COMPUTERISED BILLING SYSTEM

A CASE STUDY OF

NEPA PLC, MINNA

BY

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APPROVAL SHEET

This project has been examined and found acceptable in partial fulfilment of the requirement for the Post-Graduate Diploma in Computer Science of the Federal University of Technology, Minna.

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DEDICATION

This work is dedicated to my beloved family Mrs. M. A. ADEAGBO AND CHILDREN for their seif-denial and perseverance.

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ABSTRACT

A billing system becomes necessary in order to calculate the charges for services rendered. As regards the NEPA Plc, the billing system is performed in the Kaduna Zone which Minna office belongs to.

However, the consumers are experiencing delay in getting bills and this leads to the accumulation of their charges. It is against this background that it becomes difficult to pay.

A computerised system is designed and recommended for use in Minna office.

CHAPTER ONE

1.0 GENERAL PREAMBLE

1.1 INTRODUCTION

The use of computers is now so widespread that there are very few people who are not affected by.their use. Bank statements, bills for electricity and gas payments for rates and other services are handled by computer system. The continued substitution of electronic data processing for manual operation is due to increase activities throughout the world. This has gone to such an extent that it is obvious that human efforts alone can no longer cope with the increased pace of these activities. As a result of this, computer operation has been introduced in so many spheres of life. It is conveniently use in banks, parastatals, private establishment and provision of management information.

However, a computer can be defined as an electronic device that accepts input, process the input according to the instructions programmed in order to generate output. Specifically, the benefit of using computer include accuracy, speed and efficiency. This is because computer has the capacity of processing a large data within a very short period of time and with the most possible accuracy.

1.2 HISTORICAL BACKGROUND OF NEPA PLC

The history of electricity in Nigeria dates back to 1896 when electricity was first produced in Lagos and the total capacity of the generators used then was 60KW.

Thus, the maximum demand in 1896 was less than 60KW. Several other towns later established electricity supply by the installation of isolated generators in each town. In 1896, also , the Nigerian Government electricity Undertaking was established within the then Public works Department to take over the responsibility for electricity supply in Lagos area. However, in 1950, a central body was established by the Legislative Council Ordinance No. 15 of 1950 which transferred electricity supply and development to the care of the central Body known as the "Electricity Corporation of Nigeria" ECN. Other bodies also had licences to produce electricity in some locations in Nigeria. Significant among such bodies were: The Nigerian Electricity Supply Company (NESCO) in Jos and the African Timber and Plywood Limited sapele. the total maximun demand of Lagos on the 1st October 1960 was 39MW. This was produced by 2 x 12.5MW from 'B' Power Station and 30MW from 'A' Power Station at Ijora in Lagos.

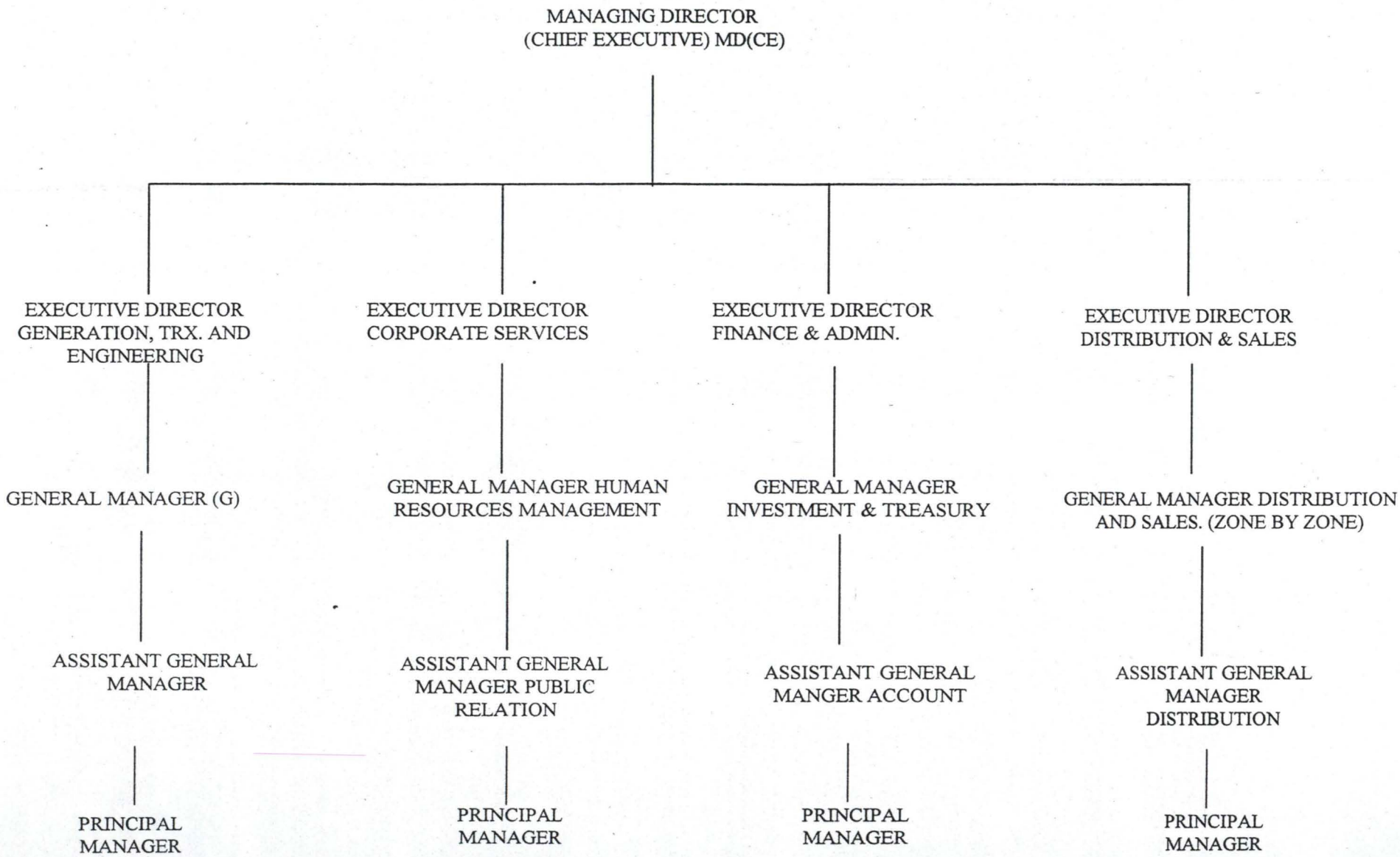
The first 132KV transmission line under the regime of ECN was commissioned in June 1971 and was 146KM long connecting Lagos with Ibadan via Shagamu. In 1962, anotherbody known as Niger Dams Authority (NDA) was established by an act of parliament. the authority was responsible for the construction and maintenance of dams and other works on the River Niger and else where, generating electricity by means of water power improving Navigation and promoting fisheries and irrigation.

