

**COMPUTER BASED INFORMATION SYSTEM FOR
CRIME PREVENTION**

(A CASE STUDY OF THE NIGERIAN POLICE FORCE)

BY

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CERTIFICATION

This is to Certify that "Computer based Information System for Crime Prevention (A Case Study of the Nigerian Police Force)" as a project was carried out by OSUNMOSU DADA ADEWALE of the school of P.G.D of Department of Mathematics/Computer Science, Federal University of Technology, Minna – Niger State.

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DEDICATION

This project is dedicated to the Almighty God for his mercies, glory and loving kindness over me and my family.

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Firstly, I give thanks to almighty God who is all in all in my life.

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ABSTRACT

The importance of computer in the society has greatly increased the appetite of its members for information processing and dissemination. This may be related to the high speed and its relevance in almost all society activities, hence the evolution of the Computer Based Information System. My Case Study "The Nigerian Police Force". Presently require a Computer Based Information System that will support and facilitate the eradication or reduction to the minimum the Crime Rates in the Society. This is done using the Decision and Support System (DSS), together with Management Information System (MIS) to generate reports that is used to guide and direct government policies in elimination of Crime.

TABLE OF CONTENT

CHAPTERS	PAGES
<u>CHAPTER ONE</u>	
INTRODUCTION	
1.1 HISTORICAL BACKGROUND	1
1.2 SIGNIFICANT AND SCOPE OF STUDY	2
1.3 OBJECTIVE OF STUDY	3
1.4 LIMITATIONS	3
<u>CHAPTER TWO</u>	
LITERATURE OF REVIEW	
2.1 PRESENT PROBLEMS OF THE NIGERIAN POLICE FORCE	4
2.2 PREFERRED SOLUTION OF THE NPF	6
2.3 COMPUTER BASED INFORMATION SYSTEM	6
2.4 TYPES OF COMPUTER BASED INFORMATION SYSTEM	8
2.4a MANAGEMENT INFORMATION SYSTEM & DECISION SUPPORT SYSTEM	9
2.5 INTEGRATED OF COMPUTER BASED INFORMATION SYSTEM	12

.6	PROCESSING COMPUTER FILES	13
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CHAPTER THREE

SYSTEM ANALYSIS AND DESIGN

3.1	RECOGNITION OF NEEDS	18
.2	THE SYSTEM DEVELOPMENT LIFE CYCLE	20
.2.1	PRELIMINARY INVESTIGATION	21
.3	SYSTEM ANALYSIS	24
3.4	SYSTEM DESIGN	28
3.4.1	OUTPUT	28
3.4.2	INPUT	29
3.4.3	FILES	
3.4.4	PROCEDURES	29

CHAPTER FOUR

SOFTWARE IMPLEMENTATION

4.1	INSTALLATION	31
4.2	TYPES OF INSTALLATION	31
4.3	SITE AND EQUIPMENT PREPARATION	32
4.4	TEST RUNNING	33

5	PROGRAMME DEBUGGING & TESTING	38
4	PROGRAMME DOCUMENTATION	39
4.5	TRAINING OF STAFF	40
4.6	HARDWARE REQUIREMENT	40
4.7	SOFTWARE REQUIREMENT	40

CHAPTER FIVE

RECOMMENDATION AND CONCLUSION

5.1	OVERVIEW	41
5.2	RECOMMENDATION	44
5.3	CONCLUSION	45

CHAPTER ONE

INTRODUCTION

1.1 HISTORICAL BACKGROUND

Computer based information system came in as a tool to solve problems.

Computer Based Information System will play a vital role in almost all areas and fields where computers are used e.g. library, law, engineering, business etc.

We are all aware that information is derived from analysis of data and useful for solving problems, therefore information is a potential function of data. Data becomes information when evaluated in a specific situation or applied to solving a particularly problem. This however can be categorized into two basic types of system that have evolved to meet business operation and management needs. Every processing and monitoring of activities have computers applied to the operation and control of business. This control function and related decision are supported by Management Information System. One of the important features of a management information system is exceptional reporting, which focuses on management attention on situations requiring corrective action. They final type of Computer Based Information System in the Decision support system which is used as a planning tool.

The Nigerian Police Force is an organisation, which is required to maintain law and order. The operational system of the Force is still purely manual.

The Nigerian Police Force operates manual filing system. This system makes retrieval of information quite difficult and often times impossible. When the force goes into data base information system, their information can be categorized and stored.

- (1) Homicide case;
- (2) Fraud case;
- (3) Robbery case;
- (4) Car theft case; and
- (5) General investigation etc.

Such information can be retrieved by whichever command requires it from the computer's data bank once they are all on-line. This will quicken investigations and crime can be reduced to a minimal level.

1.2 SIGNIFICANT AND SCORE OF STUDY

This project is designed for crime prevention using Nigerian Police Force as a case study.

This is to reduce crime to the barest minimum level. Due to the lack of Computer Based Information System in the Nigerian Police Force which has all the crime data in their possession on cardboard files, it has been chosen as a case study. With the aid of computer, data can be stored, retrieved and processed. This can be called a crime Data bank. This study will endeavour to set up a Computer Based Information System for the organisation.

1.3 OBJECTIVE OF STUDY

Computer Based Information System is very important in crime prevention. The society is highly corrupt. The process of filling and storing of data manually is very faulty. It takes time to obtain information, if at all it can be obtained. Sometimes, the investigating Police Officer (I.P.O) may be difficult to locate.

This project has looked into the major areas of Computer Based Information System, which are the Management Information System and Decision Support System.

Inherent in the project also is the algorithmic approach in developing a Computer Based Information System. Identifying the phases in the system-developing life cycle and describing the purpose and result of each phase with respect to creating a viable Computer Based Information System for the Nigerian Police Force.

I shall mention briefly the system analysis and design, software implementation which shall include installation, test running and documentation, recommendation and conclusion of the work.

1.4 LIMITATIONS

A general case study of the Computer Based Information System is cumbersome. I therefore limit my project to DATA COLLECTION, RETRIEVAL AND PROCESSING using Nigerian Police Force, Abuja Command as a case study because of the relevance of Computer Based Information System to the Establishment. For security purposes, the depth of this study will be limited to an extent.

CHAPTER TWO

LITERATURE OF REVIEW

PRESENT PROBLEMS OF THE NIGERIAN POLICE FORCE

The Federal Government of Nigerian established the Nigerian Police Force in order to maintain law and order in the Country. Over the years, the task of maintaining law and order has become very laborious and this can be linked with several reasons among the underlisted.

