But it was not very attractive. The detail is presented above the table 4.7.3.

4.7.5 Characteristics of Free Installation

Figure 14: Characteristics of Free Installation



Above pie chart shows that 45% of the respondents either strongly agreed or agreed that the installation of prepaid meter is free or less cost. Some 30% strongly disagreed or disagreed with free installation. And 25% of them were not sure whether it is free or not. This implies that the majority of the employees agreed that the prepaid meter installation is free or less costly.

4.8 Opinions about the Participation of Employees in Implementation of Prepaid Metering System at the Planning.

4.8.1 Training is given about Operation and Installation

Table25: Training is given about Operation and Installation

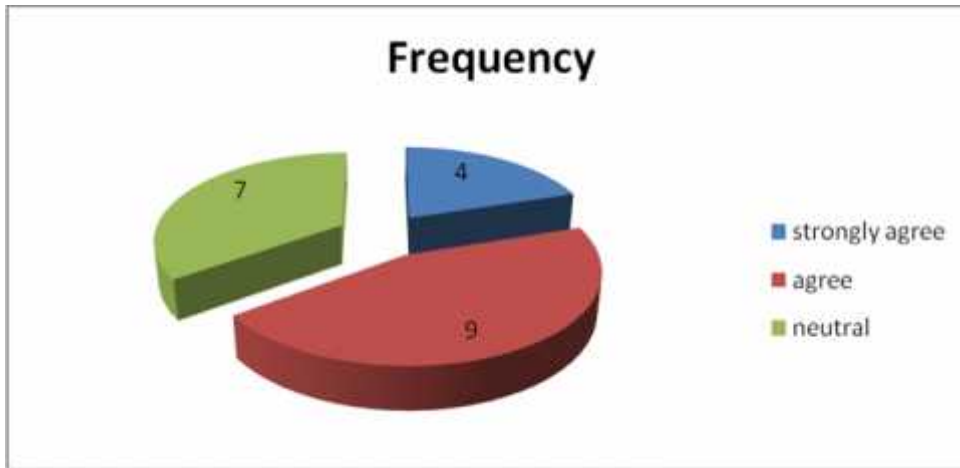
	Frequency	Valid Percent
strongly agree	4	20.0
agree	9	45.0
neutral	4	20.0
disagree	2	10.0
strongly disagree	1	5.0
Total	20	100.0

Source: primary data, March 2016

As the study found 65% of the total respondents strongly agreed or agreed that the training was given about the operation and installation of the prepaid system. About only 15% of the employees disagreed or strongly disagreed that the training was given, the rest 20% were neutral in their opinion about the training. Therefore, the majority of the respondents agreed that the training was given to employees who are directly linked with the system. The detail is presented above the table 25.

4.8.2 Employees Having Information about the Intention of the Organization

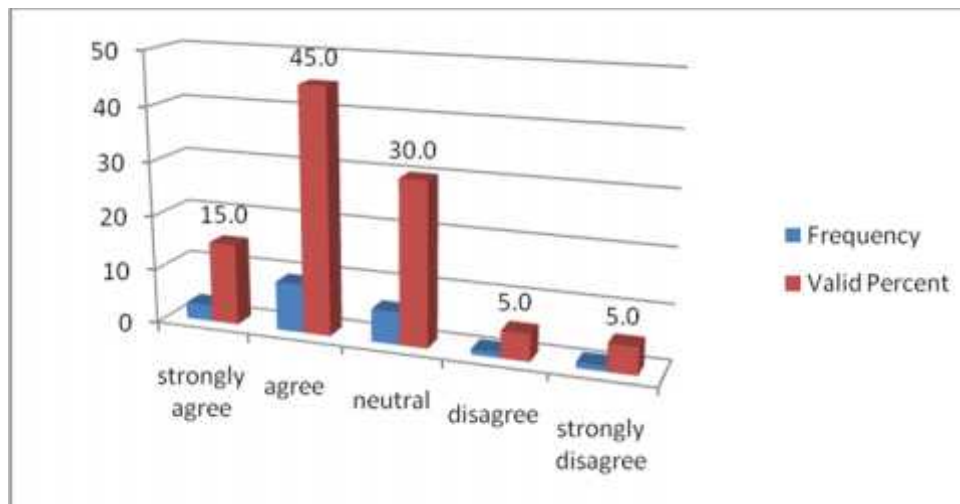
Figure 15: Information about the Intention of the Organization



From the above pie chart, the study about 65% of the respondents strongly agreed or agreed that they have information about the intention of the organization. No respondents disagreed about it except some 35% who were neutral, i.e. they were not sure having information about the intension of the organization. This implies that the majority of the employees were sure in participating with organization plan.

