

**COMPUTERISATION OF PATIENT
RECORD KEEPING SYSTEM
A CASE STUDY OF
GENERAL HOSPITAL MINNA**

BY

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**A PROJECT SUBMITTED TO THE DEPARTMENT OF
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CERTIFICATION

This is to certify to the best of my knowledge that this work was carried out by me, Umar Musa under the supervision of Mr. Isah Audu of the Department of Mathematics/Computer Science, Federal University of Technology, Minna.

MR. ISAH AUDU
(PROJECT SUPERVISOR)

DATE

DR. S. A. REJU
(HEAD OF DEPARTMENT)

DATE

EXTERNAL EXAMINER

DATE

DEDICATION

This work is dedicated to the Glory of Almighty God.

ACKNOWLEDGEMENT

First and foremost, I give glory to God Almighty for giving me the strength to complete this work.

I am highly indebted to my supervisor, Mallam Isah Audu whose meticulous supervision has led to the completion of this work. I equally acknowledge the contribution of the Head of Department of Mathematics/Computer Department, Dr. S.A. Reju whose administrative capability has help in no small way.

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ABSTRACT

The manual method of keeping patient record in General Hospital, Minna is currently being faced with some problems ranging from loss of data which makes access to medical history of patients difficult. The solution to the problem is the computer application where records will be stored in the computer.

A package using a database management system is required to be used for the development of an appropriate software to manage the Patient records.

CHAPTER ONE

1.0 GENERAL PRELIMINARIES

1.1 HISTORY OF GENERAL HOSPITAL, MINNA

General Hospital, Minna was established in 1962 as a secondary health institution with the sole objective of taking care of health need of the populace. Like any General Hospital in the world it was made up of vital departments and sections such as Medical Records, Laboratory, Pharmacy, Medical, Surgical, Obsteteries and Gynecology, Pediatrics, Outpatients, Wards, etc. In most cases the drug information unit is an extension of pharmacy department but at the time of establishments of this hospital there was no drug information unit, Until 1992 when the need became very obvious. General Hospital Minna at the beginning was a 100 bed capacity hospital, was later expanded to 150 bed capacity probably because of the population growth, the same hospital was expanded the second time in 1980 to 200 bed capacity hospital, merely five years after Minna became the state capital. This Hospital is headed by Chief Medical Officer designated "Head of Hospital Service" (HHS), there is also the head of the administration designated "Hospital Secretary" All other departments are headed by the relevant professionals at the rank of either Principal, Assistant Chief or Chief as the case may be. The hospital also undertake the practical training of House officers, intern pharmacists, students nurses and midwives and other allied health courses.

General Hospital, Minna is the only hospital in Niger State with its own infusion plant (plant that produce infusion solutions) and perhaps the biggest of all the hospitals in the state. The hospital is fully operational with all the departments performing their specific jobs in promoting the health care need of the populace.

As mentioned earlier the need for a proper patient record keeping system become obvious because of the increase in patronage of the hospital services. This is largely as a result of the present economic recession in the country which make it difficult for many people to patronage private clinics. In addition, the population increase in the country leads to over utilization of the available social services in Nigeria.

1.2 THE FUNCTION OF HOSPITAL DEPARTMENTS

The function of a hospital is to provide facilities for the reception, diagnosis and treatment of the sick whether as an in-patient or out-patient. In addition, many hospitals provide facilities for the training of medical and nursing students, physiotherapists, medical social workers, hospital administrators, etc.

A. Reception Departments

1. Out - patients. The 'way in' to hospital for most patients. A letter from their G.P. and an appointment are necessary to see a consultant in the appropriate speciality. Here a final diagnosis is made either immediately or following special tests; arrangement are made for

further treatment of an in -patient or out - patient basis. A letter is always sent back to the patient's G.P. telling him of all decisions taken and outlining future treatment.

2. Accident/Emergency Department. Sometimes called 'Casualty', and as its name suggests, this department deals with both major and minor episodes and may be the referral point for in - or out-patient care or home care by a G.P. To protect patient and junior medical staff many hospitals now appoint Consultant staff to head teams of doctors and nurses working round the clock in these vital department.

B. Diagnostic Departments

Every function of the body can now be investigated by experts and each can be done in a specialist department. Most hospitals have the following:

- i. Bacteriology
- ii. Biochemistry
- iii. Electro-cardiography
- iv. Hematology
- v. Pathology
- vi. X-ray

All these departments are staffed by qualified personnel and trainees and may have a doctor as head of the team.

Patients should be escorted to these departments in the most appropriate way, i.e. wheelchair or stretcher, if unable to walk, and left in the care of staff with clear instructions what the tests have finished. Voluntary helpers of hostesses can be of great assistance in escorting of patients between various departments.

c. **Treatment (In-patients)**

The total care of a patient does not depend entirely on the nursing service. But some or all of the following must be co-ordinated by the Ward Sister and Medical Staff.

1. Administrative Services

Catering

Domestic

Laundry

Secretarial

Pottering

Maintenance

2. Area Health Authority Services

Pharmaceutical

Community Health Care

3. Local Authority Services

Social Services Department

4. Paramedical Services

Occupational therapy

Physiotherapy

Radiotherapy

Speech therapy

5. Nursing Services

Operating theatres

Special Care Units

The smooth, efficient and effective care of all patients depends very much on the co-operation among all departments. Each must respect the contribution to patient care by the others.

1.3 OBJECTIVES OF THE STUDY

The basic objectives of this cover the following:

- i. To study and analyse the activities of General Hospital, Minna.
- ii. To observe the problems associated with the management of patient information in the hospital.

- iii. To provide the logical and physical design of a computerised patient record keeping system.
- iv. To provide a documentation manual which will state the various operations of the proposed system and its mode of operation.
- v. To provide a basis for the implementation of the computerised system for the sake of efficiency.
- vi. To eliminate delays and ensure prompt, reliable and automatic generation of the reports.

In the light of the above, the overall objective of this study is to design and implement a computer-based system which will be efficient, fast and have the capability of managing the records of patient in the hospital.

1.4 JUSTIFICATION OF THE STUDY

The year 1965 to 1963 saw the take off of business computing through out the world. Today, computer is more relevant in all spheres of human endeavour. Nigeria is also not left out of this computer era as most organisation in the country have embraced computerisation as an aid to day-to-day activities for the purpose of achieving their set goals.

Specifically, in the past five years, there has been a boost in the utilisation of information technology for accomplishing required task in Nigeria. Much of this was brought about as a result of the advent of micro or personal computers. The

application of computer therefore enables organisations meet up with the demand of increased economic activities nationwide. It also aid the organisation in making best decisions as well as data and information storage.

However, many organisations are beginning to realise that computer system can help them store information and retrieve accurate data from the system. This is because the information derives from the use of computers is more reliable and efficient than the manual system.

It is against the aforementioned area of computer application that it is necessary to design a computer procedure for the management of patient record keeping for the General Hospital, Minna.

1.5 SCOPE AND LIMITATION

The area of coverage of this study includes the study and design of a computerised record keeping system of patient. A system that will give prompt and accurate medical report.

However, in designing the proposed system, it was observed that there are many restrictions which will limit the scope of this study. These include the following:

- i. Lack of time for proper analysis, study and design. This is because the time is not enough to carry out a detailed study of all the operations of General Hospital, Minna.

- ii. Problem of acceptance. Another major limitation of this study is the acceptability of computers as a basic solution to most of the companies' problems. The management and staff are not interested in computer application because of fear of fraud and possibly loss of job.

1.6 SOURCES OF DATA

The two major sources of data used in this study are the Primary source and Secondary source.

PRIMARY SOURCE

The primary source was used to study the companies' operations directly in order to have a first hand information about their problem areas. The technique of fact finding adopted under this source of data are:

- * Observation
- * Interviewing
- * Record sampling

SECONDARY SOURCE

This source was basically used for the purpose of extracting standard information on the operations and procedures of the brewing industry. This includes information about the brewing process, the activity of the brewing industry and some other common information about the companies. Mostly, the source of information used under this category are Journals, Textbooks, Newspapers and other written and published text.

1.7 ORGANISATION OF THE STUDY

In order to provide a vivid analysis of the step by step requirements of computer approach to record management of engineering tools, the study is divided into five chapters. Each of the chapter contains unique information for the ultimate aim of the computerisation.

Chapter one discusses the necessary preambles of a study of this nature, while chapter two reviews the evolution of computer technology and the concept of record keeping system. Chapter three is centered on analysis of the existing system as well as the design of the proposed system.

Finally, the mode and nature at implementing the proposed system is discussed in chapter four while the concluding part is contained in chapter five.

CHAPTER TWO

2.0 COMPUTER TECHNOLOGY AND RECORD KEEPING SYSTEM

2.1 BRIEF ON COMPUTER TECHNOLOGY

No single development within the past few decades has a greater effect in all human endeavour than the advent of Electronic Data Processing (EDP).

Technical developments in hardware may be seen in terms of "generation". the first generation was characterised by the use of vacuum tubes or thermonionic valves, with the development of electronic transistor in 1948, the vacuum tubes became obsolete, thereby giving birth to second generation machines. the third generation machines are computer or machine produced using the technology of the middle 1960's, this machine have become more intricate through the development of printed micro-circuits so small that their detailed 'wiring' is scarcely visible.

The unifying tread throughout this process has been a persistent desire to reduce the size of the machine and make them work faster. their processing speeds being measured in micro seconds or even what is called "nanoseconds", i.e. thousand millionths of a second.

The computer system undertakes four basic data operations. these are input, processing, storage and output. Input and Output mean putting something into a computer and getting results out of it respectively. the computer reads from input and storage devices, the computer unites to output and storage devices, Before data can be processed they must be "read" from an input device or data storage

device. once data have been processed, they are "written" to an output device such as a printer, or to a data storage device.

The computer is totally objective, that is any two computers instructed to perform the same operation will arrive at the same result. This is because the computer can perform only computation and logic operations. The computational capabilities of the computer include adding, subtraction, multiplying and dividing. logic capability permits the computer to make comparisons between numbers and between words. the result of the comparison is used to perform appropriate functions

The computer has many capabilities, that makes it a special machine, the reason for which it has become very important for everyday use at home or in the office. The computer is faster and more efficient at doing lengthy or complex analysis on data in a very short time. once the procedures are specifically defined, and appropriate data is fed, rapid processing and accurate output is guaranteed. it should be pointed out however, that the computer is incapable of doing anything that can not be done manually. It must also be acknowledged that errors do occur even when computers are used, but very few, if any can be blamed on the computer itself. The majority if not all can be traced to the software writer (program logic error), a procedural error, or mistakes made at the time raw data was being entered. All these are human errors to the extent that we can almost conclude that the computer do not make mistakes, once the user gives correct instructions and correct data.