- i) Population explosion
- ii) Foreign culture inculcated into our culture
- iii) Lack of modern day crime combating facilities logistic problems.

Presently, the Nigerian Police Force has no Computer Based Information System. The system development life cycle is a project management technique. It acts as a influences for management control and decision-making and produces formal documentation as evidence of progress toward short and long-term goals.

This requires the creation of programme in a highly systematic approach that would execute step by step the specific requirement of the system. Since programming is algorithmic instruction directly into the Computer to execute a particular task, the idea of programming if handled efficiently would require the combination of proper instruction

with correct logic control. Modularity, which is also fully expressed in structured programming would enhanced such programmes efficiency. The modules one created and combined with the main programme in such a way that it makes debugging less cumbersome under such conditions programmes that does not meet the system specific requirement can be edited within a particular module and with much speed.

Preliminary investigation conducted by the Nigerian Police Force show that manual documentation seem to dominate their mode of record keeping. Information storage and retrieval as a result is slum and sometimes impossible. Ld data based programme found have not been properly utilized for crime management. Can be attributed to lack of standardized requirement analysis, system development and programming structures.

A formal system development life cycle has value in guiding development of the new and replacement of old problems.

- (a) Unnecessary lengthy time required in designing and developing a Computer Based Information.
- (b) Organisation decisions of storage of data within files most often the programmes that processes
- (c) The technology used for system development. The demand for technical specialist to produce a Computer Based Information System grows.

PREFERRED SOLUTIONS OF THE NPF

The problem affecting the Nigerian Police Force activities has called for system development procedure listed below with the following attributes:

- (a) The speedily development of system to most users requirement
- (b) Making use of standard Programming Language and ethnics
- (c) Provide enough flexibility to meet users changing requirement
- (d) Encourage the construction of system that are easy to modify and maintain over time

COMPUTER BASED INFORMATION SYSTEM

A Computer Based Information System is a management technique which does not actually make decisions but only provides information that can aid the management in making decision. Therefore the Computer Based Information System accumulates, organizes and distributes information for decision-making purposes. Information is provided through such a system in most organizations even though this does not mean that the information will be used in an effective manner upon receipt by the management. This in no measure explains how important the role of a user is in interacting with a computer. In the beginning, the user inputs data in a computer usable or machines readable format. During processing, direction is given by the user on how to process the data and at the end, users review information output.

For information to be efficient, the basic parts of any computer information system must be linked to form a functioning whole. This functioning whole is the system formation derived from the five basic components of a Computer Based Information System. These are Hardware, Software, People-Ware, Procedures and Data/Information. All these components must be functional for there to exist a Computer Based Information System. The Hardware are the Electronics/Electrical part of the system that aid the processing. The Software proffer direction with the People-Ware on what sort of information is being processed and how the information is processed. The procedures are the laid down rules/instruction required to achieve the specific requirement.

A Computer Based Information System can be grouped into four (4) basic phases based on the distinguished activities of the different phases:

- 1) The input phase;
- 2) The processing phase;
- 3) Output phase; and
- 4) Storage phase.

- i) **The Input Phase:** Involves the collection and representation of data to the computer in machine readable format.
- ii) **The Processing Phase:** Calculates, classifies, inputs data, sort data, summarizes data and perform logical process activities.

- iii) **The output Phase:** Provides the hard copy such as paper or microfilm.
- iv) **The Storage Phase:** Deals with the different storage facilities available which include Floppy Disk and CD ROM Tape etc.

Nevertheless, Computer Based Information System is a specific type of system that process data and delivers information to meet the requirement of people.

2.4 TYPES OF COMPUTER BASED INFORMATION SYSTEM

All information processing and delivery systems meet identified need of the user. Without users needs, there will be no computing requirement and hence no information system.

To understand the Computer Based Information System and the methodology for their needs, begins with identification of users and their needs.

We have three existing types of users information they are:

- 1) Capture/Maintain record of and report on Police Activities;
- 2) Manage and Control crime operations and activities; and
- 3) Plan for the allocation of money and other scarce resources, logistic, active policeman and equipment. All these can be grouped into two specialized Computer Based Information System
 - (a) Management Information System
 - (b) Decision Support System

2.4 (a) MANAGEMENT INFORMATION SYSTEM

This system is designed specially to channel a lot of numerous types of information through an organisation. In this system data is collected, collated and processed and made accessible to the management to assist in management's operation. A management information system enables management to produce information that compares actual performance with projected or past result. Much of this information is often in the form of reports.

This type of reports will enable the Nigerian Police to maintain, control and also serve as a communication link between various Police Command information units to enable effective and efficient coordination of activities. This MIS is composed of a data based computer system and the form in which data is distributed.

- i) **Information Collection Organisation:** Component in M.I.S is the Management of data base which must contain relevant and quantity information computer are used for safe keeping of information or data, efficiency and effectiveness at a lower cost
- ii) **The Computer System:** The computer with reference to management information system process data and generate information for use by the different units in the organisation. The information can take several terms such as reports on investigation on some matters which can be use for decision in the present or futures. They can be

generated if the request of management or on a regular basis as a matter of policy. These report can be categorized into three categories:

(a) **Schedule Reports**

Schedule reports are management information system issued at regular intervals. Such as annually, monthly, weekly or daily. The reports normally summarize trends and serve as the buses for projected, current and past levels of activities.

(b) **On Demand Reports**

On demand reports are used to monitor special events. For example if there is a robbery situation, the information of the people could be traced on the Police database for the true identification and historical capability of the people involved or alternatively the death of my suspect or accused still awaiting trial for identification.

(c) **Exceptional Demand Reports.**

Exceptional demand report are automatically produced by the computer wherever crime operations or activities darning and police reactions are not yielding positive results.

2.4 (b) DECISION SUPPORT SYSTEMS

A Decision support system is an information system with the capacity to support the management in the decision-making process. It differs from a Management information system in that the manager acts as an internal component in a management information system. In other words, the Manager interacts with the computer based information system' such that a decision is reached by an interactive process. As a result, decision support system are typically thought of as having interactive capability where the Manager establishes a dialogue with the information system.

For example, the Nigerian Police Force often needs information on Active Staff strength of the force, available number of ammunition, equipment, vehicles to meet the demand at hand. Government policies could also play a role prominent in decision support system.

i) **Interactive Decision Making**

The Information flow reflects to the interaction between the management and the computer system, or what is more commonly referred to as what if?

