COMPUTERIZATION OF NEPA HOSPITAL ADMINISTRATION

(A CASE STUDY OF NEPA SHIRORO POWER STATION HOSPITAL)

BY

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REG. NO. PGD/MCS/98/99/848

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TITLE PAGE

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APPROVAL PAGE

This research paper on computerization of NEPA HOSPITAL ADMINISTRATION (A CASE STUDY OF NEPA SHIRORO POWER STATION HOSPITAL) has been made and approved as meeting the requirements of the department of Maths/Computer Science of the Federal University of Technology, Minna for the award of Post Graduate Diploma in Computer Science.

MALLAM ISAH AUDU
Project Supervisor

Date:

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Date:

External Examiner

Date:

DEDICATION

This research paper is dedicated to Almighty God for seeing me through up to the completion

of this programme and to my daughter, Chiagoziem, and darling husband Engr. U. E. Chioke

who was my source of inspiration throughout this programme.

To God be the Glory.

ACKNOWLEDGEMENT

I wish to express my profound gratitude to my supervisor Mallam Isah Audu for taking pains to read through my work and also making the necessary corrections.

I remain very grateful to the head of Maths/Computer department, Dr. Reju whose good sense of administration quickened the completion of this programme.

I also extend my appreciation to Mallam Hakimi for his wonderful encouragement towards the completion of this programme, and to all the lecturers of the Maths/Computer Science department who handled the course.

My utmost appreciation also goes to the staff and management of National Electric Power Authority, Shiroro Power Station for giving me their maximum cooperation towards this this successful research work. I thank most especially the hospital staff and Mr. Emma for his great encouragement.

Finally, I thank my good friends and colleagues in school.

May our Good Lord bless you all.

To God be the Glory.

Chioke, Ogochukwu U. E. (Mrs.)

ABSTRACT

This project aims at computerizing NEPA- Shiroro Hospital Administration to lessen the burden of operational difficulties encountered in manual information management system that is currently in use.

Several man-hours are currently spent everyday in manual handling and processing of patients medical records.

Therefore, automation of data processing through the use of computers has shown to be the only way out for proper and improved information management system. This will quicken the pace of health care delivery services and increase the overall efficiency of this NEPA-owned hospital

The commonest DBASE software (DBASE IV) has been adopted to suit the various information requirements of this hospital.

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CHAPTER ONE

GENERAL INTRODUCTION
1.0   BRIEF HISTORY OF SHIRORO HYDROELECTRIC PROJECT

In April 1957, the Northern Nigeria government and the then ECN jointly authorized an investigation of the hydroelectric potential of the River Kaduna at Shiroro Gorge . The investigation was carried out by Alexander Gibbs and partner in collaboration with Messers Preece Cardew and Rider .

In February 1959, preliminary report on hydroelectric development of the Kaduna River at the Shiroro gorge was published by sir Alexander Gibbs and partners and Preece Cardew and Rider.

In 1977, design works and consultancy works were awarded to Messers Chas T Main of Boston

U.S.A. In march 1978, main civil work contract of Shiroro Dam was awarded to Messers J.V.Torno of Milan, Italy .

By 1978, Torno started work at the dam site . Construction of the Operators village started simultaneously with the construction of the dam due to the importance of the housing units to the personnel working at the dam. Construction of the village was carried out by Interstate Construction (Nig) Limited.

In 1980, resettlement of the villagers displaced by the construction of the Shiroro hydroelectric dam project commenced. Compensation was paid to the villagers as demanded by them. Construction of the senior and employers camps started and were completed in 1981 . These housing units were built to accommodate the contractor's staff and the employer's staff alike.

By 1981, excavation and construction of the spillway and the Shiroro dam power house commenced, but its completion was held up due to lack of payment from the owner, hence it was not completed as scheduled in the contract plan . In 1984, Shiroro hydroelectric dam lake reservoir was successfully completed . Main civil contractor, J.V. Torno in 1985 started to demobilize after successful completion of the civil works .

A presidential task force was set up by the then head of state, General Ibrahim Badamosi Babangida in 1988, to oversee the completion of the Shiroro hydroelectric project which had suffered delay in completion due to lack of fund and other bureaucratic problems. The Task Force was headed by Engr. M. K. Ibrahim who performed creditably well towards the completion of the Shiroro Hydroelectric Project. His appointment was a big morale booster and a big relief to all working at the Shiroro Hydroelectric Project and this contributed in no small way towards the completion of the project, which was then four years behind schedule.

On 31st October, 1989, unit No 4 which was the first unit to be completed was commissioned. Unit 1 was commissioned and synchronized to the National Grid on 29th November, 1989. Unit 3 was commissioned and synchronized into the National Grid on 21st December, 1989. On 21st January, 1990,Unit 2 was commissioned and synchronized into the National Grid, while the Power Station as a whole was commissioned by General Ibrahim Babangida, the then President and Commander-in-Chief of the Nigerian Armed Forces on 20th June, 1990.

In 1991, two years maintenance contract was awarded to all contractors involved in the construction of the Shiroro Hydroelectric Project to undertake the training of NEPA staff on the operation and maintenance of equipment installed in the station.
The maintenance contract was extended for another two years term in 1992.

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1.1 ECONOMIC AND SOCIAL IMPACT OF SHIRORO POWER STATION.

I. The Lake, Power House and Switchyard constitute a tourist center where people from all walks of life visit for tourism during holidays and weekends.

II. The presence of the station has created job opportunities at various levels for both indigenes and non-indigenes.

III. The construction of Shiroro Dam has resulted in improved revenue generation for the state and local government through taxes from civil servants and levies from other settlers.

IV. The station represents a unique engineering firm for students on excursion and provides a good training ground for industrial training of students of engineering and allied
courses of study.

V. The indigenes feel a sense of belonging by way of contributing to national development through power generation from Shiroro Dam.

VI. The station contributes immensely towards science education by providing higher institutions with instructional materials like old transformers, electric motors, pumps etc.

1.2 SPECIAL FEATURES OF SHIRORO POWER STATION

I   The station runs on 4No Francis Turbines which are suited for the medium head Reservoir operation of Shiroro Lake (optimum head = 97m).

II Quick start from cold and quick load pick-up are also special features of the Machine in Shiroro Power Station.

III.   Each of the 4 Shiroro machines can boost power supply to the National Grid by 150MW in just 6 minutes. This is one of the most important special features of Shiroro Power Station which makes the station vital in handling emergencies resulting from sudden increases in load demand or sudden loss of a machine from another station.

1.3   UNIQUE ACHIEVEMENS AND AWARD WINING PERFORMANCE

I.   Shiroro Power Station has remained the most reliable power station in the country's electricity network.

II.   Shiroro Power Station operates at 100% capacity.

III.   Its units are the fastest in boosting power supply to the National Grid.

IV.   In emergencies NEPA falls back on Shiroro Power Station for bulk production of electricity.

V.   The station generates 25% of the nation's current electricity demand.

1.4   VARIOUS DEPARTMENTS IN SHIRORO POWER STATION

Shiroro Power Station is made up of the underlisted twelve departments, namely,

I.   **Mechanical Maintenance Department--**   This is responsible for all mechanical aspects of the plant .

II   **Electrical Maintenance Department-----**This group sees to the Electrical aspects of plant maintenance in the station .

III   **Protection, Control and Metering Department---**This is responsible for maintenance of all instruments and measuring devices in the station .

IV   **Operations [Production] Department**----This is responsible for the operation of the equipment involving all switchings that are necessary for producing electrical power in the station.

V   **Estate and Civil works Department**----This is responsible for maintenance of the civil structures, that is, Dam and Power house building in addition to maintenance of the entire housing units and the road network in the station.

VI   **Administrative Department**----This is responsible for the day to day administration of the station.

VII   **Accounts Department**----Takes care of all the accounting jobs necessary for effective running of the station.

VIII   **AutoWorkshop Department**----This maintains the station's vehicles of all types including cranes and forklifts, and ensures the sustenance of a dependable transportation system for the entire workforce in the station.

IX   **Health/Medical Department**----It provides healthcare services to the entire workforce in the station, and their immediate families and dependants.

X   **Education Department**----This is responsible for meeting the educational needs of children and wards of staff at primary level.

XI   **Fire Service and Safety Department**----This is responsible for prevention and control of fire in the station and also enforces the observance of safety rules in the day to day running of the station by all other departments.

XII   **Technical Services Department**----This is responsible for provision of technical assistance to all other departments in the station in the performance of their duties.