By 1965, the Lagos/Ibadan 132KV Line had been extended to Oshogbo, Benin and Ughelli forming what was known as the Western System and the popul;ar k-z-k, kaduna-Zaria-Kano system in the Northern part of Nigeria.

In February 1969, N. D. A. Hydroelectric Power station in Kainji was commissioned with an initial capacity of 32MW (i.e 4 x 80MW units). The energy producedby NDA was sold to ECN for distribution and sales at utility voltages. The first Kainji-Lagos (Akangba) line was also commissioned in june 1969.

In 1972, the operations of ECN and NDA were combined in a new organisation known as National Electric Power Authority (NEPA). The bulk of the supply for energy in the country has been the main task of NEPA and in terms of increased facilities, NEPA expands at an esimated annual rate of expansion, the need to meet the ever increasing demand is yet to be satisfied.

MANAGEMENT ORGANISATIONAL CHART OF NEPA PLC



1.4 OBJECTIVE OF NEPA

NEPA was formed in order to enhance better co-ordinated and economic system of electricity supply for all parts of the Federation. This is considered important because the economy of a nation depends to a large extent on the level of industrialisation attained by the country.

1.5 OBJECTIVES OF THE STUDY

The main objective of this study is to provide an indepth analysis and need for a computerised billing procedure in NEPA PLC, Minna. Specifically, its main objectives are as follows:

i. To study and analyse the activities of the operations of the customer billing system.

ii. To observe the problems associated with the existing operations and provide the need for a computerised operation in the organisation.

iii. To provide a logical and physical design of a computerised billing system that will suit the organisation.

iv. To describe the various operations of the proposed computerised system and its mode of operations.

v. To eliminate delays involved in the preparation of customers' bill.

More importantly, the study is inspired by the conviction that the achievement of a good computerised billing system in NEPA, Minna will lead to the success of the organisation in terms of achieving its stated objectives.

1.6 METHODOLOGY OF THE STUDY

In trying to fashion out a new computer based system, many methods were involved in gathering information about the existing system. These are:

i. OBSERVATION: This method was used to directly study the operations of the existing system.

ii. RECORD REVIEW: Written information, such as forms and reports used in the operations of the system were reviewed and analysed.

iii. INTERVIEWING: This was used mainly to confirm some information gathered using the above two methods. It was also used to obtain information or suggestions that can be considered relevant to the proposed system.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 REVIEWING NEPA OPERATIONS AND CAPACITY

The economy of a nation depends to a large extent on the level of industrialisation attained by the country. To substain industrial output and ensure rapid growth there is a need for a reliable and efficient supply of electricity. This is necessary to take care of the ever increasing population, the expanding industries and insatiable consumers apetite.

Electricity, because of its importance, now virtually rules the world. Contrary to speculations, electricity could not be said to have been invented, but was just stumbled on by Micheal Faraday, a 19th century British physicist. faraday, as a matter of fact, only discovered the principle of electro-magnetic induction. Put simply, electricity is produced through power generation which is a process of energy conversion.

Using the example of a stream power plant, the chemical energy of a fossil fuel (like coal or oil) is converted through combustion in a boiler furnance into thermal energy which is into kinetic energy when the steam enters the turbine generator rotor rotating and finally into electrical energy in the generator. This is made available to consumers as electric power.

2.2 SOURCES OF ELECTRICITY

In Nigeria, power generation takes place principally in thermal and hydro-power stations. Aside from these, there are other forms of power generation used ~~are~~ in other countries, some of which are only just beginning to make significant impact on the industry and in home. These include the conversation of solar energy and nuclear energy as sources of thermal energy in properly adapted steam power stations. Others are the conversations originating from wind energy in fluids under pressure below the earth's surface tidal energy ans so on.