Analysis that is. The computer system generates the results of a management science model and the manager asks the computer, what if somethings were changed in the model?

ii) **Management Decision**

The final stage in the decision support system reflects the actual decision made by management. Based on information contained in reports, the solution results from management science models and what if?

Analysis, Managers make decisions. However, these decisions and their results in the form of feedback provide additional data for the database. As such, an ideal decision support system is an ongoing dynamic system that continuously updates itself.

2.5 INTEGRATED OF COMPUTER BASED INFORMATION SYSTEM

Computer Based Information System are designed to assist in the operation and management of organizations. Its back bone is the People-ware that are required to proffer direction to computer operations, these people-ware are so important and play vital roles in both Management Information System and Decision Support System.

Consequently, in entrenching a new system, the standard and skillfulness of each participant must be considered during programming. The system is fashioned with an interactive package that would aid authorized users on information retrieval or storage. This easy to use mode is to ensure that organizations do not spend much on staff training. This ensures that knowledge on the system usage can be passed within a short period. With proper documentation of programmes, auditing to meet the new system requirement is very and almost without cost. These are the things

taken into consideration during the integration of Computer Based Information System.

Generally, the development of a Computer Based Information System needs highly specialized Programmers and Analysts. For these to be an effective and efficient system, these Programmers and Analysts would have to work as a team requiring the organisation function knowledge of the decision making process of managers and the information need of the users. Therefore in integrating a business entity knowledge of the organisation with the knowledge of hardware, software, human-ware and data resources serve as important challenges for both the developer and user of Computer Based Information System.

2.6 PROCESSING COMPUTER FILES

The two types of Computer Based Information System have processing, output and storage requirements. This shows the importance of files during the different stages to process or store information. A file is made up of records and is termed as a group of related data items. A record is defined as a collection of field, and a field defined as related characters or bytes of data. A byte or character of data is made up of 8 bits.

FILES GENERALLY FALL INTO TWO CATEGORIES

i) **Data Files:** These are files that contain data and are classified according to how they are used.

- (a) Transaction file
- (b) Master file

- (c) Report file
- (d) Output file
- (e) History file
- (f) Backup file

- (a) **Transaction File:** Data input into computer – usable form and then retained only until it is time to process. It is stored in an input transaction file
- (b) **Master File:** Some data stored in Computer usable for lengthy periods of time after which it is used or retrieved and is updated during processing. A file containing such data is called a master file.
- (c) **Report File:** In large computer system, the volume of reports to be produced is so immense that a special smaller system is set up just to control and coordinate the printing of report. This is often true of major utility companies that produce millions of customer bills and statements each month. To make this report easier, the data necessary to produce the reports are the special computer system for printing after processing in the main computer.
- (d) **Output File:** Many computer software applications are designed to produce data as output to be used later by another program or application. An application is usually a group of related programmes e.g. payroll

(application of twenty programmes). A file that is created for this purpose is called an output file. It becomes an output transaction file when it is fed into another programme for processing.

(e) **History File:** Many establishments find it useful to produce reports that require analysis of data on past company operations. A file created to collect data for long-term reprinting purposes is termed a history file.

(f) **Back-up File:** There are copies of other files that ensure that data and programmes will not be lost if the original files are damaged.

2.6.2 Data used in the computer can be stored in the following way.

- i) Sequential i.e. Records are stored and retrieved sequentially.
- ii) Direct – records are not stored or retrieved in any special order.
- iii) Indexed sequential – records are stored in sequential order but with an index that allows both random and sequential retrieval.

a) **Sequential Storage and Retrieval**

The evolution of the sequential storage and retrieval method was based at least in part on the characteristics and limitations of the early storage medium and devices. Punch cards are of the

earliest secondary storage media were handled in sequential order as they were read by the card reader. This is not so for new storage media such as magnetic tapes, disks and diskettes. They support sequential storage and retrieval of data.

b) **Direct Access Storage and Retrieval Random Access**

This method is best suited to a situation in which only a few records in a file need to be accessed and in no particular sequence. The most common approach of accessing records directly is to use a unique element of data called a key field or key. This is contained in each record as a basis for identifying the record and for determining which storage location on the disk the record should be stored in or retrieved from. To determine where to store a record so it can be retrieved directly, the computer performs a mathematical calculation called Hashing on the key field value. This computer operation translates the records key field directly into an address. However, this method cannot be used with magnetic tapes and it is very inefficient in situations that require accessing all records in sequential order.

(c) **Indexed Sequential Storage and Retrieval**

This method is used almost exclusively with direct access micro computer storage devices to provide maximum flexibility for processing and has proven to be the most flexible business application.

In computer file storage, the address of the records location – on the disk is vital. It is also possible to create accessed using different key fields.

Generally, indexed sequential accessed method file organisation allows efficient regularly scheduled processing of large batches of data and irregular update with small amount of input. However, indexed access method is slower than direct access and the hardware and software needed for indexed file are more expensive than with sequential or direct – access organisation. In addition, indexing makes less efficient use of storage space.

CHAPTER THREE

SYSTEM ANALYSIS AND DESIGN

3.1 PROBLEM DEFINITION

Looking into the Nigerian Police Force operation system, it's no gainsaying the old system has failed to meet the need for which it was established originally. This is fully expressed in a system life cycle. The problem definition of a system analysis and design can be retrieved from the Computer Based Information System:

- i) Recognition of needs
- ii) Solution
- iii) Growth
- iv) Decline
- v) Observation
- vi) Replacement of Refurbishing

3.1 (i) **Recognition of Needs:**

In any organisation there is bound to be some sort of problem or need. In the Nigerian Police Force, the need for a Computer Based Information System cannot be ruled out. The increase in crime rate and the ease to retrieve information on such case for research and planning has shown the dearth of the old system. Space saving and longevity of information supports the development of a Computer Based Information System.

(ii) **Solution:**

This has to do with the methodology for developing system that would meet the set out requirements. It could be a modification of the old system or a development of new system altogether to meet the new requirement states.

(iii) **Growth:**

Growth comes as a function of the system acceptability. Obligation from other various unit of the Police Force. With the manual system been used by the force, the database is increased such that information processing (retrieval) becomes difficult.

(iv) **Decline:**

Decline set in, when the system requirement can no longer be met. In a situation like this, processing of information may be difficult and even in some cases impossible.

(v) **Observation:**

Observation is the dearth of the system. It becomes inefficient and un-useable. During this period, the users no longer want to make use of the system. There is a yearning for change. A change that brought the present inefficiency to be in the first place.

