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MEASURING CUSTOMER SATISFACTION OF ETHIOPIAN ELECTRIC UTILITY

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Declaration

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university, and that all sources of materials used for the thesis have been duly acknowledged.

Israel Birhanu

Signature: _____

GRADUATE STUDIES PROGRAM
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(The Case of North Addis Ababa Region)

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Under the supervision of: Mohammed Seid (PhD)

Approval by Board of Examiners

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Abstract

This study aims at measuring customer satisfaction of the Ethiopian Electric Utility company Services at North Addis Ababa region in both technical and customer services. The study reveals that there is a moderate customer satisfaction in two technical services; electricity tariffs, billing methods, and poor customer satisfaction in failure fixing and new connection. The major problems in the technical services provided by Ethiopian electric utility are; handling disputed bills and the long time needed for fixing electricity failure and power supply connection. On the other hand, the study shows that there is a moderate satisfaction in payment method, the length of waiting time in the company offices, and accessibility of customer offices of EEU. Respondents have a poor satisfaction with the remaining five services ; replies of employees to customer telephone calls, about information and guidance provided to customers, in complaint handling, in continuity of power supply and good quality of power. The customers' also very poor satisfaction to prior intimidation of power cut. Finally, respondents think that the overall performance of Ethiopian Electric Utility Company in general is poor. The residential customers are the most satisfied group followed by the commercial then the industrial. Therefore, the EEU should come up with an appropriate service delivery standards; proper complaint handling mechanisms; improve the technical department service delivery to new connection, failure fixing and improve billing service ; relevant training for its front line and technical employees; developing various payment mechanism; informing customer about planned interruption; reduce power interruption and fluctuation to the standard; upgrade and maintain its old transmission, substation and distribution network systems; improve its generation capacity and adequate resource management in order to meet customer satisfaction.

Keywords: Customer Satisfaction, Services, Electricity, Measuring, TQM, Ethiopia.

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Acronyms

CSC:	Customer Service Center
ICS:	Interconnected System
KWHM:	Kilo-Watt-Hour Meter
MW:	Mega Watt
A:	Ampere
GIS:	Geographical Information System
GPS:	Global Positioning System.
HVDS:	High Voltage distribution system.
KA:	Kilo Ampere
KV:	Kilo Volt
KVA:	Kilo Volt Ampere
KW:	Kilo Watt
SCADA:	Supervisory Control and Data Acquisition System.
V:	Volt
W:	Watt
PPBS:	Program planning and budgeting
MBO:	Management by Objective
ZBB:	Zero-base budgeting
TQM:	Total Quality Management
ISO:	International Standard Organization
PDCA:	Plan Do Check Act
ANOVA:	Analysis of Variance
SPSS:	Statistical Package for Social Science.
EEU:	Ethiopian Electric Utility
EEP:	Ethiopian Electric Power
GTP:	Growth and Transformation Plan
SAIFI:	System Average Interruption Frequency Index
CAIDI:	Customer Average Interruption Duration Index
SAIDI**:**	System Average Interruption Duration Index
CSPP:	Customer Service Policy and Procedure

Definition of Key Terms

Commercial Customers: are customers who consume power supply for commercial purpose and their power consumption varies according to their needs requirements

Domestic Customers: are customers who consume the power supply for domestic purpose (for house lighting only)

Industry Customers: are customers who use power for industry purpose

Prepaid meter: is a kind of new style meter which adopt micro-electronics techniques and it manage electricity fee by computer, which use smart card as media purchased electricity. In the same time the electronic watt-hour meter realize using electric power after prepaying in advanced.

Postpaid meter: is a normal devise in which EEU installs at customers' house in order to measure how much energy they consumed in hourly basis

Transformer: is an electrical device by means of which high voltage electrical power is converted into low voltage suitable for consumers

Transmission Line means the system consisting of all high pressure cables and overhead lines (not being an essential part of the distribution system of a EEU) transmitting electricity from a generating station to another generating station or a sub-station, together with any step-up and step-down transformers, switch-gear and other works necessary to and used for the control of such cables or overhead lines, and such buildings or part thereof as may be required to accommodate such transformers, switchgear and other works and the operating staff thereof. It shall include any substation and line including 132 KV level and above.

Power factor means the ratio of watts to Volt-amperes, or the ratio of KWh to KVAh; as applicable, for the duration for which it is to be determined.

Premises means the area/portion of the building/shed/field etc., for which, the electric connection has been applied for or sanctioned for a single consumer.

Meter means an equipment used for measuring electrical quantities like energy in KWh, and or KVAh maximum demand in KW and or KVA, reactive energy in KVAR hours etc. including accessories like Current Transformers (CT) and Potential Transformers (PT) where used in conjunction with such meter and any enclosure used for housing or fixing such meter or its accessories and any devices like switches or fuses used for protection and testing purposes. It

will include any seal or sealing arrangement provided by EEU for avoiding unauthorized use of electricity. This shall also include prepayment meters.

Distribution System means the system of wires and associated facilities between the delivery point on the transmission lines or the generating station connection and the point of connection to the installation of the consumers;

Consumer means any person who is supplied with electricity for his own use by EEU, and includes a person whose supply has been disconnected for the time being; by the Government or by any other person engaged in the business of supplying electricity to the public under the CSPP or any other law for the time being in force and includes any person whose premises are for the time being connected for the purpose of receiving electricity with the works of EEU, as the case may be.

Conductor means any wire, cable, bar, tube; rail or plate used for conducting electrical energy and so arranged as to be electrically connected to a system.

Breakdown means an occurrence on account of failure of equipment of the electric energy supply system including electrical line that results in disruption of supply.

Billing Cycle or Billing Period means the period for which electricity bills shall be prepared for different categories of consumers by EEU.

System Average Interruption Frequency Index is defined to be the average number of outages for the system over a specified time period.

Customer Average Interruption Duration Index is defined to be the average duration of a single outage event.

System Average Interruption Duration Index is defined to be the average outage duration for the system over a specified time period. Also, the indexes are mathematically related as follows: SAIDI= (SAIFI) × (CAIDI).

Appendices

Chapter One –Introduction

1.1 Back Ground of the Study

Ethiopia has registered impressive GDP growth in recent years, ranging between 6% and 12% per year depending on the data source. Ethiopia ranks as sub Saharan Africa's second most populous country, with over 90 million people. Investments in renewable energy resources and hydro power in particular have been key drivers of economic growth in recent years. The total installed electricity power (http://www.usaid.gov/powerafrica). Projection suggests that total generation 2014 equal to 2145 Mw. Demand for power will grow by 30% per year. In 2012/2013 hydro power comprised 90% of the electricity supplied in Ethiopia. (http://www.usaid.gov/powerafrica).

The flourishing electricity intensive industries, commercial buildings ,businesses, and the widespread utilization of in efficient electrical appliances ,coupled with the inefficiency of the electricity utility services, not only created a huge gap between electricity demand and supply, but also negatively affected the reliability of supply of electricity to the country. "The actual supply of electricity is not more than 60% to 70% of the total demand." Engineer Azeb CEO at EEP said after a press briefing held at intercontinental hotel on June 11 2015. (Addis Fortune, 15 June 2015).Alemayehu Tegenu, Minister of Water, Irrigation and Energy said that "the demand for energy is growing at 25% to 32% annually in the country. Actual supply for the whole country amounted to 2300MW in GTP I." (Addis Fortune, 15 June 2015)

The Ethiopian Energy Agency noted that 20% of energy produced in Ethiopia is believed to be wasted. This is equivalent to 400 mega watt power almost equivalent to the electricity generated by the country‘s Gilgel Gibe II hydro electric dam. So the energy produced becomes a loss. This creates power supply shortage. The power produced not used efficiently. (Addis Fortune, 15 June 2015).

Power sector Status

- Generation capacity in the grid – 2,268 MW
- Hydro – 1,978 MW
- Wind – 171 MW
- Geothermal –7.3 MW
- Diesel – 112 MW
- HV transmission line length > 12,000 km
- MV & LV distribution line length – 157,000 km
- Customers ~ 2.1 million
- Access to electricity grid to Rural Towns and Villages –54%

Source: Mekuria Lemma Strategy & Investment Head Ethiopian Electric Power (2014).

The World Bank awarded Ethiopia last place in Africa, with power utilization of 45 KWH per person in 2009, the year before GTP I was launched, as compared to South Africa, which ranks first with 4,532KWH.The bank gave a slightly higher rating of 51.96 KWH for 2011. Total power consumption in Ethiopia in 2014 was, according to the World Bank, 4,645,000,000kwh, compared to 6,515,000,000 kwh in Kenya and 6,715,000,000kwh in Sudan. (Addis Fortune news paper, 2015).

Ethiopian Electric Utility (EEU)

The Ethiopian Electric Utility came into existence on The Regulation may be cited as the "Ethiopian Electric Utility Establishment Council of Ministers Regulation No. 303/2013".The Ethiopian Electric Utility (hereinafter the "Enterprise") is established as a public enterprise. The Enterprise shall be governed by the Public Enterprises Proclamation No. 25/1992. The Ministry of Water, Irrigation and Energy shall be the supervising authority of the Enterprise. The Enterprise shall have its head office in Addis Ababa and may have branch offices elsewhere as may be necessary. The Ethiopian Electric Utility came into existence on The Regulation may be cited as the "Ethiopian Electric Utility Establishment Council of Ministers Regulation No. 303/2013".The Ethiopian Electric Utility (hereinafter the "Enterprise") is established as a public enterprise. The Enterprise shall be governed by the Public Enterprises Proclamation No. 25/1992. The Ministry of Water, Irrigation and Energy shall be the supervising authority of the

Enterprise. The Enterprise shall have its head office in Addis Ababa and may have branch offices elsewhere as may be necessary.

Purpose

The purposes for which the Enterprise is established are:

(1) To construct and maintain electric distribution networks; to contract out the distribution networks construction to contractors as required;

(2) To administer electric distribution networks, to purchase bulk electric power and sell electric energy to customers;

(3) To initiate electric tariff amendments and, upon approval, to implement same;

(4) In line with directives and policy guidelines issued by the Ministry of Finance and Economic Development, to sell and pledge bonds and to negotiate and sign loan agreements with local and international financial sources;

(5) To undertake any other related activities necessary for the attainment of its purposes.

Capital

The authorized capital of the Enterprise is Birr 64,715,822,693.20 (Sixty Four Billion Seven Hundred Fifteen Million Eight Hundred Twenty Two Thousand Six Hundred Ninety Three Birr and Twenty Cents) of which Birr 16,178,955,673.30 (Sixteen Billion One Hundred Seventy Eight Million Nine Hundred Fifty Five Thousand Six Hundred Seventy Three Birr and Thirty Cents) is paid up in cash and in kind.(Ethiopian Electric Utility Establishment Council of Ministers Regulation No. 303/2013".(Federal Negarit Gazette _No.5 December 27th 2013 Page 7126-7128)

The electricity delivered to your home or business is typically generated in large centralized power plants as illustrated in the figure below. Power then travels over long distances via high voltage transmission lines, which are interconnected in a grid or network configuration .From the transmission system, power travel to distribution substations. From these substations, distribution lines, operating at lower voltage levels, disperse the power throughout cities and neighborhoods. For safety reasons, each distribution lines are protected by circuit breaker in the substation. The power then travels from the distribution line through a service transformer located in close proximity to your home or business. Electricity enters the facility either through over head or underground service entrance conductors (wires) which connect to the meter.EEU reads this

meter on a monthly basis and reports the information gathered to the billing department and the respective department sold the bill. (CenterPointEnergy.com)

Customer service is one of the most important tools that help an organization to achieve a high level of profitability and long term success. Since under this context of EEU, that's very important for them to be able to provide a high and improve its existing service that being provided to its customers. It is important to note that EEU must continually improve its services because people's expectations and needs keep on changing. However, EEU has been subject of a lot of criticism from the public in the quality of services they provide to them. Since an important analysis needs to be made about the customer expectations and perceptions regarding to the services that EEU are providing.

One important aspect of EEU operations is its dealing with customers in order to achieve their satisfaction through determining their needs and establishing the operation system that deliver such needs. Quality in a service organization is a measure of the extent to which a delivered service meets the customer's expectations. It is determined by the customer's perception and not by the perceptions of the providers of the service. It is therefore, very important to determines customer needs and wants and, then design the service to meet these requirements. Measuring customer satisfaction is an important element in the Total Quality Management (TQM) concept.TQM includes elements that constitute its interrelated systems of operations where customer focus is an important element of TQM (customer satisfaction being the fuel that drives organizations is one of the philosophy of TQM). In general customer focus in the TQM approach has two sides; assessing customer demands and achieving customer satisfaction. In ISO 9001: 2008 model, inputs of the model require that organizations have to investigate the needs of the customers and design the operation system that would fulfill such needs. In addition, outputs of the ISO 9001 model require achieving customer satisfaction. Hence, measuring customer satisfaction of EEU can lead to better assessment of its operations and better continuous improvement of the company. In achieving that, this current study will attempt to evaluate EEU services at North Addis Ababa Region in all the 23 customer service centers and region office.

1.2 Statement of the Problem

Electricity power supply for domestic and industrial sector took a vital role in economic development. Electricity services are recognized as the live blood to the nation and its development. Further, it provides the power or energy to other industries to do their functions properly and perfectly. If there is a problem in terms of power supply, whole economy is in question mark. Due to that, government should focalize electricity services as prominent and fundamental one.

In Ethiopia the general public complaining about the Electric service provided by Ethiopian Electric Utility through different means. Among the problem the customer complaining frequent power disruption, and days and weeks long black out, wastage of product and time in the manufacturing sector. Power cuts and fluctuation result in economic, health, and security hazard. There is big customer complaint in the new connection, failure fixing, billing, reliability of power, and customer service delivery.

Different past studies shows that the company service delivery is not meet customer satisfaction. Zeritu Fikre's (2010) study shows that there was poor service quality and poor performance in service process like new connection, complaint handling and recovery of service failure procedure. So the corporation failed to meet such requirements in order to provide a reliable service to its customers. Aman Abdie, (2011) effect of service delivery and quality on customer satisfaction study service delivery process and service quality in Ethiopian Electric Power Corporation are below the expectation of customers.

