

**DATA BASE OF RECORDS INVOLVED IN
BUILDING DEVELOPMENT SCHEME**

**A CASE STUDY OF
NIGER STATE HOUSING CORPORATION**

BY

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CERTIFICATION

This project has been examined and found acceptable in partial fulfilment of the requirement for the Post-Graduate Diploma in Computer Science of the Federal University of Technology, Minna.

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DEDICATION

This project is dedicated to the entire members of Akinwande family, my lecturers, with my greatest regard to my wife, Mrs. Jumoke Akinwande, and my child Daniel.

May the Almighty God continue to shower His blessings on every one of us (Amen).

ACKNOWLEDGEMENT

To God be the glory, I express my sincere gratitude to God Almighty for the privilege and wisdom granted me to be able to successfully complete this program and also for making me a living witness up till today.

I am particularly grateful to my group supervisor, Mr. L. N. EZEAKO and also to the course co-ordinator, Prince Badmus. My sincere appreciation also goes to the Head of Department Dr. Reju and also to Mr. Kola Raheem for his advice.

I also acknowledge with gratitude the willing co-operation and assistance received from great number of people who have provided information and helping in various capacities during the period of preparing this report, so many that it is not possible to mention them all individually. Some have provided information indirectly through their books and other publications or lectures.

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I am particularly grateful to the family of Engr. Mustafa Bello for their physical and moral support in the course of executing the program. May God continue to be with them and reward them accordingly.

My deepest gratitude also goes to my wife Mrs. Jumoke Akinwande and my child Daniel for tolerating most of my long absence at home while undergoing the course.

Lastly, I register my appreciation to some of my colleagues like Mr. Ata, Mr. Henry etc. for their various ideas and knowledge which helped in this project.

May God Almighty continue to bless you all and guide you alright.

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ABSTRACT

This project focuses on the general over-view of Building and the Database of Records involved in a Building development scheme.

It is designed to find out how a building development scheme can be computerised in a Building Industry.

The program written can be used by those that have little knowledge about programming, as well as those who have considerable experience in programming.

The Software used is database (IV) for easy understanding of the user. Special attention is being placed on the Building Development Scheme of a typical Building Industry with special reference made to Niger State Housing Corporation. However it could be modified or adjusted based on the circumstances, to suit other industries that might find it useful despite the fact that material usage for different buildings varies.

CHAPTER ONE

1.0 INTRODUCTION

It is a necessity for every establishment to keep and have access of information about the employees and the activities of the said organisation.

Thus, the task of evaluating and analysing the housing needs with computer in our environment can not be over emphasized, for computer is an important tool for efficiency improvement and precision of job execution.

Perhaps it is necessary at this junction to define **COMPUTER** "As an electronic device which accepts data from an input device, perform arithmetic and logical operations in accordance with pre-defined program and finally transfers the processed data to an output device to produce an accurate and efficient result.

Housing scheme which is the subject matter of this report entails the analysis of the housing needs and their classifications as well as the procedural module of effective and efficient housing.

So, in presenting us with the means by which calculable certainties and probabilities can be manipulated on a vaster scale than ever before, the computer also requires that the judgement we fed in should be more sensitive than ever.

In order to meet up with the Housing development records in our environment, we must therefore consider the problem as the one that requires a solution and that the solution can be achieved through the use of computer.

Having mentioned above the problem proessed by the Housing need, this project will therefore be focused on how relevant data can be collated for a useful program development.

I therefore have no doubt that this report will be a very useful one to the housing sector in particular and Nigeria in General.

1.1 ARCHITECT AS A DESIGNER

The symbolic making of places is mostly seen or regarded as an architecture which can be defined as the art and sciences of structure.

Man makes new universe which are closer to his hearts desire. By this imagination, Architect ought to play a greater part in it by ensuring creativity in whatever he does. Creativity involves a response or an idea that is novel or at the very least statistically infrequent. If a response is to lay claim to being part of the creative process, it must to some extent be adaptive or of reality.

Also, true creativity involves sustaining of the original in sight, an evaluation and elaboration and developing it to the full.

A good Architect must enjoys aesthetic impression, has a high aspiration level for self, values own independence and Autonomy, must be productive and appears to have a high degree of intellectual capacity.

It is of paramount importance that Architect ought to be interested in people, things and their surroundings. If they are interested in people, they will be divergent, verbal imaginative, empirical in their approach and anxious to satisfy human needs. If they are interested in things, they will tend to be convergent and interested in philosophical abstraction for it's own sake and in perfect architecture.

Whatever the nature of the architect, his building is eventually going to impinge on the senses of other people.

In most cases, the architect will have to exercise skills of location analysis (putting things in the most appropriate places). He will be concerned with structures, servicing and environmental control, he will exercise his judgement over matters of cost, interior design which will require from him the skills of the artist.

He is concerned with spatial ability and in particular with his capacity for visualizing, or otherwise generating the three - dimensional forms of buildings, interior spaces and the spaces about buildings.

1.2 HOUSING - BASIC NEED OF LIFE

Housing no doubt is one of the basic need of every person individual, collectively and communally.

This is however where the simplicity of an agreement on the term ends. Housing is a term that is both simple and complex at the same time. It is simple because it is physical and very visible and important as shelter in which we spend a significant proportion of our time no matter what you do outside. A large proportion of our resources also go into housing.

If however we look at housing from the view point of a broader social context, we will find that it is diverse and complex because of it's interrelationship within the social, economic, political and neighborhood environment.

Because of the complex nature of it, it can be described as the residential neighborhood micro-distinct or physical structure that man kind use for shelter and the environment of the infrastructure including all necessary facilities needed for the physical health and of the social well being of the family and individual.

DETERMINATION OF A GOOD SHELTER

Almost all new residential development comes about through a sub-division of low land, such sub-division is a process whereby a relatively large track of land is divided into blocks between streets that provides access. These blocks are further divided into individual ownership. The types of streets and parking element of any sub-division design, street systems must be laid out functionally and be appropriate for it's particular use.

For one to determine whether a particular shelter is good, the following has to be taking into consideration.

(a) *Surrounding Sub-soil*

The soil and sub-soil condition should be such that is suitable for further development or expansion and should be suitable for location of utilities connection, grading and planting.

The bearing capacity should be able to allow for economic developments.

(b) *Ground Water and Drainage*

The water table level should be the type that can easily be controlled to help in protecting the building against basement flooding and interference with sewage.

The water table level should easily be controlled to prevent periodic flooding and allows for sufficient slope that permits

surface drainage of normal rainfall and a free flow of sanitary sewers.

(c) ***Topography***

The location of a building should not have elevation above which normal water pressure for the domestic use can not be obtained. It should permit adequate vehicular and pedestrian circulation within the surroundings.

(d) ***Open Areas***

There should be a suitable opening area for development of gardens and recreational areas like playing grounds and parks.

(e) ***Sanitary Provision***

The surroundings of a good shelter should have proper sanitary sewage disposal system. Collection and ultimate disposal of human excrete without sanitary hazards is of paramount importance. In this regard, the sewer line where applicable should be well located.

There should be facilities for the effective removal of domestic wastes (notably garbage and non combustible rubbish).

(f) ***Water Supply***

It is very important that a good shelter is situated in an area where there is a water supply that is adequate.

There won't be means of conveying disease. The water should be free from physical and chemical impurities. A public water supply with assumed maintenance of official Health Standard is generally preferable to individual or community supplies.

Water of good quality must be made available in each dwelling under pressure and supply must be adequate to provide for fire fighting and other special needs.

(g) Power and Communication

Location of a good residential building must be of such a manner that Telephone and electricity line are easily connected.

(h) Accident Hazards

Buildings should be well positioned in such a way that it will be entirely free from hazards to life or health.

Certain hazards may not be apparent immediately as they may depend on the climatic conditions.

Major Accidental Hazards are:-

- * Collision with moving vehicle
- * Fire outbreak
- * Explosion and drowning
- * Rail Crash

- * Crash Landing of Air Craft, should circumstances warrant situating a house within the aforementioned zones, adequate protective measures should therefore be taken.

(i) Odours

Excessive localise smoke, odour or dust unless it can be controlled should be avoided in a building meant for residential use.

Seriousness of these nuisances will depend on the intensity and frequency.

The presence of these nuisances can be subjected to weather condition.

Sources of objectionable odours are:

- Industrial plants, Abattoirs etc.
- Refuse Dumps
- Streams surrounded by sewage disposal
- Fumes from Heavy Motor traffic and rail lines.

(j) Noise

A good shelter should be free from undue disturbances sources of Noise are:

- * Airports
- * Busy Roads
- * Rail Lines
- * Markets etc.