Computer systems are particularly perfectly suited to repetitive tasks provided of-course that appropriate maintenance procedures are in place and the environment for instance in terms of power are quite optimal. there could be sick-off though, because computers also get sick and therefore sometimes require treatment.

Computer systems have total and instant recall of data no forgetfulness they also have virtually an unlimited capacity to store data. A typical mainframe computer system will have many billions of characters stored and available for instantaneous recall at the press of a key. Large amounts of information may be store on a computer (or a disks which can be inserted into the computer like a tape cartridge) in a manageable form. it is possible to change data store on a computer particularly easily in a similar fashion to reusing tapes on a tape-recorder, once information has been entered into a computer the user can ask for summaries and breakdowns of this information expressed in anyway the user like.

At a most simple level, a computer can provide data for other computers for instance, the transfer of price information in a digital (i.e. computer-held) format over telephone lines from a regional market to the central market information center may speed up the dissemination of that information to a significant degree and with greater accuracy.

A well designed computer system will allow untrained, but educated users to use an information system or access a database (a set of store data) with no more skill than is needed to operate a video recorder. it will be available all day (and night, if necessary) and will not get bored with repeating the same task over and

over. Of course, the computer has to be given precise instructions (clear and detailed instructions) and will not cope with situations unforeseen by its designers, so there is still a need for human supervision.

2.2 RECORD KEEPING SYSTEM

Records are facts and figures about events and activities. Every material and activities that comes into and out of an organisation becomes a record. Records can be viewed as an account in written or other permanent form serving as evidence of a fact or event. Information are preserved and handed down on it. For example, the performance of an organisation depends on the information extracted from records. It offers evidence of an event.

Every organisation whether business or otherwise keeps a record in one form or the other. As efforts were directed towards identifying, collecting and making available the most urgently needed information at all levels of organisation, the type of records available in any organisation depends on the type of services provided by the organisation. As an example, the type of record kept for a business organisation will be different from that of an educational institution.

However, record keeping is the method by which facts and figures are recorded and stored. The ease of record retrieval and the speed with which findings are retrieved when needed makes the difference between success and failure.

2.3 THE ROLE OF RECORD KEEPING IN AN ORGANISATION

One of the important roles of record in an organisation is to give information. This information is then used by the organisation, customers and even the competitors and any other interested party.

In the business world, the information is used for planning and taking decisions. Such information is also used by customers and shareholders for guidance. This, partially accounts for why records are to be stored in a proper way. Specifically, the role of a good record keeping system include the following:

A good record keeping system makes retrieval of information easier and faster. This basically states why there is need for application of modern method of record keeping which will allow for retrieval at optimal level with efficiency. The retrieval of the references enables the user to locate the desired record (document). In many sophisticated retrieval system, parts of records may be retained for a time not exceeding the period for which other records are retained.

In addition, a good record system must play the role of storing information. If an information could not be stored properly, then the method of keeping the record should be checked. References to the information are made at one time or the other for updating the fact figures in the record in order to make decisions for the next plan of actions.

In view of the above roles, the essence of keeping record is to ensure that information are readily available at all times when needed. Therefore, a good record keeping must properly store information so as to allow quick retrieval for instant use.

2.4 RECORD MANAGEMENT AND ITS OBJECTIVES

Today, there are many ways and methods of regulating the volume of records which are usually destroyed because the information are either duplicated or changed due to changes in law and regulations, business practice and the need of the user. The system of controlling these records is known as record management.

The available system and techniques needed to support information retention and retrieval at optional level are not being used to any large degree. Because of these, a highly sophisticated system which could collect, evaluate, store, remove, reproduce and reference information through mechanization and automation was developed. However, it is entirely possible to achieve dramatic reduction in cost without employing an elaborate and expensive equipment and methods.

The adoption of some of the most elementary concepts and techniques of record management will result in the number of records being processed and stored in order to provide easier and accurate records in the identification and retrieval of essential records.

CHAPTER THREE

3.2 SYSTEMS ANALYSIS AND DESIGN

3.1 INTRODUCTION

The analysis and design of the proposed system is the major task of this section. In this vein, the analysis of the present record keeping retrieval system of patient record in General Hospital, Minna will be carried out in order to evolve the basis and operation of the computerised system.

In the light of this, issues considered in this section also include the logical design in the form of input and output specification and formats, the basis of data modelling, as well as the physical design at the proposed system.

3.2 THE CURRENT SYSTEM AND ASSOCIATED PROBLEMS

A patient coming to the hospital for the first time will first be registered where the personal details of the patient is entered into an appropriate card. At this point the patient is given a card number which is unique. The card is then taken to the Doctor who will make necessary entries as regards the findings and his judgement about the illness of the patient. In addition, the prescription is also written on the card for the sake of future reference. Subsequent coming of the patient will require tracing of the card for onward presentation to the doctor.

Although, the principles and concepts of manual method of record management are universal. Each organisation has its specific features and problems which need to be identified before a suitable solution can be found.

Specifically, the problems associated with manual record system in General Hospital, Minna are as follows:

- i. Inaccurate, incomplete and incorrect documentation which arises from lapses such as lack of proper safekeeping of patient card.
- ii. Lack of confidentiality of patients' medical history.
- iii. Explosive volume of records which is tantamount to loss of records.
- iv. Increasing retrieval time which is a manifestation of poor retention and retrieval procedures.

3.3 THE DESIGN OF THE PROPOSED SYSTEM

System design can be defined as the drawing, planning, sketching or arranging of many separate elements into a viable unified whole. The systems analysis, on the other hand, answers the questions of what the system is doing and what it should be doing to meet the users requirements. The system design phase is however concerned with the method which system is designed to meet these requirements.

3.4 PROPOSED SOFTWARE APPLICATION

The proposed requirement of the new system is expected to be met by the application of a Database Management System (DBMS). This implies that a database package would be used for the software design.

DBMS is a collection or suite of programs used for the purpose of maintaining and manipulating a database. A database is taken to be a storage tank for data. With

the above definition, a DBMS is a software that perform the following functions on a database.

- i. Add records
- ii. Modify records
- iii. Display records
- iv. Delete records
- v. Organise records
- vi. Summarise records
- vii. Extract records
- viii. Print records.

In addition, DBMS is a term used to represent a category of packages which perform the above functions.

Given the above, it should be noted that DBMS is a collection of packages such as Foxpro, dBASE, Clipper, Oracle, etc. With the intended design objectives, dBASE (dBASE IV) is used for the software application.

3.5 OBJECTIVES OF DBMS

The overall objectives for development of a database technology is to treat data as an organisational resource and as an integrated whole. DBMS allows data to be protected and organised separately from other resources (e.g. hardware, software and program).

In order to achieve these objectives, the database technology was designed with the following features:

1. DATA CO-ORDINATION AND ACCESSIBILITY

In a database environment, information from several files is co-ordinated, accessed and operated upon as if they are contained in a single file. In this way, database technology allows for logical centralization of information even though, the data may be physically located on different devices. The user therefore, gain valuable information by linking data across the organisation.

2. DATA ELIMINATION

Data redundancy is the duplication of similar data in different files. This duplication leads to wastage of storage space and duplication of efforts during data entry and modification. The basic features of DBMS in this regard is that it does not allow for duplication of data storage. In order to achieve this, the technology requires the use of data modelling tools such as normalization and courting techniques.

3. DATA INDEPENDENCE

With the introduction of database technology, software development requires data to be separated from the application program. This feature of DBMS enables the users to modify the application program without necessarily changing the data and vice versa.

4. MAINTENANCE OF DATA INTEGRITY

Data redundancy can lead to lack of data integrity and a common feature of this is inconsistent information. This means that the information generated by the data processing system would no longer be trusted. However, since the database technology does not allow for data duplication, the possibility of having different entries for similar data is completely removed. Hence, the practice ensures the integrity of data.

5. CENTRAL COLLECTION AND CONTROL OF DATA

This is an important feature of DBMS. In database environment, data and operations on data are centrally controlled. This leads to better management of data because it allows for proper security of information stored.

3.6 OUTPUT AND INPUT DESIGN

In software development, the required output presented in the form of report determines the input data required. This is because some of the information on the report will have to be captured via the use of input form.

The proposed system is expected to produce three forms of reports which are Individual Patient Data, Patient Medical Data and Charges Report.

In view of the above output requirement, there are three forms of input data that would be required into the proposed system. These are the Patient Registration Detail, Patient Medical Detail and Patient Charges.

3.7 DATA MODELLING

Data modelling is the process of identifying the data needs of an operation as well as defining the structure of files. It is also used as a tool to segregate data into separate files or the integration of data structure when developing a database software. The necessary tools of data modelling which were used in this study are normalisation and courting.

However, in the design of the proposed system, the normalisation techniques was carried out to pinpoint the data needs of the system. This was carried out during the Systems Analysis stage. During the process, it was recognised that various database files are to be set up to contain various information. In order to avoid data duplication, courting technique was also applied to ensure that similar data are not duplicated as best as possible. With respect to the application of the data modelling techniques, it was recognised that three database files are required. The files are PAT.DBF, MEDI.DBF and CHARGE.DBF.

The detail description of each of the above files are as follows:

PAT.DBF

A database file that contains information about the personal information of all the patient to the hospital. The structure of this file is as shown below:

FIELD NAME	TYPE	WIDTH	DEC
CARD_NO	Character	9	
D_ADMIT	Date	8	
D_DIS	Date	8	
TREAT	Character	25	
DIAGO	Character	25	
DIAGO1	Character	25	
DO_IN_CH	Character	15	
NU_IN_CH	Character	15	
WARD	Character	2	
STATUS	Character	9	
TREAT1	Character	25	
TREAT2	Character	25	

MEDI.DBF

A database file that contains medical detail of all the patient to the hospital The structure of this file is as shown below:

FIELD NAME	TYPE	WIDTH	DEC
CARD_NO	Character	9	
P_NAME	Character	25	
AGE	Character	3	
SEX	Character	1	
OCCUPATION	Character	15	
ADDR	Character	20	
F_NAME	Character	15	
M_NAME	Character	15	

3.8 PHYSICAL DESIGN OF THE PROPOSAL SYSTEM

This states the physical construction of the logical design described above. It involves the source program specification for output, files and processing into computer software. The designing of the computer software is important in order to ensure that the actual programs produced perform all tasks as intended and to allow for future modifications to be performed in an efficient manner and with a minimum destruction to the design of the system. Therefore, the documentation of the program specification are specified in the Appendix II.