2.2.1 THERMAL POWER STATION

Make use of fossil fuels namely, coal and natural gas to generate electricity. Thermal stations could be sub-divided into steam power stations, gas turbine stations and diessel generating stations (isolated power stations).

2.2.2 STEAM UNITS

These operate with water/steam as the main cycle fluid. The steam is generated when water is heated principally in the boiler rising solid fuel, liquid fuel or gaseous fuel. Depending on fuel imput and cycle characteristics, the steam generated cuold have this temperature and pressure. When this steam is directed to the turbine, the action of the steam on the rotor blades causes the rotor to rotate. The generated rotor which is coupled on to the turbine also rotates, and since this occurs in an electro-magnetic field sustained through excitation, electricity (alternating current) is generated and tapped at the generator terminals at a regulated voltage.

Steam units operate on closed cycles which use specially treated water. The steam after having spent the recoverable portion of its thermal energy content in the turbine, is condensed in the condenser into the boiler for conversion boiler, the condensed water is pumped through various stages of heating using extraction steam from the turbine as the heating fluid.

The condensation of the cycle fluid is achieved using circulating water of inferior quality compared with the main cycle water. Where there is abundant water, like in a power station located close to a river, lake, lagoon or sea, the circulating water is in an open circuit, otherwise a closed circuit is used to save water. In the latter case, a cooling tower would be required for effective evacuation of un-usable calories of the main cycle fluid.

Although the main fluid is in a closed circuit system, losses occur principally through boiler blow-down, which is required to maintain a certain level of water purity in the boiler. Other losses to the system occur through steam tracing, heating and atomisation of fuel oil (if used), other external uses of steam,drinage, leakages at valves and joints and so on. These losses are compensated for with make-up water introduced generally in the condenser hot well.

Steam thermal plants can be designed to use any of the following fuel. For conventional ones, coal, crude oil, residual oil and naturalgas could be used, while nuclear stations can use natural and enriched uranium and plutonium. it should be noted however,that none of those for nuclear stations is used in Nigeria.

2.2.3 GAS TURBINE UNITS:

As the name implies, gas at a certain enthalpy is sent into the turbine which through being coupled to a generator generates electric power. The gas that expands in the turbine, thus bringing about rotation of the turbine generator rotor is the product of the combustion that takes place in the combustion chamber(s) between air coming from the compressor and the fuel introduced into the combustion chamber(s) is at a very high temperature and relatively high pressure, the pressure being just slightly lower than the compressor end pressure.

At the end of the expansion in the turbine, the gas temperture is still high, and this is why elsewhere attempts are now being made to recover part of this heat in a recovery boiler associated with a steam turbine unit. NEPA has no such installation for heat recovery in any of the existing gas turbine stations, since among other reasons, is preferable to incorporate the recovery system in the design stage of a gas turbine unit/station. Gas turbine sets are generally designed to fire liquid and gaseous fuels. Heavy refinery products like residual fuel oil are, however not ideal for gas turbine sets. gas turbine plants are generally desingned to use natural gas petroleum distillers (light fuel oil).

2.2.4 HYDRO POWER STATIONS

Make use of dammed water at a certain elevation compared with the tailwater to generate electricity. This elevation constitutes the pressure at the turbine inlet and corresponds to the difference between the elevation of the water at the intake and the

elevation of tailwater level at the discharge from the power plant. The power plant configuration depends on whether the turbines are of impulse or of the reaction type.

The impulse turbine (not used by NEPA) has a free jet of water impinging on the buckets of the runner and is controlled by a niddle type nozzle. The runner takes along with it the generator rotor that is coupled to it and electric power is generated. The power turbine (embracing both the Francis and Kaplan types) has movable wicket gates with axes parallel to the turbine shaft casing from the intake passages, or penstock, passes through in to the draft tube, through which it flows into the tail race below the power house. By actuating the movableswicket gates, the power output can be controlled.

The part-load efficiency can be increased in the case of Kaplan type by actuating the adjustable runner blades during operation synchronously with movable wicket gates. The choice of type for a given set of conditions largely depends on the available net head. It should be noted that hydro power stations do not use any kind of fuel except water.

2.3 GROWTH OF ELECTRICITY IN NIGERIA

At present, in Nigeria power is generated from seven hydro and thermal stations across the country. These are the Kanji hydro with installed capacity of 760MW and the Jebba hydro with installed capacity of 540MW. The thermal power stations are the egbin power station with installed capacity of 220MW as at then and ultimately 1320MW by November, 1987; the Sapele power station with installed capacity of

720MW and are available capacity of 115MW (steam Turbine) and installed capacity of 286MW and available capacity of 170Mw; (Gas Turbine); the Afam power satation with installed capacity of 340MW; the Delta power station with installed capacity of 91.5MW and available capacity of 10MW. Others have an installed capacity of 57MW and available capacity of 6MW. This makes the total capacity 3,696.5MW as at June 24, 1985.