To give better service the Ethiopian government unbundled the former Ethiopian Electric Corporation in to two separate entities, that is Ethiopian Electric power (EEP) and Ethiopian Electric Utility (EEU) through Council of Ministers Regulation No. 302/2013 and NO. 303/2013 (EEP Regulation and EEU regulation), respectively, enacted on December 27, 2013.

To get new management capacity and to improve the customer service delivery the government provides the management of Ethiopian Electric Utility to foreign company (A consortium of three Indian companies under the management of power grid corporation of India-PGCI-which is

responsible for operations, distribution, and sales services).The company won the contract for 21 million USD.

This study tries to measure the quality of customer service delivery and customer satisfaction of EEU in the different operational unit of the utility retail and wire businesses, by focusing its study on North Addis Ababa region 23 customer service centers which include both urban and rural customers (both urban and rural customers classified as Domestic or residential, Commercial and Industrial customers).This research paper tries to evaluate EEU's service in the eyes of customer after the Indian management overtake the management and assess the level of customer satisfaction during the management time of Indians management contract which ends August 2015.This research study Measuring customer satisfaction of EEU after the foreign management run the company. Measuring customer satisfaction can lead to better assessment of its operations and better continuous improvement of the company.

1.3 Research Questions

- How customers Perceive the EEU and its services?
- What is the level of customer satisfaction in EEU?
- What are the overall customer satisfaction regarding the general performance of EEU?
- What are organizational factors that affect customers' satisfaction?
- What kinds of measurement should be taken to improve or boost the satisfaction level of customers?

1.4 Objectives of the Study

- The general objective of this research is to measure customer satisfaction of EEU services.
- The Specific objectives:-
  - ❖ The first objective of the study is to measure the level of satisfaction of customers regarding four technical service areas that is electricity tariffs, billing methods, failure fixing and power supply connection.
  - ❖ The second objective is to measure customer satisfaction of the quality of EEU customer service operations.
  - ❖ Third, this current study will attempt to assess the overall satisfaction of customers regarding the general performance of EEU.(To know how customers generally perceive the EEU service.)
  - ❖ Fifth, to identify organizational factors those affects customers' satisfaction.
  - ❖ Finally, the study will investigate if there is any differences in the level of satisfaction between electricity users due to their type of subscriptions; residential, commercial or industrial clients.

1.5. Research Hypothesis

Based upon the literature review, the research hypothesis will be defined and predicted the relationship between two variables of the study which are as follows:

Hypothesis 1

H1: There is statistically significant difference in customer satisfaction level in the EEU tariff services among Residential, Commercial, and Industrial customers.

Hypothesis 2

H1: There is statistically significant difference in customer satisfaction level in the EEU billing services among Residential, Commercial, and Industrial customers.

Hypothesis 3

H1: There is statistically significant difference in customer satisfaction level in the EEU failure fixing among Residential, Commercial, and Industrial customers.

Hypothesis 4

H1: There is statistically significant difference in customer satisfaction level in the EEU new connection service among Residential, Commercial, and Industrial customers..

Hypothesis 5

H1: There is statistically significant difference in customer satisfaction level in the EEU customer service among Residential, Commercial, and Industrial customers.

Hypothesis 6

H1: There is no statistically significant difference in the general performance of EEU among Residential, Commercial, and Industrial customers.

1.6. Significance of the Study

Customer satisfaction plays significant role in the achievement of organizational objectives. Preliminary analysis of customers' needs help the organization in designing strategic planning. The study having analyzed the theoretical perspectives, and after processing the feedbacks from the various categories, will devise ways to improve service quality and increases customer satisfaction in the company. Moreover, the study is believed to have the following importance:-

- It will enable EEU officials know customers view of their service delivery quality
- EEU and Government will get feedback about its customers' satisfaction level and help to take the necessary actions.
- Ethiopia is recognized as an emerging country in terms of industrial development and also economic growth has been increasing trend since the last decade. Due to that, power supply in terms of electricity is the fundamental and denoted as the back bone to the economy and its development. Therefore, this research gives fruit full suggestion to the policy makers and researchers regarding to the service quality and the level of customer satisfaction in the Ethiopian electric utility.
- This kind of customer satisfaction survey and evaluation conducted by researchers help the company to assess the problem areas.

1.7. Scope of the Study

This study delimited to North Addis Ababa Region Retail and Wire businesses. The study assesses 23 customer services centers (Districts) in urban and rural areas using the descriptive research design. The study not covered the entire 15 regional Wire and Retail businesses of EEU. The study not covered Generation, Transmission and substation in detail, but it focuses on Distribution and sales sectors of electricity services. The data collected with the use of questionnaire, and document techniques.

1.8. Limitation of the Study

Customers' service delivery covers all aspects of an organization performance. However, due to budget and other related resource constraints this study is limited its scope to measuring customer satisfaction particularly by taking the Ethiopian Electric Utility (EEU) North Addis Ababa Region customer service centers. Furthermore, since the sample is only Addis Ababa and some rural areas particularly North Addis Ababa Region customer service centers are not large enough to represent the entire organization nationwide. Therefore, the finding of this study should be considered as showing the circumstance of customer satisfaction level and service quality in EEU. Another study with a large sample size may be required in the further to arrive at reliable conclusion about Ethiopian Electric utility customer satisfaction level.

1.9. Outline of Research Project

This research consists of five chapters. Chapter one is the general introduction ,and this one presents the back ground ,the statement of the problem ,the objective of the study ,research hypothesis ,the significance of the study ,scope and limitation of the study ,and the outline the research project .

Chapter two, literature review which is critical analysis of what other researchers have said on the subject and where the research project fit in ,the research gaps to be clearly identified .

Chapter three, explanation of why the data are collected, what data collected, from where data collected, and how to collected data analyzed.

Chapter four presents data analysis, results and discussion of findings. Analysis of results, this chapter described the research findings their analysis and look an attempt of interpreting the main findings of the study based on the stated objectives.

Chapter five presents the summary of the major findings, conclusion and recommendations is given in this chapter.

Chapter Two
Literature Review

2.1Total Quality Management (TQM)

To differentiate American quality management systems from Japanese quality management systems and to integrate the theories and writings of the major American quality experts, the term total quality management (TQM) was coined. As cited by Lawrence (1993) TQM is a sort of umbrella term, used to describe various American quality management systems operating in both the public and private sectors.

In his literature, TQM has been defined as "the application of quantitative methods and human resources to improve the material and services supplied to an organization, all the processes within an organization, and the degree to which the needs of the customer are met now and in the future"(Mossard, 1991,as cited in Lawrence, 1993). The reference to both quantitative methods and human resources in this definition is reflective of TQM's attempt to integrate the analytical perspective of scientific management with the human relation school's focus on organizations, groups, and employees (kronenberg &Loeffler, as cited in Lawrence, 1993).In other word, Lawrence (1993) added that TQM is an attempt to blend the analytical and working smarter aspects of scientific management with the organizational, group, and employees focus of the human relation school.

2.1.1 Customer Defined Quality.

One of the areas of general agreement between the big four quality experts (Deming, Juran Crosby and Fegenbaum) is that customers determine the relative importance of various quality dimensions. For example, Fegenbaum, 1983 (as cited in Lawrence, 1993) states that quality means products and services that "meet the expectation of customers." Crosby, 1983 (as cited in Lawrence, 1993) define quality as "conformance to requirements." Since customers determine what the requirements are, according to Crosby, this is just another way of saying that customers define quality.Juran 1989 (as cited in Lawrence, 1993) states that quality is "fitness for use."As the customer determines whether a product or service is fit for use, this again is simply another way of saying that customers define quality.

Deming does not really define quality, but a definition can be inferred from his writings: the reduction of variation. Since variation is the cause of quality problems, the less variation – the higher the quality. Deming is unique in his view that quality is not defined solely by the customer. He maintains this posture because he believes that customers do not know all the various ways a product or service can be improved .Despite Deming's caveat, Lawrence stated in his book TQM takes the position that quality is primarily, if not exclusively, defined by customers. Richardson (1997) added that there is one fundamental principle of TQM; it is that quality is what the customer defines it as, not what the organization defines it to be. According to whitely (as cited in Richardson, 1997) the customer driven company moving from talk to action, "companies that deliver what their customers want differ from others in diverse but understandable ways. Perhaps most fundamentally, they provide high quality not according to definitions they have developed on thereon but rather as the customer defines it."

2.1.2 Quality Gurus (Experts of quality or coaches of quality)

The four quality gurus opposes old concept of be reactive, designed to correct quality problems after they occur. They support new concept of proactive, designed to build quality into the product and process design.

Lawrence (1993) noted in his book to fully understand the TQM movement, we need to look at the five notable Quality gurus who have shaped the evolution of TQM. Their philosophies and teachings have contributed to our knowledge and understanding of quality today. According to Richardson (1993) Philip B Crosby, Joseph M.Juran, and W.Edwards Deming are crusaders for the Holy Grail of TQM. Lawrence (1993) called them as the patriarch of TQM.

W. Edwards Deming

According to Lawrence (1993) W. Edwards Deming is often referred to as the "father of quality control." He was a statistics professor at New York University in the 1940s. After World War II he assisted many Japanese companies in improving quality. The Japanese regarded him so highly that in 1951 they established the Deming Prize, an annual award given to firms that demonstrate outstanding quality. It was almost 30 years later that American businesses began adopting Deming's philosophy. A number of elements of Deming's philosophy depart from traditional

notions of quality. The first is the role management should play in a company's quality improvement effort. Historically, poor quality was blamed on workers on their lack of productivity, laziness, or carelessness. However, Deming pointed out that only 15 percent of quality problems are actually due to worker error. The remaining 85 percent are caused by processes and systems, including poor management. Deming said that it is up to management to correct system problems and create an environment that promotes quality and enables workers to achieve their full potential. He believed that managers should drive out any fear employees have of identifying quality problems, and that numerical quotas should be eliminated. Proper methods should be taught, and detecting and eliminating poor quality should be everyone's responsibility.

According to Richardson (1997) In Deming's classic Out of Crisis ,he was exteremely critical of management and stated that it is responsible for most quality problems.His famous fourteen points and seven deadly diseases focus on management as being even more important than statstical tools.According to Lawrence (1993) Deming outlined his philosophy on quality in his famous "14 Points." These points are principles that help guide companies in achieving quality improvement. The principles are founded on the idea that upper management must develop a commitment to quality and provide a system to support this commitment that involves all employ ees and suppliers. Deming stressed that quality improvements cannot happen without organizational change that comes from upper management.

Joseph M. Juran

According to Richardson (1997) After W. Edwards Deming, Dr.Joseph Juran is considered to have had the greatest impact on quality management. Juran originally worked in the quality program at Western Electric. He became better known in 1951, after the publication of his book Quality Control Handbook.In 1954 he went to Japan to work with manufacturers and teach classes on quality. Though his philosophy is similar to Deming's, there are some differences. Whereas Deming stressed the need for an organizational "transformation," Juran believes that implementing quality initiatives should not require such a dramatic change and that quality management should be embedded in the organization.

Richarson (1997) cited in his book ,Juran recognizes that specified requirements may be what managements wants but adds the needs of customers. Quality is not just afunction of inspection and control but a part of all mangement functions in an organization.

According to Lawrence (1993) One of Juran's significant contributions is his focus on the definition of quality and the cost of quality. Juran is credited with defining quality as fitness for use rather than simply conformance to specifications. When Juran , defining quality as fitness for use takes into account customer intentions for use of the product, instead of only focusing on technical specifications. Richardson (1997) noted that Juran favors the concept of quality circles because they improve communications between management and labour.

According to Lawrence (1993) Juran is well known for originating the idea of the quality trilogy: quality planning, quality control, and quality improvement. The first part of the trilogy, quality planning, is necessary so that companies identify their customers, product requirements, and overriding business goals. Processes should be set up to ensure that the quality standards can be met. The second part of the trilogy, quality control, stresses the regular use of statistical control methods to ensure that quality standards are met and to identify variations from the standards. The third part of the quality trilogy is quality improvement. According to Juran, quality improvements should be continuous as well as breakthrough.

Armand V. Feigenbaum

Another quality leader according to Lawrence (1993) is Armand V. Feigenbaum, who introduced the concept of total quality control. Feigenbaum took a total system approach to quality. He promoted the idea of a work environment where quality developments are integrated throughout the entire organization, where management and employees have a total commitment to improve quality, and people learn from each other's successes. From Feigenbaum we learn about the "cost of Quality" and why it is cheaper in the long run to build quality in to products and services than to correct errors later.

Phillip B. Crosby

According to Lawrence (1993) Crosby is concerned with the tools of TQM. Deming is frequently described as the TQM philosopher; Crosby is often described as a TQM technician.

He developed the phrase "Do it right the first time" and the notion of zero defects, arguing that no amount of defects should be considered acceptable. He scorned the idea that a small number of defects are a normal part of the operating process because systems and workers are imperfect. Instead, he stressed the idea of prevention.

To promote his concepts, Crosby wrote a book titled Quality Is Free, which was published in 1979. He became famous for coining the phrase "quality is free" and for pointing out the many costs of quality, which include not only the costs of wasted labor, equipment time, scrap, rework, and lost sales, but also organizational costs that are hard to quantify. Like Deming and Juran, Crosby stressed the role of management in the quality improvement effort and the use of statistical control tools in measuring and monitoring quality.

Kaoru Ishikawa

According to Richardson (1997) Dr. Ishikawa edited JUSE'S hand book, Quality control for foremen, which is a guide for establishing and maintain quality circles or he was a proponent of implementation of quality circles, which are small teams of employees that volunteer to, solves quality problems.

Kaoru Ishikawa is best known for the development of quality tools called cause-and-effect diagrams, also called fishbone or Ishikawa diagrams. These diagrams are used for quality problem solving. He was the first quality guru to emphasize the importance of the "internal customer," the next person in the production process. He was also one of the first to stress the importance of total company quality control, rather than just focusing on products and services.

