

INFORMATION TECHNOLOGY AND ITS POSTIVE IMPACT
ON PETROLEUM PRODUCTS MARKETING IN NIGERIAN:
PPMC AS A CASE STUDY

BY

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DECLARATION

I Olaitan Oluwole G.P hereby declare that this research work is my original effort and has not been presented (whether in part or whole) for any other purpose(s) prior to this time, I therefore accept sole responsibility for any error(s) their in.

All materials (references) consulted in the course of this study have been duly acknowledged.

Sign: _____

Date: _____

CERTIFICATION

This project titled “Positive Impact of Information Technology on petroleum Product Marketing in Nigeria PPMC as a case study” meets the regulations governing the award of PGD in Business Management Technology of Federal University of Technology, Minna and it is approved for its contribution to knowledge and literacy presentations.

Alh. Danladi Hakimi
Project Supervisor

Signature/Date

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Head of Department

Signature/Date

DEDICATION

This project is dedicated to the rock of ages, to the ancient of days, my trust my refuge my saviour, the only source of unfailing help, my love and my best friend, his name is J-E-S-U-S.

It is also dedicated to my late parents, Mr. F.O. Olaitan and Mrs. C.E. Olaitan for educating and training me in the first place, may their gentle souls continue to rest in peace.

Special dedication goes to my darling wife for all her encouragements and to my children Gospel and Grace for cheering me up always; my God continue to keep us all and bless us as a family.

ACKNOWLEDGEMENT

I cannot stop thanking God for he is my all-in-all; he is responsible for every little achievement I make, praise be to his holy name forever more amen.

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I cannot finish this part without thanking my siblings (my brothers and sisters) for their support always through prayers, it is the power of God through prayers that can see a man through, may God almighty continue to bless their respective families amen.

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ABSTRACT

Information is an indispensable element without which an organization cannot operate successfully, it is a useful aspect of decision making and it cuts across the organizational structure, which include finance, marketing, personnel and production. Technological break through of recent years have heralded a new dawn in handling an organization information structure. This technology, which is associated with the use of computers and telecommunication devices, are all combined to form what is known as information technology. Marketing is the bedrock of an organization's operation as revenue is generated through it. As a field, it involves the application of various principles theories and practices such as sales, advertisement, merchandising, inventory management, customer satisfaction etc. Petroleum product marketing is an important aspect of Nigeria economy and as such must be taken seriously, this is why a very able parastatal (PPMC) is set up for it. Marketing of petroleum products in a big country like Nigeria is a large network of activities, therefore the use of information technology via computers and telecommunication is highly necessary to facilitate and be a help mate to the other human manual activities to see to the smooth running and enable PPMC to achieve its corporate aims and objectives. This study tends to relate information technology (as a variable) and assess how well it has been applied in the organization's marketing activities and operations.

CHAPTER ONE

Brief Overview of Information Technology

1.1 Introduction

The growth of contemporary age has evolved in the use and application of information technology in virtually every field of human endeavour and the twentieth century electronic invasion and growth has really enhanced faster data processing and hence quicker availability of information. Today, largely through advances in computer knowledge and information technologies (IT), we are in information age.

Information is defined as facts told or knowledge gained or given which is useful in making good decisions. Sources of information may be external or internal. Internal sources may arise from organizational objective, operational behaviour, finances and production decision while external sources may come from environment, competitors, consumers and government policies. Most big and sophisticated organizations have management information

system (MIS) unit where data processing activities of the organization are handled, most MIS unit employ the use of computers and other related devices in information processing.

Information is often confused with data, however, it is important to know that they are not the same. Data simply means raw facts that need to be analysed and processed to information, this means that information refers to already processed data.

Information Technology (IT) is the termed used to describe all computers, telecommunication and other related technology that is concerned with information processing and dissemination. Thus any form or sources of information which enables management to be carried out more efficiently and effectively aiding the actualization of organizational goals can be regarded as a form of IT (miles 2000).

The use of information technology in both private and public organizations is becoming increasingly significant as it paves way for simplified modes of operations i.e. it provides practical means, way, methods, procedures and skills of operationalizing the functions

performed by these organizations and in doing so enhances a higher level of accuracy and elimination of cumbersome and non standard procedures.

The gradual encroachment of these electronic 'help mate' has simultaneously resulted in the gradual elimination of manual procedures in the performance of organizational activities whether in product or service marketing, small scale or large scale industries, government agency/parastatals or even multinational firms.

As earlier pointed out, organizations make use of information along functional lines i.e. in marketing, finance, operations etc and it would be an exception as information technology has really improved its activities in every strata. How well has PPMC excelled in the use of information technology forms the bulk of concern among other issues, this study intends to explore as the research progresses.

In the era of global advancement where technology has eaten deep into the fabrics of humanity, the need for its application in the activities of every organisation is very paramount as it creates the basis or criteria to compete in global market arena. Against this

background, the need for PPMC to imbibe and integrate sound info-tech practices to aid its functions is highly necessary.

1.2 Statement of the Problem

From logical perceptions, inefficiency in most organization PPMC inclusive has been attributed to factors such as inadequate record keeping and inability to use and employ appropriate technology in handling organizational information for management decision making.

Against this background, the researcher intends to provide answers to these research questions by administering questionnaires and interviewing the management staff of the Petroleum Pipelines and products Marketing Company PPMC. Part of the questions to be answered are:

1. What are the general information technology practices in the organization?
2. How is IT relevant to petroleum product marketing in the organization?

3. To what extent has the organization absolved info-tech machineries as an integral part of its marketing operations?
4. Has the introduction of IT improved the quality product marketing in the organization?
5. What impact is IT having on the growth of the organization?
6. What effect does info-tech systems have on the existing manpower?
7. How has the introduction of IT in PPMC improved the quality of life of Nigerians?
8. What are the limitations encountered in the application of IT in PPMC?
9. Should the use of IT be encouraged or discouraged?
10. What are the future prospects of IT in the Nigeria Petroleum Marketing Industries?

1.3 Scope and Limitations of the Study

For the purpose of this work, we shall concern ourselves to the petroleum industry with some reference data from PPMC, independent marketers and major marketers of the petroleum

products. A good attempt will be made at analyzing the impact IT has on PPMC right from its inception to date.

Carrying out a study of this nature cannot but experience some obstacles, the researcher however has done his best possible to minimize the effects of the militating problems. Despite this, some problems still lingered on throughout the period of this research some of them are:

- (1) Displacement of information: some vital information were destroyed as a result of virus effect and handling if diskettes, some files are also misplaced, burnt or loss completely.
- (2) Time Constraint: A research of this nature requires adequate time for both planning and execution, unfortunately, this was not available due to pressure of work from school and office.
- (3) Finance: Finance has been a major constraint in carrying out this research money is not available at all times.

- (4) Respondents Attitude: Even at the wake of the twentieth century, Nigerians are still not well informed on what research is all about. At the time of introducing the researcher to the respondents, some of them show a great deal of reluctance hiding under the canopy of 'office secret' and expressing fear of losing their jobs.

1.4 Objectives of the Study

The broad objective of this study, is to ascertain by means of evaluation, the extent to which information technology applications has affected and assisted the operational activities of PPMC i.e. to understand the working of IT system in the running of pipeline and product marketing company PPMC.

The project is designed to know the exact impact and determine whether it has elevated it or otherwise. Other specific objectives include:

- (a) We want to know how IT has helped to improve marketing in the organization.
- (b) How IT has affected the growth of PPMC
- (c.) To know whether further utilization of IT should be encouraged or not
- (d) To show that IT can help to improve the economy of this country via petroleum product marketing
- (e) To determine whether the benefits from the use of IT in PPMC is commensurate or justifies the cost associated with its introduction and utilization.
- (f) One of the objectives of this work is also to encourage research into the field of information technology. There is also the need to sanitise the petroleum product marketing,

it is the intent of this work to throw light on the limitation faced by this industry which could improve its services and bring a new lease of life to consumers in satisfaction and increased values.
- (g) To have an elementary/functional understanding of information technology.

- (h) To evaluate the performance of PPMC prior to info-tech age in comparism with the present.

1.5 Significant of the Study

The importance of IT as a product marketing tool and the importance of petroleum product within any society or economy make this work very significant as it would in any small way contribute to the existing body of knowledge, suggesting improvement where necessary, crate awareness and also encourage researches into the field which will eventually affect the positive growth of PPMC in particular and the economy of the country in general.

The significant of this study can be perceived in three major perspectives as follows.

- The Researcher
- The organization (case study)
- General

- (1) The study will expose the researcher to more knowledge and use of information technology, which is fast becoming a singular passion to reckon with in making the world a global village.
- (2) The study can help to reveal the weakness and opportunities of the organization hence accurate decisions can be taken by the management; it also help the organization to improve on their activities where necessary.
- (3) The study could be relevant to government agencies like bureau of public enterprises. It could be useful to government ministries like industry, commerce, social development, labour and productivities. It will also be useful to government parastatals like NNPC. LNG, DPR in PPMC and to labour unions like PENGASSAN, NLC etc. This study is also useful to people who might be interested in carrying out further research since it is relatively new and vast.

1.6 Formulation of Hypothesis

In research methodology, hypothesis can imply a proposition that is stated in a testable form that predicts a particular relationship between two or more variables. It is a tentative explanation for which the evidence necessary for testing it is best potentially available (Bailey 1994:43).

A hypothesis could be null usually denoted by H_0 , which assumes no relationship between variables. An assumption made against the null hypothesis denoted by H_1 is called an alternative hypothesis.

The following hypothesis has been developed for this study since it is scientific in nature.