4.8.3 Participation of Employees in Promoting the Benefits of the System

Figure 16: Promoting the Benefits of the System



As the bar chart illustrates above 60% of the respondents agreed or strongly agreed with the participation of promoting the benefits of the prepaid metering system. Only 10% of the respondents disagreed or strongly disagreed. Followed 30% were not sure in participating of promotion. So that the study implies the majority of the employees were participated in promoting the benefits the system in many ways.

4.8.4 Employees Participation about Operation and Installation

Table 26: Employees Participation about Operation and Installation

	Frequency	Valid Percent
strongly agree	3	15.0
agree	6	30.0
neutral	6	30.0
strongly disagree	5	25.0
Total	20	100.0

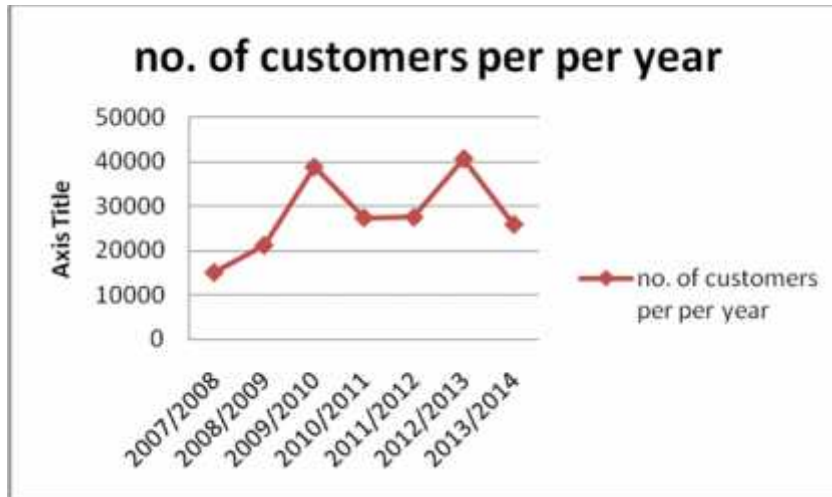
Source: primary data, March 2016

The study found that 45% of the respondents strongly agreed or agreed with the participation of employees in operation and installation of the prepaid system. About 25% the respondents strongly disagreed, followed 35% of them were not sure with the participation. Therefore, the study implies that above the averages number were participated in installation and operation of the prepaid metering system. The detail is presented with the above table 4.8.4

4.9 Trend of Customers(Growth of Customers per year) for Seven Years

years	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014
no. of customers per year	15112	21213	38799	27432	27510	40662	25915

Figure 17:



Source: customer
data base, December
2015

Above is to show about the customer growth for the consecutive seven years trend. As illustrated in table and in graph, for the first three consecutive years there was continuous and fast growth of customers in prepaid metering system. After third year the growth was decreased, but in sixth year there was maximum number of customers shifted to the prepaid metering system. Even though there are other factors that can be considered for the growth of customers, the trend implies that there was irregularity of growth.

4.10 Non-Parametric Tests

In this study the characteristic type of test is probably the most common non-parametric test which is the chi-square test of independence. However, there are other non-parametric tests that should be known about.

4.10.1 Chi-Square Test

Frequencies

age of respondents

Age group	Observed N	Expected N	Residual
18-30	159	80.6	78.4
31-45	183	80.6	102.4
46-60	53	80.6	-27.6
above 60	5	80.6	-75.6
missing	3	80.6	-77.6
Total	403		

educational level of respondents

Education level	Observed N	Expected N	Residual
reading and writing	46	66.5	-20.5
primary	35	66.5	-31.5
secondary	140	66.5	73.5
diploma	92	66.5	25.5
first degree	79	66.5	12.5
others	7	66.5	-59.5
Total	399		

family size of respondents

Family size	Observed N	Expected N	Residual
two	81	87.5	-6.5
three	52	87.5	-35.5
four	116	87.5	28.5
five and above	101	87.5	13.5
Total	350		

marriage of respondents

Marital status	Observed N	Expected N	Residual
single	138	99.5	38.5
married	238	99.5	138.5
separated	14	99.5	-85.5
widowed	8	99.5	-91.5
Total	398		

service years of respondents using the system

years	Observed N	Expected N	Residual
below one year	87	99.0	-12.0
1-3 years	184	99.0	85.0
4-6 years	77	99.0	-22.0
above 6 years	48	99.0	-51.0
Total	396		

Test Statistics

	age of respondents	educational level of respondents	family size of respondents	marriage of respondents	service year of respondents using system
Chi-Square	361.429 ^a	167.842 ^b	26.251 ^c	365.296 ^d	105.596 ^e
df	4	5	3	3	3
Asymp. Sig.	.000	.000	.000	.000	.000

1. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 80.6.
2. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 66.5.
3. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 87.5.
4. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 99.5.
5. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 99.0.