ORGANOGRAM

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│ (E)  ││SM(CIVIL) ││ SM(P/A)  ││SM(ACCTS) ││ SM(AUTO) ││ SM(MED)  ││ MGR(EDU) │
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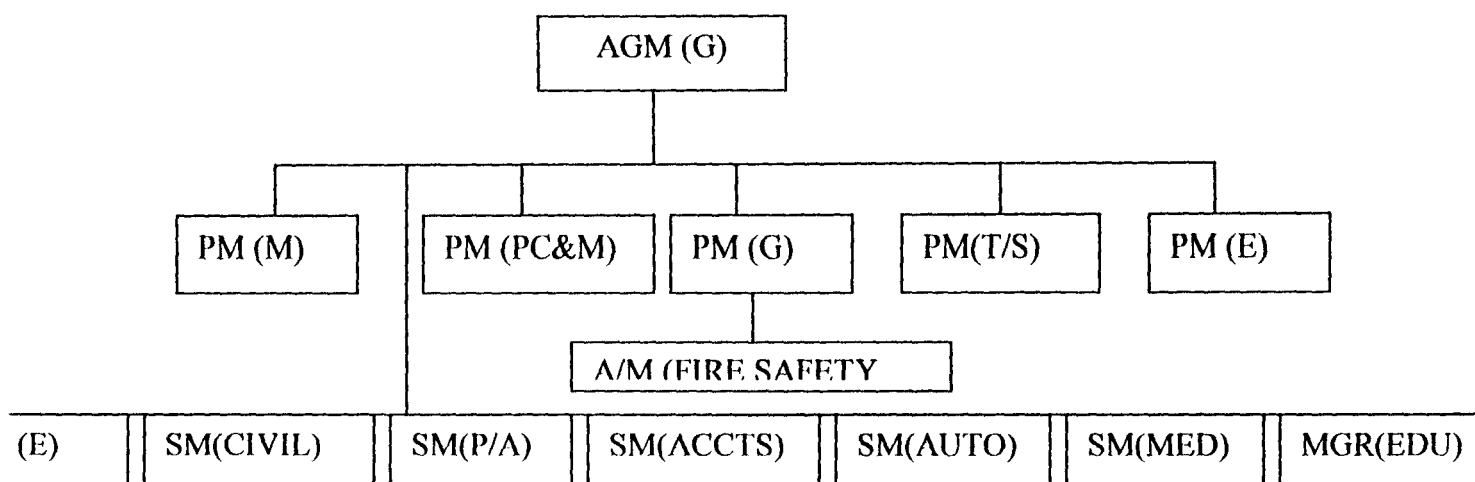
1.5 OBJECTIVES OF THE STUDY

The main objective of computerizing the National Electrical Power Authority's hospital is to enable the hospital management carry out its administrative functions effectively.

It is also to help the management of the hospital to improve its services to NEPA staff and others.

1.6 SIGNIFICANCE OF THE STUDY

Successful computerization of NEPA Shiroro hospital administration will protect the system against alteration, tampering, damage or loss of original documents.

The problem of data duplication and inconsistency of data will be very much reduced if not totally avoided.

1.7 SCOPE OF THE STUDY

Data acquisition and processing are central to effective administration of any hospital . The larger the number of patients, the greater the need for speedy handling and processing of data.

This project therefore covers the acquisition of information, handling and general processing of data for the entire workforce of NEPA Shiroro Power Station complex. This consists of workers in the following sub-divisions:

I. NEPA – Shiroro Power Station

II. NEPA – Area Transmission Work Centre

III. NEPA – Supplementary National Control Centre

IV. Day Secondary School –Shiroro

V. Nigerian Police Force – Shiroro Division

VI. SIEMENS – Electrical Contractor

VII.   Voest Alpine – Mechanical Contractor

VIII.   Vita Construction – Civil Contractor

IX.   Others – mainly villagers who are brought in and treated on emergency.

These workers and their families total over 3000, and make over 16,000 calls at the hospital annually. With this large number of calls at the hospital in mind, the project strives to minimize the time and cost of handling of all information relating to these patients with a view to improving the efficiency of administration of this NEPA – owned hospital.

CHAPTER TWO

LITERATURE REVIEW

2.1 HOSPITAL ADMINISTRATION

The NEPA Hospital in Shiroro is one the twelve departments that make up Shiroro Power Station.

It is a 30-bed hospital and offers both in-patient and out-patient healthcare delivery services to NEPA employed workers together with families and immediate dependants.

At present, the hospital is manned by two medical doctors, three matrons and twenty-five other workers all of whom are NEPA-employed . While the core medical personnel provide healthcare services from pre-natal to geriatrics, other auxiliary workers provide such services as catering for the in-patients and general maintenance and upkeep of the entire hospital complex, all of which quickens the recovery of both in-and out-patients

2.2 HOSPITAL AS A UNIT IN NEPA-SHIRORO POWER STATION

The hospital as a unit provides the healthcare services required by the 500 NEPA-employed workers in Shiroro Power Station as well as their families and dependants all totaling about 3,000 patients .

On humanitarian grounds, the hospital also caters for the staff of various support organizations like the Shiroro Division of the Nigerian Police Force, the teachers in the government owned Day Secondary School in Shiroro, staff of various contractors working in the Shiroro Power Station Complex and their families and dependants .

Infrequently, villagers in dire need of medical attention are also rushed to this NEPA hospital and are treated under emergency . This particular group of patients is classified as 'OTHERS' in table II.

The workforce of these other support organizations has greatly increased the number of patients the hospital attends to.

Table I shows the PATIENTS' STATISTICS in the hospital for the year 1997. Also depicted are the levels of in-patient and out-patient, Births recorded, Deaths, the number of major and minor operations carried out, X-ray pictures taken and laboratory tests .

SHIRORO POWER STATION
HOSPITAL PATIENTS STATISTICS FOR 1997

	OUT PATIENTS	IN PATIENTS	BIRTHS			DEATHS	OPERATIONS			X-RAY		LAB.INVESTIGATIONS			POWER HOUSE CLINIC
			MALE	FEMALE	TOTAL		MAJOR	MINOR	TOTAL	TOTAL PTS	NO. OF FILMS USED	TEST DONE	MALARIA POSITIVE TEST	TOTAL PATIENTS TEST	
January	1.322	61	9	7	16	—	1	22	23	2	2	270	51	117	81
February	992	33	2	8	10	1	2	12	14	10	14	293	35	98	—
March	786	44	8	4	12	—	2	20	22	25	33	133	20	68	102
April	1,192	27	5	4	9	—	1	18	19	11	10	192	37	82	62
May	1,588	54	6	7	13	1	2	4	6	18	28	185	33	74	114
June	1,520	50	5	3	8	—	3	10	13	21	32	113	48	85	80
July	1,506	47	4	6	10	3	—	8	8	—	—	148	58	80	87
August	1,378	54	2	3	5	1	1	2	3	36	37	255	74	122	—
September	1,522	52	3	2	5	1	6	15	21	20	20	238	75	131	—
October	1,274	78	6	5	11	1	—	12	12	12	15	247	87	116	—
November	1,274	98	6	5	11	—	—	12	12	12	15	247	87	116	—
December	1,388	50	5	4	9	1	1	1	2	14	14	218	76	112	—
TOTAL	15,742	648	75	58	119	9	19	136	155	181	220	2,539	681	1,201	526

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Table 2. goes further to show the total number of patients who attended the hospital in 1997 according to their various organizations i.e. NEPA as the main organization, as well as the support organizations-according to the various names by which they are known .

Records of patients who came into the hospital under emergency (casualty) as well as ante-natal and dental clinic attendants are also shown .

1997 BREAKDOWN OF TOTAL PATIENTS SEEN
ORGANISATION

MONTHS		NEPA	D.S.S.	N.P.F.	SIEMENS	V/A	VITA CONST	TOTAL	OTHERS	CASUALTY	ANTENATAL CLINIC	DENTAL CLINIC	TOTAL
January	WK	131	2	1	—	1	—	135	15	476	70	20	1412
	DP	654	15	18	—	9	—	696					
February	WK	112	2	3	—	—	—	117	20	242	80	8	989
	DP	469	38	8	—	7	—	522					
March	WK	133	—	2	—	—	—	135	14	273	83	14	990
	DP	432	30	9	—	—	18	471					
April	WK	135	2	5	—	—	18	160	8	274	101	18	1206
	DP	611	9	22	—	1	2	645					
May	WK	159	2	4	—	5	—	170	33	427	68	15	1606
	DP	873	10	10	—	—	—	893					
June	WK	182	1	5	—	—	13	201	12	446	76	10	1598
	DP	791	46	13	—	3	—	853					
July	WK	195	4	2	—	1	5	207	11	420	129	15	1537
	DP	683	38	23	—	4	7	755					
August	WK	174	9	11	—	2	—	196	14	438	74	18	1524
	DP	778	—	4	—	2	—	784					
September	WK	184	—	3	—	3	—	190	17	339	72	4	1392
	DP	743	3	16	—	8	—	770					
October	WK	182	—	1	—	—	—	183	11	358	81	16	1538
	DP	844	22	16	2	5	—	889					
November	WK	148	2	1	2	—	—	153	8	440	78	1	1431
	DP	715	24	9	—	3	—	751					
December	WK	188	—	—	—	3	—	191	14	373	92	5	1402
	DP	694	11	11	—	11	—	727					
TOTAL		10,210	270	197	4	68	45	10,794	177	4,506	1,004	144	16,625

*WK -WORKERS

*DP -DEPENDANTS

From table II, a new table, 'Table III' is derived which shows the average number of patients attended to in this hospital on monthly basis, and the overall average for the year 1997.

