HEALTH INFORMATION MANAGEMENT AND COMPUTER APPLICATION.

(A CASE STUDY OF NIGER STATE MINISTRY OF HEALTH)

BY

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A PROJECT SUBMITTED TO THE DEPARTMENT OF MATHEMATICS/COMPUTER SCIENCE, FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE POST GRADUATE DIPLOMA IN COMPUTER SCIENCE

MARCH 2000.

APPROVAL PAGE

This research project has been examined and found acceptable in partial fulfillment of the requirement for the award of the post graduate diploma in computer science of the Federal University of Technology, Minna.

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Project Supervisor Date

L.N. Ezeako

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Head of Department Date

(Dr. S.A. Reju)

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External Examiner Date

DEDICATION

To the memory of Late father who made the past excited.

To my husband Mall. J.D. Abubakar who gives meaning to the present.

To my children, Mustapha, Abass, Kabir, Zainab and Salamatu Abubakar.

And Mr. and Mrs. J.D. Alhassan for their Moral and Financial support.

DECLARATION

I, Amudat K. Abubakar, hereby declare that the whole of this project work is as submitted to the Department of Mathematics/Computer science, Federal University of Technology, Minna, is the result of the research work, except where references were made to published literature and this has been duly acknowledged.

The material has never been presented else where for the award of any of my certificate.

ABUBAKAR AMUDAT

CERTIFICATION

This is to certify that this project titled "Health Information Management and Computer Application - A case study of Niger State Ministry of Health by Mrs. A.K. Abubakar of the Department of Mathematics/Computer Service, Reg. No. PGD/MCS/551/97/98 meets the regulation governing the award of a Post Graduate Diploma in computer science of the Federal University of Technology, Minna, Niger State, and is approved for its contribution to knowledge and literacy presentation.

ACKNOWLEDGEMENT

I sincerely give glory to ALLAH, Subhanaa Ta Allah, the perfect and most merciful God, who plan and see me through this course at the most require time of my life, may he continue to guide and protect us with His |Infinite Mercy (AMEN).

Most theses or dissertation, contribute greatly to what one becomes, therefore I wish to express my profound gratitude to the Head of Dept. of Math/Computer, Professor Adeboye and our course co-ordinator Mr.-- Badmus who gave me the sense of fulfillment may Almighty Allah continue to guide and have mercy on them all AMEN.

Next is my project supervisor L.N. Ezeako for his untiring assistance not only on this thesis but on my course work, I am grateful once again for his painstaking efforts and valuable assistance towards the completion of this dissertation.

I thank also Mall. Ibrahim Mahmood and mall. Ndawashi Mohammed they are my working colleague of the HIS Unit of the State Ministry of He3alth for their co-operation while I was running the course may they be abundantly blessed AMEN.

Also I must not fail to express my appreciation to the staff of the University Library for sparing me their time and giving me access to books and journals of the library.

I am particularly grateful to my husband and children who gave me sense of purpose encouragement, patient, and understanding, without their moral and financial support, I would not have attended the course.

The typing of the manuscript was done excellently by Mall. Ibrahim Mahmood & Usman Abubakar Dabban of HIS Unit, State Ministry of Health, Minna, Niger State

ABSTRACT

Information they say is power. The dynamic nature of Health Care System makes imperative the need to develop the information sustain within it. Information system development, even though costly, has immense gains.

Orthodox medicine is about one century old in Nigeria; Its information system is largely under developed.

This research work is a humble contribution to the development of computerized Health Management Information System in Nigeria using the State Ministry of Health a case study. The work catches on the potential advantages of reliability, efficiency, completeness and continuity of health data from about 4,000 health facilities responsible for about 40% of the total health care services rendered in the State Capital (Niger State).

A study of the existing system was made and the design for all improved one was carried out. The electric approached to system conversion was suggested with a built in maintenance culture.

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CHAPTER ONE.

1.1 Health Information System could be defined as the system for collating, analysis, presenting and using of all health related information necessary for effective management, planning, monitoring & evaluation of the health services of the nation.

Since health is a function of social, economic, political and environmental factors, any data pertaining to theses in relation to health and diseases are useful. Therefore computerization of Health.

Health Information is the main concern of the study. This study will look at the method of collecting, processing, storing and retrieving of staff records/file and examine the various benefits the health producer and users derive from such information.

Niger State Ministry of Health is a second tier level of health care delivery system, which collates all health care services in the State. It services apart from the routine co-ordination of all health facilities in the State is also assist in implementing Non Governmental agencies assistance in the State health care services e.g. UNICEF, WHO, FFPN, MIDDLE BELT ASSITED PROGRAM and other Non governmental organizations e.g. Rotary international Christian Health Association in Nigerian to mention but few.

This topic of this study relates to computer application to Health Information. It is hard to over estimate the contribution that computer applications have made to effective, planning, operation and control of business activities of all sorts. In recent years, there has been an increase awareness of the use of computer as a tool to effective management in many spheres of life.

1.2 AIMS AND OBJECTIVE OF THE PROJECT.

I. At present health information compiled at various clinics, Health centres, General Hospitals etc vary from institution to institution according to local needs, this should not be, this project made arrangement for the standardization of health information forms use in collecting, and analysis Health Information from it health facility. It problems and prospects and to offer some useful suggestions for possible improvement.

ii. To develop an information system which is capable of capturing all department representing health data in the State health facilities.

iii. Design a means and strategies required to effects computerization of Health Information System or theoretical basis so that in near future, this can be use for some project and research.

iii. Design and implementation of the software required for effective use in the near future.

1.3. PROJECT SCOPE.

This project is limited scope to computerization of Health Information in Niger State Ministry of Health and Computer Application.

The limitation I scope does not mean that certain things cannot be generalized in terms of application and reference.

The computer based Health Information System (HIS) to be introduced would provide basic information different Health Information producers and users in the State. It will be capable for use in future project, and research work that will improve health services.

1.4. COMPUTERISATION.

The widest benefit of computerization should be seen in terms of the expansion of activities. Organizations which introduce computer rapidly come to realize that they have acquired a tool which not only rationalizes their previous work procedures but also enable the introduction of new activities which were hither to not engaged in.

In principle, any kind of information processing can be done with the aid of a computer. However, the computer is not always the best tool for the job. It should not be assumed that every task which involves the processing of information can benefit from being automated,. Indeed, some types of processing are much better candidates for computerization than others, and some are best performed by manual method.

1.5. ADVANTAGES OF COMPUTERIZATION

There are some tasks for which computer offer clear advantages.

i. Long and complex calculations which require great precision, such as may be required in scientific research, whether forecasting and control of space modules, may be quits infeasible without the aid of a computer.

ii. Repetitive tasks in public and private sector may be boring for humans, leading to fatigue induced errors.: a computer can take on such tasks with a consistent level of reliability

iii. Manual method of storing data may require a large amount of storage space, making access difficult and creating opportunities for internal contradictions where the same data is required for different purposes. Here computer can help by miniaturizing the special dimensions of the store, by providing remote access using communications links, and by enabling the data to be organized in a manner satisfying to all users.

1.6. MANAGEMENT INFORMATION SYSTEM (HIS)

This study will not be complete if MIS is not included; Management Information System is a computer-Based Information System, which is defined as an organized collection of people, procedures, database and devices used to provide routine information to maroyers and decision makers. The information are used for planning and decision making.

Management Information System is designed to improve the flow of information in an entire organization, so as to interact more effectively and enable management personnel to perform their jobs more efficiently.

An MIS is useful to all level of management top and middle levels of management use the information to formulate corporate strategies, develop administrative plans and establish operational policies. Lower levels of management can benefit from MIS information In their daily operations.

Finally, an MIS can reduce waste of resources and time of labour, as well as increases corporate goals and information provided by the system are accurate.

1.7. HEALTH INFORMATION SYSTEM IN NIGERIA.

Even though Western medicine is about one century old in Nigeria, the State of its information system has been largely under developed. The quality and quantity of health data vary considerably in certain areas, relevant data are collected and are seldomly used whereas in some cases data collected are not relevant, worst still, are some cases where data are never collected at all.

Some of the excuses for the poor quality of health data in Nigeria include lack of Finance and other support from management, low literacy level, low/lack of patronage,

insufficient technical know how and lack of qualified staff. Another important constraint is the cultural factor. Generally, on our culture, sad events are best forgotten, never to be remembered or recorder.

Above nor withstanding the role of health information in qualitative health care delivery cannot be over - emphasized. Health Information is needed for a variety of uses, including policy formulation, effective health administration and management, efficient health service interaction and for health related research activities.

The National policy on health adopted by Government in 1988 and formally launched in 1989, identified the following six specific categories of indicators required for effective and comprehensive monitoring and evaluation of health care services and health delivery.

i. Health Status Indicator
ii. Social Indicators
iii. Economic Indicator
iv. Health Care provision and utilization Indicator
v. Health "policies" Indicators
vi. Quality assurance Indicators.

Health as a subject in Nigeria is on the concurrent list of the constitution. This means that all three tiers of Government have responsibilities for its provision. The Nigeria Health System has three subsystems with the Primary Health Care subsystem constituting the main entry point. Only those whose needs cannot be met at the primary level should filter (through a well established referral process) to the Secondary Health care subsystem. referral yet again, from the secondary to the Tertiary subsystem should be for patient who require highly specialized and invariably expensive medical interventions. These subsystem (primary, secondary and Tertiary) require health data inform than on the health care status of Nigeria.

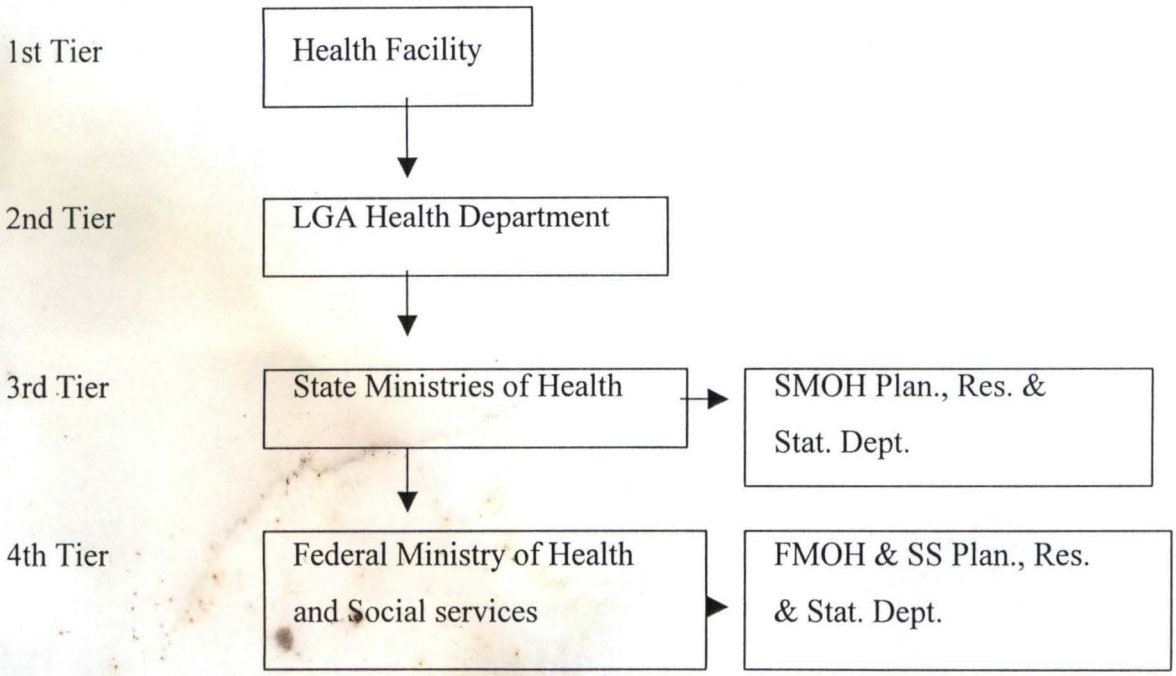
In 1988, in an attempt to remedy the grievous in efficiencies of the civil service, Government decree has among many other, established in every Ministry (Federal and state) and is very extra-ministerial department , Department of Planning Statistics and Research,. This gave birth to a new National Health Information System (HIS).

The new NHIS is expected to provide accurate, timely and good quality data for policy makers, service managers, operators, the consumers of health services and for the data generators themselves through expedity, forwarding and feedback processes.

The National Health Policy also prescribes the stages of development of health information system. During the first stage, data collection and usage will be institutionalized at the community level such that data shall be available and used for planning and monitoring health services at the Local level.

During the second stage, State Ministry of Health shall provide technical support to Local Government Health Authorities to improve the quality of information collected and to achieve standardization as far as possible to facilitate data collation. and comparability. During the third stage, State Health Ministries shall acquire simple electronic data processing equipment for data storage, retrieval and analysis. At the Federal level, the Planning Research and Statistics (PRS) unit of the Federal Ministry of Health and Social Services shall be responsible for obtaining, collating, analyzing and interpreting health and related data on a national basis. The unit shall support the Satte Health Information System.

The flow of data and information within the Nigeria Health Information System is illustrated below diagrammatically.



1.7.1 HEALTH INFORMATION FLOW IN NIGERIA.

Finally, the National Policy on Health clearly points out the more effective delivery of health care can be achieved in the country by a more efficient management of the health resources and that it is essential to establish permanent systematic managerial processes for health development at all levels of health care. This is illustrated in the diagram below.

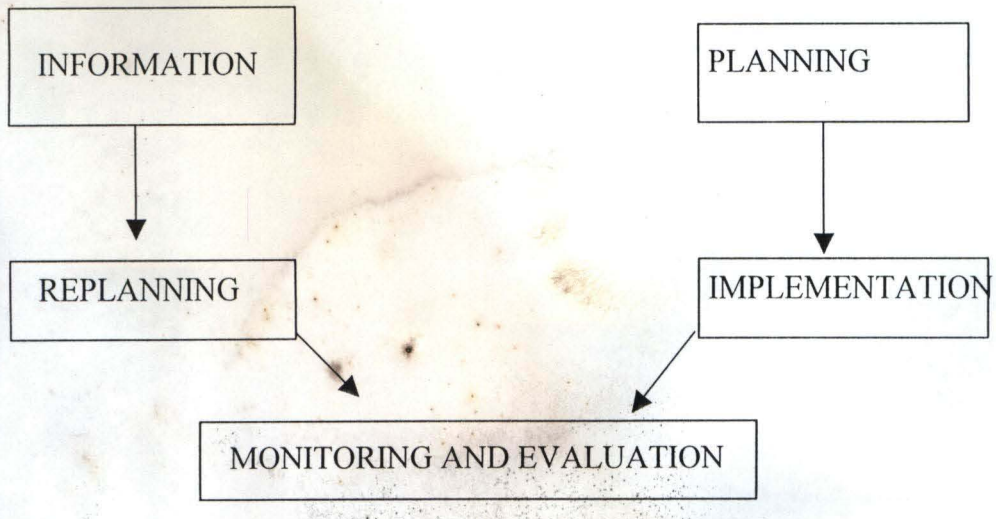


FIGURE 1.7.2 MANAGEMENT PROCESS FOR THE HEALTH DEVELOP

The Managerial process implies the use of information to plan. It means the implementation of project and programmes only after these have been carefully planned, during implementation, it demands preplanning at intervals, applying experiences and information's obtained from mountory activities. It means readiness to change the content and approaches adopted during implementation in line with replanned programmes.

THE HEALTH PROFESSIONALS IN THE DEPARTMENT

1.9 The department has the following categories , Professionals in the service who carried out its functional responsibilities.

I. Medical Director
Dentists
Pharmacists
Nurse/Midwives
Radiographers
Medical Laboratory Technologists
Community Health Officers
Environmental Health Officers
Optometrists
Nursing/Midwifery Tutors
Medical Records Officers
Health Educators
Nutritionists/Dieticians
Medical Equipment/Instrument Technologists
Health Planners
Health Statisticians
Hospital Secretaries
Dental Technologists/Therapists.

CHAPTER TWO

LITERATURE REVIEW

NIGER STATE MINISTRY OF HEALTH

1.1. Niger State came into existence in 1976 after the creation of more State by General Murtala Ramat Mohammed, which was curved out of former North Western State with the Capital then in Sokoto.

With the creation of Niger State, many Ministries were established. Ministry of Health is of the largest Ministry even at the Federal Level, because health is paramount and very essential, an adage says "Health is Wealth".

Ministry of Health collect, collate, analyze and present health data sent in from all health care facilities in the State, this includes all health care facilities from General Hospitals, Rural Hospitals, Comprehensive Health Care and even Basic Health Centre.

It also receive and disseminate health material through aids from other Government and Non Governmental organization.

2.1 THE NATURE OF INFORMATION SYSTEM.

The principles of information system rest on the concept of the General System Theory (GST) of further appreciation of the nature of information system beings with a look at the general system theory.

The general system theory is connected with the general properties of systems. A system can be defined as the assemblence of elements joined together according to predetermined rules and forming a whole that works towards a result. A system therefore, is an organized or complex whole.

It is an entity which consist of interdependent parts (subsystems) which work (interact) together for example, an organization (system) consist of department and sections (subsystem) which have the status of an entity but most work together with each other for the organization to achieve its goals. The system can be a collection of men, machines and methods organized to accomplish a set of specific functions. Every boundary is usually expressed in terms of areas of constraints that separates it from its environment. As a matter of fact, any arrangement which involves the handling, processing or manipulation of resources of whatever type can be represented as a system.

T. LUCEY, 1993 (13) gave the following as characteristics of systems

I. They are composed of inter related parts (sub systems) and can only be explained as a whole. This is otherwise called the law of Holism or Synergy. This law states that any whole is more than the sum of its individual parts.

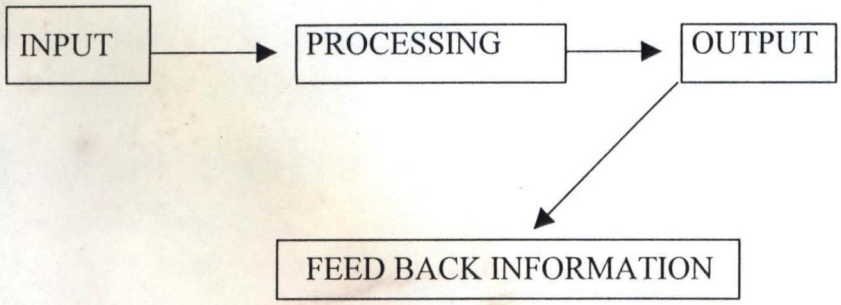
ii. They are hierardual in that part of subsystem are made up of other smaller parts. For example, the Pharmacy or Nursing system of an health organization are subsystem of the health information system which is itself a subsystem of the as a organization whole.

iii. The parts of system cannot be altered without affecting other parts.

iv. The subsystem work together towards the goal of their higher systems and donor pursue their own objectives independently.

v. They contain hard and soft properties. Hard properties are those that can be assessed in some objective way. Examples are the number of components in a storage bins, the amount of Payee tax a person will pay with tax code of 250 the size of a product. The soft properties of a system are those that cannot be assessed by any objective standard or measuring process. They are a matter of individual values or taste.

In their own contribution, Brightmen R.W. and Dims Dale J. (1986) (7) presented the nature of system as cyclically repetive. One most be careful however, to generalize the repetitive feature of system, for we know that not all system are so rigidly tied to repetive output. The banality of their contribution is however shown by their observation of a four feature characteristics for all systems; VIS; Input, processing, output, and feedback. The figure below illustrates their data.



F.2.1.1. OPERATIONAL FEATURES OF SYSTEMS.

This is for example easily seen in a manufacturing system where input consists of raw materials, labour and equipment and the raw materials are process to produce an output. (The finished good). The feedback loops is a formal or informal process by which the output of the system is evaluates, and the result of the evaluation are referred to the system as are of the system is inputs.

All systems have boundary that separates them from the environment. The boundary defines the scope of activities to be supported by the system. Lucey (1993), rightly pointed out that a system boundary can be properly determined by management and vary from organization to organization,. As such when finding a system one must also need to establish a boundary, Lucey further observed that boundary alterations are on inevitable consequence to or organize to further observed that boundary alteration are to inevitable consequence or organization adapting to change which is essential if they

are to survive. He warned however that changes at the margins of interacting systems can brew a source of friction if not handled properly.

It has been established that information system has all the features of the general system information system is cyclically repetitive with the element input, processing, output and feedback. It receives as input, data and information and produces as input, processing, output and feedback.

It receives as input, data and information and produced as inputs information.

Brightmern R.W. and Dimsdade J. M. (7) define an information system as a system. Information is data (or information) that is organized in a form that is useful in making decisions.

In doing its work, an information system performs several routine tasks which include editing and checking data files, up dating data files producing transactions documents and producing routine tasks which include transacting documents and producing routine operational document and various management reports.