The chi-square goodness of fit test assumes that all of the expected frequencies are less than 5. This assumption is evaluated by information in the footnote of the test statistics table.

For this problem, we see that zero cells had an expected frequency less than 5. The assumption is satisfied.

Since, .000 is less than .05; we reject the null hypothesis and find support for the alternative hypothesis that the observed sample frequency counts differ from the expected frequency counts based on the population.

4.11 The Benefits of Prepayment Metering System

According to the study findings from primary and secondary source such as manuals, reports and brushers from the company as well as from the supplier; the benefits of the prepaid system are as follows:

1. For the customer

- It is transparent
- Easy to add credit to the meter through smart card
- They can control their own consumption
- They can control their budget
- No hassles with bill payment, disconnection or reconnection
- There is no minimum charge
- Require no deposit
- No more disputed bills
- Warning for low credit
- Abnormal voltage protection
- Automated record keeping

2. For the power company also benefits in the following way:

- Upfront payment,
- Improved cash flow,
- Decreased non-technical losses,
- Lower overheads expenses (no meter reading or billing),
- Increased revenue,
- No outstanding debt
- Tamper protection

- Non-allowance of over sanctioned load
- Better load management.
- Better customer services
- Automated record keeping
- Create power saving attitude to the consumers

3. Using software to run prepayment rather than hardware has a number of Advantages:

- Elimination of hardware costs—not just procurement but also installation, maintenance, and replacement.
- Extension of the program to all interested parties. There are no special meters. Any advanced meter will do, so long as it includes either remote connect / disconnect or flow restriction capabilities.
- The utility can use a single billing system for all customers, provided it has appropriate capabilities.
- Customers can use a utility’s existing infrastructure for payments. Granted, some utilities may choose to offer tokens or smart cards, plus the ability to top them up. Others may choose to offer in-house displays but neither is required.

4.12. Comparison of Findings with the Literature

As compared to the literature, the findings are supporting all the theories. From the theory it says “the critical role service quality plays in the customer's service experience. For instance, researchers demonstrate that better service quality increases perceived service value and satisfaction; improves the service provider's customer retention and financial performance.”

From the findings, in general the researcher can conclude in both experienced and new customers; the system is fairly acceptable but it needs further improvement. Because of these some bad side effects; the majority of customers choose post paid metering system. This is only for sustainable power supply without any interruption. But in other

cases such as financial reports, saving power and money, billing process, etc... are the benefits that the customer satisfied with the system. In the other hand Ethio telocom networking, inadequate voltages, poor quality of hardware components of the system, and inaccessibility of emergency team are some big challenges to provide quality service.

CHAPTER FIVE:

5. SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

The findings derived from the research assessment which are based on the objectives of the study are: level of acceptability of the prepaid metering system among customers in the Western Addis Ababa Region of EEU, factors customers consider before accepting the prepaid meters, existing challenges in service provision, the benefits of the prepaid system and the strategies in promoting customer acceptability of the prepaid meters.

The findings of the study to be drawn were shaped by the following and have two parts; they are findings of samples from the customers and employees:

5.1.1 Part One: Findings from the Customers

📌 Characteristics of Customers' Acceptability and Perception

From the study findings, there is a general perception that prepaid meters are fairly acceptable to customers in the study area associated with user friendliness, durability and reliability of the prepaid meters being installed, clarity in financial report, cost of installation, and in accessibility of vending station. On the other hand availability of technicians when needed for maintenance and vending stations especially during holidays, evenings and weekends are big challenges for their acceptability.

📌 Characteristics of Customers who were shifted from Postpaid to Prepaid System

Those customers who were shifted from post paid to the new system are considered to have better knowledge of both systems. This helps the customers to evaluate, compare and contrast in any aspects. Accordingly, the research found that the system is good in saving power and money due to the reason that the customers are controlling and follow-up their consumption daily. In addition to these customers under this category accepted the system with its user friendly. However, under this category what they are blaming is accessibility of vending

stations and the experiencing of blackout of power with related to the system. This might happen due to sudden lasting the power purchased at any time, Or due to lack of the quality of hard ware components of the meters and the like.

In general the researcher can conclude in both experienced and new customers; the system is fairly acceptable but it needs further improvement. Because of these some side effects, the majority of customers choose post paid metering system. This is only for sustainable power supply without any interruption.

