COMPUTERIZATION OF HEALTH AND DISEASE CONTROL PROGRAMME IN SMALL RUMINANT

(A CASE STUDY OF STATE VETERINARY CENTRE MINNA).

A PROJECT SUBMITTED TO THE DEPARTMENT OF MATHS/COMPUTER SCIENCES.

BY

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APPROVAL PAGE

This project has been supervised and approved as meeting the requirement of the department of Mathematics/Computer Science.

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DEDICATION.

This project is dedicated to my beloved daughter Sylvia Zainab Lanko, with honour and Glory to the almighty God who delivered me safely of this baby during my course, and also to Samuel , Serah, Baba, David, Hajiya and Solomon who assisted in carrying her during my lecture hours.

CERTIFICATION

I certify that this work was carried out by me Anna Gogo Lanko of the post Graduate school, Department of Maths/Statistics/Computer science, F.U.T. Minna, Niger State.

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To all those not mentioned, I say thank you for been there always.

ABSTRACT

The project is solely based on the application of diagnosis and prescription in small ruminants (sheep and Goats).

It also includes the usage of experts system in disease preventive and control measures. The consultation process; Animal disease prevention by vaccination and personal data storage of each animal.

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CHAPTER ONE.

1.0 INTRODUCTION.

Computers are increasingly becoming indispensable. Many tasks at home and in the office that were hitherto executed manually are being automated at a very fast pace. Thus, it is becoming apparent that in whatever discipline of study or nature of employment, the computer is now an important tool for efficiency improvement and precision of job or task execution.

But we should be aware that because the computer is surrounded by intricate webs of softwares, the procedure for computerizing a problem is made more complex. This is due to the fact that it involves a large area of computing known as paracomputing. One of the main function of paracomputing is to convert an existing manual system into a computerised system.

Expert system and their many applications have brought with them both economic and social changes. They are the most significant technological development of the century. Its literacy involves recognising and using it (expert system) as a problem solving tool and potentials for improving the quality of life.

Computer or expert system is used in the diagnosis of disease in the medical fields, including veterinary experts of it. Diagnosing disease in small ruminants (sheep and goats) can be accomplished in several ways. The following are the different means by which disease can be diagonise;

(i) External observations of the patient in quation.

(ii) By laboratory test.

The animals under review are of great economical, social and religious importance in Nigeria and their disease are highly contagious in nature and of great economic and public importance, and have occurred in the recent past in Nigeria.

1.1 AIMS AND OBJECTIVES

The aims and objectives of computerizing Health and disease control programme in small ruminants are as follows - It is designed to provide information to all those who are interested in using expert system to assist in the diagonizing disease and also assist in the running of disease control programme, in small ruminants.

Its major objectives are to help overcome the hard task involved in going through text books before carrying out vaccination programme of healthy sheep and goats and before prescribing drug for the infected once. With the aid of this soft ware, these can be done easily.

1.2 Literature Review

1.2.1 HISTORY OF COMPUTER

The evolution of computers and its increasing effects on the way things are done now a days is important to enable readers of this project to have insight into how far and how well humanity has gone in applying technology to our day to day living.

ABACUS one of the earliest calculating instrument was inverted around 500BC and is still widely used in China up till today.

Blaise Pascal, a French philosopher and mathematician invented and produced the first mechanical adding and subtracting machine ie a calculator. His early work with mechanical calculators is recognized today by the popular computers programming language that bears his name (ie pascal language) This was in 1642. In 1671 ie in 30 years, after pascal invented the adding machine (calculator) German Gottfried leibnitz improved on pascal's work by producing machine that could in addition to just adding and subtracting the machine could multiply and divide.

Nappier's Bones, an ingenious device for multiplying and dividing was developed in the 17th century (1617) by John Napier.

In 1833, charles Babbage who is considered the father of the modern computers started work on the DIFFERENCE ENGINE. The difference engine is a machine that could generate mathematical tables.

A small working model of the machine which look 10 years to complete was able to accurately solve equations upto six decimal places. As designed, it could add, subtract multiply and divide in Automatic sequence at a rate of 600 additions per minute. The draw back of this machine was that the specified design required thousands of gears and drivers that would cover the area of a foot ball field and be powered by a locomotive engine.

Babbage also designed the ANALYTICAL ENGINE which is widely regarded as the mechanical forerunner of the modern computers. This analytical engine was designed to Automate mathematical calculations.

In 1884, a statistician (Herman Hollerith) applied for a patent for a punched card tabulation machine, with the punch-card processing and Hollerith's punch-card tabulating

machine, the census was completed in three years. This saved the Bureau over US $5,000,000. The transaction obviously initiated the era of automated processing - The advert of the computer age.

1.2.2 THE BEGINNINGS (1940_S)

The computer era, as we know it today, began in 1939 with the so-called A B C computer.

John V. Atanasoff, a mathematics professor at Iowa state college, required a calculating device to perform mathematical operations for 20 masters and doctoral students. None of the mechanical calculators available served his needs. With an assistant, Clifford E. Berry, he designed and named their machine the Atanasoff - Berry - computers, or the A B C computers.

The ENIAC (Electronic Numerical Integrator and computer) is the first large - scale general purpose computer ever built, and its design was obviously influenced by the design as the ABC computer.

It was used to compute firing and ballistic tables for Army Artillery guns which was put into generations in 1946, at the university of Pennytoania (U.S.A) by John Nauchly and J. Prosper Eckert.

The EDSAC (Electronic Delay storage. Automatic calculator) was designed and constructed at Cambridge University in England by Maurice V. Wilkes and his associates while BINAC (Binary Automatic computer) was built by ECKERT and Mauchly.

In 1951, an improved model of EDVAC (Electronic Discrete variable Automatic computer) which was smaller, more versatile, and more flexible machine than ENIAC was designed and became a true stored program binary machine using numbers for both, instructions and data.

The first computer designed with eventual real-time applications in mind was developed by the mass achutbetts institute of Technology in 1945 and called WHIRL WIND I. Completion of his project resulted in the primary internal storage used in all computer until 1964.

The first business data processing system UNIVAC I was developed by Eckert and Mauchly and contained 500 vacuum tubes.

UNIVAC I could read, compute, and write information simultaneously. Not long after UNIVAC I was in operation, automatic programming techniques were developed to help people use these machines. These techniques have since become programming languages that are used extensively in solving problems on modern computers.

1.2.3 THE COMPUTER GENERATION AND ITS CHARACTERISTICS.

Generally, advances in computer technology can be classified into categories called computer generations. What distinguishes each generation is the main electronic logic element in use at the time. The term logic elements refers to the electronics logic components used to facilitate the circuit functions within the computer.

The following are the logical elements and generations they belong.

1] First Generation (1951 - 1958) : Vacuum tube

2] Second Generation (1959 - 1963) : Transistor

3] Third Generation (1964 - 1970) : Integrated Circuit.

4] Fourth Generation (1971 - 1990) : Microminiaturized circuit.

5] Fifth Generation (1990 - till now) : Major Advances.