CHAPTER FOUR

4.0 SOFTWARE APPLICATION AND IMPLEMENTATION

4.1 INTRODUCTION

The development of a software as was done in the last chapter requires its application and implementation. This is done in order to use the system for the purpose its design was intended for.

However, the implementation of a system requires recommendations on the following:

- * The proposed hardware configuration and environment.
- * The required application packages for effective computerisation of the organisation.
- * Software testing for the purpose of discovering logic errors.
- * The changeover procedure requires for the purpose of continuity and reliability.
- * The reference manual and the mode of interaction with the system by the potential users.

4.2 PROPOSED COMPUTER CONFIGURATION

The success of the later researches and developments has led to the introduction of computer hardware of tremendous speed, great RAM (Random Access Memory) and high disk storage space. This has made it possible for computer

users to have choice from which an appropriate one can be selected in order to further enhance the capabilities of the system.

However, the required hardware for this newly developed software is a computer with the following configuration:

Pentium II 350 MH₃

64KB RAM

4.3GB Hard Disk

SVGA Colour Monitor

3.5" Disk Drive

CD-ROM Drive

Windows 98 Keyboard

Mouse & Mouse Pad

Windows 98 Software Pre-installed

The above configuration is recommended so that the speed of the software will be complemented. This will result into a greater efficiency in the organisation's operation as enquiry can be made and the response gotten within the shortest possible time.

Other peripheral required is EPSON Printer for the purpose of generating the required report. The model of the required printer should not be less than:

ESPON LQ 2170.

As regards the UPS (Uninterrupted Power Supply) APC Back-Up Pro 720 VA is recommended for the computer. This has the capabilities of holding on to power for about 30 minutes.

4.3 PROPOSED SOFTWARE REQUIREMENT

The computerisation of patient record keeping system in General Hospital, Minna is expected to form the basis of computer application in the organisation.

Other areas of computer application are:

- * Text and report preparation
- * Calculations
- * Data analysis
- * Graphical representation of data
- * Data storage

For these various purposes highlighted above, already made application packages can be purchased and installed on the computer. These will include Word Perfect for Windows for text and report preparation . Lotus 1-2-3 will be required for calculations, data analysis and graphical representation of data. dBASE IV will be used for record storage and the program modification. This becomes necessary because of the dynamic nature of government policy. Therefore, as changes are carried out, necessary modification would be expected on the software.

However, the mode of usage of these recommended package would be performed during training which is a necessary task in this computerisation.

4.4 SYSTEMS AND PROGRAM TESTING

Systems testing is the stage of implementation which is aimed at ensuring that the system works accurately and efficiently before life operation commences. Program testing, however, is an integral part of systems where the program is tested in order to confirm that there is no logic error inherent in the program design.

Specifically, this stage required both the logical and physical designs to be thoroughly and continually examined to ensure that the new system will work when implemented. It, therefore, serves as a confirmation that all is correct and an opportunity to show the potential users and convince them that all is well with the new system.

Given the above objective, a user acceptance testing was performed on the new system where the users form an integral part of the testing. It was done using a set of carefully selected test data which was entered into the system. The result was compared with the result obtained from that of the manual operation and they were found to be the same.

In view of this, it was observed and concluded that the new system is working accordingly. This, therefore, gives the required confidence for the installation of the systems with the hope and belief that it will enable the industry achieve its set objectives.

4.5 PROPOSED CHANGEOVER PROCEDURES

There are basically three methods of changing over from one system to another. They are:

- * Direct changeover
 - * Parallel changeover
 - * Pilot running changeover
-
- i. **DIRECT CHANGEOVER:** This method is the wholly replacement of the old system by the new system. The mode of replacement is once. It is always recommended when the computerisation is less complex and not large.

 - ii. **PARALLEL CHANGEOVER:** In this case, the old and new systems run currently using the same inputs. The outputs are compared and reasons for differences resolved. Outputs from the old system continue to be distributed until the new system has proved satisfactory. At this point, the old system is discontinued and the new one takes its place. This system is very reliable but costly to use.

 - iii. **PILOT RUNNING CHANGEOVER:** This involves a gradual replacement of the old system by the new one. The bit by bit changeover continues until the old system is completely replaced. Pilot running is always recommended for large computerisation in order to reduce its complexity.

Given the above options, a parallel changeover is recommended for the introduction of this new system because of its reliability and simplicity.

4.6 COST BENEFIT ANALYSIS

This will be discussed under two subheadings namely:

- * Cost analysis of the system
- * Benefit of the system

4.6.1 COST ANALYSIS OF THE SYSTEM

(a) **DEVELOPMENT COST** This is sketched as follows for three working weeks or one hundred and fifty man hours:-

	₦
i. Systems Analysis/Design	150,000
ii. Software Development & Implementation	85,000
iii. Equipments	

* Computer

1 No Pentium II 350 MH₃

64KB RAM

4.3GB Hard Disk

SVGA Colour Monitor

3.5" Disk Drive

CD-ROM Drive

Windows 95 Keyboard	
Mouse & Mouse Pad	
Windows 98 Software Pre-installed	255,000
* Computer Printers	
1 No. Epson Printers (DFX 5000)	150,000
* Uninterrupted Power Supply	
1 No. APC Back Up Pro	80,000
* Installation Cost (Software)	100,000
* Procurement & Installation of 2 Nos.	
Air Conditioners (₦150,000.00 each)	300,000
* Personnel Training	
2 Operators @ ₦17,500.00	
for 2 months	35,000
Total Development Cost	1,155,000

(b) SYSTEM OPERATING COST	₦
i. Program Maintenance Per Annum	75,000
ii. Equipment Maintenance Per Annum	120,000
iv. Supplies of Computer Stationeries	120,000

v.	Labour cost	
-	1 No. Systems Analyst/Programmer Per Annum	120,000
-	2 Nos. Computer Operators (₦36,000 Per Annum/Operator)	72,000
vi.	Miscellaneous expenses	25,000
	Total System Operating Cost	582,000
	Grand Total of (a) and (b) = ₦1,737,000	

4.6.2 BENEFITS OF THE SYSTEM

Specifically the General Hospital, Minna would derive the following benefits from this newly designed system.

- i. Enhance the efficiency operation of the hospital in terms of managing patient records.
- ii. Creation of speedy ways of responding to enquiry in order to provide ways of formulating policy.
- iii. Avoidance of regular problems such as loss of card, fraud, etc as it is currently being experienced.
- iv. Creation of speedy ways of generating reports from the system.
- v. Maintenance of data security
- vi. Allow for the possibility of carrying out major change in the design of the system as the need arises. This is because the new system is fully documented.

4.7 DOCUMENTATION

Documentation is the description of how a system works. This is required to ensure a better understanding of the system by the users. The documentation of the new system provides information on how the system can be started and its operation.

4.7.1 STARTING THE SYSTEM

The execution of the programs required the installation of dBASE IV into the system. The source program would then be copied into a directory (e.g. HOSPITAL) on the hard disk (i.e. drive C). To start the system is as follows:

- * Type CD\HOSPITAL + <ENTER> Key
- * Type DBASE + <ENTER> Key
- * At the dot prompt of dbase IV, type DO HOSPITAL + <ENTER> Key

The execution of the above steps allows the first level menu appear on the screen from which the user would select an appropriate choice.

4.7.2 MENU DESCRIPTION

The first level menu consists of five options as displayed in Figure 1 in Appendix I. Each of these is itemised and discussed as follows:

- * Registration of Patient
- * Medical Details

- * Charges Update
- * Reports Production
- * System Exit

REGISTRATION OF PATIENT

This option contains five sub-options as displayed in Figure II. It is used to update the data file as regards the personal details of the patient. The sub-options are New Registration Detail for adding record, Edit Registration Detail for editing record, View Registration Detail for displaying record, Delete Registration Detail for deleting record and Submenu Exit for moving out of the sub-option. The screen design for each of these is represented by Figures III – VI in the Appendix.

MEDICAL DETAILS

This option contains five sub-options as displayed in Figure VII. It is used to update the medical file of individual patient. The sub-options are New Medical Detail for adding record, Edit Medical Detail for editing record, View Medical Detail for displaying record, Delete Medical Detail for deleting record and Submenu Exit for moving out of the sub-option. The screen design for each of these is represented by Figures VIII – XI in the Appendix.

CHARGES UPDATE

This option contains five sub-options as displayed in Figure XII. It is used to update the system on charges made. The sub-options are New Charge Entry for adding record, Edit Charge Detail for editing record, View Charge Detail for displaying record, Delete Charge Detail for deleting record and Submenu Exit for moving out of the sub-option. The screen design for each of these is represented by Figures XIII - XI in the Appendix.

REPORT PRODUCTION

This is used to produce reports from the system. The system is desired to produce three various reports as shown on Figure XVII.

SYSTEMS EXIT

This option is used to move out of the system.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATION

5.1 CONCLUSION

The continued substitution of a computer-based system for manual procedures has, in modern days, become a world wide affairs. This is due to the relevance of computer application in virtually all aspects of human endeavour. The substitution of the manual system with computers is, however, intensified by the capability of computers in performing a given set of procedures with all necessary accuracy. It is not subject to committing errors, and its ability of accomplishing any task with high speed.

Therefore, it could be stated that the introduction of a computer based system in storing information about patient biodata and their medical history would enhance the operational efficiency of the General Hospital, Minna.

5.2 RECOMMENDATION

The need for installation of the proposed system is to ensure the maximization of its benefits. However, for the new system to be of immense benefits to the General Hospital, Minna, the following recommendations should be adopted.

1. **MANPOWER REQUIREMENT**

The use of computer in an organisation requires the services of trained professionals in Computer Science. As a result of this, it would be recommended that trained computer professionals needs to be recruited. Some of the old staff like the typist will have to be trained to the use of the Word Processing Packages. The computer professional to be employed needs to be knowledgeable about the concept of Database Management System. This is to ensure future modification of the suite of programs that constitute this proposed system.