5.1.2 Part Two: Findings from the Employees

🚧 Factors of challenges in implementation

With the factors of the challenges, the study found that the respondents of the employees were determined. According to findings, improper handling of smart cards, improper fixing of meters, possibility of fraud, poor production of hard ware components (such as energy meters, smart cards, card readers, relay system), finally Ethio Telecom networking problems and inadequate voltage or poor networking of power in some areas were big challenges for employees and for the company in implementation of prepayment system.

🚧 Factors of attitudes of employees in implementation

As the study concluded, the employees responded that even though they have awareness about the system, they were not sure or not well confident whether the meter is:

- Durable
- Establishment of emergency team and
- Increasing vending unit.

Factors of employees involvement in planning and participating in implementation

According to the study, the employees agreed that they were participated in training, having the information about the intension of the company, in operation and installation of the system.

Factors of management's strategy of the system in the future

As the trend shows the growth in number of customers is irregular. The management team indicated that this has been other factors such as in accessibility of materials. The main management strategies adopt to promote customer acceptability of prepaid meters includes education on the benefit of using prepaid meter, installation of durable prepaid meters, free installation and increase of vending points.

A minor strategy being adopted by management in promotion of customer acceptability of prepaid meters is the establishment of an emergency response unit and the recruitment of more field officers in order to address all technical issues customers may have promptly.

5.2 Conclusion

To conclude the research study of the Implementation of the Power Energy Prepayment System it is important to remind that research design adopted for the study was the descriptive method. Both primary and secondary sources of data were used with questionnaire as the main instrument for collecting primary data on customer acceptability, factors customers perceive before accepting the use of prepaid meters, the challenges of service provision, the employees' attitude, and management strategies. The stratified sampling method was used to categorize customers into the type of tariff whether domestic or commercial. A total sample size of 403 were drawn out of 57, 002 customers in 10 districts.

It is known that this subsection presents the conclusion of the study. These conclusions are derived from the findings which are based on the objectives of the study. The study examined the assessment of customers' perception, the existing

challenges of service provision, the employees' attitude, and management strategies towards prepaid metering system in Western A/A Region of EEU. The aim of this study was to improve customers' acceptability by determining the level of acceptability of prepaid meters, analyze the factors customers consider before accepting the use of prepaid meters, to improve the service quality and determine management strategy in promoting usage of prepaid metering system, and determining the benefits of the prepaid system. The conclusions to be drawn were shaped by the findings of the study and have two parts; they are findings from the customers and employees. According to the findings some of the basic factors were discussed. Some of these factors are:

- ❖ Characteristics of Customers' Acceptability and Perception
- ❖ Characteristics of Customers who were shifted from Postpaid to Prepaid System
- ❖ Factors of challenges in implementation
- ❖ Factors of employee's involvement in planning and participating in implementation.
- ❖ Factors of management's strategy of the system in the future

5.3 Recommendations

One of the objectives of the study was to make appropriate recommendations for the successful implementation of prepayment Metering system. Based on the findings and the conclusions drawn, the following recommendations are considered to be ideal for successfully implementing the system.

1. Since there were more male customers than female ones in the study area and the fact that there are more male subscribing to use of prepaid meters than their female counterparts. It is being recommended that management should refocus their public education on the use of prepaid meters on women in order to get a lot more women to subscribe and to use of prepaid meters. Its education can motivate female landladies who normally register their property in the name of their husbands to register their property in their own names so that they can subscribe

and use the prepaid in their facility. In employee side to adjust the number of females with males, management should encourage female employees to engage in the system.

2. There is the general perception that prepaid meters are fairly acceptable to customers in the study area. This perception suggests that the acceptability level is quite low. As a result of this management should intensify public education as well as improve on the efficiency of prepaid metering services in order to increase the acceptability level of customers by addressing their concerns in terms of installing quality products of hard ware components and increasing prepaid meter vending points.
3. Customers consider a number of factors before accepting the use of prepaid meters. Among the key factors are the user friendliness, durability and access to prepaid vending point. It is therefore necessary that management should focus on such factors in order to improve the acceptability on the use of the prepaid meters.
4. Management should not only rely on major strategies of promoting acceptability such as education on benefits on the use of prepaid meters, free installation, increase vending points but should also emphasize on the need to establish an emergency response unit that will attend to all technical emergency issues relating to prepaid metering issues promptly.
5. In order to overcome the challenges facing the employees in day to day operation in service provision and for customers to get good service and quality energy, the company should adjust the power networking problems by the system or by the site in improving the power distribution line which are being affected by inadequate voltage.
6. The management of EEU should deal with the partner companies such as Ethio Telecom Company for poor networking system that aggravates the service problem and the hard ware components supplier company. In this case the only supplier company is the ELSWEEDY ELECTROMETER Company which is the Egyptian. But there are other companies who supply quality products for the other countries, such as conlog type metering system of South Africa.

