COMPUTERISATION OF APPROVED

BUILDING PLAN IN NIGER STATE

BY

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PGD/MCS/96/97/270

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SEPTEMBER, 2000.

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A PROJECT SUBMITTED TO THE DEPARTMENT OF
MATHEMATICS/COMPUTER SCIENCE, FEDERAL
UNIVERSITY OF TECHNOLOGY, MINNA. IN PARTIAL
FULFILMENT OF THE REQUIREMENTS FOR THE
AWARD OF THE POSTGRADUATE DIPLOMA IN
COMPUTER SCIENCE (PGDCS).

SEPTEMBER, 2000.

DEDICATION

This project work is dedicated to the glory of the Lord, my special family and all those who have inspired me to this height. May the Lord bless you all.

CERTIFICATION

This project work has been read and certified by the undersigned as

meeting the requirements of the Department of Mathematics / Computer

Science, Federal University of Technology, Minna.

....

Prince R.O. BADMUS   Date

Project Supervisor

....

Dr. S.A. REJU,   Date

HEAD OF DEPARTMENT

....

External Examiner   Date

ABSTRACT

In Niger State, approved building plans are stored using conventional filing system, thus, constituting a huge task when there is a need to retrieve and check any information on such plans. This project therefore seeks to computerize the storage procedure-using database in management procedures or systems, to achieve a better approach to building plans in Niger State.

TABLE OF CONTENTS

(h)   Documenting the analysis, design and implementation techniques in the form of project report.

(f)   Designing of approved building plan Database system.

(g)   Processing of approved building plan Database.

(h)   Documenting the analysis, design and implementation techniques in the form of project report.

2.3 THE ROLE OF RELEVANT PROFESSIONALS IN THE APPROVAL OF BUILDING PLANS.

2.3.1 LAND SURVEYOR:

After the acquisition of the land by he client, the land surveyor produces the Survey plan with the following information:

(i)   Name of client.

(ii)   Location of land.

(iii)   Area of the (size), Scale, access roads.

(iv)   Adjoining properties.

(v)   Numbers of relevant pillars and.

The approved survey plan is accompanied with the under listed documents, which are submitted, to the department of lands where letter of land allocation is issued to the applicant:

- Evidence of ownership of land (Affidavit sworn in law court).

- Tow recent passport size photographs.

- Three years tax clearance certificate.

- Three years development levy.

- A sum of money charged as allocation fee paid and receipted.

- This is charged at a specific rate per metre square.

4. CONDITION OF SITE:

(a)   Levels and gradients.

(b)   Benchmarks.

(c)   Shelter or exposure form surrounding ground.

(d)   Direction of prevailing wind.

(e)   Aspect and orientation.

(f)   Dimensions and area of site.

(g)   Existing trees and features.

(h)   Existing buildings on the site and on adjoining land.

(i)   Overhead cables and poles.

5. POSITION, SIZE AND DEPTH OF SEWERS:

(a)   Position, size and depth of sewers.

(b)   If no sewer, suitability and possible sitting of septic tank and over flow outlet.

(c)   Utility services available such as gas, water, electricity etc with name and addresses of supply undertakings.

(d)   Position and pressure of waterman.

(e)   Electricity supply, voltage, capacity of any existing cables.

(f)   Position and size of gas main.

(g)   Telephone services.

(h)   Possibility of sinking wall.

6. **COMMUNICATIONS:**

(a)   Means of access.

(b)   Nature and proximity of public highway.

(c)   Rights of way access site.

If the approval is to be extended to extended to existing building the following in addition to the foregoing are applicable:

1. **DRAWINGS:**

Plans elevations and sections as applicable drawn to scale.

2. **CONSTRUCTION:**

(a)   Type and method of construction of foundations, walls floors and roof.

(b)   Wall and floor thickness.

(c)   Battened –out wall surfaces or other hidden construction.

(d)   Stone and stucco finishes.

3. **CONDITION OF STRUCTURE:**

(a)   Signs of dry rot, beetle, etc in timber.

(b)   Loosens of plaster surfaces.

(c)   Damp roof course to walls.

(d)   Damp roof course to walls.

(e)   Settlement cracks.

(f)   Windows and doors etc.

4. CONDITION OF SERVICES:

    (a)   Gas, water, electricity, drains wells, central heating, and hot water.

    (b)   Possibility of extending these services.

5. HISTORY OF BUILDING:

    (a)   Age.