(vi) **Replacement:**

Modification of the whole system is necessary in order t meet the new users requirements. Over times, new development in

data requirement has occurred which the old system if modified may not be able to handle. In such case, a new system is developed. This new system replace the old system. This lead to rebirth of new life cycle while another life cycle is terminated as well.

3.2 THE SYSTEM DEVELOPMENT LIFE CYCLE

New Computer System's fervently replace existing manual systems, and the new systems may be replace after sometime. The process of replacing the old system by the new happens in a service of stages and the whole process is called the "system life cycle"

The system development life cycle of the Nigeria Police Force is an organized process carried out in phases. The beginning of a new system life cycle is the result of some "trigger" such as the perception of a business need, failure on limitations of the existing system causing dissatisfaction, or heightened awareness of modern developments. However, whatever the reasons, it's the management that will initiate the selection of a project for preliminary study or investigation

The phases are as listed below:

- i) Preliminary Investigation
- ii) System analysis
- iii) System design
- iv) Implementation
- v) Review
- vi) Maintenance

3.2 1. **Preliminary Investigation:**

This is the point where the proposed new system gain is first exposure and scrutiny. A problem is identified before any system design or development effort takes place. This problem is therefore reported to computer professionals who therefore take a brief study and this is reflected in the format.

- (a) **Preliminary Study:** The purpose of this survey is to establish whether there is a need for a new system if so to specify the objective of the new system
- (b) **Feasibility Study:** This is to investigate the project in sufficient dept to be able to provide information which either justifies the development of the new system,
- (c) **Terms of Reference:** It is good that a firm basic of investigation is established before the analysts start to pursue the project.

This terms form the basis and are produced so that the user can decide whether or not be warns to proceed with the project. The terms may lakes this farm.

- i) The title of the project
- ii) The subject
- iii) The development involved
- iv) The scope of the study
- v) The personnel involved

development, implementation and transition to the new system.

- vii) The social and other impacts of the proposed system, considering its effect within the organizations.
 - viii) **Cast:** the operation cast and any other development along the line.
 - ix) **Recommendation and justification:** out of many possibilities and options which are presented and contrasted and recommendation are made on which course of action should be followed. This will be described and are always presented as benefits to the users. However, the benefits should be quantified in terms of reduced costs or increased income.
- (e) **Planning:** The feasibility report include an estimate costs and time for the various stages in the life of the project from the system analysis and design through its programming, testing and final implementation.
- (f) **Fact Finding:** It is essential to gather all the facts about a current to ensure that all strengths and weaknes are discovered. Thus, when a new system is designed, as many of the weakness as possible are eliminated, whilst

- vi) The time frame for each stages
- vii) The amount involved for the total stages
- viii) The resources available to the analyst
- ix) The scope of work

(d) **Project Feasibility Report:** This report will show the information about what to be done

- i) The term of reference under which the study was made
- ii) A description of the current system and this will include the problems and way out
- iii) A description of the hardware and software of the proposed system.
- iv) A description of the functions of the proposed system.
- v) A description of the reliability of the proposed system, its flexibility, and ability to respond to the organisation changing needs in the futures. The security integrity and confidentiality of the information which is to be held will also be addressed.
- vi) A development plan which we show the resources and time-scales which will be required for the

retaining the strength. The following methods are applied. They are background reading, intervening, observation and record inspection.

3.3 SYSTEM ANALYSIS

Having made some progress with our investigation, there are some ideas about what the current system does, the data which it uses and the result which it produces. There is therefore enough basis for analysis. It is better to ensure that we represent a true picture of the current state of affairs within the organisation.

More so, there must be a restraint not to include ideas in the new system which has not been fully worked out. The aim of the stage is to ensure that all feasible alternatives are eventually produced. The present system must be criticised against the principles of procedure, after which the strengths and weaknesses of the system should be apparent.

The present system may be criticised against the principles of procedure which include:

- (a) Document flow chart
- (b) Problems and Requirement list

(a) **DOCUMENT FLOW CHART:** The most tangible form on which the data are encountered in which depicts the key documents and the physical resources such as the crime suspects, culprits, crime environment which are associated with the existing system. This shows the flow of these between the functional area within the

organisation. Such as personnel or officers in the crime investigation unit of the Nigerian Police Force.

These functional areas will be the source and / or the recipient of the document. This depicts:

- i) The documents and physical resources, such as culprits and suspects and evidences (exhibits), which flow within the system.
- ii) The sources and the recipients of the document or the physical resource.
- iii) The flow of the document resource.

The sources and recipients of these documents and the physical resources fall into two main groups:

- the internal functional areas: within the organisation
- the external functional areas – outside the organisation.

INTERNAL FUNCTIONAL AREAS: This is a functional areas is the Nigeria Police Force in which could be Homicide Unit, Fraud Unit of the Force.

EXTERNAL FUNCTIONAL AREAS: The external functional area could be the complainant, or the Management such as Police Commissioner. This is because they are outside the main processing part of the organisation. They are recipients of information and are not involved in the provision or the processing of that information.

This is mainly documents flow diagram, the under-listed points should be borne in mind.

- (a) The forms and other documents which are encountered within the system are used to provide the information. These documents must have been identified and samples collected in the course of the preliminary investigation.
 - (i) A list of the internal; functional area or internal entities. The offices and officers of the organisation such as the S.I.I.B Departments and its subdivisions, the Patrol Arms of the Force and store where five Arm and equipment are kept.
 - (ii) Make a list of the external entities – such as the complainants, Accused or Culprits, and Management – which send or received information, documents or physical resources.
 - (iii) Make a list of the Documents and physical resources such as registration of cases and wideness / suspects which flow with the system.
 - (iv) Draw up a document flow mating to show what documents and physical resources and functional areas.
 - (v) The documents flow diagram may be drawn from the matrix.
 - (vi) The document flow diagram represents the various external entities and functional areas linked by the flow lines. These flow lines bear the names of the documents or physical resources which passes between the two entities and have a single arrow head showing the

direction in which passes between the two entities and have a single arrow head showing the direction in which the document is flowing.

- (vii) Storage areas and files do not appear on the document flow diagram.
- (viii) Then document flow diagram is reviewed with the users (personnel of the Nigerian Police Force) to ensure that nothing important has been lifted out.
- (ix) When manual methods that is pencil and paper to produce the documents flow diagram and not an on-line documents package, then first attempts are changed when ones thoughts and the users comment feed back.

(b) **PROBLEM AND REQUIREMENT LIST:** As the Analysis proceed, there is a build up of a shortcoming list of the present system. This is a term principles of procedure. It deliberates on the economical, workflow, Reliability of the existing system.

