COMPUTERISATION OF LAND ALLOCATION
(A Case study of Ministry of Lands, Survey, And Town Planning, Minna, Niger State)

BY

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April, 2002.

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A PROJECT SUBMITTED TO THE DEPARTMENT OF MATHEMATIC/COMPUTER SCIENCE, IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF POST GRADUATE DIPLOMA IN COMPUTER SCIENCE OF FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA-NIGER STATE.

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ACKNOWLEDGMENT

CERTIFICATION

This is to certify that the tittle, computerisation of land allocation (A case study of Ministry of Lands, survey and Town Planning, Minna, Niger State), was done by Yaya Graba Isah PGD/MCS/2000/2001/1016 and that the work has been read and approved having met the requirement for the award of Post - Graduate Diploma in Computer Science in the Department of Mathematics /Computer Science of the Federal University of Technology, Minna.

Mall. Abubakar Usman Yusuf
(Supervisor)

Date

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Date

(External Examiner)

Date

DEDICATION

This book is dedicated to the Almighty Allah for his mercies over us. And my beloved family.

ABSTRACT

From the existing manual system, it was observed that the land allocation within the Ministry, which involved opening a file, processing the file through all the departments before allocation, has not being fast and easy.

A computer programme in visual basic language has been written as introduction of new system for the land allocation, which is a computer system based. It will make the allocation faster, effective and efficient services, without duplication of record and will be easy to retrieve information about a particular plot or piece of land.

CHAPTER ONE

GENERAL INTRODUCTION

1.1 INTRODUCTION TO LAND ALLOCATION

The project covers activities in the Ministry of Lands Surveys, and Town planning, Minna, Niger State for Allocation of land, production/retrieved of information about land allocated to individuals, private and government organisations in Niger State, thus the many characteristic of various sizes and purpose of land allocation are taken into consideration in the design. Entry of input in the system is through the keyboard, scanning and visual display unit.

The computarisation of land allocation is design to combine the advantages of the manuals and system as flexible and easy access to information and straight forward operation with improved accuracy, avoidance of duplication and better management information.

1.2 BRIEF HISTORY OF NIGER STATE MINISTRY OF LAND, SURVEY AND TOWN PLANNING

The Ministry of land, survey and Town Planning Minna, is created in the Year 1999. Prior to this year, it has been as a department under various ministry since the creation of the State in 1976.

The Ministry is headed by a Commissioner follow by Permanent Secretary, that finalised the administrative affairs of all the departments which include the following:-

i)   Survey Department Headed by Director of Survey. (Surveyor General)

ii)   Lands Department Headed by Director of Lands.

iii)   Town Planning Department Head by Director of Town Planning.

iv)   Administration and Personnel Department Head by Director Admin. and Personnel.

1.3 PURPOSE OF THE STUDY

The purpose of the study cannot be over emphasised because with the introduction of source code or key field name, a plot cannot be allocated to two applicants because as it is inputted into the computer the key field name or source code shall be able to detect the plot number 'A' has been allocated already, thereby the issue of double allocation, or encroachment, i.e one plot allocating to two applicants will be eliminated.

1.4 OBJECTIVE OF THE STUDY

The study treats the retrieval of informations and allocation of plots within Niger State, and the objective of this project are:

a)   Development of computerised methods of checking allocation of plots within Niger State in order to stop the cases of mixed up or double allocation of plots.

b)   To provide an opportunity for the Ministry on how best information on plots or land allocation can be carried out.

c)   To provide means of generating summaries of the allocation of land within the state.

d)   To provide appropriate security to the nature of information collected and held.

e)   For the system to allow interactive and batch mode of processing for the preparation of the best methods of allocation of land or plots within the state which could be monthly, quarterly or yearly reports of the allocation.

1.5 DEFINITION OF TERMS

GEOGRAPHIC INFORMATION SYSTEM (GIS)

GIS is a computer system, which perform operation on spatial data, that is data which have positional references. GIS interest is the spatial data; it is therefore necessary to understand spatial data as geo-references data that have

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shape, size, dimension and physical form. They represent features of our real world, maps and drawings, are historical spatial database. Spatial information has two major components namely:-

1) Graphical

2) Non Graphical

Graphical (or geometrical) information refers to the shape, size and length of features and how the features are spatially related to one another (Topology) Non graphical information on the other hand, refers to the attributes of a feature such as the name of a highway or the owner of a land parcel. Regardless of how the information is actually stored on the computer.

It is sometimes convenient to regard the database as being composed of the graphical database and the attributes, each of which is related to the other. A computer data base containing predominantly spatial information is called a geographic information system. For this database to be of any use, a computer system must be built around it to allow for easy input analysis and display of information.

Spatial information is therefore the term that encompasses data and knowledge about the location and distribution of earth related entities. These entities can be natural object such as trees, natural phenomenon such as precipitation or man made.

Object such as land percel or man made phenomenon such as population densities. A spatial information system is used to create, maintain and to disseminate such information, it includes the organisational context, or structure that manage the system and procedures and tools, such as geographic information system GIS registered for systems operation.

1.6   LIMITATIONS OF THE STUDY

The limitation of the project is that it should covers and check whether the plot with certain number "A" has been allocated initially using the key field name that will be introduced later in the project. And the scope of the project is that the project will be design in such a way that all the layouts, maps of any area should be inputted or scanned in the computer and when allocated, there will be source code or key field name to detect the status of the existing plot within the area.

CHAPTER TWO

IMPORTANCE OF COMPUTER IN LAND ALLOCATION

2.1   WHAT IS A COMPUTER

A computer is essentially an electronic device which processes data supplied through any available input device (e.g keyboard), into information which can be stored in its memory or communicated to the user via any available output device (e.g. screen).

The commuters used in Data processing composed one or more electronic machines using digital signal for recording and moving data and instructions. Thus, an interface has to exist between the computer itself and the users to (a) provide it with instructions and raw materials (b) understand the information produced by processing the raw material.

2.2   HISTORICAL DEVELOPMENT OF A COMPUTER SYSTEM

The historical development of computer in Data processing ranges from the pre-modern (Early man) Abacus to the latest development in computer technology.

STAGE 1:   THE PRE-MODERN ERA ABACUS (450BC)

The Early man was the first to recognize data processing system in the history of mankind by making use of the frigers of his hands to represent the members. The next major step taken by the first civilization was to represent members by means of stones in heap of ten. This in turn lead to the development of Abacus or counting frame of beads used by ancient Greeks or Romans and even today by many shops in China. This relatively sample device is a frame with bead arranged in parallel with wire at the middle represent figure. Arithmetic calculations are performed by manipulating the beads.