Hypothesis One

H_0 : Info-Tech cannot be applied in product marketing in PPMC

H_1 : Info-Tech can be applied in product marketing in PPMC

Hypothesis Two

Ho: The use of Info-Tech has no positive impact in PPMC

H1: The use of Info-Tech has positive impact in PPMC

1.7 What is IT in Petroleum Marketing Industry

The business mission statement of PPMC is: 'To ensure security of supply of petroleum products to the domestic market at low operating costs; market special products competitively in the domestic and international markets; provide excellent customer service by effectively and efficiently transporting crude oil to refineries and moving refined products to the market' – PPMC profile 2004. The key elements of the business mission as identified by the company are:

- ▶ Efficient transportation of crude oil to the refineries
- ▶ Efficient and effective evacuation of refined petroleum products from refineries
- ▶ Security of supply of petroleum products to the domestic market

- ▶ Competitive marketing of special products
- ▶ Safe operation at minimal cost

Some of its other aims and objectives are:

- ▶ It will stimulate the consumption of liquefied petroleum gas LPG to a significant level of the domestic energy mix.
- ▶ After consolidating the home market, intends to explore possibility of extending its line network to neighbouring countries to earn valuable revenues.

1.7.1 Mode of Operation of PPMC

The company will buy crude oil from the federation account on behalf of NNPC or can receive it from the NNPC unit called National Petroleum Investment Management Services (NAPIMS). It then supplies the crude oil to refinery for refining; the company will pay a fee to the refineries for this service. It will then take the products obtained to depots through the pipeline systems for sale and onward distribution to the petroleum marketing companies. Sometimes

petroleum products are imported to supplement local production when the local refineries are unable to process enough for country needs.

Petroleum products which are either imported or locally refined are received by PPMC through import jetties and pipelines are distributed through pipelines to depots strategically located all over the country from where petroleum tankers lift the product in a process called bridging to designated retail outlets; there is also provision for using the rail system to move products from some of the PPMC depots. Nigeria product pipelines has a total length of about 4,950 km. The products are moved through the pipelines by pumping using mainline and booster pump installed in pump stations scattered around the country. The products are pumped through the pipelines to several depots in the country. Presently, there are about 21 depots also scattered all over the country (Port Harcourt, Aba, Enugu, Makurdi, Yola, Warri, Benin, Ore, Ibadan, Mosimi, Lagos satellite (Ejigbo), Atlas Cove (Takwa Bay), Suleja, Minna, Kaduna, Kano, Gombe, Gusau, Jos, Maiduguri and Calabar.

The products pumped are:

- ▶ Premium Motor Spirit (PMS) Petrol
- ▶ Automotive Gas Oil (AGO) Diesel
- ▶ Household Kerosene (HHK) Kerosene

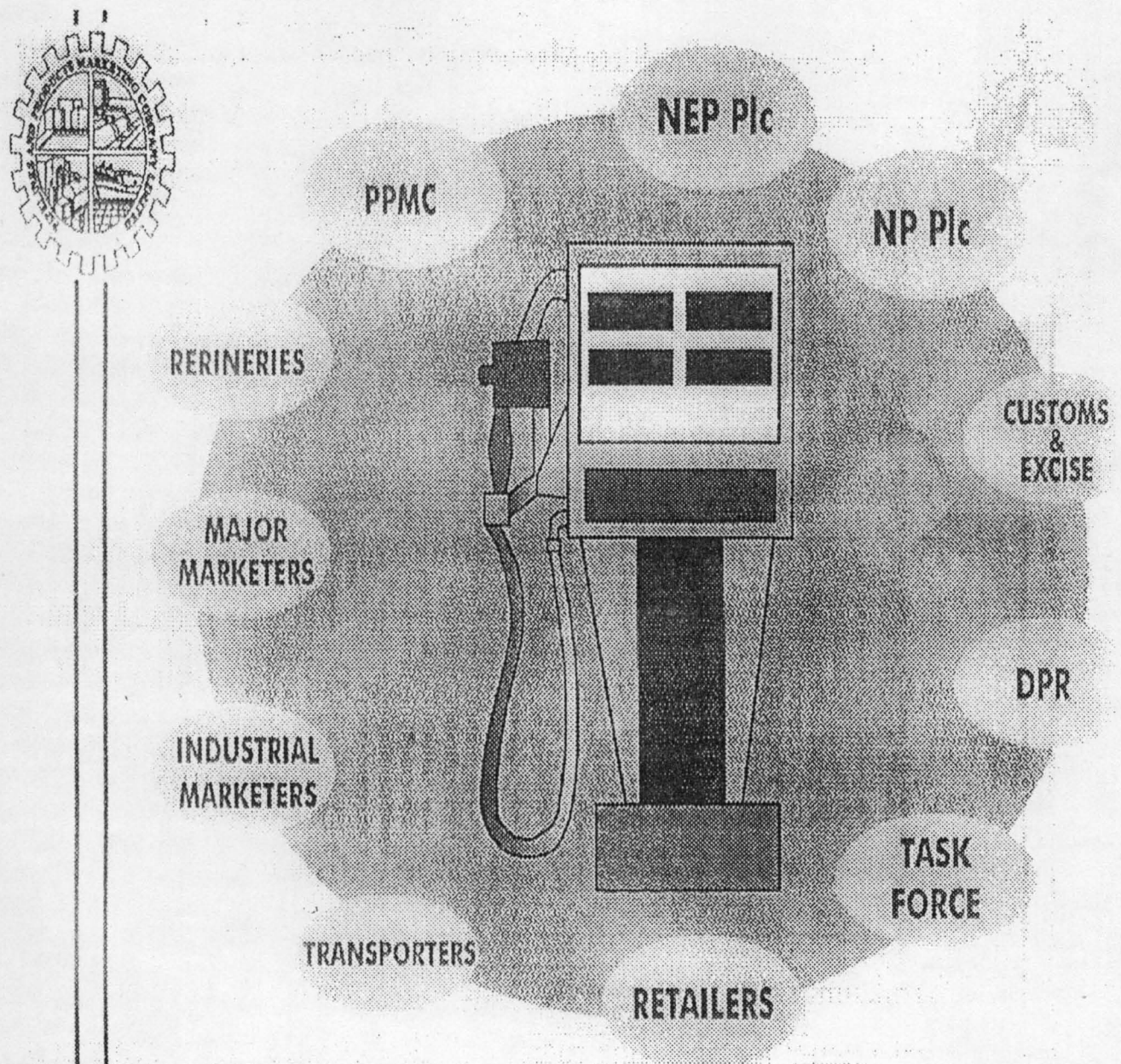
From the above discussion, it can be seen that the work of PPMC is largely extensive and rather complex involving network of pipeline and depot system to ensure accurate distribution of petroleum products to the nook and cranny of a big country (Nigeria) with a population of close to 160 million people. To ensure accurate distribution, accurate means of doing it is also necessary; hence the need for effective information technology via computer and telecommunication; in PPMC Remember information is power and power is the rate at which work is done.

1.7.2 Uses of IT in PPMC

Info-Tech has helped PPMC in faster data processing, storage of vital information concerning lifting and distribution of products which is effectual for monitoring the movement and sales of the product, it has help member of staff in the presentation of reports, it has facilitated budgetary procedures, helped in inventory control and enhanced the pay-roll system.

With all these, crucial management decisions are taken on time for the smooth running of the organization and for the over all well being of Nigerians.

Figure 1.7.1
PARTICIPANTS IN THE TRANSPORTATION AND
DISTRIBUTION CHAIN



SOURCE: PPMC PROFILE 2004.

1.8 History and Origin of PPMC

Up till 1965 when Nigeria's first petroleum refinery was established in Port Harcourt by Shell and British Petroleum (BP), petroleum products used in the country were imported; the importation of petroleum products continued even after the refurbishing of the old Port Harcourt refinery which was damaged during the civil war, today, the story is different, the marketing companies (major and independent) now distribute most of the product to the end users after receiving supply from PPMC. The pipelines and products marketing company limited (PPMC) as it is today was created out of the former pipelines and products marketing sector (PPMS) of the NNPC in March 1988 during the NNPC re-organisation of that year. When NNPC was established in the year 1977, its marketing division was called Pipelines and Products Marketing Division (PPMD), this transformed to PPMS and later PPMC.

Petroleum products demanded in the country before the civil war were used Mainly for operating motor vehicles, electronic power generators, heavy industrial plants and for lighting and heating/cooking in homes. Even with all these uses, meeting the demand for petroleum products

was not an issue of concern to the government. However, by the end of the civil war in the mid 1970's demand for petroleum products in the country had outstripped the production capacity of Nigeria's only refinery. Products consumption took a vertical climb rising from 21,516 barrels per day in 1970 to 68,217 barrels per day in 1975 – PPMC profile (2004). Consequently Petroleum Product Marketing activities became very big businesses in Nigeria hence the establishment of PPMC.

The following are the managing directors of PPMC from inception (1988) to date.

1. Engr. D. A Bayero - - - - - 1988 – 1990
2. Alhaji A.N. Abdullahi - - - 1990 – 1992
3. Mallam M.L.Buba - - - - - 1992 - 1994
4. Alhaji. A. U. Gumel - - - - - 1994 – 1995
5. Alhaji H. A. Abubakar - - - - 1995 – 1998
6. Mr. O. C. Okonkwo - - - - - 1998 – 1999
7. Engr. D. M. Nzelu - - - - - 1999 – 2003
8. Engr Austin Oniwon - - - - - Aug. 2003 – Nov 2003
9. Engr. S. A Achimugu - - - Nov 2003 to date

1.9 Presentation of Project

In the first chapter of this project, the researcher will introduce the subject matter. What the problems are, the objective of the research work, the scope, limitation and the significance of the study and definition of terms. In the second chapter, related literature would be reviewed. In the third chapter, we shall concern ourselves with the research methodology. In the fourth chapter, we shall concern in data analysis while the fifth and the final chapter is concerned with the summary of the research, conclusions, limitations faced in the course of the research and recommendations based on the research findings.