1.3 OBJECTIVE OF THE STUDY

The objective of this study being contemplated upon which is the computerization of Housing development scheme is aimed at creating a housing development scheme that will help the general public in having access to conducive and functional housing.

However, it acts as a comprehensive guide for intending developer to project and forecast the possible construction cost of different types of functional housing scheme that minimise as much as possible of accommodation in our environment so as to enhance adequate, quality and standard of living of the populace.

Also it leads to a measure of standardization in construction methods.

For one to maintain this uniform standardization, adequate consideration should be given to the selection of land meant for the development of housing scheme.

Residential areas should be desirably, be conveniently located on a physical suitable - not excessively steep, be above flood plains and reasonably health. Ordinarily, one would have expected that this write-up looks for a way of determining the type size and number of housing development required in a particular area which will be based on the population density.

But there is a limitation due to the fact that Government alone can not shoulder the responsibility of providing adequate housing.

Compounded also by the daily fluctuation of labour rates, increase in prices of building material and misappropriation by some of the officers in charge of the development.

1.4 EXISTING SYSTEM

Studying and Analysing the existing system is what prompted me into embarking on this project.

The shortcomings of the existing system has been carefully looked into and the problem must be correctly and completely defined.

In arriving at the definition of this problem, I have conducted an interview among the employees of the establishment. Even though problem definition can be through interview or questionnaires. I have found it worthy to conduct an interview because of the attitude of people towards completing questionnaires. Based on the outcome of the interview the existing system lacks well defined accurate information of development techniques, making it difficult for one to have accurate information of the development process.

Also, forecasting the likely cost of building materials and labour required might be difficult.

Therefore, computerizing the scheme is of paramount importance for it will make it possible for one to have detail and accurate knowledge as well as viewing and projecting the developmental process and at the end achieving excellent performance of the organisation.

1.5 PROBLEM OBSERVATION

It has been rightly observed that great system in efficiency is being experienced from the present operational process.

To reduce therefore or to eliminate these deficiencies brings about the need for system development.

Misplacement of files in most of the government offices nowadays as well as shroud behaviour of officers that misappropriate the public fund makes it difficult to get accurate information about the projects already executed.

To eliminate or reduce these trends, there must be the need for a system where every information of data can always be stored and possibly have a back up whereby making it difficult for anybody that might want to tamper with the record.

To achieved this, **MASTER FILE** shall be created to contain most of the relevant data required and it can be updated with the records in a **TRANSACTION** file that contains daily/regular activities of the scheme to reflect the current status.

For the organisation to make effective use of information, or a more useful structure for information and also for it to experience reasonable growth which require expanded and more powerful systems to meet the needs of increasing housing demands, The problem observed need be reduced or completely eliminated.

PROBLEM SOLVING TECHNIQUES

Having realised that system is bound to be confronted with one problem or the other. It will be appropriate to look at some of the techniques that can be used for problem solving.

Problem may occur in very definite form, so that the mind begins to speculate at once on it's probable explanation. Or it may manifest itself first as a feeling of unease, followed by a gradual realization after further investigation as to what the problem really is.

The possible solution can therefore be viewed by involving the idea of going from what is known to what is unknown.

Corroboration of an idea and formulating of a concluding believe can be channelled by reasoning which shows that if an idea is adopted, then certain consequences will follow but this is only a hypothesis, and before it can be adopted finally it must be tested.

For one therefore to achieve a meaningful problem solving. The following decision sequence can be adopted:

- * Defining the problem
- * Analysing the problem
- * Developing alternative solutions
- * Deciding on best solution
- * Conveying decision into effective action.

Operations Research

The aforementioned sequence can be related to operation Research which can be defined as the "Application of scientific methods by interdisciplinary terms to the problem involving the control of an organised system as to provide solutions which best serve the purposes (needs) of the organisation as a whole.

Some of the techniques of operation Research can be as highlighted below:

- Linear programming
- Transportation problem
- Queuing Theory

Linear Programming

Linear programming is perhaps the most frequently used of all operational research techniques. It is one of a few mathematical tools that can be used in the solution of a wide variety of large or complex problems that involves decision making. Such problems are characterised by the goals and restrictions (constraints).

It is based on the fact that in many problems when the relationship between variables is plotted on a graph it proves to be linear.

In many cases for example, if one doubles the resources one may also doubt costs and profits.

Some of the problems that can be approached in this way are:-

- (i) Finding out how a particular set of parts can be manufactured at minimum cost.
- (ii) Allocating the available capital between different kinds of new equipments.
- (iii) Finding the cheapest mix of available material to match a given set of criteria.
- (iv) Dividing work between different teams.
- (v) Allocating scarce building materials.
- (vi) Locating new plant, offices, warehouse etc.

For example, let us suppose we have to design on Odunoye estate of 40 blocks, each block to be 4 stories high and containing 320 flats. For reasons of orientation and for variety there are two types of block.

Types 'A' which contains 120, 3-Bedroom flats for the senior staff and 200, 2-Bedroom flats; for the income earners and Type 'B' which contains 100, 3-Bedroom flats for the senior staff and 220, 2-Bedroom flats for the low income earners, based on assumption of government policy that two-thirds of the flats should be for the low income earners and the remainder for the senior staff.

The problem is to decide on how many blocks of each type should be built on the estate.

This problem can be solved graphically by plotting the given values for the two variables. These graphs can also be used to analyse the cost of each set of flats.

Transportation Method

This particular application is designed to cut to a minimum the cost of distributing goods between several dispatch points and several receiving points.

It has obvious applications, say in the distribution of Sandcrete Blocks from a number of moulding industry's to a number of sites and it would be particularly relevant in the case of special buildings where for instance concrete cladding panels were to be made in a number of different factories for distribution to a number of sites.

Suppose for example, that three factories can each produce the following in given time.

- Factory** A: 1,000 Units
- B: 750 Units
- C: 500 Units

Quantity required at each site in a given time are:

- Site** 1: 450
- 2: 1,200
- 3: 600

From Factory	A	B	C
To Sites	1:20	25	12
	2:12	15	8
	3:15	5	4

One might start to solve the problem by selecting the cheapest transport route by given special consideration to the total output of the particular factory in relation to the total demand from various sites.

One should as much as possible try to element the most expensive routes.

INITIAL SOLUTION

FACTORY	A	B	C	TOTAL
Site 1:	450 @ 20 = 900	0 @ 25 = 0	0 @ 12 = 0	
2:	550 @ 12 = 6,600	650 @ 15 = 9,750	0 @ 8 = 0	
3:	0 @ 15 = 0	100 @ 5 = 500	500 @ 4 = 2000	
Total	1000 @ Total 15,600	750 @ 10,250	500 @ 2000	

Revised Solution

1.	0 @ 20 = 0	450 @ 25 = 11,250	0 @ 12 = 0
2.	600 @ 12 = 7,200	300 @ 15 = 4,500	300 @ 8 = 2,400
3.	400 @ 15 = 6000	0 @ 5 = 0	200 @ 5 = 1000
Total	1000 @ 13,200	750 @ 15,750	500 @ 3,400

Queuing Theory

Queuing theory, as the name implies, is concerned with waiting of any kind.

Obviously, it has some bearing on traffic problems. For example one may queue for a bus, one may que for services in a shop and also in industries.

Workman may also que for materials or tools from the store. Queuing theory therefore has a great deal to offer the designer who is concerned with efficient planning.

Queuing theory could be appropriate for problems concerned with:-

- (i) The number of machines which are operator can use.
- (ii) Servicing in Batches, such as passenger lives, etc.

CHAPTER TWO

2.0 LITERATURE REVIEW

Building development no doubt is one of the basic need of every person, individually and communally.

Housing is a term that is both simple and complex. It is simple because it is physical, we see it therefore very visible and important as shelter in which we spent significant proportion of our time. A large proportion of our resources also go on it.

It is complex because of the process it takes. The process of building development begins when a need first arise in someone or corporation mind and terminate when the completed building starts serving the purpose for which it was meant for.

Building development scheme therefore can be described as the step by step procedure that is involved in the execution of a building project right from when the idea is conceived to when the physical structure is completed.

The above description can be related to the planning, organisation, directing and controlling of the given project from inception to completion with the aim of meeting the clients (owners) requirements and ensuring quality, effective economic and Timely completion.

If the National Housing Policy adopted by the Federal Government in the National Development Plan is to be fully achieved, (the policy called for accelerated housing supply and direct involvement of government in housing. Also, institutions and organisations were encouraged to contribute to the expansion of the housing stock) also with the artificially inflated cost of procurement of building materials to be controlled, the importance of "DATA BASE of BUILDING DEVELOPMENT SCHEME" can not be over emphasised.