2. **TRAINING REQUIREMENT**

There is the need for training of staff in the organisation on how to use the proposed system and other areas of computer application. This could take the form of seminar. This is expected to be done before the installation of the system.

3. **SECURITY**

In any computer-based system, there is the need for security in order to avoid both logical and physical problems. In view of this, people (both staff and outsider) should not be given any access into the computer room.

4. **COMPUTER ENVIRONMENT**

Normally, a computer environment should be air-conditioned. The authority of the hospital should provide a good cooling facility for the computer so as to ensure durability of the system.

However, it should be realised that the above recommendations need to be adopted in order to fully maximise the importance of the new system.

REFERENCES

1. Badmus R. (1997): Systems Analysis and Design (Lecture Note) F.U.T. Minna (Unpublished).
2. Lawrence S. O. (1986): Computers and Information System - An Introduction (Third Edition) by McGraw-Hill Book Company, Lagos.
3. Lawrence S. O. (1976): Introduction to Business Data Processing (Second Edition) by McGraw-Hill Book Company, Lagos.
4. Perry E. & Bruce B. (1982): Data Processing - Computers in Action (Second Edition) by Wadsworth Publishing Company, Britain.
5. Raheem K. (1997): Database Management System. Managing Databases Using dBASE IV (Lecture Note) F.U.T. Minna (Unpublished).

APPENDIX I: SCREEN DESIGN

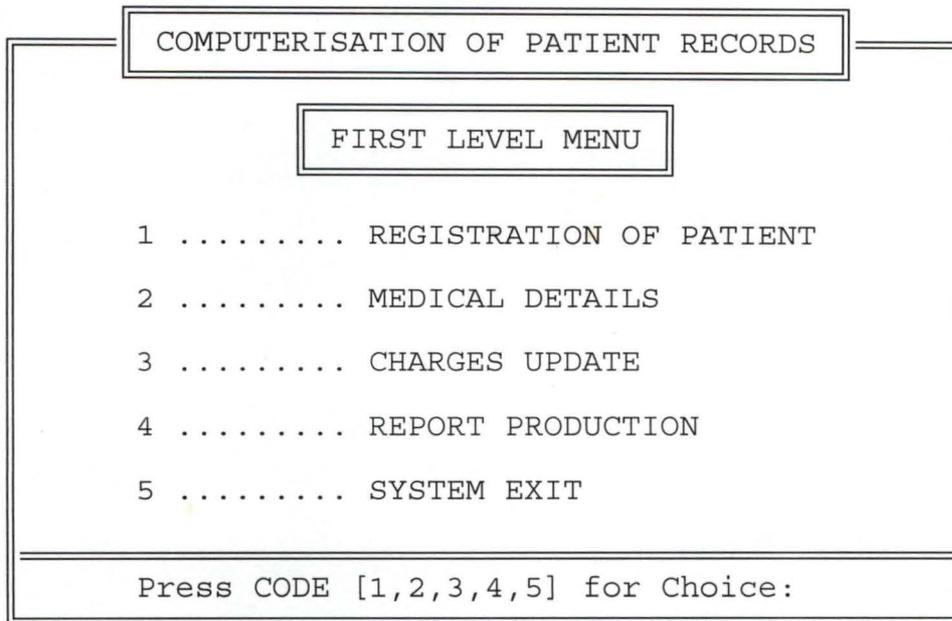


FIGURE I

COMPUTERISATION OF PATIENT RECORDS

PATIENT'S REGISTRATION MENU

- 1 NEW REGISTRATION DETAILS
- 2 EDIT REGISTRATION DETAILS
- 3 VIEW REGISTRATION DETAILS
- 4 DELETE REGISTRATION DETAILS
- 5 SUBMENU EXIT

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

FIGURE II

NEW PATIENT REGISTRATION

CARD NO (Press <ENTER> to Exit): 123

CARD NO: 123

PATIENT NAME: ABDULAH I

OCCUPATION: FARMER

AGE	SEX	STATE OF ORIGIN	RELIGION	DATE	TRIBE
30	M	NIGER	MUSLIM	12/12/99	GWARI

ADDRESS: PYATA

NATIONALITY: NIGERIAN

TELEPHONE NO:

STATUS: MARRIED

FATHER'S NAME: MUSA

MOTHER'S NAME: ADAMA

NEXT OF KIN: GARBA

NEXT OF KIN PHONE NO:

ADDRESS OF NEXT OF KIN: PYATA

BLOOD GROUP: A GENOTYPE: A

DO YOU WANT TO SAVE THIS DATA (Y/N) :

FIGURE III

VIEW PATIENT RECORDS

CARD NO (Press <ENTER> to Exit): 113

CARD NO: 113

PATIENT NAME: KWASI

OCCUPATION: STUDENT

AGE	SEX	STATE OF ORIGIN	RELIGION	DATE	TRIBE
23	M	KUMASI	CHRISTIANITY	10/09/90	GHANA

ADDRESS: TUNGA LOW COST

NATIONALITY: GHANA

TELEPHONE NO: 066-234455

STATUS: SINGLE

FATHER'S NAME: GOTANGA

MOTHER'S NAME: GORTO

NEXT OF KIN: FISIMA

NEXT OF KIN PHONE NO: 066-344555

ADDRESS OF NEXT OF KIN: BAY CLINIC ROAD

BLOOD GROUP:

GENOTYPE:

VIEWING PATIENT DATA.....

FIGURE V

DELETING PATIENT RECORDS

CARD NO (Press <ENTER> to Exit): 123

CARD NO: 123

PATIENT NAME: ABDULAH

OCCUPATION: FARMER

AGE	SEX	STATE OF ORIGIN	RELIGION	DATE	TRIBE
30	M	NIGER	MUSLIM	12/12/99	GWARI

ADDRESS: PYATA

NATIONALITY: NIGERIAN

TELEPHONE NO:

STATUS: MARRIED

FATHER'S NAME: MUSA

MOTHER'S NAME: ADAMA

NEXT OF KIN: GARBA

NEXT OF KIN PHONE NO:

ADDRESS OF NEXT OF KIN: PYATA

BLOOD GROUP: A GENOTYPE: A

ARE YOU SURE YOU WANT TO DELETE THIS DATA (Y/N):

FIGURE VI

COMPUTERISATION OF PATIENT RECORDS

PATIENT MEDICAL DETAIL MENU

- 1 NEW MEDICAL DETAILS
- 2 VIEW MEDICAL DETAILS
- 3 EDIT MEDICAL DETAILS
- 4DELETE MEDICAL DETAILS
- 5 SUBMENU EXIT

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

FIGURE VII

PATIENT MEDICAL DETAILS

CARD NO (Press <ENTER> to Exit): 112

CARD NO: 112

NAME: GRACE OCCUPATION: STUDENT BLD GRP:A GENOTYPE: A

AGE SEX DATE ADDRESS TELEPHONE NO: STATUS
12 F 10/10/90 BOSSO LOW COST 066-32123 SINGLE

NEXT OF KIN:ALICE NEXT OF KIN PHONE NO: 066-34455

DATE ADMITTED 12/10/98 WARDD DATE DISCHARGE 12/12/99

DIAGONISED OF TREATMENT STATUS
MALARIA FEVER, THYPHOID GIVEN TWO CHLOROQUINE ALIVE

FEVER INJECTION WITH SOME DRUGS

DOCTOR NAME: DR. MICHAEL NURSE NAME: MISS JOY

DO YOU WANT TO SAVE THIS DATA (Y/N):

FIGURE VIII

COMPUTERISATION OF PATIENT RECORDS

PATIENT CHARGE DETAIL MENU

- 1 NEW CHARGE ENTRY
- 2 VIEW CHARGE DETAILS
- 3 EDIT CHARGE DETAILS
- 4DELETE CHARGE DETAILS
- 5 SUBMENU EXIT

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

FIGURE XII

EDITING PATIENT CHARGE DETAILS

CARD NO (Press <ENTER> to Exit): 112

CARD NO: 112

NAME: GRACE OCCUPATION: STUDENT BLD GRP:A GENOTYPE: A

AGE	SEX	DATE	ADDRESS	TELEPHONE NO:	STATUS
12	F	10/10/90	BOSSO LOW COST	066-32123	SINGLE

NEXT OF KIN:ALICE

NEXT OF KIN PHONE NO: 066-34455

TOTAL CHARGE	1000	AMOUNT PAID	500
--------------	------	-------------	-----

TOTAL BALANCE	500
---------------	-----

PAID TO: MICHAEL

DATE OF FIRST PAYMENT12/12/90

DATE OF LAST PAYMENT12/12/90

DO YOU WANT TO UPDATE THIS DATA (Y/N)

FIGURE XV

DELETING PATIENT CHARGE DETAILS

CARD NO (Press <ENTER> to Exit): 113

CARD NO: 113

NAME: KWASI OCCUPATION: STUDENT BLD GRP: GENOTYPE:

AGE SEX DATE ADDRESS TELEPHONE NO: STATUS
23 M 10/09/90 TUNGA LOW COST 066-234455 SINGLE

NEXT OF KIN: FISIMA NEXT OF KIN PHONE NO: 066-344555

TOTAL CHARGE 1000 AMOUNT PAID 500

TOTAL BALANCE 500

PAID TO: MICHAEL

DATE OF FIRST PAYMENT 12/12/90

DATE OF LAST PAYMENT 12/12/90

DO YOU WANT TO DELETE THIS DATA (Y/N)

FIGURE XVI

COMPUTERISATION OF PATIENT RECORDS

REPORT PRODUCTION MENU

- 1 INDIVIDUAL PATIENT DATA
- 2 PATIENT MEDICAL DATA
- 3 CHARGES UPDATES
- 4 SUBMENU EXIT

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

FIGURE XVII

COMPUTERIZED HOSPITAL RECORD SYSEM

=====

GENERAL PATIENT LIST

=====

S/NO	CARD NO.	NAME	AGE	OCCUPATION	SEX	STATE
1	112	GRACE	12	STUDENT	F	EDO
2	113	KWASI	23	STUDENT	M	KUMASI
3	123	ABDULAH	30	FARMER	M	NIGER
4	132					
5	22					
6	566					