    (b)   Purpose of its previous occupation.

    (c)   Quality of previous maintenance work.

Consequent to the site surveys, design of the following drawings (to be suitable scale) are produced:

    (a)   Site location plan.

    (b)   Site layout plan.

    (c)   Floor plan (s).

    (d)   Foundation plan.

    (e)   Elevations.

    (f)   Sections.

    (g)   Roof framing plan.

    (h)   Details: staircase, lintel, beams and columns etc.

2.3.3 STRUCTURAL ENGINEERS.

During the preparation stage, the structural engineer is invited to determine the type of foundation suitable for such site after having carried out soil test through which the bearing capacity is determined. Structures also determined by structural engineers are columns, beams lintel etc.

2.3.4 TOWN PLANNERS.

Having received the four or 6 printed of set of drawings aforementioned in 2.3.2. And accompanied with letter of allocation of land signed by Area Land Officer, the plan is then ready for assessment in respect of registration fee, development levy and assessment fee. The client/Architect is made to pay the said amount to the cashier (town planning department) who in turn issues receipt and receive the plan the stamp designated for such purpose.

THE SITE INSPECTOR RECEIVES THE SET OF DRAWINGS AND PROVIDES:

(a)   FILE JACKET WITH FOLLOWING INFORMATION FILLED IN:

- Building plan Reference number (Town/Year/Serial no or file submitted).

- Name of the Client.

- Location of the proposed building site.

- Architect

The town planner (site inspector) in company of the Architect visits the site to generate report in which the following standards for all aspect of town planning are maintained.

THE STANDARDS INCLUDE:

- The setbacks to be provided from to be built in a given area of land.

- Orientation of the building in terms of the position of the bedroom with respect to sun and wind direction.

- Air spaces between buildings.

- Dimensions of bedrooms, sitting room, kitchen and other spaces in the house.

- Securing and improving good sanitation conditions.

- Ensuring that proposed building is structurally sound and provides all essential utilities, services and facilities.

OTHER FUNCTIONS OF THE TOWN PLANNERS:

- Preserving the places of national interest or reality or historical importance.

- Exercising force through police assistance to demolish and eradicate illegal structures and non-conforming uses.

- Dealing with petitions and protests form members of the public in respect of planning matters.

- Preparing and approving layouts to ensure provision of

- Standard plots necessary utilities and planned environment.

- Checking the activities of landowners and builders by ensuring that they do not develop their property, as they like and to the detriment of others.

- Ensuring that residential, commercial, industrial, educational and agricultural areas are carefully zoned to prevent conflict and promote harmonious interrelationship.

- Responsible for the preparation of comprehensive development or master plan which serves as a framework and provide guidelines for developing a town or village in a planned and orderly manner.

If the report on the proposal is error-free then the town planner (Area Town Planning Officer) gives his final approval to the proposed building plans by appending his signature sealed and dates on the plans.

At the end two copies of the approved building pans are received by the client/Architect with signature and date for record purposes.

CHAPTER THREE

3.0 DESIGN OF APPROVED BUILDING PLAN DATABASE SYSTEM

The database system is concerned with the role of data and knowledge about data in the design, development and utilization of information system. Database is a sharable resource in corporate organization. Thus several different database users may pose query and update transaction on a given database concurrently.

In this section, the design of the relational database for approved building plan in Niger State is presented. The database is viewed in terms of relations, the integrated view of the relations and the database transactions.

3.1 THE RELATIONAL REPRESENTATION OF DATABASE

A relation is a class of intuits or objects which have identical properties. A relation is similar to what is customarily referred to as a flat file and it is generally received and prepared by a set of structural tuples. Each n-tuple of the relation corresponds to fields on data items of records of a file.

THE GENERAL FORM OF A RELATION IS GIVEN BY.

R. (A)

Where R represents the name of the relation, the set (Aj), J=1,2 .....n

Represents the attribute of the relation R and the underlined attributes constitute the unique key of the relation. For the purpose of project work, emphasis will be laid on building as a relation.

3.2 TYPES OF BUILDING

The types of building depend on the function of he building. Buildings are categories on the following functional types:

(i) Residential buildings

These include building for residential purposes such as, detached bungalow, semi-detached bungalow, duplex tenement (face to face,) marionette etc.

(ii) Commercial buildings

These include building for commercial purposes such as Banks, markets, insurance houses etc.

(iii) Industrial buildings,

These include building for industrial purposes such as assembly plant, bottling company etc.