Each new logic element led to improvement that made computers significantly faster, smaller, more flexible, more reliable, and

less expensive than those of past generations. The first generation of computers began with Eckert and Mauchlys' ENIAC. This generation of computer is characterized by the used of vacuum tubes in the central processing unit (CPU) and Internal Memory Units.

In the second generation of computers i.e 1959 - 1963, vacuum tube was replaced by the transistor. The transistor, a solid-state device, was the major break through that allowed computers to have reasonable size and power.

The third generation computer era was characterised by advanced miniaturization of circuitry. This was the introduction of the integrated circuit in 1964. With this technological advance, an entire circuit board containing transistors and connecting wires could be place on a single chip. This development meant greater reliability and compactness combined with low cost and power requirements.

The fourth and current generation of computers began in 1971 with the introduction of the Micro- a central processing unit on a chip. This generation includes the introduction of super computers. Another important advance of this generation has been the introduction of personal computer (PC), the power of the computers has been made available to anybody

who wishes to use one.

Although we are potentially in the fourth generation of computers, research into fifth generation of computer systems is now under-way. Japan and the United States are heavily committed to developing fifth generation computers. These computers will depend on a major advances in artificial intelligence, voice recognition and image processing. If successful, fifth generation computer will be powerful and easier to use. They will utiliese circuit chips manufactured using ultra large scale integration (ULSI) techniques. Ultra large scale integration chips contains between one million to one hundred million transistors.

Japanese researchers predict that fifth generation computers will be used every where, serving as "Intelligent assistants" and giving users access to a broad range of information and expertise.

In the offices, the machine will accept spoken requests search through reservoirs of stored knowledge, and decide which information is most relevant to the management decision-making.

In the home, the computers could give advice on personal money management.

1.3 EXPERT SYSTEM

Expert Systems are often regarded as representing a sub-class of artificial intelligence. They are one of the key developments contributing to the international fifth generation programme.

Addis, 1982, review that the range of expert system represent degrees of enhancement to an information retrieval system. An expert system can be regarded as a means of recording and assessing human competence in a particular specialist field.

Duda et al, 1980, suggests that an expert system is capable of human like performance and can serve thereby as a replacement expert. Some of the most successful expert systems are as follows.

1]. MYCIN and INTERNIST (for medical diagnosis)

2). DENDRAL and SECS (for chemical analysis)

3). Prospector (for geological prospecting)

4). GPS (General Problem Solver).

They are called knowledge based. This is because their performance depends critically on the use of facts and heuristicsused by experts.

The British computer society's Committee of the specialist group on expert system has defined an expert system as:

"The embodiment within a computer of a knowledge-based component from an expert skill in such a form that the machine can offer intelligent advice or take an intelligent decision about a processing function. A desirable additional characteristic, which many would regard as fundamental, is the capability of the system on demand to justify its own time of reasoning in a manner directly intelligible to the requirer.

The style adopted to attain this characteristic is rule-based programming.

Expert systems represent a flexible approach to computer competence, drawing on specialist knowledge and exploiting various types of influence (not only deductive reasoning).

CHAPTER TWO

2.0 FEASIBILITY STUDY

It is the process of carrying out preliminary investigation of a system of an organization.

2.0.1 STUDY OF EXISTING METHOD

Some disease control and prevention measures in small ruminants includes:-

1. Vaccination program
2. Good Management
3. Endoparasite/ Ectoparasite Control.

2.0.2 VACCINATION PROGRAMME

This is an important aspect of animal production. It involves a set out schedule in which various diseases are prevented or controlled using specific vaccines/Bacterin.

Routine vaccination of a herd/Flock ensure adequate protection of small ruminants against such diseases like pest de petit ruminantum i.e. (PPR) which is found to be highly prevalent and courses substantial amount of loses in all small ruminants around it's region. A vaccine is a biological agent which when introduced into an animal, stimulates the production of antibodies against a disease entity. Vaccination is a process through which vaccine is administered into an animal.

Below is a schedule of vaccination.

DISEASES	VACCINE TYPE	DATE OF VACCINE	DURATION
Pest depetit remination (PPR)	Tissue Cultured Render pest Vaccine (TCRV)	Any age	Repeat annually
2. Contagious Carprine Pleuropneumonia (CCPP)	Contagious Caprine Pleuromonia Vaccine (CCPPV)	Six (6) months	Repeat annually
		Anyage	Annually
	Flukivac Strain-19	Six (6) months	Annually
	A.R.V (CAT)	Six (6) months	Annually
	A.R.V.(DOG)		

The above schedule could however be variable depending on the discreation of the veterinarian.

Before undertaking any vaccination, animals are ascertain to be of good health.

The existing system of identifying or diagnosing diseases in animals are as follows:--History of the animals i.e. you ask the herd man, (1) How many there are in the herd? (2) How many have this similar symptoms. (3) For how long has the animals been in this condition?(4) what is the feeding habit etc.

- Routine physical examination of the animal i.e. the temperature rate, pulse rate, hair coat examination, of the mucor gland etc

-laboratory examination i.e. faecal and blood sample for microscopic examination for worms and blood parasite etc

-postmortem examination i.e. opening up of the carcass of a dead animal to investigate the possible cause of death.

In the past when animal come down with a disease, there where no detailed scientific methods of examine them. all examination were based primarily on physical observations and history of the animal. the result however from these methods are quite limited.

these diagnostic techniques where by history not give a complete knowledge of disease.

Confirmations are made through laboratory techniques.

However it gives a preknowledge of what is wrong. some disease entities could have some pathognomonic signs given a satisfactory ideas through physical examinations.

After physical examination, clinical test which either microbiological or chemical are carried out.

In the event of loosing an animal the tendency in the part is to dispose it by burring. this practice leads to a loss of knowledge as to the course of death.

With the advent of scientific development carcass are not disposed, immediately. rather a general post-mortem is carried out to ascertain the course of its death. this knowledge gained help to assist the veterinarian in dealing with such occurrence in the future.

2.0.3 GOOD MANAGEMENT.

the entire management practice for increase productivity involve:

1. Good appropriate housing including ventilation.
2. Improved hygienic(sanitary)condion of the environment.
3. Unproductive and breeding techniques.
4. Proper and improved nutrition.

FEEDS/FEEDING.

Feed and feeding involves the following:

- Fresh water should always be available in their water troughs.
- Feeds which are simply cereals grains, seed meals and cakes, fresh grass and leaves etc could be served twice daily i.e. morning and evening.

The pen should always be clean to avoid dirty environment.

ENDO/ECTO PARASITE CONTROL.

This is a process through which animals are rendered free of helminths and other external body (skin) infectious and infestations.

The most important of this are Haermondius contortus, ostertagia circumcincta cotubriformis, Trichostrongylus axeci, Bunostomum, Trigonocephalum, and Oesophagostomum, Columbianum., Cooperia, Curticei, Strongyloides, papillosus, Trichuris, Ovis, and Chabertia ovina may also be patogenic in sheep/ goat (ref The MERCK veterinary manual 3rd edition).