STAGE 2:   NAPIER'S BONES (1617)

The invention of logarithms by John Nepier, is a landmark in the history of

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computing.

Logarithms enable us to multiply and divide large members quickly, accurately and easily.

As a by-product of logarithms, Napier devised a tools for multiplication and division that was nick named Napier Bones

STAGE 3: PASCAL ADDING MACHINE (1642)

In 1642, Blaise Pascal produce the first mechanical calculating machines. In his machine pascal replace beads of the Abacus by cylinders with the number 0 - 9 and engraved it around the circumstance of the beads.

STAGE 4: LEIBNIS'S CALCULATOR (1671)

Gottfried Von Leibniz in 1671 developed a machine which was an inprovement of pascal calculator. It utilized the same technique for addition and subtraction of the pascal device. In addition, it can now perform multiplication and division of members

STAGE 5: JACQUARD WEAVING LOOM

In 1801, Joseph Marie Jacquard developed a method of controlling operations of a weaving loom with the use of holes punched into card. This devise was called Jacquard weaving loom. The holes punch into appropriate position on the card and could be mechanically programmed to weave specific pattern and to use specific colour. Jacquard device was the prototype of thje punched card machine which we are using today.

STAGE 6: CHARLES BABBAGE

In 1822, Babbage built his first different engine. It is a small machine involving several linked adding machine which will automatically generate successful value of simple algebraic function using the method of finite difference.

STAGE 7: HOLLERITH TABULATING MACHINE

Toward the end of 19th century, Dr. Herman Hollevith modified the idea of

babbage different and analytical engine to produce a machine to speed up to task of taking national census in U.S.A. The machine that Hollerith design incorporate manual operator which consist of punched card with holes punched on a card of 80 column and 12 row, that can be read using electronic means. This machine was capable of tabulating and sorting numbers and they used it for data processing for the population census in 1890 in U.S.A.

STAGE 8: MARK 1

In 1036, Prof. Howard Aiken in collaboration with IBM (International Business Machines) construct the Automatic sequences controller calculator.

This machine was an electronic device which make use of counter wheel to store numbers in decima form.

STAGE 9: ENLAC

This machine could complete in one hour as many calculations as the mark 1 - could do in a weak.

The major short - coming of ENLAC was its inability to store programmes along with the data to be processed.

STAGE 10:   EDVAC *(Electronic Discrete Variable Automatic Computer)*

In 1946, Manuchly Eckert thought of another device that could incoporate Dr. Von Neumann's idea of stored program.

These men aimed at constructing a device EOVAC, but their intention was not immediately achieved as they both separated to float their separate companies.

STAGE 11:   EDSAC *(Electronic Delay Stored Automatic calculator)*

This was the first computer to use the stored program. It was developed by M.V. Wilkes of Cambridge University. The stored program concept allows modification to be done during the execution of program as intermediate result, data and infact the programs could be stored for future use instead of the usual repetition each time a program is run (executed).

Recently, we have other electronic commercial and scientific computers that was designed by the pioneers of EDSAC. Notably among these UNIVAC, I, II & III (Universal Automatic Computer), IBM (International Business Machine) system / 360 series, Burroughs and Honeywell.

2.3 COMPONENTS OF A COMPUTER SYSTEM

A computer system consists of a number of components each performing a specific function.

The basic components include i) Input device (used to send information to the computer). ii) A central processing unit. iii) Output device (that communitcate results to human).

These physical components of the computer system are called HARDWARE.

iii) **INPUT DEVICE**: Input devices are used to enter data into the computer. This Unit facilitates flow of information into the computer memory from source cards. It translates information in form acceptablle to the computer. The form in which the information is translated into so as to acceptable to the computer is binary numbers.

Some common input devices are the keyboard, disk drives, tape drives and light pens.

ii .THE CENTRAL PROCESSING UNIT (CPU)

The most complex and powerful of a computer system is the CPU - just as the brain in the centre of human activity, in exactly the same way, the CPU is central to the operation of computers.

The CPU can store data temporarily it can be also perform operation on these data - the CPU can be thought of as the "brain" of the computer. The CPU comprises three major units. There are the control unit (CU), the arithmetic's logical unit (ALU) and the primary storage unit.

Just as the cerebellum is the part of the brain that controls vital organs of the body, the CU directs processor activities for the various devices that are attached to it. As the cerebellum is to the brain, so is the CU to the CPU.

The control unit is in charge of the activities of the CPU. It does not process or store data itself, but instructs, various parts of the computer in performing these tasks.

Just as the cerebrums is the centre of thought and decision of the brain, the arithmetic and logic unit (ALU) is the reasoning centre of the CPU. This controls all operation of Arithmetic and logic.

The primary storage unit is the component of the CPU that temporarily stores program, data and results. It is also referred to the main memory, primary memory or internal storage, and it holds program instructions, data and the intermediate and final results of processing.

Figure 1.0 shows a diagram of a Basic components of a micro computer system.

2.4 CAPABILITIES OF A COMPUTER SYSTEM

The computer is a workhouse, it is generally capable of laboring 24 hours a day, and will do the ten - thousandth task exactly the same way it did the first one. There are at least six reasons why computer have become an indispensable to our lives:

i) **SPEED**: A computer carry out its tasks with great speed usually measured in micro seconds (one millionth of a second). The speed of the computer also makes it ideal for processing large amounts of data, as in accounting systems and scientific applications.

ii) **RELIABILITY**: Computers are extremely reliable. Any error in the output of a computer system, is as a result of human error in input.

iii) **STORAGE CAPABILITY**: Computer system are able to store tremendous

amouunts of data, which can then be retrieved quickly and efficiently. This storage capability is especially important in an information age.

iv) **PRODUCTIVITY**: Computers are able to perform boring, dangerous, or highly sensitive jobs that people should not perform or in same cases cannot perform, such as working with nuclear fuel rods. Computers also free human being from other kinds of productivity.

v) **DECISION MAKING**: Because of expanding technology, communications, and the interdependency of people, we suffer from an information deluge. Although this is in part brought on by the computer, it is also the computer that will help solve it, to make essential business and governmental decision managers need to take into account a variety of financial. Geographical and logistical factors. The computer helps the manager's sort "wheat from chaff and make better choices.

vi) **REDUCTION IN COST**: Finally, for all of these reasons, the computer helps reduce waste and hold down the cost of labour, energy, and paper work, thus computers increase productivity and reduce the costs of goods and services.