OTHER TYPES OF BUILDINGS ARE:

- Buildings for religious purpose such as churches and mosques.

- Health buildings such as hospitals and maternity.

- Administrative and educational buildings such as building to house government offices, schools etc.

The relation described below may be considered for any basic type of buildings:

1. BUILDING (Building-ld, Client-ld, description-of-building, location-of-building, building-type, date-of-approval, cost-of-assessment).

2. CLIENT (Client-ld, Client-name, client-address, client-telephone).

3.　　　ARCHITECT (Architect-ld, architect-name, architect-address, telephone, remark).

4.　　　ASSESSMENT (Building-ld, building-type, building-size, cost-of-assessment).

5.　　　APPROVAL-RECORD (Building-ld, date-of-approval, cost-of-assessment)

If should be noted form the attributes entity-type of a relation BUILDING is all of the same type. Since database is model of reality, attributes of a relation are naturally functionally related to one another. Thus each attribute has domain, which describes the attributes set of values.

3.3　RELATIONSHIP BETWEEN ENTITIES AND ENTITY-TYPE

Building as an entity is any concrete thing that other types such as residential, commercial, industrial etc are shared. Type in this content is a classification of similar things. Means, things that have certain properties in common, are said to be of a certain type.

It is common that when we mention types, we have to relate it to its entities. For instance, it is very to say residential-building, industrial building and so rather than mentioning a phrase, residential, commercial, industrial where the meaning attached to it is meaningless.

Here, residential which represent an entity-type of building is considered. The form of a relation that exist between residential and its entity-type detached bungalow, duplex, maisonette and tenement may be represented.

From above, we cannot talk of detached bungalow, duplex, maisonette or tenement without relating it to residential buildings. It means that residential is a common property of detached bungalow, duplex, maisonette and tenement. There is a form of functionality of a

relationship between them. If also consider the relationship between the entity-type detached bungalow, duplex, maisonette or tenement and their attributes, a relation may have one or more key or an identifies of the relation.

Any attribute or combination of attributes that uniquely identifies a type is described as a relation candidate-key as underlined in the relation above. In the relation CLIENT for instance having attributes client-Id, client-name, client-address and telephone.

Client-Id is selected as a candidate key of the relation for it uniquely identifies other attributes of the relation. The value of the candidate key in any attribute of a relation uniquely distinguished that attribute from all other attributes in that relation. If any attribute in the candidate key is dropped then the property building described above is lost.

3.4 THE INTEGRATED VIEW OF THE RELATION.

The integrated view of the relation is presented below. A rectangle describes a relation and an arrow describes the logical relationship between two relations.

3.5 THE DATA BASE TRANSACTIONS.

The transactions, which are envisaged on the approved building plan relational database, are described in this section. The list of transactions contained the minimum transaction required for the development of approved building plan database. The transactions are:

(a)   Generate relevant information about the total number and types of building in a particular area

(b)   Find out if different types of building such as residential, commercial and industrial buildings are all constructed in an area

(c)   General relevant information about the population density of a particular zone.

(d)   Calculate the amount of money generated from assessment of proposed building plan.

CHAPTER FOUR.

PROGRAM /SOFTWARE IMPLEMENTATION

PREAMBLE

A program could be defined as list of instructions that enable the computer in which these instructions have been fed into to perform a specific task. A program is fed through the keyboard into the CPU and its control unit, and then into the internal storage of the computer. A computer program development involves some stages and these are: -

(a)   PROGRAM. PLANNING – It is virtually impossible to write a program without first identifying and clearly understanding the problem. The planning stage is concerned with the formulation of the requirement, identifying input data, the required output and the formula needed.

(b)   PROGRAM DESIGN - This involves the listing and ordering of successive steps and activities to be undertaken to achieve the desired

(c)   CODING – Once the steps of the solution has been observed and outlined. The next stage is the transformation of these steps into the form understandable by the computer.

(d)   DEBUGGING – As one starts to code and compile the program you may discover that one or more errors have occurred which have to be removed as they are detected. There are two kinds of errors that may occur in program i.e. logic errors and syntax errors.

(e)   TESTING – this is also referred to as program validation and the essence is the determine whether any error still remain in the program. Running the program with

various sets of input values so as to be sure that the expected result is achieved does the testing.

(f) IMPLEMENTATION – Once the program has been tested and found working as required the next stage is implementation, that is applying the program to solve the problem it is meant to solve.