Stomach worms of sheep and goats like Haermondius contortus, etc as listed above could be controlled through the use of drugs like

1. Phenothiazine
2. Thiabedazole
3. Bephenium embonate
4. Piperazines
5. Albeidazole

Albeidazole is the commonest anthelminthic readily found in the market it is administered at about 7.5- 10mg/kg body weight orally.

Ectoparasite that are of economics importance in small ruminants are :-

1. Tick
2. Marge
3. Flea
4. Lice

TICK INFESTATION.

Frequent site of tick attachment are the ears, neck, flanks and outerdigital space, but ticks can be found all over the body surface.

Without exception, ticks are dependent on blood for their existence.

MANGE

In sheep/goats the causative agent of marge are sarcoptes, Scabies var oris Psoroptes Equip var ovis, or Chorioptes bovis. The agents cause sarcoptic, psoroptic or chorioptic marge respectively.

FLEA INFESTATIONS:-

Fleas are small, wingless, laterally compressed, blood sucking external parasites. All adult fleas feed only on blood and it's feeding, cause intense pruritus and irritation to the hypersensitive host.

When only a few ectoparasits are present on the animal, they may be removed by simply plucking them off, taking care that this is done carefully without breaking of the mouth parts or head, into the animal body. If this does occur, care must be used to remove the broken parts.

The control of ticks in livestock is usually a matter of herd or flock treatment which is through spraying or dipping with acaricide.

Earticks may be removed from the ear carnal manually but this is usually very difficult and laborious than spraying or dipping.

In the case of mange, since large number of animals are usually affected, dips are the most common treatment.

To control fleas and lice, both the and environment must be treated. Many of the acaricide will remove fleas from the hosts body, but other fleas will return, unless they and the immature fleas are killed in the bedding or other places.

In general, the control of echoparasites could be effected by the combination of washing or dipping in acaricide and injection with IVOMEC. Ivomec is an injectable solution use in the treatment of both external and internal parasites.

2.2 PROBLEM IDENTIFICATION

"The Veterinarian is the best doctor because he does not need to ask his patient what's wrong, he just got to know as stated by " WILL-ROGERS".

It is in line that the process of disease identification is of paramont importance to the veterinarian. The veterinary clician has to be conversant with animal behaviour. Any change in the normal behaviour is an indication of ill-health.

One of the problems associated with physical observation of animals in livestock disease condition detection or diagnosis is that some of the disease have similar symptoms. As such it is usually difficult to identify a particular disease an animal is suffering - from just the physical examination. At times it is when the disease is at an advanced stage that the symptom become more clearly manifested.

CHAPTER THREE

3.0 SYSTEM ANALYSIS & DESIGN.

A system is a group of elements (people, machine, cell, animal e.t.c) organised for the purpose of achieving a particular goal.

It could also be defined as an organised method of accomplishing a business operation. A system is build on individual elements each contributing to form an organised intergreted entity.

All systems have a boundary that separates them from their environment. This boundary defines the scope of activities to be supported by the system. For example, the activities in the state vetenary centre Minna includes the following

A. Diagnosing disease through investigating methods like History taking, physical examination, laboratory tests.

B. Treatment of infected animals and

C. Disease control.

When defining a system, you need to establish a boundary.

A boundary may delineate an area of responsibility. For example, the activities within the veterinary department of ministry of Agriculture and Natural Resources may represent the boundary of the system for which the department head i.e the director livestock services, is responsible.

Within the system of the department, the director is responsible for organising work schedules, assigning staff to different Zonal offices in the state, evaluating existing programs.

System boundaries are also established within a business system. A sales manager may be responsible for managing, motivating and evaluating the performance of a sales organisation .

Systems may consist of numerous subsystems. An agricultural system for example may consist of individual course that are subsystem. Each course provides specific knowledge that is a part of the overall agricultural system and contributes to its goals. For example veterinary medicine, agricultural science etc are all courses under agricultural system and have the same aim of providing aboundant food for the nation through the conversion of the exiting manual system of farming and animal husbandry into machnised farming and improved animal husbandry.

A system needs feedback to do its job. Feedback is a form of control. Control means that it is necessary to asses current performance and to make continuous adjustments in the activities of a system to ensure that the system achieves its goals.

In system analysis and design, the concern is usually with manmade systems involving input, processing, and output. In this case a system could be regarded as a set of interacting elements responding to input to produce outputs.

INPUT -> PROCESS -> OUTPUT.

System analysis involves the system life cycle i.e defining the problem, its feasibility study and analysing it. It also includes designing, acquisition, implementation and maintenance of the system.

Analysis of a system is the procedual study of its operation with an attempt to discover what its basic problems are. The analyst must examine all the facts gathered inorder to make a proper assessment of the existing system.

Designing a system is the application of judgement, skill, and knowledge by the systems analyst inorder to be able to interpret the requirement specification to create one or more system specification.

A system specification provides detailed documentation of the entire system. It serves as

(a) Communication to management, programmers, operating staff and user.

(b) It provides complete record of the system used for evaluation, modification and training purpose.

The system should be well documented as analyst who design it can go to other projects or change employment.

3.1 MAIN OBJECTIVE OF SYSTEM ANALYSIS :-

The objective is to study the' current system including its procedures, information flows and methods of work organisation and control.

Here are certain vital questions asked.

(a) Why did the problem occur ?

(b) why were the present methods adopted ?

(c) what are the alternative methods ?

The analysis also spell out the strength and weakness of the existing system.

3.1.0 The aim of system design is to provide information to all those who are interested in using the computers on their farms to diagnose livestock diseases. This will reduce the cost of labour involved in inviting several livestock personals to the farm. It is also aimed at providing information to the visiting veterinary clinician from the farm record kept in the system.

In the veterinary clinic the use of computer will faster the steps(i.e physical examination, laboratory tests etc) involved in diagnosing disease and treatment.

3.1.1 TOOLS REQUIRED:-

Tools Required for the system design-are as follows:-

1. Veterinary or livestock personnel
2. Stockman
3. Data collected from Stockman on various recorded symptoms and treatment.
4. A P.C plus line printer.

System specification contains the following-

a-- Preliminary information contents:-Involving names of those who can change files, programme etc

b-- Objectives of the system depts involved and their benefits.

c-- System description - i.e. the detail procedures, both clerical and consulting using flowcharts ,were possible or applicable.

d-- Detailed specification of input files, output files, master files, source document and output document.

e-- Time scale for getting the system working.

f-- Plans to enable a smooth, change-over from old to the new system.

Other items considered in system design include input, output, files and procedure--

Input-This is influenced by the needs of output. The following are put into consideration-

a - Type of Input media

b - Data collection methods.

c - Design of input layouts.

d - Volume of input documents.

How the above points affect a new system should be put into consideration.

Output-- It is necessary to consider what is required from the system before deciding how to set about producing it.

The main things are:-

a) How often are they required?

b) Who needs the output and in what form?

c) Are multiple copies needed for circulation within and outside the organisation?

d) Are reprinted forms needed.

FILES:- In the design stages, the analysis is concerned with the file structure and organisation. The file handling depends on input/output requirement and data volume to be retained in the system for reference purposes or updating.

--Arrangement for easy access.

--Visible size for an output file.

---Suitable storage facility.

---File security.