2.5 APPLICATION OF A COMPUTER SYSTEM

Applications of computers are as varied as we can image, but the following are some of the principal applications:

i) **PAPER WORK**: Our present society runs on paer and computers have revolutionized the way paper work is handled. Computers are used to prepare manuals, documents, letters, memos and other types of written communication.

ii) **ENERGY**: Oil companies use computers to locate oil, coal, natural gas, electricity companies use computer to monitor their vast power networks.

iii) **GOVERNMENT**: Computers are used in most government activities. They

are used for forecasting weather and river flow, and for collecting taxes.

iv) **EDUCATION**: Computers are used in the administration, record keeping and accounting in Secondary schools and Universities.

v) **INCREASE IN SOPHISTICATED CRIME**: The speed of operation of the computer and the increased in automated banking has made it possible for hi-tech criminals to commit their nefarious activities in equally blinking speed with less chance of being discovered.

STORAGE DEVICES
e.g. FLOPPY DISKETTES,
MAGNETIC TAPE DISK.

CENTRAL PROCESSING UNIT

INPUT DEVICES
e.g. KEY BOARD
DISK DRIVE,&
OTHER DEVICES

OUTPUT DEV-
ICES
e.g. T.V.
MONITOR,
PRINTER

RAM
TEMPORARY — MEMORY

ROM
PERMAN-
ENT.
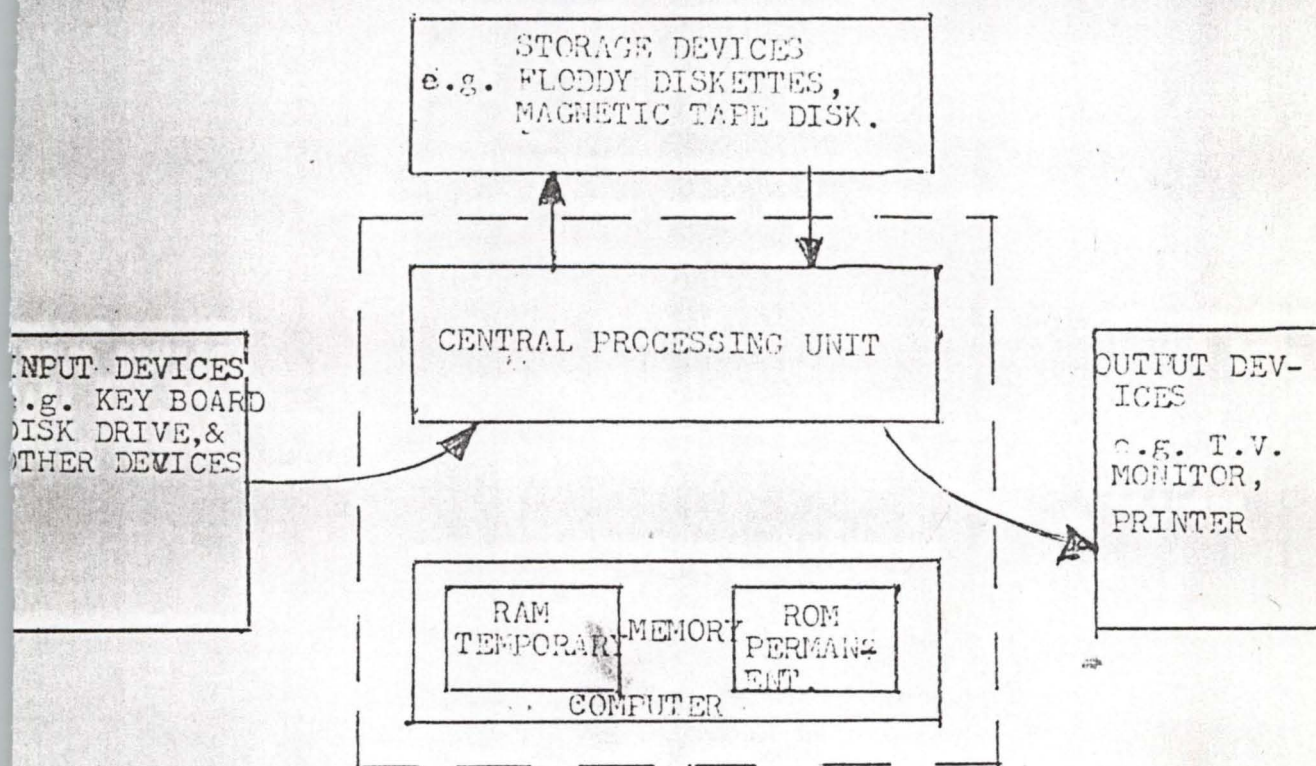
COMPUTER

BASIC COMPONENTS OF A MICRO CPT. SYSTEM.

FIG. 1.0

CHAPTER THREE

3.0 SYSTEMS ANALYSIS AND DESIGN

Before a computer can be used within a business or an organisation, to carryout task previously under taken by other means. It is important to examine the established procedures by which the business operate to see how they need to be changed to enable the efficient used of the computer. And this study is called system analysis which usually result in the design and implementation of a completely or partially new system.

It involves, analysis of all the different activities of the organisation developing detail procedures for collecting, manipulating and evaluating of all the related data. And the reason for the analysis to understand better activities of the establishment and the stages includes the following:-

f.   Feasibility study

g.   Investigation and facts reading

h.   Design and implementation

i.   Data analysis and review.

3.1 INTRODUCTION TO AN EXISTING SYSTEM

The present system that is existing is the manual methods of land allocation within the state, by the department of lands, where the form are filled and submitted by the applicants. Plot could be allocated by Director of land or land allocation committee after going through the data supplied by the applicant. And the first to analyse here is the organisation's main objectives of the system, based on the phases mentioned above.

3.2 FEASIBILITY STUDIES

The main reasons for the feasibility study is to be able to look at the project

that is sufficient to department to be able to provide first and update information which will satisfied the reason for the new system. At the course of this study data was collected about the difficulties faced with the existing system which includes slow access to files - it is not always easy to access information contain in the file because of too much volumes of files which are filed manually.

a. Less security and privacy of files as files are manually kept which sometimes not properly kept, there could be less security and privacy of files which could lead to cost of data or information.

b. Misplacement of files. This misplaced of files is carried after accessing it for an information which normally result in days of delay in accessing the files at another time, thereby as a result delay the management decision since they are based on files.

c. Constant direct charting on the survey records, causes wear and tear of the records easily.