7. To the interested researchers; the researcher recommended that capable researchers to conduct a comprehensive research in EEU regarding the prepaid metering system and other causes for the repeated power interruption in the country.

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- (Customer data base, 2014/15)

Appendices

School of Graduate Studies MA in Business Administration (General MBA)

Part1: Questionnaires (For customers) Purpose:

The purpose of these Questionnaires is to collect the data on customers' perception and acceptability and some other related issues on the use of prepaid metering system in Ethiopian Electric Utility Company (EEU) West A/Ababa Region. It is purely for academic purpose and does not affect you (customers) in any course. You are not expected to write your names and your answers and profiles will be kept confidential and would only serve the intended purpose of academic Thesis. Your genuine, frankly, and timely response is vital for the success of the study. Therefore, I kindly request you to response to each item below carefully.

I thank you for your contribution towards the success of this research.

How to complete the questionnaire:

Most of the questions seek response by ticking “√” in the box that corresponds to the appropriate answer.

Section A: Social Demographic Profile of Respondents

1. Your gender/sex

Male Female

2. Group of age you belong to

18 – 30 31 – 45 46 – 60 61 & above

3. Marital Status

Single Married Divorced /separated Widowed

4. The number of your family members using electric power in your house.

Only two (couples only) three four more than five

5 .The level of education you have

No Formal Education Primary/JHS Secondary/SHS
 Diploma/Certified First degree

If any (Specify).....

6. How many years have you been using prepaid meter (s)?

Less than 1 year 1 – 3 years
 4-6 years above 6year

7. Which of these categories of users do you belong?

Residential (Domestic) Non-residential (general)
 Both domestic and general

SECTION B: the perception and acceptability of customers towards prepayment service.

Strongly Agree= 1, Agree =2, Neutral=3, Disagree=4, strongly disagree=5

No.	Statement	1	2	3	4	5
1	I accept Prepaid meters because of its reliability					
2	I accept Prepaid meters because of its durability					
3	I accept Prepaid meters because its Cost of installation is less or free					
4	I accept Prepaid meters because of the availability of technicians to repair faults of prepaid meters					
5	I accept Prepaid meters because of the reliability of financial report of vendors					
6	I accept Prepaid meters because of I am accessing to prepaid vending points easily					
7	I accepted prepaid meter because I did not have any other choice					
8	Most customers accepted prepaid meters in my locality					
9	Most customers did not accept prepaid meters in my locality					
10	I realized The availability of energy purchase during holidays, weekends and evening					
11	I realized the improvement of prepaid service provision system					
12	I accepted it because I realized no standing long queues to get the service					
13	I satisfied more on Service provision from prepaid meters					

Section C: Rating of Opinions for those customers Shifted from post paid to Prepaid Billing System

Strongly Agree= 1, Agree =2, Neutral=3, Disagree=4, Strongly Disagree=5

No.	Statement	1	2	3	4	5
1	I am now careful with my consumption of electricity					
2	I would encourage my colleagues to shift to prepaid billing system					
3	I pay less since I shifted to the prepaid billing system					
4	I experience more blackout since I shifted to prepaid billing system					
5	The vending stations are easily accessible whenever I need them					
7	I wish to change to postpaid billing system if given a chance					
8	I spend little time at the station to purchase a power					
9	Prepaid meter blows my electronic gadgets frequently due to excess current					
10	I now consume less power since I shifted to prepaid billing					
11	I observed un ethical actions from employees during service provision related in prepaid meters					

Part2: For employees only

Purpose:

The purpose of these Questionnaires is to collect the data on customers’ perception and acceptability and some other related issues on the use of prepaid metering system in Ethiopian Electric Utility Company (EEU) West A/Ababa Region. It is purely for academic purpose and does not affect you (customers) in any course. You are not expected to write your names and your answers and profiles will be kept confidential and would only serve the intended purpose of academic Thesis. Your genuine, frankly, and timely response is vital for the success of the study. Therefore, I kindly request you to response to each item below carefully.

I thank you for your contribution towards the success of this research.

How to complete the questionnaire:

Most of the questions seek response by ticking “√” in the box that corresponds to the appropriate answer.