(g) DOCUMENTATION- this is the description of the program in the proper form for users and to enhance maintainability. It describes the working of a program and how expected problem could be solved. This stage aids the user to understand the program and maintenance of such program.

DATABASE MANAGEMENT SYSTEM

The proposed system is to be operated on a DATABASE Environment.

Database is a collection of pertinent data about a company with minimum duplication, serving as pool of information for many users.

The software is generally called database management systems (DBMS), which is a high-speed filing system that manages the database. The database could therefore be considered as a set of files in a cabinet while DBMS (Data Base management system) is a computer program used for maintaining and creating the database to extract information form it.

All database software system has the

Capability to: -

(a) Add, delete, modify and revise records in a database.

(b) Extract and list all records or some that meet a specified criterion.

(c) Query the database (Making inquiry)

(d) Sort all records and generates formatted reports.

(e) It provides the interface between the user and data in such a way that it enables the user to record, organize, select, sort etc.

(1)   Data integration – information from several files could be coordinated, accessed and operated upon as though it is in a single file.

(2)   Data independence – Data could be independently achieved by insulation of application programs from the physical or logical storage of data.

(3)   Data are centrally controlled – in database environments, data and operations on data are centrally controlled and this can lead to better management of data by enforcing standards for all the data base users on how information would be released.

(4)   Security of data – it allows for proper security since there is only one source of data in the organization and such standards would easily be enforced for control purposes.

HARDWARE REQUIREMENTS

(1)   Pentium 166456 Base Pc 66 MTT2 and above

(2)   Minimum 14MB Main Memory

(3)   2.5 GB Hard Disk drive

(4)   3 1/2 floppy disk drive

(5)   14" SVGA Colour Monitor

SOFTWARE REQUIREMNETS

The software is the non-physical component of the computer system. While the software requirements are those software needed to be install on the system in order to use or implement the building plan software and other application package.

(a)   OPERATING SYSTEM SOFTWARE

- WINDOWS 95 or 98

- MS – DOS 6.22

(b)   OTHER APPLICATION SOFTWARE

- WORD PERFECT 6.1

- DBASE IV

CHANGE OVER/CONVERSION PROCEDURES

This is the process of changing from the old system to the new system. This is best carried out in the following ways: -

I. Parallel System – Here both old and new systems are run concurrently using the same inputs and outputs compared with reasons for difference in output is resolved. The output of the old system continues in circulation until the new system in place is working satisfactorily.

This conversion method is the safest, it gives guarantee, and if there is any problem the old system can be referred to immediately without waste of time.

II. Direct cut over – This is the direct and abrupt change form the old to the new system, which becomes operational immediately, the change over which may be over a weekend. Lack of having a system to fall back becomes a serious disadvantage.

If problem arises and this may head to stoppage of operation in the organization.

III. Phase - In -Method -This method is used when installation of a new system is not feasible within an organization at any time. File conversion, training of personnel or

piecemeal arrivals of equipment are the possible factors which delay the implementation of the new system in good time.

From the above highlighted change over procedures, the parallel system is been recommended for implementation. This is due to inheriting advantages of comparing the output of the new system with the old using the same data. Errors can easily be detected and where necessary correction made before phasing out the old system

POST IMPLEMENTATION AND SYSTEM REVIEW

Post implementation is referred to as the review of any system or project that has been fully implemented. It is the X- ray of the system to ascertain whether it has conformed to the kind down implementation procedures.

An analyst and those who use it usually do review of a system. The review gives room for determining how well the system is working, the acceptability and to see where modification is required. Also it enables the management to know how the system will be maintained since depreciation i.e. Bound to take place. The main focus of post implementation is to ascertain whether the set objectives for which it was designed have been achieved.

The Analyst may ask certain question in order to obtain or gather correct information about the system being received. These question assist the analyst to determine the success of the system and what necessary steps to be taken in the case of lapses

TRAINING OF PERSONNEL

The success or failure of any system designed depends on its user. The type of training received by various personnel assist or prevents the successful implementation of any system. The training should be comprehensive enough to provide a good understanding of all the operational techniques of the system. The amount and period of training for this system will depend upon its complexity and the available skills on the ground presently.

The proposed system will be users friendly. However, it is necessary to have adequate and well-exposed in- house training for the various personnel in the organization.

The training will cover areas like basic computing and operation guidelines for the transfer section.