Information system can be divided into two types:

1. OPERATIONAL INFORMATION SYSTEM: Which produce the information and documents needed for the routine operations of the organizations, and Management Information Systems, which produce information needed for effective decision-making. Many decisions must be based upon operational information and most operations follow management decision. Since our study of interest bothers on management information system, it suffices to give a illustration of operational information system in the diagram below:

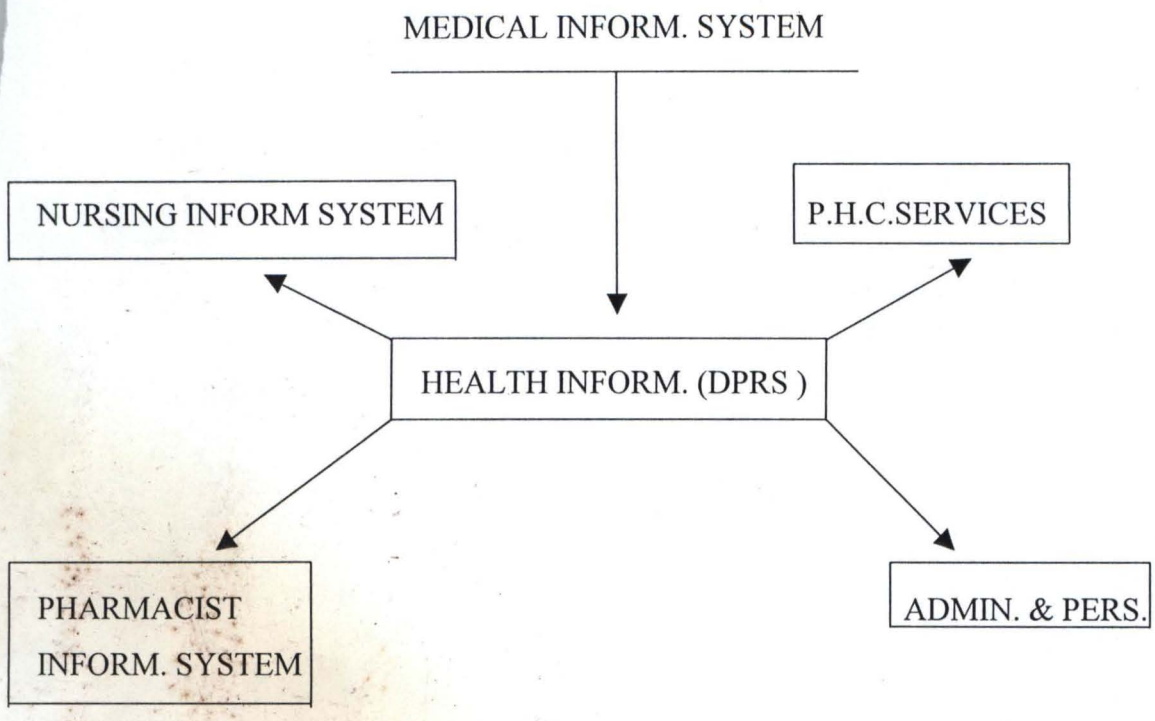


FIG. An Illustration of Operation Information System

As seen from the diagram above the distinction between operation systems and management information systems lies more in their emphasis than in their operation.

We now devote the rest of this study on management information system with emphasis on health the interact on study.

2.3. THE CONCEPT OF MANAGEMENT INFORMATION SYSTEM.

The emergence of this aspect of information system is no doubt due to the lack of performance of the traditional information systems. Donald H. Sanders (1979) (8), advanced six problem with the traditional information system. Three are:-

I. High cost
ii. Time and effort consumption.
iii. Improper integration
iv. Not concise
v. Little or lack of conformity with established format.
vi. Little or no relevance to modern developments.

To reduces the difficulties experienced with traditional approaches, Senders argued in favour of a new management information concept, which operates a management information system (MIS). He defined MIS as

A NETWORK of computer based data processing procedures developed in an organization and integrated as necessary with other manual, Mechanical, and/or electronic procedures for the purpose of providing timely and effective information to support decision making and other necessary management functions.

He justified the use of the word computer-based in the definition by the fact that as MIS is expected to produce information system. He argued that only a computer-based information system can process such capabilities.

Lucey in his own contribution believed that there is no university accepted definitions for MIS and that those that exist reflect the emphasized bits propreualies of

the people concerned. For example, the term MIS has become almost synonymous with computer-based data processing and indeed many books with MIS in the titled turn out to be exclusively concerned with topics such as systems analysis, file design and various other technical facts of computer based system. The above definition of MIS by Senders and the one bellow by Kelly are examples of these production oriented definition of MIS.

MIS is the combination of human and computer based resources that result in collection, storage, retrieval, communication and use of data for the purpose of efficient management operations and for business planning.

Kor Koi (1991) (11) gave five conditions for a successful establishment and operation of MIS. These are:

i. Availability of a system and the inter-play of its subsystem.
ii. The existence of an information system
iii. Existence of management structure, which must support this MIS and should be involves in its design.
iv. The systematic use of information
v. The influence of information technology on the information system.

Point's ii-iii can be termed the necessary and sufficient conditions. A good information system and innovative management structure is a great impetus to any MIS. Lucey and Bpp's study text on systems analysis and designs (1987), give the following as quality of good information.

I. Relevance for its purpose
ii. It should be sufficiently accurate for it purpose
iii. It should be complete for its purpose
iv. It should be clear to the user.
v. It must be from a source in which the user has.

vi. Confidence

vii. It should be communicated to the right person

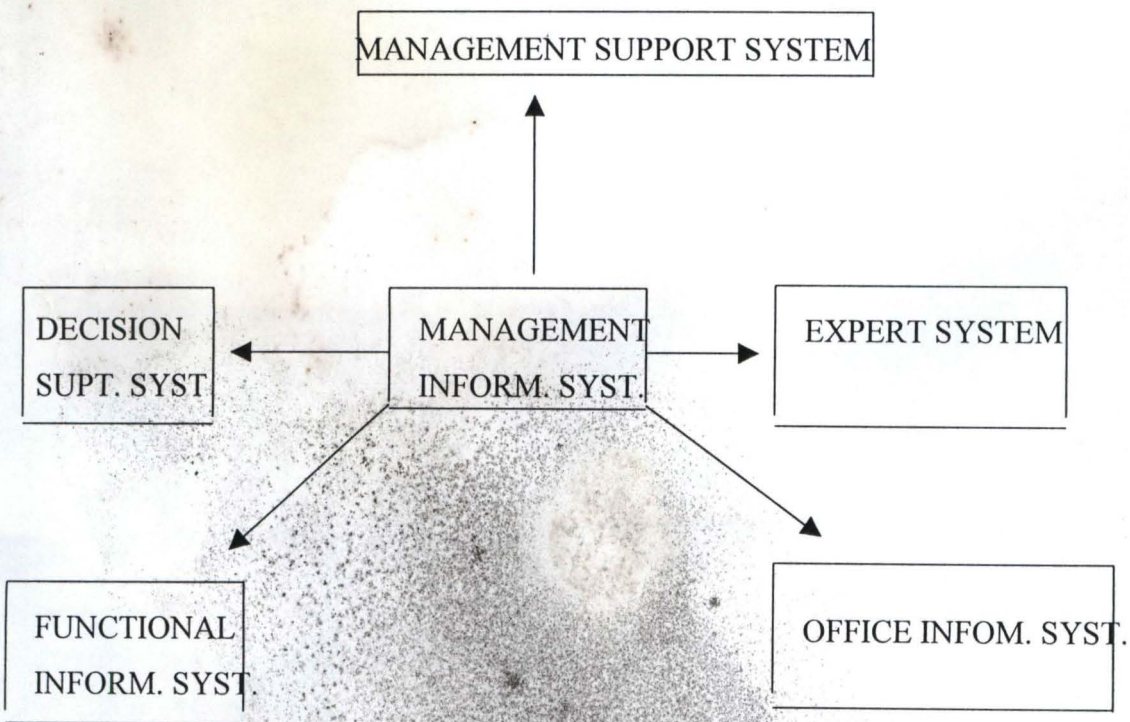
viii. It should be communicated in term for its purpose.

ix. It should contain the right level of details.

x. It should be communicated by an appropriate channel of communication.

xi. It should be provided at a cost, which is less than the value of the benefits it provides.

From study, Five branches of MIS are identified. This is illustrated in the diagram below



MANAGEMENT:- This is the aspect of MIS that is aimed at helping managers make effective decisions by providing them with reports that are timely and accurate. Operational managers depend a great deal on the information from the report generated through management support system MSS. While tactical (middle level) and strategy

(upper level) manager also use reports generated by the MSS , their decision are not easily programmed like those of operation manager since discussion at these higher levels of management largely depends on institution and problem solony talents.

ii. DECISION SUPPORT SYSTEM DSS: - This is the branch of MIS, which supplies information on which top-level policy decisions and plans can be based. DSS outputs permits executives to project likely results of decisions. It provides top-level managers with the ability to ask "what if ---" types of questions (sensitively analysis) and to receive results under various assumptions and scenarios. DSS outputs can project results of such alternatives in terms of revenues, profits, cost share of market and other measures of business performance.

iii. FUNCTION INFORMATION SYSTEM (FIS): This aspect pf MIS centres on information from each functional area of a system. Fort example, in a business organization, functional units (subsystem)s such as marketing, production, personnel, accounting, etc, need their own information subsystem in order to carry out their operations.

iv. OFFICE INFORMATION SYSTEM (OIS): This is a machine or machines communication system used to make more efficient the job or obtaining, organizing, retrieving and prepari9ng needed information. Examples of machines that can be linked for OIS are word processors, VDU and terminals, tele text, microfilm, electronic mail, telecommunications, tele conferencing, fax, and computer networks.

v. EXPERT SYSTEM: This is a computer system, which is able to draw reasoned conclusions from body of knowledge it has reached a conclusion. The computer is able to do expert reasoning by the use of the heuristic methods represent a departure from traditional computer programming techniques in which problem solony is algorithmic. Heuristic problems solving is responsive to encountered situations. The purpose of an expert system is to provide reasoned advice at a comparable level of that provided by a

human expert. This capability has two main aims; to enhance the abilities of leading experts in certain field, and to make a high level of expertise available to less highly qualified practitioners.

2.4. CONCEPTUAL BASIS OF HEALTH MANAGEMENT INFORMATION SYSTEM.

The Alma (USSR) conference of September 1978 helped of refocus attentions on health as a priority for national and international development strategies. The resulting "Health for all by the year 2000" strategy stresses the need to provide Primary Health Care (PHC) re directing resources towards rural community-oriented health delivery rather that the widespread hospital-Based approached (WHO, 1978) and progress has been made in some countries (Gowers, 1987, Hegenhouges, 1987).

These developments have led many to ask questions about the level of progress attained, whether that level is satisfactory, and how to move forward. There is the need for feedback on inputs to health care delivery through the measurements of it output. This has led many health facilities to routinely collect patient statistics of attendance, diseases and treatment. (WHO, 1989, Kulakow, 1983, Wilson Etal, 1988). This requirement obviously has brought additional burden on health care providers at the various levels, distracting them from normal duties. Protti D.S.Etal, (1992 (16), reported that thirty percent or more of hospital activities and cost involve handling information. Health Information and aims at determining the relationship between health and development, and the operational aspects of putting the strategy into practice. There is therefore the need to balance the energy of resources expended in data collection and compilation and their ultimate in planning and routine management (Forster D. (Forster D, 1992) (10).

The gains of health information are invaluable particularly when it has been properly analyzed and interpreted. Health information can serve the following purposes.

I. To provide relevant information to draw profile of community by age, sex, disease, mortality and morbidity. This helps in the understanding of people and their health problems.

ii. To provide information for comparism purpose so that the health situation of the community at a particular time can be compare with that at another time of the same community comparism can also between different regions of a country; occupation or socio economic classes. This can help on the decision or distribution of resources.

iii. To provide a surveillance system that can used to monitor, recognize, diagnose and control at an early stage of disease out break. This will help in the rational decision on preventive and control measures.

iv. To help in determining priorities in health development. Information is needed to determine the survey and frequency of the occurrence of any health problem so that a good health programme capable of solving such problem can be drawn up.

v. To provide useful and appropriate sources of data for health workers and thus help to determine deviations from the norm e.g. birth weights, mental capacity/capability, blood pressure levels etc and what to do about them.

vi. To help in the development of meaningful and essential health research programmes and referral systems and designing of appropriate educational programmes.

vii. To improve increases output and coverage of health programme.

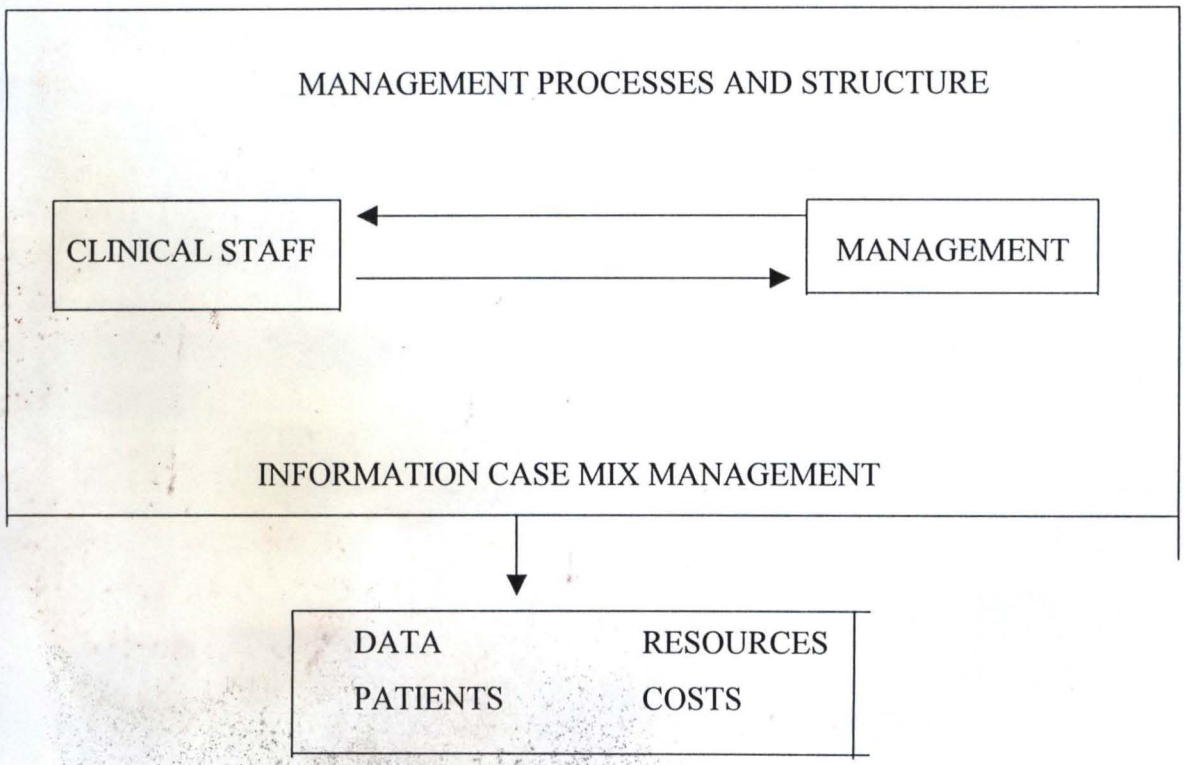
viii. To improve standard of quality health care.

ix. To provide basis for medical handling or more efficient use of resources.

x. To increase the acceptability of health programmes and services to the community and create room for active involvement of the community in the health planning and management.

Health services throughout the world invest significantly resources in collecting data of recent too, there has been a greater awareness of the strategic needs of management to which proper use of health information can contribute immensely. In

their works on hospital information systems and management, Bulas S. and Scoh .T (1992) (8), presented a conceptual management model of a typical hospital. This is illustrated in the diagram below:



This concept divides all hospital staff into two distinct groups labeled clinical staff and management (or administration). The first groups are often professionally qualified and perform either a direct patient care role as with surgeons and Nurses or a secondary patient care is with pathologists, unaesthetic, technicians. The second group of staff are part of the organizational infrastructure and support, maintain and develop the environment within health care is delivered.

In general, communication between these different groups is through the organization structure of the organizational process. There will be a variety of monitoring

and so on. For theses to work effectively, they require support from a common information system.

Information is the key element in information system. The single most distinguishing feature of an information system is its emphasis upon the flow of information within the organization. Information is the common link binding the organization sub parts. An information system within the health system order to pay its role well therefore have the following perspectives.

I. Patient
ii. Health care workers (personnel)
iii. The health care system (facility)
iv. External

This brings about the recognition of the fact that information is a resource that is subject to management planning and control in the same way as other resources such as land, labour and capital. Traditionally, subsystems within health system are discrete in nature, serving department needs with little regards for those of a wider audience. Information was rarely used beyond by the department except in the form of data pertaining to a specific patient. It was almost never used to provide strategic support to the organization as a whole except in the limited sense of activity reporting. This is because of the fact that in a health system, Information processes lack long identity. Management did not give them the same attention as they give other organization activities. The information from the senior management to ensure patronage and sponsorship.

Today, the story is quite different; the health system has growing in complexity. The need for better and more timely information and for improved decision making technique are becoming critical giving place for management information system (MIS)

within the health system. This will enable management to be able to fully answer the critical questions of what do we do? and what do we do well?.

2.4.2 CONCEPT AND STRUCTURE OF HEALTH MANAGEMENT INFORMATION SYSTEM.

The dynamic nature of health does not make easy. The issue of the contents and structure of its information's system. There is generally speaking, little agreement amongst academics managers and professionals as to what type and volume of data is required for resource allocation decision in both the public and private sector. this is further compounded by the ambiguities surrounding the definition of (Ogunbekun 1.0, 1992) (15). Economists have sought to overcome some of the ambiguities by the use of valuation tools like cost-benefit analysis and cost-effectiveness analysis the value and cost of various public health programs and treatment modules in clinical machines. These efforts are however confronted with major procedure difficulties that limit their application in practice.

Ogunbekun suggested the following as consideration for the content of a health management information (HMIS) in a private sector.

A. INTERNAL ANALYSIS.

i. Patient or utilization of services provides indicators to consider hore include: Number of patients visits (attended) Number of antenatal booking and deliveries, immunization records, bed occupying rate etc.

ii. Patient characteristics: Theses include classified age group of patient, disease pattern, payment made by patients etc.

iii. Financial Situation; Monthly recurrent or operating expenses (including cost of supplies, manpower and equipment maintained) revenue generated by department and out standing financial obligations.

iv. Manpower Situation: Indicator to be considered here include Physician characteristics admission and prescription patterns, number of full-time/parts timers, staff distribution classified by status, type of employment and rank etc.

v. Evaluation of Facilities: This includes inventory and physical state of building equipment and utilities e.g.

B. External Analysis

This involves the use of national statistics and indicators in assessory opportunities created by the trends in economic and social environment. The categories of data indicators community applied here include:

i. Demographic data

ii. Economic data

iii. Health policy data

iv. Epidemiologist data

v. Data on competition

The above is exhaustive for an HMIS. If attention is not paid, such an exhaustive system could give rise to a problematic MIS where health workers could spend most of their time collecting data at the expense of their primary function, as such the content of a HMIS if it is to be effective should.

i. Bear relation with the aims and objectives of the system.

ii. Have indicator whose selection are based on the objective and goals of the system.

iii. Have indicators whose selection are based on the objective and goals of the system.

iv. Provide information that is usable and useful to the existing structure.

v. Have instruments for data collection for the HMIS, such instruments should be as much as possible be uniform at the various level of the system.

vi. Have a simple structure, which is clear to all in the management team. Infact, it should be acceptable to all. The determination of the structure should therefore involve all so that no member of the team or system is left out.

2.5. RESOURCES IMPLICATION FOR HMIS

Traditionally, Information system in health is assumed to help the operational efficiency of the organization, but more recently there has been a greater awareness of the strategic needs of management and a different approach has begun to revolve. This development in information system has also pave way for a significant change in the resources requirement of modern information system. resources implication of HMIS 25 can only be truly define after an agreed scope structure and data needs of such a system had been determined.

It is however clear that the setting up of an HMIS could involve a sizeable capital out. Bpla Ajeni (1992) (5), Points out that the major infrastructure and equipment needs for an HMIS are essential material, equipment, hardware and software. As today in Nigeria, all of these resources are imported into the country (Kluzer 1990) (12) noted that computer imports growth states has been high above the average for all machine imports with total purchases increase between 1978-1989. He also stated that over the period 1981-1986, Nigeria alone accounted for 20% of all compute imports in Africa. Unfortunately, this is not reflecting in the value of our national HMIS.

Apart from the above name HMIS resource needs must be quick to add to in human resources, which is an important resources input to HMIS. Adewole I.D. (1992 (3) listed three main important groups of personnel involved in HMIS as follow.

i. Statisticians
ii. Computer specialist
iii. End-User--health professions.

Even though he did not spell out in clear terms the role of these groups, we note with interest the three cardinal are of any information system.

i. Data generating and manipulation
ii. Data processing using the computer
iii. Information usage.

Professor S.R. Adamu in a conference on HMIS in 1992 (2) argued that the manpower need of an HMIS are varied in terms of job content and skill. He maintained that in terms of professional relevance apart from management capability and supporting services, an HMIS manpower need will include the following occupational group.

i. Statisticians
ii. Computer system designers and analysis
iii. Computer programmers
iv. Others (hard ware and soft ware specialist).

Computer Assistants
Computer equipment operators
Statistical associated professional
Clerk-coding clerks or word-processing clerks.
Data entry operators.
Statistical Clerks.

Discussion on manpower resource for HMIS is not complete without the consideration of its development. Manpower development means updating staff skills in a continuous manner through staff attending appropriate conference, seminar, symposia etc.