3.3 EXISTING SYSTEM AND ITS PROBLEMS

From the existing system it was observed that the land allocations within the ministry, the planning and survey record keeping and retrieving has not being easy, with the problems and difficulties mentioned in 3.2 (Feasibility Studies), thus I suggested that there is the need for new methods of land allocation procedures, with the studying how the existing system work.

3.4 INTRODUCTION TO A NEW SYSTEM

The main purpose of this study is to fully understand the existing system and to identify the basic information requirement which is done manually. The new system for the land allocation within the State, the Ministry of land, survey and town planning shall be computer system based which will make the allocation

faster without duplication of record and it will be easy to retrieve information about a particular plot or piece of land which save time and to reduce management cost.

For record updating, record keeping and record generation will be included in the new system.

3.4.1 THE NEW SYSTEM AND ITS BENEFITS

The new system for the land allocation within the Niger State by the Ministry of Lands, Survey and Town Planning Minna, shall be Computer System based.

– It make the allocation faster without duplication of record
– Information can be retrieved easily
– Giving a proper and update record keeping
– Information sharing between the various units of the department will be easy and help in management timely decision
– It gives better services.

3.5 SYSTEM DESIGN

System Design is a process of planning a new system or replace an existing one or complement an existing system.

In order to design a database system we have to create an image of the real world in the Computer memory and provide the means to retrieve it.

To represent a feature in the Computer in a comprehensive way two types of data are required.

1. Positional or graphic data
2. Attribute or semantic data.

The positional representation should describe the position of a feature and

eventually its shape and size, while attribute data should give all other properties of the feature. For instance in this project, as in a case of cadastral parcel of land where the position, size are determined by the co-ordinates of the corner points and its attribute will includes the name and item number of the owner use etc.

All the maps and layouts must be store in the Computer through scanning before the commencement of allocation.

3.6 DATA SPECIFICATION

The main purpose of this study is to fully understand the existing system and to identify the basic information requirement.

Basically, land allocation's applicants file is made up of the following data specification.

1. Name the Applicants:..
2. Contact Address:..
3. Nationality:...
4. State of origin:...
5. Local Government Area:...
6. Home Town:..
7. Occupation:...
8. State whether its individual, company or organisation, and attached Certificate of incorporation and other necessary document as the case may be:......................................
9. Name and Address of Agent or Reg. Particular:...
10. Specific purpose for which the land is required:..
11. Sufficient description of land including size of the plot required and the area, layout number. (For layout, the code is MTP i.e Minna Town Planned Area).

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11. If the land is outside an approved layout attach a sketch plant if the area:.........................

12. If the land is developed attach valuation report:...

13. Attach Age Declaration:...

14. Attach 3 years Tax Clearance:..

15. If you have been allocated a plot give sufficient description of the plot:.........................

16. Any other relevant information:..

3.7 FLOW CHART AND ITS IMPORTANCE

The next challenge is to translate the system design and specification into instructions that can be interpreted into programs and executed by the Computer.

It is said the "A picture is worth a thousand words" and so it is with programs. It is much easier to understand the flow than if we hear a description.

A flow chart is a diagram of a process. It consists of symbols, indicating operations; and connecting lines indicating how the process moves from operation to operation. Differently shaped symbols are used for different types of operations. (refer to figure 2.0 for the flow chart).

3.8.1 HARDWARE REQUIREMENT

From the user - requirements survey, the following system configuration is recommended:

HARDWARE:-

iii) Database Management Subsystem - One pentium - based PC with minimum of 16 MB RAM, 4.0 GB, HDD, 1.44 MD FDD. CPU speed = 166 Mh. Full multimedia with peripherial.

iv) Map Digitizing Module - A Q Digitizer and peripheral

v) Map Scanning - A φ Scanner

vi) Data Acquisation - A hand held GPS

- A handheld GPS
- GPS receive with one reference and one rover relevant computer hardware

vii) Information Presentation Subsystem

- One A φ plotter (colour)
- One laserjet printer

3.8.2 SOFTWARE SPECIFICATIONS

i) *Data Base Management Subsystem*

- DBMS e.g dbase iv for Dos or dbase v for windows
- OS, Dos 6.2, and window 98 or 2000

ii *Map a Gigitizing Module*

- CAD e.g. Auto CAD, Micro station etc or vector GIS e.g. interhraph MGE.

iii *Map Scanning*

- Raster - based graphic package e.g. Paintbrush or Raster GIS

iv Information Presentation Subsystem

- CAC e.g. Map Publisher.

3.9 COST ANALYSIS

A cost analysis is necessary to determine economic feasibility and to see best how the project research can be able to advice the management of the organisation to consider the change from manual system of land allocations to computer base system, hence the primary objectives of the cost benefit analysis is to find out whether it is economically with while to invest in the project.

In course of this research project certain elements of the cost was recommended to the management which includes:-

a) **Equipment Cost**

i) Data base Management subsystem (Hardware)

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–	One Pentium base PC, full multimedia with peripheral = 550,000.00	
ii	Data base Management Subsystem (Software)	
–	DBMS e.g. dbase iv for Dos or dbase v	
	for windows	150,000.00
–	OS, Dos 6.2 and windows 98 or 2000	140,000.00
iii	Map Digitizing Module (Hardware)	
–	A φ Digitizing and peripherals	750,000.00
iv	Map Digitizing Module (Software)	
–	Auto CAD	400,000.00
V	Map Scanning (Hardware)	
–	A φ Scanner	300,000.00
vi	Map Scanning (Software)	
–	Point brush or Rater GIS	150,000.00
vii	Data Acquisation	
–	A hardheld GPS	185,000.00
viii	Information Presentation Subsystem (Hardware)	
–	One A φ Plotter (colour)	250,000.00
–	One lesserjet Printer	50,000.00
ix	Information Presentation Subsystem (Software)	
	CAC e.g. Map Publisher	400,000.00
x	5 stabilizer at the cost of 10,000	50,000.00
xi	3 UPS at the cost of 50,000	150,000.00
c)	Installation Cost	200,000.00
d)	**Development Cost which include:**	
	i) Software consultancy	80,000.00
	ii) Change over cost	150,000.00

d)   Personnel Cost which includes:-

i)   Staff Training   200,000.00

d)   Operating Cost includes:-

    i)   Consumable materials (tape, card, disk etc)   100,000.00

    ii)   Maintenance cost   110,000.00

Sub Total   830,000.00

Grand Total   =   3,525,000.00

    830,000.00

    ₦4,355,000.00

3.9.1 SYSTEM CONVERSION

System conversion is a vital activity and it requires careful handling of data. One of the means of system conversion is change over.