PROCEDURES:- These are steps which unite the whole process and link everything together to produce the desired output. Those will involve both computers and clerical procedure.

They will start with the origination, with the source document and end with the output document being distributed.

3.2 SYSTEM SPECIATION

Hardware requirement

The hardware requirement needed to run this software consists of an IBM P C or compatible with a minimum of 256KB of memory.

Recommended hardware configuration are:-

1. An IBM PC/AT or 100% compatible computer.
2. 256 KB of RAM minimum.
3. AN IBM BIOS or compatible to keyboard.

Software requirement

The operating system for running this system is the disk operating system, system disk are contained in the disks and are accessed through using command. Secondly one diskette containing the DBASE 3+ software and all the necessary files, this diskette has to be inside the drive at all times during the running of the programme.

3.3 ANALYZING OF THE INVESTIGATIONS.

This is divided into three parts -- A,B,C.

The A part deals with the physical examinations of the animal (goat/sheep), part B is the microscopic n examination, while part C is the post mortem findings:-

A. Physical examination/observation.

The veterinary clinician should be able to know the normal behaviour of healthy animals, so that he/she can tell when an abnormal sign or symptom is noticed in their behaviour.

1. General posture/ movement.

Animal standing with its head down, moving slowgishly and with a tendency of separating from the herd -its a warning sign that there is something wrong.

2. Feeding Habit

Normally, healthy animals feed greedily reduced or loss of appetite and in some cases stoppage of rumination are early signs of several diseases.

3. Mucus Membranes/Nostrils/Hair coat

Healthy animals have pinkish membrane. Their nostrils are free of discharges and are always moist. The hairs on their body is normally smooth- while discharges from nostrils and rough hair coat are signs of ill health in them.

B Post Mortem Findings-

This is carried out by cutting open the carcass of the dead animal. The different organs are examined one after the other for any change in the colour, texture, size. content e.t.c. of the normal to the abnormal.

The result from the findings could be used to treat the other animals in the herd.

Only diseased animals have changes in there organs when cut open.

C. Microbiological or Laboratory Test.

With this we mean taking samples, either faecal blood or any discharge from an animal and sending it to the lab. for microscopic examination. Some worms or rather larva or helminths maybe seen in faeces of infected sheep/goat. Some blood parasites larva could also be seen in the blood of such animals

4. Variation in body temperature.

With a change in the normal body temperature its always an indication of one infection or another.

Body temperature can be taken by inserting a clinical thermometer into the rectum of the animal for a minute. High temperature are usually associated with increased activity of the body in fighting infection.

The normal body temperature of sheep/goat are 38.9_0c and 39.1_0 respectively.

5. Variations in pulse rate.

This reflects the rate at which the heart pumps blood through the body.Pulse rate can be taken by placing the index or record fingers on arteries where arteries pass near the surface of the body or by using an instrument called statoscope.

The pulse rate of sheep/goat is 70-80 per/sec.

6. The eyes of healthy animals are bright and alart.Shrinking eyes with a fix staring look often accompany the on set of fever. Discharges from both the eyes indicate systematic ailment.

7. Dung of sheep/goat that are healthy are semi solid, rich green in colour, and free from gas bubbles or blood clots.Any deviation from the above is an indication of a problem.

Information accessibility_

The information regarding this project were obtained from the following.

1. Experts, this includes the veterinary officers and other livestock personels at the state vet centre Minna.
2. Books or textual file[Handouts].
3. Direct experience of the programmer.

Cost Implementation Of The New System

1. Cost of hardware/software

processor 80286/80386

Ram 1.2MB

Diskette drive/slot

a. 3.5 1.44MB

51/4 1.2MB

Hard disk 30 or 40MB #45000

Dot matrix printer #72000

Ups 500 wott #18000

System development cost #15000

Recurrent expenditure #38000

Operating Cost Perannum

a. Paper (multiruled 2 parts) #1300

b. Ribbo n #800

c. Diskette #1000

d. Maintenance #15000

CHAPTER FOUR

4.0 ANALYSIS OF RESULTS

4.1 JUSTFICATION OF THE NEW SYSTEM

It has become very important that liveshock farmers should have a computer based system for diagonising diseases for efficiency purposes. It will satify the rapid growing need for improved management.

The sytem is meant for veterinary clinicians and livestock farmers it could also be used in schools and universities for learning purposes.

The new system will erable accurate diagonises of diseases, hence appropriate and proper treatment and preventive measures can be applied. This will unvariably reduce the mortality rate and out break of diseases.

It should be noted that only healthy animals are recormened for vacination (i.e a method of diseases control). so with the introduction of the new system the healthy once can easily be identified and differenciated from the deasesed once hence allowing proper and effective aim of vaccinating them to be achieved.

4.2 SYSTEM REQUIRMENT.

The requirments for this new system one as follws:-

1. Increased speed rate
2. Large and recured storage facilities
3. Need for Accuracy

4. Quick accessibilty of information

5. Automation

The above features are incorporated into the new system in order to enhance its performance.

4.3 DESIGNED DATABASE FILE

This is grouped into 4 structurial forms

A

SYMPTOM DATA

1. 1. Symptom

2. all code

B

RECOVERED OR SICKCURE OR

DISEASE/TREATED DATA

1. All code

2. Disease

3. Treatment

4. Control

5. Causative agent

C

PERSONAL DATA

1. Data
2. Ear-tag Number
3. Age
4. Sex
5. Disease
6. Treatment

4.4 STRUCTURE FOR SYMPTOMS DBF

FIELD	FIELDNAME	TYPE	WIDTH	DEC.
1	Symptom	c	40	0
2	allcode	c	2	0

Structure for Sickcure, Recovered or

Disease/Treated DBF

FIELD	FIELDNAME	TYPE	WIDTH	DEC
1.	allcode	c	2	0
2.	Disease	c	15	0
3.	Treatment	c	40	0
4.	Control	c	30	0
5.	causal-agent	c	20	0

Structure for personall DBF

FIELD	FIELDNAME	TYPE	WIDTH	DEC
1	Date	d	8	2
2	Ear-tag number	c	6	0
3	Age	N	3	2
4	Sex	c	6	0
5	disease	c	30	0

4.5 MODULAR PROGRAM STRUCTURE (PROCEDURE)

In modular Structure, each process has its duty to perform effectively in the prosed system. The duties are as follows:

Main Menu.

This is the program that displays the main menu of the system.

It consists of the following options

1. Consultation
2. Up date knowledge base
3. Delete knowledge
4. Edit knowledge
5. Exit

These options are sub-programs. They are displayed for execution

CONSULTATION:

It is concerned with the consultation. The existing symptoms in knowledge base are displayed for the user to select. The Symptom that matches what is observed on the animal. After the relation the causal agent responsible for illness is displayed with disease, treatment and control.

UPDATE KNOWLEDGE BASE:-

Update knowledge base consists of six options as follows:

1. Update symptoms
2. Update disease
3. Update treatment
4. Update control
5. Update causal agent
6. Exit

Any of the options can be updated, from time to time by insertion of new date

DELETE KNOWLEDGE

This reaction is concerned with deletion of any particular part of the knowledge base that is not required. It consists of the following options.