1.10 Definition of Terms

- (1) Hardware: This consist of the physical (mechanical and electrical) components that make up a computer system e.g. integrated circuits (IC'S), floppy disc drive, input and output devices etc.
- (2) Software consists of the various program executable on a computer system together with the associated documentation
- (3) Data: It refers to raw facts and figures that are yet to be processed.
- (4) Information: It refers to processed data, it is any useful fact in making decisions.
- (5) Internet: It is a collection of many computer network all over the world.

- (6) Intranet: It is the collection of computer network within an organization geographical location not a restriction.
- (7) Extranet: It is the entire collection of computer network beyond an organization, i.e. computer network world over. Internet is a form of extranet.
- (8) WAN: Wide Area Network
LAN: Local Area Network
MAN: Metropolitan Area Network
- (9) Info-Tech: Information Technology
- (10) IT: Information Technology
- (11) RAM: Random Access Memory
- (12) PPMC: Pipelines and Products Marketing Company Limited
- (13) PPMS: Pipelines and Products Marketing Sector

- (14) PPMD: Pipelines and Products Marketing Division
- (15) DPR: Department of Petroleum resources PPMC
- (16) NEP PLC: National Electric Power PLC
- (17) NP PLC Nigerian Petroleum PLC
- (18) LNG : Liquidified Natural gas

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

Just as the overall working of any system depends largely on some indispensable elements e.g the role of fuel to automobiles, food to man etc so also this project work is dependent on this chapter (literature review) as in it we can find the summary of previous related studies which is a pivot of exposition on the research. It includes information from all major and significant previous texts, journals, research project, articles e.t.c. the objective of this chapter includes: to add or complement existing knowledge, be consistent with basic principle of existing state of knowledge and to ensure non duplication of work which had already been done.

This chapter intends to explain some key issues the researcher considers to be of relevance to the study, some of them are: concept of information technology, evolutions of information technology, functions of information technology on petroleum product marketing, business process re-engineering via information technology e.t.c

2.2 Concept of Information Technology

The term information system is normally used in situations where an organization is being considered as a whole with respect to its information requirements and utilization. The information system of an organization can therefore be defined as the total apparatus for handling information within an organization in all respect French C.S A(1997:21)

Usually and basically, organizations strive to achieve their goals for their benefits and that of their client; to achieve these objectives, an organization must plan ahead, control and co-ordinate its activities, for this, it depends on the provision and communication of information. The information is likely to be used most effectively if is seen as a resource which needs to be exploited to the fullest by the whole organization. Information is obtained by assembling and processing of data into a meaningful form e.g payroll, an invoice, financial statement, sale and marketing etc

Data processing is the collection and manipulation of items of data to produce meaningful information. For many years, data processing have involved electronic means, principally the computer; any data processing must therefore look at electronic data processing (EDA) which is an important area of information technology (IT)

2.3 Basic Understanding Of Information Technology

Information technology is the technology which supports activities involving the creation, storage, manipulation and communication of information, together with its related methods, management and application, thus information technology may be seen as the broadly based technology needed to support information system. Woherem (200:19)

Info- tech embraces two main technologies or domains namely, computers and telecommunications, the two involve refining of data. Today the word data encompasses, vice , text, numbers, figures, fax, graphics, pictures, video and multimedia Habadah (2000:31)

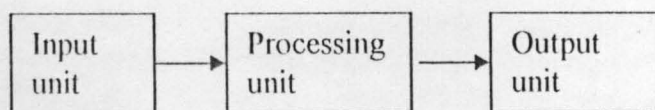
At this point , we will discuss the two main domains of information technology.

2.3:1 Computer System

A computer is an electronic machine or device which works under the control of a stored instruction to accept data as input , process it using the arithmetic and logic processing unit and then produces output (information) in a specified pattern from its internal processing and also stores results for future use shay W.A (1995:4)

A computer could also be seen as a device which can accept data in some predetermined form , juggle with it for some time according to an arranged set of instruction or rules and then return the information in another form. It basically has three sections as illustrated in the diagram below:

Figure 2.3: 1



A computer may also be defined as a device that works under the control of stored programs, automatically accepting, storing and processing data to produce information French C.S (1997:11)

The first programmable general-purpose computer was developed at university of pennsylvania in 1946; it was called the electronic numerical

integrator and calculator (ENIAC). Since the use of ENIAC, computer technology has progressed rapidly. With further

Advancement in technology, new production techniques led to better quality and sophisticated products which resulted to the reduction in size of components. With the availability of 'micro processor chip', more functional and processing capabilities could be encapsulated in smaller and smaller chips. With this, various sizes of computers are available. One of the ways by which computers can be classified is through their sizes, thus we have

- Palm top computers
- Lap top computer
- Desk top computer
- Note books
- Personal digital assistance
- Word processor
- Work stations
- Mini computer
- Main frame and super-micro computers

2.3.2 Parts Of A Computer

A complete computer system is made up of two main parts:

- (i) The hard ware

(ii) The software

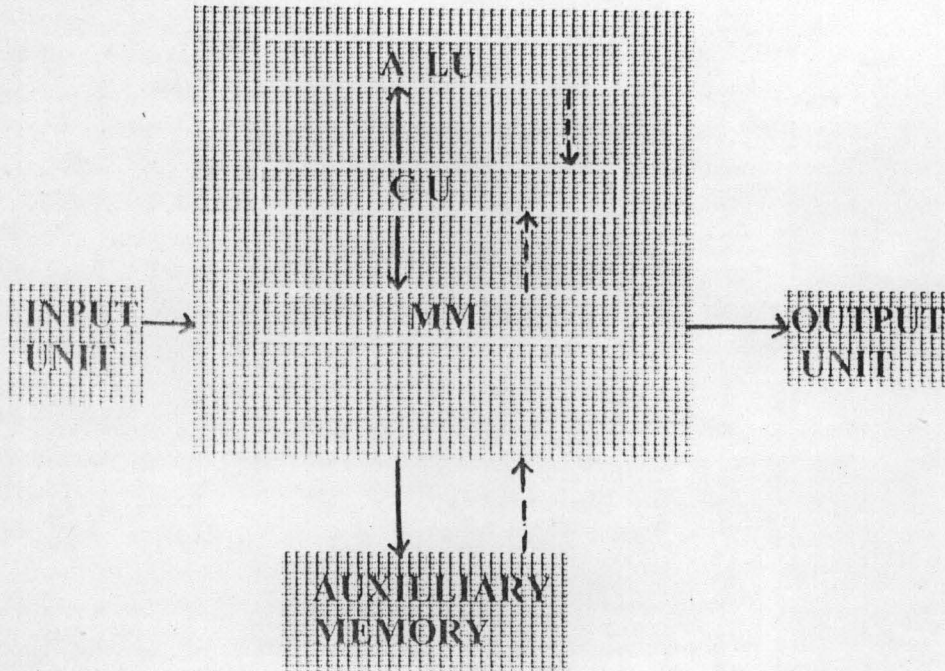
The hardware includes all the physical parts which can be seen and touched i.e. those that are physically manipulable e.g. monitor, keyboard, mouse e.t.c.

Software refers to the set of instructions that are fed into computer to enable it process data. There are two basic types of soft wares, these are: application software and system software, examples of application software are word processor, spread sheet, transaction process systems, databases, personal information and management system. The system software is the operating system that enable the application to run they are inter-phase between the application software the users and the equipment.

2.3.3 Elements of A Computer System

The basic elements of computer system are people ware, hardware and software; they form the elements of a complete computer system, if any of them is missing, the computer system cannot functions

FIG. 2.3.1



2.3.4 Telecommunication

The other part of IT is telecommunication. People have communicated in very crude ways before, but now, telecommunication is newer and more powerful. Telecommunication is a technology which bring about the communication of voices and data signals across geographical distance, it started in 1837 when Samuel Morse invented the telegram (Woherem 200:15)

Alexander Graham Bell in 1876 improved upon the weakness of telegram. He showed that instead of transmitting voice signals through dots and dashes as it were, voices can actually be converted to electrical energy which are then transmitted through conductors e.g

copper wire, this gave birth to what is now known as telephone and it marked the genesis of telecommunications.

Telephones have become ubiquitous at offices and homes, they can not only be used to communicate voices (audio) but also data in the form of graphics, pictures, numbers, video and multimedia different data types. Instead of copper wires, we now have fibre optics, radio and satellites. Digital signals are now replacing analog ones, we now have wireless communication system.

The data rates representing the number of bits that can be transmitted per unit and the band width representing the difference between the highest and lowest frequencies that can be transmitted have grown significantly. For example, from a band width of 9.6 kbps (9.6 kilobits per second) provided by our normal copper wire, we now have band width of more than 2mbps (2 million bits per second) provided by media like fibre optics, satellites and radio. In fact, a fibre as small as a strand of hair can today provide an infinite bandwidth of data (Worehem 2000:8)

The relationship between computer and communication dated back to 1947 at the advent of new generation computers. The first communication system with computer was simple but reliable and is still in use today; it basically involves writing information on a magnetic tape or rings and taking the tape to another computer to read the information. Today we have a better more organized computer network of communications which shall be discussed in another section of this project research.

2.4 Evolution of Information Technology

Computation which is an aspect of information technology has come a long way. Computer inventions and development has undergone various stages of evolution which spanned over several thousands of years.