Information system in turn should be able to justify such investment in term by their timely, accurate information for sound decision making .

2.6. FUNCTIONS AND RESPONSIBILITY OF THE STATE MINISTRY OF HEALTH .

The State Ministry of Health is charge with the implementation of National Health Policy Programmes in the State which is providing a level of Health that will enable all every liv ing in Niger State and its environments to achieve socially and economically productive lives. This is being executed through the provision of preventive, promotive and rehabilitative health care services.

B. It is responsible for secondary health care in the State and in this regards has 16 G.H., 12 Comprehensive & 54 Rural Hosp., 102 P.V. in the 25 LG Area councils of the State.

C. It is charged with supervision and provision of technical support to the area councils for primary health care as well as the registration and regulation of private health institutions in the State.

The State Ministry of Health provides the above services to the inhabitants of the state through a coordinated network activities of the five divisions in the department, which were based on professional groupings. These divisions are :

1. Medical Division (Hospital services)
2. Nursing Department
3. Pharmaceutical Services Department.
4. Primary Health care Department
5. Health Education
6. Planning Research and Statistics
7. Personnel and Administration

They have the Honourable Commissioner for Health and its Permanent Secretary as the administrative head.

The Honourable Commissioner/Permanent Secretary office

The decission on matters relating to Health in the FCT are made here, the Directory of health services supervises the administrative work of all the division in the department. The health personnel and accounts units are closely supervised by the Director's office

ii. HOSPITAL SERVICES DIVISION

The division is responsible for providing diagnostic and curative hospital based services to the inhabitants or the State and it's environment. These services includes Medical, Laboratory, X-ray, Dental, Physiotherapy, Nutrition/Diet and Medical.

iii. NURSING SERVICES DIVISIONS.

The Nursing division is responsible for the provision of nursing services to patients in Public Health Institutions. Also it administers the Nurses and Midwives in the Territory and provides general training to them.

The schools of Nursing and Midwifery, Gwagwalada is under the management of this division.

iv. PHARMACEUTICAL SERVICES DIVISION.

This division takes care of the procurement and distribution of drugs to the Public Health Institutions in the State, it monitor drug administration, management, storage and control of dangerous drugs in all the State Health Institutions.

The drug Revolving Fund Scheme (DRFS) Drug Abuse Control, Registration of Pharmaceutical Shops, and patient Medicine Stores are under the management of the division.

v. PRIMARY HEALTH CARE DEPARTMENT.

This department is concerned with the following functions.

a. Preventive services such as National Programme on Immunization (NPI) and Oral Rehydration Theraphy (ORT).
b. Control of outbreak of infections diseases such as Cholera, Cerebro-Spinal menigities (CSM), Yellow Fever, Guinea Worm etc.
c. Family Planning and Child Welfare
d. Health Education.

vi. HEALTH PLANNING RESEARCH AND STATISTICS DEPARTMENT.

This is the department responsible for Health project in the State, it programmes and plans even distribution of Health facilities to the Area Councils and Schedules equipment for Government Hospitals. It handles Tenders and contract processing for the department.

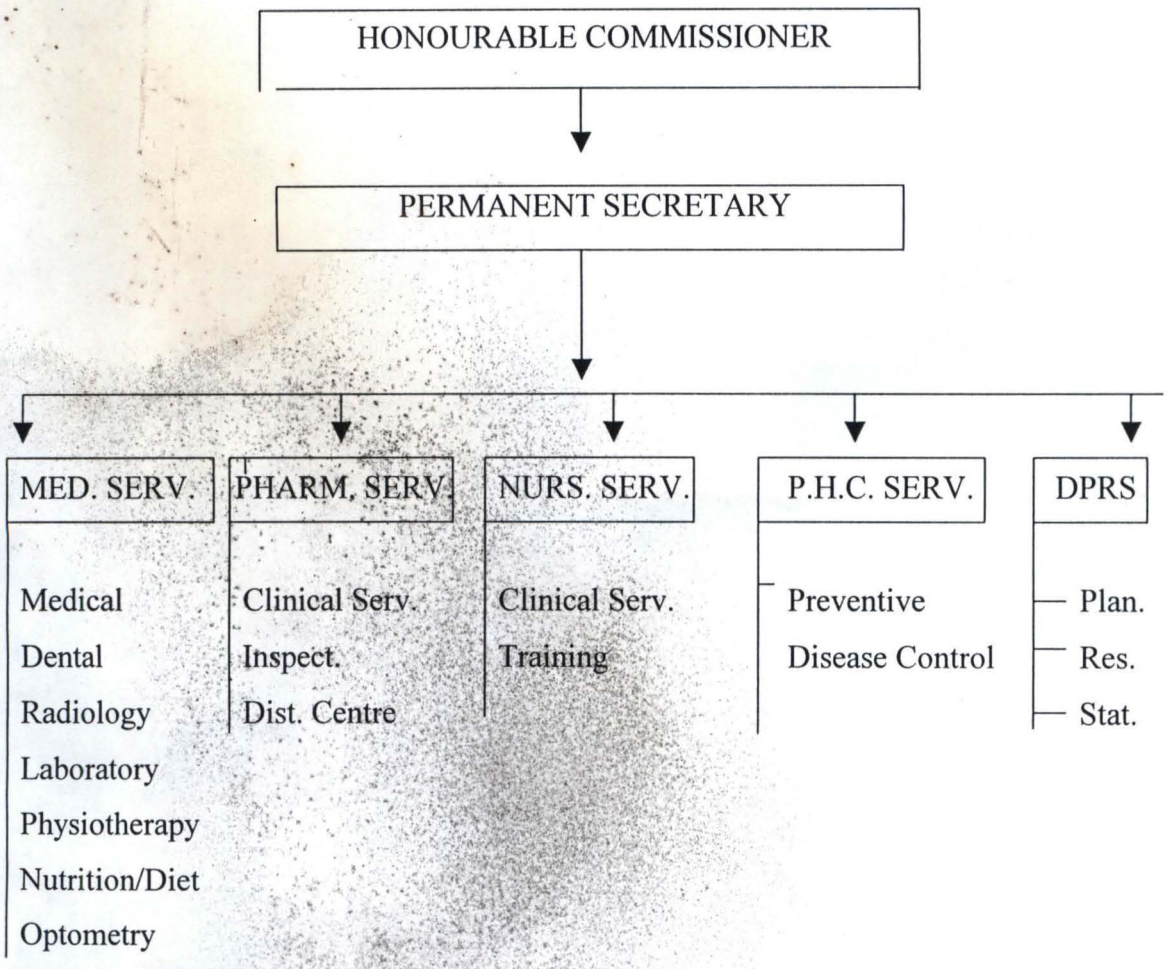
It also charged with Health Management Information System in the State. This includes gathering and producing of Health Statistics and provision of computer services. It undertakes annual budget proposal and the three-year rolling plan preparation.

Finally, it co-ordinates the National and State Council on Health.

2.6. STRUCTURE OF STATE MINISTRY OF HEALTH.

The Ministry is headed by Honourable Commissioner and a Permanent secretary. It has 6 department each is headed by Director.

STRUCTURE OF STATE MINISTRY OF HEALTH



1.8 DEFINITION OF TERMS

1.8.1.

A mathematical procedures or series of steps followed in performing an activity or solving as problem

1.8.2 COMPUTER SYSTEM

A collection of resources, both human and material, including digital electronic processing devices, stored programmes and sets of data, which under the control of the stored programs, automatically inputs, processes, stores, retrieves and outputs data and information, and may also transmit and receive data and information.

1.8.3. DATA

Coded or raw facts that are relatively meaningless in isolation but can be combined to represent people, objects, ideas and events which are acceptable for input to an processing by a computer system.

1.8.4. DATA SECURITY

The application of safe guards to prevent data from loss, alteration or unauthorized access.

1.8.5. DATA BASE

An integrated collection of data representing entities important to the functioning of an individual or organization, organized to reflect logical relationships among data elements and supports shared access by multiple users and is protected and managed to retain its value over time.

1.8.6. DBMS

Database Management System: The software used for all aspects of the creation, accessing and updating of database.

1.8.7. FILE

A collection of related data organized on a storage medium for convenient access and retrieval.

1.8.8. HEALTH

A state of complete physical, mental and social well being and not merely the absence of disease or

1.8.9 INFORMATION

Data in a useful Form

1.8.10 LOBBY

This use of strategic means such as information by a group or individual for the purpose of seeking for support towards a cause of action.

1.8.11. PASSWORD.

A security word or symbol used to prevent unauthorized access to a computer or to data stored in it.

1.8.12. PROGRAM

A set of instructions written in a language understood by the computer in order for it to carry out a task automatically.

1.8.13.

A set of data items, which are related in some way, generally forming the unit of data in al larger structure such as a file.

1.8.14. SUBSYSTEM

A part of a system, which accomplishes a part of the goals of the system

1.8.1 SYSTEM

A collection of parts working together towards some common goals.

1.9.1. SYSTEM ANALYSIS

The study of how systems should work

1.9.2. SYSTEM DESIGN

Process of developing as plan for implementing the set of functional requirement for a few systems as a completely operational hardware/software system.

1.10. SCOPE OF THE STUDY.

The study is aimed at managing health information system from all health care facility under Niger State Ministry of Health existing Health Information Unit of the DPRS with is the data book of the State Ministry of Health for easy flow of data.

Because of the extensive nature of health, the study is focused only on data that favour its effective use by Ministry of Health for management for decision, planning, advocacy, monitoring and evaluation. It shall however provide a basis for health system research at the non-Governmental level.

1.11. RESEARCH METHODOLOGY

In the study, great enhancement is placed on the placed on the use of questionnaire method for data collection. However, visits are made to sample member's institution for data verification and validation.

Carefully designed questionnaires are sent to member institutions on a routine basis, the filled forms are returned to the MIS unit of SMOH through the zones. The number to no response are minimized because the routine visits of SMOH staff to member institutions are also used to called such questionnaires.

The MIS unit of SMOH upon the receipt of the receipt of the questionnaires edits and codes them into the computer.

CHAPTER THREE

3.0 SYSTEM STUDY, ANALYSIS AND DESIGN.

3.1 IDENTIFICATION AND DEFINITION.

The Management Health Information System in Niger State Ministry of Health is done manually and presently health information is sent in from all health care facilities under the State Ministry of Health, Such information include disease surveillance, Notification Form (DSN) Monthly Family Planning form, Immunization form, Growth Monitoring, Ante-natal form, Inpatient Statistics, Out patient Statistics, Laboratory statistics Pharmaceutical statistics, Dental and Radiology etc.

3.2 PROBLEMS WITH THE EXISTING SYSTEM

The existing system has the following problems

(a) STORAGE PROBLEM – Information stored on files make the file appears bulky and occupying more space in the cabinet at the time no enough storage facility.

(b) RETRIVAL PROBLEM – The speed of retrieval is very slow as one has to search for a particular file (among many) from which the information is to be obtained.

(c) UPDATING PROBLEM – It is always difficult as various information has to be entered into the file about changes that occur, either in the case of current Health information data. It possesses boredom and in-efficiency as different files have to be updated virtually every time.

(d) POOR SAFETY AND SECURITY FOR THE FILES – Poor file handling resulting in destruction/mutilation of vital documents.

(e) Ineffective Management Information System and lack of understanding the concept of information system.

(f) POOR MANAGEMENT- Lack of appreciation of information in decision-making.

(g) LACK OF SUPPORT AND COMMITMENT AT THE MANAGEMENT – Some top executive of an organization has often failed to provide the needed leadership and support in order to bring about an information conscious system.

(h) Some flaw in the reporting system, inconsistent method and time of data collection (Scientific method are not used in data collection. Information system is entirely based on estimate.

Excessive reliance on vendors of machines and accessories, Head of Department of Management are not objective, this has resulted in the supply of substandard machines.

Hardware approach phenomenon – management is found of approving the purchase of computers first before deciding on how it should be used. Prestige should not be the goal of purchasing computers.

The problem now is to pick and develop a system that will ease processing, storage and retrieval of staff records, so that all the drawbacks that are associated with the manual methods are eliminated or at least drastically reduced.

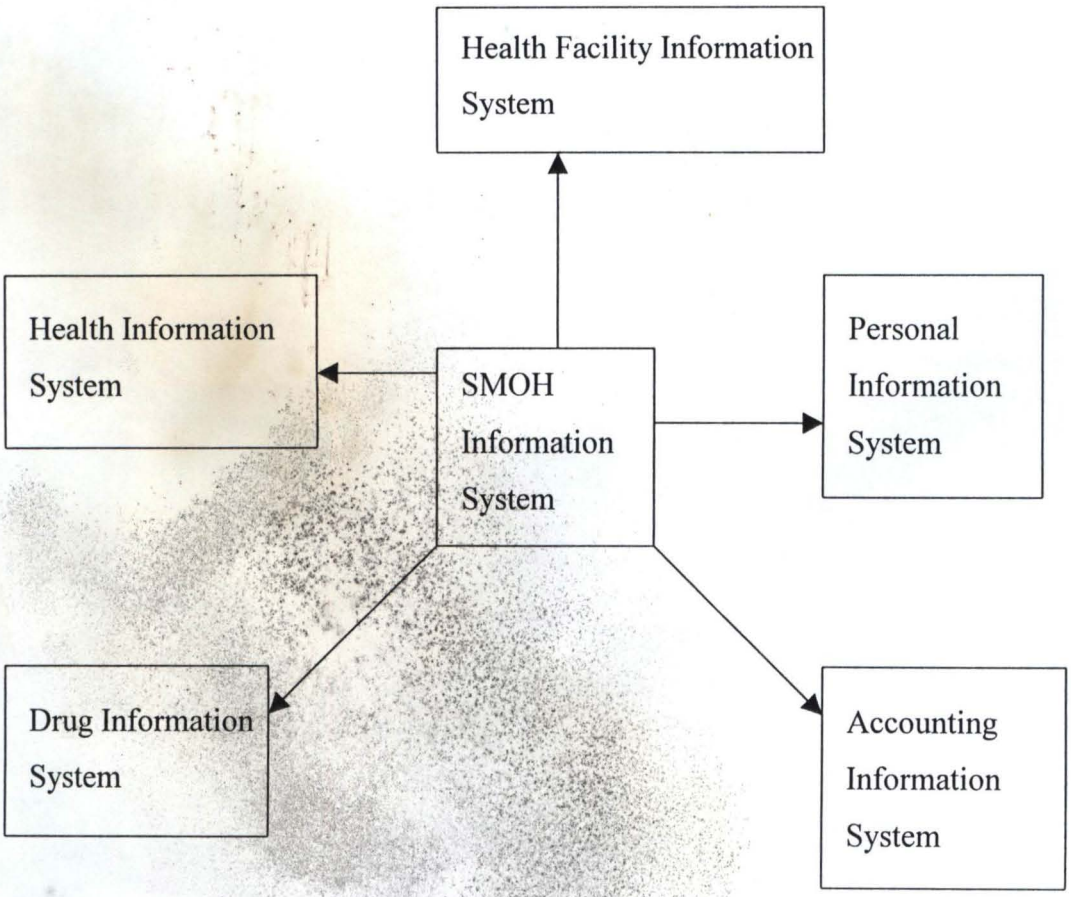
The solution has been identified to be the computerization of Health information system so that at the end of every month, quarter and end of year (Annual Statistics collected, collated, processed and produce for the management with minimal input of labour, time and maximum level of accuracy and speed is achieved.

From the above, the system under study should be able to produce information on the following:

a) All Niger State Health care Facilities Health Information
b) Personal Information System
c) Accounting Information System
d) Drug Order Inventory and distribution

See Diagram Below.

Health Care Delivery Activities



SMOH Information System showing the various functional subsystem.

3.3 FEASIBILITY STUDY

The main aim of carrying out feasibility study is to carefully examine the current manual way of managing State Information System, with a view of determining whether it should be enhanced or that an entire new system be developed

3.3.1 TESTING PROJECT FEASIBILITY

OPERATIONAL FEASIBILITY – The operational feasibility of the proposed system was conducted during which it was discovered that the new system being envisaged is operationally feasible because of the followings.

i) Top management has to accept the idea of computerization.
ii) There was ecstasy that the office is going to be computerized
iii) There was yawning need for a change.

3.3.2 TECHNICAL FEASIBILITY

The available staff in the health statistics unit will be able to handle the proposed system when required computerization is effected.

3.3.3 FINANCIAL FEASIBILITY

The cost of implementing the proposed system will be quite reasonable and affordable, as the required computer is available locally.

3.3.4 SYSTEM ANALYSIS

The following fact finding techniques (FFT) were used in carrying out the analysis

i) Interviews – Asking question from staff in the Health Information Unit of the Ministry.

ii) Record Searching – Going through the existing Health Information Format sent in

3.5. OPERATION OF THE EXISTING SYSTEM

The management of the entire health data of the State Ministry of Health is done manually by the staff of the Health Information unit (HIS).

All health information are sent to the HIS unit which is under the Department of Planning Research and Statistics, they are filed according to the type of information e.g. all family planning return from all Local Government in the State are filed in one file, so also are immunization return forms.

Antenatal return form
In-patient return form
Outpatient return form
Disease Surveillance return form
Laboratory return form
Pharmaceutical return form

Which are summarized manually and presented manually. The final summary when approved by the Head of Department (Director) is then countersigned by the Permanent Secretary then it is send to the Federal Ministry of Health through the despatch office.

3.5.1 RECORD UPDATE – It is very tedious on each information on the above listed items and treated manually it posses boredom and inefficiency as different files have to be up dated virtually every time which result in poor file and forms resulting in destruction/mutilation of vital documents; Health information records are compulsory

updated on monthly basis, most of health care facilities sent in their records on monthly basis; It is done manually.

3.6 COST BENEFIT ANALYSIS

3.6.1 Cost benefit analysis of the proposed system cost of the alternative system solutions was projected based on the following criteria.

a) Equipment cost (capital cost) of
   i) Computer and peripherals
   ii) Anxilliary equipment
   iii) System initial consumables such as diskette, papers, and printer ribbon e.t.c.

b) Installation cost and the required environment

c) Development cost (software/consultancy work on programming and charge over costs.

d) Personnel cost
   i) Staff training
   ii) Staff recruitment/relocations
   iii) Soft ware installation
   iv) Over heads

e) Operating cost
   i) Consumable materials (diskette, ribbon and stationary)
   ii) Maintenance
   iii) Accommodation cost
   iv) Power/insurance/telephone
   v) Back up services

f) Incidental cost – This was estimated at 10% the total cost includes:
   i) Accidents
   ii) Forgotten items
   iii) Inflation

The benefit accruing from the proposed system include:

i) SPEED: The most obvious benefit of using computer is speed. The computer can perform calculation and data processing more quickly then alternative method can, work that might take human, months or even year to complete manually may be accomplished in hours or at most days by computer. For example, some computers can do hundred or thousand or even millions of arithmetic's operation per seconds.

ii) ACCURACY – The computerized Health information system with accurate data will do an interested work with a very high degree of accuracy. The computer does exactly what the project tells it to do.

In addition, the computer does not get bored or fatigue thus avoids the errors human might make under the same circumstance.

iii) RELIABILITY- The computer can work almost twenty four hours a day (with a little time out for equipment check out the maintenance every day of the year it still operate reliably.

iv) ATTENTION – The computer can store and search massive file of data and programs. The content of the file does not fade of get lost, and it can be used as often as needed.

v) ECONOMY – The advantage of speed and accuracy can often be transferred into dollars saving realized. Accurate record can reduce the frequencies of bad decisions that were made because of unreliable or unavailable information.

vi) WIDE APPLICABLE – A computer can be used to solve a wide variety of problems that arise in science and business. The boundaries of what the computer can accomplished are limited only by the ability and imagination of its user.

vii) Drastic reduction in space occupied by files in all file cabinet.

viii) Reduction in staff strength handling health information duties.

ix) SECURITY – The security of the system taken into cognizance such that the facilities are provided only for authorized users to have assess to them.

x) FLEXIBILITY – The system is designed such that it can operate in a dynamic rather than static environment.

xi) Better Management information system.

xii) A more effective department.

3.7. PROPOSED COMPUTERIZED HEALTH INFORMATION SYSTEM

The computerized Health information system is to develop an overall plan for an integrated system. As the plan proves economically and technically feasible, particular phase of the integral system can be computerized in a planned sequence.

This approach entails integrating, by using the system approach and the multiple file of different health care facilities in the State.

It also attempts to keep up to date records so that inquiries may be answered with timely and accurate information. As a result a great deal of duplication and inconsistency is existing file should be eliminated or reduced to the barest minimum.

3.7.1 OBJECTIVE OF THE PROPOSED SYSTEM.

The new system will improve the use and implementation of Health information system and microcomputer.

To eliminate duplication of records
To improve Health information system
To reduce management cost e.g. Production/Maintenance cost.
Fast processing, Retrieval and safe storage.

3.8 PROGRAME DEVELOPMENT

The programme Health information is written in Dbase IV tailored towards the result from investigation of the existing system or operating in the department. This programme will represent the manual system of preparing health facilities information as well as production of report.

3.9 PROGRAMME DESCRIPTION AND MAIN MENU

The programme is menu drive. At the running of the program, a menu is displayed on the screen consisting of five options as below.