Conversion, involves conversion of old data files into the form required by the new system. The changeover from the old to the new system may take place when:

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

2. Users, manager are satisfied with the results of the system test, staff training and reference manuals.

3. The target data for changeover is due. The changeover may be in a number of ways. The most common method are, direct, parallel running and staged changeover.

1. **PARALLEL OPERATION METHOD**: Here the new system is used along with old one which is gradually phased out.

2. **DIRECT CHANGE OVER**: This is the total replacement of an old systeme by the new one at once.

3. **PILOT APPROACH**: A working version of the system is implemented in

one part of the organisation, changes are made based on feedback and the new system is then installed in the rest part of the organisation.

4. **PHASE - IN METHOD**: This is a gradual process of changing from old to new. The new system is used in a section of the organisation in parallel with the old, until it becomes effective on its own. Then the same thing is done in another section. This is repeated in all the sections until the entire organisation is covered.

The parallel running method is most appropriate for the system developed for land allocation.

PARALLEL RUNNING

This means processing current data by both the old and the new system to check the results. The main advantage lies in the fact that, it allows for the old system to be kept alive and operational until the new system has been proved for at least one system cycle, using full live data in the real operational environment by place, people, equipment and time. It allows the result of the new system to be compared with the old system before acceptance by the user, thereby promoting user confidence.

However, have the disadvantages of extra cost, difficulty and (sometimes) the impracticability of user staff, having to carry out the different clerical operations for two systems (old and new) on the time available for one.

Meanwhile, parallel running (changeover) procedure is recommended for the new system.
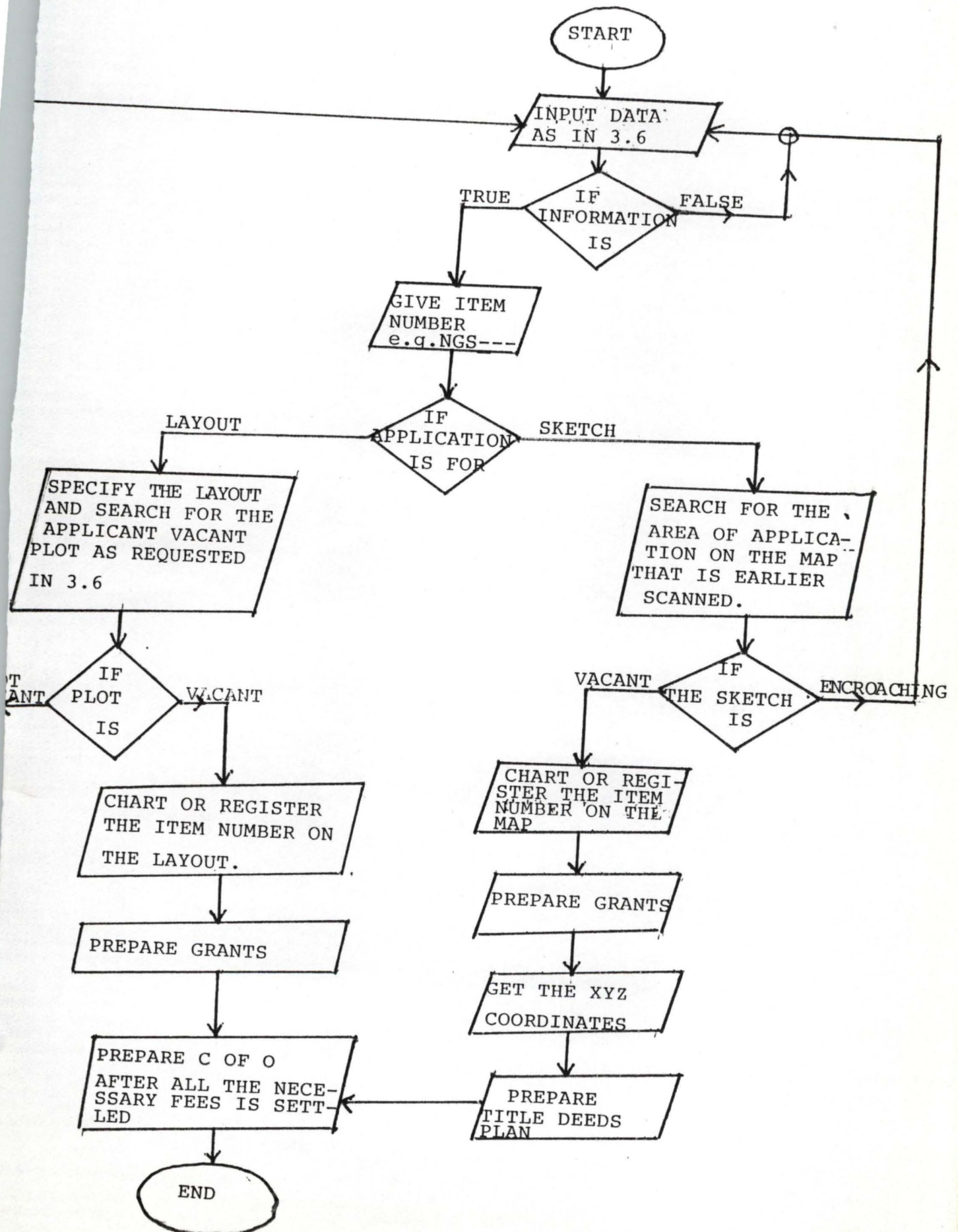
FLOW CHART DIAGRAM

```
                          ┌─────────┐
                          │  START  │
                          └─────────┘
                               │
                               ▼
                    ╱────────────────────╲
                    ╲  INPUT DATA         ╲
                    ╱  AS IN 3.6          ╱◄────────────⊖──────────┐
                    ╲────────────────────╱                        │
                               │                                  │
                               ▼                                  │
        TRUE              ╱────────╲              FALSE           │
       ◄──────────────── ╱   IF     ╲ ──────────────────►         │
                         ╲INFORMATION╱                            │
                         ╲   IS     ╱                             │
        │                 ╲────────╱                              │
        ▼                                                         │
  ┌──────────────┐                                                │
  │ GIVE ITEM    │                                                │
  │ NUMBER       │                                                │
  │ e.g.NGS---   │                                                │
  └──────────────┘                                                │
        │                                                         │
        ▼                                                         │
  LAYOUT     ╱────────────╲        SKETCH                         │
 ◄──────────╱    IF        ╲─────────────────────►                │
            ╲ APPLICATION  ╱                                      │
  │         ╲   IS FOR    ╱                          │            │
  ▼          ╲───────────╱                           ▼            │
┌─────────────────────┐                   ┌──────────────────┐    │
│ SPECIFY THE LAYOUT  │                   │ SEARCH FOR THE   │    │
│ AND SEARCH FOR THE  │                   │ AREA OF APPLICA- │    │
│ APPLICANT VACANT    │                   │ TION ON THE MAP  │    │
│ PLOT AS REQUESTED   │                   │ THAT IS EARLIER  │    │
│ IN 3.6              │                   │ SCANNED.         │    │
└─────────────────────┘                   └──────────────────┘    │
        │                                          │              │
        ▼                                          ▼              │
 ANT ╱────────╲  VACANT          VACANT      ╱────────╲ ENCROACHING│
◄────╱  IF     ╲─────────        ◄──────────╱   IF     ╲──────────┘
     ╲  PLOT    ╱                            ╲THE SKETCH╱
     ╲  IS     ╱           │                 ╲   IS    ╱
      ╲───────╱            ▼                  ╲────────╱
        │          ┌──────────────────┐          │
        ▼          │ CHART OR REGI-   │          
  ┌──────────────┐ │ STER THE ITEM    │
  │ CHART OR     │ │ NUMBER ON THE    │
  │ REGISTER     │ │ MAP              │
  │ THE ITEM     │ └──────────────────┘
  │ NUMBER ON    │          │
  │ THE LAYOUT.  │          ▼
  └──────────────┘ ╱──────────────────╲
        │          ╲ PREPARE GRANTS   ╱
        ▼          ╲──────────────────╱
 ╱──────────────╲           │
 ╲ PREPARE      ╱           ▼
 ╲ GRANTS      ╱   ╱──────────────────╲
 ╲────────────╱    ╲ GET THE XYZ      ╱
        │          ╲ COORDINATES      ╱
        ▼          ╲──────────────────╱
 ┌──────────────┐           │
 │ PREPARE C OF O│          ▼
 │ AFTER ALL THE│  ╱──────────────────╲
 │ NECESSARY    │◄─╲ PREPARE          ╱
 │ FEES IS SETT-│  ╲ TITLE DEEDS      ╱
 │ LED          │  ╲ PLAN             ╱
 └──────────────┘  ╲──────────────────╱
        │
        ▼
   ┌─────────┐
   │   END   │
   └─────────┘
```