TABLE III

MONTHS	NO. OF DAYS	NO. OF PATIENTS	AVERAGE NO OF PATIENTS TREATED PER DAY
JAN	31	1412	46
FEB	28	989	35
MAR	31	990	32
APR	30	1206	40
MAY	31	1606	52
JUNE	30	1598	53
JULY	31	1537	50
AUG	31	1524	49
SEPT	30	1392	46
OCT	31	1538	50
NOV	30	1431	48
DEC	31	1402	45
TOTALS	365	16,625	

From table III, the NEPA-Shiroro Power Station hospital handled an overall Average of 16,625 / 365 = 46 patients per day throughout the year 1997 .

Apart from treatment of out-right sicknesses, the hospital also carries out immunization programmes for the workers.

Table IV depicts the various types of immunization conducted on monthly basis for the year 1997, as well as the total number of patients immunized per month, and the overall total for the whole year.

By way of guidance towards planned parenthood, the hospital also organizes family planning programmes for the workers, their families and dependants .

SHIRORO POWER STATION HOSPITAL
ANNUAL IMMUNIZATION RECORD FOR 1997

MONTH	B.C.G.	ORAL POLIO	D.P.T.	MEASLES	TETANUS TOXOID * (W.R.A.) ONLY	TOTAL
January	4	33	29	4	39	109
February	7	16	9	4	24	60
March	12	45	33	4	21	115
April	10	42	32	6	28	108
May	12	38	26	6	18	100
June	11	40	29	7	15	102
July	3	15	12	4	21	55
August	6	24	18	6	18	72
September	9	36	27	8	18	98
October	5	26	21	8	28	88
November	5	1,521(N.I.P.)	16	9	19	1,570
December	11	35	24	8	6	84
TOTAL	95	1871	276	74	255	2,571

* B.C.G. - BAULLE CALMETTE GUERIN

D.P.T. - DIPTHERIA PERTUSSIS TETANUS

W.R.A. - WOMEN OF REPRODUCTIVE AGE

N.I.P. - NATIONAL IMMUNIZATION PROGRAMME DAY INCLUSIVE

Table V shows a record of clients to the family planning programmes as well as summarizes the total number of applications for each class of family planning method for the year 1997.

SHIRORO POWER STATION HOSPITAL
FAMILY PLANNING CLIENTS FOR 1997

MONTHS	PILLS			INJECTIONS			I.U.C.D.			BARRIER (CONDOM)			GRAND TOTAL
	NEW	OLD	TOTAL	NEW	OLD	TOTAL	NEW	OLD	TOTAL	NEW	OLD	TOTAL	
January	—	7	7	1	4	5	—	1	1	—	—	—	13
February	1	4	5	—	9	9	1	—	1	—	1	1	16
March	—	5	5	1	15	16	—	2	2	—	1	1	24
April	—	7	7	1	14	15	—	1	1	—	3	3	26
May	—	8	8	—	13	13	—	3	3	—	3	3	27
June	—	8	8	—	8	8	—	2	2	—	3	3	21
July	—	7	7	—	17	17	—	—	—	—	7	7	31
August	—	4	4	—	10	10	—	—	—	—	6	6	20
September	—	7	7	1	5	6	—	—	—	—	6	6	19
October	—	5	5	—	9	9	—	1	1	—	8	8	23
November	—	7	7	—	11	11	—	2	2	—	7	7	27
December	1	12	12	—	13	13	1	—	1	—	4	4	31
TOTAL	2	81	83	4	128	132	2	12	14	—	49	49	278

* I.U.C.D. — INTRA URINE CONTRACEPTIVE DEVICE

From table II, a total number of 16,625 patients were treated in this NEPA-Shiroro Power Station hospital in the year 1997.

However, with fresh transfers of workers into the Shiroro Power Station complex within 1998 and 1999, and very few transfers out of the complex, it is evident that the number of patients being treated is on the increase.

A speedy and easier handling of medical records of this large number of patients requires some form of automation. This underscores the need to computerize the patients' records and medical history in order to enhance operations of this NEPA-owned hospital in Shiroro.

2.3   COMPUTER AS A DATA PROCESSING MACHINE

Electronic computers are essential tools of modern society. They have become the center of an economic industry. They have found a place in offices and factories, landed on the moon, and will perhaps soon be as common in homes as television sets.

Information Technology often referred to as 'IT' includes computing, communication and control systems- all based on digital microelectronic components more commonly known as chips. It provides us with a means of sending, receiving, manipulating and sorting information at speeds and quantities never before possible.

In their early days, computers had the image of mysterious electronic brains, with enormous power and a will of their own. With computers now being sold in millions and more and more people working with them, much of this mystery has disappeared. Computers are seen

to be reliable, fast and efficient, but as is common with all machines, capable of occasional breakdown. Their capabilities as well as limitations have become better understood.

2.3.1 COMPUTER CAPABILITIES AND LIMITATIONS.

First of all, computer is a machine which hardly has any moving parts and which carries out various tasks-arithmetic operations and logic operations – without human intervention. In other words, a computer is a power driven machine equipped with keyboards, electronic circuits, storage components and recording devices that perform mathematical operations at high speed. Most of the work of a computer is done by tiny solid state electronic components called chips.

Chips can handle millions of items of information in one second, and some of them can store tens of hundreds of thousands of items of information. In addition to chips, computers contain printed circuit boards to connect the various components display screen, keyboards a number of connections for power supplies, printers, etc.

In spite of its calculating and decision making powers, a computer cannot think for itself. A computer does not understand what it is doing. It cannot make moral judgement or in any way go beyond the information at its disposal and the instructions it has for processing that information. Computers cannot interprete continuous passages in a natural language but can respond to individual words or phrases and anything more complicated is beyond them. They process many kinds of information such as prices, bank balances, names, addresses, letters, wages, etc. While this information is inside a computer, it is in a special form- often in a

code. Everything a computer does is in response to instructions. It stores a large number of these information and then works through them one at a time.

2.3.2   COMPUTER STRUCTURE.

Computers come in various shapes and sizes. The smallest, known as micro-computers are larger than a typewriter, and they are based on a single-chip micro-processor. Most micro computers can only be used by one person at a time. Next in size and price are mini computers which may occupy a small room and generally comprise several units. Most mini computers can be used by about a dozen people at one time. The largest and most powerful of all are the main frame computers. These occupy large air-conditioned rooms and can cost millions of naira. A typical main frame computer can be accessed by up to one hundred people at any one time.

A typical digital computer consists of the following units: a central processing unit (known as the CPU), input unit, output unit, and a number of peripheral devices including backing store.

THE CENTRAL PROCESSING UNIT.

The central processing unit , CPU, has three parts, namely, memory, arithmetic and logic unit, and control unit.