Historically the machine we call computer today came about because of many inventions and discoveries. Its historical profile spans a very long time from the time human beings began to represent their transactions in numerical forms. We can recall the prehistoric man using stones, sticks, knot on thread as a way of keeping records for the

purpose of trade and commerce around 3,500 BC. The ancient Babylonian merchants keep records on clay tables, the Egyptians improved on record keeping when they developed papyrus and sharp pencil called calamus. An early manual calculating device was the abacus which although over 2000 years old may still be the most widely used calculators in the world.

The word calculation comes from a latin word 'calculus' which means stone of reckoning. The mechanical means of calculating was carried a step further around 1614 by John Napier who publish the first logarithm tables and produced an elementary slide rule, with this more complex calculations that cannot be carried out with abacus were possible. In 1618, Henry Briggs refined the logarithm table and brought it to its present state. In 1621, John Gunter combined Napier two ideas to produce the first slide rule which was the first analog computing device. In 1642, Blaise Pascal introduced the first adding machine. In 1671, this device was improved by Baron Gottfried Von Leibniz which is digital in nature i.e they store and represent information numerically. Leibniz's work in particular showed the advantage of binary (0 and 1) over decimal which uses the digit zero

to nine. Between 1804 and 1874, Charles Babbage, George Boole and Joseph Jacquard (a French weaver) made their significant contribution to the development of computer. Jacquard introduced the idea of punch card. Babbage designed the first automatic mechanical general purpose calculator, this was known as analytic engine. George Boole introduced a new type of algebra based on symbolic logic in 1876. James Thomson invented the mechanical integrator which later forms the basis of analog computers; in the same year lord Kelvin proposed a form of mechanical analog computer known as the differential analyzer. In 1887, a German immigrant in America, Herman Hollerith developed a calculator that used punched cards, this was used to solve large statistical problems. In 1930, differential analyzer (a vacuum tube) was built by Vannevar Bush of Massachusetts institute of technology , his machine was based on Lord Kelvin's proposal of 1876, this was a great stride in computer technology as this mark a gradual shift form mechanical to electronic components

As a follow up on Vannevar Bush's effort, professor Howard Aiken of Harvard university built a truly digital computer system known as mark 1 in 1944, he combined the punch card technique with modern

electronics. In 1946, John mauchly and J. Presper Eckert Jnr. at Pennsylvania university developed ENIAC (Electronic numerical integrator and calculator).

Up till this stage, these computers are too big, expensive, consume a lot of electrical energy, can only carryout only few instructions at a time and store small quantity of information all these are drawbacks and something had to be done. Another contributor von Neuman brought about these changes. He introduced the idea of storing instruction internally and executing them automatically, the first of its kind was built at Cambridge University and was called the electronic delay storage automatic calculator. It is on basis of this that modern computer with all its sophistications is made

About a decade after the second world war, the computer finally left the exclusive domain of the military and research institution and gradually found its way into commerce, these were main frame computers with propriety operating system and software called 'numbër cruncher', this crunched far less than what today's Pentiums would. – Introduction to a computer system by Sunday A. Mbe.

In the 1970's terminals could be connected to mainframe and minicomputer within a radius of short distance around a building, it was called the centralized system, the early employers of this invention in Nigeria were the first generation banks like UBA to operate its data control Unit (DCU)

The 1980's witnessed the advent of telecommunication and networking and many business enterprises, government agencies and parastatal like NNPC(PPMC) began to explore information technology to carry out their data processing and facilitate achieving the overall objectives and goals of the organizations. Agencies, parastatals, business organizations world over now deploy information system through local area network, (LAN), wide area network (WAN) and metropolitan area network (MAN).

Perhaps the greatest breakthrough in IT was in the 1990's tagged the era of 'information superhighway' , organization sought to expand their business frontiers by leveraging on new technologies such as internet, group ware e.t.c to exploit business opportunities; the trend towards globalization has left business enterprises with little choice. It is important to note that large proportions of world expenditure on

IT was related to marketing as it generates revenue, this is why PPMC is a good case study.

Just as total quality management (TQM) was the business improvement slogan of the 1980's business process re engineering (BPR) has emerge as a corporate process audit tool for the establishment of efficient service standards of the 1990's. The concept of group ware has also emerge as a way of automating business processes, especially work flow. This was another step ahead of the evolution of the now familiar e-mailing system

2.5 Roles and Uses of Information Technology

Information technology has moved from the realms of being a supporter of business practice to being a core element of business infrastructure and in some cases, almost the entire businesses. In a global organization, control and co-ordination would be impossible without information and communication technology. The data network is now as important as the social network of an organization. Aside this, info-tech has found application in all areas of life but foremost of all is IT application in business.

- a. Business use IT in many different ways. Some IT application automate variety of basic business activities, from production control systems in manufacturing to word processing and financial calculations in office work. Other applications involve databases and information retrieval that support management customer services, logistics, products design, marketing and competitive analyses. Through IT, companies can combine computing and communication to facilitate ordering and product tracking and marketing. The use of IT in business began with and in many instances continue to rely on mainframe computers, mini computers, and micro computers, as well as telephone network including public switched network and leased line private networks. More recently, the business community has begun to broaden integration of business based systems and through then, integration of enterprises. The spread of internet technology and the proliferation of portable computing and communication devices have accelerate trends that began in the past two decades and now are viewed as electronic commerce or e-commerce (mesanbourg 2000).
- b. It fosters co-operation. A networked organization will be a cooperating one. Technology makes the identification of possible partners and effective dialogue with them much easier.

- c. In a rapidly changing environment, introduction of technology (such as automation) to the operations of an organization can help transform a bureaucratic, administrative structure into an organic one by removing many of the simple repetitive tasks (Keen 1991).
- d. A network organization has the potency to become flexible and would deliver services and process on the backs of charging, multi-disciplinary project teams, make extensive use of out sourcing, retaining only core activities, have a core work force and access to a large network of specialist and ancillary staff.
- e. It is also commonly credited to being a key factor in the economy's structural shift from manufacturing to services. The widespread of IT diffusion is largely responsible for the easy marketability and distribution of refined petroleum products in the world as a whole (OPEC) and Nigeria in particular (PPMC).
- f. IT positively affect productivity and overall economic growth.
- g. It aids vast knowledge of the world around us i.e through global internet access. Katz (2000).
- h. In some advanced countries it plays the role of creating a psychological balance especially for people with physical disabilities

e.g it reduces moving about since, a bulk of accessible information can be downloaded from the internet.

- i. It aids educational development. Most American universities now offer major courses via internet and this of no doubt has the prospect of enhancing knowledge , academic profile and standards of those who take advantage of it.

2.6 Computer Network

Digital computer networks interconnect multiple computers and other devices that are based on computer-based data. They are networks of computer scattered in different location, such that data can be retrieved from one location to another. Depending on the size of area covered by the computer in network we can have (mainly) a LAN or a WAN.

While telecommunication networks carry analog signals, digital computer networks carry digital (on and off) signals once the network is in place, users can send e-mails, they can also automate some of their workflows, share computer resources such as software programs etc.

Network have become ubiquitous in business, especially in the developed economies. They have become critical for the survival of business in these countries, especially in the emerging cyber age in which e-commerce on the internet is fast becoming the norm. We now examine in some detail the two major types of networks LANS and WANS

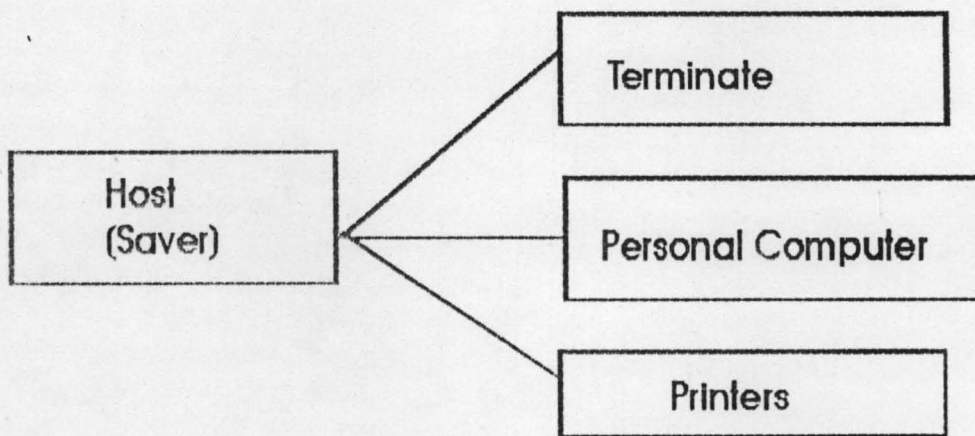
2.6.1 Local Area Network

Short distance electronic communication between intelligent workstations is supported by a networking technology known as local area network (LAN). The institute of electrical and electronic engineers (IEEE) defines a LAN as a data communication system which allows a number of devices to communicate directly with each other, within a moderately sized geographical area over a physical communication channel of moderate data rates.

LANS can be useful for shared data, application and device access, e-mail, process monitoring in a factory environment etc. the most interesting feature of a LAN is its capacity to support cooperative applications in which an application runs partly on a LAN server or possibly a mainframe host advances in physical transmission

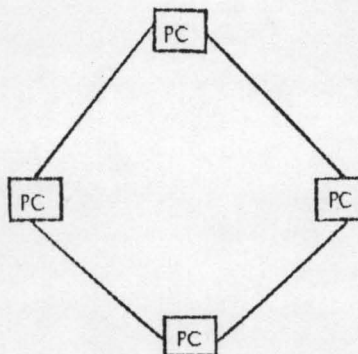
technology especially in fibre optic communication allow LANS to support data rates of up to 100 mbps. There are different LAN typologies. The two most common typologies are the bus and ring while the other is the star. The LAN remains the basic technology for networking today most networks usually start from LAN. The next three diagrams represent different types of local area networking.