FIG. 2.0

CHAPTER FOUR

4.0   PROGRAMMING LANGUAGE

The type of programming language used in this project is visual basic. The Visual Basic's Integrated Development Environment (IDE) and the basic principles of developing applications with visual tools and event programming.

One language, three Editions: Visual basic comes in three flavours:

i.   The Visual Basic Learning edition is the introductory edition that lets you easily create Windows applications.

ii.   The Visual Basic Professional edition is for Computer Professionals and includes advanced features such as tools to develop. Active X and interest controls.

iii.   The Visual Basic Enterprise edition is the most advanced edition and is aimed at programmes who build distributed applications in a team environment.

Visual Basic is not just a language. It's an Integrated Development Environment in which you can develop, run, test and debug your applications.

In visual Basic, as in any other programming language, variables store values during a program execusion. For example, you're wrting a program that frequently prompts the use for date, and you decide to add a personal touch to the interface.

Figure 3.0 and 3.1 shows type of projects you can create with visual Basic and A New Visual Basic project (respective).

4.1   TESTING AND ITS IMPORTANT IN PROGRAMMING

When a program is written, it is normally tested in order to see whether the program will work according to the required needs of the program and also to make correction where necessary, therefore the program for this research project has been tested and found okey.

computer.

4.3   PROGRAM   INTERFACE

The main menu calls and controls all the other sub-menus. Therefore, all the other menus are accessed by selecting the relevant option from the main menu. Below here is a detailed breakdown of the several options and their functions.

i)   **DATA ENTRY MENU.**

This allows the user to enter and even add new records in the existing records. So when the Data entry option is selected from the main menu, it displays another submenu which allows us to perform any of the following operations on selection .

ii)   **RECORDS;**

On selection, this option displays a submenu with three options which function as follows:

iii)   **ADD RECORD:**

This allows the user to add new records to either entry DA Vbf file or the DEP.DA vbf which holds record for provisional and final operations respectively.

iv)   **DELETE RECORDS.**

This option allows the user to delete existing records from either the ENTRY-DA. vbf file or DEP-DA vbf files.

v)   **EDIT RECORDS**

This allows the user to add, delete and/for modify existing records.

vi)   **VIEW**

This option displays a submenu (view menu) which enables the user to view any of the following:

vii)   **SAVE.**

The save option enables us to save all the records entered.

viii)   **EXIT**

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This option on selection allows the user to terminate the use of the system. It has two options which are:

ix)   **EXIT.**

This option on selection returns control to the main menu.

x)   **QUIT.**

This option on selection closes all data bases in use, terminate the execution on the system and return the user to the destop. This options is selected when the user wants to quit from using the system.

4.4   **PROGRAM OUTPUT**

From the list of applicant input into the system, the program output displayed clearly that plot number 45 at MTP 25 Chanchaga is allocated to Agip Oil Nig. Ltd for commercial use.

The report are show on the following pages.

LIST OF APPLICANTS

Number ***> NGS00001

Name	Entity	Home Town
Ahmed Yakubu	Individual	Paiko

L.G.A	Age	C. Address
Paikoro	38	Ministry Of Education

Allocation	Size	Purpose
Plot105	15mX30m	Residential

Occupation	Nationality
Civil Servant	Nigeria

All. Before	U Developed
0	1

Fm Lct >>	Area	Size
..	..	

Number ***> NGS00002

Name	Entity	Home Town
Paramonut Plc.	Company	..

L.G.A	Age	C. Address
...	00	P.M.B 56 Minna

Allocation	Size	Purpose
Plot10	60mX40m	Commercial

Occupation	Nationality
...	Nigeria

All. Before	U Developed
0	0

Fm Lct >>	Area	Size
No	..	

Number ***> NGS00003

Name	Entity	Home Town
Agip Oil Nlg. Ltd	Company	..