[1] ADD RECORD
[2] EDIT RECORD
[3] DELETE RECORD
[4] REPORT GENERATION
[5] EXIT

The above listed options are therefore SUB-PROGRAME to the HEALTH INFOR. PROGRAM, which are executed when the desire option is chosen from the menu.

[2] EDIT RECORD.

The option will enable the user to effect changes to the existing record in the data base file. The program will display a text "ENTER HF – NO" and pause for the user to input Health Facility Number, the program will then search the data base file for a match with the number entered. If a match is found the corresponding record to that HEALTH FOCUS number will be displayed on the screen and the cursor will be in the first field of the form, which enable the user effect desired changes. After which this massage will be displayed. ARG THE EDITTED ENTRIES CORRECT (Y/N) if Y is chosen, the new entry will replace the old information in the data base file. Also a text will be shown asking the user if he want to modify more records or not on the other hand, if a match is not found, this massage will be displayed RECORD NOT FOUND.

Refer to appendixes IV and IX for the EDIT PRG and out put respectively.

[3] DELETE RECORD

This program to delete a record looks familiar with that of Edit. At the beginning of running the program a text is displayed on the screen to enable the user enter the Health facility number. (i.e. HF – NO) to be deleted. The program search the data base file for the corresponding number. If a match is found the massage will be displayed on the screen to enable the user view the record he want to delete at the same time the text "DELETE THIS RECORD (Y/N)" will be displayed at the bottom of the record if the user chooses N denoting that he doesn't want the record to be deleted, the programme will write the record back to the data base file on the other hand, if the user chooses Y meaning that he want the record to be deleted, the record will permanently remove the record from the data base file.

* Refer to appendixes V&X for the DELETE PRG and output respectively.

REPORT GENERATOR.

This program module call REPORT PRG. Will enable the user to generate report from the data base file. This report will be obtained either from the computer screen or the printer. To view a print out the out put device must be selected before the calling of the data base file, then the user will specify the Division to report on, after which sorting operation will be carried out on the choosing key field MSS or HSS or GL. The record concern will be arranged in descending order, resulting in creating another data base file called SORTED FILE. The sorted file is used in generating the Reports.

* Refer to appendixes VI and XI for the Report PRG and Result respectively.

[4] EXIT

By selecting this option from the menu the program will quit and pass control to the Dot prompt of Dbase IV

All valuable names used in the program will be rest back to their defaults.

* Refer to appendix II for the RETURN Command.

3.9 HOW TO RUN THE PROGRAM.

At the Dos (Disk Operating System) prompt changes directory to Dbase

1) At the Dos Prompt

Type DBASE and press ENTER Key, wait for some few seconds, DBASE IV will be loaded and present you with the dot prompt.

II) AT THE DOT PROMPT

TYPE DO HEALTH INFOR and press ENTER key. DBASE IV will execute the program file called HEALTH INFOR PRG. During the execution, the program will clear the screen and present the user with the main menu consisting of listed options.

3.10 FILE SPECIFICATION:

A) THE HEALTH INFOR PRG. Is the file name of the main program that will display the menu options and activate any subprograms, are also known as program modules.

* Refer to HEALTH INFOR PRG and out put respectively.

B) In this project, four program modules were developed with each one having its own file.

The File names are:

(i) ADD. PRG
(ii) EDIT PRG
(iii) DELETE PRG
(iv) REPORT PRG

* Refer to HEALTH INFOR programs for their options.

(C) The Data base file created in this project is called HEALTH INFOR DBF

3.11 SYSTEM REQUIREMENTS

The following complement is essential for the implementation of the proposed system.

(a) HARDWARE REQUIREMENT

1. IBM PC or compatible

- IBM 486 of 66 MHZ speed
- 8MB RAM (memory)
- 246 MB. Hard dick
- 2 Serial/parallel cards
- 4 Free expansion slots
- 3.5 Floppy disk drive
- 101 Enhanced key board

2. MONITOR

- 14 Color SVGA (1024 x 768 pixel 0.28 dot/pitch)

3. PRINTER

- Laser Jet on heavy duty Epson printer – LQ 2(1070)
- 132 Column
- Parallel/serial interface
- 360 x 360 dpi resolution

SPEED

Draft mode: 400CPS

Letter quality: 133CPS

Fonts: 780

Buffer – 8KB

4. POWER STORAGE

- APC Smart uninterrupted power supply (UPS) 500vn
- Nnulec voltage stabilizer
- Model: RT LR 1600
- Power 1600 VA

B. SOFT WARE REQUIREMENT

- MS – DOS version 4.0 or higher version
- Database Management System Package version IV

C. CONSUMABLE ITEMS

- "3.5" HD Diskettes (Maxwell)
- 5.2 HD Diskettes (Maxwell)
- Maxwell ribbons
- Computer papers with carbon sheet.

D. Accommodation and furniture

- A room that is well filled with air condition.
- Computer table and chairs
- Office cabinets

3.12 TRAINING NEEDS

The computer professional in the health statistics unit of the department are capable of manning the propose system when operational, but in-house training will need to need to be given to them to re-fresh their knowledge on how to use the HEALTH INFOR. PRG and other computer operations.

3.13 SYSTEM CONVERSION

The system conversion to use PARALLEL CHANGE OVER where both the old and new system will be kept alive and operational, until the new system have been prove satisfactory by using full live data in the real operations. It allows the result of the automated system to be compared with the manual system before accepted by the user. Thereby promoting user's confidence. When this is observed for sometimes the old system would then phased out gradually.

CHAPTER FOUR

SYSTEM DESIGN AND IMPLEMENTATION

4.1 SYSTEM DESIGN AND DISCRIPTION.

The proposed system is implemented by action of four core Database. These are briefly described below.

(a) Health Facility Database – This database captures data on Health Facilities in thestate, the data include name of facility, location, Local Government Area, etc. The database is meant to essentially give the directorate of member institution, their membership status and monitor their health information returns to the state – This database capture data on health activity of member institutions. The data include name and type of facilities, location, number of patient treated per disease in a year and their age. The database is meant to give a health activity report of member institutions. The disease reporting is based on indicator disease as spelt out in the National Health Information System. The database is also design to report diseases based on age distribution. The output of this database will bring the focus contribution of health care work to health care delivery in Nigeria.

(c) Drug database – this database, which is design to monitor drug stock and distribution among member institutions have at it, contents the following data. Name of drug, opening stock, stock received and closing book.

(d) Personnel database – This database which has to do with the internal process Niger State Ministry of Health, monitors staff details and attempt to generate a simple payroll of the staff for account department, location, qualification, employment data, basic salary

4.2 DESIGN APPROACH

In describing the approach used in this design, we shall use the following sequences.

a) Out put (Result)
b) Input (data)
c) Files
d) Procedures.

a) Out put – The major out put of this system are

1, Listing of SMOH registered health facilities location and type.

2. Out put of activities of health care facilities

i) Ante-natal and pregnancy out come
ii) Immunization programme.
iii) Inpatient services
iv) Out patient services
v) Disease surveillance
vi) Pharmaceutical inventory and utilization.

b) input (data)

The input data expected to generate the above named out put are as follows.

Data collected from member institution on a routine basis. This is based on major activities of all health care facilities and drug utilization.

ii) Data on all registered health care facilities in the State.

c) File

Files under this system are divided into two, data file and program files.

The database file consists of the following.

i) Member DBF – Capture data of health facility status.

ii) Member DBF – A coding database file for member DBF

iii) Disease DBF - A coding database file for main DBF

iv) Main DBF – Capture data on routine notifiable diseases reported in SMOH.

v) Drug DBF - A coding database file for main d 2 dbf

vi) Main 2 dbf – Capture data on drug inventory and utilization of member institution

vii) Personnel dbf – Capture data on the staff of the Ministry

viii) Temp. dbf – A temporary Database file used for processing in the Health Information System

ix) Tem p.2 dbf – A temporary Database file used for processing in the Health Information System.

x) Tem p.2 dbf – A temporary Database file used for processing in the Information System.

2. PROGRAM FILE – These are design to activate the above named database files. The program file includes:-

i. Data entry routine files – Addrec1.prg. Addrec2.prg Addrec3.prg and Addrec4.prg.

ii. Data deleting routine files – delrec1.prg. Delrec2.prg. Delrec3.prg and Delrec4.prg.

iii. Data editing routine file – Editrec1.prg. Editrec2.prg. Editrec3.prg and Editrec4.prg.

iv. View file – Viewrec1.prg, Viewrec2.prg, Viewrec3.prg and Viewrec4.prg.

and employment status. The information obtained here are useful in staff appraisal and evaluation process.

Each of the above mentioned database is maintained by a program files. The database approach is recommended for this system because of the following reasons.

(i) To achieve data integrity: This means that different applications can be written for one type of data. This will also go for many department who use a particular data.

(ii) Reduction or eliminating of data redundancy: This will take care of data repetition in every database file as there is the possibility of linking up with a type of data within a database from another database file. This leading to saving of storage space that would have been otherwise wasted.

(iii) Attainment of data independence: This means that under the system, application program can be instituted from the physical or logical storage of data. This allow for the modification of application program of the data without affecting the other .

(iv) Attainment of data integrity – The use of database approach reduce the risk of data duplication and this enhance the integrity of the data and the information generated from data.

(v) Centralized System – The database approach ensure that centrally controlled. This means that data collected with huge cost are properly controlled. Data security is maintained and data standard can easily be enforced.

(vi) Flexibility or access to the data, Database are managed by database management system. (DMS). (DMS) provide many different process by routes for extracting DBMS are easily available to computer novices as well as for computer professionals.

(vii) Report generation – With the use of database (DBMS) one can easily generate customized reports that can be used at anytime for decision-making.

(viii) Access to the use of fourth generation language (4GL) which can be used for development of application and file management.

v. Data control files and

vi. Report (out put) file

d) PROCEDURES

The procedures used in this design is illustrated in the diagram below:-

YOU ARE WELCOME TO
NIGER STATE MINISTRY OF HEALTH, MINNA
Coordinating Health activities in the state
Paiko Road, Minna, Niger State, Nigeria.
TEL. 066-221427

Press any enter key to continue.....

Fig. 4.1.1

This is
SMOH Management Information system
Authored by Mrs A. K Abubakar
HND 1987, PGCHP 1998, PGD(Maths /Comp.) MSC/551/9798
This program was developed in July 1998
WARNING: This program is copyrighted.....
Please Do Not Copy
Press any enter key to contiune.....

Fig.4.1.2

HEALTH INFORMATION SYSTEM SUBMENU

Task Code		Task
{A}	-	ADD A NEW RECORD
{B}	-	DELETE ONE RECORD
{C}	-	EDIT A RECORD
{D}	-	DISPLAY THE CONTENTS OF A RECORD
{E}	-	REPORTS
{F}	-	EXIT TO MAINMENU

Press any LETTER of your choice {A-F}

Fig. 4.1.6

HEALTH INFORMATION MANAGEMEENT SYSTEM

ADDING NEW RECORD FORM

REGISTRATION NO: 0001 FACILITY NAME:GEN. HOSP .MX

TYPE CODE: 01 TOWN: MINNA BOX/PMB: 57

LGA: BOSSO STATE: N/STATE

TITLE; HON. COMM. CONTACT: Dr. NUHU Z. POST. HON. COMM.

REGISTERED MEMBERR {Y/N} NO OF BEDS:256

STAFF STRENGTH:

DOCTOR:30 DENTISTS:4 PHARM. 10 NURSES: 190 OTHERS: 200

SAVE RECORD [Y/N}

Fig .4.1.7

HEALTH INFORMATION SYSTEM

DELETING RECORD FORM

REGISTRATION NO: 0001 FACILITY NAME: GEN. HOSP. MX

TYPE CODE :01 TOWN : MINNA BOX/PMB ;57

LGA:BOSSO STATE : NIGER STATE

TITTLE: HON. COMMI. CONTACT :DR.NUHU Z.

REG. MEMBER {Y/N}:Y NO. OF BED 290

STAFFSTRENGTH:

DOCTORS:30 DENTISTS: 4 PHARM;4 NURSES:190 OTHERS 200

EXPEENCES:

ON SALARY: 104,00.00 ON DRUGS : 20,000.00 ON OTHERS: 600,000.00

TO DELETE THIS RECORD? {Y/N}

HEALTH INFORMATIO SYSTEM

EDITING THE RECORD

REG. NO: 0001 FACILITY NO : GEN . HOSP. MINNA

TYPE CODE :01 TOWN : NIGER STATE BOX/PMB

LGA: BOSSO STATE: NIGER STATE

TITTLE : HON. COMM. CONTACT: DR. NUHU Z.

REG:MEMBER {Y/N} NO OF BEDS : 260

STAFF STENGTH:

DOCTORS:30 DENTISTS:2 NURSES : 297 OTHERS:200

EXPENSES :

ON SALARY: 450,000.00 ON DRUGES:21,000.00 ON OTHERS 600,000.00

SAVE CHANGES {Y/N}

Fig. 4.1.9

HEALTH INFORMATION SYSTEM

VIEWING RECCORD FORM

REG. NO.: 0001 FACILITY NAME : GEN. HOSP. MX

TYPE CODE : 01 TOWN : MINNA BOX/PMB:57

LGA :BOSSO STATE: NIGER STATE

TITTLE : HON. COMM. CONTACT: DR NUHU Z. POSSITION :H. COMM.

REGISTERED MEMBER: [Y/N}:Y NO OF BEDS;290

STAFF STRENGTH

DOCTORS; 150 DENTISTIS :4 PHARM: 8 NURSE;190 OTHERS:150

EXPENSES

ON SALARY: 104,050,00 DRUGS:122,000.00 OTHERS :600,000.00

VIEWING RECORD - Press any key to continue

Fig .4. 1.10

REPORT HEALTH FACILITY INSTITUTION

REG. NO

iv. Data editing routine file – Editrec 1 prg. Editrec 2 prg. Editrec. 3prg and Editrec 4 prg.

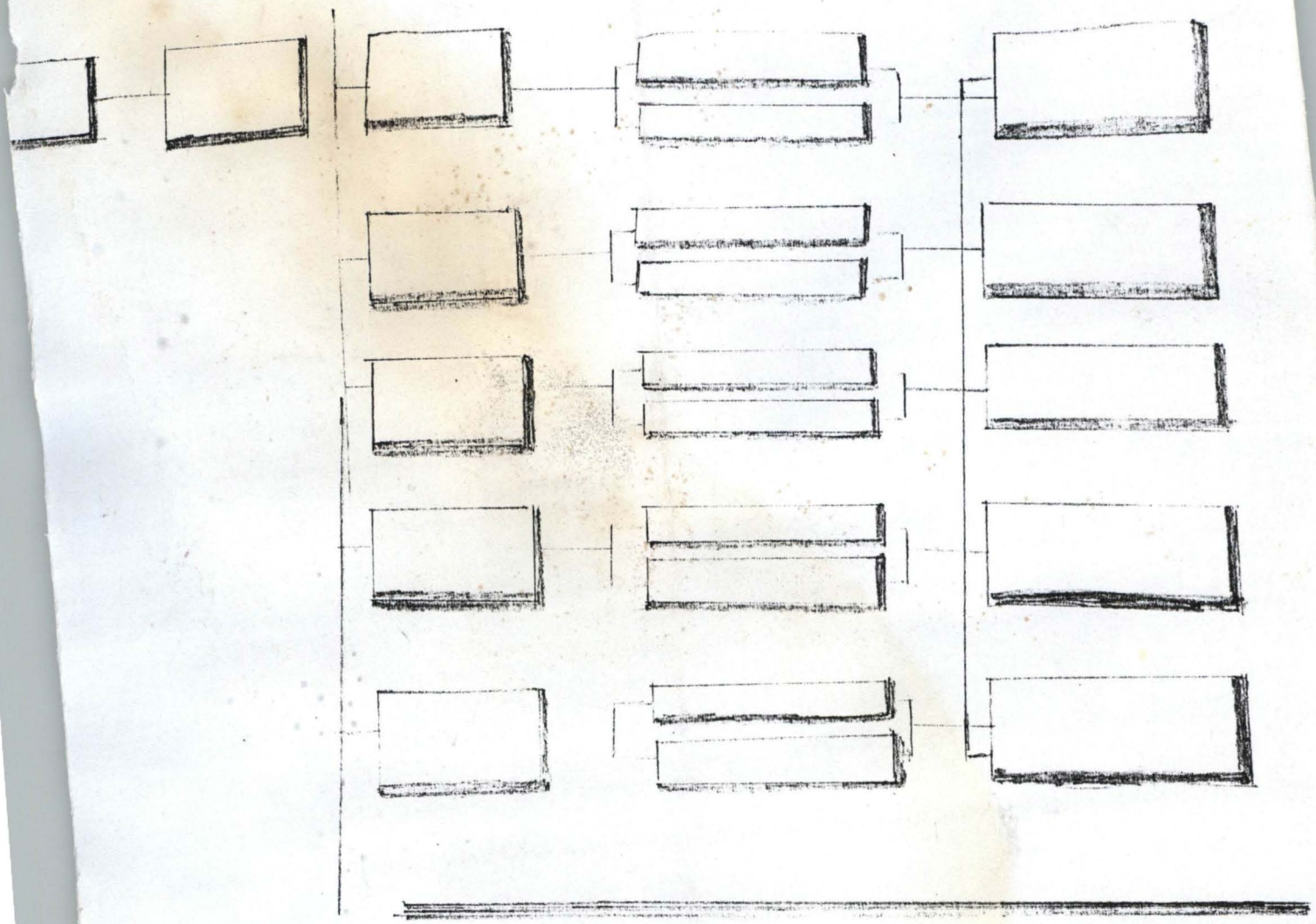
v. Menu and sals Menu file

vi. View file – View rec 1 prg. View rec 2 prg. View rec 3 prg and view rec 4 prg.