Such requirements are those areas which the user prefers given that the main aim of the analysis is to produce a requirement specification. In recent years methods have been developed so that the Requirement specification can be produced in an implementation free form for which is intelligible to the user. Since part of the requirements are technical in nature and need some formal expression they might not be very intelligible to the user.

3.4 SYSTEM DESIGN

The implementation free nature of the Requirements Specification means that all feasible alternative designs are open to consideration. By applying judgment, skill and knowledge, the analyst interprets the requirement specification to create one or more system specifications. A system specification provides detailed documentation of the new system. That is it gives the detail of a particular implementation unlike the Requirements Specification, which is implementation-free. A system specification requires acceptance by management just as the requirements specifications does.

Activities connected with these phases involve design of the inputs, output and file formats, design of the system, control development of software for the new system, acquisition of computer and other resources to support the system and testing the effectiveness of the new system for operational readiness of the new system for operational readiness. In general, these activities translate the logical, functional requirements into the following elements:

- a) Outputs
- b) Inputs
- c) Files
- d) Procedures

3.4.1 OUTPUT: It is often necessary to consider what is required from the system before deciding how to set about producing it. These requirements will have become the clear later as the project progress. Choice of media will also have to be made.

3.4.2 INPUTS: The required input will depend greatly on the needs of output. The necessity for quick response from the system would determine the need for an on-line type of type. Consideration would be given to:

- (a) Data collection method and validation
- (b) Volumes of input documents
- (c) Types of input documents
- (d) Design of input layouts.

3.4.3 FILES: This is related very much to the input and output. Input is processed against the files to produce the output.

In a secure system, each person authorised to access the database is assigned a user account.

You create a user account by specifying a user name. Each user can also have a password for validation. A log on dialogue prevents unauthorised entry. The Account names and passwords differ in their case sensitivity. While the Account name is not case sensitive, the password would only allow access when it is typed with the same exact consideration of upper and lower cases.

3.4.4 PROCEDURES: Procedures are the steps which unify the whole process, which link everything together to produce the desired output. These will involve both computer and clerical procedures. It starts with the origination of the source document and end with the

output document being distributed. The design of the computer programs will constitute a major task in itself such as:

- (a) Form design
- (b) Internal checks
- (c) Design Test Data

(a) **Form Design:** This will include Personal Record Form, Crime Record Form and City Code Form, this are by-product of an operation within a procedure.

(b) **Internal Check:** The allocation of Duties such that there is an automatic checks on what is being done. No one person should be placed in the position of having responsibility for all aspect of operation.

(c) **Design Test Data:** Specify test data are developed to ensure the ability of the system to meet performance criteria. Test data are basically sample of events that the new system is expected to handle as it concerns the Nigerian Police Force.

CHAPTER FOUR

SOFTWARE IMPLEMENTATION

4.1 INSTALLATION

It has been implied that system is developed, tested and then put to use (installed). The process of installation should begin in the development phase by involving in the design of the system, the operation managers and others who will use the system and its outputs, for participation will make them familiar with the system. As the system is being diagnose for errors or commission (debugged), operating personnel can be participants valuate their knowledge of the details of the operation, especially of the nature and likelihood of usual events can assist in developing system tests.

A major decision associated with system convention lies in choosing the methodology to use. There are almost infinite numbers of plans than can be devised for phasing in one system and phasing out another. There are three basic method of changing over to a new system.

4.2 TYPES OF INSTALLATION

I. **Direct Convention**

The old system is discontinued altogether and the new system becomes operational immediately. This sudden system cut over may produce a gap in operation while the cut over is being

made. For this reason and because it is difficult to develop complex system without errors, this process is recommended only for small systems.

II. **Parallel Convention**

The old and new systems are run concurrently using the same inputs are compared and reasons for differences resolved. Output from the old system continue to be distributed until the new system has proven itself satisfactorily.

At this point the old system is discontinued and the new one takes its place. The drawback to this approach is that the workload for the user and information processing personnel is double for the duration of the parallel period. This include sensitive operations involving people related activities such as charging people to court etc. This is strongly recommended.

III. **Phased Convention**

A variation of either of the two basic method is the phased convention. The new system is substituted in stage. It is phased in one minor sub-system at a time. The fact that such phasing in is possible, however, can be a clear indication that the new system is no more integrated than the old one. Phasing in is usually impossible when a computerized batched system.

4.3 **SITE AND EQUIPMENT PREPARATION**

New systems usually involve new equipment. A major revision of facilities and offices may be required to house the added equipment

and staff. A new layout of work space may be needed to adjust to a revised work flow, whatever the reason, space planning is a must. The spaces to be occupied by people and equipment must include exist, utilities and storage areas, special requirements for environmental. Control (humidity, temperature, cleanliness of air etc.) must be considered. Safety conditions relating to fire, flood, general working environment must be met. The relationship between people and equipment should be determined early. Training is more successful if it is based on the exact way in which each employee will interact with equipment.

4.4 TEST RUNNING

The Programme Development Process

With the frame work of the system development life circle, computer programming is part of the implementations step in the building of a new system programmes are designed, written and integrated with other system resources to produce a functioning computer based information system.

Within the overall scope of a computer based information system, programming is accomplished through use of process within a process. The system development life circle be thought of as an overall umbrella under which a separate "programme process" fits and receive support. Programming is achieved by jotting down computer instruction in a programming language. The writing of codes, which is the instruction that controls the computer does from one part of the programming process. By the time code is written, the programme should have been conceptualized, structured and for all

intents and purposes developed at that point. Coding represent a means of implementing the ideals that are the real essence of the programme. The programme development process have five phase.

- (a) Problem analysis
- (b) Programme design
- (c) Programme specification
- (d) Programme code
- (e) Programme debugging and testing

1. **Problem Analysis:** The first step in the process should be developed to analysis these specification and building an understanding of the components of the programme to be developed. To demonstrate and document how the programming process works, our case study will be used. Programme Case Study : Assume that the Nigerian Police Force owns a micro-computer and want to develop a set of programme that will process records to keep records of the different cases every month. These records can be written in a "case registration form".

Now they wish to develop a programme that will process the data on their discharge, pending and confirmed cases. They will produce a case register at the end of each month. The register will be a list of their acquitted, charged and pending cases for the entire month.

Problem analysis employs a technique called Data Flow Analysis. As the name implies, this technique traces the flow of data from the

point of input, through computer processing, until output is produced. The purpose data flow analysis is to gain an understanding of the processing activities required to transform the input data into output.