SECTION A: Social Demographic Profile of Respondents

1. Your gender/sex

Male Female

2. Group of age you belong to

18 – 30 31 – 45 46 – 60

3. Marital Status

Single Married Divorced /separated Widowed

4. The level of education you have

No formal education Primary/JHS

Second degree Diploma/Certificate First degree

If any (Specify).....

5. Your work experience related to prepayment service

1-3 years 4-6years above 6 years

Section B: Involvement of employees in Promoting Customer Acceptability of Prepaid Meters.

Strongly Agree= 1, Agree =2, Neutral=3, Disagree=4, strongly disagree=5

No.	statement	1	2	3	4	5
1	Awareness of Benefits of Prepaid Meters					
2	Installation of durable Prepaid Meters					
3	Establishment of Emergencies Response team					
4	Free installation					
5	Increasing vending point					

Section C: challenges in implementation of prepayment system

Strongly Agree= 1, Agree =2, Neutral=3, Disagree=4, strongly disagree=5

No.	statement	1	2	3	4	5
1	Meter hardware components (micro-processor , battery, IC-reader , relay , relay switch and others) failure due to improper meter fixing					
2	Smart card failure due to improper handling.					
3	If there is no follow up, the customer may use his domestic tariff meter for commercial use.					
4	Network problems due to Ethio-Telocom service					
5	The frequency of customers complain is high due to voltage fluctuation					
6	Meter hardware components (micro-processor , battery, IC-reader , relay , relay switch and others) failure due to poor production					
7	Smart card failure due to poor production quality					
8	Date setting and interface of smart card and meters increased the frequency of trips					

Section D: Opinions about the implementation of prepaid Billing System

Strongly Agree= 1, Agree =2, Neutral=3, Disagree=4, strongly disagree=5

No.	statement	1	2	3	4	5
1	We were involved in sensitizing the consumers on the advantages of using the prepaid meters					
2	We were informed of the organization’s intention to adopt the new prepaid meters					
3	We were involved in sensitizing the consumers on the use of the prepaid meters					
4	We were given in service training on how to install the new prepaid meters					
5	We were actively involved in the installation of the prepaid meters					

Part3: Interview (for management team)

Purpose:

The purpose of this interview is to collect the data on customers’ perception and acceptability and some other related issues on the use of prepaid metering system in Ethiopian Electric Utility Company (EEU) West A/Ababa Region. It is purely for academic purpose and does not affect you in any course. You are not expected to write your names and your answers and profiles will be kept confidential and would only serve the intended purpose of academic Thesis. Yours genuine, frankly, and timely response is vital for the success of the study. Therefore, I kindly request you to response to each item below carefully.

I thank you for your contribution towards the success of this research.

1. Do you think the management of EEU is doing enough to promote the use of prepaid meters?

Yes No

2. If yes to question 1 above, Explain what the management has been doing?

.....
.....
.....

3. In your opinion, what are the challenges of prepayment service from the company, employees (sales people) and customers’ perspectives?

.....
.....
.....

4. According to your view, how has it all been affecting (refer to the question No. 3 above) the overall service quality of the utility and some other implications, if any, say cost/revenue of the company?

.....
.....
.....

5. What measures, if any, have been taken to manage these problems and thereby improve the customer service quality?

6. How is the role of the technology vendor (Supplier Company) in affecting the customer service?

7. Do you evaluate and monitor the customers' satisfaction or perception about the system? And how?

8. Could you please, briefly describe how customer complaints are being handled?

AMHARIC VERSION

በቅድስት ማሪያም ዩኒቨርሲቲ በቢዝነስ ኢኮኖሚክስ ስኬት ስልጠና

የድህረ ምረቃ ፕሮግራም

(General MBA) ዲፓርትመንት

ክፍል አንድ: የደንበኞች መጠይቅ

የመጠይቁ ዓላማ:

የዚህ መጠይቁ ዋና ዓላማ በኢትዮጵያ ኢኮኖሚክስ አገልግሎት ምዕራብ አዲስ አበባ ሪጅን በአስተዳደር ዲፕሎማ በአገልግሎት መስጫ ማዕከላት የቅድመ ክፍያ ቆጣሪ ኤሌክትሮኒክ አገልግሎት ተጠቃሚ ደንበኞች ለአገልግሎቱ ያላቸውን ግንዛቤና አመለካከት እንዲሁም አገልግሎቱ ያለውን ተቀባይነት ለማወቅ በተጨማሪ ከዚህ ጋር ተያይዞ ያሉ መረጃዎችን ለማሰባሰብ ተብሎ የተዘጋጀ ነው። ይህም መጠይቅ ሙሉ-በሙሉ ለትምህርት መመሪያ አገልግሎት የሚውል ስለሆነ የእናንተን መረጃና ሚስጥር ገፊው አሳልፎ እንደማይሰጥ በመተማመን እውነተኛ መረጃውን እንድትሞሉ ገላጭ በትህትና ይጠይቃል። በመሆኑም እያንዳንዱን ጥያቄ በጥንቃቄና በትክክል እንዲመልሱ በአክብሮት እጠይቅዎታለሁ።