Aside from these, there are some power stations under construction and some power proposed ones. they are the Shiroro hydro (4 X 150 MW) under construction, the Oji river coal power plant (120 MW), the Delta IV gas turbine (6 X 100 Mw), Makurdi hydro (6 X 177 MW), the Mambilla hydro (6 X 3000 MW), and zungeru hydro (4 X 150 MW). Others are the Makurdi coal thermal plant (4 X 75 MW), the Onitsha thermal (1,200 MW) the Afam V gas turbine plant (4 X 75 MW), the Oron steam plant (1,200 MW), the Lokoja hydro-electric, Abuja (300 MW). Most of these are still under feasibility studies stage.

Other mentioned earlier with 57 MW installed capacity and 6 MW available available capacity including diesel generating sets in isolated power stations are only nearing the end of their useful life span. Such isolated stations will progressively serve as standby till the end of their usefulness as the national grid expands and bigger power stations are built to adequately meet the needs of power supply.

It is pertinent to mention that whereas installed capacitty is what has been contractually bought from the power station contractor(s) taking site conditions fully into consideration, the available capacity of a power station depends on a number of

factors which include operational age, level of maintenance, availability of fuel and fuel characteristics (in thermal stations) and available operating head and discharge quality of water in hydro stations). The available capacity varies therefore from time to time and this is why the value indicated here must be seen as only applicable up till June 1985.

CHAPTER THREE

3.0 SYSTEMS ANALYSIS AND DESIGN

3.1 INTRODUCTION

Based on the findings on the existing systems an attempt is to be made on the design of the proposed system. In designing the computerised billing system in NEPA PLC, Minna, major considerations were based on the information gathered and suggestions made for improvement. It is designed in a way that the basic billing activities and generation of necessary reports are performed as effective as possible and in accordance with the need of the users.

However, this chapter intends to describe the software required as well as the logical and physical designs of the new system. The logical design is considered in terms of the output format, input format and the database files design.

3.2 CHOICE OF LANGUAGE

The proposed system is designed using a database management package. The term database refers to a body of stored information. In a database environment, a database management package is the software that is used to construct, expand and maintain data contained in a database. It provides the interface which enables the user to record, organise, select, summaries, extract, report on and otherwise manage data contained in a database.

There are various types of database management packages which include dBASE, clipper, oracle, informix, ingres, foxbase etc. The dBASE is of various version and which are dBASE II, dBASE III plus, dBASE IV and of recent dBASE V Specifically the system is designed using dBASE IV.

3.3 FEATURES OF LANGUAGE CHOSEN

Basically, the primary objectives of using a database management system are accuracy and integrity, clarity and ease of use, controlled redundancy, data independence, fast recovery powerful and user language, privacy and security.

All these objectives constitute the features of database management packages and specifically, they are associated to dBASE IV. In addition dBASE IV allowed for designing database files using relational structures. The relational structures allows information to be stored in the form of a two dimensional table consisting of a number of rows and columns. Each row represents a record in the database file, and each column represents field in the record of the database file. The major importance of this is that it allows for easy retrieval of information from the file.

3.4 OUTPUT FORMAT

In designing a new system, the first consideration is the determination of the types and nature of the reports to be generated. The reports from a computerised system are required primarily to communicate the results of processing to users, or other system or more importantly for reference. It is therefore necessary for the

reports to be intelligible so that it will be meaningful to the users. There are three reports to be generated from the new system.

3.5 INPUT REQUIREMENT

The inputs is designed to suit the need of the output. Input are data entered into a system. The input of the proposed computerised system is designed to reduce errors and allow for easy data entry.

In addition, the input is designed to reject non existing and inappropriate data entered. This is always accompanied by a message which gives instructions to the users. However, the input data into the system are mainly details of the transactions in the form of the date, account codes, amount and whether it is a debit or credit entry which will be contained in a source document. Each transaction is entered into the source document which will in turn be keyed into the system by the user.

3.6 DATABASE FILES DESIGN

As stated in section 3.2 the proposed system will be developed with dBASE IV. This will require creation of database files which will serve as storage for data that are needed to be processed and those that are results of processing. For the sake of conveniences and efficiency, the proposed computerised billing system in NEPA PLC, Minna will require 2 database files namely CUST.DBF and CHARGE.DBF.

However, the description of contents and structures of each of the database files are stated as follows.

CUST.DBF:- This is a database file that contain the details of all customers within Minna. It is like a transaction file where monthly transactions are stored before processing. It consists of 5 fields which are described below:

S/NO	FIELD NAME	FIELD TYPE	FIELD WIDTH
1	METER	CHARACTER	7
2	NAME	CHARACTER	30
3	ADDRESS	CHARACTER	30
4	PURPOSE	CHARACTER	1
5	MONTH	CHARACTER	2

CHARGE.DBF: This file contains the details of all the category of electricity users and their respective tarrif. It is made up of 3 fields which are described as follows:

S/NO	FIELD NAME	FIELD TYPE	FIELD WIDTH
1	USER	CHARACTER	1
2	CATEGORY	CHARACTER	10
3	PRICE	NUMERIC	10

3.4 THE PHYSICAL DESIGN OF THE SYSTEM

This section contains the actual coding of the source program. It is made up of the raw program which enable the computer to carry out the expected task as analysed and designed earlier. The program is mainly the transformation of the logical

design into form understandable by the computer. The inclusion of the program is considered necessary so as to aid modification of the new system in the future. Therefore, the program specification is contained in appendix 1.