Figure2.6.1



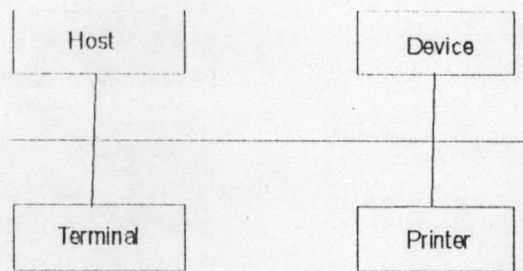
Star network

Figure 2.6.2



Ring network

Figure 2.6.3



Bus Network

2.6.2 Wide Area Network

The distance between network users is one of the most important factors determining the required network type and its underlying technology, the most important inter connecting, in such a case, the networking solutions may involve public telecommunications facilities capable of rapid data interchange. The network that tie all these uses together are called the wide area network (WAN).

Many WAN usually evolve by connecting existing networks, and because these networks often use different equipment and different protocols, connecting them is through the use of protocol converters which define the logic that translates one protocol to another.

2.6.3 The Internet

The internet is one of the most well known wide area networks. It actually consist of many networks, which are collectively called the internet. It's history dates back to the late 1960's when the advanced research project agency (ARPA) of the U.S. department of defence (DOD) began funding universities and private organizations for the development of communication systems.

The various networks connected in the internet runs a protocol know as TCP/IP. TCP (Transmission Control Protocol) and IP (Internet Protocol) were developed along with ARPA project and have become the DOD's standard.

The beauty of internet is that most of the communication occurs over a standard phone line which makes it very cost effective. Most of the major backbones of the internet consist of fibre optics cables known as T1 and T3 lines.

The internet carries all kinds of things that people do as well as all types of data and information. We can find discussion groups, electronic mail, live conservation, file archives and much more on the internet.

The million of users on the internet can communicate with one another in a variety of ways which includes the following.

- Telnet (terminal emulation link network)
- FTP (file transfer protocol)
- Gopher
- WWW (World wide web)
- WAIS (wide area information search)
- E-mail (electronic mail)
- Usenet.

2.6.4 World Wide Web

The world wide web is a large collection of documents stored on the internet. Each of these documents is linked to other documents with a technology called hypertext, which comprises little colored texts.

2.6.5 Intranet

An intranet is a simple means of handling documents and information within an organization, ensuring that users are always provided with up-to-date data and information. IT is thus an internet system for a closed user group.

One of its major benefits is that it breaks down the wall of bureaucracy within an organization and enables all units to see what is happening in other units in order to interact with one another in an online, real time mode.

2.6.6 Group Ware

Group ware is any software produced or technology that enables groups of people to work together. Group ware is designed to improve the productivity of work groups. It is a relatively new technology that has been made possible by the growth and wide spread use of electronic networking.

Group ware products are broadly categorized into three which conforms to the complex ways in which human beings work together.

These are:

- Communication product e.g e-mail, fax, computer telephony, video conferencing and chat program.
- Collaborating product: e.g lotus notes software, document management systems, graphic design software, computer aided design (CAD) software, and other multi-user applications.
- Coordination products.

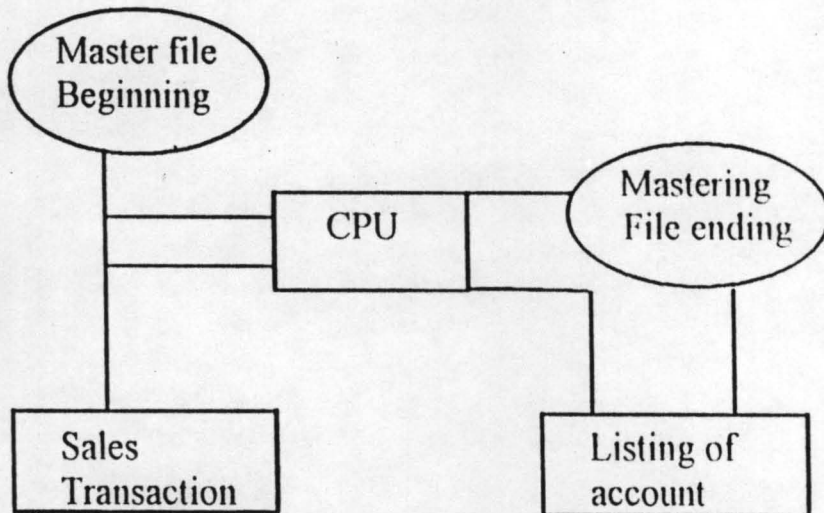
2.7 Computer Accounting System

It is important to note the similarities between basic accounting system and a computer. Each involves three essential phases: input, processing and output. The integration of computer into accounting system consist of business forms, journals, ledger and reports. In computer accounting system, the basic business forms can be used as those used in a manual system, but they must be converted into a machine readable format to be accepted as input to the computer. Business transactions are recorded on coding forms.

The data are then put into the computer through some devices such as a keyboard which is similar to the keyboard of an ordinary typewriter, the program supporting a particular accounting application are moved into the primary storage area of the computer, the work area of the central processing unit, input , programs and output are worked in and out of the primary storage area as the computer processes data according to well defined instructions. Files, which are ordered set of accessible records, are used to process the accounting data. Example, the account receivable master file (consisting of a record for each

customer) at the beginning of an accounting period can be update by the computer to record credit sales as follows.

Fig 2.7.1 accounting information system

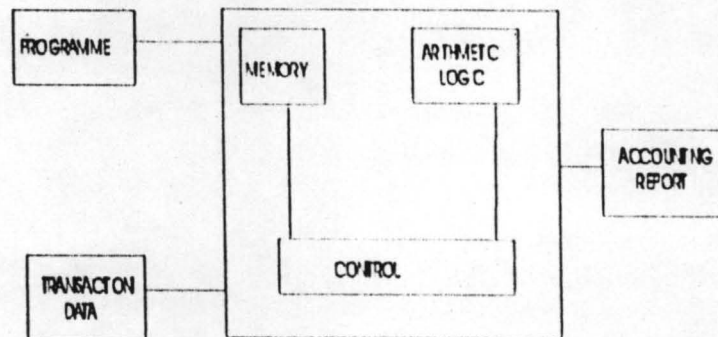


Sources: computerization of accounting system in private organization (project research) Alexander M. 1999

Note the similarities between this updated account receivable file and the manual procedures. In this case, these are two sources of input and output, the input consist of account receivable (master file at the beginning of the period and sale transaction called a transaction file) required to update the beginning balance. On the output side, an updated account receivable master file and listing of account receivable bills are produced through the

computer processing. In general, the transaction of data into information with a computer accounting system can be diagrammed as follows

Figure 2.7.2



Sources: computerization of accounting finance systems of private organization (project research Alexander m. 1999)

2.8 Business Process Re-Engineering and Information Technology

Today, info-tech has grown to become a major instrument for the automaton of industrial and commercial activities, organizations are looking for ways to reduce operational costs, risks, achieve improved efficiency etc. These demand push them to re-engineering their processes.

In the past, numerous types of organizational and process change terminologies had been introduced e.g total quality management (TQM), activities based costing (ABC) , to engender gradualist

changes and benefits i.e where in a new enterant into the industry can gradually unseal existing borders in the industry, these however are no longer winning strategies.

Business process re-engineering (BPR) now provides the means for generating radical rather than incremental changes to realize the enormous potentials of a business; in doing this, IT is often used as an enabler.

The concept of BPR was introduced into the literature through the works of people like Michael Hammer and Champy (1993), and Tom Davenport (1993). Its application has grown enormously since the early 1990's with the original concept going through significant refinement. In actual terms, BPR is really the "Re-architecting of the information flows of a business process so as to achieve radical or dramatic improvements in the performance of the process (Woherem 2000:198)

A process according to Davenport (1993) is a set of logically related tasks performed to achieve a defined business outcome. A process has both an explicit and inexplicit dimension. The explicit part of a

process is that part that is particularly and measurable while the inexplicit part is that which is not measurable, qualitative and inarticulable e.g includes process steps, information flows, stores, objects etc, the former is also referred to as facet dimensions.

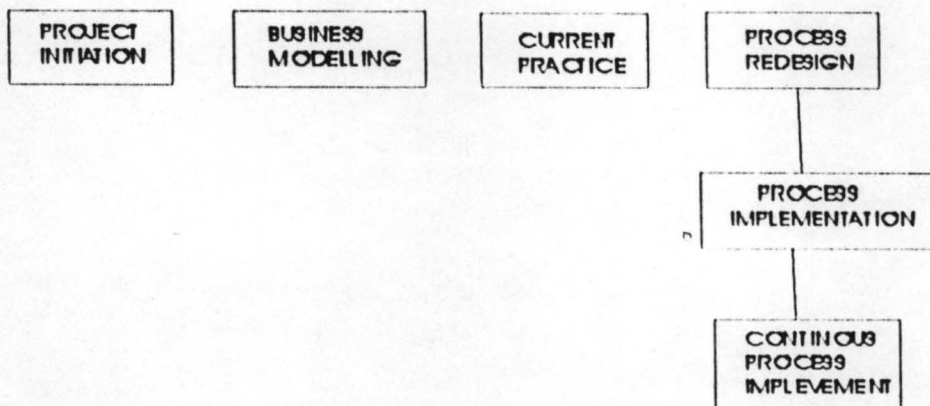
Process modeling means diagramming or use of textual modeling scheme to capture the salient features of a process. This needs to be done in order to demonstrate the visibility of the process to the process operators and their managers, this helps them understand the nature and dynamics of the process and perform it in the same fashion without deviation.

Re-engineering is a generic life cycle methodology for carrying out the re-engineering of process in an organization. This implies that many organizations have different methods for handling re-engineering but there are some related activities that could be discerned from most of the methods. There is need to a formal project for BPR and this needs to be treated as a full project, with a project manager to concentrate solely on the project throughout its lifecycle.