The actual processing of data takes place in the CPU. It consists of integrated circuits (chips) mounted on printed circuit boards. As illustrated in the figure below, the control unit co-ordinates the step-by-step running of the whole system. It shares control of all the units of the

computer with the user. The arithmetic and logic unit (ALU) does all the calculations and makes the logical decisions. The memory or main store holds the programs and data that are in use at the time. This memory consists of numbered storage locations or addresses. The other devices connected to the CPU are called peripherals. They carry out the input, output, storage, retrieval and communication operations of the computer.
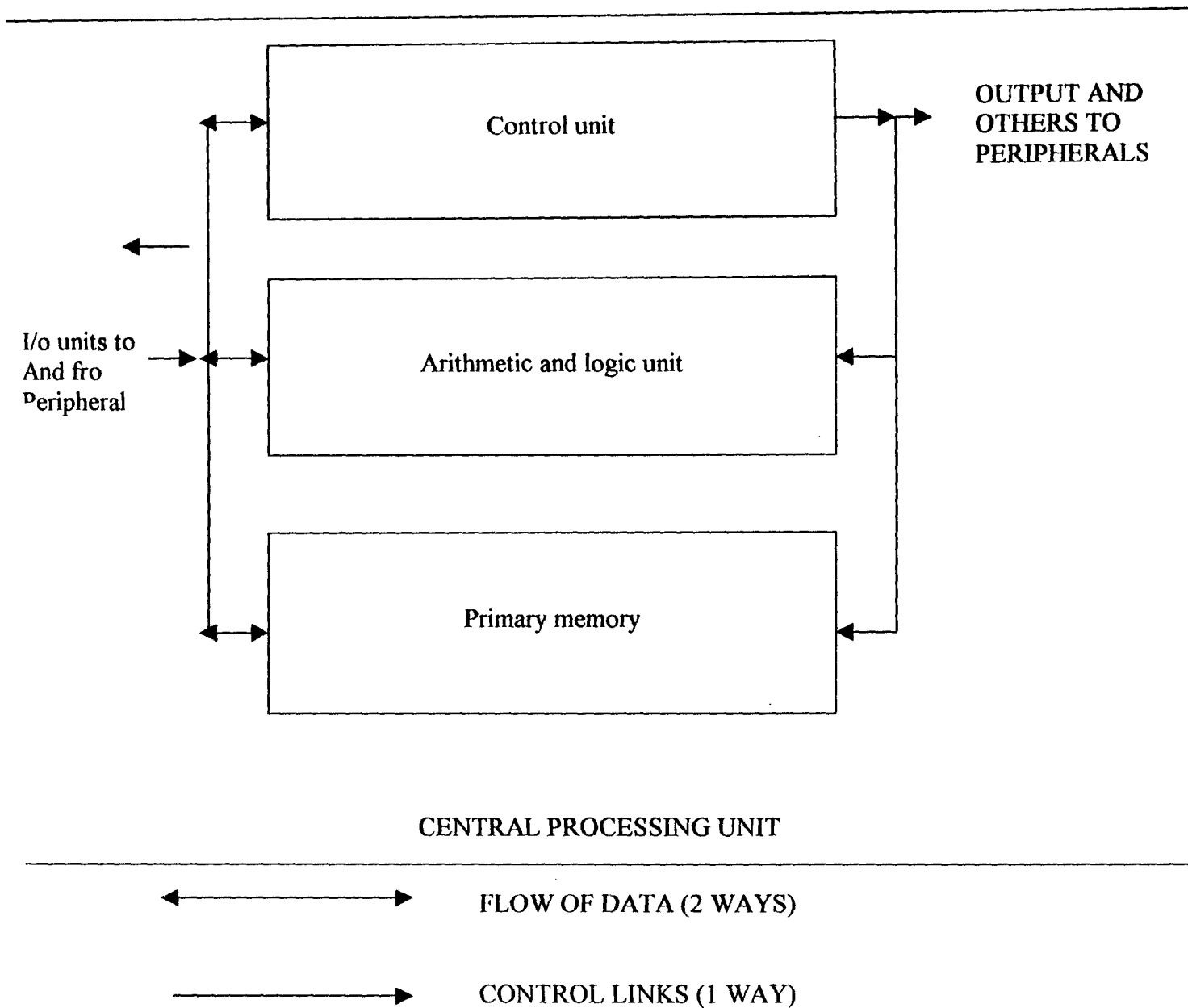
INPUT DEVICES.

The input devices receive data from outside the computer. The data may be typed in directly or in the case of older computers read from punched cards, paper tapes, or other storage media. The input unit converts the data to the pattern of electrical pulses used by the CPU.

OUTPUT DEVICES.

The output unit changes the electrical pulses from the CPU into patterns understandable to the user by printing or displaying on the screen. In many applications, there is an increasing emphasis on output put in graphical form.

BACKING STORE

Secondary store gives the computer rapid access to very large quantities of data far more than can be stored in the CPU memory. The most common backing store media are magnetic tapes and magnetic discs.

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                    ┌─────────────────────────────────┐
                    │                                 │      OUTPUT AND
      ◄────────────►│          Control unit           │────► OTHERS TO
                    │                                 │      PERIPHERALS
                    └─────────────────────────────────┘

      ◄──────

I/o units to         ┌─────────────────────────────────┐
And fro       ──────►│     Arithmetic and logic unit    │◄─────
ᴾeripheral    ◄─────►│                                 │
                     └─────────────────────────────────┘


                     ┌─────────────────────────────────┐
      ◄─────────────►│         Primary memory          │◄─────
                     │                                 │
                     └─────────────────────────────────┘
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CENTRAL PROCESSING UNIT

◄──────────────►   FLOW OF DATA (2 WAYS)

──────────────►   CONTROL LINKS (1 WAY)

2.4   **FACTORS INFLUENCING INTRODUCTION OF COPUTER**

The following factors make the introduction of computers in NEPA-Shiroro hospital administration quite an attractive idea.

I.   Computers have the ability to handle large amount of data that needs to be processed.

II.   Once programmed, computers can perform complex calculations.

III.   Computers also have the speed and ability to access data directly.

IV.   The use of computers increases efficiency, accuracy and consistency.

VI.   Data inside a computer can be copied onto diskettes or other secondary storage

        devices as back-up copies to guard against total loss of information in case data is

        deleted accidentally or lost through a fire accident.

VII.   With conventional files, the data is often collected at different times and validated

        by different validation routine. Therefore, the output produced by different

        systems could well be inconsistent. With the introduction of computers, data can

        now be collected once and processed but it is essential that good integrity and

        security features operate in such systems.

CHAPTER THREE.

3.1   SYSTEM ANALYSIS AND DESIGN.

System analysis involves studying the existing system operations in an attempt to discover the strengths and weaknesses of the system. In this case, the system analyst uses all facts collected in other to make proper assessment of the system, and establishing the fact on the need for an alternative system that will facilitate the activities of the administrative arm of the hospital, and as such, overcome the shortcomings of the existing system.

3.1.1   FEASIBILITY STUDY.

The term feasibility study means possibility that is based on idea which simply ask the fundamental questions on whether the proposed system will work or not, its desirability, viability (costs and benefits), or practicability (operational and technical).

An objective feasibility study enables us to understand clearly the project request such as what to do and why. It helps to determine the size of the project so as to estimate the amount of time and personnel required to develop the system.

3.2   PROBLEM DEFINITION.

Analysis of the existing system will help in understanding the nature of the problems of the existing system. It will also help in setting the objectives and priorities. Failure to do this will amount to addressing the wrong issue.

Some of the problems identified with the existing system include:

1.   Delay in providing adequate and accurate information as of the time it is mostly needed.

2.   Difficulties in retrieving records of patients.

3. Absence of articulate system of record management in respect of NEPA – Shiroro Power Station hospital administration which led to non-standardization of records, and

4. Pilfering of records.

3.3 ANALYSIS OF THE EXISTING SYSTEM.

A detailed analysis of the existing system is very necessary in order to convince the hospital management and the management of Shiroro Power Station that there are inherent weaknesses in the manner in which records and information are managed in the hospital at present. For example, unless it is clearly explained, the uninformed mind which is not computer literate will find it difficult to understand that there could be savings in time and operational cost by changing the system of information management, especially through automation with the use of computers.

3.3.1 LOSS OF OPERATIONAL TIME.

In NEPA- Shiroro Power Station hospital, a minimum of three minutes is usually spent in the initial clerical works concerning every patient before the job of the core medical personnel starts.

This clerical works involves:

I. Obtaining the patient's identification number (card number) from the patient.

II. Sorting out the patient's card from the rest (arranged serially).

III. Registering the patient for the day.

IV. Booking the patient for the day.

Considering the overall average of 46 patients treated every day, (see chapter two), it becomes evident that a total of 46 x 3 / 60 = 2Hrs 18Mins is spent per day on patients' pre-treatment clerical works. This length of time could be greatly reduced with computerization.

3.3.2   DOUBTFUL ACCURACY OF INFORMATION

Under the manual operational system, accuracy of information depends to a large extent on the individual handling the data. The accuracy of entries, accurate retrieval of data, and re-presentation of retrieved information for immediate use depend on the disposition of the clerical staff involved.

The risk and cost of misrepresentation of information can be enormous.

3.3.3   UNAUTHORIZED ACCESS TO DATA.

At present, all information about a patient is logged in a card and plain sheets which are kept in a flat file.

Unauthorized access to these files cannot be controlled and as such, loss of information, alteration of data, unauthorized entry of data into files of interest and even loss of entire files are all possible consequences of this manual operational system.

In all, the manual operational system of data management in this hospital is full of lapses which can be brought under control by the use of computers.