FIGURE XVIII

COMPUTERIZED HOSPITAL RECORD SYSEM

=====

PATIENT MEDICAL REPORT

=====

NO	CARD NO.	STATUS	DATE ADM	DATE DISCHARGE	WARD	DOCTOR
1	112		/ /	/ /		
2	113	ALIVE	12/12/90	12/12/91	4	DR. GOOD

FIGURE XIX

COMPUTERIZED HOSPITAL RECORD SYSEM

=====

PATIENT CHARGE REPORT

=====

/NO	CARD NO.	CHARGE	AMT PAID	BALANCE	DATE	PAID TO
1	112	1000	500	500	12/12/90	MICHAEL
2	112	500	500	500	/ /	
3	112	-336	668	332	12/12/90	MIKE
4	112	3444	434444	-431000	12/12/12	FF
5	112	444	555	-111	12/12/12	R4R

FIGURE XX

APPENDIX II: PHYSICAL DESIGN

Medical prg

```
set talk off
set stat off
set safe off
set scor off
set date brit
do while .t.
  clea
  @ 3,17 to 21,64 doub
  @ 2,22 to 4,58 doub
  @ 3,23 say 'COMPUTERISATION OF PATIENT RECORDS'
  @ 5,25 to 7,55 doub
  @ 6,28 say "PATIENT MEDICAL DETAIL MENU"
  @ 9,22 say '1 ..... NEW MEDICAL DETAILS'
  @ 11,22 say '2 ..... VIEW MEDICAL DETAILS'
  @ 13,22 SAY '3 ..... EDIT MEDICAL DETAILS'
  @ 15,22 SAY '4 .....DELETE MEDICAL DETAILS'
  @ 17,22 say '5 ..... SUBMENU EXIT'
  @ 19,18 to 19,63 doub
  @ 20,22 say 'Press CODE [1,2,3,4,5] for Choice:'
  do while .t.
    check=' '
    @ 20,56 get check pict '!'
    read
    if check $ '12345'
      exit
    endi
  endd
do case
  case check='1'
    do MED1
  case check='2'
    do med2
  case check='3'
    do med3
  case check='4'
    do med4
```

```
othe
  exit
endc
endd
clea
retu
```

Rep3.prg

```
sele 1
use charge
sele 2
use pat
Set devi to prin
*sort on card_no to pati.dbf
*use pati
clea
sele 1
@ 1,31 say 'COMPUTERIZED HOSPITAL RECORD SYSEM'
@ 2,31 say repl('= ',35)
@ 4,24 say 'PATIENT CHARGE REPORT'
@ 5,24 say repl('= ',21)
@ 6,0 say repl('-',80)
@ 7,0 say '| S/NO | CARD NO.'
@ 7,20 say '| CHARGE'
@ 7,31 say '| '
@ 7,32 say 'AMT PAID '
@ 7,40 say '|BALANCE|'
@ 7,53 SAY '| DATE'
@ 7,63 say '| PAID TO '
@ 8,0 say '|-----|'
@ 8,8 say repl('-',32)+'| '
@ 8,41 say repl('-',12)+'| '
@ 8,54 say repl('-',9)+'| '
@ 8,64 say repl('-',15)+'| '
sno=0
r=8
do while .not. eof()
  sele 2
```

```

mcard_no=card_NO
sele 1
mcharge=charge
mpaid=paid
mbal=bal
mdatef=datef
mcoll=coll
skip
*if mcard_no=card_no
  * loop
*endi
sno=sno+1
r=r+1
@ r,0 say '|'
@ r,2 say sno pict '9999'
@ r,7 say '|'
@ r,9 say mcard_no
@ r,19 say '|'
@ r,16 say mcharge
@ r,30 say '|'
@ r,26 say mpaid
@ r,63 say '|'
@ r,40 say mbal
@ r,55 say mdatef
@ r,65 say mcoll
@ r,79 say '|'
if eof()
  exit
endi
r=r+1
@ r,0 say '|'
@ r,7 say '|'
@ r,40 say '|'
@ r,53 say '|'
@ r,63 say '|'
@ r,79 say '|'
endd
r=r+1
@ r,0 say '|' + repl('-',78) + '|'
r=r+1

```

```
@ r,0 say '|'  
wait  
clos all  
clea  
retu
```

Rep2.prg

```
use PAT  
Set devi to prin  
sort on card_no to pati.dbf  
use pati  
clea  
@ 1,31 say 'COMPUTERIZED HOSPITAL RECORD SYSEM'  
@ 2,31 say repl('= ',35)  
@ 4,24 say 'PATIENT MEDICAL REPORT'  
@ 5,24 say repl('= ',21)  
@ 6,0 say repl('- ',80)  
@ 7,0 say '| S/NO | CARD NO.'  
@ 7,20 say '| STATUS'  
@ 7,31 say '|'  
@ 7,32 say 'DATE ADM'  
@ 7,40 say '|DATE DISCHARGE|'  
@ 7,53 SAY '| WARD'  
@ 7,63 say '| DOCTOR '  
@ 8,0 say '|-----|'  
@ 8,8 say repl('- ',32)+'|'  
@ 8,41 say repl('- ',12)+'|'  
@ 8,54 say repl('- ',9)+'|'  
@ 8,64 say repl('- ',15)+'|'  
sno=0  
r=8  
do while .not. eof()  
    mcard_no=card_NO  
    mstatus=status  
    md_admit=d_admit  
    md_dis=d_dis  
    mward=ward  
    Mdo_in_ch=do_in_ch
```

```

skip
if mcard_no=card_no
  loop
endi
sno=sno+1
r=r+1
@ r,0 say '|'
@ r,2 say sno pict '9999'
@ r,7 say '|'
@ r,9 say mcard_no
@ r,20 say '|'
@ r,22 say mstatus
@ r,30 say '|'
@ r,32 say md_admit
@ r,63 say '|'
@ r,43 say md_dis
@ r,57 say mward
@ r,65 say mdo_in_ch
@ r,79 say '|'
if eof()
  exit
endi
r=r+1
@ r,0 say '|'
@ r,7 say '|'
@ r,40 say '|'
@ r,53 say '|'
@ r,63 say '|'
@ r,79 say '|'
endd
r=r+1
@ r,0 say '|' + repl('-',78) + '|'
r=r+1
@ r,0 say '|'
wait
clos all
clea
retu

```

Rep1.prg

```
use MEDI
Set devi to prin
sort on card_no to pati.dbf
use pati
clea
@ 1,31 say 'COMPUTERIZED HOSPITAL RECORD SYSEM'
@ 2,31 say repl('= ',35)
@ 4,24 say 'GENERAL PATIENT LIST'
@ 5,24 say repl('= ',21)
@ 6,0 say repl('- ',80)
@ 7,0 say '| S/NO | CARD NO.'
@ 7,20 say '| NAME'
@ 7,33 say '| '
@ 7,37 say 'AGE'
@ 7,40 say '| OCCUPATION |'
@ 7,53 SAY '| SEX'
@ 7,63 say '| STATE '
@ 8,0 say '|-----|'
@ 8,8 say repl('- ',32)+'|'
@ 8,41 say repl('- ',12)+'|'
@ 8,54 say repl('- ',9)+'|'
@ 8,64 say repl('- ',15)+'|'
sno=0
r=8
do while .not. eof()
  mcard_no=card_NO
  mp_name=p_NAME
  mage=age
  moccupationc=occupation
  msex=sex
  MSTATE=STATE
  skip
  if mcard_no=card_no
    loop
  endi
  sno=sno+1
  r=r+1
  @ r,0 say '|'
```

```

@ r,2 say sno pict '9999'
@ r,7 say '|'
@ r,9 say mcard_no
@ r,20 say '|'
@ r,22 say mp_name
@ r,33 say '|'
@ r,35 say mage
@ r,63 say '|'
@ r,45 say moccupation
@ r,57 say msex
@ r,65 say mstate
@ r,79 say '|'
if eof()
  exit
endi
r=r+1
@ r,0 say '|'
@ r,7 say '|'
@ r,40 say '|'
@ r,53 say '|'
@ r,63 say '|'
@ r,79 say '|'
endd
r=r+1
@ r,0 say '|' + repl('-',78) + '|'
r=r+1
@ r,0 say '|'
wait
clos all
clea
retu

```

Cha4.prg

```

*SELE 1
*USE PAT
SELE 2
USE MEDI
SELE 3

```

```

USE CHARGE
DO WHILE .T.
  CLEAR
  @ 0,5 TO 24,74
  @ 22,6 TO 22,73
  @ 1,27 SAY 'DELETING PATIENT CHARGE DETAILS'
  @ 2,27 TO 2,49 DOUBLE
  SELE 2
  MCARD_NO=SPACE(9)
  @ 4,7 SAY 'CARD NO (Press <ENTER> to Exit):' GET MCARD_NO PICTURE '@!'
  READ
  IF MCARD_NO=SPACE(9)
    EXIT
  ENDIF
  GO TOP
  LOCATE FOR CARD_NO=MCARD_NO
  IF .not. FOUND()
    @ 23,16 SAY 'PATIENT NOT REGISTERED - PRESS ANY KEY TO CONTINUE'
    SET CONSOLE OFF
    WAIT
    SET CONSOLE ON
    LOOP
  ENDIF

  mp_name=p_name
  msex=sex
  mage=age
  moccupation=occupation
  mf_name=f_name
  mn_o_kin=n_o_kin
  mphone=phone
  mstatus=status
  mphone1=phone1
  MDATE=date
  maddr=addr
  MBLGRP=BLGRP
  MGENO=GENO
  @ 4,53 SAY 'CARD NO:'
  @ 4,62 say Mcard_no
  @ 6,7 SAY 'NAME:'

```

@ 6,14 say MP_NAME PICTURE '@!'
 @ 6,22 SAY 'OCCUPATION:'
 @ 6,34 say MOCCUPATION PICT '@!'
 @ 6,45 SAY 'BLD GRP:'
 @ 6,53 SAY MBLGRP PICT '@!'
 @ 6,56 SAY 'GENOTYPE:'
 @ 6,67 SAY MGENO PICT '@!'
 @ 8,7 SAY 'AGE'
 @ 9,7 say mAGE
 @ 8,11 SAY 'SEX'
 @ 9,12 say MSEX PICTURE '@!'
 @ 8,17 SAY 'DATE'
 @ 9,15 say MdATE
 @ 8,31 SAY 'ADDRESS'
 @ 9,26 say MADDR PICT '@!'
 @ 8,49 SAY 'TELEPHONE NO:'
 @ 9,50 say MPHONE PICT '@!'
 @ 8,64 SAY 'STATUS'
 @ 9,63 say MSTATUS PICT '@!'
 @ 11,7 SAY 'NEXT OF KIN:'
 @ 11,19 say MN_O_KIN PICT '@!'
 @ 11,39 SAY 'NEXT OF KIN PHONE NO:'
 @ 11,62 say MPHONE1 PICT '@!'