2. **PROBLEM DESIGN:** The programme designed activities determine the structure of the programme. The structure of a programme is a way the computer process functions (identified during problem analysis) are to be organized and presented to the computer in an application programme.

For most programme, effective method of structuring programme is to focus on the three main functional parts that appear in virtually all programs. These three main program section and the type of processing activities that occur in each are

- (i) **Initiation Activities:** Occur one time only, at the beginning of processing;
- (ii) **Main Processing Activities:** Occur repeatedly but usually once for each record processed;
- (iii) **Termination Activities:** Occur once at the end of each processing.

This structure provides computer problem solving model that can be adapted for any program. It provides a framework for organizing, processing functions and for presenting them to the computer as an application program. Such as:

- (a) **Structure Charts:** A convenient way of describing the structure of processing function in a program is with "Structure Charts". This structure chart is for the case Register Program. This structure chart is composed of boxes representing modules of program with a number representing its hierarchical relationship with other modules. Also included is the rotation describing the program's logical central structure.

- (b) **Program Design Model:** The top level of the structure chart for the case Register processing program can serve as a model for the design of a wide variety of program even though there may be difference in the processing detail required. That is almost all program include activities for start-up (initialization), for main processing and for close down (termination). Further, most database program require an initial input from a file and a second input operation to read subsequent records.

- (c) **Flow Chart:** A Flow Chart shows the step by step sequence of computer operation necessary to solve a problem. In preparing flow chart, the programmer should follow a different thorough process from the hierarchical approach of structure design. In using flow chart, the programmer should consider the sequence of the activities that the computer will carry out. This type of design has been labeled the algorithmic

approach. An algorithmic approach is a recipe for solving a problem.

A flow chart for the case register program is presented in the appendix. In step by step sequence, this flowchart show the processing activities required to produced the case register. Flow charts do not represent the best method for designing larger, more complex programs. It simply becomes too difficult and error-prone to deal with a large number of detailed processing steps and to determine the best, logical sequence in which they will be performed. For complex programs, hierarchical method offers a number of advantages.

The end result of System Design on program development process is the chart, diagram or flow chart that represent the structure and logic of the diagram. Once this design step is completed, the program is ready to specify the actual computer operation needed for program processing.

3. **PROGRAM SPECIFICATION:** Processing specification consist of a series of brief, precise statement written in English. This elaborates upon the structure chart or of readiness for coding in the programming language to be used.

The English language statements prepared during this step corresponded closely with the instruction to be written in the programming language code. Therefore, this statements are called "Pseudo-Code". There are no grammatical rules for writing pseudo-

code. In general, each pseudo-code should be written in sufficient detail so that it can be coded directly into a programming language command.

This is a programming technique for structured programming. Therefore are two reason for using pseudo-code to indicate the sequence of computer operation rather than converting immediately from a design chart or diagram into a programming language. One of these is that the program is still in a design stage. Therefore the strict formality required by the programming language would inhibit design, flexibility. Further, the rate of coding error would be greater if the intervening pseudo-code could not been prepared. The second reason is that the programmer might not know, even at this point in the programming process the programming language to be used.

4. **PROGRAM CODING:** This sis an important part of the system development. In this part all the work done by system Analysts and Programmers are coded awaiting implementation. In this project the programming language used for coding in Microsoft Access. Microsoft Access is a Window based programming language and a Relational Database Management System.

Coding is done with simple commands that are close it English and are understandable in terms of what they do, with due consideration of important programming technique such as "Stepwise Refinement". This is used in order to drive at functional decomposition of programs.

5. **PROGRAM DEBUGGING AND TESTING:** Debugging is the identification and correction of syntax and semantic errors. Syntax errors are violation of the programming language used. Semantic or logical errors are flows in the design of the program structure or logic.

The presence of bug in a program is often symptomatic of poor workmanship on the part of the person who produce the specification or who wrote the program. When a bug is discovered it is important that the reasons for its occurrence are investigated fully and that the program design and implementation are reworked where necessary. Alternating programs to remove bug, often called "fixes" or "patches" invariable could produce "new bugs for old". Good programming involves the absence of syntax and semantic errors.

4.4 **PROGRAM DOCUMENTATION**

Documentation refers to any explanatory notes which will assist a reader of the program to understand the programmer's meaning., in Microsoft Access, there are remarks statement that are not executed during run time. This statements assist the programmer in understanding what a particular module or statement function implies.

4.5 **TRAINING OF STAFF**

The amount of training required for various categories of personnel will depend upon the complexity of the system and the skills presently available. The system analyst would require to ensure that all persons involved with the new system are capable of making it an

operational success. The following aids would be used as appropriate.

- (i) **Hand Books:** These will be produced as part of or development from the systems specification.
- (ii) **Courses:** Either full- time or part-time courses, often run by the computer manufacturers.
- (iii) **Lectures:** General background knowledge of specific areas, could be covered by means of lecture.

4.6 HARDWARE REQUIREMENT

The Software will require the following

- (i) An IBM Personal Computer or compatible with a Pentium processor and a clock speed not less than 166MHz with MMX for effective
- (ii) SVGA Monitor
- (iii) Enhanced Keyboard
- (iv) A flat bed scanning machine for scanning in identification image.
- (v) Printers (Laser and DeskJet) for printing out reported.

4.7 SOFTWARE REQUIREMENT

The program will run well on Microsoft Windows 95 or higher version with Microsoft Access 97 pre-installed. It support a Network environment

CHAPTER FIVE

RECOMMENDATION AND CONCLUSION

5.1 OVERVIEW

In summary, a computer based information system consist of hardware, software, data, human ware and manual procedure used for processing data and delivery of information. Though the types of computer information system can be found in daily activities of organizations, but in the course of this project it is limited to two major types.

- (a) Management Information System, and
- (b) Decision Support System.

A Management Information System is a Business System which provision past, present and projected information about the organisation and its environment. By definition a MIS does not require a computer, but in practice, most MIS do use Computer. The strength of the MIS in its regular recurring report and exceptional reporting which provides managers with information used to monitor operating status and condition.

Decision Support System is used to improve the quantity of a particular decision. The DSS is a toolkit managers can use to access company and other data and present results. A Decision Support System generally is directed at solving a specific, short-term problem. Though the decision support system is interactive and highly helpful in decision making, it does not make decision.