The project manager should come out with a clear, quality plan for the project. The plan should then become the means for running the project ensuring that all members are working to schedule towards the

attainment of the assigned tasks and to expected levels of quality. The next figure shows a typical BPR methodology sharing six phrases of major activity area.

Fig 2.8.1 business process re-engineering.



In re-engineering process of an organization, it is vital to get a clear understanding of where the organization wants to go in terms of its vision, mission, goals, objectives and SWOT analysis and its critical success factors.

Having said all these, further discussion is not too relevant, however, to get more focused from the explanation so far, one could deduce that info-tech is not a compulsory component of re-engineering. In fact, the reason for Hammer's diction; "Don't automate, obliterate" is the

recognition that all too often , many people select a process and implant a silicon coat on it by merely introducing IT to automate it. This process leads to process automation which has it attendant ills.

The best thing is to first systematically rethink the process and then employ IT, if and where necessary in achieving the desired near dramatic effects or changes. What this means is that IT is used as an enabler for BPR but not necessarily a compulsory companion.

In practice however, many BPR projects end up using one info-tech system or the other to achieve the redial effects. Beer (1974) argued that the society should use IT and telecommunication to redesign institutions. All things considered, IT remains an invaluable tool for doing BPR following reasons.

1. It overcomes most constraints imposed by distance and time.
2. It can increase collaboration and remove hand-offs
3. It encourages more coordinate action and decision making based on up-to-date information
4. It diminishes unnecessary labour
5. Sequential process can be processed in parallel fashion

6. Non-useful intermediaries in the process can easily be removed
7. Data can be gathered at source and distributed on line real time to other parts of the organization

2.9 Associated Problems with Information Technology

The rise of computer and telecommunication has become wide spread around the globe including developing countries like Nigeria; yet it has been characterized by its attendant problems. Some of these have been highlighted and each is briefly explained according to the researchers perception of their relative significance

1. Lack of basic infrastructures and facilities for the exchange of information : standard packages for technical exchange of digital information are generally lacking especially in Nigeria, this include sophisticated and modern telecommunication exchanges , internet gateways and backbones, satellites, IDSN(integrated digital system network) packet switching e.t.c in such environment, performance will be sub-optimal.
2. Poor maintenance culture: this has often led to frequent breakdown of most of the equipment required for the exchange of information.

3. The Gimmicks of vendors: many systems are purchased as a result of a persuasion or gimmicks of vendors rather than the actual requirements of the firms. This stem from the organizations lack of knowledge of their own needs and how to proactively seek to satisfy those needs all by themselves , they therefore rely heavily on vendors to inform them on their IT solution.
4. Absence of IT strategy: in this case organization operate in an adhoc manner in which their IT needs are neither determined nor projected. This habit does not allow the firm to attempt evolve short term and long-term plan for IT needs bearing in mind the business strategy of the organization
5. Poor IT management knowledge. This involves a situations where IT are introduced without proper feasibility studies which should specify requirements before embarking on a design. Most organizations also operate without knowledge or use of any national or international standard e.g Iso 900 -3 (webis1993)
6. System down times: this is most common in developing countries like Nigeria, it stems down to chronic features of telecommunications infrastructure such as constant link failures from noisy carrier, damaged cable, damaged equipment and slow communication speeds.

7. Computer fraud: this is any fraud committed with or through the computer: Atysan (1993:29), he described fraud in three ways.

- i. A computer is the object of fraud
- ii. A computer creates unequal environment in which fraud takes place
- iii. A computer is used as a symbol to intimidate or deceive.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

Carrying out a research involves the use of some tools, instrument, skill, method etc, all these constitute a very essential part of the entire study. Methodology is literally the science of arranging in due order. It is a division of pure logic that treats the method of directing the means of thinking to the end of clear and connoted thinking.

3.1 Method of Data Collection

This research adopts the use of method of primary data collection which Includes questionnaire administration and personal interview.

3.1.1. Questionnaire Administration

A questionnaire is a device for getting answers to question design for the purpose of a research work by using forms which the respondents fill by himself. It attempts to know the belief, feeling experience and

opinion of the respondent on particular issues. This research use the combination of both closed and open form of questionnaire.

3.1.2 Personal Interview

This is a technique used for collecting information from others in a face to-face contact, it could be structured, unstructured, non directive depth or focused forms. This research makes use of the unstructured form.

3.2 Method of Data Analysis

The analysis and interpretation of raw data of an investigation depends on the way by which the research problem is answered and the stated hypotheses are tested. Analysis can be defined as the ordering and breakdown of data into constituent parts (Osuala 1993:128) and in doing this, data analysis tools like, table, percentages, pictograms, pie chart etc are used. Data analysis involves statistical calculations performed with raw data to provide answers to the questions initiating the research.

The chi-square method denoted by Greek letter χ^2 will be used to test the stated hypothesis concerning the difference between a set of observed frequencies of a sample and a corresponding set of expected or theoretical frequencies and it is computed as follows:

$$\text{Chi square} = \chi^2 = \sum \frac{(O - E)^2}{E}$$

to obtain the value a table will be computed from the contingency

table to test the hypothesis.

3.3 Justification of the Method Used

The questionnaire permits wide coverage for a minimum expenses both in money and effort. As it does not call for signature or other means of identification, the questionnaire may because of its great impersonality elicit more candid and more objective replies. The method place less pressure on the respondent for immediate response. A total of 70 questionnaires were shared. Virtually all the staff of IT department filled it. The questionnaire were shared at

PPMC and among independent and major marketers of refined products.

The interview method is flexible and it is applicable to different types of problem, the questions can be rephrased for clarity. The petrol attendants were particularly useful and comfortable with this method. It allows the interviewer to observe what the respondent says and how he says it. It is particularly useful in probing for additional information.

While the questionnaire method seems to favour quantitative method of data analysis, the interview method appears to work better with qualitative of data analysis and hence, the use of both methods by the researcher for data collection.

The chi-square is extremely useful particularly in behavioural sciences. The calculation formula is generalizable to expand for future studies and it is widely accepted.

The use of any of the method mentioned above is borne out of the scientific nature of the study.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction:

This chapter shows the level of analysis adopted to obtain an opinion on each question asked the respondents. It is presented in the form that can be analyzed. For the purpose of clarity and easy understanding to future users, the study shall present data in tabular format using simple percentages for comparative analysis. These shall be based on responses received from numerous questions given to respondent, serve as a basis for generalization and will help in arriving at the solutions to the problem under study. Upon presentation and analysis, summary of findings shall be drawn from this chapter.

Seventy questionnaires were administered in all; some to staff of ITD (information Technology Department of PPMC), some to principal staff of other departments in PPMC and some to staff of major and Independent Oil Marketers.

4.2. Data Presentation and Analysis

The researcher want to point out at this stage that there are some questions in the questionnaire that will be handled and reported

theoretically as they are of no significant contribution to the intension of this study; question like: are you a staff of this organization? Are you in IT department? Etc other relevant questions will be presented in a tabular form as will be shown later.

Question 1: Are you a staff of PPMC?

Most people that responded are from PPMC; others are from Major and Independent Petroleum Product Marketers.

Question 2: Are you in IT department of PPMC?

Not all the respondents are from I.T department but quite a number of them are from there. Some other respondents are from personnel, and finance departments.

Question 3: Does PPMC have its own website?

Responses	No of Respondents	Percentage
Yes	40	88.9
No	3	6.7
I don't know	2	4.4
TOTAL	45	100

Source: Fieldwork.

From the percentage, it can be deduced that PPMC certainly has website; about 6.7% that said no may have not really found out.

Question 4: Does PPMC have corporate e-mail?

Responses	No of Respondents	Percentage
Yes	38	84.5
No	5	11.1
Don't know	2	4.4
TOTAL	45	100

Source: field work.

It can be deduced from the table that PPMC has corporate e-mail based on the percentage of people that responded yes, the 11.1% of people that said no might not really be aware or may not be making use of it, this informed their responses.

Question 5: Does PPMC have intranet and extranet services?

Responses	No Respondents	Percentage
Yes	20	44.44
No	23	51.11
I don't know	2	4.45
TOTAL	45	100

Source: field work.

From the above table, it can be concluded that PPMC has non of these services but this is not true as the researcher saw them in use during his several visits to PPMC. Most people don't know what is meant by intranet and extranet services or probably they know it in another terminology that is why their responses (51.11% and 4.45%) have been negative

Question 6: Can you state briefly some of the problems associated with IT in your organization.

From the responses, the researcher deduced the following:

- (i) Parts of the problems faced with IT are manipulations, falsifications and syntax errors.
- (ii) When computer crashes , some data may be lost even from hard copy.

- (iii) Computer frauding
- (iv) It causes unemployment problems
- (v) Poor maintenance culture
- (vi) Lack of basic infrastructure

Question 7: List the various ways IT is put to use in your this organization.

From the responses, the following can be written of the use of IT.

- (i) It has made information available to organization in a more faster and cheaper way
- (ii) It has helped in inventory control of the organization
- (iii) It has enhanced budget preparation of the organization
- (iv) Through the computerization of the pay-roll system, payment of salaries has been hastened.
- (v) It has facilitated report writing and presentations
- (vi) It has made statistical information needed daily on the petroleum products lifted either as crude or refined more easily available for close monitoring
- (vii) It has made scheduling of work and other activities easier
- (viii) It enhances storage and retrieval of large volume of data

Question 8: How applicable is information technology in your organization?

Responses	No of Respondents	Percentage
Very applicable	46	66.0
Fairly applicable	16	23.0
Not applicable	8	11.0
TOTAL	70	100

Source: field work.