2.1 BUILDING REQUIREMENT DATA ANALYSIS

Effective Housing Development can be achieved by a building Industry which depends on careful analysis of the required data.

Data holds the key to the orderly and efficient development and control of housing schemes.

A Continuous record of the type of housing or building demands of the generality of the public as well as the Estimated Completion Cost of Various type of buildings which depends on the material used will help a typical developer in deciding on what types of project to embark upon.

Continuous record of location of Building development and how convenient and conducive the location is to the occupant will definitely guide the developer so as to avoid the situation whereby an estate is being built only for it to be abandoned and vandalised within short period.

2.2 REQUIREMENT DETERMINATION

The Determination of the aforementioned requirements is based on the past experience of the developer taking into consideration the living habits of the inhabitants as well as the economic situation.

Some of the Data that can be used includes:-

- (a) Major Occupation in the area
- (b) Type of services available
- (c) The desire of the inhabitants to occupy the building
- (d) Project location
- (e) Type of materials
- (f) Availability of materials
- (g) Availability of labour
- (i) Means of transportation. etc.

The above mentioned Data will no doubt determines the estimated total cost (ETC) of the project.

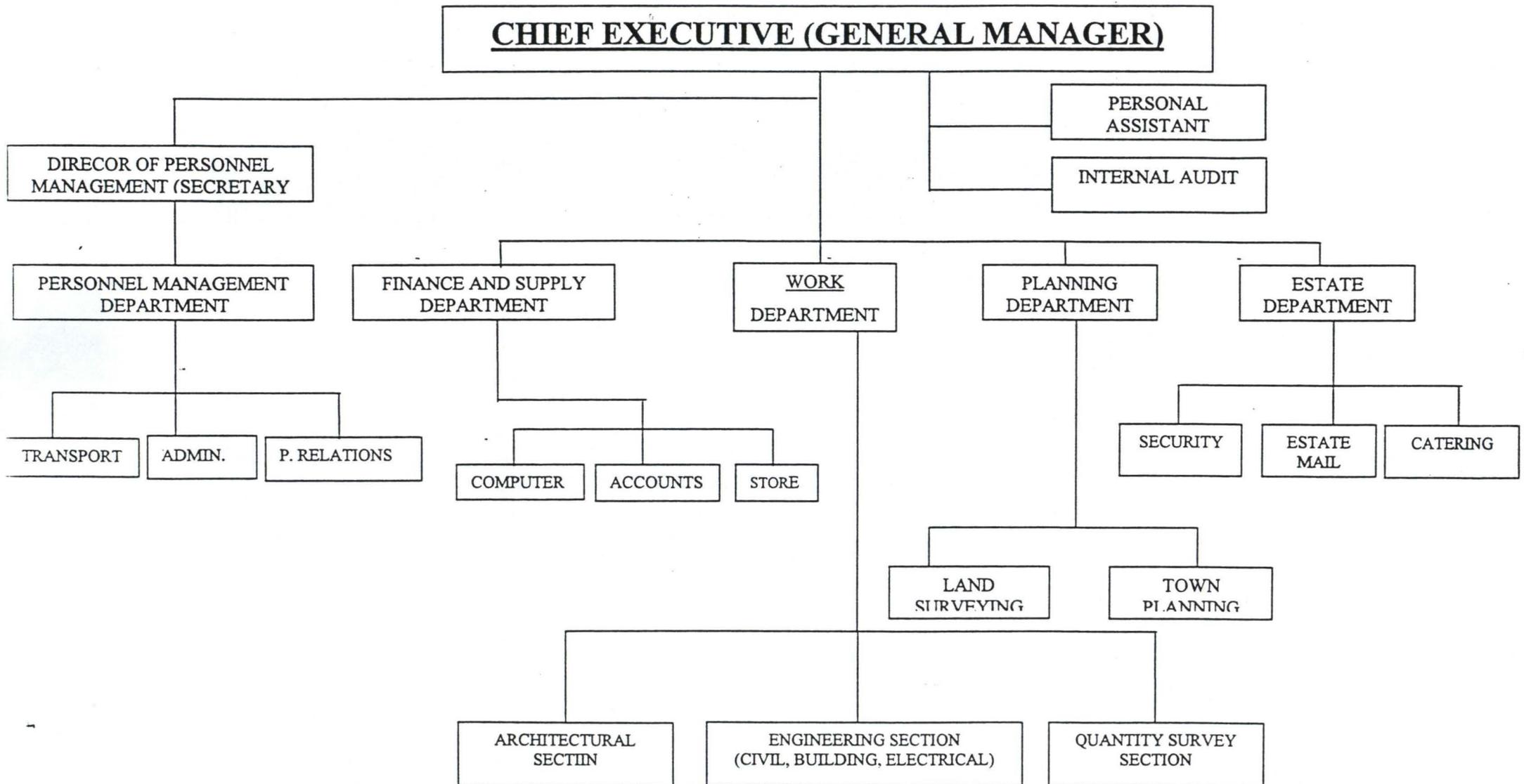
HISTORICAL BACKGROUND OF THE NIGER STATE HOUSING CORPORATION

Niger State Housing Corporation was established on 15th May 1979 by Edit No. 5 of 1979. The main objective of the Corporation is to minimise as much as possible the problem of accommodation in the state by providing improved and adequate housing thus enhancing the quality and standard of living of the citizens of Niger State and Nigerians in general.

ORGANIZATION CHART

The corporation has five departments for maximum efficiency and effectiveness namely: Administration, works, Planning, Finance and Supply, Estate department. Internal Audit and public relations are under the office of the General Manager.

NIGER STATE HOUSING CORPORATION
ORGANISATION CHART



2.4 AREAS OF INTERVENTION BY NIGER STATE HOUSING CORPORATION

The Corporation Completed Tudun Wada Housing Estate, comprising of 260 Units of Three bedroom low income houses and Sixty Intermediate 3-Bedrooms house between 1980 and 1981.

ZARUMAI HOUSING ESTATE

- Comprising of 27 3 - 4 Bedrooms was purchased from - New Nigeria Development Company towards the end of 1979,

NIGER HOUSE ESTATE

- In 1981, the Corporation embarked on the Construction of 27 Units of 4 bedroom executive bungalows. The Estate was completed in 1983, and tagged Niger Housing Estate, also has 8 number 3-bedroom, executive bungalows.

SULEJA AND BOSSO HOUSING ESTATES

- The Suleja Housing Estate comprising of 50 Low Cost Houses of 4, 3 and 2 bedrooms, and the Bosso Housing Estate in Minna consisting of 56 Low Cost houses are free lease from the State Government.
- The corporation also has a consultancy Unit that provides comprehensive professional services in the field of Housing Development, Physical Planning, Engineering etc.

OTHER ACHIEVEMENT OF THE CORPORATION INCLUDE

- Progress Court '84 - A 4-Store block of 12 No. 3 bedrooms flats and 4 shops completed in 1986 at Zarumai residential area at a cost of 1.2 Million Naira;
- Construction of Commercial complexes (3 Storeys) were completed along Bosso road Minna. There is also a proposal to construct a fourth Commercial complex along Bosso Roads;
- The corporation in 1988 Converted the former parliament Building into a High Court complex. It constructed and completed the Kasuwan Gwari Market, Minna in 1988;
- Constructed and completed residential Quarters at Minna Army Barracks; 100 number corporals and below quarters
- Completed Doctors flat at the Minna General Hospital;
- Constructed and completed Warehouses and Service pits on a UNICEF assisted health project, along Kpakungu Road;
- Constructed and completed the Gynecological Ward at Minna General Hospital;
- Built the Shiroro Local Government Secretariat at Kuta;
- Completed 43 number 1 bedroom core houses at Tunga Minna and 10 in Bida Under its co-operative scheme;
- Completed 20 2-Bedroom Traditional Houses at Tunga Low-cost extension, Minna;

- Construction of Modern Markets at Bida, Suleja, Kontagora and Minna Have been completed by the Corporation;
- Built the Minna Local Government Secretariat.
- Markets at Agaie and Kagara, Constructed by the Corporation, have been commissioned;
- A basic Health Centre at Kura, Mariga Local Government has been completed and commissioned in 1993;
- Niger House Building Society Ltd, a primary Mortgage Institution established by NSHC was commissioned in 1993;
- Construction of Local Government Secretariats at Wushishi, Gurara and Gbako have all been completed and commissioned.
- Hill-Top Science Laboratory was completed and commissioned on the 30th October, 1995 by the Emir of Minna, on behalf of the Military Administrator of Niger State.