Dr. Ishikawa believed that everyone in the company needed to be united with a shared vision and a common goal. He stressed that quality initiatives should be pursued at every level of the organization and that all employees should be involved.

2.1.3 Common Ground among the Big Four TQM Experts

According to Lawrence (1993) Deming, Crosby, Juran, and Feigenbaum disagree with each other frequently with considerable vigor over exactly what TQM means as a philosophy of management. Despite their areas of disagreement, however, several key areas of general agreement do exist. These areas of common ground also provide useful insights into TQM as a philosophy of management.

He also added that Six key elements of general agreement were identified that appear to be central to an understanding of TQM as a philosophy of management. These six key elements (see Table 2.1) are (a) quality as a primary organization goal, (b) quality being determined by an organization's customers, (c) customer satisfaction being the fuel that drives organizations, (d) the study and reduction of variation in processes, (e) change being continuous and accomplished by teams and teams work, and (f) top management commitment to promoting a culture of quality, employee empowerment, and a long- term perspective In addition contractor involvement in TQM program in the organization is another major issue in TQM program.

Table 2.1 Key Elements of TQM as a philosophy of Management

1.	Quality	Is a primary organizational goal.
2.	Customers	Determine what quality is.
3.	Customer Satisfaction	Drives the organization.
4.	Variation	In processes must be understood and reduced.
5.	Change	Is continuous and is accomplished by teams and teamwork.
6.	Top management commitment	To promoting a culture of quality, employee empowerment, and a long- term perspective.

Source: Lawrence, 1993

2.1.4. Comparison of Traditional Management philosophy and TQM philosophy

Lawrence (1993) pointed out in his book there is difference in traditional American management philosophy and TQM in substance and style.

Table 2.2 compares principles derived from traditional American management philosophy with TQM philosophical principles. Some of the major principles of traditional American management philosophy are (a) profit and bottom line considerations as the primary driving

forces, (b) a preference for competition over cooperation, (c) the belief that change occurs in quantum's , and (d) a penchant for what the Japanese call "cowboy management" (Imai,1986 as cited in Lawrence, 1993),or entrepreneurial champions who battle bureaucracies to bring about innovations and change (peters & Waterman,1982 as cited in Lawrence 1993).Finally, the slogan that may best characterize traditional American management philosophy is, "If it is not broke , don't fix it."Underlying this slogan is the belief that when an organization is running smoothly, managers and employees can simply sit back and rest on their laurels.

TABLE 2.2 comparison of Traditional American Management Principles with TQM Management Principles

	Traditional American Management principles	**Total Quality Management (TQM)**
1	The organization has multiple Competing goals.	Quality is the primary organizational goal.
2	Financial concerns drive the organization.	Customer satisfaction drives the organization
3	Management and professionals determine what quality is.	Customers Determine what quality is.
4	The focus is on the status quo- "If it Is not broke, don't fix it."	The focus is on continuous improvement-"unattended tend to run down."
5	Change is abrupt and is accomplished by champions battling the bureaucracy.	Change is continuous and is accomplished by team work
6	Employees and departments compete with each other.	Employees and departments cooperate with each other.
7	Decisions are based on "gut feelings." It is better to do something than to do nothing.	Decisions are based on data and analysis. It is better to do nothing than to do the wrong thing.
8	Employee training is considered a luxury and a cost	Employee training is considered essential and an investment.
9	Organizational communication is primarily top-down.	Organizational communication is Top-down, down up, and sideways
10	Contractors are encouraged to compete with each Other on the basis of price.	Long-term relationships are developed with contractors who deliver quality products and services.

Adapted from Lawrence, 1993

2.1.5. The Philosophy of TQM

What characterizes TQM is the focus on identifying root causes of quality problems and correcting them at the source, as opposed to inspecting the product after it has been made. Not only does TQM encompass the entire organization, but it stresses that quality is customer driven. TQM attempts to embed quality in every aspect of the organization. It is concerned with technical aspects of quality as well as the involvement of people in quality, such as customers, company employees, and suppliers. Here we look at the specific concepts that make up the philosophy of TQM.

- **Customer Focus**

The first, and overriding, feature of TQM is the company's focus on its customers. Quality is defined as meeting or exceeding customer expectations. The goal is to first identify and then meet customer needs. TQM recognizes that a perfectly produced product has little value if it is not what the customer wants. Therefore, we can say that quality is customer driven. However, it is not always easy to determine what the customer wants, because tastes and preferences change. Also, customer expectations often vary from one customer to the next. Lawrence (1993).The customer who complain, have problems, or are not satisfied with a process .product or service is the most important customers. These customers are helping point the way for continuous improvement. Richardson (1997).

- **Continuous Quality Improvement**

According to Richardson, in step five of Deming points, management is obligated to continually look for ways to improve quality. Another basic tenets of TQM as a philosophy of management is the notion of continuous quality improvement through team work.

Traditional American management theory tends to view change as being radical in nature and occurring in quantum leaps. Change comes about as a result of "breakthrough" created by the application of new technologies (Carr &Littman, 1990 as cited in Lawrence 1993) or by "champions" who engage the bureaucracy in individual combat to promote their ideas (Peters &Waterman, 1982 as cited in Lawrence in 1993).Change in TQM is constant and, consequently,

tends to be incremental in nature. Change in TQM tends to be slow and plodding, but in the end successful.

Traditionally, change for American managers involves large magnitudes, such as major organizational restructuring. The Japanese, on the other hand, believe that the best and most lasting changes come from gradual improvements. To use an analogy, they believe that it is better to take frequent small doses of medicine than to take one large dose. Continuous improvement, called kaizen by the Japanese, and requires that the company continually strive to be better through learning and problem solving. Because we can never achieve perfection, we must always evaluate our performance and take measures to improve it. According to Bruce and M. Suzanne Brocka it is easier, and more effective, to lift 50 pounds 10 times, than to move 500 pounds all at once .Continuous improvement is similar; small improvements done continuously arrive at the same point as a major innovation. Unlike innovation, which can require great resources, and no small amount of serendipity, continuous improvement is easier to manage and utilizes every one talents. Japanese companies have used this idea for some time, and call this approach Kaizen. This idea fits hand in hand with team building approaches such as quality circles and brain storming, can be inexpensively managed. Richardson (1997) cited in his book Deming recommended using a never ending, circular management process adapted from the work of Shewart. This cyclic process, sometimes called the Deming wheel or cycle or chain reaction. Now let's look at the Deming cycle that can help companies with continuous improvement: the plan – do – study – act (PDSA) cycle.

The Plan – Do – Study – Act Cycle

The plan – do – study – act (PDSA) cycle describes the activities a company needs to perform in order to incorporate continuous improvement in its operation. This cycle, is also referred to as the Shewhart cycle or the Deming wheel. The circular nature of this cycle shows that continuous improvement is a never-ending process. Let's look at the specific steps in the cycle.

- Plan: - The first step in the PDSA cycle is to plan. Managers must evaluate the current process and make plans based on any problems they find. They need to document all current procedures, collect data, and identify problems. This information should then be

studied and used to develop a plan for improvement as well as specific measures to evaluate performance.

- Do: - The next step in the cycle is implementing the plan (do). During the implementation process managers should document all changes made and collect data for evaluation.
- Study: - The third step is to study the data collected in the previous phase. The data are evaluated to see whether the plan is achieving the goals established in the plan phase.
- Act: - The last phase of the cycle is to act on the basis of the results of the first three phases. The best way to accomplish this is to communicate the results to other members in the company and then implement the new procedure if it has been successful. Note that this is a cycle; the next step is to plan again. After we have acted, we need to continue evaluating the process, planning, and repeating the cycle again.

According to Richardson (1997) some people have considered "continuous improvement "as being equivalent to TQM. Others make distinctions between total continuous improvement (TCI), continuous process improvement (CPI), and, TQM. This would imply that only TCI would create an environment where everyone is continuously involved in the elimination of waste and in reduction of variation, where as CPI might imply that quality gains are made by improving each process.

He added that the objective of continuous improvement is to improve processes in order to ,in turn ,continuously improve customer satisfaction .It also implies a continuous focus on finding or measuring key quality factors and correcting (taking action to reduce) sources of variability in quality and management.

- **Employee Empowerment**

According to Richardson (1997) in the industrial society, bosses would do the work. Today; we must accept the view that every person at every level of the organizations knows something that can improve the way things get done. In empowerment authority is delegated so decision can be quickly implemented .communication is essentially in participative management. Information must be widely distributed for use by each worker. To be effective "managers must drive out fear". Most employees do not speak up because of fear of repercussions and mistrust of management. In TQM, managers are still in charge, but they develop a genuine partnership with

the work force. Team based, worker empowered paradigm that heightens productivity by viewing workers as a fertile sources of creativity, not extension of robotic machines. Brocka, (1992).

If an organizational culture is to be transformed in to one based on the values and norms of TQM, top management must also be committed to employee empowerment. Employee empowerment can be thought of as any effort designed to move power, information, knowledge, and rewards down ward in the organization (Business week, 1992, as cited in Lawrence, 1993). The premise on which employee empowerment rests is a belief in the creative energies of the people who really understand an organization's systems and major processes.

Several of Deming's 14 points are designed to empower employees AS a general rules, Deming recommends removing all barriers that rob employees of pride and ownership in their work. He also specifically advocates a vigorous program of employee training and self-improvement. An interesting caveat concerning employee training is that evaluation of TQM programs suggest that employees must be provided with detailed training and instruction in how to do their jobs better from a TQM perspective ,because most employees believe they are already doing the best job possible (Koons,1991,as cited in Lawrence 1993).

- **Process Management**

The purpose of TQM is to optimize the value added steps and minimize the cost –added steps. Richardson (1997).According to TQM a quality product comes from a quality process. This means that quality should be built into the process. Quality at the source is the belief that it is far better to uncover the source of quality problems and correct it than to discard defective items after production. If the source of the problem is not corrected, the problem will continue. The old concept focused on inspecting goods after they were produced or after a particular stage of production. If an inspection revealed defects, the defective products were either discarded or sent back for reworking. All this cost the company money, and these costs were passed on to the customer. The new concept of quality focuses on identifying quality problems at the source or the process and correcting them. Lawrence (1993).

- **Team work**

A team is two or more workers who serve as a unit often with little or no supervision, to carry out organizational functions. In TQM, flexible work teams and information network within and among organizations become the basic units of production. Major gains in quality and productivity most often result from groups of people who pool their skills and knowledge to tackle complex, chronic problems Richardson (1997).

He also noted that companies have organized around team-based organizations for two basic reasons for two basic reasons: first to empowering teams allow employees to contribute more to the business and to improve quality; secondly team work increases productivity

According to Richardson (1997) teams were allowed to determine for themselves how to best accomplish the job. Teams were trained to perform production tasks from housekeeping and minor tool repair to quality improvement.

- **Managing Supplier Quality**

TQM extends the concept of quality to a company's suppliers. Traditionally, companies tended to have numerous suppliers that engaged in competitive price bidding. When materials arrived, an inspection was performed to check their quality. TQM views this practice as contributing to poor quality and wasted time and cost. The philosophy of TQM extends the concept of quality to suppliers and ensures that they engage in the same quality practices. If suppliers meet preset quality standards, materials do not have to be inspected upon arrival Lawrence (1993).

- **Understanding and Controlling Variation**

According to Lawrence (1993) one of the key elements of TQM as a philosophy of management is its focus on understanding and controlling variation. Variation can be defined as any deviation from the standard.TQM is concerned with the study, comprehension, prediction, and control of variation in systems and processes.

Variation is the natural enemy of quality. Quality suffers when too much variation is present in the processes used to produce products and provide services. The point has been made several times that reliability may well be the single most important quality dimension to customers. Reliability means that the quality of products and services is consistently the same over time.

Variation in processes setup a causal chain that affects reliability which in turn affects quality. The key to ensuring reliability and maintaining quality in any organization lies in controlling the variation in processes Lawrence (1993).

In the language of TQM, variation is said to have two primary causes, common and special (Carr &Littman, 1990, Gitlow et al., 1989, provost & Norman, 1990, as cited in Lawrence).common causes of variation are small random sources that are always present in any process or system; special causes of variation are non-random and are caused by sources outside the system or process.

2.1.6 Quality Awards and Standards

2.1.6.1 The Malcolm Baldridge Award Criteria

Table 2.3 presents the Baldridge award criteria and scoring system. The criteria have widely differing values. Each major category is assigned a score that serves to identify its relative weight, or importance, compared to the other categories.

Four major categories dominate the Baldridge Award scoring system. In order of importance, they are (a) customer focus and satisfaction, (b) quality and quality and operational results, (c) human resource development and management, and (d) management of process quality. In order to win the Baldridge Award, nominees must score well in each of these four categories.