sele 3

mcard_NO =card_no
 mpaid=paid
 mcharge=charge
 mbal=bal
 mdatef=datef
 mdatel=datel
 @ 12,7 to 12,73
 @ 13,7 SAY 'TOTAL CHARGE'
 @ 13,22 SAY MCHARGE PICT '@!'
 @ 13,38 SAY 'AMOUNT PAID'
 @ 13,50 SAY MPAID PICT '@!'
 @ 15,7 SAY 'TOTAL BALANCE'
 @ 15,20 SAY MBAL PICT '@!'
 @ 17,7 say 'PAID TO:'
 @ 17,19 SAY COLL pict '@!'
 @ 19,7 SAY 'DATE OF FIRST PAYMENT'

```

@ 19,28 SAY MDATEF PICT '@!'
@ 21,7 SAY 'DATE OF LAST PAYMENT:'
@ 21,27 SAY MDATEL PICT '@!'
@ 23,21 SAY 'DO YOU WANT TO DELETE THIS DATA (Y/N):'
DO WHILE .T.
  RESPONSE=' '
  @ 23,58 GET RESPONSE PICTURE '!
  READ
  IF RESPONSE='Y' .OR. RESPONSE='N'
    EXIT
  ENDIF
ENDDO
IF RESPONSE='Y'
  dele
  pack
ENDIF
ENDDO
USE
CLEAR
RETURN

```

Cha3.prg

```

*SELE 1
*USE PAT
SELE 2
USE MEDI
SELE 3
USE CHARGE
DO WHILE .T.
  CLEAR
  @ 0,5 TO 24,74
  @ 22,6 TO 22,73
  @ 1,27 SAY 'EDITING PATIENT CHARGE DETAILS'
  @ 2,27 TO 2,49 DOUBLE
  SELE 2
  MCARD_NO=SPACE(9)
  @ 4,7 SAY 'CARD NO (Press <ENTER> to Exit):' GET MCARD_NO PICTURE '@!'
  READ

```

```

IF MCARD_NO=SPACE(9)
  EXIT
ENDIF
GO TOP
LOCATE FOR CARD_NO=MCARD_NO
IF .not. FOUND()
  @ 23,16 SAY 'PATIENT NOT REGISTERED - PRESS ANY KEY TO CONTINUE'
  SET CONSOLE OFF
  WAIT
  SET CONSOLE ON
  LOOP
ENDIF
mp_name=p_name
msex=sex
mage=age
moccupation=occupation
mf_name=f_name
mn_o_kin=n_o_kin
mphone=phone
mstatus=status
mphone1=phone1
MDATE=date
maddr=addr
MBLGRP=BLGRP
MGENO=GENO
@ 4,53 SAY 'CARD NO:'
@ 4,62 say Mcard_no
@ 6,7 SAY 'NAME:'
@ 6,14 say MP_NAME PICTURE '@!'
@ 6,22 SAY 'OCCUPATION:'
  @ 6,34 say MOCCUPATION PICT '@!'
@ 6,45 SAY 'BLD GRP:'
@ 6,53 SAY MBLGRP PICT '@!'
@ 6,56 SAY 'GENOTYPE:'
@ 6,67 SAY MGENO PICT '@!'
@ 8,7 SAY 'AGE'
@ 9,7 say mAGE
@ 8,11 SAY 'SEX'
@ 9,12 say MSEX PICTURE '@!'
@ 8,17 SAY 'DATE'

```

```

@ 9,15 say MdATE
@ 8,31 SAY 'ADDRESS'
@ 9,26 say MADDR PICT '@!'
@ 8,49 SAY 'TELEPHONE NO:'
@ 9,50 say MPHONE PICT '@!'
@ 8,64 SAY 'STATUS'
@ 9,63 say MSTATUS PICT '@!'
@ 11,7 SAY 'NEXT OF KIN:'
  @ 11,19 say MN_O_KIN PICT '@!'
@ 11,39 SAY 'NEXT OF KIN PHONE NO:'
@ 11,62 say MPHONE1 PICT '@!'
sele 3
  mcard_NO =card_no
  mpaid=paid
  mcharge=charge
  mbal=bal
  mdatef=datef
  mdatel=datel
@ 12,7 to 12,73
@ 13,7 SAY 'TOTAL CHARGE'
@ 13,22 GET MCHARGE PICT '@!'
@ 13,38 SAY 'AMOUNT PAID'
@ 13,50 GET MPAID PICT '@!'
@ 15,7 SAY 'TOTAL BALANCE'
@ 15,20 SAY MBAL PICT '@!'
@ 17,7 say 'PAID TO:'
@ 17,19 GET COLL pict '@!'
@ 19,7 SAY 'DATE OF FIRST PAYMENT'
@ 19,28 GET MDATEF PICT '@!'
@ 21,7 SAY 'DATE OF LAST PAYMENT:'
@ 21,27 GET MDATEL PICT '@!'
READ
@ 23,21 SAY 'DO YOU WANT TO UPDATE THIS DATA (Y/N):'
DO WHILE .T.
  RESPONSE=' '
  @ 23,58 GET RESPONSE PICTURE '!
  READ
  IF RESPONSE='Y' .OR. RESPONSE='N'
    EXIT
  ENDIF

```

```
ENDDO
IF RESPONSE='Y'
  * APPEND BLANK
  REPL CARD_NO WITH McARD_NO
  REPLACE PAID WITH MPAID, BAL WITH MBAL
  REPLACE CHARGE WITH MCHARGE, COLL WITH MCOLL
  REPLACE DATEF WITH MDATEF, DATEL WITH MDATEL
ENDIF
ENDDO
USE
CLEAR
RETURN
```

Cha2.prg

```
*SELE 1
*USE PAT
SELE 2
USE MEDI
SELE 3
USE CHARGE
DO WHILE .T.
  CLEAR
  @ 0,5 TO 24,74
  @ 22,6 TO 22,73
  @ 1,27 SAY 'VIEW PATIENT CHARGE DETAILS'
  @ 2,27 TO 2,54 DOUBLE
  SELE 2
  MCARD_NO=SPACE(9)
  @ 4,7 SAY 'CARD NO (Press <ENTER> to Exit):' GET MCARD_NO PICTURE '@!'
  READ
  IF MCARD_NO=SPACE(9)
    EXIT
  ENDIF
  GO TOP
  LOCATE FOR CARD_NO=MCARD_NO
  IF .not. FOUND()
    @ 23,16 SAY 'PATIENT NOT REGISTERED - PRESS ANY KEY TO CONTINUE'
    SET CONSOLE OFF
    WAIT
```

```
SET CONSOLE ON
LOOP
ENDIF
```

```
mp_name=p_name
msex=sex
mage=age
moccupation=occupation
mf_name=f_name
mn_o_kin=n_o_kin
mphone=phone
mstatus=status
mphone1=phone1
MDATE=date
maddr=addr
MBLGRP=BLGRP
MGENO=GENO
@ 4,53 SAY 'CARD NO:'
@ 4,62 say Mcard_no
@ 6,7 SAY 'NAME:'
@ 6,14 say MP_NAME PICTURE '@!'
@ 6,22 SAY 'OCCUPATION:'
@ 6,34 say MOCCUPATION PICT '@!'
@ 6,45 SAY 'BLD GRP:'
@ 6,53 SAY MBLGRP PICT '@!'
@ 6,56 SAY 'GENOTYPE:'
@ 6,67 SAY MGENO PICT '@!'
@ 8,7 SAY 'AGE'
@ 9,7 say mAGE
@ 8,11 SAY 'SEX'
@ 9,12 say MSEX PICTURE '@!'
@ 8,17 SAY 'DATE'
@ 9,15 say MDATE
@ 8,31 SAY 'ADDRESS'
@ 9,26 say MADDR PICT '@!'
@ 8,49 SAY 'TELEPHONE NO:'
@ 9,50 say MPHONE PICT '@!'
@ 8,64 SAY 'STATUS'
@ 9,63 say MSTATUS PICT '@!'
@ 11,7 SAY 'NEXT OF KIN:'
```

```

@ 11,19 say MN_O_KIN PICT '@!'
@ 11,39 SAY 'NEXT OF KIN PHONE NO:'
@ 11,62 say MPHONE1 PICT '@!'
sele 3
  mcard_no=card_no
  mpaid=paid
  mcharge=charge
  mbal=bal
  mdatef=datef
  mdatel=datel
@ 12,7 to 12,73
@ 13,7 SAY 'TOTAL CHARGE'
@ 13,22 say MCHARGE PICT '@!'
@ 13,38 SAY 'AMOUNT PAID'
@ 13,50 say MPAID PICT '@!'
@ 15,7 SAY 'TOTAL BALANCE'
@ 15,20 SAY MBAL PICT '@!'
@ 17,7 say 'PAID TO:'
@ 17,19 say COLL pict '@!'
@ 19,7 SAY 'DATE OF FIRST PAYMENT'
@ 19,28 say MDATEF PICT '@!'
@ 21,7 SAY 'DATE OF LAST PAYMENT:'
@ 21,27 say MDATEL PICT '@!'
@ 23,21 SAY 'VIEWING PATIENT CHARGES DETAILS...'
READ
ENDDO
USE
CLEAR
RETURN

```

Cha1.prg

```

*SELE 1
*USE PAT
SELE 2
USE MEDI
SELE 3
USE CHARGE
DO WHILE .T.