PROGRESS REPORT ON PROJECTS UNDER DEVELOPMENT:

Dutsen Kura Commercial Housing Estate Works commenced on this Estate in late 1992. Presently (14) 3 bedrooms houses have been completed. The Estate would have 50 houses when completed.

KOIDA HOUSING ESTATE

The Corporation has acquired an area of 51.0659 Hectares of land between Police Secondary School and Koida Village, along the Southern-bye pass, Minna. The land is proposed for low cost housing. The Corporation has

finished layout of the plots and has approached the State Government for approval and contributions for this scheme. The Estate is expected to consist for 100,2 bedroom houses, with entrance hall (Zaure) and extendable to 4-bedrooms.

BARKIN-IKU ESTATE, SULEJA

The Corporation acquired 49 Hectares of land at an area called Barkin-Iku in Suleja. The Area is a proposed site and Services Scheme. Attempts were made to provide access roads, but works have been suspended due to lack of funds and poor responses from the market. The plots on this site will be sold to the general public after infrastructural facilities have been provided.

A Housing Estate comprising of 60 3 x 4 Bedroom Executive houses for sale is proposed for the site by the corporation.

2-BEDROOM PROTO-TYPE HOUSES FOR LOCAL GOVERNMENT AREAS IN NIGER STATE

The Corporation in conjunction with Local Government Areas in Niger State propose to construct 10 2-Bedrooms proto-type houses in each Local Government Headquarters. Discussions between the Corporation and some Local Governments have reached advantage stage.

CONSTRUCTION OF NEW LOCAL GOVERNMENT SECRETARIAT

In March, 1997 the State Government awarded contract to Niger State Housing Corporation to construct secretariat for Bangi, Tafa, Munyi, Kacha, Mashegu and Edati local government areas, by October, 1997 all

the project have been personally commissioned by C. P. Simeon Oduoye Military Administrator of Niger State at the total cost of ₦38.4 Million Naira.

Each Local Government Secretariat consist of office for the Chairman, Secretary, P. A. and treasurer, conference, hall reception hall, general office and 6 other offices for supporting staff, coffee room, 3 number toilets, open courtyard and carport.

NATIONAL HOUSING FUND PILOT SCHEME

Niger State Housing Corporation is among the corporations selected by Federal Mortgage Bank of Nigerian to participate in the National Housing Fund Pilot Scheme. Niger State Housing Corporation has already received applications from 45 interested participants.

Niger State Housing Corporation opened accounts for the participants with ASO savings and loans, Abuja through which National Housing Fund would be disbursed to the Corporation each house to be constructed by NSHC would be sold out to successful applicants at the cost of ₦750,000. The beneficiaries would then become proud owners of 2-bedrooms houses.

When more applications participant in the scheme more houses would be build. The scheme is still open to individuals that are interested in owning or having their own houses, through the National Housing Fund. The forms are now available at NSHC to interested members of the public. Actual construction of the houses for the first 45 participants is to commence soon.

CHAPTER THREE

3.0 SYSTEM ANALYSIS AND DESIGN

3.1 SYSTEM ANALYSIS

System Analysis is the process or activities involved in examine an already existing system (Manual or Computerised System) for new system to be introduced. It is carried out by system Analyst and with primary aim of obtaining complete and authentic information which will acquaint the analyst with the knowledge of prevailing situation so that the feasibility of designing an effective computerised system can be known.

3.1.1 System Design Life Cycle (STAGES)

System Design Life Cycle (stages) consists of series of activities and chronological procedures which are conveniently discussed as follows:

(a) ***Preliminary Survey***

Preliminary Survey is carried out to ascertain if there is the need for new system and to identify its objective. This process is carried out by a steering committee setup by the management of the concerned organisation to be computerised.

(b) ***Feasibility Study***

Feasibility Study is the study of a system to identify reasons which justifies the development of the new systems or favours non-execution of the project.

(c) **Fact Finding**

Fact Finding is carrying out detailed study of an existing system to completely identify the problems and information requirements of the existing system.

(d) **Fact Analysis**

Fact Analysis is a stage where critically examination of all recorded fact is done with a view of having proper assessment of the current system. This stage provides necessary information with which the design of a new system can commence.

(e) **System Design**

System Design is the use of an analyst's creativity ability and sense in organising a local but literally feasible procedure for a computerised system.

This procedure may lead to a number of possible alternative designs, for example, different combinations of manual and computerised elements may be considered.

Once one alternative has been selected the purpose of the design stage is to work from the requirements specification.

(f) **Implementation**

This is another essential stage of system execution. It has to do with the process of coding, Testing and documenting program in the system.

This stage involves development of quality assurance procedures among which is data security, backup, recovery and system controls.

3.2 SYSTEM DESIGN DEVELOPMENT

The development of a new system may arise based on the initiative of the System Analyst of the establishment.

It may be as a result of the decision of the analyst to change from the old system to the new or due to problems with the existing system.

Other reasons that might warrant development includes:

- (i) The desire to exploit new opportunities
- (ii) Increasing competition
- (iii) The desire to make more effective use of information
- (iv) Organisational growth. etc

3.3 INPUT SPECIFICATION

The term Input is the process of entering data into a system via the keyboard. The input specification will serve as an interaction avenue between the system's user and the system.

Below are all the necessary Input specification involved in the design of Database of a Housing Development Scheme. (Fig. 1.0)

DATABASE OF A HOUSING DEVELOPMENT SCHEME (A CASE STUDY OF NIGER STATE HOUSING CORPORATION)

Date:-

Time:-

REGISTRATION DATE

REGISTRATION TIME

STOCK CODE

STOCK NAME

PURCHASE DATE

QUANTITY PURCHASED

UNIT PRICE

TOTAL AMOUNT

(S) AVE

(R) EPEAT

(A) BANDON

INPUT SPECIFICATION FOR: REGISTRATION OF NEW BUILDING MATERIALS (STOCK IN) INTO THE DATABASE FILE

FIG. 1.0

DATABASE OF A HOUSING DEVELOPMENT SCHEME (A CASE STUDY OF NIGER STATE HOUSING CORPORATION)

Date:-

Time:-

REGISTRATION DATE

REGISTRATION TIME

PROJECT CODE

PROJECT NAME

CLIENT NAME

SPONSORER'S NAME

LOCATION/SITE

(S) AVE

(R) EPEAT

(A) BANDON

INPUT SPECIFICATION FOR: REGISTRATION OF NEW PROJECT INTO THE PROJECT DATABASE

FIG. 2.0

**DATABASE OF A HOUSING DEVELOPMENT SCHEME (A CASE STUDY OF
MIZORAM STATE HOUSING CORPORATION)**

Date:-

Time:-

REGISTRATION DATE	<input type="text"/>
REGISTRATION TIME	<input type="text"/>
PROJECT CODE	<input type="text"/>
PROJECT NAME	<input type="text"/>
CLIENT NAME	<input type="text"/>
SPONSORER'S NAME	<input type="text"/>
LOCATION	<input type="text"/>
SERIAL NUMBER	<input type="text"/>
STOCK CODE	<input type="text"/>
STOCK NAME	<input type="text"/>
QUANTITY ORDER	<input type="text"/>
UNIT PRICE	<input type="text"/>
AMOUNT	<input type="text"/>
LABOUR COST	<input type="text"/>
TOTAL COST	<input type="text"/>

(S) AVE

(R) REPEAT

(A) BANDON

**INPUT SPECIFICATION FOR: REGISTRATION OF PROJECT
EXECUTION (STOCK OUT)**

FIG. 3.0

3.4 OUTPUT SPECIFICATION

The term output differs from one angle to another, this depend on the areas of the study but generally the computer literally meaning of output is the result and information that are gathered by a system displayed on a computer screen or hard copies (paper)

However, some of these (Result output) are already been reprocessed by use of some certain instruction (codes) in output to get the actual and desired report. This system output is necessary to produce the result either on the computer screen or on the printer (hard copies). the output of the proposed system is designed to generate different types of reports mainly:

(1) STOCK IN REPORT

The Stock in Report produce/generate all Registered Building materials in the Housing Corporation Hardware house. Each item has a unique stock code that is used to differentiate one stock from one to another. The format of the stock-In Report Generation is as shown below in figure 4.0:

DATABASE OF A HOUSING DEVELOPMENT SCHEME

(A CASE STUDY OF NIGER STATE HOUSING CORPORATION)

REPORT ON REGISTERED STOCK/BUILDING MATERIAL IN THE

DATABASE

S/NO	STOCK CODE	NAME	PURCHASE DATE	QTY. PURCHASED	UNIT PRICE

FIG. 4.0

(2) STOCK REPORT

This Report produce all the necessary output that shows all the building materials that was given out for construction.