Table 2.3 Baldridge Award Categories and Point values

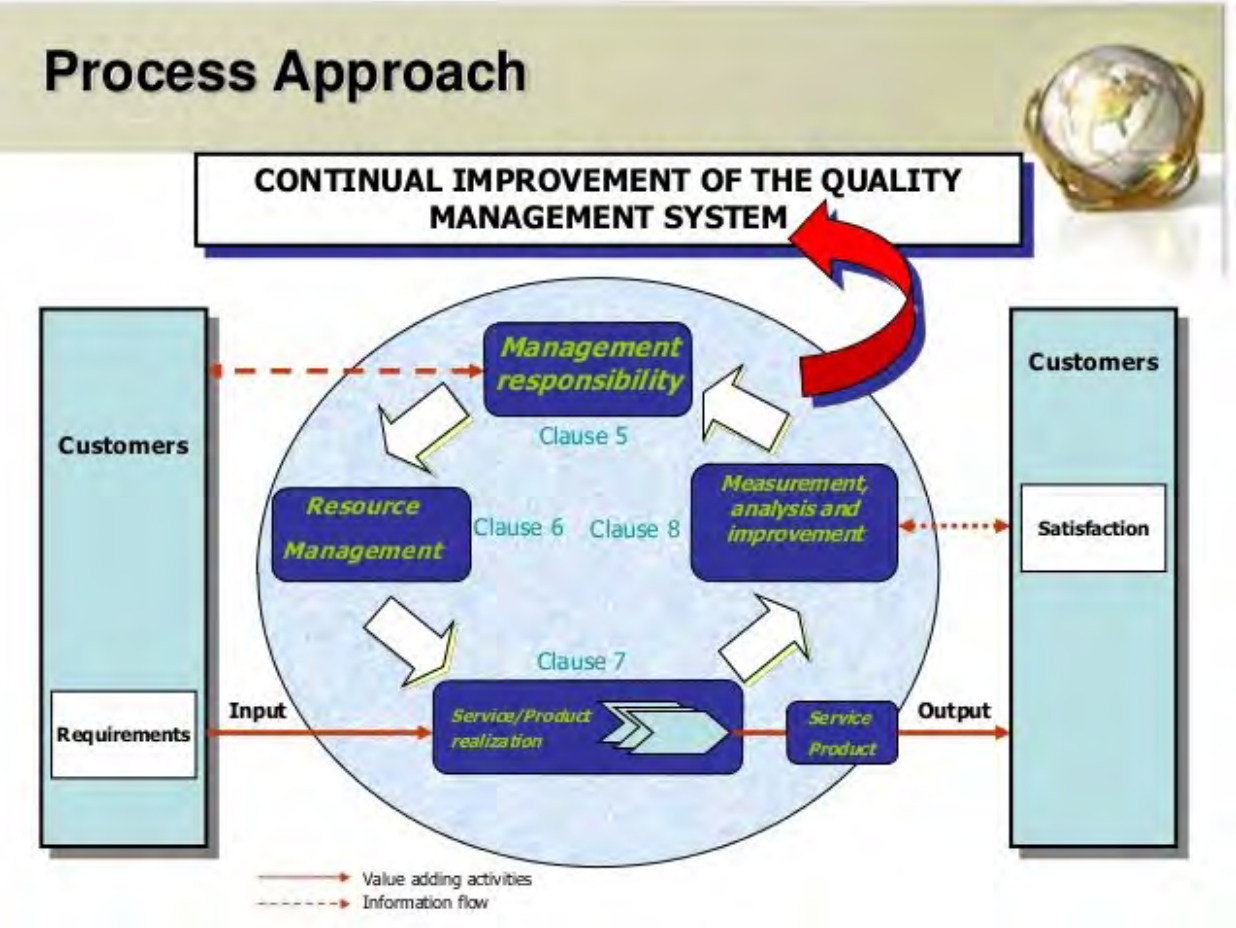
No.	Criteria	Points
1	Leadership	100
2	Information and Analysis	70
3	Strategic Quality planning	60
4	Human Resource Development and Utilization	150
5	Management of Process Quality	140
6	Quality and Operational Results	180
7	Customer Focus and Satisfaction	300
	Total point	1000

Source: Malcolm Baldrige National Quality Award-1992 Award Criteria (1992). Washington, DC: U. S Department of Commerce and the National Institute of Standards and Technology,

2.1.6.2 Customer Focus in the TQM and ISO 9000 Model

Quality has different but interrelated meanings such as fitness for use, conformity to specifications and free of defects. However, it has been agreed that quality is simply meeting customer needs and demands. Oakland (1996) emphasizes the concept of meeting customers' requirements in his definition of quality. Total Quality Management is defined by Oakland (1989) as being an approach to improve the effectiveness and flexibility of business participating by all departments, employees and levels of the organization. Pfau (1989) agrees on the concept of the participation of all levels and functions of the organization towards the improvement of the quality of goods and services. However, there is no agreement on the elements that constitute TQM; it depends on the nature, culture and circumstances of business. Nevertheless, it can be claimed that all TQM models such as the quality management systems and the quality awards include customer focus as being a major element of the models. ISO 9001: 2008 includes customer focus as an important pillar of the quality system (Clause 5.2). Figure 2 shows that customer requirements are the inputs and customer satisfaction is the output of the quality system. From that model we may conclude that measuring customer satisfaction is a major requirement of ISO 9001. In Clause 5.2 of ISO 9001:2008 (2008), it remands that top management has to be sure that customer requirements are met for the aim of the improvement of customer satisfaction.

Figure 2: ISO 9001: 2008 Continual Improvement of the Quality Management



Source: ISO 9001: 2008 (2008) Quality Management Systems – Requirements, International Organization for Standardization (ISO), Genève, Switzerland, Page VI.

Figure2. Demonstrates that the process approach model and the quality system start and finishes with the customer. In the first instance there is the customer requirement on the left hand side of the diagram, on the right hand side there is the degree of customer satisfaction with the product or service that has been provided as a result of a number of inputs. Customer satisfaction is measurable against the initial requirements and specifications. Perhaps the most important feature of the model is the need to obtain information about customer satisfaction, this feeds back into the monitoring and evaluation phase, which are in turn is a measure of overall performance. The loop into management responsibility is there to show that management has an important role to review customer feedback to ensure that the appropriate policies, objectives and strategies are in place, along with the necessary resources, to meet the quality challenges.

2.1.7 Quality Improvement

Quality improvement is another part of quality management that is focused on increasing the ability to fulfill quality requirements (Clause 3.2.12 of ISO 9000:2005). It is not concerned with correcting errors but concerned with doing things better to improve system efficiency and effectiveness (bsigroup.com).

ISO offers the PDCA cycle as a useful tool for continual improvement. The methodology applies to both high-level strategic processes and to simple operational activities.

ISO 9001:2008 Quality *Management Systems Requirements*

A management system is simply the way an organization manages its processes, people and other resources so that its products or services meet their objectives and customer requirements.

This standard specifies requirements of a QMS where the organization needs to demonstrate its ability to provide products that fulfill customer needs and applicable regulatory requirements and aims to enhance customer satisfaction through the effective application of the system. Clauses 4 through 8 contain the required elements of the QMS. The structure of ISO 9001:2008 is as follows. bsigroup.com (2013).

STRUCTURE OF ISO 9001:2008

Clause 5 — Management responsibility;

Clause 6 — Resource management;

Clause 7 — Product realization; and

Clause 8 — Measurement, analysis and improvement

Plan – management responsibility

Top level management must be committed to the development and involved in the implementation of your quality management system. And this part of ISO 9001 provides you with a powerful planning tool.

These individual requirements take managers through the following activity:

Customer focus

Find out what the customer's current and future needs and expectations. This can be achieved through feedback surveys or talking to some key customers.

Quality Policy

Use the information gathered from the customer to write a quality policy that is relevant and applicable to your organization.

Objectives

Establish measurable objectives for the organization to help you achieve the aims of the quality policy.

Plan the system

Allocate responsibilities and establish effective processes to achieve your objectives.

Review the system

Review the operation of your system at regular intervals and improve where necessary. Ensure all appropriate resources are provided.

P la n – resource management

The resource management part of the standard makes sure that you review and provide the resources needed to implement and improve the system.

Resources are looked at in three ways: **people, infrastructure** and **work environment**

People

• Decide the competencies and skills needed within the organization.

• Then look at the people you have and identify gaps in existing competencies.

• Fill those gaps by providing training and coaching or encourage self-learning.

• Then go on to see how effective the actions taken have been in helping you achieve the necessary competence for the business.

• Through this technique you always know whether the training you provide is actually adding value to the organization and contributing to results.

Infrastructure

This involves the facilities and equipment you need to perform effectively. Start by determining and providing what is needed and ensure that you review this regularly.

Work Environment

Here you look at the conditions under which work is performed and ensure that this is appropriate for meeting customers' requirements. Again, you will need to ensure that this is reviewed regularly.

Do – Product or service realization

You now have the commitment and direction from management and the necessary resources to do the job.

ISO 9001 goes on to give you a set of requirements for managing the work you do. Start with planning and plan the journey from the point where the customer asks for something, right through to delivery (and beyond if necessary).

Typically this involves defining the processes for:

• Sales

• Design and development

• Purchasing

• Production / operational / service activities

• Delivery

Don't worry if some of the topics here do not relate to you. Remember ISO 9001 is designed to be used by all types of organizations. You simply concentrate on the areas relevant to you.

Make sure at each stage that people understand their role and are competent to carry out tasks in line with business policies and procedures.

Check and Act – measurement, analysis and improvement

Once you have delivered to your customers, don't stop! Go on to find out whether they are satisfied. Take other measurements of the system's performance, analyses these and identify the areas for improvement. Again, the standard provides you with a set of requirements for achieving this using tried and tested techniques.

Customer satisfaction

This really involves the monitoring of customer perception. It does not mean that you have to send questionnaires to your customers. There are many different ways of monitoring perception. You can use methods relevant to your business.

Internal audit

Conduct reviews of your system to make sure that things are going to plan.

Monitoring and measurement of products and processes

Individual processes drive the system and it is important that they are operating effectively and efficiently. Products should be also measured and monitored to ensure that you are meeting the customer's requirements.

Control of non-conforming products

If something goes wrong, procedures should be in place to ensure the problem is controlled and dealt with appropriately.

Analysis of data

Using the standard effectively will produce data on how effective your systems are. Use the data to find improvements.

Continual improvement

One of the key objectives of the standard is to make sure that your organization improves. Using the results of the analysis will help you to determine where those improvements can be made.

2.2. Service

A service is an act or performance offered by one party to another. Although the process may be tied to a physical product, the performance is essentially intangible and does not normally result in ownership of any of the factors of production. Services are economic activities that create value and provide benefits for customers at specific times and places, as a result of bringing about a desired change in or on behalf of the recipient of the service (Lovelock and Wright, 2002).Services are deeds, processes, and performances (Zeithaml and Bitner, 2000). Services are described as objects of transaction offered by firms and institutions that generally offer services or that consider themselves service organizations (Steve and Kim, 1995).

Researchers studying service organizations point out that service possess certain characteristics that set them distinctly apart from products (e.g. Murdick, Render, &Russell, 1990).

According to Robin (1989) service has four characteristics. These are:

a) Intangibility:-services are intangible i.e. they do not have physical substance. Consumers cannot touch, see, smell, or taste services before purchasing them. This poses difficulties for the services marketer because target customers may be reluctant to buy what they cannot physically examine.

b) Heterogeneity:-services are heterogeneous i.e. they are not standardized .The nature of offering of any one seller may differ from one time period to another .Further, two or more employees of one firm may provide service that are quite different from each other.

c) Inseparability:-marketers and services they provide are always inseparable that is they are continually at the sample place at the same time. Service cannot exist unless the marketer is present.

d) Perishability:-Service tends to have very short life spans. Tangible goods can be produced and then placed in inventory, so that they are available when and where customers want them. Service, however, cannot be stored.

According to Lawrence, 1993 analysis of these service characteristics might well lead one to conclude that TQM is perhaps even more applicable to service organizations, than it is to manufacturing organization. For example, TQM focuses on customers, but so do service organization. For many human service organizations, customers are actually apart of the service

delivery process.TQM also focuses on variation and process control, but so do service organizations, Because service organizations non standard out puts, quality control is necessarily process control. In the human services, no two clients who complete a service plan (an output) are ever likely to be exactly alike. Thus service organizations deal with non standard out puts, thereby requiring that service quality control became essentially process control. It is exactly these essential characteristics of service organization that make them such good candidates for TQM programs.

2.2.1. Service Quality

Service quality is the ability of the organization to meet or exceed customer expectations. Customer expectation may be defined as the "desires and wants of consumers" that is what they feel a service provider should offer rather than would offer (Parasuraman, Zeithaml and berry, 1988). Service quality has been defined as being the difference between customer perceptions of quality and the delivery of the service to customers (Gronroos, 1984 and Parasuraman et al.1988).Oliver (1993) reports that service quality is a casual antecedent of customer satisfaction, due to the fact that service quality is viewed at transactional level and satisfaction is viewed to be an attitude.

2.2.2. Customer Expectations and Perceptions of Service

2.2.2.1. Customer Expectations

Customer expectations are pretrial beliefs a consumer has about the performance of a service that are used as the standard or references against which service performance is judge (Kenneth and David, 2003). Customer expectations may be described as the desires or wants of the Consumer. The crux is that customer expectations are what the customer expects from the organization and its range of product or services, that is what customers feel the organization should offer them. These expectations are, in most instances, different from what the customer gets in real life situations from the organization. What is important here is to focus on the customer perceptions, rather than on the reality of the performance (Brink and Berndt, 2005).

2.2.2.2 Customer Perceptions

A consumer perception is defined as the process by which an individual selects, organizes, and interprets stimuli in to a meaningful and coherent picture of the world. A stimulus is any unit of input to any of the sense. Examples of stimuli (i.e., sensory input) include products, packages, brand names, advertisements, and commercials (Leon and Leslie, 1997). Perceptions are defined in various ways; Strydom, Jooste and Cant (2000), define customer perception as the process of receiving, organizing and assigning meaning to information or stimuli detected by the customer's five senses and opine that it gives meaning to the world that surrounds the customer. Perceptions are also described as the end result of a number of observations by the customer. Customers perceive services in terms of quality of services provided and the satisfaction level attained.

2.3 Customer Satisfaction

Customer satisfaction is the individuals' perception of the performance of the product or service in relation to his or her expectations (Leon and Leslie, 2007). Satisfaction is the customers' evaluation of a product or service in terms of whether that product or service has met their needs and expectations. Failure to meet needs and expectations is assumed to result in dissatisfaction with the product or service (Zeithaml and Bitner, 2000). According to Kottler and Keller (2006), Customer satisfaction is a person's feeling of pleasure or disappointment resulting from comparing a product's perceived performance (or outcome) in relation to his or her expectations .If the performance falls short of expectations, the customer is dissatisfied .If the performance matches the expectations, the customer is satisfied. If the performance exceeds expectations, the customer is highly satisfied or delighted.