1. Delete Symptoms
2. Delete disease
3. Delete treatment

4. Delete Control

5. Delete causal agent

6. Exit

EDIT KNOWLEDGE

As the name implies, it is concerned with the editing of knowledge. Edit knowledge has a menu. The menu consists of the following options:

1. Edit symbols

2. Edit disease

3. Edit treatment

4. Edit control

5. Edit causal agent

6. Exit

PERSONAL DATA

As the name implies,it contains the personal data of the animal that is been diagnosed.Tthis includes the animal type,ear-tag number,age,sex,disease treatment and finally the date.

CHAPTER FIVE

5.0 SYSTEM IMPLIMENTATION

The final step in system development is system implimentation .In this step or at this stage written programs are used . When this is done ; the programs are then tested to ensure that they are current . Trained staff are to use the system and the data existing are taken from the old system .These data are converted to the new system and lastly the new system is installed .

5.1 PROGRAMMING . (WRITTEN PROGRAM)

The program uses the files created in the system application in chapter three and knowledge base. It has been successfully witten useing querry language and modular structure. The programe is shown in the appendix .

5.2 INSTALLATION

Installation of this system can be done by computer experts The procedure given below can be used .

THE Hardware facillities are IBM PC/AT and printer

Diskette containing the system is also riqured . About two diskettes can serve the purporse.

PROCEDURE FOR INSTALATION.

1. Boot the system ,
2. Insert "CHDC" in drive A:

3 . Close the disk drive door .

4. Create a subdirectory called CHDC in disk drive C:

5. Type A>COPY *.* C:>\ CHDC

6. Follow the instruction on the screen to enable you enter the directory were you want to install "CHDC "

7. Press any key to continue.

5.3 SYSTEM TESTING

It is important to test every program before it is used for production or before the implimentation .This determines the reliability of the programe .

System testing involves two kinds of activities they are ;

1. Integretion
2. Acceptance testing .

Acceptance testing involves planning and execution of function tests ,performance tests ,and stress to verify that the implementated system satisfy its requirements

Integretion testing ; The traditional strategy used to integrate the componets of the software system into a functional whole ,is Botton-up integration .It consists of unit testing ,subsystem testing and then the testing ofthe entire system.

In general ,if DBASE iii + files are not avalaible on the machine to be use ,then it should already be in two floppy diskettes ,which should be lablled i and ii. However, if your computer already has dbase iii + then after booting the system written like this:-

C:\>

1. Then type

C:\>dbase

When this has been done, Dbase iii+ has been loaded, you should then be ready to run the system.

2. Then press "Escape key" to go to the dot prompt.

3. Insert the diskette containing this system in drive A and then type

. Set default to A

. Do main

A message like this will appear on the screen.

COMPUTERISED HEALTH/DISEASE CONDITION IN SMALL RUMINANTS. A CASE STUDY OF STATE VET. CENTRE. MX

BY

LANKO ANNA GOGO (MRS)

For the award of post graduate Diploma in computer science.

4. Press any key to continue.

After this, the main menu appears and the system is ready to execute any of the chosen option/ choice.

5. However, in a situation were the user has Dbase III+ on floppy diskettes, then the following procedures should be followed.

1. Boot the system to get the system prompt C>

2. Put the system diskette 1

3. Change the drive by typing

C>A:

A>Dbase

At the end of the loading of the files from this diskette, the computer will ask you to insert the system diskette II + files.

4. Insert diskette ii and press the Enter key.

At the end of this, you have succeded in loading Dbase ii+ files.

5. Press "Escape key" to receive the dot prompt,

6. Then type .Do CHDC

7. Press Any key to continue.

5.4 CONVERSION

Conversion is the change over from the old system to the new one. It is usually a very expensive stage in the whole project. File conversion is often a complete and separate system task, and it involves. 1. Fact-finding analysis, 2. Data computer 3. The design of clerical methods and computer processes, 4. Form design and production of special traning courses.

Setting up new master files for large systems can involve the transfer of hundreds of thousands of records which may be beyound the data handling capacity of an organisation and must be sub contracted elsewhere.

The change-over from old to new system may take place when:-

1. The system has been proved to the satisfaction of the systems analyst and the other implementation activities have been completed.

2. User managers are satisfied with the results of the system tests, staff traning and reference manuals.

3. The target date for changeover is due

The changeover may be achieved in a number of ways:- The most common methods are

a) Direct

b) parallel running

c) Pilot running

d) Staged changeover.

Direct change-over is the complete replacement of the old system by the new, in one move. It is a bold move, which should be undertaken only when everyone concerned has confidence in the new system. When a direct change-over is planned, systesm and traning should be comprehensive, and the change-over itself planned in detail. This method is potentially least expensive but the most risky. For security reasons the old system may be held in abeyance, inducing people and equipment. In the event of a major failure of the new system the organisation would revert to the old system.

PARALLEL RUNNING:- This means processing current data by both, the old and new system to cross-check the results. Its main attraction is that the old system is kept alive and coperational until the new system has been proved for at least one system cycle, using full due data in the real operational enviroment of place, people, equipment and time. It allows

the results of the new system to be compared with the new system to be compared with the old system before acceptance by the user, thereby promoting user confidence.

Its main disadvantage is the extral cost, the difficult and sometimes the impracticability, of user staff having to carry out the different clerical operations for two system (old and new) on the time available for one.

PILOT RUNNING:- This is similar in concept to parallel running. Data from one or more previous periods for the whole or part of the system is run on the new system, after results have been obtained from the old system, and new results are compared with the old. It is not as distributive as parallel operation, since timing is less critical. This method is more like an extended system tesk, but it may be considered a more practical form of changeover for organisational reasons.

STAGED CHANGE-OVER:- This involves series of system being introduced piece by-piece. A complete part, or logical section, is committed to the new system while the remaining parts or sections are processed by the old system. Only when the selected part is operating satisfactorily is the remainder transfered.

This method reduces the risks intierent in a direct-change-over of the whole system and enables the analyst and users to learn from mistakes made as the change over progresses.

Its disadvantages are as follows:-

It creates problem of controlling the selected parts of the old and new system it tends to prolong the implementation period.

CONTROL:- Which ever method is adopted for the changeover, from old to new method, a high priority must be given to establishing controls, by value or quantity, in order to maintain the quantitative integrity of the system. In the case of this system, parallel aproach is chosen. i.e using both the new and the old system together.

The reason for chosen this, is because it's more reliable. The result of the new system can be compared with that of the old system. Dispite the fact that it is more expensive it is still preferable.

5.5 SYSTEM MAINTENANCE.

The time "software maintanance" is used to discribe the software engineering activities that takes place in delivering software product to a costomer.
Malntenance activities includes making enhancement to software product, adopting productions to new enviroments and modifying the software to suit the new enviroment.

Adoption of software to anew enviroment may involve moving the software to a different machine, or for instant, modifying the software to accomondate new additional modules.

5.6 CONCLUSION

The computerisation of health and disease control program in small ruminants, was designed, authorised and tested by Lanko Anna Gogo under the supervision of Dr. Ayesimi of the Maths/Computer Department of F.U.T. Minna.