COST AND BENEFITS ANALYSIS

The cost includes the total amount of money needed in order to put the system in place. The cost is broken down as follows: -

(A)	DEVELOPMENT COST.	N	K
(i)	System Analysis and Design for 4 weeks at 6,000 per wk	24, 000	00
(ii)	Software Development for 3 Weeks at N5, 000per wk.	15,000	00
(iii)	Equipment purchase	350,000	00
(iv)	Installation	50,000	00
(v)	Personnel Training	50,000,	00
	Total	**N 489,000**	**00**

(B)	OPERATING COST	N	K
(i)	Supplies of Accessories & stationeries	100,000	00
(ii)	Equipment Maintenance	150,000	00
(iii)	Application Software	50,000	00
(iv)	Miscellaneous expenses	75,000	00
	Total	₦ 375,000	00
	GRAND TOTAL	₦ 864,000 00	

BENEFITS OF THE PROPOSED SYSTEM

(h)   Reduction in the use of paper

(ii)   Increase the productivity of staff handling the building operations.

(iii)   Increase speed of operations.

(iv)   Generating information is always with quick dispatch with computerization

(v)   Elimination of many repetitive work of building plan section.

(vi)   Automatic updating of records and Maintenance.

SOFTWARE IMPLEMENTATION.

The need to keep records of buildings and certain information concerning each of these building led to the development of the software. The Dbase IV language was used for developing this software because of the database facilities required.

To implement the program, the user loads the dbase IV package by typing "dbase" from the dos prompt.

C:\> CD DBASE

C: \ DBASE \> DBASE

After loading the dbase IV package the user executes the software by typing "DO BUILD" form the dot prompt.

- DO BUILD

The program begins execution by showing the MAIN MEUN from which this user can make a number of choices.

Main menu

Add records

Delete records

Modify records

View records

Report

Exit

With the use of the arrow keys the user can move up and down through the menu and press, the enter key to make a selection.

ADD RECORDS

When the add record option is selected a data entry screen is display for user to enter the following information: building number, owner's name, owner's address, building location, type of plan, architect, contractor and date acquired. The supplied information is saved in the data the base file.

DELETE RECORDS.

The delete option is used for removing unwanted records from the database file. To delete a record, select the delete option, then enter the building number, the program will request if user is sure of the operation if users response is "yes" the record is deleted, otherwise the record is not deleted.

MODIFY RECORDS

There may be need to make amendments .... To already entered records, this is achieved with the modify option.

The user is prompted to supply the building number of the record to be modified and if such record is found the record is loaded and the user makes necessary amendments. The resulting record is then saved in the database.

VIEW RECORD

The view option is used to view the content of a record. When a user supplies the building number of the record to view, the program loads the record and displays it on the screen.

REPORTS

Report generation is no doubt a very important part of any program. The report is a summary of all record entered into the database. The report is sent to a file "build out" on the disk, which can then be sent to the printer conveniently

EXIT

The exist option is the way out of the software. It returns the user either to dot prompt or dos prompt depending on user's choice.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS.

This project work centres on computerization of approved building plan for the use of Town planners and other related professionals in the public sector in place of file system, which is burdensome. Attempts have been made to analyze approval of building plan. Also, database design transactions, case studies of approved building plan. Also, database design transactions, case studies of approved building plan were carried out and the result obtained using Dbase IV on IBM compatible microcomputer system.

THE FOLLOWING RECOMMENDATIONS ARE GIVEN:

A. End-users and casual users of the package can use it without undergoing any rigorous training.

B. It will enable the town planners to keep adequate recede of the building being approved for the purpose of revenue generated on assessment.

C. The package will enhance the performance of the town planners in the retrieval and updating of information.

D. It will give for data sharing among community of building approval database users.

E. It also supports multiple level and private control of data.

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*********************************
* COMPUTER APPROACH TO BUILDING PLAN
*********************************
SET DISPLAY TO EGA25
SET SPACE OFF
SET CONSOLE ON
SET DELETED OFF
SET BELL OFF
SET ECHO OFF
SET TALK OFF
SET PRINT OFF
SET CLOCK OFF
SET SAFETY OFF
SET SCORE OFF
SET CONFIRM ON
SET DATE TO BRIT
SET CARRY OFF
SET CENTURY ON
SET INSTRUCT OFF
SET DELIMITERS OFF
SET ESCAPE ON
SET MESSAGE TO ""
SET DEVICE TO SCREEN
SET STATUS OFF
CLEA ALL
SET COLOR TO GR+, G, G
CLEAR
DO DESIGNSC
ABORT = ' '
DO WHILE ABORT = ' '
DO DEFIN
DO MAIN
CLEAR
ENDDO
RETURN