Customer satisfaction is defined as an evaluation between what was received and what was expected (Oliver, 1977, 1981; Olson and Dover, 1979). Parker and Mathew (2001) treat customer satisfaction as having two approaches; process and outcome of a consumption experience. Jones and Sasser (1995) consider achieving customer satisfaction as being the main goal for service organizations. Moreover, increasing customer satisfaction helps organizations gaining market share, maximizing profits and reducing costs (Heskett et al.,

1997; Reichheld, 1996). On that regard, William and Bertsch (1992) emphasize that achievement of a strong customer satisfaction is related to understanding customer needs and expectations. Additionally, Zeithaml (1988) finds out that customers who perceive that they receive value for money are more satisfied than customers who do not perceive they receive value for money.

2.3.1 The Relationship between service Quality and Customer Satisfaction

According to Brink & Berndt (2005), customers perceive services in terms of the quality of service provided and the satisfaction level attained. These two concepts, service quality and customer satisfaction, are the focus of attention of organizations because they want to measure them. The reason for the focus on quality of service and customer satisfaction is the belief that organizations can differentiate themselves by means of providing better service quality and overall customer satisfaction.

2.3.2 The Benefits of Customer Satisfaction Management

Although every successful organization wants to provide a service that satisfies customers, this is not the only goal. Organizations can't lose sight of other basic business goals such as achieving a competitive advantage or making a profit. Customer satisfaction provides many benefits for a firm, and higher levels of customer satisfaction lead to greater customer loyalty. In the long run, it is more profitable to keep good customers than to constantly attract and develop new customers to replace the ones who leave. Highly satisfied customers spread positive word-of-mouth and, in effect, become a walking, talking advertisement for a firm, which lowers the cost of attracting new customers (Lovelock & Wright, 2002).

High levels of customer satisfaction are an insurance policy against something going wrong. Long-term customers tend to be more forgiving in these situations, because an occasional bad experience will be offset by previous positive ones, and satisfied customers are less susceptible to competitors' offerings. It's no wonder that many companies place so much emphasis on customer satisfaction, given its positive relationship to customer retention, market share, and profits (Lovelock and Wright, 2002).

2.3.3 Customer Satisfaction Measurement

Gauging the level of customer's satisfaction and its determinants is critical for every company. Marketers can use such data to retain customers, sell more products and service, improving the quality and value of their offerings, and operate more effectively and efficiently. Customer Satisfaction measurement includes qualitative and quantitative measures, as well as a variety of contacts methods with the customers. Customer satisfaction surveys measure how satisfied the customers are with relevant attributes of the product or service, and relative importance of these attributes (using attribute scale) .Generally, these survey use 5–point semantic differential scales ranging from "very dissatisfied" to "very satisfied". Research shows that customers who indicate they are very satisfied (typically a score of 5 on the satisfaction scale) are much more profitable and loyal than customers who indicate that they are satisfied (a score of 4).Therefore, companies that merely strive to have "satisfied" customers are making a crucial error. Some marketers maintain that customers' satisfaction or dissatisfaction is a function of difference between what they had expected to get from the product or service purchased and their perceptions of what they received. A group of researchers developed a scale that measures the performance of service received against two expectations levels: adequate service and desired service. This approach is more sophisticated than standard customer satisfaction surveys and more likely to yield results that can be used to develop corrective measures for products and services that fail short of customers' expectations (Leon and lesile ,2007)

2.3.4 Expectation Disconfirmation Model

The Expectations Disconfirmation Model has been the dominant model in satisfaction research. The model has consumers using pre-consumption expectations in a comparison with post consumption experiences of a product/service to form an attitude of satisfaction or dissatisfaction toward the product/service. In this model, expectations originate from beliefs about the level of performance that a product/service will provide. This is the predictive meaning of the expectations concept (Willard, 2000).

Everyone enters into a purchase with certain expectations above what the product or service will do when it is used, and satisfaction is the hoped-for outcome. Satisfaction is

defined here as a post-consumption evaluation that a chosen alternative at least meets or exceeds expectations. Richard Oliver spearheaded research on this subject with his expectancy disconfirmation model. Briefly, this theory postulates that satisfaction or dissatisfaction is the outcome of a comparison of pre-purchase expectations against actual outcomes, and it has been consistently validated in empirical research (Kenneth and David, 2003). The expectation disconfirmation model is one the main models researchers use for measuring satisfaction. In this model, customers compare their pre-consumption experiences with post-consumption experiences of service or product. This model has been the principal model in satisfaction research. In order to form attitude towards satisfaction or dissatisfaction consumers compare their experiences of the product/service. In Expectation Disconfirmation model, expectations come from beliefs of consumers about the level of performance that a service will provide.

Expectation is what consumers expect to receive from product or service which is usually ideal situation for the consumer. However, satisfaction is defined as a customer's perception of a single service experience, whereas quality is the accumulation of the satisfaction for many customers over many service experiences. Furthermore, service is equal to the perception of a single service as received and measured against the expected service received. The difference between the "perceptions" and "expectations" of a customer result in a level of Satisfaction or dissatisfaction (Hill, 1992,).This difference between "perceptions" and "expectations" essentially forms what is commonly referred to as gap model. The gap model contains a minimum of two or sometimes three key concepts Satisfaction and quality service are often treated together as functions of a customer's perceptions and expectations. The gap model can be defined as a two component equation of Q= P–E. "Q" would be "satisfaction" and "quality"; "P" stands for "perceptions" and finally "E" stands for "expectations".

Sometimes customers do not care about a service or do not have any expectations towards a service or product. However, when perceptions (P) are equal to expectations (E), service quality (Q) is satisfactory. If perceptions are lower than expectations, a customer's rating becomes negative and service quality becomes unsatisfactory (Cottle, 1990,). In order to increase customer satisfaction you either raise customer perceptions, lower their expectations, or both. Since an expectation is nothing more than an anticipation of receiving

something favorable or acceptable, it is essential for any service company to develop realistic expectations among their customers. But "expectations and perceptions are factors that are hard to control" (Davidow and Uttal, 1989).

Research Frame Work

Since the main objective of the study is the measurement of customer satisfaction on the six dimensions of Electricity Service by the use of ISO 9001: 2008 Model .Thus the frame work of this study is given below:

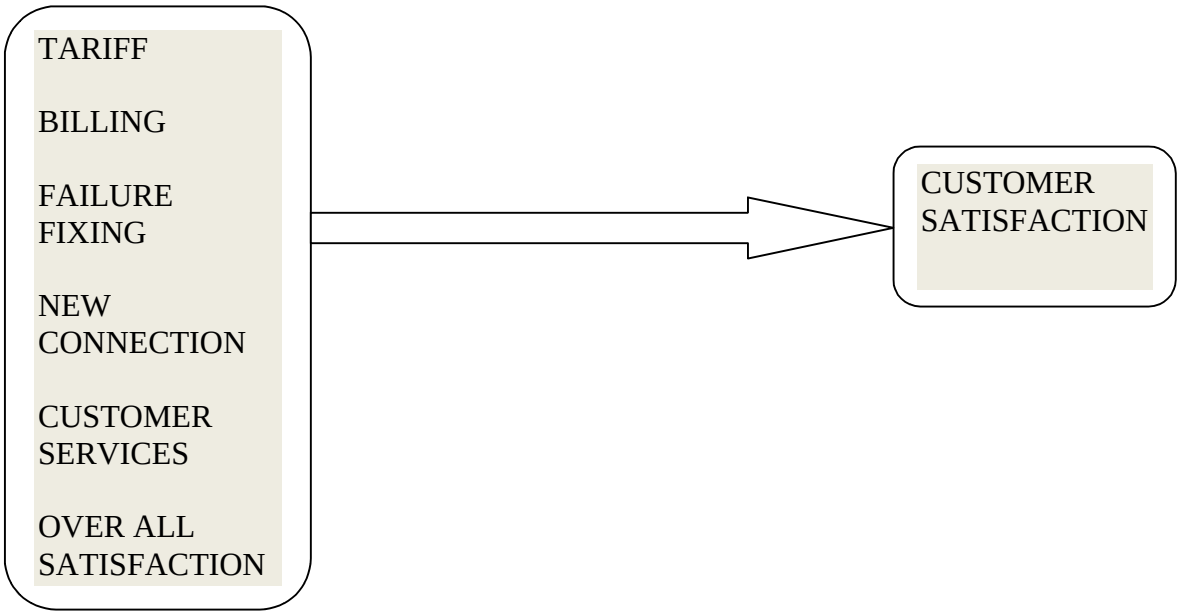


Figure 3: Research Frame Work
Source: The researcher own generated

Chapter Three

3. Research Methodology

According to, Uma and Roger (2012), the population is the entire group of people, events, or things that the researcher desires to investigate. In this study all the consumers who consume the electricity power in North Addis Ababa region are taken as the target population. They are approximately 201,931 according to the region marketing and sales office. A sample of 400 users out of total population was selected according to the table for determining sample size from a given population (Krejcie & Morgan, 1970) at 95% of confidence level. The rules of thumb proposed by Roscoe (1975) suggest that sample size larger than 30 and less than 500 are appropriate for most research. Hence, the sample size determined for this research is consistent with the above criteria. The data were collected for three months. The researcher personally distributed the questionnaire using simple random sampling technique to the users and confirmed their willingness to respond the same. As a result, a total of four hundred questionnaires (400) were given to the respondents and three hundred seventy were retrieved (370) with the response rate of 92.5 percent, which is sufficient for the survey.

Survey method performs as a significant way of gathering information (Fei, 2006). A research design should be well designed, in away to facilitate the collection of relevant evidence and information for the research, efficiently (Kothari, 1990: Sivathaasan, Murugathas, & Chandrasekar, 2014). In this study, survey method is a questionnaire, which has a set of questions to which the respondents record their answers. This was developed based on the previous review of literature. The questionnaire consists of two sections as part A & part B. In part A, question relates to demographic and organizational profile such as gender, age, marital status, education, types of subscription and meter type were asked from the respondents. Then, variables are grouped into categories and measured on nominal scale by assigning code numbers to the objects. Likewise, in part B, customer satisfaction of electric services on twenty two statements or items were measured. All items are measured on interval scale and respondents are requested to indicate their degree of agreement or disagreement on a 5- point scale, ranging from poor (1) to very high(5).

A pilot study of 30 respondents was conducted before the actual survey and this assisted to make necessary correction in the questionnaire. The primary and secondary data were collected for the purpose of carrying out the research. Primary data refers to the information that was developed or gathered by the researchers specifically for the research project at hand (Burns et al., 2006).In this study, primary data were collected through a self –administered questionnaire and Interview questions. Secondary data were collected from books, journals, magazines, research reports, websites, Customer complaint applications, and customer service procedure. The data collected was then analyzed by using a statistical package for social science (version 20).Various statistical methods were employed to analyze the data such as descriptive and inferential analyses. Further, reliability test, test of sampling adequacy was performed.

3.1. Sampling Techniques

The target populations in this research paper were Residential Customers, Commercial Customers, and Industrial Customers of Ethiopian electric utility North Addis Ababa Region. This implies that the populations under the study were not homogeneous. Hence, a stratified sampling technique was used for this research paper. The populations were stratified based on their subscription or customer type. After stratification as Residential Customers, Commercial Customers, and Industrial Customers, the questionnaires were administered to each customer type through simple random sampling technique in whom every single element in the population has a known and equal chance of being selected as a subject. Stratified sampling was selected because of the nature of population as the populations were in different consumption and tariff level, so that it was assumed that they perceive organization's customer service in different way.

3.2. Population of the Study

The population of the study was from the 23 districts (customer service centers) of residential, commercial and industrial customers in the region office of north Addis Ababa region. The districts are customer service One ,Two Three, Four, Five, Six, Seven (Cancho), Eight (Burayu), Holeta, Mugar, Addis Alem, Ginchi, Ambo, Hormat, Gudar, Gedo, Ijaji, Bako, Wayu, Fincha, Kachisae, Geldu, Shambu.

Table: 3.1 Number of subscribed customers

North Addis Ababa Region Marketing and Sales Number of Prepaid and Post Paid Customers												
No.	Customer Service Centers	Tariff(Post Paid)								Pre Paid		Total
		10	11	12	13	20	30	41	42	10	20	
1	1	16618	50	12	188	3197		444	3			20512
2	2	15371	32	3	305	1370		33		3111	360	20585
3	3	12266	35	2	151	1305		71		3909	364	18103
4	4	11725	28	0	162	1106		68		2676	160	15925
5	5	12034	22	1	166	1527		62		7863	618	22293
6	6	9213	5	0	80	1741	64	22		3600	1000	15,725
7	Chancho	4530	0	2	8	635	10	199	1			5385
8	Burayu	8977	16	18	115	720		451		8526	1750	20573
9	Ambo	7467	11	4	67	942	26	182	6			8705
10	Addis Alem	2280	9	0	35	152	4	63				2543
11	Ginchi	5125	1	3	3	681	12	201				6026
12	Baco	5264	0	0	0	343	26	178				5811
13	Mugar	5262	0	4	4	406	7	229	3			5915
14	Kachisea	1831	0	1	0	236	7	89				2165
15	Hormat	85	0	0	0	12		8	8			113
16	Gudar	3991	2	1	1	195	12	101				4303
17	Holeta	5811	1	2	20	766	10	150				6760
18	Gedo	3316	1	4	13	284	10	195	1			3824
19	Fincha	5410	37	100	44	334	8	171				6104
20	Ijaji	1852	0	1	1	299	4	82				2239
21	Wayu	1404	0	1	0	129	3	104				1641
22	Shambu	4696	0	7	19	771	8	54	44			5599
23	Geldu	870		1		171		41				1083
Total		**145398**	**250**	**167**	**1382**	**17322**	**211**	**3198**	**66**	**29685**	**4252**	**201931**

Source: North Addis Ababa Region Marketing and Sales Office

3.3. Determination of the Sample Size

It is very expensive in terms of money and time to collect data from the population, so that the researcher has to determine sample which is representative for the total population. Yamane (1967) provides a simplified formula to calculate sample sizes of finite population, which is used to determine the sample size for this study paper. A 95% confidence level was assumed for this formula to determine the sample size, at e=0.05. The sample size is determined by the following formula.