CHAPTER FOUR

4.0 SYSTEM DEVELOPMENT AND IMPLEMENTATION

4.1 INTRODUCTION

The last chapter discussed all the necessary requirement about the design of the proposed system. Having discussed the design, there is the need to communicate the mode of working with the new system to the potential users. Furthermore, the working environment as well as the step by step introduction of the new system needs to be stated.

Having recognised the need for the above, this chapter begins with the features of the language chosen and the need for the language used. It aim at stating the description of the proposed system so as to aid the users in interacting fully with the system. It will further discuss its operating environment in terms of the hardware and software requirements. The mode of testing and conversion to the proposed system are also highlighted in this chapter. All these are considered essentials in order to aid full application of the new system.

4.2 WORKSTATION REQUIREMENT

Hardware can be defined as the physical part of a computer system which constitutes the mechanical, magnetic, electrical and electronic devices. The hardware configuration is a collection of hardware which forms a complete computer system. The selection, of this configuration is always done to meet up with both the needs of

the system as well as that of the organisation. Furthermore, in making the selection, one needs to consider the future changes in the organisation in terms of memory, speed, and so on.

Given the above, the proposed system is designed to run on the IBM PC and IBM compatible micro computers with central processing unit (CPU) of 486 micro process and above. Since a hard disk offers a substantial advantages in data access speed and storage, the computer is expected to have a hard disk of not less than 850 megabyte (MB) storage capacity and a floppy disk drive of 3/5 inches. The floppy disk drive is expected to be used for data transfer into the computer while the large storage large storage capacity of the hard disk is needed against future.

In addition, a printer is also required in the configuration for the production of hard copies of reports such as the general ledger and trial balance. A line printer having an ability of printing 1200 character per second is required so as to aid speedy retrieval of information. An uninterrupted power supply (UPS) with an ability for automatic generation of power failure needs to be included in the configuration for the proposed system. This is to avoid the effect of power failure while a job is being performed.

Similarly, this newly designed accounting system needs to be operated in an environment with the following facilities:

(i) Pentium 166 MHZ

(ii) 16MB RAM (Random Access Memory)

(iii) 1.7 GBMB Hard Disk

(iv) 3.5 inches diskette drive

(v) DOS/Windows installed.

(vi) A line printer EPSON LQ 1050 OR LQ 1170

(vii) A UPS of about 800 Kilowatt

4.3 SOFTWARE REQUIREMENT

Software can be defined as programs that direct and control the activities of a computer. It serves as intermediary between the computer hardware and the computer user. This accounts for why it is believed that software enables the users to fully exploit the capabilities of a computer. The ability of this newly designed system to work on a computer is due to the requirement and ability of software.

However, the proposed system requires the availability of some forms of software which will enhances the workings of the system and other task that will be required Specifically, it requires the installation of dBASE IV lotus 1-2-3 and word perfect of version 5.1 or 6.O.

The dBASE IV is to allow for modification of the proposed system. This is possible because the system is developed using dBASE IV. Also required is lotus 1-2-3, a spreadsheet package designed to aid Accountants in performing their jobs. It was introduced to replace the ledger book which requires a manual process. The installation of word perfect is to enable the organisation create, modify and print a text of document such as a report, proposal and other official letter. The use of word

perfect for this purpose enhance the output of the reports and allow for flexibility on the contents of the document.

4.4 SOFTWARE DEVELOPMENT AND TESTING

A system is not assumed to be working perfectly until a confirmed test is performed. This is done by carrying out a system testing. Therefore, a system testing can be defined as the process of confirming whether a newly designed system is working in order or not. Because a computer system is expected to assist computer users in executing the required task with all the necessary speed and accuracy there is the need to properly test a newly designed system to ensure that it is working according to the set objectives.

However, this newly designed accounting system has been tested using data with known result. The known result was obtained after a dry run and this result was compared with the one generated by the new system. These two results turned out to be the same.

It is necessary to state that the testing was done for more than a particular period and the result is found to be perfectly the same with that of the manual operation. Specifically, the period of test was a system cycle which covers a financial year. Therefore, this new system is recommended for full implementation without any further testing whatsoever.

4.5 SYSTEM CONVERSION AND CHANGEOVER

Once a system has been fully designed and tested and found to be working perfectly, the next task is the conversion of the old procedures to the newly designed one. This requires a lot of care and precautions so as not to delay the entire working of the organisation as a whole. It is as a result of this that the introduction of a newly designed system needs a systematic approach.

The implication of system conversion is to describe the modes of the file set up, file conversion, and the changeover. File set up involves the creation of data files that will work with the newly designed system. File conversion is the process of converting existing data files into the form that would be accepted by the new system. This is relevant if the existing system is a computerised procedure and would be preferred to creating a new file and then data entry. Finally, changeover involves the full adoption and implementation of the new system.

However, the conversion required for the proposed system is in the area of file set up and changeover. The file set up is required because the current procedure is manual. The input database files are created using the control center of dBASE IV. The initial data entry into some database files were done via the use of append mode of the control center. For other input files, the data entry was made from selecting a menu in the new system. This is expected to be done before the changeover is carried out.