vii. Data control files and

viii. Report (out put) file

The procedures used in this design is ustrated in the diagram below :-



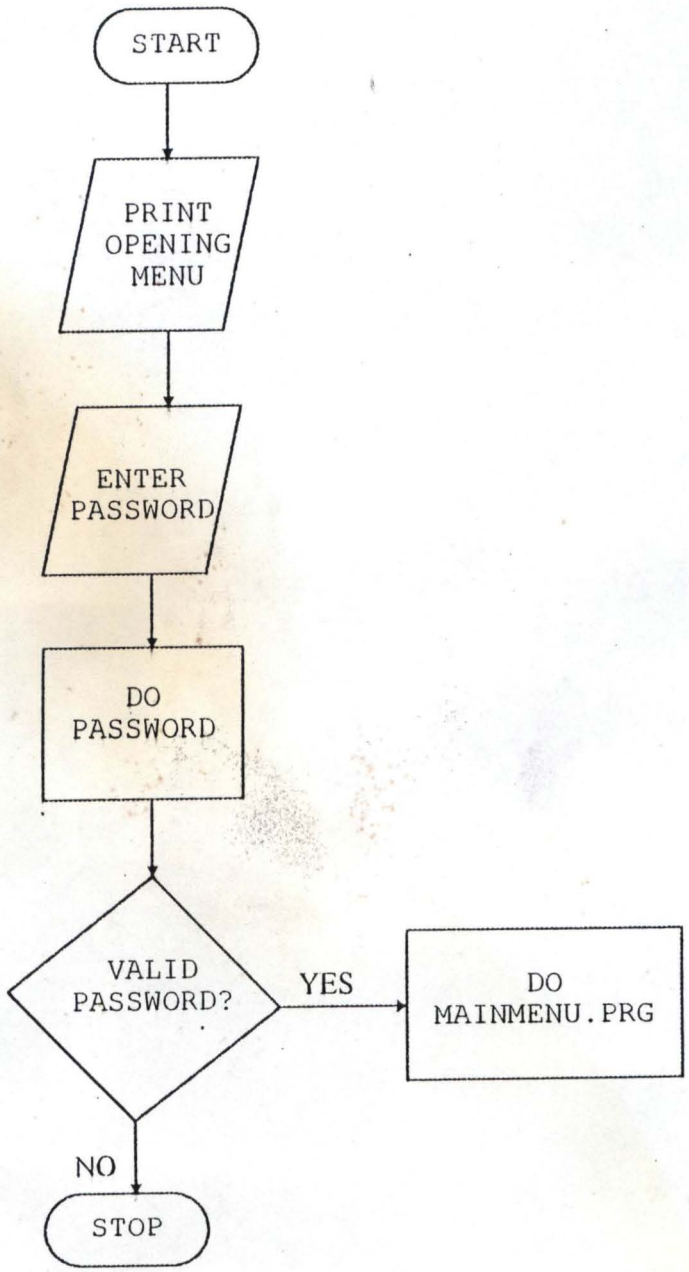
4.2

Health Management Information System Algorithms

HEALTH

4.2.1 *Opening Menu Flowchart (.prg)*

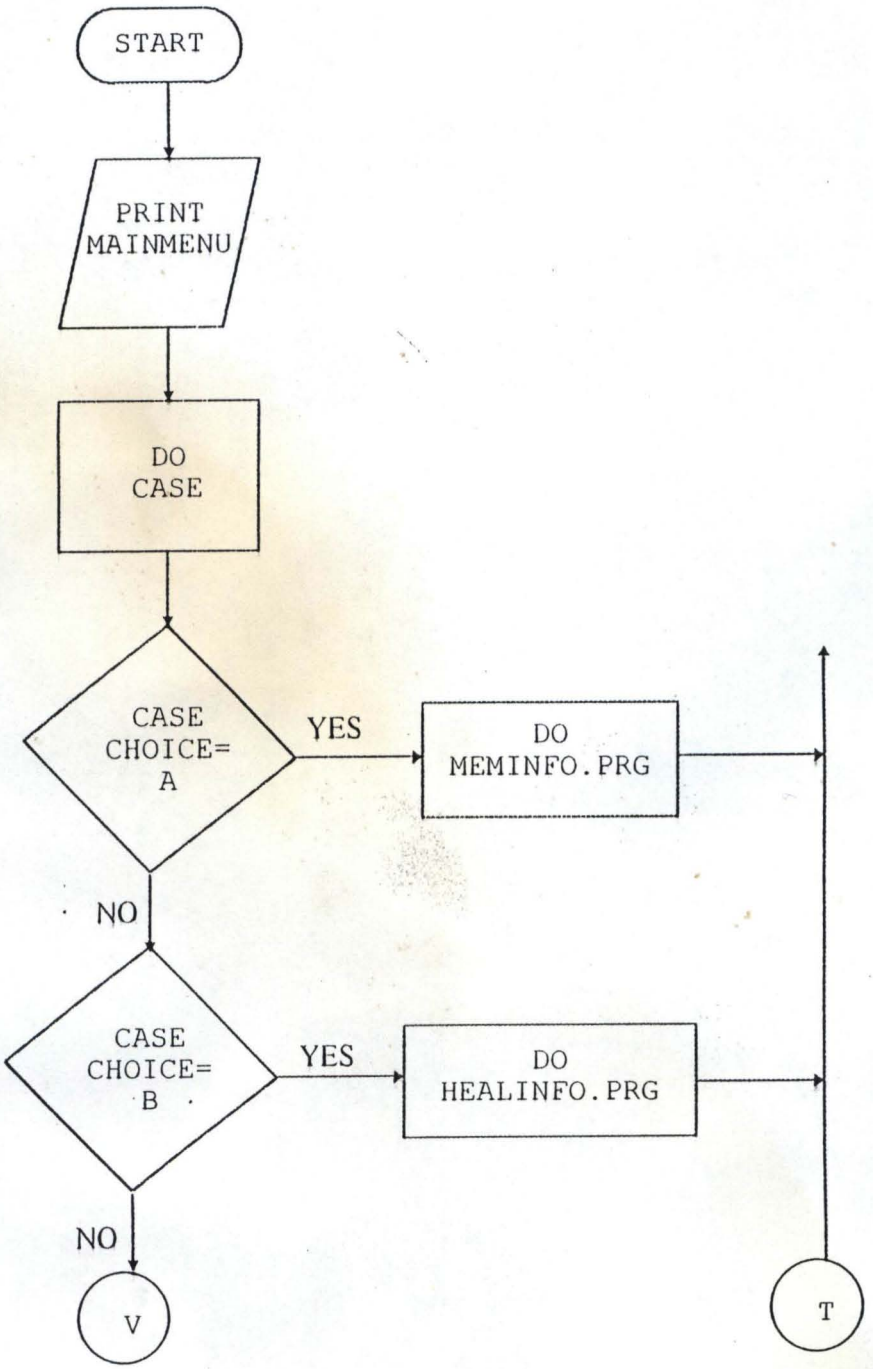
This is the opening menu and security program flowchart:

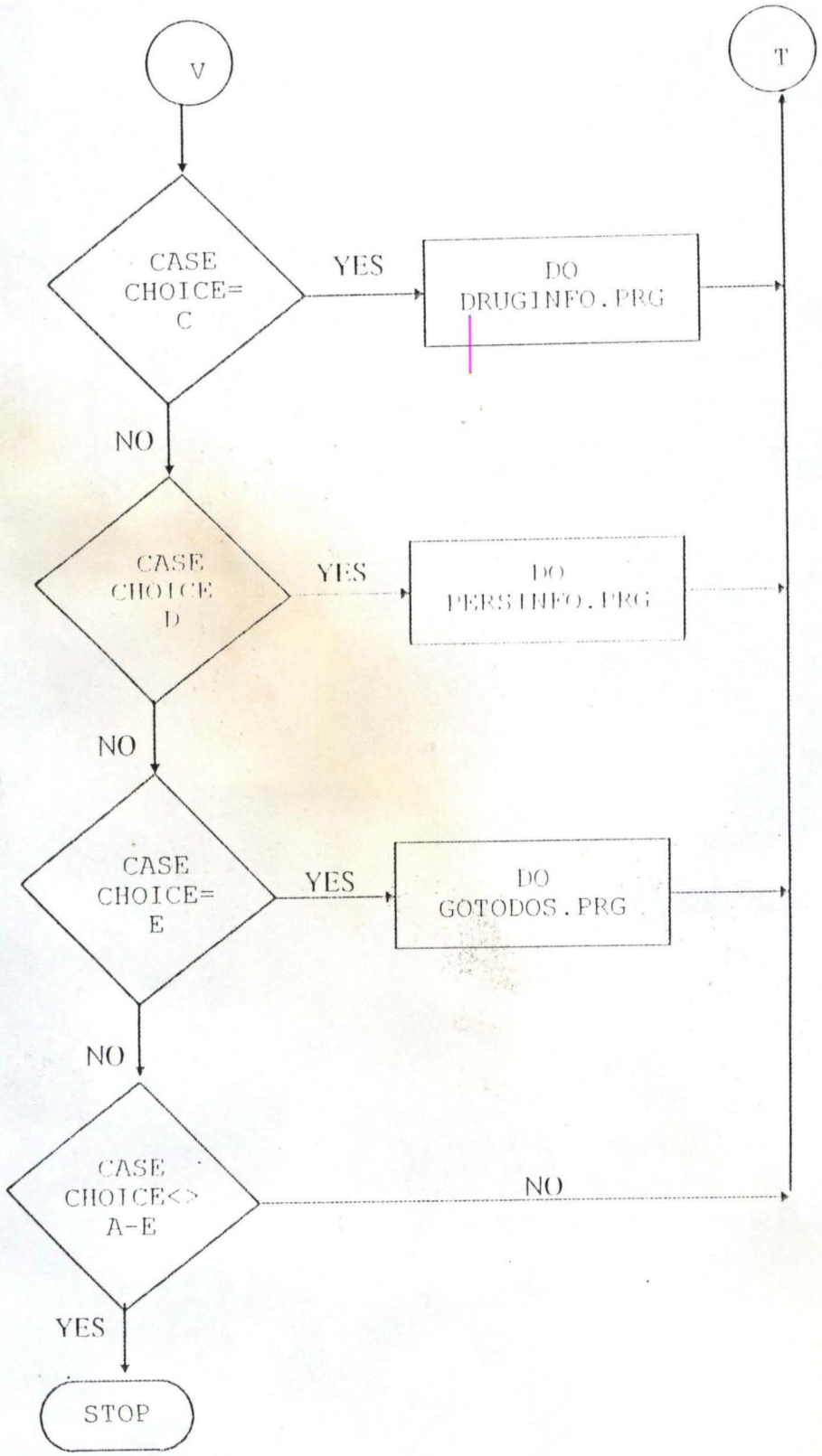


4.2.2

Main Menu Flowchart (Mainmenu. prg)

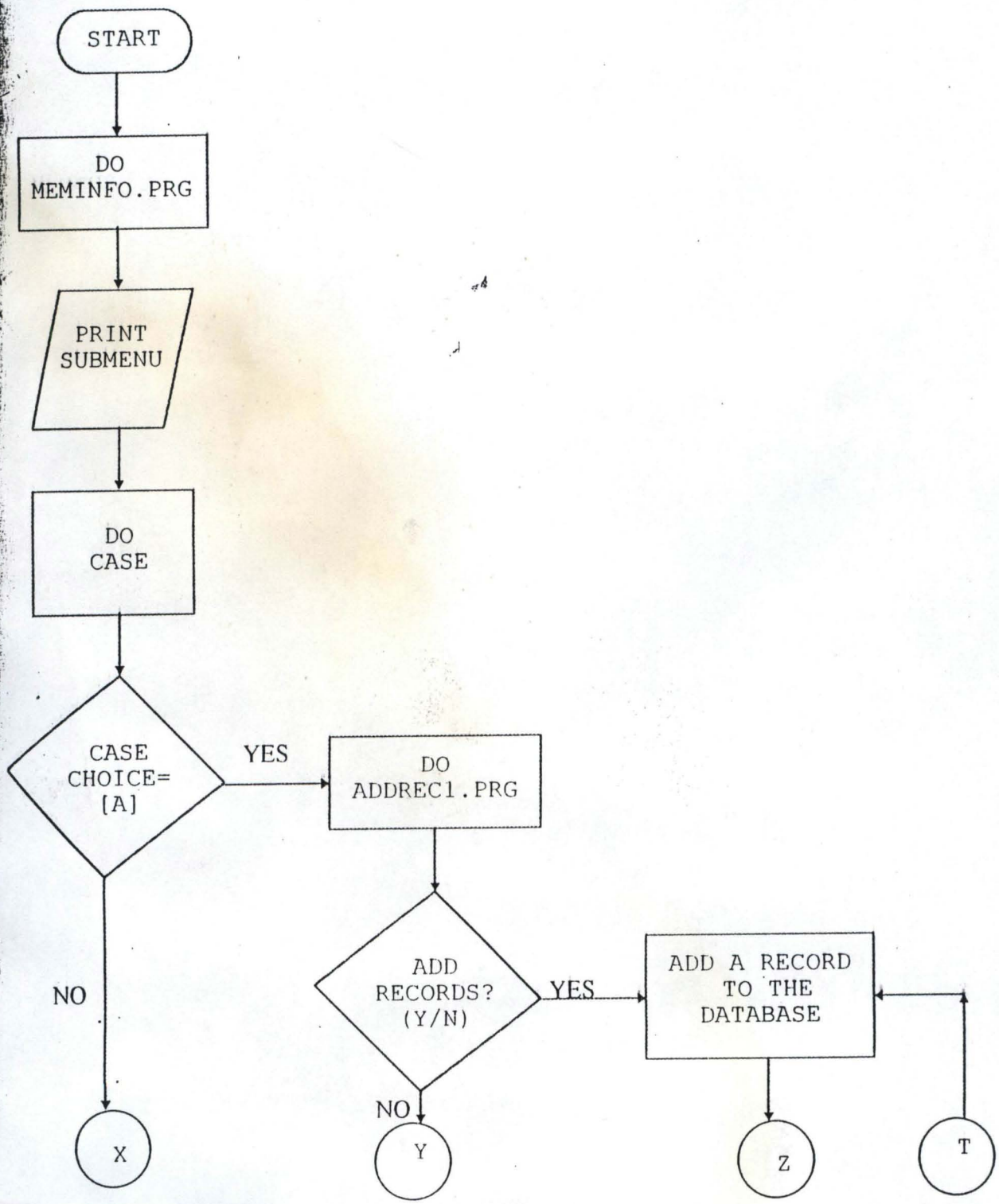
This is the Main Menu program flowchart which introduces one to the entire information system.

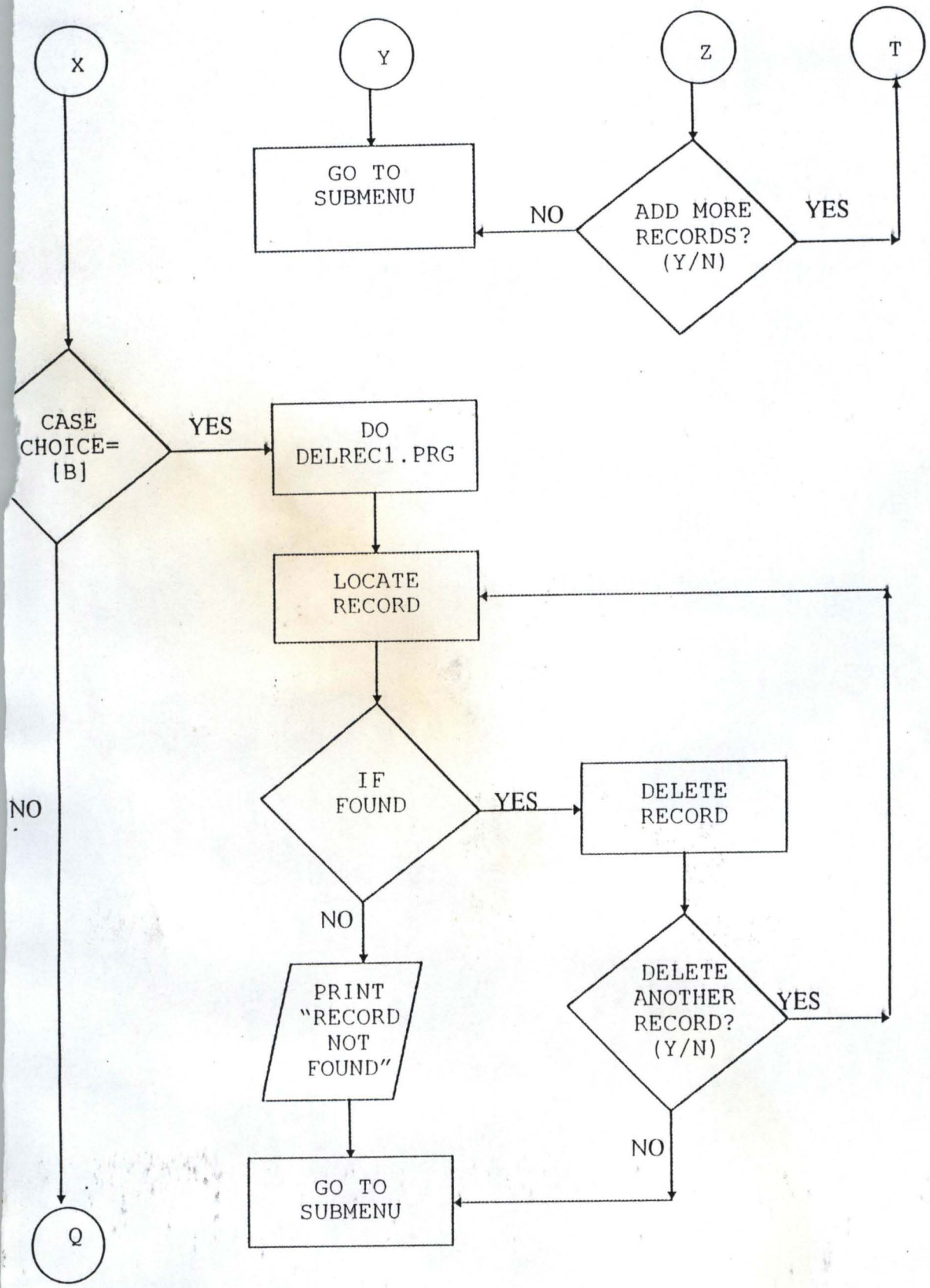


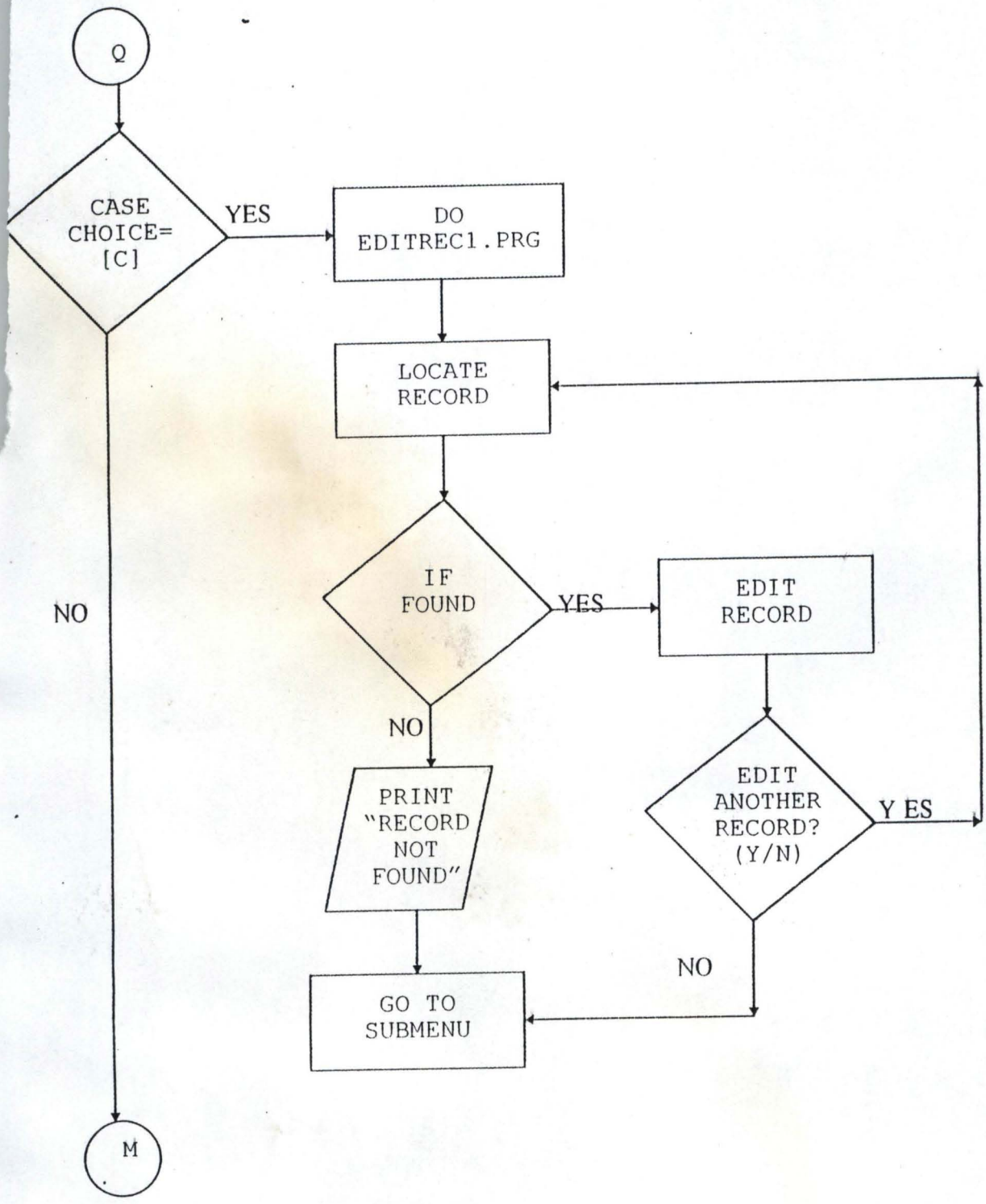

V
T
CASE CHOICE= C
YES
DO DRUGINFO.PRG
NO
CASE CHOICE D
YES
DO PERSINFO.PRG
NO
CASE CHOICE= E
YES
DO GOTODOS.PRG
NO
CASE CHOICE<> A-E
NO
YES
STOP

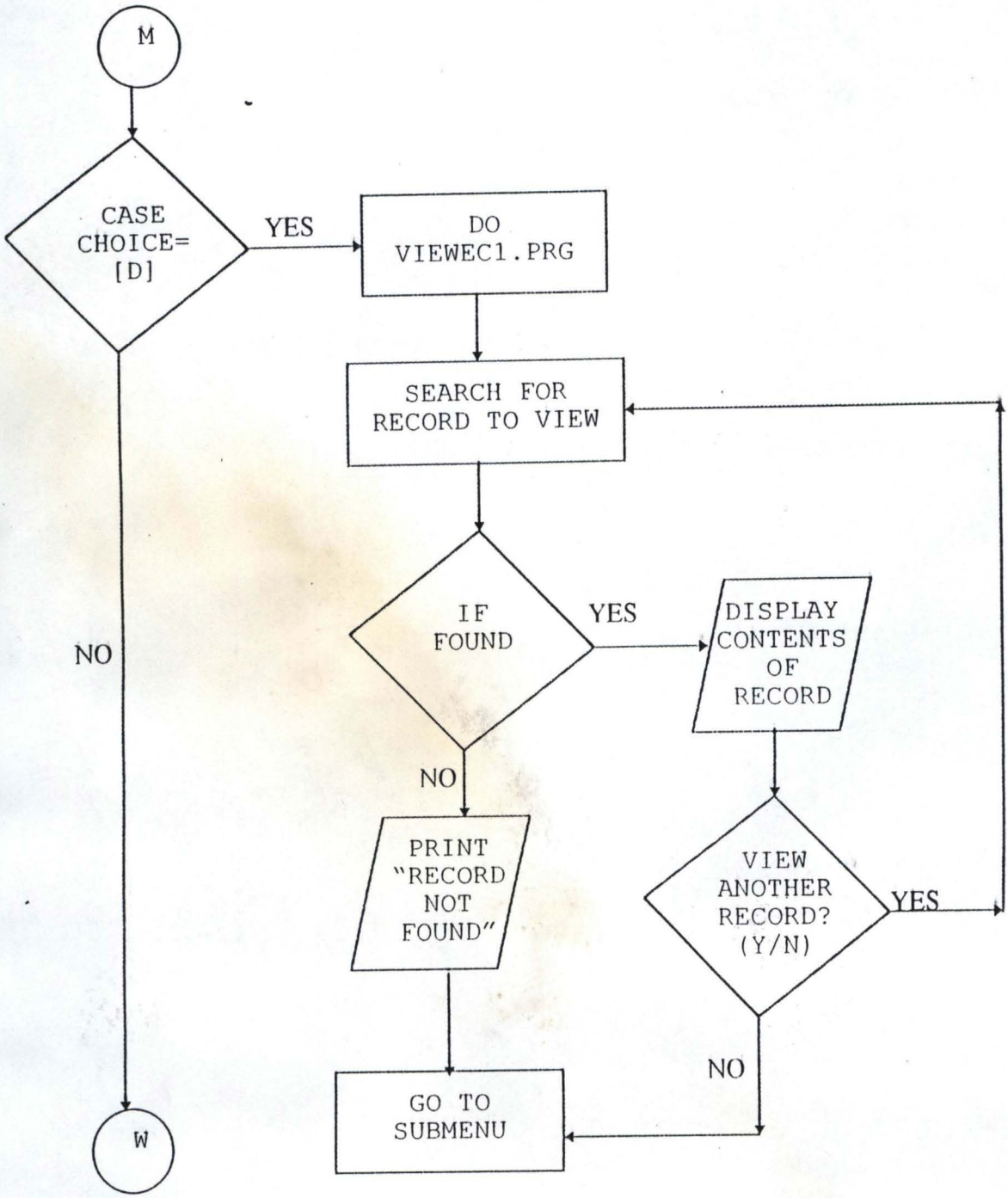
Membership Information System Flowchart (Meminfo.prg)