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

Where n is the required sample size, N is the population size and e is the level of precision. Applying the above formula,

$$\mathbf{n = \frac{201{,}931}{1+201931(0.05)2}}$$

= 399.20 approximately 400 samples. Hence the sample size for this research was 400 customers of Ethiopian Electric Utility.

3.4. Distribution, Collection of the Questionnaire and interview question.

Copies of the questionnaires were distributed to collect necessary information from respondents. The researcher used one structured questionnaire for all residential customers, commercial customers, and industrial customers and presented personally and through district managers to the respondents to gather the data. The respondents have a number of alternative options with structural questionnaire from which they must choose the one that most closely approximates their view. The value of the study and the instructions were explained to the subjects. Respondents were requested to complete the questionnaires which were collected personally by the researcher and by district managers and employee of EEU from individual respondents which ensured a high return rate.

The questionnaires were distributed to the customers of EEU North Addis Ababa Region. It took about 4 months to distribute and collect the questionnaire from the respondents. The status of the questionnaires was followed via phone and by physical visiting and a pre-test. The researcher collected the questionnaire from few respondents and make sure whether it was correctly filled or not by the respondents. Clarity of wordings in view of respondents' level of understanding was checked on the pre-test to avoid misunderstanding of the questions. Interview also conducted for the region wire and retail business head and 20 district managers.

3.5 Data Processing and Analysis

SPSS version 20 computer soft ware program was used. First the responses of the participants were coded in Excel spreadsheet and then exported to SPSS to analyze the findings. After exporting to SPSS, the raw data concerning the respondents' demographic and organizational variables were depicted using different tables. After the respondents profile was presented, the customer satisfaction variables were processed using descriptive statics and inferential statics such as correlation, analysis of variance (ANOVA). The descriptive statics parts of the variables were analyzed using means, standard deviation, and percentage whereas hypotheses of the study were tested using analysis of variance (ANOVA). ANOVA test were used to test the significant mean differences between/ among respondents' views on service quality variables (the dimensions) and their customer service satisfaction level.

CHAPTER FOUR

Results Presentation, Analysis and Interpretations

4.1 Types *of Electricity Subscription*

The respondents of the questionnaires are asked to specify their categories; residential, commercial or industrial. Table 4.1 depicts the distribution of respondents among those three categories.

Table 4.1 Types of Electricity Subscription

	Subscription Type	Frequency	Percent
1	Residential	350	87
2	Commercial	43	11
3	Industrial	7	2
	Total	400	100

Table 4.1 shows that the vast majority (87%) of respondents is from the residential sector which means private houses and apartments. Commercial shops and shopping centers come second with 11 % of the sample while industrial sector represents 2% of respondents under the study.

4.2 The Response Rate of the Questionnaire

The questionnaire administered to the respondents, returned and the percentage of returned questionnaire was analyzed in the table 4.2 below.

Table 4.2: Summary of Questionnaire Administered, Returned and Analyzed by Group

Types of subscription	Copies Of questionnaire Administered	Number of Non Respondent	Percentage of Non respondent
Residential	350	25	7
Commercial	43	5	12
Industrial	7	0	0
Total	400	30	7

Source: - Questionnaire Survey by the Researcher

The above table indicates the questionnaires administered to and Non Respondent based on their subscription type. As can see from the table 4.2, 350 questionnaires were administered to residential customers of which 25(7%) were not returned. In the similar way 43 questionnaires were administered to the commercial customers and 5 (12%) were not returned whereas 7 questionnaire were distributed to industrial customers. The total percentage of non returned questionnaire is 7%.

Testing for Non-Response Bias

It is likely that data may not fully collect if the instrument is questionnaire. Test for non-response bias needs to be conducted if there are questionnaires distributed but not collected. The study distributed 400 and actually collected 370 usable questionnaires (response rate of 93%). Therefore, there is a need to test for non response rate to check if there is any mean difference between late and early respondents using independent t-test in SPSS. There is common agreement as to how many respondents to take to test for non-response bias. There was no consensus around the number of items which should be tested. Armstrong and Overton, (1977) used 53 of the 112 items (47%); Lambert and Harrington (1990) chose 28 of 56 original questions; whilst Yaghi (2006) used 20 of the 74 items. This study used 50% of the collected data half of which are late respondents and half of them are early respondents. The t-tests results showed that for almost all of items (98.24%) there was no significant difference between the late

and early respondents (p >.05) indicating that non-response bias was not a problem for the data. (See in the appendix V).

4.3. Participants (Respondents)

The biographical variables that is presented in this research is gender, Age, marital status and educational level of the respondents whereas the organizational variables are types of subscription, meter type which are depicted and discussed in the table in the following sections.

Table 4.3 summary of personal & Organizational variables

Description of personal & Organizational variables		No of consumers	Percentage
Gender	Male	220	58.5%
	Female	156	41.5%
Age	Less than and equal to 24 years old	43	11.4%
	Between 25and34years	124	33%
	Between 35and44years	106	28.2%
	Between45and 54years	76	20 %
	Greater than and equal to 55years	27	7.2%
Marital Status	Married	249	66.2%
	Single	112	29.8%
	Divorced	10	2.7%
	Widowed	5	1.3%
Educational Level	10^{th} complete	98	26.1%
	Technical & vocational	52	13.8%
	Diploma	91	24.2%
	BA Degree	101	26.9%
	Masters Degree	30	8.0%
	PHD	4	1.1%
Type of subscription	Residential	350	87%
	Commercial	43	11%
	Industrial	7	2%
Meter types	Pre- Paid	72	19.1%
	Post- Paid	304	80.9%

Source: Survey Data, 2015

The sample consists of 58.5 percent male (220) and 41.5 percent female (156) respondents. As one can see from the above table 10th grade complete are 26.1% (n=98), Technical complete are 13.8 % (n=52), diploma holder were 24.2% (n=91), bachelor holders were so many in number 26.9% (n=101) followed by masters holders 8.o % (n=30) while doctorate holders were the least1.1% (n=4).

With regards to the marital status of the participants, as depicted in the table 4.3 above , majority of them were married comprising 66.2% (n=249) of the total respondents. On the other hand 29.8 % (n=112) of the participants were single, 2.7% (n=10) of the participant were divorced, 1.3% (n=5) of the participants were widow.

In customer subscription 87 percent of the respondent are residential customers, 11 percent are commercials customers, and 2 percent are industrial customers. Finally 19.1 percent are pre paid-meter customers and 80.9 percent are post- paid customers.

The researcher design the questionnaires in two categories; general profile information and five Likert scale questions investigating the degree of satisfaction of EEU services. The scale includes five categories; very highly satisfied, highly satisfied, moderate, poor and very poor.
The representation is shown in Table 4.4.

Table 4.4: The Representation of the Different Levels of Satisfaction

	Mean Average Range	**Level of Satisfaction**
1	From 1 to < 1.80	Very Poor
2	From 1.80 to < 2.60	Poor
3	From 2.60 to < 3.40	Moderate
4	From 3.40 to < 4.20	High
5	From 4.20 to 5	Very High

Source: Akeil Kadasah & Al-Khedran, 2014.

4.4 Test of Reliability and Validity

The researchers observe the validity of the research instrument and the reliability of data entered into SPSS software data analysis system. The questionnaire is reviewed by different employees and management working in Ethiopian Electric Utility Company along with some different clients of the company. Pearson correlation test has been used to measure the internal consistency of research questions at each dimension and how correlated the dimensions together. Results are shown in Table 4.5. This table shows that the statistical indicators for correlation (consistency) between each dimension total and the grand total for the questionnaire ranging from (0.35 ** 0.71 **), which indicates a statistical significant consistency for the research questionnaire.

Table 4.5: Pearson Internal Consistency (Construct Validity)

	Dimensions	Correlation
1	Tariff Prices	-.004
2	Billing Methods	.355 **
3	Failure Fixing	.405 **
4	Power Supply Connection	.487 **
5	Customer Service	.713**
6	Overall Satisfaction	.499 **

(**) Correlation is Sig. at (0.01)

The researcher conduct Cronbach's Alpha test to measure the reliability of data entered into SPSS soft ware program. The purpose of this test is to be sure that data cells included in the system are safe. Results are shown in Table 4.6.

Table 4.6: Cronbach's Alpha Values

	Dimensions	Cronbach's Alpha value
1	Tariff Prices	0.85
2	Billing Methods	0.83
3	Failure Fixing	0.81
4	Power Supply Connection	0.80
5	Customer Service	0.86
6	Whole Questionnaire	0.91

Table 4.6 shows that the values of Cronbach's Alpha are greater than .05 which indicate high values of the test. Therefore, those correlation values make data entered into SPSS safe for assuming reliability.

Instruments are generally considered reliable when they have an alpha of 0.80 or higher on a scale of 0 to1 (rubin & Babbie, 2009).As can be seen in the above table ,alpha values range from 0.80 to 0.91,indicating the calculated alphas are above threshold. Hence, scales developed suggest good internal consistency.

4.5 Findings

4.5.1 Satisfaction of EEU Technical Services

The technical services that have been investigated in this current study include four dimensions; electricity tariff prices, billing methods, failure fixing and power supply connection. Each dimension has three factors that constitute the delivery of each technical services of Ethiopian Electric Utility Company; North Addis Ababa Region. Results are shown in Table 4.7.

Table 4.7: Level of Satisfaction of EEU Technical Services

Rank	Variables	Mean	Std. Dev.	Satisfaction
Electricity Tariff Prices				
1	**Electricity Tariff.**	3.13	1.023	Moderate
2	**Tariff of Consumption During power interruption.**	3.07	1.070	Moderate
3	**The Price Of the Additional Tariffs Compared to The Change in Consuming Units.**	3.26	1.127	Moderate
Average Mean of Electricity Tariff Prices		**3.20**	**.936**	**Moderate**
Billing Methods*(not include pre-paid customers)*				
1	**The Length Of Time For Declaring The Final Invoices.**	3.22	1.173	Moderate
2	**The Accuracy of The Data Found in The Received Bills.**	2.98	1.207	Moderate
3	**Procedures of Handling and Reviewing Disputed Bill.**	2.60	1.271	Moderate
Average Mean of Billing Methods		**2.93**	**1.057**	**Moderate**
Failure fixing				
1	**The Repair Of Problems Inside The Houses.**	2.34	1.122	Poor
2	**The Level Of Repair Of The Break downs In The Public Streets**	2.31	1.111	Poor
3	**The Duration Of Time Taken To Repair Malfunctions.**	2.01	1.004	Poor
Average Mean of Failure fixing		**2.26**	**.913**	**Poor**
Power Supply Connection				
1	**The Quality of Distribution Material; Such as Fuses, Transformer; Tools and Equipment used in the New Connection.**	2.20	1.063	Poor
2	***The Accuracy And Quality Of The New Connection.***	2.36	1.066	Poor
3	***The lead time or Speed Of The Electrical Power New Connection.***	1.93	1.029	Poor
Average Mean of Power Supply Connection		**2.20**	**.873**	**Poor**

Table 4.7 presents the first dimension; electricity tariff prices where customers of EEU consider the price of the normal use of electricity are reasonable as the other services. Other services like tariff of consumption during power interruption are moderate. The Price of the additional tariffs

by using extra electricity that will take them from one cluster to another compared to the change in consuming units also moderate**.** When the customer consumes more electricity the tariff rises. However, their satisfaction about tariff prices in general is moderate; not high.

In the second dimension; billing methods, respondents are moderately satisfied with the billing period and the accuracy of bills. There are errors in preparation of bill; the customer reading sometimes encoded by the computer operator in correctly, the reading not correctly taken by the meter reader, the meter reader may take the reading because of the house closed or problems not related to the meter reader, there is also Balance Brought forward problems in the bill, deliance in printing bills. EEU poorly performed on correctness of meter reading, correctness of billing parameter mentioned on the bill. Because of these problems, they are a bit critical of the handling of EEU of the disputed bills. Accurate meter reading, correct billing, and adjustment of bills where overcharges and undercharges exist and process for payment of bills must be the core issue in billing.

The third dimension included in Table 4.7 presents the fixing of electric failure in houses and in public streets and amenities. This current study shows that EEU performs poorly on this regard. The problem starts with the emergency call numbers; they are not properly operated. Then, the time of the repairs is time consuming .When the customer calls to EEU emergency offices the company not responding according to the customer request. When car, fire and other accident created in the distribution network (public street) EEU not responding according to the standard that is 2 hours. In this regard there is high deliance in maintaining any fault. The minimum service standard expected from this utility company in this case is issues of time allowed in attending to faults, obligations with respect to replacement of faulty equipment, installation of equipment such as meters, minimum duration for attending to other technical problems that may impinge on the provision of un interrupted electricity supply to consumers. In this regard the customers are poorly satisfied.

The fourth dimension in table 4.7 is covering power supply connection where respondents are poorly satisfied about the tools and equipment along with the accuracy of connection and the time taken for new connection. In new connection dimension of service customers poorly satisfied. The Ethiopian Electric Utility monthly and annual report testified that there is back logs in new connection. Starting from 2002 E.C to 2007 E.C around 7213 customers are in the new connection waiting list. The major problem the company cited for this back log is poor supply of distribution materials by the company. The poor quality of distribution material and poor work man ship also other problem cited by the quality circle team in the company. The following tables show the number of customer in the waiting list and the relative shortage of material for the new connection and failure fixing work.

Table 4.8 New Connection waiting customers by health and education

Ethiopian Electric utility

North Addis Ababa Region

New Connection waiting customers

No.	Service type	Number of waiting customers in each year					Sub Total	Total
		2002	2004	2005	2006	2007		
1	Water and Health services			4	4	9	17	36
2	Education	2	1	3	7	7	19	

Source: North Addis Ababa Marketing and Sales Office

The above table shows there are 36 customers in the waiting list of water, health and education customers.