ማስታወሻ:

- ስም መጥቀስ አያስፈልግም
- ተለዋጭ ምርጫ ለቀረበላቸው ጥያቄዎች መልሱን በማክባብ ወይም ይህንን " ምልክት በማድረግ ይመልሱ
- እባክዎን የተሟላ መጠይቅ በሰዓቱ ይመልሱ
- ስለሚያደርጉልኝ መልካም ትብብር በቅድሚያ አመሰግናለሁ።

አምሳሌ አምኔ
 ስልክ ቁጥር (0913735577)
 ኢሜል: (email-amsaluamnie@gmail.com)

ክፍል ሀ: ማህበራዊ ማንነት

1. ፆታ
 - ወንድ ሴት
2. ከሚከተሉት ውስጥ የእርስዎን የዕድሜ ክልል ይምረጡ
 - 18 – 30 31 – 45 46 – 60 61 እና ከዚያ በላይ
3. የጋብቻ ሁኔታ
 - ያለገባ/ች ያገባ/ች የተፈታ/ች የሞተበት/ባት

4. የቤተሰብ አባላት ቁጥር

ሁለት/በጋበቻ ተጠማሪ ሦስት አራት አምስትና ከዛ በላይ

5 .የትምህርት ደረጃ

ማንበብ መጻፍ አንደኛ ደረጃ ትምህርት ሁለተኛ ደረጃ ዲፕሎማ
 የመጀመሪያ ዲግሪ
 ከላይ ከተጠቀሱት ውጭ ከሆኑ ይጻፉ

6. ለምን ያህል ጊዜ የቅድመ ክፍያ ቆጣሪ አገልግሎት ተጠቃሚ ነዎት?

ከአንድ ዓመት በታች 1-3 ዓመት
 4-6 ዓመት ከ 6 ዓመት በላይ

7. ከሚከተሉት ውስጥ የየትኛው አገልግሎት ተጠቃሚ ነዎት?

የመኖሪያ ቤት አገልግሎት የንግድ ቤት /ልዩ ልዩ/ አገልግሎት
 የሁለቱም አገልግሎት ተጠቃሚ ነኝ

ክፍል ለ: እባክዎ ስለ ቅድመ ክፍያ የአሌክትሪክ አገልግሎት ያለዎትን ግንዛቤና አመለካከት እንዲሁም አገልግሎቱ ያለውን ተቀባይነት በተመለከተ በሰንጠረዥ ውስጥ ያመልክቱ

በጣም እስማማለሁ = 1፣ እስማማለሁ =2፣ መካከለኛ=3፣ አልስማማም=4፣ በጣም አልስማማም=5

ተ.ቁ.	የመጠይቅ ዐ. ነገሮች	1	2	3	4	5
1	እኔ የቅድመ ክፍያ ቆጣሪ አገልግሎቱን የተቀበልኩት በአስተማማኝነቱ ነው					
2	እኔ የቅድመ ክፍያ ቆጣሪ አገልግሎቱን የተቀበልኩት በጥንካሬው ነው					
3	እኔ የቅድመ ክፍያ ቆጣሪ አገልግሎቱን የተቀበልኩት ሲገባ እርካሽ ወይም ነፃ ስለሆነ ነው					
4	እኔ የቅድመ ክፍያ ቆጣሪ አገልግሎቱን የተቀበልኩት የጥገና ሰራተኞች ሲፈለጉ በቀላሉ ስለሚገኙ ነው					
5	እኔ የቅድመ ክፍያ ቆጣሪ አገልግሎቱን የተቀበልኩት የምክፍለው የፍጆታ ሂሳብ ሪፖርት ግልፅና ታማኝነት ስላለው ነው					
6	እኔ የቅድመ ክፍያ ቆጣሪ አገልግሎቱን የተቀበልኩት የክፍያ ጣቢያውን በቀላሉ ስለማገኝ ነው					
7	እኔ የቅድመ ክፍያ ቆጣሪ አገልግሎቱን የተቀበልኩት ሌላ ምርጫ ስላለገኘሁ ነው					
8	በአከባቢዬ ብዙ ደንበኞች የቅድመ ክፍያ ቆጣሪ አገልግሎቱን በደስታ ተቀብለውታል					
9	በአከባቢዬ ብዙ ደንበኞች የቅድመ ክፍያ ቆጣሪ አገልግሎቱን በደስታ አልተቀበሉትም					
10	የቅድመ ክፍያ ቆጣሪ የኃይል ሽያጭ አገልግሎት በዓመት ባዓላት፣ እሁድና ቅዳሜ፣ ምሽትን ጨምሮ ይሰጣል					
11	እኔ የቅድመ ክፍያ ቆጣሪ አገልግሎት አሰጣት እየተሻሻለ መምጣቱን መረዳት ችያለሁ					
12	እኔ የቅድመ ክፍያ ቆጣሪ አገልግሎቱን የተቀበልኩት በኃይል ሽያጭ ጊዜ (ቻርጅ ሲደረግ) ብዙ ወረፋ ባለመኖሩ ነው					
13	እኔ በቅድመ ክፍያ ቆጣሪ አገልግሎት አሰጣት ዙሪያ በጣም ረክቻለሁ					