Generally, there are three forms of changeover that can be adopted. They are as follows:

(i) Direct Changeover

(ii) Pilot changeover

(iii) Parallel changeover

The direct changeover implies a situation where the new system is introduced at once and the old system was abandoned immediately. This is said to be dangerous especially if the newly designed system is not well tested. The risk associated to direct changeover could be reduced if pilot changeover is adopted where the new system will be introduced step by step.

A new step will not be introduced until the currently introduced one is confirmed working perfectly. This mode of changeover is mostly applicable where the new system is so large. However, the most reliable modes of changeover is the parallel changeover because both the new and old systems would be considered necessary to discard the old system.

Specifically, parallel changeover mode is recommended for the implementation of this newly designed accounting system. This is selected so that in case of any problem, the workings of the entire organisation will not be jeopardised.

4.6 DOCUMENTATION

This is the process of describing the workings of the system to the end users. It is always required so as to enhance maintainability. The documentation can also be used by the users in getting solution to some problems. However, the

documentation of this system contains how the system would be started as well as describing each of the facilities provided by the proposed system.

4.7 STARTING THE SYSTEM

The new system required the installation of dBASE IV on the computer before it can be executed. The dBASE need to be activated by following the steps below:

1. Type dBASE at the prompt to display the control center.

2 Press ESC key to take you to the dot prompt.

3 Given that the suite of programs have been copied to the hard disk, then type DO NEPA to start the execution of the program. This would display the main menu on the screen from which other selections and entries can be carried out. This is represented by figure 1.

4.10 DESCRIPTION OF THE MENU STRUCTURE

The main menu is designed to have FIVE options with each option to be selected by pressing the first letter of the option. The options are REGISTRATION OF CUSTOMERS, POWER CONSUMPTION ENTRIES, CHARGES UPDATE, REPORT PRODUCTION and SYSTEM EXIT.

REGISTRATION OF CUSTOMERS:- This option is responsible for maintaining the customer details in the file. It has a submenu containing facilities for entering new customer details, modify details, delete details and view details. These options are represented by figure 2.

POWER CONSUMPTION ENTRIES:- This is a monthly routine where the user would enter the amount of kilowatts used by electricity consumers. The system goes on to calculate the amount due by the user. The submenu to this option is represented by figure 3 in the appendix

CHARGES UPDATE:- This is an option used to make entries for the expected charges per each of the three categories of electricity users. This option presents the existing rates and give the user the opportunity to modify the tarrif.

REPORT PRODUCTION:- This option when selected will display the list of all the reports available within the system. This is represented by figure 4.

SYSTEM EXIT:- This option when selected takes the user out of the system completely. It takes the user back to the dot prompt of dBASE IV.

CHAPTER FIVE

5.0 SUMMARY, RECOMMENDATION AND CONCLUSION

5.1 SUMMARY

NEPA PLC is currently using manual procedures in performing the customer bill. This include the entries of electricity consumption as well as the calculation of the customer's charges. In addition, it requires the printing of various reports.

Specifically, the organisation has been performing this task with some associated problem such as time wastage in printing bill, loss of data, inaccurate computation of results and a lost of other problems. These are becoming more prominent these days because of the increased activities in the organisation with the net effect of pressures on the staff of the department. It then become obvious that the manual procedure can no longer cope with the need of the organisation. This then necessitated the need to propose a computerised system for the organisation.

However, the proposed system was designed based on the analysis of the existing system carried our as well as to meet the requirement of the users. Because of the feature of database management system dBASE IV was used to develop the system. The details of the software development were fully described as well as the specification of input and output files.

Given the logical and physical designs of the system, the appropriate mode of implementing the proposed system was also highlighted in order to allow for proper usage of the new system.

All these were done with the hope that the proper introduction of the computerised system would solve the problem presently encountered with the named procedures.

5.2 RECOMMENDATIONS

The proposed computerised billing system in NEPA PLC, Minna is expected to bring some benefits to the organisation in addition to solving the current problems. However, for proper execution of the new system, the following recommendation need to be adopted.

(a) The organisation needs to create a computer section which will see to the day to day operations of the computer usage. This section is expected to be head by a supervisor whose qualification should be at least a graduate in Computer Science. The supervisor should be vested with the responsibility of maintaining the computer as well as designing and developing software for local use in the organisation.

(b) A training requirement is also recommended for the staff that would be working directly with the computer training course on computer Appreciation and operation for a duration of 2 or 3 months.

(c) Computer workshop on regular basis should be organised for the management and semi management staff of the organisation. This is intended to curb compute frauds.

(d) Furthermore, there is need to install a good security measure on access to computer and its usage. Unauthorised persons should persons should not be allowed into the computer room. This is expected to safeguard the information contained in the system.