3.4 THE PROPOSED SYSTEM.

The numerous problems encountered in the manual operational system of patients' data management in the NEPA- Shiroro Power Station hospital underscores the need for a new system. It is therefore proposed that a computerized system be adopted for efficient information management in this hospital, leading to enhanced health care delivery system for the entire workforce of the station and their dependants.

Since this hospital is manned by 2 medical doctors and 3 matrons, together with their support staff (clerical workers inclusive), it is proposed that a multi-user computer system be adopted having a master station and 6 slave stations. 2 sets will be required, 1 in service, 1 on standby.

The work (master) station will be located at the central registry, while the slave stations will serve each of the 2 medical doctors, the three matrons, and the auxiliary medical personnel's office where patients' vital medical statistics are kept.

3.4.1 MODE OF OPERATION OF THE PROPOSED SYSTEM

Under the computerized system, the initial clerical work will be handled by the workstation where required information can be retrieved just at the tap of a button.

Other primary patient examination results and statistics like body temperature and body pressure will be taken by the auxiliary medical personnel and the information relayed to the central registry for inclusion in the patient's existing prior to the patient being referred to the doctor or the matron for medical consultation.

From his substation, the consulting officer should be able to call up the patient's file for any relevant information during consultancy.

Additional information to a patient's file will however be referred to the central registry for inclusion into the data bank.

3.4.2   ADVANTAGES OF THE PROPOSED SYSTEM.

The computerized patients' information handling system will provide the management of NEPA –Shiroro Power Station hospital with the following advantages:

I.   The hospital will have a standard data bank for all classes of information about every patient.

II.   The computerized system will provide quick access to stored information for the use of the medical personnel from all sub stations simultaneously.

III.   Loss of operational time in clerical works prior to medical consultation will be greatly reduced.

Once a patient's medical records have been accurately fed into the system, the accuracy of retrieved information about the patient will be guaranteed. Therefore, the risk and cost of mis-representation of retrieved information will be completely eliminated.

IV.   Illegal access to patient's data will be eliminated since the data files will be stored with passwords known only to the authorized personnel.

V.   Loss of information on loose sheets and cards or loss and mis-placement of entire files will be eliminated.

VI.   Indiscriminate entry of data into files, and mutilation of data will be eliminated since entries can only be made through the master station which is always manned and secured.

VII.   Unauthorized dissemination of information will also be eliminated since print-outs can only be obtained from a printer which is also located at the workstation.

VIII.   Reductions in operational time will reflect in enhanced health care delivery in this hospital especially in emergencies.

IX.   There will be a general improvement in the overall efficiency of operation of this NEPA-Shiroro Power Station hospital.

PROPOSED MULTI-USER COMPUTER SYSTREM FOR
NEPA – SHIRORO POWER STATION HOSPITAL.
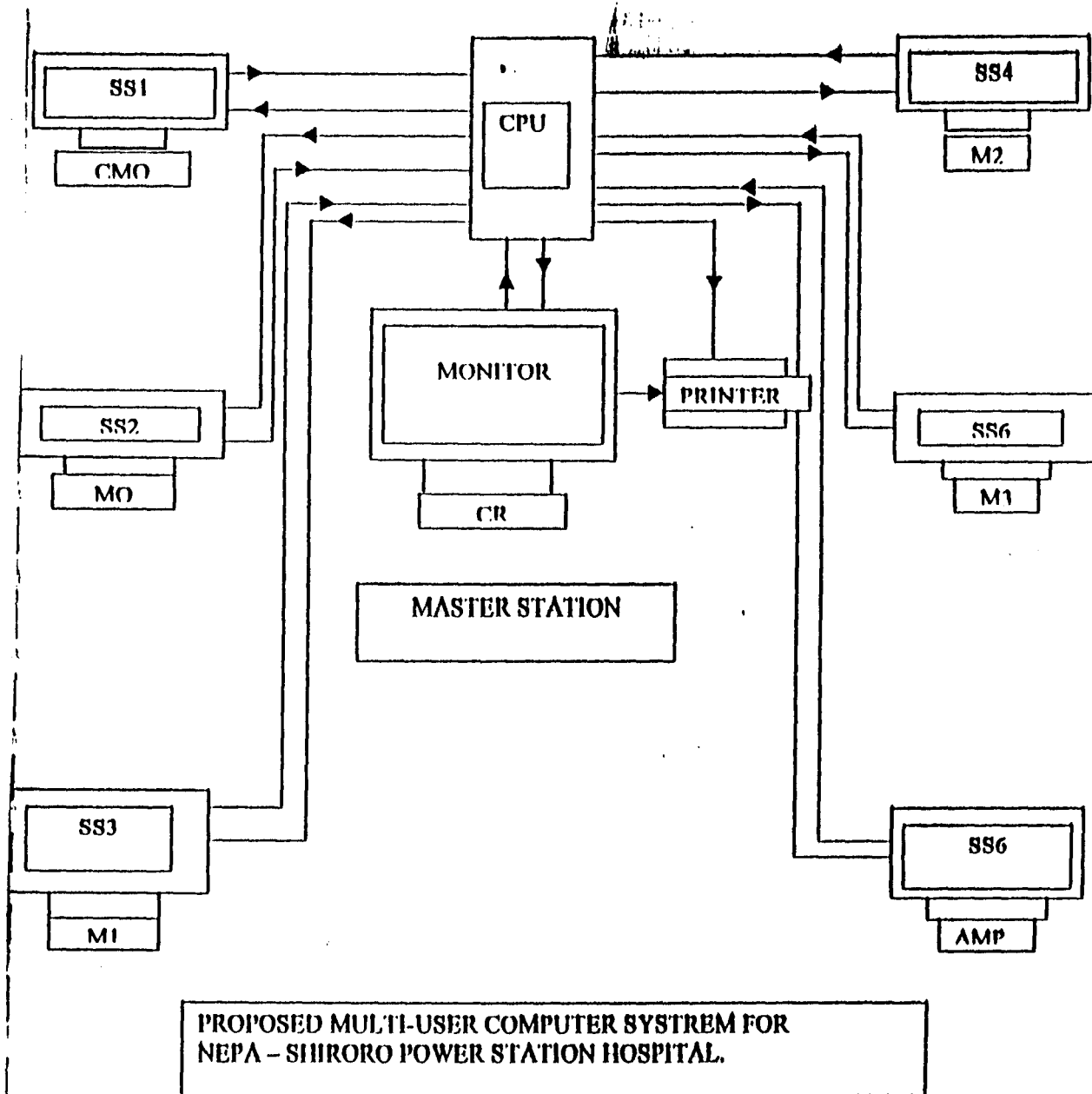
LEGEND
CR - Central Registry
CMO – Chief Medical Officer
M1   - Medical Officer
M2   - Matron I
M3   - Matron II
M3   - Matron III
Amp - Auxiliary Medical Personnel

Fig. 3

3.4.3 SYSTEM REQUIREMENTS

For the effective operation of the computerized hospital administrative management in the NEPA-Shiroro Power Station hospital, the following will be required;

3.4.3.1 HARDWARE REQUIREMENTS

These are the physical components of the computer system which are used for input, storage, processing and output of data.

As stated in 3.4, two sets of multi-user computer system each having a master station and six slave stations will be required to effectively handle this computerized system of hospital administrative management. The exact specifications of these computer system, together with their accessories will be as follows:

2No Multi-user Computer System

450MHz

64MB RAM

8.4GB HDD

3.5" and 5 ¼" FDD

14" VGA Monitor

12No Slave Stations

2No Printers-Type: Laser jet III

2No Voltage Stabilizers (240V)

2No UPS

Out of the two sets of computers, one set will be in use at any given time, while the other set will be reserved as spare which will be used in the event of the system in service developing a fault.

It will be necessary to arrange for immediate repairs to avoid the two sets of computers breaking down at the same time as this will paralyse the computerized operations of the hospital.

3.4.3.2 SOFTWARE REQUIREMENTS

Softwares comprise all forms of programs which control the operations of the computer.

Apart from the Disc Operating System, one other software which will be required for effective implementation of the proposed system is the Data Base IV Application Software.

This is a fully developed, pre-written and tested software which performs various data processing functions, and can be adapted to handle the Patients' Data Management needs of NEPA-Shiroro Power Station hospital.

The beauty of the Data Base IV application software is its high level of user-friendliness in that it allows the user to develop and write sub-programs to suit his particular circumstances and needs and still run in conjunction with Data Base IV software.

INPUT SPECIFICATION

Since the hospital in which the proposed system is being introduced is solely owned and managed by NEPA, and all patients are either NEPA staff or staff of support organizations, and outsiders (on emergency), the input required is limited to patients' profile, with provision for the updating of this profile when necessary, and provision for input of profiles of new patients.