ክፍል ሐ: ከድህረ ክፍያ አገልግሎት ወደ ቅድመ ክፍያ አገልግሎት ለዘሩ ደንበኞች ብቻ የሚሞላ መጠይቅ

በጣም አስማማለሁ = 1፣ አስማማለሁ =2፣ መካከለኛ=3፣ አልሰማማም=4፣ በጣም አልሰማማም=5

ተ.ቁ	የመጠይቅ ዐ. ነገሮች	1	2	3	4	5
1	እኔ በቅድመ ክፍያ ቆጣሪ አገልግሎት መጠቀም ከጀመርኩ ጀምሮ የፍጆታ ሂሳቤን በትክክል አቆጣጠራለሁ					
2	እኔ የቅድመ ክፍያ ቆጣሪ አገልግሎት ተጠቃሚ እንዲሆኑ ጓደኞቼን ሁሉ አበረታታለሁ					
3	እኔ በቅድመ ክፍያ ቆጣሪ አገልግሎት መጠቀም ከጀመርኩ ጀምሮ የምክፍለው የፍጆታ ሂሳብ ተመጣጣኝ ወይም ከበፊቱ ያነሰ ነው					
4	እኔ በቅድመ ክፍያ ቆጣሪ አገልግሎት መጠቀም ከጀመርኩ ጀምሮ ከቅድመ ክፍያ ቆጣሪ አገልግሎት በተያያዘ አበዛኛውን ጊዜ መብራት ይጠፋብኛል					
5	የቅድመ ክፍያ ቆጣሪ የኃይል ሽያጭ አገልግሎት ጣቢያ በምፈልግ ጊዜ ክፍት ነው					
7	እኔ እድል ቢሰጠኝ የቅድመ ክፍያ ቆጣሪ አገልግሎትን ትቼ እነደገና ወደ ድህረ ክፍያ አገልግሎት ተጠቃሚነት ብመለስ አመርጣለሁ					
8	እኔ በቅድመ ክፍያ ቆጣሪ አገልግሎት መጠቀም ከጀመርኩ ጀምሮ ኃይል ለመግዛት የማጠፋው ጊዜ አነስተኛ ነው					
9	እኔ በቅድመ ክፍያ ቆጣሪ አገልግሎት መጠቀም ከጀመርኩ ጀምሮ በአሌክትሪክ የምጠቀማቸው የአሌክትሪኒክስ ዕቃዎች ቶሎ ቶሎ ተቃጥለውብኝ ያውቃል					
10	እኔ በቅድመ ክፍያ ቆጣሪ አገልግሎት መጠቀም ከጀመርኩ ጀምሮ አነስተኛ ኃይል አጠቀማለሁ					
11	እኔ በቅድመ ክፍያ ቆጣሪ አገልግሎት መጠቀም ከጀመርኩ ጀምሮ (ስጠቀም) በሰራተኞች አከባቢ የሥነምግባር ችግር አይቸለሁ					

DECLARATION

I declare that the work done in the project entitled “**Assessment of Implementation of Power Energy Prepayment Service System**”: **Case of Ethiopian Electric Utility**: is my original work under the supervision and guidance of Dr.Matiwos Ensermu, Department of General MBA, St. MARY’s University. This work has not been previously submitted for any higher institution for any diploma, degree or other similar work.

Declared by

Student

Signature

St. Mary’s University, Addis Ababa

May, 2016

ENDORSEMENT

This thesis has been submitted to St. Mary's University, school of Graduate Studies for the examination with my approval as a university advisor.

Advisor

Signature

St. Mary's University, Addis Ababa

May, 2016