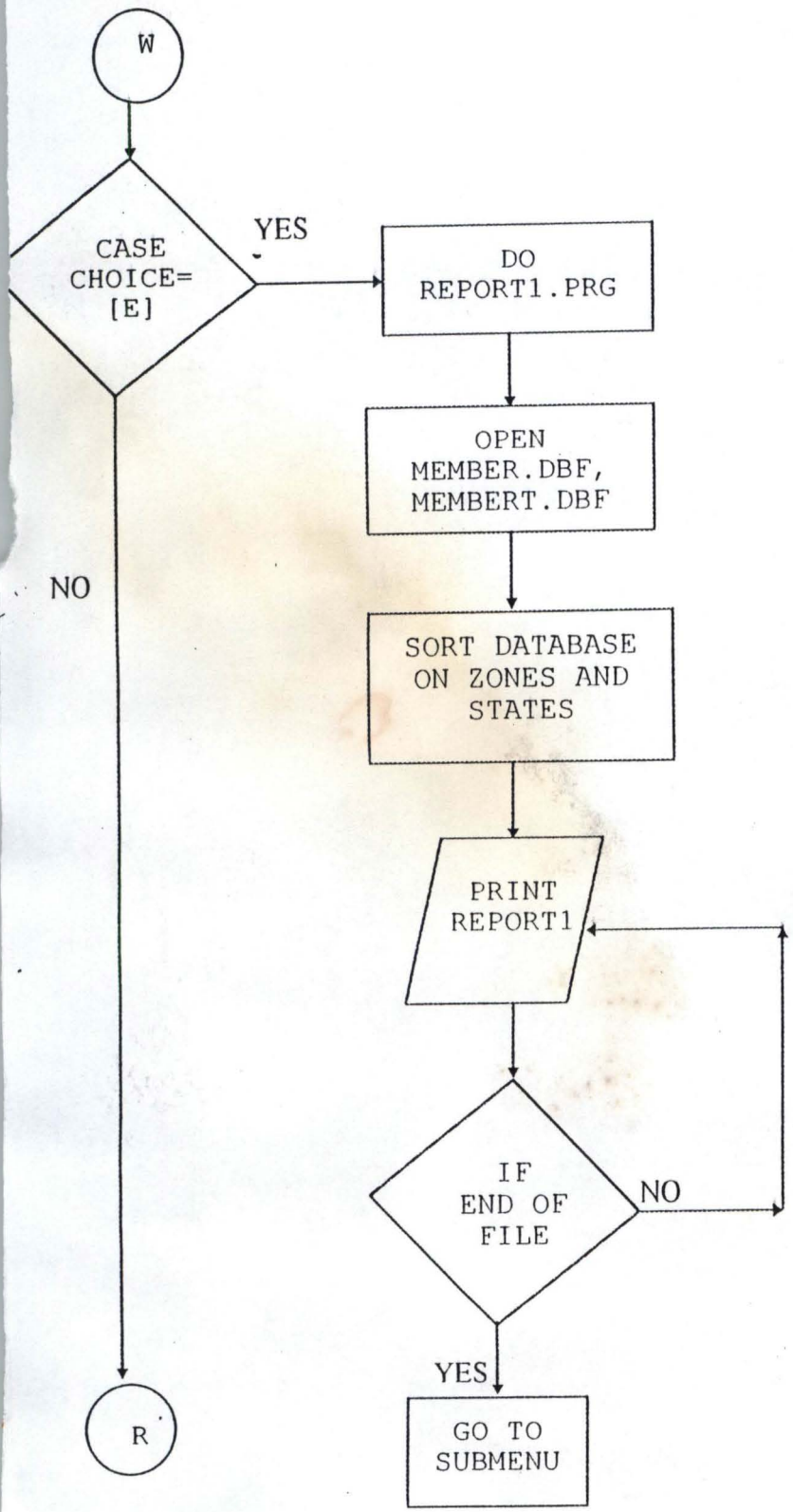
This is the membership program flowchart which activates the membership database files. This program adds, deletes, edits, views records of the member.dbf. It also gives a simple report based on the entered data.

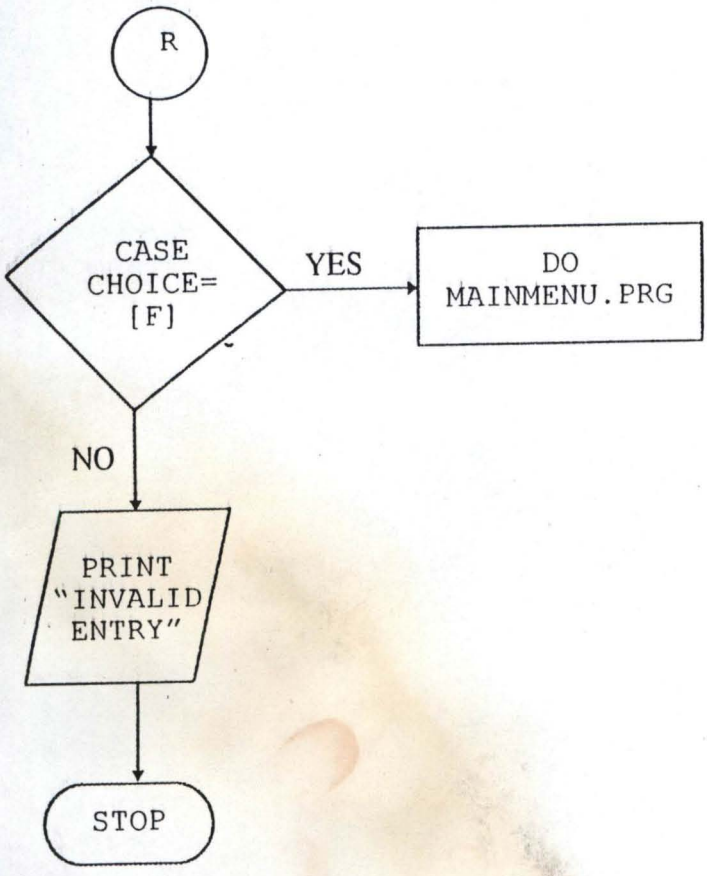



X
Y
Z
T
GO TO SUBMENU
NO
ADD MORE RECORDS? (Y/N)
YES
CASE CHOICE= [B]
YES
DO DELREC1.PRG
LOCATE RECORD
IF FOUND
YES
DELETE RECORD
NO
PRINT "RECORD NOT FOUND"
DELETE ANOTHER RECORD? (Y/N)
YES
NO
GO TO SUBMENU
NO
Q


Q
CASE CHOICE= [C]
YES
DO EDITREC1.PRG
LOCATE RECORD
IF FOUND
YES
EDIT RECORD
NO
EDIT ANOTHER RECORD? (Y/N)
Y ES
NO
PRINT "RECORD NOT FOUND"
NO
GO TO SUBMENU
M


M
CASE CHOICE= [D]
YES
DO VIEWEC1.PRG
SEARCH FOR RECORD TO VIEW
IF FOUND
YES
DISPLAY CONTENTS OF RECORD
NO
PRINT "RECORD NOT FOUND"
VIEW ANOTHER RECORD? (Y/N)
YES
NO
NO
GO TO SUBMENU
W


W
CASE CHOICE= [E]
YES
NO
DO REPORT1.PRG
OPEN MEMBER.DBF, MEMBERT.DBF
SORT DATABASE ON ZONES AND STATES
PRINT REPORT1
IF END OF FILE
NO
YES
GO TO SUBMENU
R



4.3.1 ***Health Information System Flowchart (Healinfo.prg)***

This is the Health Information System Flowchart that activates all the database files on health care activities of member institutions. The routine is similar to that of the Membership Information System (3.5.3) except that different database files are used. There is a sub menu for this level through which data on health care activities of member institutions can be added, deleted, edited, viewed and reports generated. The programs to carry out these functions are titled Addrec2, Delrec2, Editrec2, Viewrec2 and Report2.

4.3.2 ***Drug Information System Flowchart (Druginfo.prg)***

The Drug Information System activates database files on member institutions' drug utilization and inventory. The flowchart follows the same routine as in the case of Membership Information System (3.5.3) above, except the database files that are different. Programs that carry out the routine are titled Addrec3, Delrec3, Editrec3, Viewrec3 and Report3.

3.3

Personnel Information System Flowchart (Persinfo.prg)

The Personnel Information System activates the Personnel database file of [redacted] and oduces updated information on SMOTT staff. The flowchart follows the same pattern with the mbership Information System except for the database file which is different. The programs for the tine functions are titled Addrec4, Delrec4, Editrec4, Viewrec4 and Report4.

Database Files Structures

Member.dbf

ucture for database: C:\DBASE\PROJECT\MEMBER.DBF
mber of data records: 7
te of last update : 23/02/98

ield	*Field Name*	*Type*	*Width*	*Dec*	*Index*
1	F_NAME	Character	30		N
2	TYPE	Character	2		N
3	TOWN	Character	15		N
4	BOX_PMB	Character	6		N
5	LGA	Character	15		N
6	STATE	Character	12		N
7	CONTACT	Character	15		N
8	TITLE	Character	7		N
9	POSITION	Character	22		N
10	CHURCH	Character	12		N
11	MEMBER	Character	1		N
12	REGNO	Character	6		N
13	DJOINED	Date	8		N
14	BEDS	Numeric	4		N
15	DOCTORS	Numeric	2		N
16	DENTS	Numeric	2		N
17	PCIST	Numeric	2		N
18	NURSES	Numeric	2		N
19	OTHERS1	Numeric	3		N
20	REGFEE	Numeric	8	2	N
21	DEVFEE	Numeric	8	2	N
22	SUBSFEE	Numeric	8	2	N
23	SEXP	Numeric	10	2	N
24	DEXP	Numeric	12	2	N
25	OTHERS2	Numeric	10	2	N
26	DATE	Date	8		N
	** Total **		231		

Membert.dbf

ture for database: C:\DBASE\PROJECT\MEMBERT.DBF
ber of data records: 7
of last update : 20/02/98

Field Name	*Type*	*Width*	*Dec*	*Index*
CODE	Character	2		N
DESC	Character	15		N
** Total **		18		

Personel.dbf

ture for database: C:\DBASE\PROJECT\PERSONEL.DBF
ber of data records: 8
e of last update : 21/02/98

d	*Field Name*	*Type*	*Width*	*Dec*	*Index*
	IDNO	Character	10		N
	SNAME	Character	12		N
	FNAME	Character	12		N
	ONAME	Character	12		N
	SEX	Character	1		N
	DBIRTH	Date	8		N
	STATE	Character	12		N
	COUNTRY	Character	15		N
	ST	Character	1		N
0	QUAL1	Character	2		N
1	QUAL2	Character	2		N
2	QUAL3	Character	2		N
3	QUAL4	Character	2		N
4	QUAL5	Character	2		N
5	DEMP	Date	8		N
6	DCONF	Date	8		N
7	DEPT	Character	15		N
8	LOCATE	Character	12		N
9	DPRO	Date	8		N
0	RANK	Character	17		N
1	GRADE	Character	2		N
2	BSAL	Numeric	10	2	N
	** Total **		174		

6.3

Maind.dbf

ucture for database: C:\DBASE\PROJECT\MAIND.DBF
mber of data records: 24
e of last update : 23/02/98

ld	*Field Name*	*Type*	*Width*	*Dec*	*Index*
	REGNO	Character	6		N
	DCODE	Character	5		N
	CASES	Numeric	6		N
	DEATH	Numeric	6		N
	** Total **		24		

Maind2.dbf

ucture for database: C:\DBASE\PROJECT\MAIND2.DBF
mber of data records: 17
te of last update : 21/02/98

eld	*Field Name*	*Type*	*Width*	*Dec*	*Index*
1	REGNO	Character	6		N
2	DCODE	Character	7		N
3	RECEIVED	Numeric	6		N
4	ISSUED	Numeric	6		N
5	BALANCE	Numeric	6		N
	** Total **		32		

6.4

Drug.dbf

ructure for database: C:\DBASE\PROJECT\DRUG.DBF
mber of data records: 10
te of last update : 21/02/98

eld	*Field Name*	*Type*	*Width*	*Dec*	*Index*
	DCODE	Character	7		N
2	DESC	Character	25		N
3	MEASURE	Character	5		N
	** Total **		38		

.6.5

Temp.dbf

tructure for database: C:\DBASE\PROJECT\TEMP.DBF
lumber of data records: 0
ate of last update : 23/02/98

ield	*Field Name*	*Type*	*Width*	*Dec*	*Index*
1	REGNO	Character	6		N
2	DCODE	Character	5		N
3	CASES	Numeric	6		N
4	DEATH	Numeric	6		N
	** Total **		24		

.6.5

Temp2.dbf

Structure for database: C:\DBASE\PROJECT\TEMP2.DBF
Number of data records: 0
Date of last update : 21/02/98

Field	*Field Name*	*Type*	*Width*	*Dec*	*Index*
1	REGNO	Character	6		N
2	DCODE	Character	7		N
3	RECEIVED	Numeric	6		N
4	ISSUED	Numeric	6		N
5	BALANCE	Numeric	6		N
	** Total **		32		

.6.6

Disease.dbf

tructure for database: C:\DBASE\PROJECT\DISEASE.DBF
lumber of data records: 21
ate of last update : 21/02/98

ield	*Field Name*	*Type*	*Width*	*Dec*	*Index*
1	DCODE	Character	5		N
2	DESC	Character	25		N
	** Total **		31		

CHAPTER FIVE

SUMMARY AND RECOMMENDATIONS

5.1 SUMMARY

The contribution of SMOH to the health sector of Nigeria cannot be under estimated. It has been shown that SMOH is capable of generating adequate Health through its network of health facilities across the State. The value of the information generated from this data are of great import and as they can be used in planning, health system research and monitoring of health programmes and activities.

It was shown that the logistics of transforming data into information is not an easy one, let alone its capital-intensive nature. This project made an attempt at suggesting a cost-effective method of data collection and the systematic usage of information so generated.

A detailed of the information system of Niger State was carried out and a new one designed. The new design shows preference for a computerized Health Management System. This is in view of the need for accuracy, time and effort-saving and cost-effectiveness in the bid to tackle the problems of information explosion facing our generation.

SMOH will benefit from the new system in the following ways:

I. Enhancement of the efficient operation of its drug, health, personnel and Health information system.
ii. Integration of the various subsystem of the SMOH Information System.
iii. Creation of speedy, accurate and cost-effective processing of data and the generation of necessary reports for lobbying and advocacy strategies

iv. Laying of a scientific basis for health systems research and effective monitoring and evaluation of SMOH activities.

v. Elimination/reduction of the constant problems associated with the existing system.

vi. Introduction of some procedures which reduces the task of the users as well as making provision for the facilities required by the system.

vii. Maintenance of data security and attainment of data security.

Recommendations

Given the above benefits of the newly designed system, it is highly recommended that the ware requirements for the new system as stated in the preceding chapters be provided immediately. s will allow for the commencement of the system conversion as from June 1998.

It is recommended that the intending users of this new system be trained for a period of three ks on the use of the system.

The laid down procedures for logistics and maintenance of the system should be strictly adhered

Conclusively, the pursuance of the installation of this newly designed system needs to be olute as all the procedures have been tested and confirmed efficient. Therefore its application in SMOH will meet both present and future needs of the organization.

APPENDIX

PROGRAMS

1. SMOH.PRG

```
** This program opens the new HMIS software developed for
SMOH"
*** author: A ABUBAKAR (Mrs)
set talk off
SET STAT OFF
set echo off
set safety off
set scoreboard off
clea
set colo to gr+/b,r*
@ 1,1 clea to 20,70
* set colo to gr
@ 9,27 say "YOU ARE WELCOME TO"
@ 11,15 say " NIGER STATE MINISTRY OF HEALTH INFORMATION
SYSTEM."
@ 13,15 say "                    MINNA, NIGER STATE."
@ 15,24 say "press any key to continue......."
set cons off
wait
set cons on
clea
set colo to gr+/b,r*
@ 2,32 say "This is "
@ 4,10 say "NIGER STATE MINISTRY OF HEALTH Management
Information System"
@ 7,22 say "Authored by Abubakar A. Mrs"
@ 12,18 SAY "This System was developed in March 2000"
@ 15,13 say "WARNING: This Program is
Copyrighted........."
@ 17,25 say "Please Do not Copy"
@ 19,24 say "Press any key to Continue......."
set cons off
wait
set cons on
@ 6,9 clea to 15,65
@ 3,32 clea to 3,40
@ 17,0 clea to 22,79
set colo to gr+/b,r*
@ 9,18 say "You are about to enter the Main Menu"
@ 11, 21 say "But before you do ..........."
@ 13,21 say "You need a PASSWORD"
@ 15, 15 say "Remember, you have warned not to COPY"
```

```
@ 17,24 SAY "Press any key to Continue......."
set cons off
wait
set cons on
clea
do password
clear
return


procedure delay
k=0
do while k<=300
  k=k+1
enddo
return
```

2. MAINMENU.PRG

```
*** This program gives the MAIN MENU of CHAN MIS***
*** Author:Abubakar ***
choice = space(1)
set color to w+/b,gr+/r,b
set century on
do while .t.
clea
@ 2,5 say date()
@ 2,60 say time()
@ 3,15 say "NIGER STATE MINISTRY OF HEALTH INFORMATION
SYSTEM"
@ 4,30 SAY "NIGER STATE"
@ 5,10
@ 4,5 TO 17,70 DOUBLE
@ 5,12 SAY "             *** MAIN MENU ***"
@ 6,12 say "                 =========    "
@ 8,20 say  "A. MEMBERSHIP INFORMATION SYSTEM"
@ 10,20 say "B. HEALTH INFORMATION SYSTEM"
@ 12,20 say "C. DRUG INFORMATION SYSTEM"
@ 14,20 say "D. PERSONNEL INFORMATION SYSTEM"
@ 16,20 say "E. EXIT TO OPERATING SYSTEM"
@ 18,30 say "PICK CHOICE:" get choice pict '!'
read
do case
case choice ='A'
    do meminfo
case choice = 'B'
   do healinfo
```

```
case choice = 'C'
   do druginfo
case choice = 'D'
   do persinfo
case choice = 'E'
*   otherwise
    exit
 endcase
 enddo
clea
*set colo to
return
```

3. PASSWORD.PRG

```
*** This is a PASSWORD program***
*** Author Abubaker
clea
store "AMUDAT" to mpass
mmpass=space(9)
set colo to r,b
@ 9,15 clea to 15,56
@ 9,16 to 15,55 double
set colo to gr+/r,w/r,gr*
@ 12,23 say "Enter password please......."
set colo to n,n
@ 13,38 get mmpass pict "@!"
set colo to
read
if mmpass<>mpass
set colo to b/w*
do password
endif
if mmpass=mpass
do main
endif
return
```

4. MEMBINFO.PRG

```
*** This program gives the MAIN MENU of CHAN MIS***
*** Author:Abubakar ***
choice = space(1)
set color to w+/b,gr+/r,b
```

```
do while .t.
clea
@ 2,5 say date()
@ 2,60 say time()
@ 3,15 say "NIGER STATE MINISTRY OF HEALTH INFORMATION
SYSTEM"
@ 4,30 SAY "NIGER STATE"
@ 5,10
@ 4,5 TO 20,70 DOUBLE
@ 5,12 SAY "      MEMBERSHIP INFORMATION SYSTEM"
@ 6,12 say "      ============================="
@ 8,20 say  "A. ADD A NEW RECORD"
@ 10,20 say "B. AMEND A RECORD"
@ 12,20 say "C. DELETE A RECORD"
@ 14,20 say "D. BROWSE THE DATABASE"
@ 16,20 say "E. REPORTS"
@ 18,20 say "F. EXIT TO MAINMENU"
@ 21,30 say "PICK CHOICE:" get choice pict '!'
read
do case
case choice ='A'
    do addrec1
case choice = 'B'
   do editrec1
case choice = 'C'
   do delrec1
case choice = 'D'
   do viewrec1
case choice = 'E'
   do reports1
   otherwise
    exit
 endcase
 enddo
clea
*set colo to
return
```