A typical patient's profile will contain the following information:

Name

Sex

Age

Address

Blood Pressure

Rhf

Medicine Allergy

Weight

Glasses (used or not)

Current Medication

Food Allergy

Patient's Relatives

Full details relating to the above will be sought and fed into the system for all the patients without exception.

3.4.6   OUTPUT SPECIFICATION.

The output concerning every patient which will require to be printed out after every visit to the hospital is the patient's name and the following:

I.   Drugs prescribed

II.   Patient's bill

This is tenable since we have two groups of patients, namely,

a) Patients with free medical services, and

b) Patients with only free consultation.

PATIENTS' BILL

The need for a print-out of the bill stems from the fact that the staff of the support organizations make payments for drugs administered, and only enjoy free medical consultancy, while outsiders who come in and are treated on emergency make payments too.

Billing the NEPA staff is for internal use in costing the operation of the hospital and not for the purpose of payment.

PATIENTS' DRUG

A print-out of the drugs administered is necessary both for drugs collection at the drugs dispensary and for purchases of drugs that are out of stock.

For drugs purchased, a post-purchase documentation will be carried out by returning prescription forms and cash receipts to the hospital for updating in order to obtain the total expenditure of the station on the hospital on weekly, monthly, and yearly bases as the case may be.

Every print-out of drugs administered will contain the following information:

Type of drug

Quantity of each drug, and

Unit price of each drug.

3.5   COST AND BENEFIT ANALYSIS

The estimated cost of computerizing the NEPA-Shiroro Power Station hospital administrative system is subdivided into two main categories, namely,

    I.   Development cost, and

    II.   Operating cost

While the Development cost covers system analysis and design, software development, hardware and installation, the Operating cost covers the cost of running the computerized system of administrative management- including stationery, equipment maintenance and all other miscellaneous expenses.

These costs are summarized as follows:

A.   DEVELOPMENT COST

ITEMS	COST (=N=)
I. System analysis and design	50,000.00
II. Software development	100,000.00
III. 2No Multi-user computer systems	
With 6 sub st ations each	450,000.00
IV. 2No Printers	
Type: Laser jet III	150,000.00
V. 2No UPS	38,000.00
VI. 2No Stabilizers	19,000.00
VII. Installation charges	30,000.00
VIII. Staff training (4 staff for 4 weeks)	16,000.00
Total	853,000.00

B. OPERATING COST | MONTHLY | ANNUALY

		MONTHLY	ANNUALY
I.	Materials	5,000.00	60,000.00
II........	Salary/wages (No extra cost as Operators will be regular NEPA Hospital staff)		
III.	Equipment maintenance	2,500.00	30,000.00
IV.	Miscellaneous	1,000.00	12,000.00
	Total		102,000.00

It could be observed that the proposed system does not entail any extra cost arising from salaries and wages of system operators. This is because the system operators will be drawn from regular workers in this NEPA hospital, and will be made to undergo some training in operation of the computer system.

The benefits of this computerization will, in the long run outweigh the seemingly high initial cost of introducing the system.

These benefits are as follows:

a). There will be great savings in the extensive operational time usually required for manual handling and processing of large data.

b). With time, the hospital management will be able to generate a large and dependable data bank covering all the registered patients.

c).   Experimental treatment of patients will be eliminated because each patient's medical

history can easily be obtained from the computer. With this medical history, even a

new medical personnel will be able to start any patient off on the right course of

treatment without having to experiment with drugs which are known to have adverse

effects on the patient.

d).   There will be a substantial reduction in the cost of running this hospital. This will

result from quick access to information and speedy processing of data which the

computerized system will provide.

e).   Prompt health care delivery to the patients will be guaranteed and by so doing the

hospital will be in a better position to contain cases of emergency, and prevent bad

cases from getting worse.

CHAPTER FOUR

4.0   SYSTEM IMPLEMENTATION.

4.1   CHOICE OF SOFTWARE PACKAGE AND ITS FEATURES,

Dbase IV was chosen as the programming language. This is because it has most of the features of the many competing data base products available in the market.

Dbase IV has the following features:

I.   Dbase IV allows data to be entered and stored in a predetermined format which is the form of rows and columns. Each column represent a field and each row represent a record. [A record is a combination of related fields]. Dbase IV can accept up to 255 fields per record. In this regard Dbase IV provides a full relational database environment for user.

II.   Dbase IV has facilities that allows records to be entered, modified or filtered out from the stored records. It also has some in-built function for mathematical and string manipulations.

III.   Different users can manipulate the same data in different ways to suit individual requirement. Furthermore, it can be related to two or more databases.

IV.   It allows users to interact with the program in most areas where necessary, to design, analyze and mould data output into presentable reports.

V.   It also allows commands to be supplied to Dbase IV by selecting an option available in the menu provided by the control center mode.

4.2 PROGRAM AND PROGRAMMING

A program can be defined as asset or sequence of instructions which informs a computer of the steps required for achieving a defined task. Programming is simply the mode of communicating to computers. It is in the form of an artificially defined set of characters, symbols and words plus the rules for combining these characters,symbols and words into meaningful communications, so designed to be conveniently used by human beings in developing programs.

Here, only the operational procedure and description of the modular program code is dealt with while the main program codes are provided in the appendix.

The modular structure analysis is stated below:

Main Menu- This program displays the main menu of the project which contains all the operations to be performed. They include;

a). patient's profile

b). billing

c). report

d). drug

a). **Patient's profile-** This includes all the information about the patient.

These information are:

Name, Age, Sex, Address, Blood pressure and Medical history i.e. the type of sickness the patient had suffered before, the drugs he or she is allergic to etc.

b). **Billing-** This is the total cost of all the drugs and treatments received in the hospital by patients.

c). **Report-** This program gives information on all the patients treated in the hospital at any given time – their bills and drugs inclusive.

d). **Drug-**This contains the number of drugs, type of drugs, quantity, unit price and prescriptions being administered in the hospital.

4.3   OPERATION MANUAL

Below are the users'guide on how to operate the system.

Step I: Booting the system- A successful booting takes the user to command prompt, C\:

Step II: When you are at C: prompt, type cd Dbase IV. This will take the user to control panel.

Step III: Press the ESC key and it takes you to DOT Prompt.

Step IV: At this point, insert the diskette containing the program for the for the project into "A" drive of the computer, type SET DEFAULT to "A" and press the "Enter" key.

Step V: For the execution of the program in the order in which it was written, i.e. sequentially,

The user starts from the main menu by typing DO main menu, and pressing the Enter key.

The main menu in the project will appear on the screen, and at the bottom, an instruction "PRESS ANY KEY TO CONTINUE" will also appear. The user will continue to execute the instructions given on the screen.

EXIT PROGRAM

This helps the user to leave the environment. The exit procedure is described below:

Step I.   Press Exit in the main menu, and it will lead the user to the main screen.

Step II: Press any key to continue. The message whether to continue with the main

           program will appear on the screen (Y/N).

Step III: Press 'N' key to discontinue. The user quits the environment.

4.4.   FILE CONVERSION

This involves the conversion of the old data files into the form required by the new system,

and is usually a very expensive stage in the whole project.

Although it is usually regarded as a part of change-over, file conversion is often a complete

and separate system task in itself, involving fact-finding, analysis, data capture, the design of

clerical methods, and computer processes – from design to production of special training

courses.

4.5   SYSTEM CHANGE-OVER

This is the conversion from old to the new system. This may take place when:-

a). The system has been proved to be satisfactory to the systems analyst and other

   implementation activities have been completed.

b). User managers are satisfied with the results of the system tests and staff training

   reference manuals.

c). The target data for change-over is due.

The change-over may be achieved in a number of ways. The most common methods are:

Direct Change-over.

Parallel Running Change-over, and

Pilot Change-over.

All these methods have their merits and demerits. However, parallel change-over is being recommended. This is because with parallel change-over, you can process current data by both the old and new systems to cross check the results.

Its main attraction is that the old system is kept alive and operational until the new system is proved for at least one system cycle, using full live data in the real operational environment of Place, People, Equipment, and Time, and the old system is phased out gradually. This method gives room for comparison of results of the new and old systems before acceptance by the user, thereby promoting user confidence.

CHAPTER FIVE

5.1   SYSTEM TESTING AND EVALUATION

System testing involving code and specification tests were carried out. It examined what
is expected from the program.

Also the system evaluation was carried out with a view to determining whether:

I).   The system is working effectively and as well delivering the required benefits.

II).   The users are satisfied with the system or having problems in working with the new
       system.

III). The system controls are functioning well.

IV).   Whether the project was completed within the budgeted amount and also determine
       the system's operating cost.