The format of the Stock-Out Report Generation is as shown below in fig. 5.0

DATABASE OF A HOUSING DEVELOPMENT SCHEME

(A CASE STUDY OF NIGER STATE HOUSING CORPORATION)

REPORT ON REGISTERED STOCK/BUILDING MATERIAL IN THE DATABASE

STOCK-OUT REPORT

S/NO	PROJECT CODE	CLIENT NAME	STOCK CODE	STOCK NAME	QTY ORDERED	UNIT PRICE	AMOU.	LAB. 25%	TOTAL COST

FIG. 5.0

(3) PROJECT REPORT

This Report produce all the Registered Project undertaken by the Niger State Housing Corporation to date. The format of project Report is as shown below in fig. 6.0

DATABASE OF A HOUSING DEVELOPMENT SCHEME

(A CASE STUDY OF NIGER STATE HOUSING CORPORATION)

REPORT ON REGISTERED STOCK/BUILDING MATERIAL IN THE DATABASE

PROJECT REGISTERED REPORT

S/NO	PROJECT CODE	CLIENT NAME	SPONSORER'S NAME	LOCATION

FIG. 6.0

(4) BUILDING REPORT

The Building Report produces a comprehensive output project executed in the total cost that was spent on a project. The format of the Building Report is as shown below in fig. 7.0

DATABASE OF A HOUSING DEVELOPMENT SCHEME

(A CASE STUDY OF NIGER STATE HOUSING CORPORATION)

REPORT ON REGISTERED STOCK/BUILDING MATERIAL IN THE DATABASE

BUILDING REPORT

S/NO	PROJECT CODE	PROJECT NAME	CLIENT NAME	LOCATION SITE	COST OF PROJECT

FIG. 7.0

3.5 CHOICE OF PROGRAMMING LANGUAGE

The choice of programming language for the proposed system is Dbase IV which is a good example of a complete Database Management System (DBMS).

3.5.1 Why Database Management System (DBASE IV)

The concept of database system will be explain in terms of the objectives of database which reflect the present needs of the modern data processing community.

The overall objectives in the development of database technology has been to treat data as an organisational resources and as an integral whole. Moreover, database systems allows the data to be protected and organised separately from other resources (e.g. Hardware, Software and Program).

It is in respect of the above points that Dbase IV was chosen as the choice of the programming language, specifically because of the following reasons:

- (i) It is suitable for transaction processing application
- (ii) It is easy to use and understand
- (iii) It is easy to make correction
- (iv) It is easy to develop a user friendly applications, hence data entry and updating can be easily performed.

3.6 DATABASE FILE DESCRIPTION

Database file Description shows the description of all the database used in the proposal. This however, include the description of the contents of the files used and their structured. Hence, all files that are used in the system

are fully described in this section. Below are the database structure used throughout the program.

(1) STOCK-IN DBF

The Stock-In database file comprises of seven fields (2 Date filed, 3 Character fields and 2 Numeric fields). Its aims is to hold information regarding stock/materials in the warehouse of the Niger State Housing Corporation.

S/No.	FIELDNAME	TYPE	WIDTH
1.	REG DATE	DATE	8
2.	REGTIME	CHR	8
3.	STOCKCODE	CHR	4
4.	STOCKNAME	CHR	30
5.	P-DATE	DATE	8
6.	NUM	NUM	4
7.	NUM	NUM	12.2

(2) PROJECT DBF

This database file is used to hold only registered project that is to be executed or that has already ben executed. The structure of the database file is as shown below:

S/No.	FIELDNAME	TYPE	WIDTH
1.	REGDATE	DATE	8
2.	REGTIME	CHR	8
3.	PROJECTCODE	CHR	4
4.	PROJECTNAME	CHR	30
5.	CLIENTNAME	CHR	30
6.	SPONSPOR	CHR	30
7.	LOCATION	CHR	30

(3) BUILDING DBF

The Building Database file is the Masterfile of this program. A masterfile is a permanent file that contain records considered to be of vital running of an organisation. The records available are of vital importance, hence, the data must reflect the up-to-date state of the Data types and of course, the Data Occurrence must be correct.

However, since the Building Database file carries all information of each project executed by Niger State Housing Corporation, it is very easy to estimate and know the actual cost of any project executed by the corporation. The structure of the Building Database file is as shown below:

S/NO	FIELDNAME	TYPE	WIDTH
1.	REGDATE	DATE	8
2.	REGTIME	CHR	8
3.	PROJECTCODE	CHR	4
4.	PROJECTNAME	CHR	8
5.	CLIENTNAME	CHR	30
6.	SPONSOR	CHR	30
7.	LOCATION	CHR	30
8.	SERIAL/NO	NUM	3
9.	STOCKCODE	CHR	4
10.	STOCKNAME	CHR	30
11.	QUANTITY-ORDER	NUM	4
12.	UNITPRICE	NUM	12.2
13.	AMOUNT	NUM	12.2
14.	LABOUR (25%)	NUM	12.2
15.	TOTALCOST	NUM	12.2
16.	DATE	DATE	8

3.7 STRUCTURE OF THE NEW SYSTEM

The proposed system is designed to be user friendly and menu driven (that is an active user interface).

It has a main menu system tag "PROJECT EXECUTOR" with five (5) options as submenu underneath. Each of this option can be activated with the use of the **UP** and **DOWN ARROW KEY** preceded with an **ENTER KEY** to call or activate the concerned procedural program. The format of the main menu system is as shown below:

DATABASE OF A HOUSING DEVELOPMENT SCHEME

Date:-

Time:-

PROJECT EXECUTOR

STOCK – IN OPTION

STOCK – OUT OPTION

PROJECT-EXECUTOR

PROJECT PROCESSOR

REPORT GENERATION

QUIT PROGRAM

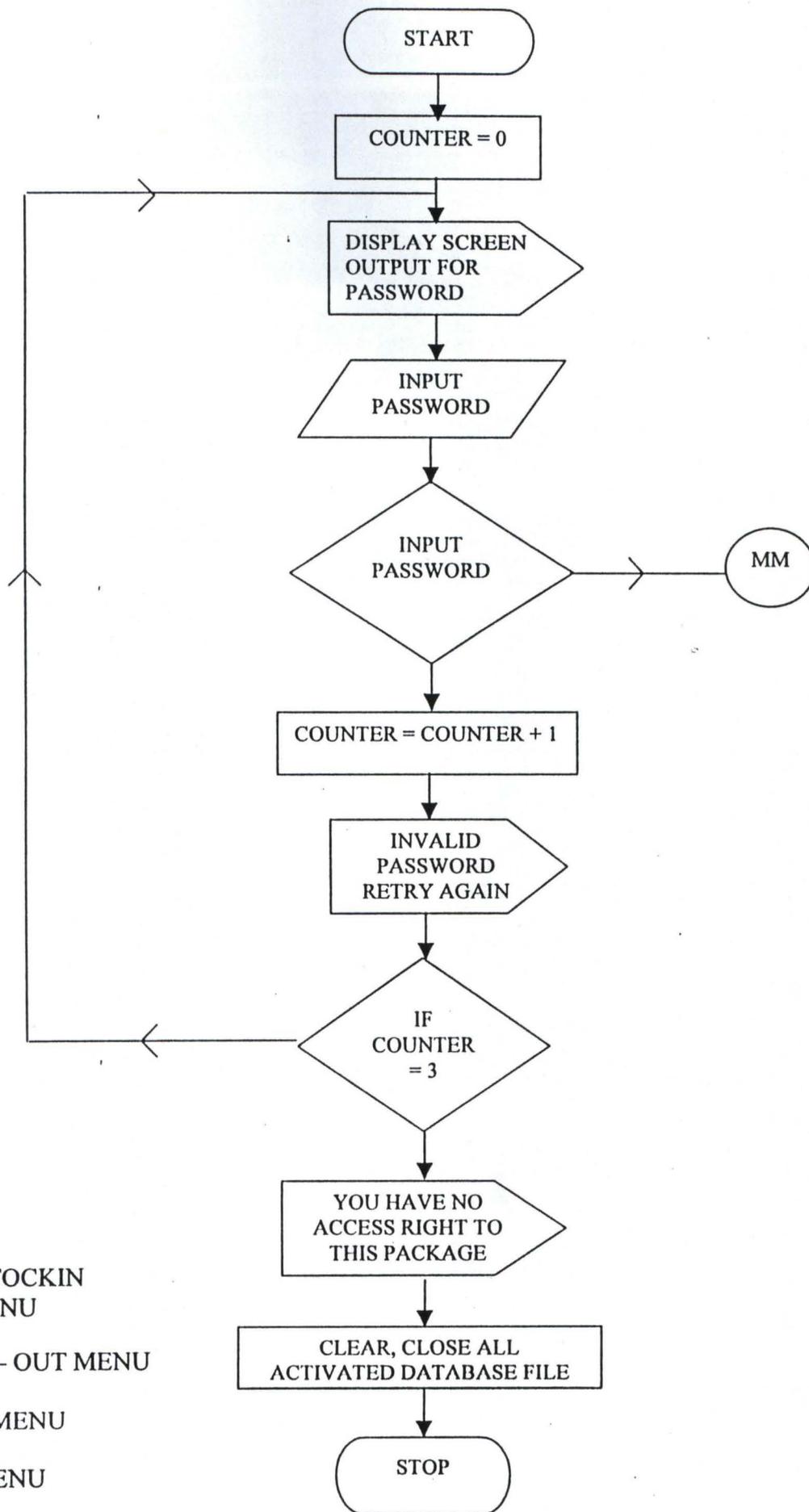
USE UP AND DOWN ARROW KEY TO HIGHLIGHT

AND PRESS ENTER TO EXECUTE

3.8 FLOW CHART

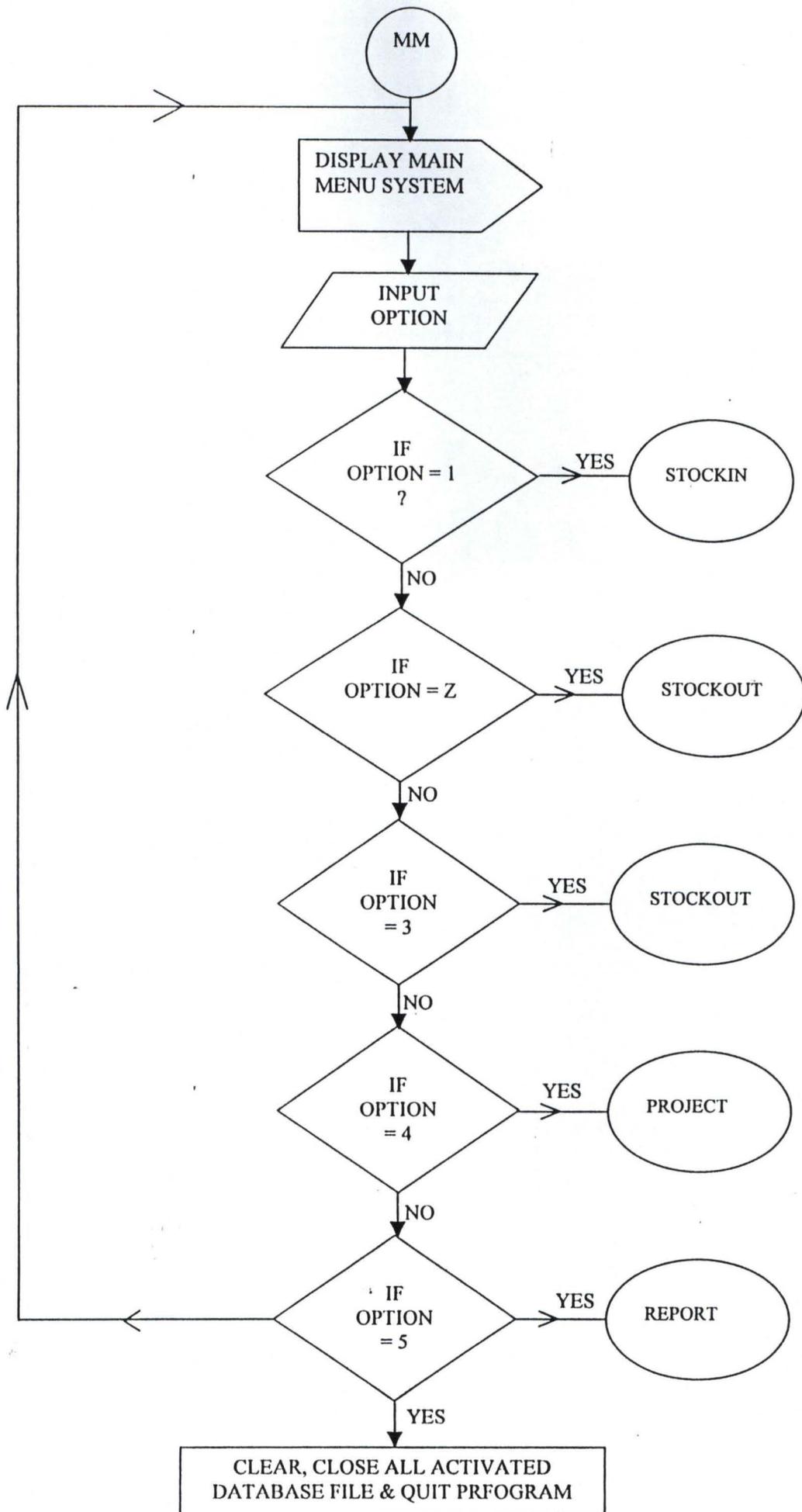
Flow Chart is a technique for recording and analysing gained from inquiries about a system, observation of data processing activities, and examination of transactions and documents flowing through a system.

However, it can also be said as a diagrammatical representation of a program. The flow charts for the system is as follows:



KEY

- MM – MAIN MENU STOCKIN
STOCK – IN MENU
- STOCKOUT – STOCK – OUT MENU
- PROJECT – PROJECT MENU
- REPORT – REPORT MENU



CHAPTER FOUR

4.1 SYSTEM TESTING

After the system must have been developed, the next stage is the system testing. System Testing can be defined as the process of entering raw data into the system via the use of the keyboard in order to establish an error free program and to confirm it does what it is required to do appropriately. It is ironically impossible to test a program so thoroughly that it can be claimed to be free of errors. In most cases, fixing one errors gives rises to a lot of others, which in turn have to be corrected and exhaustively tested. It is much more realistic to think of testing as a "process of finding errors". When a stage is reached when the program appears to run perfectly, this does not mean that there are no more errors in the program, it only means that those errors have not been discovered.

Hence, system, "PROJECT EXECUTOR" has been developed and fully tested and found to be Errors free for now.

4.2 SYSTEM IMPLEMENTATION

This involves the co-ordination of all task which are necessary in ensuring the operations of the new system.

However, it is the stage of system development when the conceptual requirement of the new system and then overall objectives are to be

transformed into a reality. System Implementation involves or comprises of 2 major tasks namely:

(i) ***Programming***

Programming is the act of setting up well defined and constructed instruction which direct the activities of the computer systems.

(ii) ***Staff Training***

4.3 SYSTEM CONVERSION

System conversion which is also known as changeover is the process of changing from an existing (old system) to a new system to put into effect.

The system conversion entails some certain methods, these methods depend on such factors as the types of system that is being installed with preference to the organisation involved.

Below are the various methods available for system conversion:-

- (1) Direct Change Over
- (2) Parallel Change Over
- (3) Pilot Change Over
- (4) Phased Change Over

From the above 4 methods of changeover procedures, parallel changeover is chosen, which mean that the old system and the newly created system are run differently for at least one system cycle using life data in the real

operational environment of place, people, equipment and time. The Ultimate aim here is to ensure that the newly created system prove effective before abandoning the old system.

4.4 TRAINING AND INDUCTION

Having tested the new system and equally system conversion takes place in changing from the old system to the newly created system, the next stage is the training and induction.

Training involves showing to the staff the layed down procedure for effective operation and use of the new system while induction is the acceptance of the new system by the organisation concerned. The acceptance of any new system depend on what organisation stand to gain from it, and its flexibility, that is no matter how good, simple and user friendly the system is, if the social aspect of the system (both on a personal level as it is found in the user interface, and on an organisational level like the Niger State Housing Corporation are not dealt with properly, the system will not be fully accepted by the end-users.

4.5 SYSTEM REVIEW

This involved examining and modifying the new system (as may be required due to changes in organisations requirement) for a period of time to ensure that the set objectives are achieved and new improvements inculcated.

4.6 SYSTEM LIMITATIONS

The system has been fully designed to suit and tailored towards the Niger State Housing Corporation. Scheme activities and a small Housing Unit Industries in Nigeria with the aim of subject to modification. Specifically, the system limitation includes:-

- (1) Limitation to only stand-alone-computers
- (2) The system can work in a Dos environment
- (3) It is year 2000 compliance free (Y2k).

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATION

5.1 SUMMARY

The primary objective of this project is to effectively design and develop a computerised system that will ensure proper updating of data base in the Building Development Scheme and also ensure efficiency.

The special attention of this project is on the usefulness of computer application to building development.