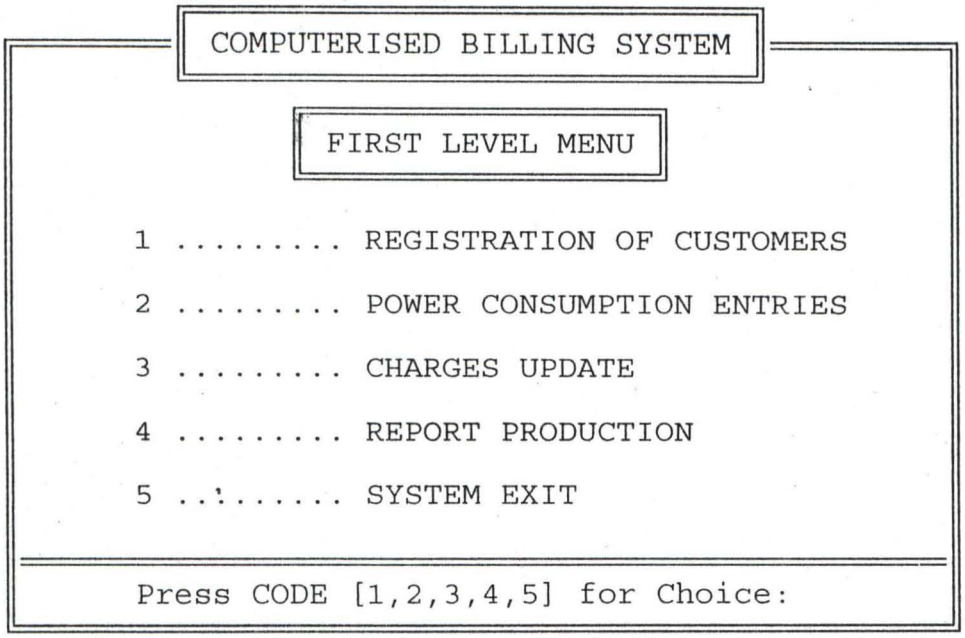
(e) Finally, there should be a strict adherence to the application software required and the hardware configuration in order to achieve the efficient implementation of this newly designed system.

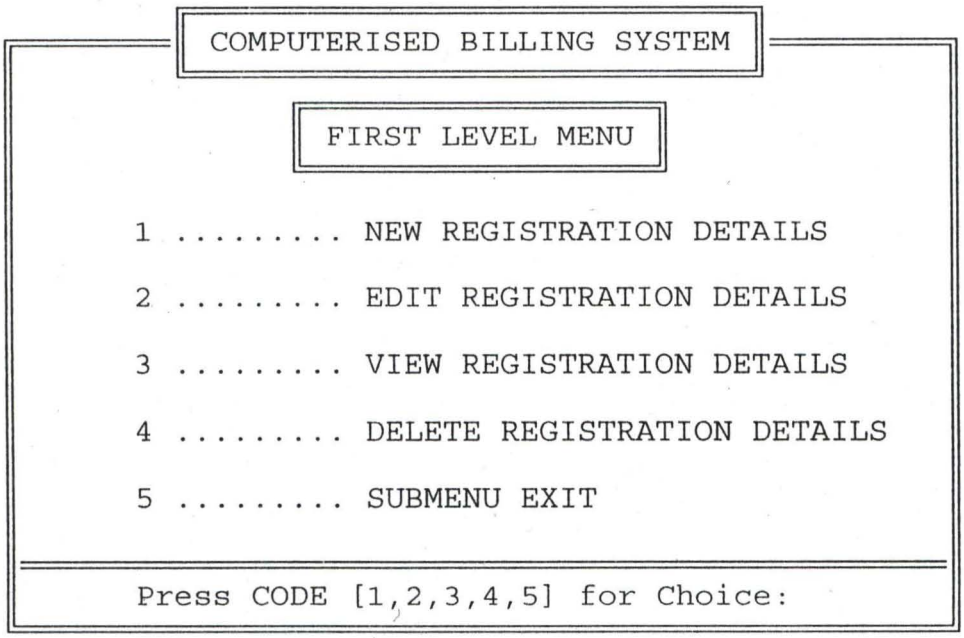
5.3 CONCLUSION

The presence of computerization of operations is done because of the expected benefits . In addition, the world is going into computer age and any organisation that wants to be relevant needs to be computerised. similarly, a professional without a computer touch will also not be considered relevant in this present world.

In realisation of this, the proposed system when finally in operation will in no doubt bring the establishment immeasurable benefits in its present and future day-to-day activities.

APPENDIX I


COMPUTERISED BILLING SYSTEM
FIRST LEVEL MENU
1 ..... REGISTRATION OF CUSTOMERS
2 ..... POWER CONSUMPTION ENTRIES
3 ..... CHARGES UPDATE
4 ..... REPORT PRODUCTION
5 ..... SYSTEM EXIT
Press CODE [1,2,3,4,5] for Choice:


COMPUTERISED BILLING SYSTEM
FIRST LEVEL MENU
1 ..... NEW REGISTRATION DETAILS
2 ..... EDIT REGISTRATION DETAILS
3 ..... VIEW REGISTRATION DETAILS
4 ..... DELETE REGISTRATION DETAILS
5 ..... SUBMENU EXIT
Press CODE [1,2,3,4,5] for Choice:

```
        COMPUTERISED BILLING SYSTEM

              FIRST LEVEL MENU

      1 ..... NEW MONTHLY ENTRIES

      2 ..... EDIT MONTHLY ENTRIES

      3 ..... VIEW MONTHLY ENTRIES

      4 ..... SUBMENU EXIT


      Press CODE [1,2,3,4] for Choice:
```

```
        COMPUTERISED BILLING SYSTEM

              FIRST LEVEL MENU

      1 ..... INDIVIDUAL CUSTOMER BILL

      2 ..... DETAILS OF MONTHLY CHARGES

      3 ..... STATEMENT OF MONEY COLLECTED

      4 ..... LIST OF DEBTORS

      5 ..... SUBMENU EXIT


      Press CODE [1,2,3,4,5] for Choice:
```