L.G.A	Age	C. Address
..	00	P.o.Box 45 Minna

Allocation	Size	Purpose
Plot 45	50mX50m	Filling Station

Occupation	Nationality
..	Nigeria

All. Before	U Developed
0	1

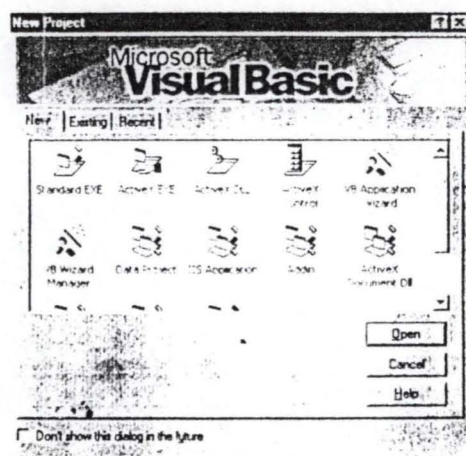| Fm Lct >>	Area	Size
...	..	

FIG, 3.0

FIGURE 1.3.1

A new Visual Basic project

Menu bar
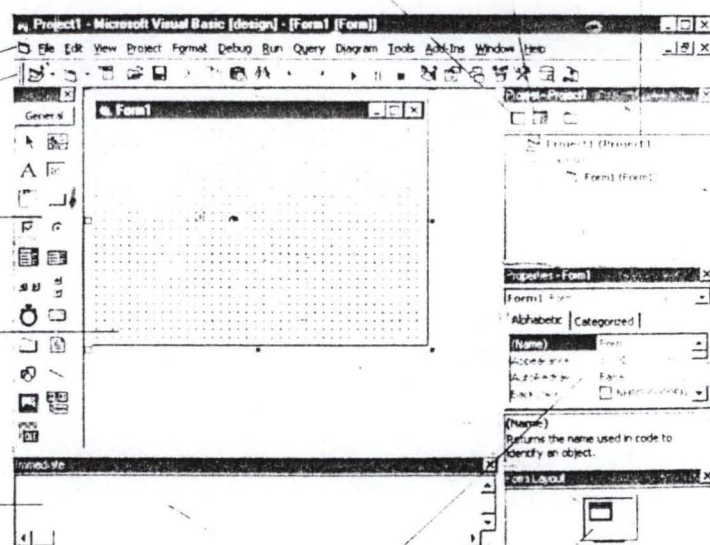
Toolbar

Toolbox

Form Designer

Immediate window
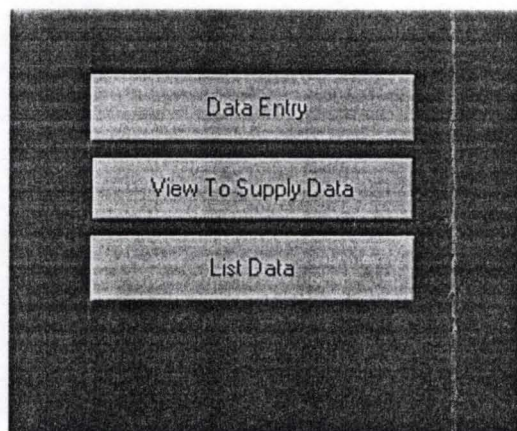
View Code button   View Form button   Project Explorer

Properties window   Form Layout

FIG. 3.1

FIG. 4.0

Save	Quit	Entry Form
Residential	MTP10 TUNGA	
Commercial	MTP60 MAITUMBI	
Sketch	NO SCAN	

FIG. 4.1

Name			Contact Address	
Agip Oil Nig. Ltd			P.o.Box 45 Minna	
Age	Nationality	L.G.A		State Of Origin
00	Nigeria	--		--
Home Town	Occupation		Entity	Size
--	--		Company	50mX50m
Purpose	Area		Allocation	
Filling Station	MTP25 CHANCHAGA		Plot 45	

☐ OutSide Approve Area   ☑ Under Developed Area

Record
Exit

Allocated Before

Area   [...]   [oo]

Size   [--]

Residential

MTP10 TUNGA
MTP14 TUNGA
MTP21 DUTSEN-KURA

Sketch

MTP40 BOSSO
MTP25 CHANCHAGA

FIG. 4.2

CHAPTER FIVE

SYSTEM SECURITY AND DOCUMENTATION

5.1 INTRODUCTION TO SECURITY

With computers a data and programs vulnerable not only to heckers but to out and out criminals, duplicitous insiders and acts of God, one has to keep all component safe.

One a computer system has been penetrated, the intruder can use the system's own software to pilfer information (and often money as well) and to erase or create data.

5.2 TYPES OF SECURITIES AND THEIR IMPLICATIONS

i) Access to the system is restricted by password to restrict initial and subsequent access for selected changes to information on files that are very sensitive or viewing records inside these files. The restriction will help to check the integrity of ther files and enhance good and reliable records since it is only the computer operator who knows the passwprd are allow to access the system thereby reducing too many access to the records.

ii) Local terminals housed with the mainframe so much they are wired local terminals are prime gateways for mischief minded insiders who may already have legitimate access to the system. Such terminals have no microprocessor of their own.

iii) Other Technique matches the pattern of blood vessels in the retina as unique as a finger print against a cataloque of individuals retina images stored in the computer, similar comparisms are possible using the destructive tone and timbre of a person's voice or the inimitable outline of a hand.

iv) Provide storage for preserving duplicate copies of irreplaceable data in a well secured bank.

v)   Other Technique in computer design to block signals that would otherwise emanate from monitors and keyboard or from deep inside a machine circuity and allow an eavesdropper to listen in on the computer business.

5.3   DOCUMENTATION AND ITS IMPORTANCE

Documentation can be defined as the process of describing how a program works and there are two major types of Documentation namely internal Documentation and External Documentation.

–   Internal Documentation is the way of adding comments into the program and it is good to note that all the programming language have facilities for adding comments into the program writing such that the comments are not access by the compiler.

–   External Documentation on other hand it serve as reference manual which describe the ways or methods of interacting with the program as well as the methods requires to solve any anticipated problems.

The important of Documentation in program writing can not be over emphasised, this is because the documentation help in trying to describe how best the program can work in order to solve the intended problems.

It also serves as a reference manual for other programmers, which it can be help in writing their own programs in a particular program language. It also describes the ways of interacting with the program, which is required to solve an anticipated problems.