CHAPTER ONE of this project deals with the basic background of housing as well as highlighting some of the problems encountered in building developments and proferment of possible solutions to this phenomenon.

CHAPTER TWO describes the requirement determination of a building set up together with the Historical Background of reference organisation.

THE THIRD CHAPTER gave a full description of the over-all computerisation system within the scope of the organisation.

THE FORTH CHAPTER is all about the Testing and Implementation of the new system.

WHILE CHAPTER FIVE is the general summary of the Report

5.2 SYSTEM MAINTENANCE

One of the essential features of the system is to ensure easy maintenance ability. The maintenance of the system should be taking care of by making sure that the system is working perfectly at all time without any irregularity, or with minimal irregularity which can be put in order within the possible shortest time. Should there be notice of any shortcomings in the system, It could therefore be recommended for changes.

However, changeover from the system to another system should be carried out upon confirmation that the new system has been proved to the satisfaction of the system analyst of which the user managers are satisfied with the results of the system tests, staff training and reference manuals.

Strict Adherence should be observed to this reference manuals and the new system to prevent over tasking of the computer.

It is however optimistic that the maintenance of the system is easy because all the information needed are stored in the storage medial such as the hard disk of the computer and the diskettes that prevents unnecessary misplacement of files or incorrect information.

Moreover, there is always back up files that are kept in different places/locations to avoid accidental losses.

5.3 CONCLUSION

Computerisation of a Building Development surely brings about greater potentials and success to organisations.

In effect, the system is designed to provide timely information and ensure proper accountability to the management.

The program is written in such a way that it can be modified to suit a similar building development out fit bearing in mind that computer is indeed a helpful instrument, Niger State Housing Corporation will no doubt benefit a lot from the application.

It is my believe therefore that the program will achieve it's aim by using the Database file to monitor the different activities of the corporation, moreso that no user pass word is used to avoid complexity. Introduction of the system will make the transaction easy for both the management and the staff.

5.4 RECOMMENDATION

The writing of this project can be completed without recommending emphatically the use of Computer in Building Development Scheme.

For proper efficiency, The management should ensure that the person to be employed to manage the Data processing Department should make sure that adequate security is provided for the files to avoid loss of Data.

It is also recommended that a good number of staff should be trained to be Computer literate.

Adequate protection should be provided against fire, Environmental problems and other Natural disasters.

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Public.
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APPENDIX

```
*-----*
* AUTHOR           : KOLA AKINWANDE
* MAT No.          : PGD. MCS. 97/412
* LICENSEE         : NIGER STATE HOUSING CORPORATION
* PROJECT TITLE    : DATABASE OF A HOUSING DEVELOPMENT SCHEME
* TRADE MARK       : ROYAL PACKAGE
*-----*
```

```
Set Talk off
Set Echo off
Set Bell off
Set Stat off
Set Scor off
Set Safe off
Set Conf off
Set Esca off
Set Wrap on
Set proc to clap
Set date to brit
Private sc_hpop // Saves horizontal popup
Clear
*do floor
*do warn
x = inkey (2)
Set color to w+/br,,
Do 1ftcarpet
@00,00 clear to 05,79
@00,00 to 05,79 color "w+/r "
fb1= "DATABASE OF A HOUSING DEVELOPMENT SCHEME"
fb2= "(A Case Study of Niger State Housing Corporation)"
@01,(80-LEN(fb1) 2 say fb 1
@02,(80-LEN (fb2))/2 say fb2
xregdate=date()
xregtime=time()
@04,03 say "CURRENT DATE: "+ dtoc(date())
@04,55 say "CURRENT TIME: "+ time()
Do while .t.
Do action
@ 08,25 clear to 20,49
@ 08,25 to 20,49 doub
@ 09,27 prompt "1 STOCK IN" "
@ 11,27 Prompt "2 STOCK OUT" "
@ 13,27 prompt "3 PROJECT EXECUTOR" "
@ 15,27 prompt "4 PROJECT PROCESSOR" "
@ 17,27 prompt "5 REPORT GENERATION" "
@ 19,27 prompt "6 QUIT"

menu to ch1
Save screen to sc_hpop
Do case
  Case ch1 = 1
    do stockin
  case ch1 = 2
```

```

do stockout
case chl = 3
do project1
case chl = 4
do project2
case chl = 5
do reporter
othe
!del *.ntx
!del *.ndx
!del *.obj
!del *.dbk
!del *.bak
exit

```

```

Endcase
Restore Screen from sc_hpop
Enddo
clear
Return

```

```

*\----- Procedure Stockin -----

```

```

proc stockin
clea
set color to w+/b
set proc to header
do head
do request
x=0
do while x=0
x=inkey()
if upper (chr(x)) $ "CMVDQ"
exit
endif
x=0
enddo
if upper (chr(x)) $ "Q"
close all
return
endif
if upper (chr(x)) $ "C"
fb="Registration of New Stock \ Building Material into the Database"
@05,(80-LEN(fb))/2 say fb
do cstockin
endif
if upper (chr(x)) $ "M"
fb="Modification of Registered Stock \ Building Material in the Database"
@05,(80-LEN(fb))/2 say fb
do mstockin
endif
if upper (chr(x)) $ "V"
fb="Viewing of Registered Stock \ Building Material in the Database"
@05,(80-LEN(fb))/2 say fb

```

```

do vstockin
endif
if upper (chr(x)) $ "D"
fb="Deletion of Unwanted Obsolete Building Material in the Database"
@05,(80-LEN(fb))/2 say fb
do dstockin
endif
return
*\----- CSTOCKIN.PRG -----
proc cstockin
do while.t.
@ 22,03 clear to 23,77
do stitle
xregdate=dtoc(date())
xregtime=time()
@07,35 get xregdate pict "99/99/99"
@09,35 get xregtime pict "99:99:99"
clea gets
do while .t.
@23,02 clea to 23,77
fb="Enter 4-Digit for Stock Code or Press Enter Key on Stock Code To Exit"
@23,(80-len(fb))/2 say fb
xstockcode=space(04)
@11,35 get xstockcode pict "9999"
read
if xstockcode=space(04)
clear
close all
return
endif
use stockin
index on stockcode to stockcode
go top
seek xstockcode
if found()
@23,02 clea to 23,77
fb="STOCKBUILDING MATERIAL CODE ALREADY EXIST, Press Any Key To Retry"
@23,(80-len(fb))/2 say fb
set cons off
wait " "
loop
set cons on
endif
exit
Enddo
do while .t.
@23,02 clea to 23,77
fb="Enter Stock\Building Material Name"
@23,(80-len(fb))/2 say fb
xstockname=space(30)
@13,35 get xstockname pict "@!"
read

```

```

if xstockname=space(30)
  @23,02 clea to 23,77
fb="STOCK\BUILDING MATERIAL NAME CANNOT BE EMPTY, Press Any Key To Retry"
  @23,(80-len(fb))/2 say fb
  set cons off
  wait " "
  loop
  set cons on
endif
exit
Enddo
do while .t.
  @23,02 clea to 23,77
fb="Enter Purchased Date of Building Material"
  @23,(80-len(fb))/2 say fb
xp_date=ctod(" / / ")
  @15,35 get xp_date pict "99/99/99"
read
if (dtoc(xp_date))=(" / / ")
  @23,02 clea to 23,77
fb="PURCHASED DATE OF MATERIAL CANNOT BE EMPTY, Press Any Key To Retry"
  @23,(80-len(fb))/2 say fb
  set cons off
  wait " "
  loop
  set cons on
endif
exit
Enddo
do while .t.
  @23,02 clea to 23,77
fb="Enter Quantity Purchased"
  @23,(80-len(fb))/2 say fb
xquantity=0
  @17,35 get xquantity pict "9999"
read
if xquantity=0
  @23,02 clea to 23,77
fb="QUANTITY PURCHASED CANNOT BE EMPTY, Press Any Key To Retry"
  @23,(80-len(fb))/2 say fb
  set cons off
  wait " "
  loop
  set cons on
endif
exit
Enddo
do while .t.
  @23,02 clea to 23,77
fb="Enter Unit Price"
  @23,(80-len(fb))/2 say fb
xunitprice=0.00