After system testing and evaluation, it was seen that the users are happy with the new
system and the benefits of this computerization will in no distant time outweigh the cost
or the money spent on introducing the system.

5.2 SUMMARY

This study has presented an overview of NEPA-Shiroro Power Station's Hospital, ranging from its background, through its staffing, management and the operations of this hospital as a unit in NEPA-Shiroro.

The operational difficulties encountered in the manual information management system currently in use have also been highlighted.

Several man-hours are currently spent every day in manual handling and processing of patients' medical records.

Automation of data processing through the use of computers has been shown to be the only option for enhanced information management, leading to prompt health care delivery services and improvement in the overall efficiency of this NEPA- owned hospital.

This will be easily achieved by the adoption of DBSE IV software, adapted to suit the various information requirements of the management of NEPA- Shiroro Power Station hospital.

It is necessary to remark that redundancy of staff, leading to retrenchment of workers, which usually accompanies system automation is ruled out. In fact, the new system proposed in section 3.4 will entail the employment of two more workers so that the master station will manned round the clock by four workers on 8-hour shift duty every day, making provision, of course, for one staff on off-duty at any point in time.

5.2 RECOMMENDATIONS.

In view of the advantages of computerized information management system enumerated in section 3.4.2, it is recommended that the patients' data and information management system in this NEPA- Shiroro Power Station hospital be computerized to take care of the over 16,000 who are treated every year.

Since the hospital is being manned by two medical doctors, three matrons and the auxiliary medical personnel, with one central registry, and considering that the cost of providing various complete personal computers for each officer will be too much for the station to handle, it is recommended that the multi-user computer system discussed in section 3.4, together with its six slave stations be adopted.

It is hoped that the management of this hospital will consider this proposal seriously and adopt the multi-user computer system, with its six slave stations in other to derive the numerous benefits of a computerized patients' data and information management system.

5.3   CONCLUSION

The computerization of the patients' data and information management system in NEPA-Shiroro Power Station hospital is a time and cost- saving innovation.

The processing of every patient's primary data involving retrieval of patient's medical history, updating of primary health records prior to medical consultation with the core health workers, and updating of the patient's medical records both in the course of treatment (short term and long term) and thereafter will be handled much faster and more accurately than when manual information management systems are employed.

The many advantages of this computerized patients' data and information management system remains as enlisted in section 3.4.2 of this study.

Back-ups will be used to forestall loss of files and will equally be useful in recovering whatever information that may get lost on account of mistaken erasure of files or file escape during power interruptions.

However, uninterruptible power supply systems will be required to enable the system operator save worksheets and files that are currently in use in the event of any power cut to avoid losing the files.

In conclusion, the computerization of the information management system of this hospital will be a worthwhile venture in terms of reductions in operational time and cost.

It is equally envisaged that the efficiency of this hospital in terms of prompt provision of healthcare services to its patients will be improved upon.