Table 4.9 New Connection waiting customers by single and three phases

Ethiopian Electric utility

North Addis Ababa Region

New Connection waiting customers

No.	Service type	Number of waiting customers in each year						Sub Total	total
		2002	2003	2004	2005	2006	2007		
1	Single Phase	3	2	88	766	2395	3784	7038	7177
2	Three Phase	1	0	6	41	54	37	139	

Source: North Addis Ababa Region Marketing and Sales Office

This table show there is 7177 single and three phase customers in the waiting list starting from 2002 E.C TO 2007 E.C.

Table 4.10 Transformer Demand

Ethiopian Electric Utility

New Connection Waiting Customers

Transformer Demand

No.	Region	Voltage Level /kv/	Transformer Capacity in KVA							Sub Total	Total
			50	100	200	315	630	800	1250		
1	N/A/A/R	15	14	32	10	11	2	1		70	78
		33	1		2					3	
2	Compact Transformer	15					1		4	5	
		33									

Source: North Addis Ababa Marketing and Sales Office

This table show that there is 78 transformer supply needed for the above new connection and failure fixing work.

Table 4.11 KWH Meter Demand

Ethiopian Electric Utility

North Addis Ababa Region

New Connection Waiting Customers

KWH Meter Demand

Single Phase			Three Phase /Active Reactive KWHM							Total
5*30	5*100 Pre paid	20/60	15/30	30/60	3- phase pre paid	100/5	200/5	300/5	400/5	7879
5555	2180	9	6	44	19	44	12	6	4	

Source: North Addis Ababa Marketing and Sales Office

This table show 7879 single phase and three phase meters needed for the above new connection work.

Table 4.12 Distribution Material Demand

Ethiopian Electric utility

North Addis Ababa Region

Distribution Material Demand

No.	Material	Description	Unit	Quantity	Total
1	Wooden Pole	8mt.	Ea.	2391	2732
		9mt.	Ea.	97	
		10mt.	Ea.	37	
		11mt.	Ea.	69	
		12mt.	Ea.	138	
2	Drop out fuse	15kv	Ea.	208	217
		19kv	Ea.	-	
		33kv	Ea.	9	
3	HRC fuse	100A	Ea.	132	198
		160A	Ea.	36	
		300A	Ea.	18	
		400A	Ea.	12	
4	Meter Board	Single phase	Ea.	3799	4721
		Three phase	Ea.	856	
		51*16 cm Active /Reactive	Ea.	66	
5	Lighting Arrestor	15kv	Ea.	208	217
		19kv	Ea.	-	
		33kv	Ea.	9	
6	Conductor	AAC 25	Mt.	15000	49175
		AAC 50	Mt.	23000	
		AAC 95	Mt.	11175	
7	Cable	1*4mm	Mt.	59673	64517
		2*10mm	Mt.	4000	
		4*10mm	Mt.	339	
		4*16mm	Mt.	505	
8	Hook	15	Ea.	280	
		LV/N*80/	Ea.	4450	

					473 0
9	Insulator	15	Ea.	280	
		33	Ea.	-	473 0
		LV/N*80/	Ea.	4450	
10.	Pole Shoe	Concrete/steel/	Ea.	27	
		Wooden	Ea.	54	81
11	Load Break Switch	15 KV.	Ea.	6	
		33kv	Ea.	1	7

Source: North Addis Ababa Marketing and Sales Office

Table 4.12 shows the demand for distribution material which needed for the new connection work. To do new connection work and to fix any fault the above distribution material must be supplied to the region store at the right time, at the right quality and quantity.

We may conclude from Table 4.7 that the major problems in the technical services provided by EEU are; handling disputed bills and the long time needed for failure fixing and new connections, low quality of work in the emergency work and the quality and quantity of distribution material they used for fixing electricity failure and for power supply connection is poor. Finally, the overall satisfaction about EEU all technical services are poor. Electricity service delivery in the region is characterized by frequent outages; load shedding, Fluctuations, and the utility company shabby treatment of electricity consumers. EEU must reduce variation in the process of service delivery. There is deviation in the standard in new connection, the standard for single phase is 3days but practically it takes the customer to wait years. The standard for three phases without pole is 7 days but the customer waiting many years. The standard for emergency work is two hours but the customers wait for the service for days and weeks.

4.5.2 Satisfaction of the Quality of Customer Service

This section includes results of the study in quality of customer service matters provided by Ethiopian Electric Utility Company. The results are shown in Table 4.13

Table 4.13 ***Satisfaction of the Quality of Customer Service***

Rank	Customers Services Variables	Mean	Std. Dev.	Satisfaction
1	**On methods of payment via payment method Lehulu and collection by EEU itself.**	2.93	1.094	Moderate
2	**With Respect To The Replies For The Telephone Calls (Emergency call or Other call).**	1.99	1.125	Poor
3	**The provided Service Location is Easy and Clear for Access**	2.71	1.160	Moderate
4	**About The Length of Waiting Time in The company's Offices.**	2.71	1.160	Moderate
5	**About Information and Guidance Provided to Customers.**	2.59	1.121	Poor
6	**With Regard to complaint handling**	2.13	1.037	Poor
7	**Prior Intimidation of Power Cuts.**	1.77	.944	Very Poor
8	**Continuity Of Power Supply.**	1.81	.933	Poor
9	**Good Quality of Power.**	1.99	.982	Poor
Average Mean of Customer Service		2.33	.724	Poor

Table4.13 shows that customers of EEU are moderately satisfied with three customer services; payment methods, the length of waiting time in the company offices and accessibility of customer services offices of EEU. (Means are higher than 2.60). For some customers, the customer payment method is out sourced to lehulu other customers paid their bill in their districts. The payment method lacks uniformity and it is difficult to handle complaint related to bill. The lehulu payment method blamed for Balance Brought Forward problem. In addition the customer complaint about missed bill, estimated readings, and negative bills. So that the customers are moderately satisfied with the payment method. In regard to accessibility of

customer services offices of EEU the rural area customer service center opened additional small customer service center (SATELLITE) to access their customers because of the rural customers settled in scattered way. In the rural areas the customer paid their bill monthly in satellite areas and when they come to market (like kidamea gebaya, hamuse gebeya) and also the district sell the bill in the company vehicles.

Respondents have a poor satisfaction with the remaining five services; reply of employees to customer services calls or the replies of the telephone calls, about information and guidance provided to customers, in complaint handling, in continuity of power supply (the customer says there is frequent power interruption). The process of handling complaints and inquiries from customers at the call center are long and takes more time and effort for customers. There is no information desk or guidance center for customers in the region office.

With regard to the interview result it shows that the quality of power is unreliable (there is high voltage power and the customer property damaged and there is voltage drop most of the times it is difficult to do home activities, commercial business and industrial work). Practically all local and foreign investors engaged in the manufacturing sector are complaining that the persistent power outage ,coupled with the inability of the national electricity supplier to meet the ever growing demand , is determinately affecting their operation by inducing a fall in output and an upsurge in wastage .They say that though they have restored to using generators to maintain the production levels , the extra cost they are incurring has led to a spike in production costs and there by rendered them uncompetitive. Running cost of generator, fuel cost of generator and the life time of generator reduced when the generator operated continuously. In glass and Bags factory the loss is high. The glasses heated and melted by electric city when it lacks continuity of power supply. The heated material changed to scrap and the melted material stacked in the machine and it costs the factory to clean the scrap from the machine is a testimony in Addis Ababa Glass and Bottle factory. Flower farmers in the region need refrigerators to maintain seedlings and harvested flowers, but the reality is the reverse.

The interviewee also mentioned that it is not only industrialist alone who are suffering at the hand of power outage, Small and medium scale enterprises, hospitals schools, households, etc that cannot afford to buy a generator are as well facing the brunt of the problem. And as if power

shortage and outage is not enough, sudden power surges damage electrical appliances for which the utility company rarely pays the compensation.

On an individual and community level, power cuts and fluctuations result in economic, health and security hazards. Besides rendering electrical equipments useless, power cuts and fluctuations considerably diminish the working hours of small businesses and individuals eroding their sustainability. With a considerable number of power cuts, small businesses find it hard to pay rent, salary of employees and expand their businesses. Individuals and families, on the other hand, would be subjected to additional energy and other costs as a result of power cuts. Power cuts also infringe on quality of life.

Power cuts in health facilities can have minor to fatal health hazards. The use of electronic health machines is hampered by power cuts and fluctuations, making it harder for medical personnel to save lives. At individual level ,alternative energy sources such as biomass or charcoal for cooking purposes could prove to be bad for health besides the environmental negative impact their promote.

Power cuts also pose security threats on both businesses and households as those with criminal intent find it easy to manipulate the situation. Besides using the dark, criminals find it easy to maneuver security breaches as electronic security materials would be out of use during power outages. It can be concluded from Table 4.15 that customers are poorly satisfied with the quality of customer services of EEU.

4.5.3 Hypothesis Testing

Now we investigate the differences, if any, between the three types of subscription, residential, commercial or industrial in their satisfaction about the quality of customer service. For that purpose, we use statistical tests; Analysis of Variance (ANOVA) Test and Scheffe Test. Results are displaced in the following tables.

Hypothesis 1

H1: There is statistically significant difference in customer satisfaction level in the EEU tariff services between Residential, Commercial, and Industrial customers.

Table 4.14 ANOVA and Scheffe Test on Tariff

Part I

ANOVA

Tariff

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	2.451	2	1.226	1.383	.252
Within Groups	330.593	373	.886		
Total	333.045	375			

Part II

Tariff

Scheffe

Types of customer	N	Subset for alpha = 0.05
		1
Residential customer	263	3.1014
Commercial customer	64	3.2500
Industrial customer	49	3.3061
Sig.		.411

Table 4.14, Part I shows that there are no significant differences (Sig. or p- value = .252 greater than .05) between the three types of subscription in their satisfaction of the quality of Tariff service. However, we use Scheffe Test (Table 4.14, Part II) in order to determine the ranking of the level of satisfaction among the three groups of subscription. Scheffe test shows that the industrial sector has the highest level of satisfaction followed by the commercial then the residential in the level of satisfaction about the Tariff services of EEU in North Addis Ababa region.

Hypothesis 2

H1: There is statistically significant difference in customer satisfaction level in the EEU billing services between Residential, Commercial, and Industrial customers.

Table 4.15 ANOVA and Scheffe Test on Billing

Part I

ANOVA

Billing

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.047	2	2.523	2.276	.104
Within Groups	373.664	337	1.109		
Total	378.711	339			

Part II

Billing

Scheffe

Types of customers	N	Subset for alpha = 0.05
		1
Residential customers	229	2.8486
Commercial customers	64	3.0990
Industrial customers	47	3.1206
Sig.		.299

Table 4.15, Part I shows that there are no significant differences (Sig. or p- value =. 104 greater than .05) between the three types of subscription in their satisfaction of the quality of customer service. However, we use Scheffe Test (Table 4.15, Part II) in order to determine the ranking of the level of satisfaction among the three groups of subscription. Scheffe test shows that the industrial sector has the highest level of satisfaction followed by the commercial then the residential in the level of satisfaction about the billing services of EEU in North Addis Ababa region.

Hypothesis 3

H1: There is statistically significant difference in customer satisfaction level in the EEU failure fixing between Residential, Commercial, and Industrial customers.

Table 4.16 ANOVA and Scheffe Test on Failure Fixing

Part I

ANOVA

Maintenance

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.609	2	.304	.355	.701
Within Groups	319.696	373	.857		
Total	320.305	375			

Part II

Maintenance

Scheffe

Types of customers	N	Subset for alpha = 0.05
		1
Residential customers	263	2.1952
Industrial customers	49	2.2381
Commercial customers	64	2.3021
Sig.		.778

Table 4.16, Part I shows that there are no significant differences (Sig. or p- value = .701 greater than .05) between the three types of subscription in their satisfaction of the quality of customer service. However, we use Scheffe Test (Table 4.16, Part II) in order to determine the ranking of the level of satisfaction among the three groups of subscription. Scheffe test shows that the industrial sector has the highest level of satisfaction followed by the residential then the commercial in the level of satisfaction about the quality of failure fixing of EEU in North Addis Ababa region.

Hypothesis 4

H1: There is statistically significant difference in customer satisfaction level in the EEU new connection service between Residential, Commercial, and Industrial customers.

Table 4.17 ANOVA and Scheffe Test on New Connection

Part I

ANOVA

New Connection

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	6.729	2	3.365	4.366	.013
Within Groups	287.479	373	.771		
Total	294.208	375			

Part II

New Connection

Scheffe

Types of customers	N	Subset for alpha = 0.05	
		1	2
Industrial customers	49	2.0544	
Residential customers	263	2.1090	2.1090
Commercial customers	64		2.4531
Sig.		.930	.057

Table 4.17, Part I shows that there are significant differences (Sig. or p- value = .013 less than.05) between the three types of subscription in their satisfaction of the quality of new connection service. However, we use Scheffe Test (Table 4.17, Part II) in order to determine the ranking of the level of satisfaction among the three groups of subscription. Scheffe test shows that the commercial sector has the highest level of satisfaction followed by the residential then the industrial in the level of satisfaction about the new connection services of EEU in North Addis Ababa region.

Hypothesis 5

H1: There is statistically significant difference in customer satisfaction level in the EEU customer service between Residential, Commercial, and Industrial customers.

Table 4.1 8 ANOVA and Scheffe Test on Customer Service

Part I

ANOVA

Customer Service

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.559	2	.280	.508	.602
Within Groups	205.491	373	.551		
Total	206.051	375			

Part II

Customer Service

Scheffe

Types of customers	N	Subset for alpha = 0.05
		1
Residential customers	263	2.2733
Industrial customers	49	2.2789
Commercial customers	64	2.3767
Sig.		.694

Table 4.18, Part I shows that there are no significant differences (Sig. or p- value = .602 greater than .05) between the three types of subscription in their satisfaction of the quality of customer service. However, we use Scheffe Test (Table 4.18, Part II) in order to determine the ranking of the level of satisfaction among the three groups of subscription. Scheffe test shows that the commercial customer has the highest level of satisfaction followed by the industrial then the residential sector in the level of satisfaction about the quality of customer services of EEU in North Addis Ababa region.