It is a complete and efficient system in itself. The system is open for use by farmers who are interested in rearing of sheep/goat;Clinicians of any veterinary establishment, farm organisations and the Agricultural Department of the universities. The system has been designed and tested on IBM as well as a KINTECH (i.e IBM Compatible) brand of Compters.

The language used to develop this software is called querry language. The software can be used on monochrome and colour monitors.

Finally, it is necessary to note here that no previous experience is assumed for any user who might wish to use the software. Thus, it has been made user friendly as much as possible. The programe is structured in such a way that changes can be easily effected.

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APPENDIX I

Derfinition of terms.

Append- Adds records to the end of database

Bug- AN error, ussually used in relation to software problems.

Claer- erased the screen.

C.C.P.P.-Contigious caprine pleuro pneumonia.

Causal agent-Organism that causes disease.

Diseaze-An ailment.

Delete- erase.

Display-display fields of record structure.

Do- Begin execution.

Data- Fact or information used by the system.

Database- Information stored in computerised form.

Edit- Editing of Dbase.

Exit- End a dowhile loop without exicution.

Go Top/Bottom-Move record pointer to a specified position

List- List record in current database.

Knowledge base- Data bank.(i.s. Data stord in the database file)

Read- permit data entry get.

Quit- Close all file of datebase and return to operating system

Return- Ends execution.

Seek- Look for a perticular record.

Input- The process of getting information in to the system.

Output- The process of getting information out of the system.

Symptoms- Sign of illness which are visible.

Vaccination- Process of injecting materials in to an animal to promot long time immunity, or at least, give the animal ability to tolerate a disease.

[MAIN MENU]

ADDING NEW DISEASE AND SYMPTOMS

DIAGONISE DISEASES

PROMOTE THE EXISTING DISEASES RECORDS

EXIT TO DRASE

```
*****THE MAIN MENU PROGRAM (DIAMENU.PRG)

SET TALK OFF
SET BELL OFF
SET STATUS OFF
SET SCOREBOARD OFF
SET TITLE OFF
SET HEADING OFF
SET CURSOR OFF
SET PROC TO SYMPTON
LELL=0
OLDDIR="        "
NEWDIR="        "
MLEVEL=0
MMENU=.T.
SET COLOR TO W+/R
CLEAR
ITEM1="ADDING NEW DISEASE AND SYMPTOMS       "
ITEM2="DIAGONISE DISEASES                    "
ITEM3="BROWSE THE EXISTING DISEASES RECORDS  "
ITEM4="EXIT TO DBASE                         "

TEMPITEM=ITEM1
@1,15 SAY "[ MAIN MENU ]"
@6,25 TO 18,70 DOUBLE
@8,30 SAY ITEM1
@10,30 SAY ITEM2
@12,30 SAY ITEM3
@14,30 SAY ITEM4
*@16,30 SAY ITEM5

SET COLOR TO W+/BR
@8,30 SAY ITEM1
TEMPV=8
TEMPITEM=ITEM1
REALV=8
DO WHILE MMENU
AA=INKEY()
IF AA=13
SET COLOR TO W+/R
set cursor on
IF REALV=14
STORE .F. TO MMENU
ENDIF

IF REALV=8
DO ADD1
ENDIF
IF REALV=10
DO DIAG
ENDIF
IF REALV=12
DO MOD4
ENDIF

set cursor off
SET COLOR TO W+/R
CLEAR
ITEM1="ADDING NEW DISEASE AND SYMPTOMS       "
ITEM2="DIAGONISE DISEASES                    "
ITEM3="BROWSE THE EXISTING DISEASES RECORDS  "
ITEM4="EXIT TO DBASE                         "
```

```
TEMPITEM=ITEM1
@5,35 SAY "[ MAIN MENU ]"
@6,25 TO 18,70 DOUBLE
@8,30 SAY ITEM1
@10,30 SAY ITEM2
@12,30 SAY ITEM3
@14,30 SAY ITEM4
*@16,30 SAY ITEM5

SET COLOR TO W+/GR
@8,30 SAY ITEM1
TEMPY=8
TEMPITEM=ITEM1
REALY=8



ENDIF


IF AA=24
REALY=REALY+2
IF REALY>16
REALY=8
ENDIF

IF REALY=8
REALITEM=ITEM1
SET COLOR TO W+/R
@TEMPY,30 SAY TEMPITEM
SET COLOR TO W+/GR
@8,30 SAY REALITEM
TEMPITEM=ITEM1
TEMPY=8
ENDIF

IF REALY=10
REALITEM=ITEM2
SET COLOR TO W+/R
@TEMPY,30 SAY TEMPITEM
SET COLOR TO W+/GR
@10,30 SAY REALITEM
TEMPITEM=ITEM2
TEMPY=10
ENDIF

IF REALY=12
REALITEM=ITEM3
SET COLOR TO W+/R
@TEMPY,30 SAY TEMPITEM
SET COLOR TO W+/GR
@12,30 SAY REALITEM
TEMPITEM=ITEM3
TEMPY=12
ENDIF

IF REALY=14
REALITEM=ITEM4
SET COLOR TO W+/R
@TEMPY,30 SAY TEMPITEM
SET COLOR TO W+/GR
```

```
@14,30 SAY REALITEM
TEMPITEM=ITEM4
TEMPV=14
ENDIF


ENDIF


IF AA=5
REALY=REALY-2
IF REALY<8
REALY=16
ENDIF

IF REALY=8
REALITEM=ITEM1
SET COLOR TO W+/R
@TEMPV,30 SAY TEMPITEM
SET COLOR TO W+/GR
@8,30 SAY REALITEM
TEMPITEM=ITEM1
TEMPV=8
ENDIF

IF REALY=10
REALITEM=ITEM2
SET COLOR TO W+/R
@TEMPV,30 SAY TEMPITEM
SET COLOR TO W+/GR
@10,30 SAY REALITEM
TEMPITEM=ITEM2
TEMPV=10
ENDIF

IF REALY=12
REALITEM=ITEM3
SET COLOR TO W+/R
@TEMPV,30 SAY TEMPITEM
SET COLOR TO W+/GR
@12,30 SAY REALITEM
TEMPITEM=ITEM3
TEMPV=12
ENDIF

IF REALY=14
REALITEM=ITEM4
SET COLOR TO W+/R
@TEMPV,30 SAY TEMPITEM
SET COLOR TO W+/GR
@14,30 SAY REALITEM
TEMPITEM=ITEM4
TEMPV=14
ENDIF

ENDIF

ENDDO

set color to w+/b
clear
SET CURSOR ON
SET TALK ON
```

THE DIAGNOSTIC [illegible] IS AS FOLLOWS

[illegible]

THE PATIENT [illegible] / [illegible] IRRITATION

PRESCRIPTION:WASHING WITH [illegible]

PRESCRIPTION:WATER

PRESCRIPTION:

[illegible]SCRIPTION:

MORE DIAGNOSTIC (Y/N)? N

THE DIAGNOSTIC MESSAGE IS AS FOLLOWS

THE PATIENT COULD HAVE ROUNDWORM

PRESCRIPTION: DEWORMING WITH ALBENDAZOLE

PRESCRIPTION: 1 BOLUS 30Kg BODY WEIGHT

PRESCRIPTION:

MORE DIAGNOSTIC (Y/N)? N

THE DIAGNOSTIC MESSAGE IS AS FOLLOWS

THE PATIENT COULD HAVE PNEUMONIA

PRESCRIPTION: CRYSTICILLIN 1MU/10KG

PRESCRIPTION: VITAMIN B/COMPLEX INJECTION 1ML/10KG

PRESCRIPTION: AMPICILLIN INJECTION 1GM/10 KG

PRESCRIPTION: NOTE: ONE AMPULE IN ONE ONE DAY

MORE DIAGNOSTIC (Y/N)? N

THE DIAGNOSTIC MESSAGE IS AS FOLLOWS

THE PATIENT COULD HAVE MEST DE MEDIT PNEUMONIA(BUP)

PRESCRIPTION: PROCAINE PENICILLIN 1MU/10KG

PRESCRIPTION: MAX VET DMLS/10KG OVERLEY

PRESCRIPTION: VITAMIN B/COMPLEX INJECTION 1ML/10KG

PRESCRIPTION:

MORE DIAGNOSTIC (Y/N)? N

```
**********************************SYMPTOM.PRG
*PROCEDURE TO ADD DISEASE AND SYMPTOMS
procedure add1
            O[100]
DECLARE MYNAME[100]
REPEAT1= T
DO WHILE REPEAT1
USE SYMPTON
RR1=RECCOUNT()
CLOSE DATABASES
USE DISEASE
RR2=RECCOUNT()
CLOSE DATABASES
USE DISEASE
YESNO=" "
STORE 0 TO SN1,SN2,SN3,SN4,SN5,SN6,SN7,SN8,SN9,SN8,SN10
STORE SPACE(30) TO SM1,SM2,SM3,SM4,SM5,SM6,SM7,SM8,SM9,SM10
MMNAME=SPACE(30)
MYDIA=SPACE(40)
MYPRE=SPACE(40)
MYPRE1=SPACE(40)
MYPRE2=SPACE(40)
MYPRE3=SPACE(40)
MSERIAL=SPACE(10)
SET COLOR TO W+/R
CLEAR
@1,30 SAY "DISEASES AND SYMPTOM ENTRIES"
@2,30 SAY "============================"
@4,10 SAY "ENTER DISEASE SERIAL NUMBER:" GET MSERIAL
READ
MSERIAL=UPPER(MSERIAL)
MSERIAL=LTRIM(MSERIAL)
MSERIAL=RTRIM(MSERIAL)
LOCATE FOR DNO=MSERIAL
IF EOF()
@5,10 SAY "DISEASE NAME" GET MMNAME
READ
@6,30 SAY "ENTER THE SYMPTOM ASSOCIATED WITH IT 0 FOR NONE"
@7,30 SAY "==============================================="
SET COLOR TO GR+/B
@8,10 SAY "SYMPTOM 1:" GET SM1
@9,10 SAY "SYMPTOM 2:" GET SM2
@10,10 SAY "SYMPTOM 3:" GET SM3
@11,10 SAY "SYMPTOM 4:" GET SM4
@12,10 SAY "SYMPTOM 5:" GET SM5
@13,10 SAY "SYMPTOM 6:" GET SM6
@14,10 SAY "SYMPTOM 7:" GET SM7
@15,10 SAY "SYMPTOM 8:" GET SM8
@16,10 SAY "SYMPTOM 9:" GET SM9
@17,10 SAY "SYMPTOM 10:" GET SM10
@18,1 SAY "PRESCRIPTION:" GET MYPRE
@19,1 SAY "              " GET MYPRE1
@20,1 SAY "              " GET MYPRE2
@21,1 SAY "              " GET MYPRE3

APPEND BLANK
READ
REPLACE DNO WITH MSERIAL
REPLACE DNAME WITH MMNAME
REPLACE PRESCRIP WITH MYPRE
REPLACE PRESCRIP2 WITH MYPRE1
REPLACE PRESCRIP3 WITH MYPRE2
REPLACE PRESCRIP4 WITH MYPRE3
```

```
REPLACE SYMPNO1 WITH RR1+1
REPLACE SYMPNO2 WITH RR1+2
REPLACE SYMPNO3 WITH RR1+3
REPLACE SYMPNO4 WITH RR1+4
REPLACE SYMPNO5 WITH RR1+5
REPLACE SYMPNO6 WITH RR1+6
REPLACE SYMPNO7 WITH RR1+7
REPLACE SYMPNO8 WITH RR1+8
REPLACE SYMPNO9 WITH RR1+9
REPLACE SYMPNO10 WITH RR1+10
CLOSE DATABASES
USE SYMPTON
APPEND BLANK
REPLACE SPNO WITH RR1+1
REPLACE SPNAME WITH SM1

APPEND BLANK
REPLACE SPNO WITH RR1+2
REPLACE SPNAME WITH SM2


APPEND BLANK
REPLACE SPNO WITH RR1+3
REPLACE SPNAME WITH SM3

APPEND BLANK
REPLACE SPNO WITH RR1+4
REPLACE SPNAME WITH SM4

APPEND BLANK
REPLACE SPNO WITH RR1+5
REPLACE SPNAME WITH SM5

APPEND BLANK
REPLACE SPNO WITH RR1+6
REPLACE SPNAME WITH SM6

APPEND BLANK
REPLACE SPNO WITH RR1+7
REPLACE SPNAME WITH SM7

APPEND BLANK
REPLACE SPNO WITH RR1+8
REPLACE SPNAME WITH SM8

APPEND BLANK
REPLACE SPNO WITH RR1+9
REPLACE SPNAME WITH SM9

APPEND BLANK
REPLACE SPNO WITH RR1+10
REPLACE SPNAME WITH SM10
ELSE
@22,20 SAY "RECORD ALREADY EXIST"
ENDIF
@23,10 SAY "MORE RECORD YES OR NO" GET YESNO
READ
IF UPPER(YESNO)<>"Y"
REPEAT1=.F.
ENDIF
SET COLOR TO W+/B
ENDDO
```

```
RELEASE MYNO
RELEASE MYNAME
RETURN


*****PROCEDURE TO DIAGNOSE DISEASES
PROCEDURE DIAG
SET SAFETY OFF
     ARE MYNO[200]
DECLARE MYNAME[200]
DECLARE MYNO2[10]
DECLARE MYNAME2[10]
DECLARE NNO[10]
DECLARE SSV[10]
DECLARE MNO2[200]
DECLARE DDO2[200]

DEFINE WINDOW WIN1 FROM 4,1 TO 24,75 DOUBLE

REPEAT6=.T.
DO WHILE REPEAT6
YYES="N"

XX=1
DO WHILE XX<=10
NNO[XX]=0
XX=XX+1
ENDDO
F=1
DO WHILE F<=200
 NO[F]=0
MYNAME[F]="                                                    "
  2[F]=0
DDO2[F]="                    "
F=F+1
ENDDO

USE SYMPTON
WW=1
LC=4
DO WHILE .NOT. EOF()
MMN=SPNAME
DDN=SPNO
MMN=LTRIM(MMN)
MMN=RTRIM(MMN)
HHMN=SUBSTR(MMN,1,1)
IF HHMN<>"0"
MYNAME[WW]=MMN
MYNO[WW]=DDN
WW=WW+1
LC=LC+1
ENDIF
SKIP
ENDDO

SC=1
KK=WW   &&-1
RR=1
LC=1
CLEAR
@0,20 SAY "ENTER SYMPTOM NUMBER FOR THE DISEASE TO DIAGNOSE"
@1,20 SAY "==========================================="
SET COLOR TO BR+/B
```

```
@2,10 SAY "Use UP and DOWN arrow to browse for your symptom"
@3,10 SAY "Press ENTER key to enter symptom number and DIAGNOSE"
@4,10 say "Press Q for final diagnosis"
SET COLOR TO W+/R
ACTIVATE WINDOW WIN1
SET COLOR TO GR/B
@0,1 say "SYMPTOM NUMBER"
@0,20 SAY "SYMPTOM NAME"
SET COLOR TO W+/R
MSTA=" "
END1=14
BEG1=1
TEMPEND1=END1
TEMPBEG1=BEG1
subcount=1
DO WHILE BB<=14
@LC,1 SAY MYNO[BB]
@LC,20 SAY MYNAME[BB]
BB=BB+1
LC=LC+1
ENDDO

DO WHILE .T.
AA=INKEY()
IF AA=113
MSTA="F"
EXIT
ENDIF

IF AA=24
BEG1=BEG1+1
END1=END1+1
clear
SET COLOR TO GR/B
@0,1 say "SYMPTOM NUMBER"
@0,20 SAY "SYMPTOM NAME"
SET COLOR TO W+/R

IF END1=KK
END1=TEMPEND1
BEG1=TEMPBEG1
ENDIF
LC=1
BB=BEG1
DO WHILE BB<=END1
@LC,1 SAY MYNO[BB]
@LC,20 SAY MYNAME[BB]
BB=BB+1
LC=LC+1
ENDDO
TEMPEND1=END1
TEMPBEG1=BEG1
ENDIF
**************up begin
IF AA=5
BEG1=BEG1-1
END1=END1-1
clear
SET COLOR TO GR/B
@0,1 say "SYMPTOM NUMBER"
@0,20 SAY "SYMPTOM NAME"
SET COLOR TO W+/R
```

```
IF BEG1<1
 END1=TEMPEND1
 BEG1=TEMPBEG1
 ENDIF
 LC=1
 BB=BEG1
 DO WHILE BB<=END1
 @LC,1 SAY MYNO[BB]
@LC,20 SAY MYNAME[BB]
BB=BB+1
LC=LC+1
ENDDO
TEMPEND1=END1
TEMPBEG1=BEG1
ENDIF

**********end of UP

IF AA=13
MYES="N"
MSTA=0
@16,10 say "SYMPTOM NO " get MSTA
read
MNO[SC]=MSTA
SC=SC+1
IF SC>10
EXIT
ENDIF
@17,10 SAY "BIN DIAGNOSTIC (Y/N)?" GET MYES
READ
IF UPPER(MYES)="Y"
EXIT
ENDIF
@16,5 SAY "                                                    "
@17,5 SAY "                                                    "

ENDIF

ENDDO
SC=SC-1
CLOSE DATABASES
HH=1
USE DISEASE
mycount=0
QQ=1
DO WHILE .NOT. EOF()
IDSTA="N"
SSY[1]=SYMPNO1
SSY[2]=SYMPNO2
SSY[3]=SYMPNO3
SSY[4]=SYMPNO4
SSY[5]=SYMPNO5
SSY[6]=SYMPNO6
SSY[7]=SYMPNO7
SSY[8]=SYMPNO8
SSY[9]=SYMPNO9
SSY[10]=SYMPNO10
MYCOUNT=0
HH=1
DO WHILE HH<=SC
VV=1
DO WHILE VV<=10
IF NNO[HH]=SSY[VV]
```

```
MYCOUNT=MYCOUNT+1
ENDIF

VV=VV+1
ENDDO

HH=HH+1
ENDDO

NNO2[OO]=MYCOUNT
DDO2[OO]=DNO
OO=OO+1
SKIP
ENDDO
CLOSE DATABASES
DEACTIVATE WINDOW WIN1
USE DSTA
COPY STRUCT TO DSTA2.DBF
CLEAR

OO=OO-1
RR=1
DO WHILE RR<=OO
? NNO2[RR],DDO2[RR]
APPEND BLANK
REPLACE DNO2 WITH DDO2[RR]
REPLACE CCOUNT WITH NNO2[RR]
RR=RR+1
ENDDO
SORT TO DSTA2.DBF ON CCOUNT DESCENDING
CLOSE DATABASES
USE DSTA2
GO 1
WWW=DNO2
WWW=LTRIM(WWW)
WWW=RTRIM(WWW)
CLOSE DATABASES
CLEAR
@1,20 SAY "THE DIAGNOSTIC MESSAGE IS AS FOLLOWS"
@2,20 SAY "==========================================="
USE DISEASE
LOCATE FOR DNO=WWW
IF .NOT. EOF()
@5,20 SAY "THE PATIENT COULD HAVE:"+DNAME
@7,5 SAY "PRESCRIPTION:"+PRESCRIP
@9,5 SAY "PRESCRIPTION:"+PRESCRIP2
IF TRIM(PRESCRIP3)<>" "
@11,5 SAY "PRESCRIPTION:"+PRESCRIP3
ENDIF
IF TRIM(PRESCRIP4)<>" "
@13,5 SAY "PRESCRIPTION:"+PRESCRIP4
ENDIF

ENDIF
CLOSE DATABASES
USE DSTA
ZAP
DELETE FILE DSTA2.DBF
USE
@23,10 SAY "MORE DIAGNOSTIC (Y/N)?" GET YYES
READ
YYES=UPPER(YYES)
IF YYES<>"Y"
```

```
STORE .F. TO REPEAT6
ENDIF
ENDDO
RELEASE MYNO
RELEASE MYNAME
RELEASE MYNO2
RELEASE MYNAME2
RELEASE NNO
RELEASE SSV
RELEASE NNO2
RELEASE DD02

SET SAFETY ON
**PROCEDURE TO BROWSE THE DATABASES FOR SYMPTOMS AND DISEASES
PROCEDURE MOD4
USE DISEASE
DEFINE WINDOW WIN2 FROM 4,1 TO 24,75 DOUBLE
CLEAR
set color to gr+/b
01,10 SAY "YOU CAN USE BOTH LEFT AND RIGHT ARROW KEY TO BROWSE"
02,15 SAY "press ESC key to quit"
set color to w+/b
ACTIVATE WINDOW WIN2
BROWSE NOAPPEND NODELETE NOEDIT
DEACTIVATE WINDOW WIN2
RETURN
**************END OF THE SYPTON DBC PROGRAM
```