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APPENDIX II

```
set talk off
set stat off
set safe off
set scor off
set date brit
set proc to nepa
do whil .t.
 clea
 @ 3,15 to 21,64 doub
 @ 2,24 to 4,54 doub
 @ 3,25 say ' COMPUTERISED BILLING SYSTEM '
 @ 5,30 to 7,49 doub
 @ 6,32 say 'FIRST LEVEL MENU'
 @ 9,22 say '1 ..... REGISTRATION OF CUSTOMERS'
 @ 11,22 say '2 ..... POWER CONSUMPTION ENTRIES'
 @ 13,22 say '3 ..... CHARGES UPDATE'
 @ 15,22 say '4 ..... REPORT PRODUCTION'
 @ 17,22 say '5 ..... SYSTEM EXIT'
 @ 19,16 to 19,63 doub
 @ 20,22 say 'Press CODE [1,2,3,4,5] for Choice:'
 do whil .t.
  check = ' '
  @ 20,57 get check pict '!'
  read
  if check $ '12345'
    exit
  endi
 endd
 do case
  case check = '1'
```

```
    do reg
  case check = '2'
    do power
  case check = '3'
    do charge
  case check = '4'
    do rep
  othe
    exit
 endc
endd
clea
retu

PROC REG

set talk off
set stat off
set safe off
set scor off
set date brit
*set proc to nepa
do whil .t.
 clea
 @ 3,15 to 21,64 doub
 @ 2,24 to 4,54 doub
 @ 3,25 say ' COMPUTERISED BILLING SYSTEM '
 @ 5,30 to 7,49 doub
 @ 6,32 say 'FIRST LEVEL MENU'
 @ 9,22 say '1 ..... NEW REGISTRATION DETAILS'
 @ 11,22 say '2 ..... EDIT REGISTRATION DETAILS'
```

```
@ 13,22 say '3 ..... VIEW REGISTRATION DETAILS'
@ 15,22 say '4 ..... DELETE REGISTRATION DETAILS'
@ 17,22 say '5 ..... SUBMENU EXIT'
@ 19,16 to 19,63 doub
@ 20,22 say 'Press CODE [1,2,3,4,5] for Choice:'
do whil .t.
  check = ' '
  @ 20,57 get check pict '!'
  read
  if check $ '12345'
    exit
  endi
 endd
 do case
   case check = '1'
     do reg1
   case check = '2'
     do reg2
   case check = '3'
     do reg3
   case check = '4'
     do reg4
   othe
     exit
 endc
endd
clea
retu

PROC POWER
```

```
set talk off
set stat off
set safe off
set scor off
set date brit
*set proc to nepa
do whil .t.
 clea
 @ 3,15 to 21,64 doub
 @ 3,24 to 5,54 doub
 @ 4,25 say ' COMPUTERISED BILLING SYSTEM '
 @ 6,30 to 8,49 doub
 @ 7,32 say 'FIRST LEVEL MENU'
 @ 10,22 say '1 ..... NEW MONTHLY ENTRIES'
 @ 12,22 say '2 ..... EDIT MONTHLY ENTRIES'
 @ 14,22 say '3 ..... VIEW MONTHLY ENTRIES'
 @ 16,22 say '4 ..... SUBMENU EXIT'
 @ 19,16 to 19,63 doub
 @ 20,22 say 'Press CODE [1,2,3,4] for Choice:'
 do whil .t.
  check = ' '
  @ 20,57 get check pict '!'
  read
  if check $ '1234'
   exit
  endi
 endd
 do case
  case check = '1'
   do power1
  case check = '2'
```

```
    do power2
   case check = '3'
    do power3
   othe
    exit
 endc
endd
clea
retu


PROC REP

set talk off
set stat off
set safe off
set scor off
set date brit
*set proc to nepa
do whil .t.
 clea
 @ 3,15 to 21,64 doub
 @ 2,24 to 4,54 doub
 @ 3,25 say ' COMPUTERISED BILLING SYSTEM '
 @ 5,30 to 7,49 doub
 @ 6,32 say 'FIRST LEVEL MENU'
 @ 9,22 say '1 ..... INDIVIDUAL CUSTOMER BILL'
 @ 11,22 say '2 ..... DETAILS OF MONTHLY CHARGES'
 @ 13,22 say '3 ..... STATEMENT OF MONEY COLLECTED'
 @ 15,22 say '4 ..... LIST OF DEBTORS'
 @ 17,22 say '5 ..... SUBMENU EXIT'
```

```
@ 19,16 to 19,63 doub
@ 20,22 say 'Press CODE [1,2,3,4,5] for Choice:'
do whil .t.
 check = ' '
 @ 20,57 get check pict '!'
 read
 if check $ '12345'
  exit
 endi
endd
do case
 case check = '1'
  do rep1
 case check = '2'
  do rep2
 case check = '3'
  do rep3
 case check = '4'
  do rep4
 othe
  exit
 endc
endd
clea
retu
```