```

```

CLEAR
@ 0,5 TO 24,74
@ 22,6 TO 22,73
@ 1,27 SAY 'PATIENT CHARGE DETAILS'
@ 2,27 TO 2,49 DOUBLE
SELE 2
MCARD_NO=SPACE(9)
@ 4,7 SAY 'CARD NO (Press <ENTER> to Exit):' GET MCARD_NO PICTURE '@!'
READ
IF MCARD_NO=SPACE(9)
    EXIT
ENDIF
GO TOP
LOCATE FOR CARD_NO=MCARD_NO
IF .not. FOUND()
    @ 23,16 SAY 'PATIENT NOT REGISTERED - PRESS ANY KEY TO CONTINUE'
    SET CONSOLE OFF
    WAIT
    SET CONSOLE ON
    LOOP
ENDIF
mp_name=p_name
msex=sex
mage=age
moccupation=occupation
mf_name=f_name
mn_o_kin=n_o_kin
mphone=phone
mstatus=status
mphone1=phone1
MDATE=date
maddr=addr
MBLGRP=BLGRP
MGENO=GENO
@ 4,53 SAY 'CARD NO:'
@ 4,62 say Mcard_no
@ 6,7 SAY 'NAME:'
@ 6,14 say MP_NAME PICTURE '@!'
@ 6,22 SAY 'OCCUPATION:'
@ 6,34 say MOCCUPATION PICT '@!'

```

```

@ 6,45 SAY 'BLD GRP:'
@ 6,53 SAY MBLGRP PICT '@!'
@ 6,56 SAY 'GENOTYPE:'
@ 6,67 SAY MGENO PICT '@!'
@ 8,7 SAY 'AGE'
@ 9,7 say mAGE
@ 8,11 SAY 'SEX'
@ 9,12 say MSEX PICTURE '@!'
@ 8,17 SAY 'DATE'
@ 9,15 say MdATE
@ 8,31 SAY 'ADDRESS'
@ 9,26 say MADDR PICT '@!'
@ 8,49 SAY 'TELEPHONE NO:'
@ 9,50 say MPHONE PICT '@!'
@ 8,64 SAY 'STATUS'
@ 9,63 say MSTATUS PICT '@!'
@ 11,7 SAY 'NEXT OF KIN:'
  @ 11,19 say MN_O_KIN PICT '@!'
@ 11,39 SAY 'NEXT OF KIN PHONE NO:'
@ 11,62 say MPHONE1 PICT '@!'
sele 3
store space(9) to mcard_no
  mpaid=0
  mcharge=0
  mbal=0
store space(25) to mcoll
store ctod ( ' / / ' ) to mdatef,mdate1
@ 12,7 to 12,73
@ 13,7 SAY 'TOTAL CHARGE'
@ 13,22 GET MCHARGE PICT '@!'
@ 13,38 SAY 'AMOUNT PAID'
@ 13,50 GET MPAID PICT '@!'
read
mbal=mcharge-mpaid
@ 15,7 SAY 'TOTAL BALANCE'
@ 15,20 SAY MBAL PICT '@!'
@ 17,7 say 'PAID TO:'
@ 17,19 GET MCOLL pict '@!'
@ 19,7 SAY 'DATE OF FIRST PAYMENT'
@ 19,28 GET MDATEF PICT '@!'

```

```

@ 21,7 SAY 'DATE OF LAST PAYMENT:'
@ 21,27 GET MDATEL PICT '@!'
READ
@ 23,21 SAY 'DO YOU WANT TO SAVE THIS DATA (Y/N):'
DO WHILE .T.
  RESPONSE=' '
  @ 23,58 GET RESPONSE PICTURE '!
  READ
  IF RESPONSE='Y' .OR. RESPONSE='N'
    EXIT
  ENDIF
ENDDO
IF RESPONSE='Y'
  APPEND BLANK
  REPL CARD_NO WITH McARD_NO
  REPLACE PAID WITH MPAID, BAL WITH MBAL
  REPLACE CHARGE WITH MCHARGE, COLL WITH MCOLL
  REPLACE DATEF WITH MDATEF, DATEL WITH MDATEL
ENDIF
ENDDO
USE
CLEAR
RETURN

```

Report.prg

```

do while .t.
  clea
  @ 3,15 to 21,64 doub
  @ 2,22 to 4,58 doub
  @ 3,23 say 'COMPUTERISATION OF PATIENT RECORDS'
  @ 5,28 to 7,51 doub
  @ 6,29 say 'REPORT PRODUCTION MENU'
  @ 9,22 say '1 ..... INDIVIDUAL PATIENT DATA'
  @ 11,22 say '2 ..... PATIENT MEDICAL DATA'
  @ 13,22 say '3 ..... CHARGES UPDATES'
  @ 15,22 say '4 ..... SUBMENU EXIT'
  @ 19,16 to 19,63 doub
  @ 20,22 say 'Press CODE [1,2,3,4] for Choice:'

```

```

do while .t.
  check= ' '
  @ 20,57 get check pict '! '
  read
  if check $ '1234'
    exit
  endi
endd
do case
  case check='1'
    do rep1
  case check='2'
    do rep2
  case check='3'
    do rep3
  othe
  exit
endc
endd
clea
retu

```

Charge.prg

```

do while .t.
  clea
  @ 3,17 to 21,64 doub
  @ 2,22 to 4,58 doub
  @ 3,23 say 'COMPUTERISATION OF PATIENT RECORDS'
  @ 5,25 to 7,55 doub
  @ 6,28 say "PATIENT CHARGE DETAIL MENU"
  @ 9,22 say '1 ..... NEW CHARGE ENTRY'
  @ 11,22 say '2 ..... VIEW CHARGE DETAILS'
  @ 13,22 SAY '3 ..... EDIT CHARGE DETAILS'
  @ 15,22 SAY '4 .....DELETE CHARGE DETAILS'
  @ 17,22 say '5 ..... SUBMENU EXIT'
  @ 19,18 to 19,63 doub
  @ 20,22 say 'Press CODE [1,2,3,4,5] for Choice:'
do while .t.

```

```

check= ' '
@ 20,56 get check pict '! '
read
if check $ '12345'
  exit
endi
endd
do case
  case check='1'
    do CHA1
  case check='2'
    do CHA2
  case check='3'
    do CHA3
  case check='4'
    do CHA4
  othe
  exit
endc
endd
clea
retu

```

Med1.prg

```

SELE 1
USE PAT
SELE 2
USE MEDI
DO WHILE .T.
  CLEAR
  @ 0,5 TO 24,74
  @ 22,6 TO 22,73
  @ 1,27 SAY 'PATIENT MEDICAL DETAILS'
  @ 2,27 TO 2,49 DOUBLE
  SELE 2
  MCARD_NO=SPACE(9)
  @ 4,7 SAY 'CARD NO (Press <ENTER> to Exit):' GET MCARD_NO PICTURE '@!'
  READ

```

```

IF MCARD_NO=SPACE(9)
  EXIT
ENDIF
GO TOP
LOCATE FOR CARD_NO=MCARD_NO
IF .not. FOUND()
  @ 23,16 SAY 'PATIENT NOT REGISTERED - PRESS ANY KEY TO CONTINUE'
  SET CONSOLE OFF
  WAIT
  SET CONSOLE ON
  LOOP
ENDIF
mp_name=p_name
msex=sex
mage=age
moccupation=occupation
mf_name=f_name
mn_o_kin=n_o_kin
mphone=phone
mstatus=status
mphone1=phone1
MDATE=date
maddr=addr
MBLGRP=BLGRP
MGENO=GENO
@ 4,53 SAY 'CARD NO:'
@ 4,62 say Mcard_no
@ 6,7 SAY 'NAME:'
@ 6,14 say MP_NAME PICTURE '@!'
@ 6,22 SAY 'OCCUPATION:'
  @ 6,34 say MOCCUPATION PICT '@!'
@ 6,45 SAY 'BLD GRP:'
@ 6,53 SAY MBLGRP PICT '@!'
@ 6,56 SAY 'GENOTYPE:'
@ 6,67 SAY MGENO PICT '@!'
@ 8,7 SAY 'AGE'
@ 9,7 say mAGE
@ 8,11 SAY 'SEX'
@ 9,12 say MSEX PICTURE '@!'
@ 8,17 SAY 'DATE'

```

```

@ 9,15 say MdATE
@ 8,31 SAY 'ADDRESS'
@ 9,26 say MADDR PICT '@!'
@ 8,49 SAY 'TELEPHONE NO:'
@ 9,50 say MPHONE PICT '@!'
@ 8,64 SAY 'STATUS'
@ 9,63 say MSTATUS PICT '@!'
@ 11,7 SAY 'NEXT OF KIN:'
  @ 11,19 say MN_O_KIN PICT '@!'
@ 11,39 SAY 'NEXT OF KIN PHONE NO:'
@ 11,62 say MPHONE1 PICT '@!'
sele 1
store space(2) to mward
store space(15) to mdo_in_ch,mnu_in_ch
store space(25) to mdiago,mdiago1,mtreat,mtreat1,mtreat2
store space(9) to mstatus
store ctod (' / / ') to md_admit,md_dis
@ 12,7 to 12,73
@ 13,7 SAY 'DATE ADMITTED'
@ 13,22 GET MD_ADMIT
@ 13,38 SAY 'WARD'
@ 13,42 GET MWARD PICT '@!'
@ 13,50 SAY 'DATE DISCHARGE'
@ 13,65 GET Md_DIS
@ 16,11 say 'DIAGONISED OF'
@ 17,7 GET mdiago pict '@!'
@ 19,7 get mdiago1 pict '@!'
@ 16,43 say 'TREATMENT'
@ 17,35 get mtreat pict '@!'
@ 19,35 get mtreat1 pict '@!'
  @ 16,64 say 'STATUS'
@ 17,62 get mstatus pict '@!'
@ 21,10 say 'DOCTOR NAME:' GET MDO_IN_CH
@ 21,41 SAY 'NURSE NAME:' GET MNU_IN_CH
READ
@ 23,21 SAY 'DO YOU WANT TO SAVE THIS DATA (Y/N):'
DO WHILE .T.
  RESPONSE=' '
  @ 23,58 GET RESPONSE PICTURE '!
  READ

```

```

IF RESPONSE='Y' .OR. RESPONSE='N'
  EXIT
ENDIF
ENDDO
IF RESPONSE='Y'
  APPEND BLANK
  REPL CARD_NO WITH McARD_NO
  REPLACE D_ADMIT WITH MD_ADMIT, D_DIS WITH MD_DIS
  repl TREAT WITH MTREAT,treat with treat1,DIAGO WITH MDIAGO,diago1 with
mdiago1
  REPLACE DO_IN_CH WITH MDO_IN_CH,WARD WITH MWARD
  REPLACE STATUS WITH MSTATUS
ENDIF
ENDDO
USE
CLEAR
RETURN