From the above table 66% attested to the fact that information technology is very applicable to their organization. 22% agreed that it is fairly applicable while 11 % said it is not applicable. We can say generally that information technology is very and widely applicable. An interview was carried out on the 23 % and 11% respondents and it was discovered that they are not actually from IT department and some of them are field workers and petrol attendants.

Question 9: Does computer analyze financial information more satisfactorily than manual system ?

Responses	No of Respondents	Percentage
Yes	61	87
No	-	-
Not really	9	13
TOTAL	70	100

Source: field work

From the table above, it can be generally said that computer analyses financial information better than manual system. The 13 % responses are from establishments that have not computerized their financial systems particularly the Independent marketers.

Question 10: Does information technology have a positive impact on the activities of your organization?

Responses	No of respondents	Percentage
Yes	40	61.54
No	13	20.0
Not really	12	18.46
TOTAL	65	100

Source: field work

The analysis from the table above shows that 61.54 % of the respondents agreed that information technology has positive impact on their organization; this is good news. 20% that disagreed are the highly conservative people and the computer illiterate, most of them are from other departments. 18.46% respondents that said 'not really' were discovered not to be practically knowledgeable of what computers can do this was discovered in a personal interview with some of them.

Question 11: Has the introduction of info-tech system increased the speed at which budget is prepared?

Responses	No of Respondents	Percentage
Yes	43	67.2
No	7	10.9
Not really	14	21.9
Total	64	100

Source: field work

Not all departments are involved in budget. Preparation for the organization, therefore, it is not unexpected that 10.9% of people said no and 21.9 % said not really as their departments are not involved in budget preparation. Meanwhile a good percentage (67.2%) agreed that it has facilitated budget preparations.

Question 12: Has IT system made information supplied to management faster and more efficient?

Responses	No of respondent	percentage
Yes	64	92.7
No	1	1.5
Not really	4	5.8
Total	69	100

Source: field work

From the above, the percentage of people (92.7%) saying that information technology has made information supplied to their organization faster and more efficient is quite high.

Question 13: Were there any cases of fraud in the organization after the introduction of IT

Responses	No of respondents	Percentage
Yes	20	29.9
No	9	13.4
I don't know	38	56.7
Total	67	100

Source: field work

From the table of data above, it can be seen that the respondents that said 'I don't know' have the highest percentage (56.7), the researcher feels

something is hidden here as some respondents about 29.9% were bold enough to say yes, there were frauds. Those people that said no are the meticulous ones that feel such information should be exclusive reserve of the organization. The 13.4% that said 'I don't know' the researchers believe they don't want to reveal the secret of the establishment.

Question 14: Has information Technology assisted in inventory control?

Responses	No of respondents	Percentage
Yes	32	47.1
No	6	8.8
Not really	30	44.1
Total	68	100

47.1 % of respondents agreed that info-tech assisted in inventory control, 8.8% said no while 44.1 % are not sure. We can say that IT is fairly used in inventory control by most petroleum products marketing company. Inventory control is a large chunk of activities, 44.1 % of the people don't actually know what it takes. The 8.8 % of the people were discovered not to have inventory control unit; this is probably the reason for their answers.

question 15: Has the computerization of pay-roll system increased the efficiency of paying salaries?

Responses	No of respondents	Percentage
Yes	51	85
No	-	-
Not really	9	15
Total	60	100

From the above, with a percentage as high as 85%, it can be deduced that computerization of pay-roll system has really facilitated salary preparation and payment. It is unfortunate that in this computer age, some still think that the best way to avoid error is manual effort exhibited carefully, they are myopic to computer use; up to 15 % of people are in this category. Some even use religious inclination to becloud their sense of reasoning.

Question 16: What effect has the introduction of info-Tech system got on existing manpower?

Responses	No of respondents	Percentage
Positive	34	48.6
Negative	35	50.0
Can't say	1	1.4
Total	70	100

Source: field work

Since most of the result obtained previously are seemingly in support of the use of information technology, the researcher was surprised to find out of its negativity on manpower, this prompted him to have personal interview with staff of PPMC and the following are his findings:

- (i) Corporate secretes cannot be kept
- (ii) It has led to redundancy in some departments
- (iii) People are helpless during the downtime period of the computer system
- (iv) it has led to unemployment

Question 17: How well has the organization absolved computer as an integral part of its marketing activities?

Responses	No of Respondents	Percentage
Very well	40	61.5
Fairly well	23	35.4
Not well	2	3.1
Total	65	100

Source: field work

From the table, 61.5% of the respondents show that the organization has imbibed the use of info-tech very well, 35.4 % think it is only fairly well,

because they felt all the necessary devices and infrastructures are not available so they cannot boast of a functional IT department.

Question 18: Has computerization of Pump machine faster the sales of petroleum products?

Responses	No of Respondents	Percentage
Yes	50	71.4
No	7	10.0
Not really	13	18.6
Total	70	100

Source: field work

71.4% of the respondents agreed that it has fastened the sales of petroleum products. After some interview with some petrol attendants, it was discovered that those that responded 'not really' complained that a computerized pump machine is often faulty and those that totally disagree (10% are using the mechanical pump machine.

Question 19: Has IT helped your organization at the depot level of petroleum products marketing?

Responses	No of Respondents	Percentage
Yes	56	80
No	4	5.7
Not really	10	14.3
Total	70	100

Source: field work

Most people (80%) agreed that info-tech has really helped the organization at the depot level. The 14.3% that did not agree complained of easy and smart falsification of computer system and statistical data in them.

Question 20: (i) Has IT made a difference to your organization in the distribution of petroleum products?

(ii) If your answer is yes, can you briefly explain

Responses	No of Respondents	Percentage
Yes	60	87.0
No	-	-
Not really	9	13.0
Total	69	100

Source: field work.

- (i) From the responses, most people agreed that IT has helped positively in the distribution of petroleum products. The 13% negative responses are the people overwhelmed with the problems encountered with products distribution like petrol tankers breakdowns.
- (ii) The various reasons attributed for the positive effect of computerization in products distribution are:
 - (1) Data storage and retrieval of no of tankers lifting products is easier
 - (2) Statistical data of the destination of the tankers are also computerized
 - (3) It has helped in the monitoring of tankers
 - (4) Data of the volume of refined products lifted by the marketers are easily known and products diversion can easily be noticed.
 - (5) Through computerization, availability of petroleum products at depot and pump station level is ascertained.
 - (6) Computerization has helped in the overall optimal achievement of goals and objectives of PPMC and OIL marketers as a whole.

4.3 TEST OF HYPOTHESIS

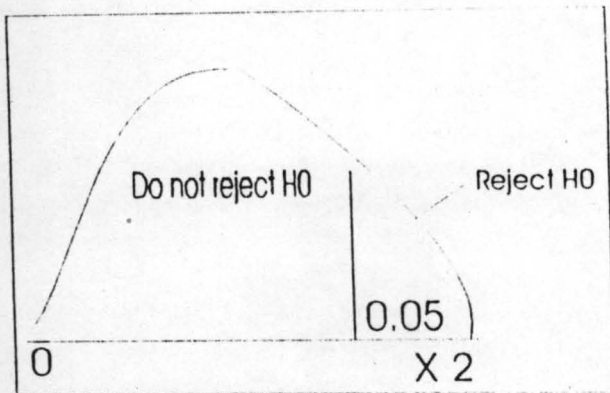
In testing the hypothesis, the researcher used the chi-square method. The criteria used are as follows:

The significant level is 5%

The degree of freedom is 2

In the table of chi-square, $\chi^2 = 5.991$ which is the critical value i.e. $\chi^2_c = 5.991$

This means that for 2 degree of freedom, the probability of exceeding a chi-square value of 5.991 is 0.05.



Hypothesis One

Statements of hypothesis

H_0 (null hypothesis): info-tech cannot be applied in product marketing in PPMC

H_1 (alternate hypothesis): info-tech can be applied in product marketing in PPMC

Table 4-2-1 contingency tables

VARIABLE	OBSERVATION		EXPECTED
Very applicable	46		23.3
Fairly applicable	16		23.3
Not applicable	8		23.3
Total	70		

Source: field work

How expected frequency was gotten

$$\begin{aligned}\text{Expected frequency} &= \frac{\text{No of respondents}}{\text{Number of variable}} \\ &= \frac{70}{3} = 23.3\end{aligned}$$

$$\text{Chi square} = \sum \frac{(O-E)^2}{E} = X^2$$

Where O = observation frequency

E = expected frequency

Degree of freedom = df = (Row-1) (column-1)

In this case, df = (3-1) (2-1)

$$= (2)(1)$$

$$= 2 \times 1 = 2$$

TABLE OF CHI SQUARE IS SHOWN BELOW

O	E	O-E	(O-E) ²	$\frac{(O-E)^2}{E}$
46	23.3	+22.7	515.29	22.1
16	23.3	-7.3	53.29	2.3
8	23.3	-15.3	234.09	10.1

Source: field work

$$\begin{aligned}
 \text{Chi square} = X^2 &= \sum \frac{(O-E)^2}{E} \\
 &= 22.1 + 2.3 + 10.1 \\
 &= 34.5 \\
 X^2 &= 34.5
 \end{aligned}$$

Decision

Since the calculated chi square (x^2) is greater than the critical value X^2_c i.e. X^2 (34.5) $> X^2_c$ H_0 is rejected and the alternate H_1 is accepted.