PROCEDURE DEFIN
IF ISCOLOR()
    SET COLOR OF BOX TO GR+/BG
    SET COLOR OF NORMAL TO W+/B
    SET COLOR OF HIGHLIGHT TO GR+/BG
    SET COLOR OF MESSAGES TO W+/N
    SET COLOR OF TITLES TO W/B
    SET COLOR OF FIELDS TO N/BG
    SET COLOR OF INFORMATION TO B/W
ENDIF


SET BORDER TO DOUBLE

    SET BORDER TO DOUBLE
DEFINE POPUP MAINMENU FROM 1,25
DEFINE BAR 1 OF MAINMENU PROMPT " M A I N    M E N U " SKIP
DEFINE BAR 2 OF MAINMENU PROMPT "====================" SKIP
DEFINE BAR 3 OF MAINMENU PROMPT "ADD RECORD(s)";
    MESSAGE "Addition of record(s) to the database file"
DEFINE BAR 4 OF MAINMENU PROMPT "DELETE RECORD(s)";
    MESSAGE "This option allows deletion of record(s)"
```

```
DEFINE BAR 5 OF MAINMENU PROMPT "MODIFY RECORD(s)";
    MESSAGE "This option allows modificatio of record(s)"
DEFINE BAR 6 OF MAINMENU PROMPT "VIEW RECORD(s)   ";
    MESSAGE "This option allows you to view records"
DEFINE BAR 7 OF MAINMENU PROMPT "REPORT SUMMARY";
    MESSAGE "This option allows Generation of reports"
DEFINE BAR 8 OF MAINMENU PROMPT "E X I T ";
    MESSAGE "You want to Shutdown"
ON SELECTION POPUP MAINMENU DO MAIN_PARA


*-----------> Popup for Exit
DEFINE POPUP EXITM FROM 7,45
DEFINE BAR 1 OF EXITM PROMPT " E X I T   M E N U" SKIP
DEFINE BAR 2 OF EXITM PROMPT "==================" SKIP
DEFINE BAR 3 OF EXITM PROMPT "EXIT TO PROMPT";
    MESSAGE "Return to the Dbase Prompt"
DEFINE BAR 4 OF EXITM PROMPT "EXIT TO DOS ";
    MESSAGE "Shutdown and return to DOS"
ON SELECTION POPUP EXITM DO EXIT_PARA



PROCEDURE DESIGNSC
* ----------------> This section design the screen
HEAD1 = "*******************************************"
HEAD2 = "COMPUTER APPLICATION TO BUILDING PLAN"
HEAD3 = "*******************************************"
HEAD4 = "  "
@0,0 TO 23,79 DOUBLE COLOR W+
DEFINE WINDOW MAINSC FROM 1,1 TO 22,78 NONE COLOR W+/B
DEFINE WINDOW WORK_IN FROM 7,5 TO 21,75 DOUBLE COLOR W+/E
X1 = MAX(LEN(TRIM(HEAD1)), LEN(TRIM(HEAD2)))
X2 = MAX(LEN(TRIM(HEAD3)), LEN(TRIM(HEAD4)))
X  = INT((80-MAX(X1,X2))/2) - 1
Y  = X + MAX(X1,X2) + 1
DEFINE WINDOW HEADBK FROM 2,X-1 TO 6,Y-1 NONE COLOR
DEFINE WINDOW HEADSC FROM 1,X TO 6,Y+1 DOUBLE COLOR W+/G+
DO CASE
    CASE DAY(DATE()) = 1
        TH = "st "
    CASE DAY(DATE()) = 2
        TH = "nd "
    CASE DAY(DATE()) = 3
        TH = "rd "
    OTHERWISE
        TH = "th "
ENDCASE
@ 0,5 SAY CDOW(DATE())+", "+ STR(DAY(DATE()),2)+TH+CMONTH(DATE())+", "+
STR(YEAR(DATE()),4)+"."
SET CLOCK ON
SET CLOCK TO 0,60
ACTIVATE WINDOW MAINSC
ACTIVATE WINDOW HEADBK, HEADSC
@ 0,INT((Y-X-LEN(HEAD1))/2)+1 SAY HEAD1
@ 1,INT((Y-X-LEN(HEAD2))/2)+1 SAY HEAD2
@ 2,INT((Y-X-LEN(HEAD3))/2)+1 SAY HEAD3
@ 3,INT((Y-X-LEN(HEAD4))/2)+1 SAY HEAD4
ACTIVATE WINDOW WORK_IN
```