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APPENDIX PROGRAMMING

```
SET CLOCK ON
SET COLOR OF NORMAL TO W+/B
SET COLOR OF HIGHLIGHT TO GR+/BG
SET COLOR OF MESSAGE TO W/N
SET COLOR OF TITLES TO W/B
SET COLOR OF BOX TO GR+/BG
SET COLOR OF INFORMATION TO B/W
SET COLOR OF FIELDS TO GR+/BG



DO HEADER
DO MAIN_DEF
ACTIVATE POPUP MAINMENU


PROCEDURE MAIN_DEF
DEFINE POPUP MAINMENU FROM 7,20 TO 20,45 ;
MESSAGE "PRESS FIRST LETTER OF MENU CHOICE, OR HIGHLIGHT AND PRESS <ENTER>"
DEFINE BAR 1 OF MAINMENU PROMPT "===MAIN MENU==="SKIP
DEFINE BAR 2 OF MAINMENU PROMPT "Patient Profile"
DEFINE BAR 3 OF MAINMENU PROMPT "Billing"
DEFINE BAR 4 OF MAINMENU PROMPT "Report"
DEFINE BAR 5 OF MAINMENU PROMPT "Drug"
DEFINE BAR 6 OF MAINMENU PROMPT "Utility"
DEFINE BAR 7 OF MAINMENU PROMPT "Quit"
ON SELECTION POPUP MAINMENU DO MAIN

RETURN

PROCEDURE MAIN
 DO CASE
   CASE BAR() = 2
       DO PP
       ACTIVATE POPUP PPMENU

   CASE BAR() = 3
       DO BILL

   CASE  BAR() = 4
       DO REP
     ACTIVATE POPUP_REPMENU

   CASE  BAR() = 5
       DO DRUG
   * ACTIVATE POPUP DRUGMENU

   CASE BAR() = 6
       DO UTI
```

```
      CASE BAR() = 7
          QUIT
      ENDCASE
   RETURN



   PROCEDURE PP
   CLEAR
   DO HEADER
   DEFINE POPUP PPMENU FROM 10,20 TO 15,55;
    MESSAGE "PRESS FIRST LETTER OF MENU CHOICE, OR HIGHLIGHT AND PRESS <ENTER>"
   DEFINE BAR 1 OF PPMENU PROMPT "===Patient Personal Profile==="SKIP
   DEFINE BAR 2 OF PPMENU PROMPT "New Patient"
   DEFINE BAR 3 OF PPMENU PROMPT "Update Patient Record"
   ON SELECTION POPUP PPMENU DO PPP
   RETURN



   PROCEDURE PPP
    DO CASE

       CASE BAR() = 2
            DO NPP
       CASE BAR() = 3
            DO OPP
    ENDCASE
   RETURN


   PROCEDURE NPP
   SET TALK OFF
   SET CLOCK OFF
   SET STATUS OFF
   CLEAR
   USE PREC.DBF
   DO WHILE .T.
   APPEND BLANK
   *@ 0,1 TO 24, 79 PANEL COLOR R+
   SET COLOR TO B+*/W
   @ 1, 35 say "PATIENT RECORDS"
   SET COLOR TO G/N
   K=3
   @ 3,  K SAY "Patient ID" GET PID
   @ 3, 35 SAY "Patient Name" get pname
   @ 5,  K say "Patient Sex" get Psex
   @ 5, 25 say "Age" get age
   @ 5, 45 say "Blood Group" get byp
   @ 7,  K say "RHF" get prhf
   @ 7, 25 say "Weight" get pweight
   @ 7, 45 say "Height" get pheight
   @ 9,  K say "Contact Glasses" get cl_g
   @ 11, k say "Address" get padee
   @ 13, K say "Blood Pressure" get pbp
   @ 15, K say "Medicine Allergic" get mall
   @ 17, K say "Medication currently taking" get mct
   @ 19, K say "Food Allergic"get fall
```

```
@ 21, K say "Patient Relation" get prelt
read
REPLACE PID WITH PID
REPLACE PNAME WITH PNAME
REPLACE PSEX WITH PSEX
REPLACE AGE WITH AGE
REPLACE BYP WITH BYP
REPLACE PRHF WITH PRHF
REPLACE PHEIGHT WITH PHEIGHT
REPLACE PWEIGHT WITH PWEIGHT
REPLACE CL_G WITH CL_G
REPLACE PADEE WITH PADEE
REPLACE PBP WITH PBP
REPLACE MALL WITH MALL
REPLACE MCT WITH MCT
REPLACE FALL WITH FALL
REPLACE PRELT WITH PRELT
more=space(1)
@ 23, 35 say "More patient record Y/N" get more;
      valid more $ "ynYN" error "Press y or n"
read
if more="y" .or. more="Y"
loop
else
CLEAR
exit
endif
enddo
RETURN



PROCEDURE OPP
CLEAR
USE PREC.DBF
*index on pid to pid1
store 0 to pid1
@ 3, 5 SAY "Give Patient ID" get pid1
read
locate all for pid = pid1
if found()
clear
@ 3, 5 say "Record alredy exit"
WAIT
CLEAR
return
endif
if .not. found()
res=space(1)
clear
@ 4, 6 say "The record is new, want to input it now Y/N" get res;
      valid res $ "YNyn" error "Press Y or N"

 read
if res="Y" .or. res="y"
clear
 do Npp
```

```
else
clear
endif
endif
RETURN



procedure billQ
clear
set talk off
set status off
do header
do test1
return

procedure test1
set exact on
clear
use bill.dbf
store space(15) to pid1
@ 10, 32  say "Enter Patient ID" get PID
read
locate all for pid=pid1
if .not. found()
clear
do test2
else
if found()
clear
@ 12, 35 say "Record already exit"
wait
return to master
endif
endif
return



procedure BILL
clear
use bill.dbf
do while .t.
append blank
@ 7, 5 to 24, 75 panel color g
set color to r+*/w
@ 9, 35 say "PATIENT BILLING SYSTEM"
set color to b+
@ 11, 10 SAY "Patient ID" get PID
@ 13, 10 say "Patient Name" get pname
@ 15, 10 say "Diagnosis" get DIA
@ 17, 10 say "Drug Given" get ndrug
@ 19, 10 say "Amount Charge" get amount
@ 21, 10 say "Relationship with Person with ID Number" get opt pict "9"
set color to w
@ 22, 6 say " E.g. 1. Parents 2. Wife 3. Children 4. Individual 5. Others"
read
```

```
      CASE BAR() = 7
            DO DIND

  ENDCASE

RETURN




      procedure pgen
      clear
      use prec.dbf
      set color to  gr+
      @ 7, 25 say "General Patient Report"
      set color to w
      Display all pid, pname, age, psex
      wait
      clear
      return




      procedure Bgen
      clear
      use bill.dbf
      set color to  gr+
      @ 7, 25 say "General Billing Report"
      set color to w
      Display all pid, pname, amount
      wait
      clear
      return




      procedure bind
      clear
      use bill.dbf
      set color to  gr+
      store 0 to num
      @ 6, 5 say "Enter the Person ID number" get num
      read
      locate all for pid=num
      if found()
      clear
      @ 7, 25 say "Individual Billing Report"
      set color to w
      Display  pname, pid, amount for pid=num
      wait
      clear
      else
      clear
      @ 12, 34 say "Record Does not exist"
```

```
wait
clear
endif
return


procedure pind
clear
use prec.dbf
set color to  gr+
store 0 to num
@ 6, 5 say "Enter the Person ID number" get num
read
locate all for pid=num
if found()
clear
@ 7, 25 say "Individual Patient Report"
set color to w
Display off pname,  psex, byp for pid=num
wait
clear
else
clear
@ 12, 34 say "Record Does not exist"
wait
clear
endif
return


procedure Dgen
clear
use bill.dbf
set color to  gr+
@ 7, 25 say "General Drug Report"
set color to w
Display all pid, pname, Ndrug
wait
clear
return


procedure Dind
clear
use bill.dbf
set color to  gr+
store 0 to num
@ 6, 5 say "Enter the Person ID number" get num
read
locate all for pid=num
if found()
clear
@ 7, 25 say "Individual Billing Report"
```

```
set color to w
Display  pname, pid, ndrug for pid=num
wait
clear
else
clear                              ▪
@ 12, 34 say "Record Does not exist"
wait
clear
endif
return


procedure drug
clear
use drug.dbf
do while .t.
append blank
 @ 2, 1 to 19,76 panel color gb+
set color to gr+*/w
 @ 4, 25 say "DRUGS FILE"
set color to r/w
@ 6, 10 say "Drug No." get drugno
@ 8, 10 say "Number of drug" get ndrug
@ 10, 10 say "Type of Drug" get dtype
@ 12, 10 say "Quantity" get qty
@ 14, 10 say "Unit Price" get unit_p
@ 16, 10 say "Prescription" get pres
read
ans=space(1)
set color to gr+
@ 18, 25 say "More Drug Y/N" get ans;
    valid ans $ "YyNn" error "Invalid Entry!!!. Press Y or N"
read
if ans="Y" .or. ans="y"
loop
else
clear
exit
endif
enddo
return

PROCEDURE UTI
DO HEADER
DO M_POPDEF
ACTIVATE POPUP BACKMENU
RETURN


PROCEDURE M_POPDEF
DEFINE POPUP BACKMENU FROM 7, 20 TO 12, 59;
 MESSAGE "Press the first letter of the menu choice, or highlight then press
<enter>"
DEFINE BAR 1 OF BACKMENU PROMPT "-Back up / Restore Menu-"  skip
DEFINE BAR 2 OF BACKMENU PROMPT "Back up your files into floppy disks"
DEFINE BAR 3 OF BACKMENU PROMPT "Restore data from floppy disks"
```

```
DEFINE BAR 4 OF BACKMENU PROMPT "Exit to the main menu"
ON SELECTION POPUP BACKMENU   DO BACK
RETURN


PROCEDURE BACK
CHOICE=SPACE(1)
DO CASE
 CASE BAR()=2
    DO SURE
IF CHOICE="y" .OR. CHOICE="Y"
    DO BACKUP
ENDIF
   CASE BAR()=3
      DO SURE
IF CHOICE="Y" .OR. CHOICE="y"
 DO RESTORE
ENDIF
  CASE BAR()=4
    RETURN TO MASTER
ENDCASE
RETURN




PROCEDURE BACKUP
DO HEADER
DEFINE WINDOW BACKUP FROM 6, 5 TO 21, 65
ACTIVATE WINDOW BACKUP
@ 8, 8 SAY "-------BACK UP DATA-----"
@ 9,9 SAY "Insert a formatted disk into drive A:"
wait "Then press any key to begin backup"
RUN COPY  *.DBF  A:
RUN COPY  *.DBT  A:
RUN COPY  *.MDX  A:
?? CHR(7)
CLEAR
?"********BACKUP PROCESS FINISHED********"
WAIT
CLEAR
DEACTIVATE WINDOW BACKUP
RETURN


PROCEDURE RESTORE
DO HEADER
ACTIVATE WINDOW BACKUP
@ 8, 8 SAY "-------RESTORE DATA-----"
@ 9,9 SAY "Insert a formatted disk into drive A:"
wait "Then press any key to begin restoring"
RUN A: COPY  *.DBF C:
RUN A: COPY  *.DBT C:
RUN A: COPY  *.DDX C:
?? CHR(7)
```

```
CLEAR
? "*********Restore process Finished*********"
wait
CLEAR
DEACTIVATE WINDOW BACKUP
RETURN


PROCEDURE SURE
CLEAR
DO HEADER
CHOICE=SPACE(1)
@ 14, 35 SAY "Are you sure Y/N"   GET CHOICE
READ
RETURN


PROCEDURE HEADER
SET TALK OFF
SET STATUS OFF
SET BELL OFF
SET CLOCK ON
SET COLOR TO B/GB

SET CLOCK TO 2,68
@2,1 SAY UPPER(CDOW(DATE())) + "," + STR(DAY(DATE()),2)
@3,1 SAY UPPER(CMONTH(DATE())) + "," + STR(YEAR(DATE()),5) + "."
@4,15 SAY "N. E. P. A. , SHIRORO, MINNA, NIGER STATE"
@5,15 SAY "===================================="
RETURN

[]
```

Patient ID   13331   Patient Name MOSHOOD ALIYU

Patient Sex MALE   Age 25   Blood Group O+

RHF 323   Weight 23G 0   Height   22

Contact Glasses Y

Address F.U.T. MINNA.

Blood Pressure 12MM

Medicine Allergic CHLOROQUINE

Medication current   INEJECTION OF CHLOROQUINE

Food Allergic BEAN, ONIONS

Patient Relati

More patient record Y/N

THURSDAY, 1
JUNE, 2000.

N. E. P. A. , SHIRORO, MINNA, NIGER STATE

==

PATIENT BILLING SYSTEM

Enter Patient ID   122

Patient Name MICHEAL H.

Diagnosis Suffered from malaria infection

Drug Given Chloroquine Tablets

Amount Charge   4355.00

Relationship with Person with ID Number
E.g. Father, Mother, Children, Individual, Self

==

THURSDAY, 1
JUNE, 2000.

7:43

N. E. P. A. , SHIRORO, MINNA, NIGER STATE
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```
■■■■■■■■■■■■■■Report■■■■■■■■■■
 Patient(General)
 Billing(General)
 Billing (Individual)
 Patient(Individual)
 Drug(Specific)
 Drug(General)
```

PRESS FIRST LETTER OF MENU CHOICE, OR HIGHLIGHT AND PRESS <ENTER>

ecord#	pid	pname	Num amount
1	888		0.00
2	12	Moshood Aliyu	4555.00
3	13	Kolo Bello	778.00
4	14	Lawal Obi	88.00
5	99	Yomi Alex	920.00
6	53	Idowu Jacob	838.00
7	16	Mairo Audu	880.00
8	16	Obi Okonkwo	99.00
9	66	Doyin Kifayat	626.00
10	89	Toyin Ibrahim	838.00
11	0		0.00
12	0		0.00
13	12	moshood aliyu	3242.00
14	12	Moshood Aliyu	99.22
15	16	moshood	33.00
16	12		0.00
17	19		0.00
18	567		0.00
19	9		0.00
20	587978		0.00
21	25		0.00
22	26		0.00

ress any key to continue...