```

Reg3.prg

```

USE medi
DO WHILE .T.
  CLEAR
  @ 0,5 TO 24,74
  @ 22,6 TO 22,73
  @ 1,27 SAY 'EDITING PATIENT REGISTRATION'
  @ 2,27 TO 2,53 DOUBLE
  MCARD_NO=SPACE(9)
  @ 4,7 SAY 'CARD NO (Press <ENTER> to Exit):' GET MCARD_NO PICTURE '@!'
  READ
  IF MCARD_NO=SPACE(9)
    EXIT
  ENDIF
  GO TOP
  LOCATE FOR CARD_NO=MCARD_NO
  IF .NOT. FOUND()
    @ 23,18 SAY 'CARD NUMBER DO NOT EXIST - PRESS ANY KEY TO CONTINUE'
    SET CONSOLE OFF
    WAIT
  
```

```

SET CONSOLE ON
LOOP
ENDIF
mp_name=p_name
msex=sex
mage=age
moccupation=occupation
mf_name=f_name
mn_o_kin=n_o_kin
mnation=nation
mstate=state
mtribe=tribe
mm_name=m_name
mphone=phone
mstatus=status
mphone1=phone1
mreli=reli
maddr=addr
mn_o_adr=n_o_adr
MDATE=date
MBLGRP=BLGRP
MGENO=GENO
@ 4,53 SAY 'CARD NO:' GET Mcard_no
@ 6,7 SAY 'PATIENT NAME:' GET MP_NAME PICTURE '@!'
@ 6,46 SAY 'OCCUPATION:' GET MOCCUPATION PICT '@!'
@ 8,7 SAY 'AGE'
@ 9,7 GET mAGE
@ 8,11 SAY 'SEX'
@ 9,13 GET MSEX PICTURE '@!'
@ 8,17 SAY 'STATE OF ORIGIN'
@ 9,17 GET MSTATE PICT '@!'
@ 8,36 SAY 'RELIGION'
@ 9,34 GET MRELI PICTURE '@!'
@ 8,49 SAY 'DATE'
@ 9,47 GET MdATE
@ 8,61 SAY 'TRIBE'
@ 9,58 GET MTRIBE PICT '@!'
@ 11,7 SAY 'ADDRESS:'GET MADDR PICT '@!'
@ 11,37 SAY 'NATIONALITY:' GET MNATION PICT '@!'
@ 13,7 SAY 'TELEPHONE NO:' GET MPHONE PICT '@!'

```

```

@ 13,38 SAY 'STATUS:' GET MSTATUS PICT '@!'
@ 15,7 SAY "FATHER'S NAME:"GET MF_NAME PICT '@!'
@ 15,39 SAY "MOTHER'S NAME:"GET MM_NAME PICT '@!'
@ 17,7 SAY 'NEXT OF KIN:'GET MN_O_KIN PICT '@!'
@ 17,39 SAY 'NEXT OF KIN PHONE NO:'GET MPHONE1 PICT '@!'
@ 19,7 SAY 'ADDRESS OF NEXT OF KIN:'GET MN_O_ADR PICT '@!'
@ 21,7 SAY 'BLOOD GROUP:'GET MBLGRP PICT '@!'
@ 21,24 SAY 'GENOTYPE:'GET MGENO PICT '@!'
READ
@ 23,21 SAY 'DO YOU WANT TO SAVE THIS CHANGES DATA (Y/N):'
DO WHILE .T.
  RESPONSE=' '
  @ 23,66 GET RESPONSE PICTURE '!
  READ
  IF RESPONSE='Y' .OR. RESPONSE='N'
    EXIT
  ENDIF
ENDDO
IF RESPONSE='Y'
  REPLACE CARD_NO WITH MCARD_NO
  repl DATE WITH mDATE
  REPLACE SEX WITH MSEX, STATUS WITH MSTATUS
  repl AGE WITH MAGE
  REPLACE PHONE WITH MPHONE,PHONE1 WITH MPHONE1,f_NAME WITH
MF_NAME
  REPLACE M_NAME WITH MM_NAME,P_NAME WITH MP_NAME,N_O_KIN WITH
MN_O_KIN
  REPLACE N_O_ADR WITH MN_O_ADR,NATION WITH MNATION,RELI WITH
MRELI
  REPLACE OCCUPATION WITH MOCCUPATION,TRIBE WITH MTRIBE,STATE
WITH MSTATE
  REPLACE ADDR WITH MADDR
  REPL BLGRP WITH MBLGRP,GENO WITH MGENO
ENDIF
ENDDO
USE
CLEAR
RETURN

```

Reg2.prg

```
USE medi
DO WHILE .T.
  CLEAR
  @ 0,5 TO 24,74
  @ 22,6 TO 22,73
  @ 1,27 SAY 'VIEW PATIENT RECORDS'
  @ 2,27 TO 2,46 DOUBLE
  MCARD_NO=SPACE(9)
  @ 4,7 SAY 'CARD NO (Press <ENTER> to Exit):' GET MCARD_NO PICTURE '@!'
  READ
  IF MCARD_NO=SPACE(9)
    EXIT
  ENDIF
  GO TOP
  LOCATE FOR CARD_NO=MCARD_NO
  IF .NOT. FOUND()
    @ 23,12 SAY 'CARD NUMBER DO NOT EXIST - PRESS ANY KEY TO CONTINUE'
  SET CONSOLE OFF
  WAIT
  SET CONSOLE ON
  LOOP
ENDIF
mp_name=p_name
msex=sex
mage=age
moccupation=occupation
mf_name=f_name
mn_o_kin=n_o_kin
mnation=nation
mstate=state
mtribe=tribe
mm_name=m_name
mphone=phone
mstatus=status
mphone1=phone1
mreli=reli
maddr=addr
mn_o_adr=n_o_adr
```

```

MDATE=date
MBLGRP=BLGRP
MGENO=GENO
@ 4,53 SAY 'CARD NO:' GET Mcard_no
@ 6,7 SAY 'PATIENT NAME:' GET MP_NAME PICTURE '@!'
@ 6,46 SAY 'OCCUPATION:' GET MOCCUPATION PICT '@!'
@ 8,7 SAY 'AGE'
@ 9,7 GET mAGE
@ 8,11 SAY 'SEX'
@ 9,13 GET MSEX PICTURE '@!'
@ 8,17 SAY 'STATE OF ORIGIN'
@ 9,17 GET MSTATE PICT '@!'
@ 8,36 SAY 'RELIGION'
@ 9,34 GET MRELI PICTURE '@!'
@ 8,49 SAY 'DATE'
@ 9,47 GET MdATE
@ 8,61 SAY 'TRIBE'
@ 9,58 GET MTRIBE PICT '@!'
@ 11,7 SAY 'ADDRESS:'GET MADDR PICT '@!'
@ 11,37 SAY 'NATIONALITY:' GET MNATION PICT '@!'
@ 13,7 SAY 'TELEPHONE NO:' GET MPHONE PICT '@!'
@ 13,38 SAY 'STATUS:' GET MSTATUS PICT '@!'
@ 15,7 SAY "FATHER'S NAME:"GET MF_NAME PICT '@!'
@ 15,39 SAY "MOTHER'S NAME:"GET MM_NAME PICT '@!'
@ 17,7 SAY 'NEXT OF KIN:'GET MN_O_KIN PICT '@!'
@ 17,39 SAY 'NEXT OF KIN PHONE NO:'GET MPHONE1 PICT '@!'
@ 19,7 SAY 'ADDRESS OF NEXT OF KIN:'GET MN_O_ADR PICT '@!'
@ 21,7 SAY 'BLOOD GROUP:'GET MBLGRP PICT '@!'
@ 21,24 SAY 'GENOTYPE:'GET MGENO PICT '@!'
* READ
@ 23,21 SAY 'VIEWING PATIENT DATA.....'
SET CONSOLE OFF
WAIT
SET CONSOLE ON
* READ
ENDDO
USE
CLEAR
RETURN

```

Reg.prg

```
do while .t.
  clea
  @ 3,15 to 21,64 doub
  @ 2,22 to 4,58 doub
  @ 3,23 say 'COMPUTERISATION OF PATIENT RECORDS'
  @ 5,25 to 7,54 doub
  @ 6,26 say "PATIENT'S REGISTRATION MENU"
  @ 9,22 say '1 ..... NEW REGISTRATION DETAILS'
  @ 11,22 say '2 ..... EDIT REGISTRATION DETAILS'
  @ 13,22 say '3 ..... VIEW REGISTRATION DETAILS'
  @ 15,22 say '4 ..... DELETE REGISTRATION DETAILS'
  @ 17,22 say '5 ..... SUBMENU EXIT'
  @ 19,16 to 19,63 doub
  @ 20,22 say 'Press CODE [1,2,3,4,5] for Choice:'
do while .t.
  check=' '
  @ 20,57 get check pict '! '
  read
  if check $ '12345'
    exit
  endi
endd
do case
  case check='1'
    do reg1
  case check='2'
    do reg3
  case check='3'
    do reg2
  case check='4'
    do reg4
  othe
  exit
endc
endd
clea
retu
```

Med.prg

```
do while .t.
  clea
  @ 3,15 to 21,64 doub
  @ 2,21 to 4,58 doub
  @ 3,22 say 'COMPUTERISATION OF PATIENT RECORDS '
  @ 5,30 to 7,49 doub
  @ 6,32 say 'FIRST LEVEL MENU'
  @ 9,22 say '1 ..... REGISTRATION OF PATIENT'
  @ 11,22 say '2 ..... MEDICAL DETAILS'
  @ 13,22 say '3 ..... CHARGES UPDATE'
  @ 15,22 say '4 ..... REPORT PRODUCTION'
  @ 17,22 say '5 ..... SYSTEM EXIT'
  @ 19,16 to 19,63 doub
  @ 20,22 say 'Press CODE [1,2,3,4,5] for Choice:'
do while .t.
  check=' '
  @ 20,57 get check pict '! '
  read
  if check $ '12345'
    exit
  endi
endd
do case
  case check='1'
    do reg
  case check='2'
    do medical
  case check='3'
    do charge
  case check='4'
    do report
  othe
  exit
endc
endd
clea
retu
```