```
RETURN

PROCEDURE MAIN
ACTIVATE POPUP MAINMENU
RETURN


PROCEDURE MAIN_PARA
DO CASE
    CASE BAR() = 3
         DO ADDREC
    CASE BAR() = 4
         DO DELREC
    CASE BAR() = 5
         DO MODREC
    CASE BAR() = 6
         DO VIEWREC
    CASE BAR() = 7
         DO REPORT
    CASE BAR() = 8
         ACTIVATE POPUP EXITM
         DEACTIVATE POPUP
ENDCASE
RETURN


PROCEDURE EXIT_PARA
DO CASE
    CASE BAR() = 3
         ABORT = 'A'
         CANCEL
    CASE BAR() = 4
         QUIT
ENDCASE
RETURN


Procedure ADDREC
 store 'Y' to ans
 set stat off
 use build
 do while ans ='Y'
  clear
  store space(5) to mbldnum
  @1,10 Say "Enter Building Number: " get mbldnum Pict "99999"
  read
  locate all for bldnum = mbldnum
  if found()
    @8,20 say 'Building no. already exist'
  else
  store space (35) to maddress
  store space (25) to mname, mlocan
  store space (15) to mplantp,marchi,mcontract
  store space (10) to mdatea
   DO GETDATA
   READ
    clear
```

```
      append blank
      replace bldnum with mbldnum
      replace address with maddress
      replace locan with mlocan
      replace name with mname
      replace plantp with mplantp
      replace archi with marchi
      replace contract with mcontract
      replace datea with mdatea
endif
   @10,10 to 12,50
   store 'N' to ans
   @11,12 say 'Are there more records? (Y/N)' get ans pict '!';
                valid ans $ 'YN' error 'Invalid entry !!!'
   read
enddo
CLEAR
close databases
return


Procedure DELREC
   store 'Y' to ans
   use build
   do while ans= 'Y'
      clea
      @2,15 to 4,55
      @3,20 say 'Deletion of record'
   store space(5) to mbldnum
   @1,10 Say "Enter Building Number: " get mbldnum Pict "99999"
   read
      locate all for  bldnum = mbldnum
      if found()
      @10,10 to 12,50
      store 'N' to reply
      @11,12 say 'Are you sure? (Y/N)' get reply pict '!';
         valid reply $ 'YN' error 'Invalid entry!!!'
      read
      if reply = 'Y'
         dele
         pack
      endif
    lse
      @8,20 say 'Building no. does not exist'
      endif
      @10,10 clea to 12,50
      @10,10 to 12,50
      store 'N' to ans
      @11,12 say 'Delete more records? (Y/N)' get ans pict '!'
      read
   ddo
   EAR
   ose data
   turn
```

```
Procedure MODREC
  use build
  store 'Y' to ans
  do while ans = 'Y'
    clea
  store space(5) to mbldnum
  @1,10 Say "Enter Building Number: " get mbldnum Pict "99999"
  read
    locate all for bldnum = mbldnum
    if found()
    store bldnum to mbldnum
    store address to maddress
    store locan to mlocan
    store name to mname
    store plantp to mplantp
    store archi to marchi
    store contract to mcontract
    store datea to mdatea
  DO GETDATA
  READ
  clear
    replace bldnum with mbldnum
    replace address with maddress
    replace locan with mlocan
    replace name with mname
    replace plantp with mplantp
    replace archi with marchi
    replace contract with mcontract
    replace datea with mdatea
else
    @8,20 say 'Record does not exist'
endif
    @10,10 to 12,50
    store 'N' to ans
    @11,12 say 'Modify more record? (Y/N)' get ans pict '!';
            valid ans $ 'Y/N' error 'Invalid entry!!!'
    read
enddo
CLEAR
close databases
return

Procedure VIEWREC
  use build
  store 'Y' to ans
  do while ans = 'Y'
    clea
  store space(5) to mbldnum
  @1,10 Say "Enter Building Number: " get mbldnum Pict "99999"
  read
    locate all for bldnum = mbldnum
    if found()
    store bldnum to mbldnum
    store address to maddress
    store locan to mlocan
    store name to mname
    store plantp to mplantp
```