5. ADDREC1.PRG

```
*PROGRAM.........ADDREC1.PRG
*DATE WRITTEN....MARCH 2000
*AUTHOR..........ABUBAKAR A.K.(MRS)
*NOTE............This program inputs data for membership
database
set deli on
set deli to "[]"
close all
```

```
clear
@ 12,10 say "Please wait indexing in progress..."
use member2 index member2
reindex
clear
mregno=space(6)
store space(25) to mf_name
mtype=SPACE(2)
store space(15) to mtown,mlga,mcontact
store space(12) to mstate,mchurch
mbox_pmb=SPACE(6)
mtitle=SPACE(7)
mposition=space(20)
mmember='  '
store ctod(' /  /  ') to mdjoined
store 0 to mbeds,mdoctors,mdents,mpcist,mnurses,mothers1
store 0 to mregfee,mdevfee,msubsfee,msexp,mdexp,mothers2
set function 10 to "999999"
set color to +gr/r,w/r,gr*
do while .t.
@ 0,25 say "HEALTH INFORMATION SYSTEM"
@ 1,25 SAY "MINISTRY OF HEALTH, MINNA"
@ 2,21 say "NEW RECORD ---------> Data Entry"
*SET COLOR TO +W/rb
@ 3,3 TO 21,79  DOUBLE
@ 4,4 SAY "REG NO. or F10 to Exit :" get mregno pict "@!"
read
if mregno="999999"
    clear
    @ 12,10 say "House Cleaning in Progress....."
    close database
    clear
    return
 endif
 seek mregno
 if found()
     clear
     @ 12,15 say "Duplicate Registration No."
     do delay
     CLEAR
     loop
     clear
  endif
@ 4,38 SAY "Facility Name:"get mf_name pict "@!"
@ 6,4 say "Type Code:"get mtype pict "@!"
@ 6,36 say "Town:" get mtown pict "@!"
@ 8,4 say "Box/PMB: " get mbox_pmb
```

```
@ 8,36 say "LGA:" get mlga pict "@!"
@ 8,58 say "State:" get mstate pict "@!"
@ 10,4 say "Position:" get mposition pict "@!"
@ 10,40 say "Title:" get mtitle  pict "@!"
@ 10,58 say "HIS:" get mchurch pict "@!"
@ 12,4 say "Registered Member<Y/N>:" get mmember pict "@!"
@ 12,36 say "Date Joined:" get mdjoined
@ 12,60 say "No of Beds:" get mbeds pict "9999"
@ 13,6 say "S T A F F    S T R E G T H"
@ 14,4 say "Doctors:" get mdoctors pict "99"
@ 14,36 say "Dentists:" get mdents pict "99"
@ 14,60 say "Pharmacists:" get mpcist pict "99"
@ 16,4 say "Nurses:" get mnurses pict "99"
@ 16,36 say "Others:" get mothers1 pict "99"
@ 18,4 say "Reg. Fees:    " get mregfee pict "99,999.99"
@ 18,32 say "Dev. Fees:" get mdevfee  pict "99,999.99"
@ 18,56 say "Subs. Fees:" get msubsfee pict "99,999.99"
@ 19,5 say " E X P E N S E S"
@ 20,4 say "On Salary:" get msexp pict "9,999,999.99"
@ 20,30 say "On Drugs:" get mdexp pict "9,999,999.99"
@ 20,54 say "On Others:" get mothers2 pict "9,999,999.99"
read
kkans=" "
  do while .not. kkans$"YN"
  @ 22,16 say "Are these entries correct ? <Y/N>" get kkans
pict "@!"
   read
  enddo
if kkans="N"
     clear
     loop
endif
append blank
repl regno with mregno,f_name with mf_name, type with mtype
repl box_pmb with mbox_pmb,lga with mlga, state with mstate
repl town with mtown,church with mchurch,title with mtitle
repl contact with mcontact, position with mposition,member
with mmember
repl djoined with mdjoined,beds with mbeds,doctors with
mdoctors
repl dents with mdents,pcist with mpcist,nurses with
mnurses
repl others1 with mothers1,regfee with mregfee,devfee with
mdevfee
repl sexp with msexp,dexp with mdexp,others2 with mothers2
repl subsfee with msubsfee
mf_name=space(25)
```

```
mtype=SPACE(2)
store space(15) to mtown,mlga,mcontact
store space(12) to mstate,mchurch
mbox_pmb=SPACE(6)
mtitle=SPACE(7)
mposition=space(20)
mmember='  '
store ctod(' /  /  ') to mdjoined
store 0 to mbeds,mdoctors,mdents,mpcist,mnurses,mothers1
store 0 to mregfee,mdevfee,msubsfee,msexp,mdexp,mothers2
clear
 loop
 close database
enddo
return
```

6. EDITREC1.PRG

```
*** This Program views each record of the membership
database file
*** Author Abubakar A.K.
clear
@ 12,10 say "Please wait, Indexing in progress..."
use member2 index member2
reindex
set function 10 to "999999"
store space(6) to mregno
clear
do while .t.
@ 8,25 SAY "HEALTH INFORMATION SYSTEM"
@ 9,25 SAY "MINISTRY OF HEALTH, MINNA"
set color to w+/b,gr+/r,b
@ 10,21 say "MEMBERSHIP ---------> Amend Entry"
@ 11,5 TO 13,75  DOUBLE
@ 12,7 SAY "Registration No. or F10 to Exit :" get mregno
pict "@!"
read
if mregno="999999"
    clear
    @ 12,10 say "House Cleaning in Progress....."
    close database
    clear
    return
 endif
 seek mregno
 if .not. found()
    clear
```

```
    @ 12,20 say "Registration No. does not exist......"
    do delay
    clear
   loop
 endif
clear
mf_name=f_name
mtype=type
mtown=town
mlga=lga
mcontact=contact
mstate=state
mchurch=church
mbox_pmb=box_pmb
mtitle=title
mposition=position
mmember=member
mdjoined=djoined
mbeds=beds
mdoctors=doctors
mdents=dents
mpcist=pcist
mnurses=nurses
mothers1=others1
mregfee=regfee
mdevfee=devfee
msubsfee=subsfee
mdexp=dexp
msexp=sexp
mothers2=others2
@ 0,25 say "HEALTH INFORMATION SYSTEM"
@ 1,25 SAY "MINISTRY OF HEALTH, MINNA"
*set color to +w/r+
@ 2,21 say "Membership ---------> Amend Entry"
SET COLOR TO +W/rb
@ 3,3 TO 21,79  DOUBLE
@ 4,4 SAY "REG NO. :"+mregno
@ 4,38 SAY "Facility Name:"+mf_name
@ 6,4 say "Type Code:"+mtype
@ 6,36 say "Town:"+mtown
@ 8,4 say "Box/PMB: "+mbox_pmb
@ 8,36 say "LGA:"+mlga
@ 8,58 say "State:"+mstate
@ 10,4 say "Position:"+mposition
@ 10,40 say "Title:"+mtitle
@ 10,58 say "HIS:"+mchurch
@ 12,4 say "Registered Memeber<Y/N>:"+mmember
```

```
@ 12,36 say "Date Joined:"+dtoc(mdjoined)
@ 12,60 say "No of Beds:"+str(mbeds,4)
@ 13,6 say "S T A F F    S T R E G T H"
@ 14,4 say "Doctors:"+str(mdoctors,2)
@ 14,36 say "Dentists:"+str(mdents,2)
@ 14,60 say "Pharmacists:"+str(mpcist,2)
@ 16,4 say "Nurses:"+str(mnurses,2)
@ 16,36 say "Others:"+str(mothers1,2)
@ 18,4 say "Reg. Fees:    "+str(mregfee,8,2)
@ 18,32 say "Dev. Fees:"+str(mdevfee,2)
@ 18,56 say "Subs. Fees:"+str(msubsfee,8,2)
@ 19,5 say " E X P E N S E S"
@ 20,4 say "On Salary:"+str(msexp,10,2)
@ 20,30 say "On Drugs:"+str(mdexp,10,2)
@ 20,54 say "On Others:"+str(mothers2,2)
 ans=" "
  do while .not. ans$"YN"
  @ 22,16 say "Is this the record you want ? <Y/N>" get ans
pict "@!"
   read
  enddo
  if ans="N"
     clear
     loop
  endif
clear
@ 0,25 say "HEALTH INFORMATION SYSTEM"
@ 1,25 SAY "MINISTRY OF HEALTH, MINNA"
*set color to +w/r+
@ 2,21 say "Memebership ---------> Amending Entry"
SET COLOR TO +W/rb
@ 3,3 TO 21,79  DOUBLE
@ 4,4 SAY "REG NO. :" get mregno pict "@!"
@ 4,38 SAY "Facility Name:"get mf_name pict "@!"
@ 6,4 say "Type Code:"get mtype pict "@!"
@ 6,36 say "Town:" get mtown pict "@!"
@ 8,4 say "Box/PMB: " get mbox_pmb
@ 8,36 say "LGA:" get mlga pict "@!"
@ 8,58 say "State:" get mstate pict "@!"
@ 10,4 say "Position:" get mposition pict "@!"
@ 10,40 say "Title:" get mtitle  pict "@!"
@ 10,58 say "HIS:" get mchurch pict "@!"
@ 12,4 say "Registered Memeber<Y/N>:" get mmember pict "@!"
@ 12,36 say "Date Joined:" get mdjoined
@ 12,60 say "No of Beds:" get mbeds pict "9999"
@ 13,6 say "S T A F F    S T R E G T H"
@ 14,4 say "Doctors:" get mdoctors pict "99"
```

```
@ 14,36 say "Dentists:" get mdents pict "99"
@ 14,60 say "Pharmacists:" get mpcist pict "99"
@ 16,4 say "Nurses:" get mnurses pict "99"
@ 16,36 say "Others:" get mothers1 pict "99"
@ 18,4 say "Reg. Fees:     " get mregfee pict "99,999.99"
@ 18,32 say "Dev. Fees:" get mdevfee  pict "99,999.99"
@ 18,56 say "Subs. Fees:" get msubsfee pict "99,999.99"
@ 19,5 say " E X P E N S E S"
@ 20,4 say "On Salary:" get msexp pict "9,999,999.99"
@ 20,30 say "On Drugs:" get mdexp pict "9,999,999.99"
@ 20,54 say "On Others:" get mothers2 pict "9,999,999.99"
read
kkans=" "
  do while .not. kkans$"YN"
  @ 22,16 say "Are these entries correct ? <Y/N>" get kkans
pict "@!"
   read
  enddo
if kkans="N"
     clear
     loop
endif
repl regno with mregno,f_name with mf_name, type with mtype
repl box_pmb with mbox_pmb,lga with mlga, state with mstate
repl town with mtown,church with mchurch,title with mtitle
repl contact with mcontact, position with mposition,member
with mmember
repl djoined with mdjoined,beds with mbeds,doctors with
mdoctors
repl dents with mdents,pcist with mpcist,nurses with
mnurses
repl others1 with mothers1,regfee with mregfee,devfee with
mdevfee
repl sexp with msexp,dexp with mdexp,others2 with mothers2
repl subsfee with msubsfee
clear
 loop
 close database
enddo
return
```

7. DELREC1.PRG

```
*PROGRAM.........DELREC1.PRG
*DATE WRITTEN....MARCH 2000
*AUTHOR..........MRS ABUBAKAR
```

```
*NOTE.....This program deletes a membership record
clear
@ 12,10 say "Please wait, Indexing in progress..."
use member2 index member2
reindex
store space(6) to mregno
set function 10 to "999999"
clear
do while .t.
@ 8,25 say "HEALTH INFORMATION SYSTEM"
@ 9,25 SAY "MINISTRY OF HEALTH, MINNA"
set color to w+/b,gr+/r,b
@ 10,21 say "MEMBERSHIP ---------> Deleting Entry"
@ 11,5 TO 13,75  DOUBLE
@ 12,7 SAY "Registration No .or F10 to Exit :" get mregno
pict "@!"
read
if mregno="999999"
    clear
    @ 12,10 say "House Cleaning in Progress....."
    close database
    clear
    return
 endif
 seek mregno
 if .not. found()
    clear
    @ 12,20 say "Registration N. does not exist....."
    do delay
    clear
   loop
 endif
clear
mrec1=recno()
mf_name=f_name
mtype=type
mtown=town
mlga=lga
mcontact=contact
mstate=state
mchurch=church
mbox_pmb=box_pmb
mtitle=title
mposition=position
mmember=member
mdjoined=djoined
mbeds=beds
```

```
mdoctors=doctors
mdents=dents
mpcist=pcist
mnurses=nurses
mothers1=others1
mregfee=regfee
mdevfee=devfee
msubsfee=subsfee
mdexp=dexp
msexp=sexp
mothers2=others2
@ 0,25 say "HEALTH INFORMATION SYSTEM"
@ 1,25 SAY "MINISTRY OF HEALTH, MINNA"
@ 2,21 say "Membership ---------> Deleting Entry"
@ 3,3 TO 21,79  DOUBLE
@ 4,4 SAY "REG NO. :"+mregno
@ 4,38 SAY "Facility Name:"+mf_name
@ 6,4 say "Type Code:"+mtype
@ 6,36 say "Town:"+mtown
@ 8,4 say "Box/PMB: "+mbox_pmb
@ 8,36 say "LGA:"+mlga
@ 8,58 say "State:"+mstate
@ 10,4 say "Position:"+mposition
@ 10,40 say "Title:"+mtitle
@ 10,58 say "HIS:"+mchurch
@ 12,4 say "Registered Memeber<Y/N>:"+mmember
@ 12,36 say "Date Joined:"+dtoc(mdjoined)
@ 12,60 say "No of Beds:"+str(mbeds,4)
@ 13,6 say "S T A F F    S T R E G T H"
@ 14,4 say "Doctors:"+str(mdoctors,2)
@ 14,36 say "Dentists:"+str(mdents,2)
@ 14,60 say "Pharmacists:"+str(mpcist,2)
@ 16,4 say "Nurses:"+str(mnurses,2)
@ 16,36 say "Others:"+str(mothers1,2)
@ 18,4 say "Reg. Fees:    "+str(mregfee,8,2)
@ 18,32 say "Dev. Fees:"+str(mdevfee,2)
@ 18,56 say "Subs. Fees:"+str(msubsfee,8,2)
@ 19,5 say " E X P E N S E S"
@ 20,4 say "On Salary:"+str(msexp,10,2)
@ 20,30 say "On Drugs:"+str(mdexp,10,2)
@ 20,54 say "On Others:"+str(mothers2,2)
  ans=" "
  do while .not. ans$"YN"
  @ 22,16 say "Is this the record you want to delete?
<Y/N>" get ans pict "@!"
   read
  enddo
```

```
  if ans="N"
     clear
     loop
  endif
clear
 @ 12,20 say "Deleting Membership Record...."
  delete record mrec1
  pack
   clear
   loop
  close database
  enddo
return
```

8. VIEWREC1.PRG

```
*PROGRAM.........viewrec1.PRG
*DATE WRITTEN....March 2000
*AUTHOR..........Mrs Abubakar
*NOTE............This program list details of the heads
clear
@ 10,12 say "Please wait, Indexing in progress....."
use member2 index member2
clear
  @ 4,21 say "HEALTH MANAGEMENT INFORMATION SYSTEM, NIGER
STATE."
  @ 5,21 say "       MEMBERSHIP INFORAMTION SYSTEM"
  SET COLOR TO w+/b,gr+/r,b
  @ 6,22 say "ENQUIRIES ----------> Details of Members"
define window browse_win from 7,5 to 20,73
BROWSE FIELDS
regno,f_name,djoined,beds,doctors,dents,pcist,nurses FORMAT
NOAPPEND NOEDIT ;
NODELETE NOMENU COMPRESS WINDOW browse_win
clear
close all
return
```

9. REPORTS1.PRG

```
***This program generates report from the membership
database file
*** Author Mrs. A. Abubakar
use member2 index member2
sort on state to member3
use member3
```

```
clear
@ 15,24 say "PRINTING IN PROGRESS - Wait..."
set device to print
@ 1,25 say "REPORT ON MEMBER INSTITUTIONS..."
@ 2,25 SAY repl("=",29)
@ 3,1 say repl("-",80)
@ 4,1 say 'REG NO| FACILITY NAME'
@ 4,29 say '| LOCATION'
@ 4,45 say "| STATE"
@ 4,58 say '|NO OF STAFF|AMOUNT DUE'
@ 5,1 say repl('-',80)
r=5
do while .not. eof()
 r=r+1
 mregno=regno
 mf_name=rtrim(f_name)
 mtown=town
 mstate=state
 mdoctors=doctors
 mdents=dents
 mpcist=pcist
 mnurses=nurses
 mothers1=others1
 mregfee=regfee
 mdevfee=devfee
 msubsfee=subsfee
 mstaff=mdoctors+mdents+mpcist+mnurses+mothers1
 mamount=mregfee+mdevfee+msubsfee
 @ r,1 say mregno
 @ r,7 say '|'
 @ r,8 say mtown
 @ r,29 say '|'
 @ r,30 say mtown
 @ r,45 say '|'
 @ r,46 say mstate
 @ r,58 say '|'
 @ r,62 say mstaff pict "999"
 @ r,70 say '|'
 @ r,71 say mamount pict "999,999.99"
 r=r+1
 @r,7 say '|'
 @r,29 say '|'
 @r,45 say '|'
 @r,45 say '|'
 @r,58 say '|'
 @r,70 say '|'
 skip
```

```
enddo
eject
use
erase member3.dbf
set device to screen
clear
return
```

□

10. HEALINFO.PRG

```
*** This program gives the MAIN MENU
*** Author:Abubakar ***
choice = space(1)
set color to w+/b,gr+/r,b
do while .t.
clea
@ 2,5 say date()
@ 2,60 say time()
@ 3,15 say "NIGER STATE MINISTRY OF HEALTH INFORMATION
SYSTEM"
@ 4,30 SAY "NIGER STATE"
@ 5,10
@ 4,5 TO 20,70 DOUBLE
@ 5,12 SAY "          HEALTH INFORMATION SYSTEM"
@ 6,12 say "          ========================= "
@ 8,20 say  "A. ADD A NEW RECORD"
@ 10,20 say "B. AMEND A RECORD"
@ 12,20 say "C. DELETE A RECORD"
@ 14,20 say "D. BROWSE THE DATABASE"
@ 16,20 say "E. REPORTS"
@ 18,20 say "F. EXIT TO MAINMENU"
@ 21,30 say "PICK CHOICE:" get choice pict '!'
read
do case
case choice ='A'
    do addrec2
case choice = 'B'
   do editrec2
case choice = 'C'
   do delrec2
case choice = 'D'
   do viewrec2
case choice = 'E'
   do reports2
   otherwise
```

```
    return
 endif
 seek mdcode
  if found()
     clear
     @ 12,15 say "Disease Code !!!!..."
     do delay
     CLEAR
     loop
     clear
  endif
@ 14,11 SAY "Disease Description :" get mdesc pict "@!"
read
kkans=" "
  do while .not. kkans$"YN"
  @ 16,16 say "Are these entries correct ? <Y/N>" get kkans
pict "@!"
   read
  enddo
if kkans="N"
     clear
     loop
endif
append blank
repl dcode with mdcode,desc with mdesc
mdesc=space(25)
clear
 loop
 close database
enddo
return
```

12. EDITREC2.PRG

```
*Program -----Editrec2
*** This Program amends each record of the health database
file
*** Author Abubakar A.K.
clear
@ 12,10 say "Please wait, Indexing in progress..."
use disease index disease
reindex
set function 10 to "99999"
store space(5) to mdcode
clear
```

```
do while .t.
@ 8,25 SAY "HEALTH INFORMATION SYSTEM"
@ 9,25 SAY "MINISTRY OF HEALTH, MINNA"
set color to w+/b,gr+/r,b
@ 10,21 say "DISEASE ---------> Amend Entry"
@ 11,5 TO 13,60  DOUBLE
@ 12,7 SAY "Disease Code or F10 to Exit :" get mdcode pict
"@!"
read
if mdcode="99999"
    clear
    @ 12,10 say "House Cleaning in Progress....."
    close database
    clear
    return
 endif
 seek mdcode
 if .not. found()
    clear
    @ 12,20 say "Disease Code does not exist....."
    do delay
    clear
   loop
 endif
clear
mdesc=desc
@ 8,23 say "HEALTH INFORMATION SYSTEM"
@ 9,23 SAY "MINISTRY OF HEALTH, MINNA"
@ 10,21 say "DISEASE ---------> Amend Entry" color b/w
@ 11,10 TO 15,60  DOUBLE
@ 12,11 SAY "Disease Code      :"+mdcode
@ 14,11 SAY "Description       :"+mdesc
 ans=" "
  do while .not. ans$"YN"
  @ 16,16 say "Is this the record you want ? <Y/N>" get ans
pict "@!"
   read
  enddo
  if ans="N"
     clear
     loop
  endif
clear
@ 8,23 say "HEALTH INFORMATION SYSTEM"
@ 9,23 SAY "MINISTRY OF HEALTH, MINNA"
@ 10,21 say "DISEASE ---------> Amending Entry" color b/w*
@ 11,10 TO 15,60  DOUBLE
```

```
*NOTE.....This program list details of the health
information
clear
@ 10,12 say "Please wait, Indexing in progress....."
use disease index disease
clear
  @ 4,18 say "HEALTH MANAGEMENT INFORMATION SYSTEM, NIGER
STATE."
  @ 5,21 say "       HEALTH INFORAMTION SYSTEM"
  SET COLOR TO *w+/b,gr+/r,b
  @ 6,22 say "ENQUIRIES ---------> Details of Diseases"
define window browse_win from 7,15 to 20,65
BROWSE FIELDS dcode,desc FORMAT NOAPPEND NOEDIT ;
NODELETE NOMENU COMPRESS WINDOW browse_win
clear
close all
return
```