5.4   RECOMMENDATION

In order to achieve effective and reliable efficient ways of land allocation within the Ministry of Lands, Survey and Town Planning, Minna, planning, and survey record keeping and retrieval, then a computerised information system is proposed for the above Ministry, which will involve purchase of computer system

and training of staff personnel and also greater degree of system investigation.

5.4.1. CONCLUSION

This research project has describe the design and implementation of land allocation by the Ministry of lands, survey and Town planning, Minna.

The project started by studying the procedures and concepts involved in the manual land allocation within the Ministry.

In order to get a reasonable set of design objectives, I have considered important features that can be built into the land allocation and which make the project feasible and reliable.

With a well tested program that works according to required needs of the program, I concludes that a computerized information system will make the allocation faster and accurate.

This project indicate that land allocation program could be attractive idea for keeping land records for future retrieval and updating.

REFERENCES

1. Masry E.S (1986)   -   Introduction to GIS 1st Edition

2. Weber B.E (1982) -   Computer   Technology   Review Digital
                            Technology

3. Langlois Coswell (1990) -   Spatial Analysis using GIS 1st Edition

4. Borrough P.A. (1986)   -   Principles of GIS for Land Resources
                                    Assessment

5. Cisse A (1993)   -   Geographic Information system for Regional
                            Planning

6. Frank A.U (1988) -   Requirement for a Database Management System
                            for a GIS

7. Giptill S.C. (1989)   -   Evaluating Geographic Information
                                    System Technology

8. Badamasi R.A. (DCPT 011)   -   Introduction to computer system (un
                  2000- 2001   published lecture note)

9. Dr. Olajide Kufoniyi (1998)   -   Surveying and Information
                                        Technology (un published lecture
                                        note)

10. K. Owolabi -   The fundamental of spatial information system.

APPENDIX A

Source Code

```
Dim strAge As String, strEntity As String, M As Integer
Dim strAllo As String, strCaddr As String
Dim strArea As String, strArea1 As String
Dim strHtown As String, strLocal As String
Dim strName As String, strNta As String
Dim strOccp As String, strPur As String
Dim strSize As String, strSize1 As String
Dim NameLand As String, One As Integer, Two As Integer

Private Sub cmdExit_Click()
 Unload Me
End Sub

Private Sub cmdRecord_Click()

Open "C:\Mikefld\Dland\Ind1.dat" For Input As #1
M = 0
testfor: If EOF(1) Then GoTo endwork
M = M + 1
'

Input #1, strAge, strAllo, strArea, strHtown, strSize
Input #1, strEntity, strCaddr, strArea1, strLocal, strSize1
Input #1, strName, strNta, strPur, strOccp, M
Input #1, One, Two
GoTo testfor
endwork: Close #1
'

Open "C:\Mikefld\Dland\Ind1.dat" For Append As #1
'

strAge = txtAge.Text
strEntity = txtEntity.Text
strAllo = txtAllo.Text
strCaddr = txtCaddr.Text
strArea = txtArea.Text
strArea1 = txtArea1.Text
strHtown = txtHtown.Text
strLocal = txtLocal.Text
strName = txtName.Text
strPur = txtPur.Text
strSize = txtSize.Text
strSize1 = txtSize1.Text
strNta = txtNta.Text
strOccp = txtOccp.Text
One = Check1.Value
```

```vb
Two = Check2.Value

M = M + 1
frmLand.Caption = "Data Entery Form " & Format(M, "0000####")
Write #1, strAge, strAllo, strArea, strHtown, strSize
Write #1, strEntity, strCaddr, strArea1, strLocal, strSize1
Write #1, strName, strNta, strPur, strOcep, M
Write #1, One, Two
MsgBox "Mr. " & strName & " Please Pay All dues, then Come Back For Your C.O.F",
vbInformation, "Congratulations"

Close #1


End Sub

Private Sub Form_DblClick()
Me.PrintForm
End Sub

Private Sub Form_Load()
 NameLand = UCase(InputBox("Enter Location of Land To Purchase", "Purchase Of
Land"))
'

   Open "C:\Mikefld\Dland\Ind1.dat" For Input As #1

testfor1: If EOF(1) Then GoTo endwork1

Input #1, strAge, strAllo, strArea, strHtown, strSize
Input #1, strEntity, strCaddr, strArea1, strLocal, strSize1
Input #1, strName, strNta, strPur, strOcep, M
Input #1, One, Two

 If NameLand = strArea Then
  MsgBox "Can't please! This Land Has been Allocated Before"
 Exit Sub
 Else
GoTo testfor1

endwork1: Close #1

'

meek:
 txtArea.Text = NameLand

End If
```

```vb
n "C:\Mikefld\Dland\Ind.dat" For Input As #1
pen "C:\Mikefld\Dland\Frm.dat" For Input As #2
Open "C:\Mikefld\Dland\Comp.dat" For Input As #3
'
RT.SelText = "Residential " & vbCrLf & vbCrLf

'read the first Dat File
faith: If EOF(1) Then GoTo faith1
  Input #1, strInd
    RT.SelText = strInd & vbCrLf
    GoTo faith

faith1: Close #1
RT.SelText = vbCrLf
RT.SelText = "Sketch " & vbCrLf & vbCrLf
'read the second dat file
faith2: If EOF(2) Then GoTo faith3
  Input #2, strFrm
  RT.SelText = strFrm & vbCrLf
  GoTo faith2
faith3:  Close #2

RT.SelText = vbCrLf

'read the thrid dat file
RT.SelText = "Comercial " & vbCrLf & vbCrLf
faith4: If EOF(3) Then GoTo faith5
  Input #3, sComp
  RT.SelText = sComp & vbCrLf
  GoTo faith4
faith5:   Close #3
RT.SelText = vbCrLf & vbCrLf
'

Open "C:\Mikefld\Dland\Ind1.dat" For Input As #1
'M = 0
testfor11: If EOF(1) Then GoTo endwork11
'M = M + 1
'
Input #1, strAge, strAllo, strArea, strHtown, strSize
Input #1, strEntity, strCaddr, strArea1, strLocal, strSize1
Input #1, strName, strNta, strPur, strOcep, M
Input #1, One, Two

RT.SelText = "This Land " & strAllo & " (" & strArea & " )" & " Has been Allocated " &
vbCrLf
```

```
    .SelText    "Allocated To :- " & strName & vbCrLf
   T.SelText = "Allocation No :- " & "NGS" & Format(M, "00####") & vbCrLf
RT.SelText = "***********************" & vbCrLf
GoTo testfor11

endwork11: Close #1
'
'End If

End Sub
```