```
        store archi to marchi
        store contract to mcontract
        store datea to mdatea
            DO GETDATA
            WAIT
            clear
        else
            @8,20 say 'Building no. does not exist'
        endif
        @10,10 to 12,50
        store 'N' to ans
        @11,12 say 'View more record(s)? (Y/N)' get ans pict '!';
                valid ans $ 'Y/N' error 'Invalid entry!!!'
        read
enddo
CLEAR
close databases
return


Procedure REPORT
define window user from 1,1 to 22,78 none color W+,B
activate window user
@10,10 say "Check the file 'Build.out' for output"
set device to file "build.out"
set stat off
m = 13
        set space on
        DO HEADING
        store 1 to couter
        use build
        go top
do while .not. eof()
   @ m,1 say '|'+str(couter,3)+' |     ldnum+' |    name+'| '+locan+'| '+plantp+'
| '+;
      datea+'| '+archi+'| '+contract+'|'
   couter = couter + 1
   @ m+1,1 say replicate ('-',133)
   skip
   m = m + 2
   if m >= 64
      do heading
      m = 13
   endif
enddo
set device to screen
wait ""
close data
reactivate window user
return



PROCEDURE GETDATA
CLEAR
   3,1 say "OWNER'S NAME     :" get mname pict "@!"
   5,1 say "OWNER'S ADDRESS  :" get maddress pict "@X"
   7,1 say "BUILDING LOCATION:" get mlocan pict "@X"
   9,1 say  "PLAN TYPE     :" get mplantp ;
```

```
        pict "@M Residential,Office,Industrial,Estate,Hospital,Institution"
@ 11,1 say "DATE ACQUIRED:" get mdatea PICT "99/99/9999"
@  9,38 say "ARCHITECT  :" get marchi PICT "@X"
@ 11,38 say "CONTRACTOR :" get mcontract PICT "@X"
RETURN


PROCEDURE HEADING
@ 1,53 say "***********************************************"
@ 2,53 say "*     COMPUTER APPLICATION TO BUILDING PLAN    *"
@ 3,53 say "***********************************************"
@ 5,65 say "*********************"
@ 6,65 say "* LIST OF BUILDINGS *"
@ 7,65 say "*********************"
@ 9,1 say REPLICATE("*",133)
@ 10,1 say "|     |BUILDING|                            |                              |
|                  |    DATE    |                   |              | "
@ 11,1 say "| SN | NUMBER |        OWNER'S NAME         |       BUILDING LOCATION
|    PLAN TYPE    | ACQUIRED | ARCHITECT      | CONTRACTOR   |"
@ 12,1 say REPLICATE("*",133)
RETURN
```

```
                    ***************************************************
                    *      COMPUTER APPLICATION TO BUILDING PLAN      *
                    ***************************************************

                              *************************
                              *   LIST OF BUILDINGS   *
                              *************************
```

SN	BUILDING NUMBER	OWNER'S NAME	BUILDING LOCATION	PLAN TYPE	DATE ACQUIRED	ARCHITECT	CONTRACTOR
1	31323	ZUBAIRU ADAMU	No 34, Agwara Street	Residential	10/10/1998	GLOBAL & CO.	GLOBAL & CO.
2	73455	USMAN BELLO	234, GWADA STREET, MINNA	Office	11/02/1999	ADE NIG. LTD.	GOMA NIG. LTD.
3	43240	WILLIAMS DAVIES	Adewale Close, Bosso	Office	23/02/1999	WONDER PALACE	BELL & SONS LTD
4	45099	ADEBOWALE KULENDE	No 18, Behind High Court	Hospital	30/06/1999	PUTS DESIGNS	JULIUS BERGER
5	97577	FADE OLUWASEUN	44, IDRIS AUDU STREET	Estate	10/08/1999	VINT CONSORTIUM	P.W. NIG. LTD.
6	33115	POPSON BALAMIN	BARKIN STREET, MINNA	Residential	10/03/1999	PUTS DESIGNS	DANTATA & SAWOE
7	76551	JONES ALEXANBRER	23, USMAN STREET	Institution	25/01/2000	ORE PLANNERS	P.W. NIG. LTD.
8	11344	OLAPADE RACHEAL	45a BOSWORTH STREET	Institution	10/10/1999	ADEWUMI & CO.	GLOBAL BUILDERS