Furthermore, Computer Based Information System is a file processing system. It has two basic files information processing. Master file that retains information for longer period of time and the transaction file that contains present information on current activities, which however is used later to update the master's file. Computer based information system projects development is generally patterned essentially the same way as the Management of any project. The entire project is subdivided into phases and usually, each phase in to tasks. The four problems solving steps referred to earlier become the four stages of a system development project. They are stated below:

- i) Requirements / Investigation
- ii) Analysis and General Design
- iii) Detail Design and Implementation
- iv) Installation and revised.

Each stage ,is designed to produce a deliverable. A deliverable is a clearly identified product whose acceptance marks the end ,of a project phase. The model of any project can be deliverable. Once the model has been accepted by the review board, one can move from the general design phase to the detailed design phase. Acceptance of the deliverable thus marks the end of one phase and the beginning of the next one.

In business computer system development, most deliverables are documents. They might be reports drawings, program etc. To be

acceptable, deliverable must be readable (written in English, Drawn neatly and legibly, following any appropriate rules) and someone besides the author must be able to judge their accuracy and acceptability.

When a project is initiated, skilful managers not only specify the work that is to be done, they also establish acceptable criteria for each deliverable. Then as each document is delivered, it can be compared with the acceptance criteria for control purposes. If management does not specify acceptance criteria, it will not know if each phase was conducted properly and correctly. When projects are subdivided into phases and the end products of each phase identified, a project manager now develops a preliminary budget and schedule, based on the knowledge of the general scope of the system and the availability of resources such as analysts, users, and software. To visualize a schedule better, a manager can draw a chart. Throughout the project, the manager reviews the project progress and compares it to the schedule. Depending on how finely the project has been subdivided, reviews can take place once a week.

If reviews are conducted often enough, the manager can spot problems and address them before they get out of hand. This could be handled by adding more skilled personnel into the team, insisting on more cooperation from the user or purchasing software packages to aid the development team. Alternatively, managers might identify an insoluble problem and be forced to adjust the schedule.

Furthermore, computer system developer have discovered over the years that pictures do speak louder than words. More attention is paid on graphic during system development because they are more easily interpreted by all the people involved in the project – users, system analysts, computer operation managers, database administrators, and so forth. Generally, project manager involves breaking the project into steps, identifying what is to be accomplished in each phase, defining the deliverables from each step, scheduling time and personnel for each step, and then tracking actual progress against schedule progress and making necessary adjustment to keep the project moving.

5.2 RECOMMENDATION

This project is a little further development in Management Information System which is one of the tool in computer based information system. Due to the refusal of the Nigerian Police Force to give out necessary information that will aid the Decision Support System, the Decision Support System can be developed.

Consequently, I would recommend research on the Decision Support System which would support management decisions in a computer based information. This will take stock of such information as availability of arms, active service men, retention facilities, vehicles etc. With all these, report generated by the Management Information System will be matched and decision taken to address the situation be more effective.

5.3 CONCLUSION

Computer technology are generally accepted to meet the demand of the society. The shape and form of the demand are ass varied as the different activities ,in a society.

It is reasonable to say that computer will sustain its role in today's world, if adequate attention is paid on computer based information system. This is because computer based information system depends on a large extent on people.

With introduction of computer based information system into Nigeria Police Force will improve the efficient and effectiveness of the Force.

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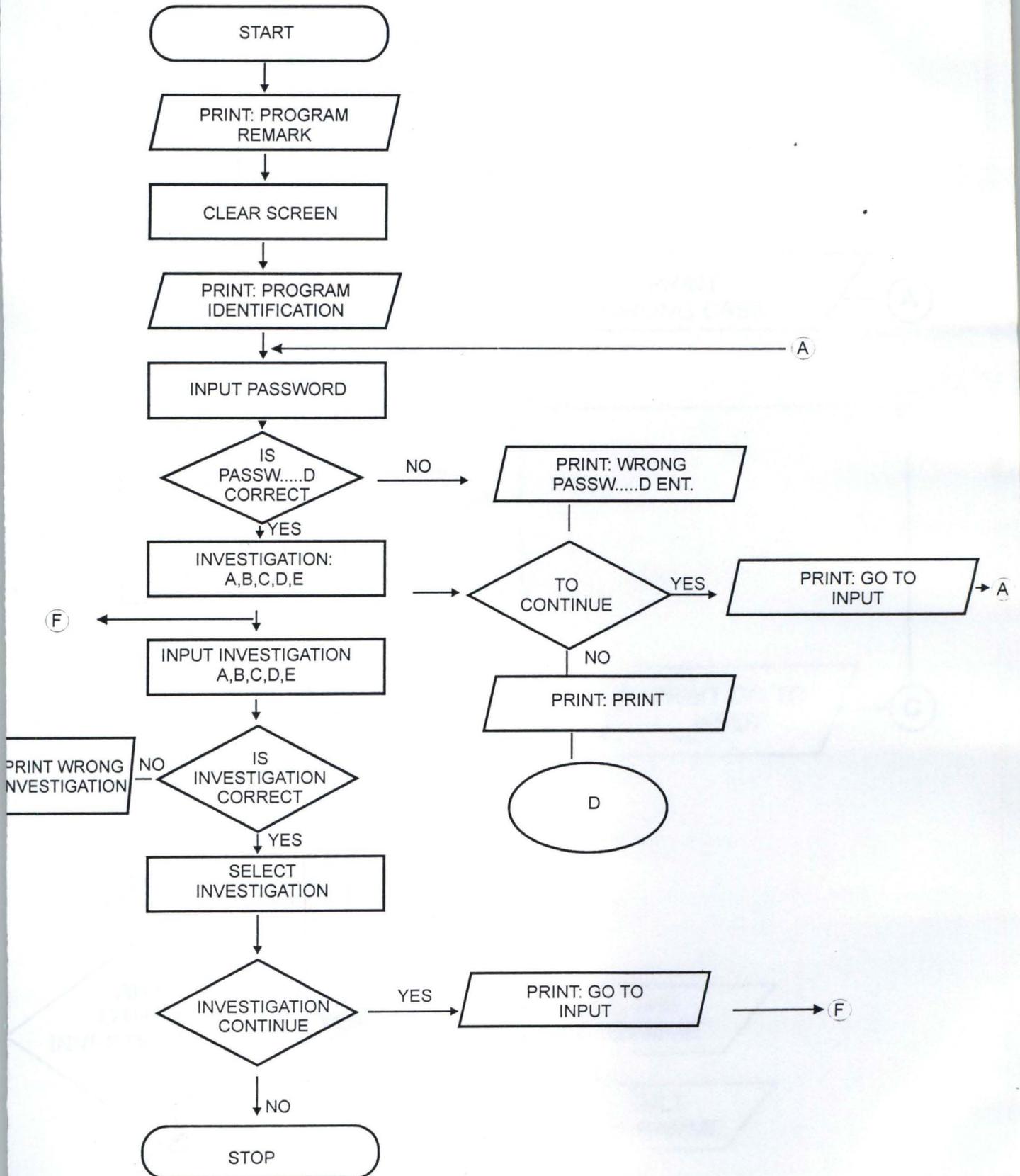
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FLOW CHART