15. ADDREC3.PRG

```
*PROGRAM.....ADDREC3.PRG
*DATE WRITTEN....MARCH 2000
*AUTHOR.....ABUBAKAR A.K.(MRS)
*NOTE.....This program inputs data for drug
information database
set deli on
set deli to "[]"
close all
clear
@ 12,10 say "Please wait indexing in progress..."
use drug index drug
reindex
clear
mdcode=space(6)
store space(25) to mdesc
store space(7) to mmeasure
set function 10 to "999999"
set color to w+/b,gr+/r,b
do while .t.
@ 8,25 say "DRUG INFORMATION SYSTEM"
@ 9,25 SAY "MINISTRY OF HEALTH, MINNA"
@ 10,21 say "NEW RECORD ---------> Data Entry" color b/w*
@ 11,10 TO 17,60  DOUBLE
@ 12,11 SAY "DRUG CODE or F10 to Exit :" get mdcode pict
"@!"
```

```
read
if mdcode="999999"
    clear
    @ 12,10 say "House Cleaning in Progress....."
    close database
    clear
    return
 endif
 seek mdcode
  if found()
     clear
     @ 12,15 say "Duplicate Drug Code"
     do delay
     CLEAR
     loop
     clear
  endif
@ 14,11 SAY "Drug Description :" get mdesc pict "@!"
@ 16,11 say "Drug Measure     :" get mmeasure pict "@!"
read
kkans=" "
  do while .not. kkans$"YN"
  @ 18,16 say "Are these entries correct ? <Y/N>" get kkans
pict "@!"
   read
  enddo
if kkans="N"
     clear
     loop
endif
append blank
repl dcode with mdcode,desc with mdesc,measure with
mmeasure
mdesc=space(25)
mmeasure=SPACE(7)
clear
 loop
 close database
enddo
return
```

16. EDITREC3.PRG

```
*Program -----Editrec3
*** This Program amends each record of the drug database
file
*** Author Abubakar A.K.
clear
@ 12,10 say "Please wait, Indexing in progress..."
use drug index drug
reindex
set function 10 to "999999"
store space(6) to mdcode
clear
do while .t.
@ 8,25 SAY "DRUG INFORMATION SYSTEM"
@ 9,25 SAY "MINISTRY OF HEALTH, MINNA"
set color to w+/b,gr+/r,b
@ 10,21 say "DRUG ---------> Amend Entry"
@ 11,5 TO 13,60  DOUBLE
@ 12,7 SAY "Drug Code or F10 to Exit :" get mdcode pict
"@!"
read
if mdcode="999999"
    clear
    @ 12,10 say "House Cleaning in Progress....."
    close database
    clear
    return
 endif
 seek mdcode
 if .not. found()
    clear
    @ 12,20 say "Drug Code does not exist......"
    do delay
    clear
   loop
 endif
clear
mmeasure=measure
mdesc=desc
@ 8,23 say "DRUG INFORMATION SYSTEM"
@ 9,23 SAY "MINISTRY OF HEALTH, MINNA"
@ 10,21 say "DRUG ---------> Amend Entry" color b/w
@ 11,10 TO 17,60  DOUBLE
@ 12,11 SAY "DRUG Code         :"+mdcode
@ 14,11 SAY "Drug Description :"+mdesc
@ 16,11 say "Drug Measure      :"+mmeasure
```

```
 ans=" "
  do while .not. ans$"YN"
  @ 18,16 say "Is this the record you want ? <Y/N>" get ans
pict "@!"
   read
  enddo
  if ans="N"
     clear
     loop
  endif
clear
@ 8,23 say "DRUG INFORMATION SYSTEM"
@ 9,23 SAY "MINISTRY OF HEALTH, MINNA"
@ 10,21 say "DRUG ---------> Amending Entry" color b/w*
@ 11,10 TO 17,60  DOUBLE
@ 12,11 SAY "DRUG CODE         :" get mdcode pict "@!"
@ 14,11 SAY "Drug Description :" get mdesc pict "@!"
@ 16,11 say "Drug Measure     :" get mmeasure pict "@!"
read
kkans=" "
  do while .not. kkans$"YN"
  @ 18,16 say "Are these entries correct ? <Y/N>" get kkans
pict "@!"
   read
  enddo
if kkans="N"
     clear
     loop
endif
repl dcode with mdcode,measure with mmeasure, desc with
mdesc
clear
 loop
 close database
enddo
return
```

17. DELREC3.PRG

```
*PROGRAM.........DELREC3.PRG
*DATE WRITTEN....MARCH 2000
*AUTHOR..........MRS ABUBAKAR
*NOTE............This program deletes a drug record
clear
@ 12,10 say "Please wait, Indexing in progress..."
use drug index drug
```

```
reindex
store space(6) to mdcode
set function 10 to "999999"
clear
do while .t.
@ 8,23 SAY "DRUG INFORMATION SYSTEM"
@ 9,23 SAY "MINISTRY OF HEALTH, MINNA"
set color to w+/b,gr+/r,b
@ 10,21 say "DRUG ---------> Delete Entry"
@ 11,5 TO 13,60  DOUBLE
@ 12,7 SAY "Drug Code to be removed or F10 to Exit :" get
mdcode pict "@!"
read
if mdcode="999999"
    clear
    @ 12,10 say "House Cleaning in Progress....."
    close database
    clear
    return
 endif
 seek mdcode
 if .not. found()
    clear
    @ 12,20 say "Drug Code does not exist....."
    do delay
    clear
   loop
 endif
clear
mmeasure=measure
mdesc=desc
mrec3=recno()
@ 8,23 say "DRUG INFORMATION SYSTEM"
@ 9,23 SAY "MINISTRY OF HEALTH, MINNA"
@ 10,21 say "DRUG ---------> Deleting Entry" color b/w
@ 11,10 TO 17,60  DOUBLE
@ 12,11 SAY "DRUG Code         :"+mdcode
@ 14,11 SAY "Drug Description :"+mdesc
@ 16,11 say "Drug Measure     :"+mmeasure
 ans=" "
  do while .not. ans$"YN"
  @ 18,13 say "Is this the record you want to remove?
<Y/N>" get ans pict "@!"
   read
  enddo
  if ans="N"
     clear
```

```
     loop
  endif
clear
 @ 12,20 say "Deleting Drug Record...."
  delete record mrec3
  pack
   clear
   loop
  close database
  enddo
return
```

18. VIEWREC3.PRG

```
*PROGRAM.........viewrec3.PRG
*DATE WRITTEN....March 2000
*AUTHOR..........Mrs Abubakar
*NOTE............This program list details of the Drung
information
clear
@ 10,12 say "Please wait, Indexing in progress....."
use drug index drug
clear
  @ 4,19 say "HEALTH MANAGEMENT INFORMATION SYSTEM, NIGER
STATE."
  @ 5,21 say "       DRUG INFORAMTION SYSTEM"
  SET COLOR TO w+/b,gr+/r,b
  @ 6,22 say "ENQUIRIES ---------> Details of Drug"
define window browse_win from 7,15 to 20,65
BROWSE FIELDS dcode,desc,measure FORMAT NOAPPEND NOEDIT ;
NODELETE NOMENU COMPRESS WINDOW browse_win
clear
close all
return
□

□
```

19. ADDREC3.PRG

```
*PROGRAM.........ADDREC4.PRG
*DATE WRITTEN....MARCH 2000
*AUTHOR..........ABUBAKAR A.K.(MRS)
*NOTE............This program inputs data for Personel
database
set deli on
```

```
set deli to "[]"
close all
clear
@ 12,10 say "Please wait indexing in progress..."
use personel index personel
reindex
clear
midno=space(10)
store space(12) to msname,mfname,moname,mstate,mlocate
store space(15) to mdept,mrank,mcountry
store space(1) to msex,mst
store space(10) to mqual1,mqual2,mqual3,mqual4,mqual5
store space(2) to mgrade
store ctod(' /  /  ') to mdbirth,mdemp,mdconf,mdpro
store 0 to mbsal
set function 10 to "9999999999"
set color to w+/b,gr+/r,b
do while .t.
@ 0,25 say "PERSONNEL INFORMATION SYSTEM"
@ 1,25 SAY "MINISTRY OF HEALTH, MINNA"
@ 2,21 say "NEW RECORD ---------> Data Entry"
@ 3,3 TO 21,79  DOUBLE
@ 4,4 SAY "Staff ID No. or F10 to Exit :" get midno pict
"@!"
read
if midno="9999999999"
    clear
    @ 12,10 say "House Cleaning in Progress....."
    close database
    clear
    return
 endif
 seek midno
  if found()
     clear
     @ 12,15 say "Duplicate Identification No."
     do delay
     CLEAR
     loop
     clear
  endif
@ 4,53 SAY "Surname:"get msname pict "@!"
@ 6,4 say "First Name:"get mfname pict "@!"
@ 6,36 say "Other Names:" get moname pict "@!"
@ 6,65 say "Sex:" get msex pict "@!"
@ 8,4 say "Date of Birth:" get mdbirth
@ 8,36 say "State:" get mstate pict "@!"
```

```
@ 10,4 say "Country:" get mcountry pict "@!"
@ 10,36 say "Status:" get mst  pict "@!"
@ 10,55 say "1st Qual.:" get mqual1 pict "@!"
@ 12,4 say "2nd Qual.:" get mqual2 pict "@!"
@ 12,36 say "3rd Qual.:" get mqual3 pict "@!"
@ 14,4 say "4th Qual.:" get mqual4 pict "@!"
@ 14,31 say "5th Qual.:" get mqual5 pict "@!"
@ 14,55 say "Dept:"get mdept pict "@!"
@ 16,4 say "Location:" get mlocate pict "@!"
@ 16,39 say "Date of Employment" get mdemp
@ 18,4 say "Date of Confirmation:" get mdconf
@ 18,39 say "Date of Last Promotion:" get mdpro
@ 20,4 say "Rank:" get mrank pict "@!"
@ 20,30 say "Grade Level:" get mgrade
@ 20,51 say "Basic Salary:" get mbsal pict "9,999,999.99"
read
kkans=" "
  do while .not. kkans$"YN"
  @ 22,16 say "Are these entries correct ? <Y/N>" get kkans
pict "@!"
   read
  enddo
if kkans="N"
     clear
     loop
endif
append blank
repl idno with midno,oname with moname,fname with mfname
repl sex with msex,dbirth with mdbirth, state with mstate
repl country with mcountry,st with mst,qual1 with mqual2
repl qual3 with mqual3, qual4 with mqual4,qual5 with mqual5
repl demp with mdemp,dconf with mdconf,dept with mdept
repl locate with mlocate,dpro with mdpro,rank with mrank
repl grade with mgrade,bsal with mbsal
store space(12) to msname,mfname,moname,mstate,mlocate
store space(15) to mdept,mrank,mcountry
store space(1) to msex,mst
store space(2) to mqual1,mqual2,mqual3,mqual4,mqual5,mgrade
store ctod(' /  /  ') to mdbirth,mdemp,mdconf,mdpro
store 0 to mbsal
clear
 loop
 close database
enddo
return
```

20. EDITREC4.PRG

```
*** This Program amends each record of the personel
database file
*** Author Abubakar A.K.
clear
@ 12,10 say "Please wait, Indexing in progress..."
use personel index personel
reindex
set deli on
set deli to "[]"
set function 10 to "9999999999"
store space(10) to midno
clear
do while .t.
@ 8,25 SAY "PERSONEL INFORMATION SYSTEM"
@ 9,25 SAY "MINISTRY OF HEALTH, MINNA"
set color to w+/b,gr+/r,b
@ 10,21 say "PERSONEL ---------> Amend Entry"
@ 11,5 TO 13,75  DOUBLE
@ 12,7 SAY "Staff Identification No. or F10 to Exit :" get
midno pict "@!"
read
if midno="9999999999"
    clear
    @ 12,10 say "House Cleaning in Progress....."
    close database
    clear
    return
 endif
 seek midno
 if .not. found()
    clear
    @ 12,20 say "Identification No. does not exist....."
    do delay
    clear
   loop
 endif
clear
moname=oname
msname=sname
mfname=fname
msex=sex
mdbirth=dbirth
```

```
mstate=state
mcountry=country
mst=st
mqual1=qual1
mqual2=qual2
mqual3=qual3
mqual4=qual4
mqual5=qual5
mdemp=demp
mdconf=dconf
mdept=dept
mlocate=locate
mdpro=dpro
mrank=rank
mgrade=grade
mbsal=bsal
@ 0,25 say "PERSONNEL INFORMATION SYSTEM"
@ 1,25 SAY "MINISTRY OF HEALTH, MINNA"
@ 2,21 say "PERSONEL ---------> Amend Entry"
@ 3,3 TO 21,79  DOUBLE
@ 4,4 SAY "Staff ID No. :"+midno
@ 4,53 SAY "Surname:"+msname
@ 6,4 say "First Name:"+mfname
@ 6,36 say "Other Names:"+moname
@ 6,65 say "Sex:"+msex
@ 8,4 say "Date of Birth:"+dtoc(mdbirth)
@ 8,36 say "State:"+mstate
@ 10,4 say "Country:"+mcountry
@ 10,36 say "Status:"+mst
@ 10,55 say "1st Qual.:"+mqual1
@ 12,4 say "2nd Qual.:"+mqual2
@ 12,36 say "3rd Qual.:"+mqual3
@ 14,4 say "4th Qual.:"+mqual4
@ 14,31 say "5th Qual.:"+mqual5
@ 14,55 say "Dept:"+mdept
@ 16,4 say "Location:"+mlocate
@ 16,39 say "Date of Employment"+dtoc(mdemp)
@ 18,4 say "Date of Confirmation:"+dtoc(mdconf)
@ 18,39 say "Date of Last Promotion:"+dtoc(mdpro)
@ 20,4 say "Rank:"+mrank
@ 20,30 say "Grade Level:"+mgrade
@ 20,51 say "Basic Salary:"+str(mbsal,10,2)
 ans=" "
  do while .not. ans$"YN"
  @ 22,16 say "Is this the record you want ? <Y/N>" get ans
pict "@!"
   read
```

```
  enddo
  if ans="N"
     clear
     loop
  endif
clear
@ 0,25 say "PERSONNEL INFORMATION SYSTEM"
@ 1,25 SAY "MINISTRY OF HEALTH, MINNA"
@ 2,21 say "PERSONEL ---------> Amending Entry" color b/w*
@ 3,3 TO 21,79  DOUBLE
@ 4,4 SAY "Staff ID No. or F10 to Exit :" get midno pict
"@!"
@ 4,53 SAY "Surname:"get msname pict "@!"
@ 6,4 say "First Name:"get mfname pict "@!"
@ 6,36 say "Other Names:" get moname pict "@!"
@ 6,65 say "Sex:" get msex pict "@!"
@ 8,4 say "Date of Birth:" get mdbirth
@ 8,36 say "State:" get mstate pict "@!"
@ 10,4 say "Country:" get mcountry pict "@!"
@ 10,36 say "Status:" get mst  pict "@!"
@ 10,55 say "1st Qual.:" get mqual1 pict "@!"
@ 12,4 say "2nd Qual.:" get mqual2 pict "@!"
@ 12,36 say "3rd Qual.:" get mqual3 pict "@!"
@ 14,4 say "4th Qual.:" get mqual4 pict "@!"
@ 14,31 say "5th Qual.:" get mqual5 pict "@!"
@ 14,55 say "Dept:"get mdept pict "@!"
@ 16,4 say "Location:" get mlocate pict "@!"
@ 16,39 say "Date of Employment" get mdemp
@ 18,4 say "Date of Confirmation:" get mdconf
@ 18,39 say "Date of Last Promotion:" get mdpro
@ 20,4 say "Rank:" get mrank pict "@!"
@ 20,30 say "Grade Level:" get mgrade
@ 20,51 say "Basic Salary:" get mbsal pict "9,999,999.99"
read
kkans=" "
  do while .not. kkans$"YN"
  @ 22,16 say "Are these entries correct ? <Y/N>" get kkans
pict "@!"
   read
  enddo
if kkans="N"
     clear
     loop
endif
repl idno with midno,oname with moname,fname with mfname
repl sex with msex,dbirth with mdbirth, state with mstate
repl country with mcountry,st with mst,qual1 with mqual2
```

```
repl qual3 with mqual3, qual4 with mqual4,qual5 with mqual5
repl demp with mdemp,dconf with mdconf,dept with mdept
repl locate with mlocate,dpro with mdpro,rank with mrank
repl grade with mgrade,bsal with mbsal
clear
 loop
 close database
enddo
return
```

21. DELREC4.PRG

```
*** This Program deletes each record of the personel
database file
*** Author Abubakar A.K.
clear
@ 12,10 say "Please wait, Indexing in progress..."
use personel index personel
reindex
set deli on
set deli to "[]"
set function 10 to "9999999999"
store space(10) to midno
clear
do while .t.
@ 8,25 SAY "PERSONEL INFORMATION SYSTEM"
@ 9,25 SAY "MINISTRY OF HEALTH, MINNA"
set color to w+/b,gr+/r,b
@ 10,21 say "PERSONEL ---------> Remove Entry"
@ 11,5 TO 13,75  DOUBLE
@ 12,7 SAY "Staff Identification No. or F10 to Exit :" get
midno pict "@!"
read
if midno="9999999999"
    clear
    @ 12,10 say "House Cleaning in Progress....."
    close database
    clear
    return
 endif
 seek midno
 if .not. found()
    clear
    @ 12,20 say "Identification No. does not exist....."
    do delay
```

```
    clear
   loop
 endif
clear
mrec4=recno()
moname=oname
msname=sname
mfname=fname
msex=sex
mdbirth=dbirth
mstate=state
mcountry=country
mst=st
mqual1=qual1
mqual2=qual2
mqual3=qual3
mqual4=qual4
mqual5=qual5
mdemp=demp
mdconf=dconf
mdept=dept
mlocate=locate
mdpro=dpro
mrank=rank
mgrade=grade
mbsal=bsal
@ 0,25 say "PERSONNEL INFORMATION SYSTEM"
@ 1,25 SAY "MINISTRY OF HEALTH, MINNA"
@ 2,21 say "PERSONEL ---------> Remove Entry"
@ 3,3 TO 21,79  DOUBLE
@ 4,4 SAY "Staff ID No. :"+midno
@ 4,53 SAY "Surname:"+msname
@ 6,4 say "First Name:"+mfname
  6,36 say "Other Names:"+moname
  6,65 say "Sex:"+msex
  8,4 say "Date of Birth:"+dtoc(mdbirth)
  8,36 say "State:"+mstate
  10,4 say "Country:"+mcountry
  10,36 say "Status:"+mst
  10,55 say "1st Qual.:"+mqual1
  12,4 say "2nd Qual.:"+mqual2
  12,36 say "3rd Qual.:"+mqual3
  14,4 say "4th Qual.:"+mqual4
  14,31 say "5th Qual.:"+mqual5
  14,55 say "Dept:"+mdept
  16,4 say "Location:"+mlocate
  ,39 say "Date of Employment"+dtoc(mdemp)
```

```
@ 18,4 say "Date of Confirmation:"+dtoc(mdconf)
@ 18,39 say "Date of Last Promotion:"+dtoc(mdpro)
@ 20,4 say "Rank:"+mrank
@ 20,30 say "Grade Level:"+mgrade
@ 20,51 say "Basic Salary:"+str(mbsal,10,2)
 ans=" "
  do while .not. ans$"YN"
  @ 22,16 say "Is this the record you want to remove ?
<Y/N>" get ans pict "@!"
   read
  enddo
  if ans="N"
     clear
     loop
  endif
clear
 @ 12,20 say "Deleting Staff Record...."
  delete record mrec4
  pack
   clear
   loop
  close database
  enddo
return
```

22. VIEWREC4.PRG

```
*PROGRAM.........viewrec4.PRG
*DATE WRITTEN....March 2000
*AUTHOR..........Mrs Abubakar
*NOTE............This program list details of the personel
clear
@ 10,12 say "Please wait, Indexing in progress....."
use personel index personel
clear
  @ 4,21 say "HEALTH MANAGEMENT INFORMATION SYSTEM, NIGER
STATE."
  @ 5,21 say "       PERSONEL INFORAMTION SYSTEM"
  SET COLOR TO w+/b,gr+/r,b
  @ 6,22 say "ENQUIRIES ----------> Details of Staff"
define window browse_win from 7,5 to 20,73
BROWSE FIELDS idno,sname,sex,demp,dept,grade FORMAT
NOAPPEND NOEDIT ;
NODELETE NOMENU COMPRESS WINDOW browse_win
clear
close all
```