4.5.4 General Overall Satisfactions of EEU Services

Respondents of the questionnaire are asked a final question about their overall satisfaction with the services of Ethiopian Electric Utility in general. The results are shown in Table 4.19.

Table 4.19 General Overall Satisfaction of EEU Services

General Overall Satisfaction of EEU	**Mean**	**Std. Dev.**	**Satisfaction**
General Impression of the surveyed sample about all services given by Ethiopia Electric Utility	2.26	.988	Poor

Table 4.19 reveals that customers of Ethiopian Electric Utility Company have a poor satisfaction with the services of the company in their overall evaluation. The Mean is 2.26 out of 5 which represents a poor satisfaction since the value of the mean is below 2.60. I attempt to determine the differences between the three groups of subscription; residential, commercial and industrial, in their general overall satisfaction about EEU. For that purpose we use two statistical tests; Analysis of Variance (ANOVA) Test and Scheffe Test. Results are shown in Table 4.20 (Part I and Part II).

Hypothesis 6

H1: There is statistically significant difference in the general performance of EEU between Residential, Commercial, and Industrial customers. Or there is a statistically significant difference between the three groups of subscription; residential, commercial and industrial, in their general overall satisfaction about EEU.

Table 4.20 ANOVA and Scheffe Test on General Overall Satisfaction about EEU

Part I

ANOVA

G1

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.343	2	.171	.170	.844
Within Groups	377.146	373	1.011		
Total	377.489	375			

Part II

G1

Scheffe

Types of customers	N	Subset for alpha = 0.05
		1
Industrial customers	49	2.20
Residential customers	263	2.25
Commercial customers	64	2.31
Sig.		.804

Table 4.20, Part I shows that there are no significant differences (Sig. P-value = .844 greater than .05) between the three types of subscription in their satisfaction of the general performance of EEU. However, we use Scheffe Test (Table 4.20, Part II) in order to determine the ranking of the level of satisfaction among the three groups of subscription. Scheffe test shows that the commercial sector has the highest level of satisfaction followed by the Residential then the Industrial in the level of satisfaction about the quality of customer services of EEU in North Addis Ababa region.

The researcher conducts interview analysis to know the factors that affect customer satisfaction.

- First, there is a change in the power utilization trend. For instance, when we take residents of Addis Ababa, they used to use fire wood to cook in the past .Now people live in the condominiums where it is not convenient to use fire wood .So now use electric power to cooking and other purposes. The life style of the public is changing. This has increased the demand for electric power. Second, due to the favorable investment climate foreign and local investors are investing in different sectors, including manufacturing. Big manufacturing industries are being established all over the country. These factories need a large amount of electric power. So overall, the demand for electric power is increasing. The flourishing electricity intensive industries, commercial buildings ,businesses, and the widespread utilization of in efficient electrical appliances ,coupled with the inefficiency of the electricity utility services, not only created a huge gap between electricity demand and supply, but also negatively affected the reliability of supply of electricity to the country.

- The Company must reduce energy loss. This creates power supply shortage. The power produced not used efficiently. The infrastructure to control energy loss must be installed for example installing energy meters in the substation and the distribution lines.

- Illegal connections: many user of electricity have no formal business arrangements with EEU; they only get their houses connected illegally. This results in the inability of EEU to account for their true customers and plan for the load demand by them. This also one of the causes for electric failure.

- Ethiopian Electric Utility distribution and transmission lines are over heads not underground. Most power outages and disturbances can be attributed to factors beyond the control of a utility. Ethiopian Electric Utility Energy's system is exposed to

environmental influences and normal operational conditions, which can create both power quality and reliability disturbances. Common sources of disturbances include :

Lightning , Insulator Flashovers, Dig-ins on Underground Lines, Automobile Collisions, Birds and Other Wildlife ,Trees and Vegetation, Strong Winds, Vandalism, Equipment Failures.

- Because of high load or stress in the distribution and substation line it is impossible to provide power to new customers.
- In related to billing poor quality of bill, missing of the customer bill, Balance brought forward problem, negative bill, estimation ,electricity disconnection by EEU when the customer already paid are the major problems.
- Lack of equipment and safety material like stationary, computers, printers, fax, safety material like staffe, ferroti etc. In 2007 alone because of safety material unavailability and lack of caution 93 employees died at the corporate level by electricity accident.
- Telecommunication network interruption especially in the billing, collection, finance, district and enforcement departments (which do technical work like inspection). For pre-paid customers, because of power interruption for long time and interruption of computer system network the customer unable to fill prepaid electric card.
- Distribution materials problem in terms of quantity and quality. Lack of supply of Transformers, wires, meters, fuses, lighting arrestor etc. which is necessary for the service according to the customer applications.
- Vehicle is a major problem. The exiting vehicles are very old and not enough. Some districts operated without even one vehicle. Cranes, Forklifts, Emergency vehicles, heavy trucks also a problem. Lack of qualified staff (employees and management staff) in terms of quantity and quality. Lack of training and education especially for technical employees.
- Lack of modern testing equipment: The common faults on transmission and distribution lines include: short circuits, open circuits, and earth faults. The point of fault may be located at several kilometers from the closest settlement of EEU station inside the bush. There is no modern equipment available to the power industry in Ethiopia to indicate the exact point of the fault. It takes the maintenance crew a lot of time tracing the transmission and distribution lines of several kilometers by foot, inside the bush. This is a

difficult task and is time consuming .The feeder concerned is likely to be in darkness for a long period of time.

- The customer unable to install some protective devices like power factor corrector, Adapter, lightning protection etc.

Implementation of the continuous improvement model:-

By measuring customer satisfaction EEU get feedback to continuously improve the service. EEU can improve the service by applying the Deming wheel that is PDCA (Plan, Do, Check, Act) cycle. Management must be responsible in reviewing customer feedback. That is the customer problem especially deliances in failure fixing and, new connection; poor quality of bill; very poor intimidation of power cut; poor continuity of power supply. The management by planning appropriate policies, procedures, objectives and strategies, and by improving the capacity and maintenance of transmission and distribution lines, by supplying appropriate distribution material to the work force can improve the services of EEU. The management can also use the company internal audit report to make sure the systems and processes are appropriately going on.

Management also makes of a review on non-conforming processes and a procedure should be in place to ensure the problem is controlled and dealt with appropriately. In the new connection many customers are in the waiting list for more than three or four years. These customers must be dealt according to their registration sequence. The company not informed its customers by different media about planned interruption, for how long the power interrupted. The customers complaining on the employee of the emergency department because they are not responding to the customer call when fault occur in the customer premises and its amenities.So all these non conforming processes must be dealt appropriately.

EEU must measure the customer satisfaction through different mechanism .Through survey, internal audit report, by assessing customer complaint and other means and by analyze the data the company must continually improve the service. This process must continue as a cycle.

Chapter 5 Conclusion and Recommendation

5.1 Conclusion

Total quality Management is one of the management philosophies which emphasize customer as a central point in organization operation. EEU must identify customer requirements and continuously improve its services to meet customer satisfaction. In this research customer requirements are identified by distributing a questionnaire to the customer and measured the satisfaction level of the customer after the Indian management over take the overall management of the company .The response from the customer shows that the company performed moderately in Tariff, billing, and poorly on failure fixing and new connection. The company also moderate performance on three customer services that is payment methods, the length of waiting time in the company offices and accessibility of customer service offices. The customer has a very poor satisfaction on prior intimidation of power cuts. Customer's also poor satisfaction with emergency call, about information and guidance provided to customer, in complaint handling, in continuity of power supply and voltage level.

The researcher identified problems from the quality circle reports and from other sources like direct observation and discuss with the company managers and employees. Major problems identified are poor supply of distribution material; shortage of power supply which does not meets demands, lack of proper complaint handling mechanisms, Lack of management commitment. To meet the customer satisfaction the company must concentrate on its customers and priority must be given to them more than other issues in the company. EEU must periodically administer customer satisfaction survey to measure customer satisfaction. To continuously improve the service ISO 9001:2008 is a requirement to continuously improve management responsible for identified the problem and improve the service. Management also responsible for providing appropriate resources and measuring and analysis and continuously improve the service. The management must be responsible to identify problem and take corrective action timely. Resources must be supplied at the right time and the resource must be used effectively and efficiently. Periodically measuring customer satisfaction, analyze it and taking corrective action is important to meet or exceed customer satisfaction and to continuously improve the services.

5.2 Recommendations

1. The main problem in power interruption and late new connection is low generation capacity of electricity. So the company must meet the growing demand of electricity. The government must accelerate the generation of electricity courtesy of the mega projects it is undertaking from renewable sources. Independent power producers (IPP) are promoted to supply power through the Electricity Operations Regulations (49/1999), the letter of power sector policy (2003) and the investment proclamation (280/2004).

Ethiopia must continue to promote the use of solar energy to replace fuel base lighting among rural households and off- grid electrical needs. Consumers, with financial help from the utilities, will need to replace old refrigerators and air conditioners with more efficient models. The Rural Electrification Fund Office (RE) must purchase and distribute Solar Home System (SHS), and improved cook stoves that are not connected to the national grid. Promote the use of incandescent florescent lamp also save energy.

2. Tackle the power outage that is increasing the cost of production of manufacturing industries, which in turn makes it extremely difficult for to emerge competitive on the global market. Particular attention should to be paid to such export commodities as textile, hides and skins flowers, cement etc which the country hopes to bring in desperately needed foreign exchange.

3. Most of the existing power substations are old. The electric power distribution lines are aging. So is the network. The substations are overloaded. The transmission lines are unable to accommodate the ever increasing electric flow. Most of the transmission lines are very old. So, improve the capacity of Transformers, substations and distribution networks, Avoid connection between electric lines and trees, Aging networks were also being replaced; supportive electric transformers must be installed, Preventive maintenances for distribution networks for example maintain loose line, old poles, etc. Upgrading the power substations to reduce the power congestion and building new substations. Provision of additional distribution transformers: in order to minimize the problem of overloading at the distribution ends, there is need to install more transformers to take care of excess loads that cause overloading on distribution networks. This will improve the supply of electricity for the customers.

4. Strong communication infrastructure within the utility's operational technology and implementation of SCADA to centralize control and monitor operations reduce power failure. Information Technology plays a vital role in a reliable power system and is the back bone to the network. The IT network is the communication tool between the grid stations, distribution, customers, and the utility staff. In addition modern testing equipment should be made available to the maintenance crew in order to reduce the long time of power outage due to the problems of fault location.

5. Distribution Management System (DMS) to centralize monitoring of the distribution network and provide faster identification of fault location. Distribution Automation (DA) to centralize control of the distribution network and provide faster restoration of faults. Implementation of DMS and DA minimizes the diagnostic time for faults and isolates the fault. This, in turn, lessens the amount of effort needed by field workers and minimizes outage time. To maximize usefulness, DMS should be integrated with a geographical information system (GIS) to provide a real world location.GIS can access land base information (such as roads, buildings, etc), the electrical network and information on consumers as they relate to the issue. An outage management system (OMS) should integrate the Customer Relationship Management system, SCADA/DMS, the Advanced Metering Infrastructure (AMI), GIS, and the work management system (WMS).An integrated OMS help manage outages efficiently by providing the utility with a perfect integration platform for all systems and processes responsible for power supply related issues.GIS has a greater impact on in assisting the utility in accessing customers and service problems. Synchronizing substations and integrating SCADA at the distribution level enhance reliability and facilitate system automation.

6. Demand Side Management (DSM) is an important tool to control consumption ,especially a country like Ethiopia where a supply–demand gap exists.DSM can provide overall energy savings, improve reliability ,increase revenue (through reduced power theft or reducing costly peak demand),and positively impact tariff subsidies.

7. Payment options should be as convenient as possible- to include collection centers, website, debit /credit cards, any time payment machines (ATPM), etc. offering customers multiple payment options as away to reduce nonpayment and to satisfy customers.

8. Automatic Meter Reading is a worthy investment for high revenue customers.AMR is used for large commercial and industrial customers to ensure timely and accurate billing and regular monitoring to prevent theft. Through AMR, reading meters and billing can occur on the same day.AMR benefit include reduced meter reading expenses ,increased accuracy ,improved reliability ,and reduced likelihood of tampering or theft. It provides customers the flexibility to pre-pay for electricity, while empowering them to monitor usage online and track expenses. Domestic consumers' meters are read on hand held devices, ensuring 100% accuracy and timely reading and billing by allowing instant onsite billing clarifications if needed. EEU must implement four or three levels of meter reading and billing quality checks before a consumer bill is generated. Accurate meter reading, correct billing, and adjustment of bills where overcharges and undercharges exist and process for payment of bills must be the core issue in billing.

9. Introduction of pre–paid meters and smart meter: if the pre paid meter introduced in all residential and commercial customers, this will check a lot of problems including power wastage and problems related to billing and meter reading and collection. For industrial customer it is better to install smart meters which generate detail report about the consumption of customers and high accuracy.

10. Law enforcement: The Company should enforce tougher penalties for illegal users of electricity and on the vandals of public properties.

11. The supply and procurement of material and vehicles must be in the right quantity, quality and in the right time.

12. Call center must be free and easily accessible, like call no. 905 but in the language customer communicate like Amharic and other local languages.

13. Complaint management should be tackled through a detailed complaint registration and status update system. Suggestion Box must be available to customers. Customer Service department should process all types of customer request by customer service procedure standard.

14. Staff should receive a variety of regular and ongoing training to meet or exceed customer satisfaction.

15. Most of the power distribution stations are busy and overloaded by electric current from 6 pm to 10 pm in the evening it is advisable for customers to choose convenient time to utilize power for house hold purpose. That is after the power load is relatively relaxed.

16. Customers have the responsibility to install necessary protective equipment to limit the adverse effect of power quality problem and to reduce loss, for example Power factor corrector, Adaptor, Lightning protection system etc. In addition, changing the over head distribution systems to underground system also reduce power cut.

5.3 Recommendation for Further Researches

The researcher suggested the following areas for further researches:

- Commercialization or privatization better for EEU to improve services?
- The impact of corruption on Electricity services.

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