INTRODUCTION



```
SET PROCEDU TO
SET ECHO OFF
SET COLOR TO B/W
SET TALK OFF
CLEAR
@ 1,1 TO 24, 79 DOUBL
@ 4,2 CLEA TO 22, 78
SET COLOR TO B/W
@ 4,2 TO 22, 78 PANEL COLOR
SET COLOR TO R+/W
@ 13,30 SAY "VIS-À-VIS"
@ 14,25 SAY "TONY CAR"
M=1
SET COLOR TO G+/W
DO WHILE T.
@ 11, 05 SAT " "
@ 11, 15 SAY "COMPUTERISATION OF INVESTIGATION TONY CAR"
@ 12,25 SAY "AND ANALYSIS PROCEDURE"
M=M+1
SEC = 0
SET COLOR TO B
AN=SPACE (1)
IF SEC. = INKEY (0.2)
CLEA
@ 2,3 TO 22, 78 DOUBL
" 3,10 SAY "COMPUTERISATION OF TONY CAR
@ 3, 54 SAY ANALYSIS PROCEDURE
@ 4, 14 SAY CASE (15) + "VIS-À-VIS"
" 5,14 SAY CASE (10) + "TONY CAR"
LT=0
J4=0
@ 10, 37 SAY CASE (15) + "ASOKORO FCT"
@ 8,10 SAY "A SOFT WARE PREPARED BY"
@ 9 5 SAY "....."
@ 9,30 SAY "JOHN MARY M" CASE
@ 12, 5 SAY "IF CAR TO BE FOUND"
@ 13,5 SAY NIGERIA
@ 14, 5 SAY "FCT"
SET COLOR TO B/W
SEC = INKEY (0.1)
CL=1
ENDIF
```

```
SET ECHO OFF
@20, 13 SAY "DO YOU WANT TO CONTINUE (Y/N)?: GET AN PILT "Y"
READ
IF AM='Y'
WAIT
CLEA
"14 5 SAY " "
@ 17 5 SAY "INVESTIGATION BY"
@ 18 5 SAY "....."
@ 17, 20 SAY A.SP JIDE
@ 19, 40 SAY APRIL 2002
CL = CL + 1
SET COLOR TO B
SEC. = INKEY (0.1)
WAIT
ENDIF
IF AN = 'N'
CLEA
EXIT
ENDIF
ENDDO
DO PASS D.
SET TALK ON
RETURN
```

```
* PROCEDURE MOD CASE
* THIS SUBPROGRAM IS FOR DATA ADDITION INTO CASE DBASE FILE
CLEA
SET TALK OFF
SET ECHO OFF
@ 2,5 TO 15, 76 DOUBL
SET COLOR TO GR + /WT
M INVESTIGATION = CASE (3)
M I CODE = CASE (9)
M I NAME = CASE (20)
M I ITEM = CASE (15)
INVESTIGATION CASE (10) TO CASE M(I)
DO WHILE - NOT EOF
GO TOP
@ 2,5 TO 22, 77 DOUBL
YN=CASE (1)
SET ECHO OFF
```

```
SET COLOR TO GR+
USE ITEM DBF
@ 15, 20 SAY "ENTER TONY CAR CODE" GET YN PICT "Y"
READ
READ
* LOCATE COMMAND WI, LL BE USED TO SEARCH FOR THE CASE LOCATE
FOR TONY CAR CASE = M
IF NOT FOUND ( )
CLEA
@ 11, 10 TO 17, 70 M
@ 13, 25 SAY "WRONG CASE CODE ENTER.....!!!"
@ 15, 25 SAY "PLEASE ENTER CURRENT CODE.....!!!"
@ 20, 28
WAIT "PRESS A KEY TO CONTINUE WORK.....!!!"
CLEA
RP = " "
@ 23, 20 SAY "TO CONTINUE (Y/N)? "GET. RS PICT "Y"
READ
ENDIF
IF FOUND ( )
CLEA
@ 12, 5 TO 16, 74 DOUBL
SET COLOR TO W/G+
SET ECHO OFF
@ 14, 25 SAY VIEW INVESTIGATION (Y/N)?:"GET RS PICT "Y"
READ
IF RS="Y"
@ 4, 6 CLEA TO 17, 77
@ 5, 7
LIST ALL INVESTIGATION
CLEA
SET FORMAT TO CASE
READ
ENDIF
IF RS = "N"
SET FORMAT TO CASE
READ
ENDIF
ENDIF
AN=CASE (1)
CLEA
SET ECHO OFF
```

```
SET COLOR RO G+
@ 12, 10 TO 16, 70 DOUBL
@ 14, 15 SAY "TO MODIFY MORE INVESTIGATION (Y/N)?: "GET AN PICT "Y"
READ
IF AN= "Y"
CLEA
RETURN
ENDIF
CLEA
CLOSE ALL INVESTIGATION
EXIT
ENDIF
ENDDO
SET TALK ON
SET CLOCK OFF
RETURN
```

Case - Wrongful Arrest
Reported - 5th January, 2002
Complainer - Mr. S.B. Shokoya
Address - Area 12, Garki-Abuja
Time Reported - 9:15 hr
Case - Land dispute at Gwagwalada
Reported at - Gwagwalada 'A' Divisional Police Station
Driver - Mr. P.T. Bama
Seller - Mr. Zakare
Investigating Police Officer - Inspector Tokunbo
Acquiesced - Mr. Tony
Investigation - Document shows that Mr. P.T. Bama

is the owner

Mr. Tony was picked because he was farming on the Land.

Mr. Shokoya's land is beside Mr. Bama's Land

Shokoya report the case because His pillar was wrongfully placed.

On investigation, Mr. Tony was released because Mr. Bama confirmed that he authorised Mr. Tony to use the land for farming.

Case referred to Area Council for confirmation on who owns the land.

Mr. Bama was confirmed as the owner and not Mr. Shokoya.

Mr. Bama and Mr. Tony seek for the case to refer to court for wrongly Arrest and damages.

Case referred to court.