HYPOTHESIS TWO

Statement of hypothesis

H_0 = the use of info-tech has no positive impact in PPMC activities

H_1 the use of info-tech has positive impact in PPMC. Activities

CONTINGENCY TABLE

VARIABLE	OBSERVATION	EXPECTED
Yes	40	21.7
No	13	21.7
Not really	12	21.7
Total	65	

Expected value = Number of respondent

Number of variable

$$= \frac{65}{3} = 21.7$$

$$\begin{aligned}
 \text{Degree of freedom} &= (R-1)(C-1) \\
 &= (3-1)(2-1) \\
 &= (2)(1) \\
 &= 2
 \end{aligned}$$

The table of chi-square $X^2 = 5.991$ i.e.

$$\text{Critical value} = x^2_c = 5.991$$

This means that for 2 degree of freedom, the probability of exceeding a chi-square value of 5.991 is 0.05.

$$\text{Chi square} = x^2 = \sum \frac{(O-E)^2}{E}$$

TABLE OF CHI SQUARE IS SHOWN BELOW

O	E	O-E	(O-E) ²	$\frac{(O-E)^2}{E}$
40	21.7	+18.3	334.89	15.43
13	21.7	-8.7	75.69	3.49
12	21.7	-9.7	94.09	4.34

Source: field work

$$X^2 = \sum \frac{(O-E)^2}{E} = 15.43 + 3.49 + 4.34 = 23.26$$

DECISION

Since calculated chi square (x^2) is greater than the critical value, then we reject null hypothesis and accept the alternate

4.4 SUMMARY OF FINDINGS:

More than ever before particularly after the Nigerian civil war, the use of petroleum products increased drastically, therefore the need arises for a better organized marketing sector of the NNPC which translated to the formation of PPMC. One of the ways by which PPMC can be well organized to meet its aims, missions and objectives is to absolve the use of information technology in its activities.

For the past one decades now or thereabout Nigerians have been experiencing uneven distribution of petroleum products, it always baffles the researcher that how can there be scarcity in the midst of plenty, it is in this respect, the researcher has decided to study to what extent can the use of information technology help to solve the problem.

This research work has understudy the level of computerization in the organizations concerned with the distribution and marketing of petroleum products and the positive impacts it has on it. The synergistic combination of sales and computer based data processing

has given status to marketing operation and has concomitantly created new area of knowledge.

It was discovered in the course of the study that computerized petroleum products distribution and marketing provide cost reduction even though the initial investment is often large. Also cost reduction occurs from greater efficiency of a computerized system over human or manual processing. The recent studies shows that it is cheaper to process the same volume of data via computerization than the normal file-to-file, office-to-office routine. In addition larger volume of sales and marketing transactions requires efficient system are much more efficient storage, computation and retrieval; information-tech system are much more efficient in such applications than in manual system.

Info tech system owes much of its acceptance in business to the increased speed and efficiency with which they exhibit data processing and reporting. Without information- tech, most organization would slowly suffocate under increasing paper work. The shift in emphasis at most managerial level from manual data manipulation to electronic base data processing, evaluations and

control represents another advantage of info-tech; this increased accuracy, efficiency and timeliness of reporting help to improve the decision making activities of the management. It was revealed that info-tech application in the organization enhances profitability and efficiency and provide better check against fraud in an organization. The computerization of the organization has also led to improved budgetary procedures, inventory control and pay roll system.

However, the organization as we can see has not fully absolved info-tech, as an integral part of its marketing activities, there is stillroom for improvement. Part of the problems faced in the application of IT system include cost of training personnel, cost of installation, lack of appropriate software and shortage of trainers among other things.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 SUMMARY

In order to conduct this research, the topic was introduced, the purpose of the study, statement of problem, scope and limitations of the study and the significance to show how relevant is information technology in the marketing of petroleum products in Nigeria.

Relevant data was collected, tabulated, analyzed and some findings made. Based on these findings, the following summary can be made. Generally speaking, marketing is typically seen as the task of creating, promoting and delivery of goods and services to consumers and businesses. Just as production and logistics professionals are responsible for supply management, marketers are responsible for demand management and in doing this, accurate and fast information are highly needed, this is why the researcher realizing the importance of information in an organization, decided to research into the effect of information technology on marketing since marketing is the bedrock of any establishment as it is implicated in revenue generation. Nigeria economy

is hinged on petroleum, this is why the study is carried out on the effect of information technology on the marketing of petroleum products to see if there could be possible improvements.

Marketing people are involved in marketing 10 types of entities: goods, services, Experiences, events, persons, places, properties, organization, information and ideas, it will be discovered that in any of them information dissemination is involved.

Today, it is fashionable to talk about new economy. We know that business are operating in a globalize economy in which things are moving at a nanosecond pace. Our marketer are characterized by hyper competition, constructive technologies are challenging every business, one of such technologies is information technology which has made business activities real easy. Today, information technology has really facilitated business activities particularly marketing as we now talk of things like debit cards, smart cards, cellular phones, personal digital assistance, hyper competition, cyber consumers, customer value analysis, consumer relationship management, price transparency, value network,

hybrid channels, supply chain management, viral marketing integrated Marketing communication and mobile marketing.

In the course of this study, it was discovered that information technology is of extreme significance in the practice of marketing; there is the need to acknowledge the new elements in today market place. The internet has multiplied the number of ways consumers buy and company sell and how companies carry on their businesses.

Cellular phones have enable people to exchange messages and buy and sell on the go. We are witnessing a precipitous decline in the effectiveness of mass advertising as a result in the explosion of communication channels. Presently, goods and services are marketed through telephoning and online ordering; for all these, the credit goes to information technology.

5.2 Conclusion

The introduction of information technology into the marketing activities of organization today has been evidently viewed as not only being unique but also inevitable.

This study has revealed that high rate of confidence is reposed and accorded the use of information technology devices (e.g. computer and telephone) in an organisation's marketing activities.

Manual computation should be disposed off because of time waste, high operation and labour cost, proness to error etc and credence should be given to the use of computer and telecommunication, which perform enormous transactions in few hours and at a greatly reduced cost. It is in this view that the researcher is of the opinion that organizations, firms, industries, government agencies and parastatals etc should computerize their marketing operations. PPMC has greatly embraced IT in their marketing activities but, there is still room for improvement as they enlarge their coast into other West-African countries, this will make the world a global village in deed in the energy sector. Computerization of government agencies will bring sanity, effectiveness, efficiency, accuracy, increased output, reliable information and lots more in the discharge of their duties for the overall economic development and political growth of the country.

5.3 Recommendations

From the foregoing discussions, the researcher wish to make the following recommendations based on the research findings. This recommendation applies generally to organizations, academics, management and the specific firm case studies

- (i) Organisations should introduce extranet and intranet services for faster communication and information dissemination outside and within it. These electronic devices should cut across not only marketing department but all the departments as non of them can act in isolation.
- (ii) The organizations should change the orientation of its staff so that introduction of information technology is not seen as a threat but rather as a help to facilitate their work.
- (iii) The organization should train and re-train its staff on information technology, this will aid professionalism and

make the opportunities available in the world as a global village not to elude them.

- (iv) Since information technology has been proved to be a tool and helpful in business process re-engineering, the intellectuals in the filed of management and info-tech should come together and develop theories, means and system etc that will ensure a better practicability of the two variables.
- (v) All establishments should commence the procurement and installation of modern telecommunication gadgets to meet up with the challenges of information age.
- (vi) The government should encourage more entrants into the national telecommunication carrier to join the existing ones i.e. the fixed wireless, global system of mobile (GSM) telecommunications etc should be expanded so that many will have access to vital information.

(vii) In Nigeria, information technology, should be incorporated to the curriculum of studies at all level of education (primary, secondary & tertiary), this will help to wipe out computer illiteracy in the country.

(viii) Regular workshops and seminars should be organized to educate the working population on computer application, this should jointly be organized by Federal Ministry of Science and Technology, Commerce and Industry; and marketing, accounting administrative and management professional bodies. This will consistently sensitized the working population of the importance of information technology.

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QUESTIONNAIRE.

The purpose of this questionnaire is to collect data for a research on the “Positive impact of information technology on petroleum products marketing” PPMC as a case study. The information is needed for a project in partial fulfillment for the award of postgraduate diploma in business management technology certificate FCT Minna.

Please, kindly co-operate and respond as appropriate:

Question 1: Are you a staff of PPMC?

Yes No

Question 2: Are you in IT Department?

Yes No

Question 3: Does PPMC have its own website?

Yes No I don't know

Question 4: Does PPMC have corporate e-mail?

Yes No I don't know

Question 5: Does PPMC have intranet and extranet service
Yes No I don't know

Question 6: Can you state briefly some of the problems associated with IT in your organisation?

Question 7: List the various ways IT is put to use in this organisation

Question 8: How applicable is information technology in your Organisation?

Very applicable Fairly applicable

Not applicable

Question 9: Does computer analyse financial information more satisfactorily than manual system?

Yes No Not really

Question 10: Does information technology have a positive impact on the activities of your organisation?

Yes No Not really

Question 11: Has the introduction of info-tech system increased the speed at which budget is prepared?

Yes No Not really

Question 12: Has IT system made information supplied to management faster and more efficient?

Yes No Not really

Question 13: Were there any case of fraud in the organisation after the introduction of IT?

Yes No I don't know

Question 14: Has information technology assisted in inventory control?

Yes No Not really

Question 15: Has the computerization of pay-roll system increased the efficiency of paying salaries?

Yes No Not really

Question 16: What effect has the introduction of info-tech system got on existing manpower?

Positive Negative Can't Say

Question 17: How well has the organisation absolved computer as an integral part of its marketing activities?

Very well Fairly well Not well

Question 18: Has computerization of pump machine fasten the sales of petroleum products.

Question 19: Has IT helped your organisation of the depot level of petroleum products Marketing?

Yes No Not really

Question 20: (i) Has IT made a difference to your organisation in the distribution of petroleum products?

Yes No Not really

(ii) If your answer is yes, can you please explain briefly?