```

*\----- CSTOCKOUT.PRG -----

```
proc cstockout
do while .t.
  @ 22,03 clear to 23,77
  do title
  xregdate=dtoc(date())
  xregtime=time()
  @07,35 get xregdate pict "99/99/99"
  clea gets
  do while .t.
    @23,02 clea to 23,77
    fb="Enter Serial Number or Press Enter Key on Serial Number To Exit"
    @23,(80-len(fb))/2 say fb
    xserialno=0
    @09,35 get xserialno pict "9999"
    read
    if xserialno=0
      clear
      close all
      return
    endif
    use stockout
    index on serialno to serialno
    go top
    seek xserialno
    if found()
      @23,02 clea to 23,77
      fb="SERIAL NUMBER ALREADY EXIST, Press Any Key To Retry"
      @23,(80-len(fb))/2 say fb
      set cons off
      wait " "
      loop
      set cons on
    endif
  exit
Enddo
do while .t.
  @23,02 clea to 23,77
  fb="Enter Project Code"
  @23,(80-len(fb))/2 say fb
  xprojccode=space(04)
  @09,42 get xprojccode pict "9999"
  read
  if xprojccode=space(04)
    fb="PROJECT CODE CANNOT BE EMPTY, Press Any Key To Retry"
    @23,(80-len(fb))/2 say fb
    set cons off
    wait " "
    loop
    set cons on
  endif
  use project
```

```

index on projeccode to projeccode
go top
seek xprojeccode
if .not. found()
  @23,02 clea to 23,77
  fb="PROJECT CODE DOES NOT EXIST, Press Any Key To Rctry"
  @23,(80-len(fb))/2 say fb
  set cons off
  wait " "
  loop
  set cons on
endif
xprojecname=projecname
@09,48 get xprojecname pict "@!"
clea gets

exit
Enddo
do while .t.
  @23,02 clea to 23,77
  fb="Enter 4-Digit for Stock Code"
  @23,(80-len(fb))/2 say fb
  xstockcode=space(04)
  @11,35 get xstockcode pict "9999"
  read
  if xstockcode=space(04)
    fb="STOCK\BUILDING MATERIAL CANNOT BE EMPTY, Press Any Key To Retry"
    @23,(80-len(fb))/2 say fb
    set cons off
    wait " "
    loop
    set cons on
  endif
  use stockin
  index on stockcode to stockcode
  go top
  seek xstockcode
  if .not. found()
    @23,02 clea to 23,77
    fb="STOCK\BUILDING MATERIAL CODE DOES NOT EXIST, Press Any Key To Retry"
    @23,(80-len(fb))/2 say fb
    set cons off
    wait " "
    loop
    set cons on
  endif
  xstockname=stockname
  xunitprice=unitprice
  @13,35 get xstockname pict "@!"
  clea gets
  exit
Enddo
do while .t.

```

```

@23,02 clea to 23,77
fb="Enter Ordered Date of Building Material"
@23,(80-len(fb))/2 say fb
xorder_date=ctod(" / / ")
@15,35 get xorder_date pict "99/99/99"
read
if (dtoc(xorder_date))=(" / / ")
  @23,02 clea to 23,77
  fb="ORDERED DATE OF MATERIAL CANNOT BE EMPTY, Press Any Key To Retry"
  @23,(80-len(fb))/2 say fb
  set cons off
  wait " "
  loop
  set cons on
endif
exit
Enddo
do while .t.
  @23,02 clea to 23,77
  fb="Enter Quantity Ordered"
  @23,(80-len(fb))/2 say fb
  xquan_order=0
  @17,35 get xquan_order pict "9999"
  read
  if xquan_order=0
    @23,02 clea to 23,77
    fb="QUANTITY ORDERED CANNOT BE EMPTY, Press Any Key To Retry"
    @23,(80-len(fb))/2 say fb
    set cons off
    wait " "
    loop
    set cons on
  endif
  exit
Enddo
@19,35 get xunitprice pict "9,999,999.99"
clea gets
xamount=(xquan_order*xunitprice)
@19,50 say "AMOUNT " get xamount pict "9,999,999,999.99"
clea gets

```

----- Saving Staff Record -----

```

@22,02 clea to 23,77
set proc to saver
do boye
  x=0
  do while x=0
    x=inkey()
    if upper (chr(x)) $ "SRA"
      exit
    endif
    x=0
  enddo

```

```

if upper (chr(x)) $ "R"
  @07,03 clea to 19,77
  @22,02 clea to 23,77
  fb="Enter 4-Digit for Stock Code or Press Enter Key on Stock Code To Exit"
  @23,02 clea to 23,77
  @23,(80-len(fb))/2 say fb
  loop
endif
if upper (chr(x)) $ "A"
  clear
  close all
  return
endif

```

```

use
use stockout
index on serialno to serialno
append blank
repl regdate with date()
repl regtime with time()
repl serialno with xserialno
repl projeccode with xprojeccode
repl stockcode with xstockcode
repl stockname with xstockname
repl order_date with xorder_date
repl quan_order with xquan_order
repl amount with xamount

```

```
@07,03 clea to 19,77
```

```
@22,02 clea to 23,77
```

```
enddo
```

```
return
```

```
*\----- MSTOCKOUT.PRG -----*
```

```
proc Mstockout
```

```
do while .t.
```

```
  @ 22,03 clear to 23,77
```

```
  do title
```

```
  xregdate=dtoc(date())
```

```
  xregtime=time()
```

```
  @07,35 get xregdate pict "99/99/99"
```

```
  clea gets
```

```
do while .t.
```

```
  @23,02 clea to 23,77
```

```
  fb="Enter Serial Number or Press Enter Key on Serial Number To Exit"
```

```
  @23,(80-len(fb))/2 say fb
```

```
  xserialno=0
```

```
  @09,35 get xserialno pict "9999"
```

```
  read
```

```
  if xserialno=0
```

```
    clear
```

```
    close all
```

```
    return
```

```

endif
use stockout
index on serialno to serialno
go top
seek xserialno
if .not. found()
    @23,02 clea to 23,77
fb="SERIAL NUMBER TO BE MODIFIED DOES NOTY EXIST, Press Any Key To Retry"
    @23,(80-len(fb))/2 say fb
    set cons off
    wait " "
    loop
    set cons on
endif
xprojccode=projccode
xstockcode=stockcode
xstockname=stockname
xorder_date=order_date
xquan_order=quan_order
xamount=amount
xunitprice=(xamount/xquan_order)
use project
index on projccode to projccode
seek xprojccode
xprojcname=projcname
exit

```

Enddo

```

@09,42 get xprojccode pict "9999"
@09,48 get xprojcname pict "@"
@11,35 get xstockcode pict "9999"
@13,35 get xstockname pict "@"
@15,35 get xorder_date pict "99/99/99"
@17,35 get xquan_order pict "9999"
@19,35 get xunitprice pict "9,999,999.99"
@19,50 say "AMOUNT " get xamount pict "9,999,999,999.99"
clea gets

```

```

@22,02 clea to 23,77

```

```

set proc to saver

```

```

do jara

```

```

    x=0

```

```

    do while x=0

```

```

        x=inkey()

```

```

        if upper (chr(x)) $ "MRA"

```

```

            exit

```

```

        endif

```

```

        x=0

```

```

    enddo

```

```

    if upper (chr(x)) $ "R"

```

```

        @07,03 clea to 19,77

```

```

        @22,02 clea to 23,77

```

```

        fb="Enter 4-Digit for Stock Code or Press Enter Key on Stock Code To Exit"

```

```
@23,02 clea to 23,77
@23,(80-len(fb))/2 say fb
loop
endif
if upper (chr(x)) $ "A"
clear
close all
return
endif
```

```
*----- Saving Staff Record -----*
```

```
@22,02 clea to 23,77
set proc to saver
do boye
x=0
do while x=0
x=inkey()
if upper (chr(x)) $ "SRA"
exit
endif
x=0
enddo
if upper (chr(x)) $ "R"
@07,03 clea to 19,77
@22,02 clea to 23,77
fb="Enter 4-Digit for Stock Code or Press Enter Key on Stock Code To Exit"
@23,02 clea to 23,77
@23,(80-len(fb))/2 say fb
loop
endif
if upper (chr(x)) $ "A"
clear
close all
return
endif
use
use stockout
index on serialno to serialno
seek xserialno
repl regdate with date()
repl regtime with time()
repl serialno with xserialno
repl projeccode with xprojeccode
repl stockcode with xstockcode
repl stockname with xstockname
repl order_date with xorder_date
repl quan_order with xquan_order
repl amount with xamount
```

```
@07,03 clea to 19,77
```

```
@22,02 clea to 23,77
```

```
enddo
```

```
return
```

```
*\----- VSTOCKOUT.PRG -----*
```

\----- MPROJECT1.PRG -----

```
proc mproject1
do while.t.
  @ 22,03 clear to 23,77
  do title1
  xregdate=dtoc(date())
  xregtime=time()
  @07,35 get xregdate pict "99/99/99"
  @09,35 get xregtime pict "99:99:99"
  clea gets
do while .t.
  @23,02 clea to 23,77
  fb="Enter 4-Digit for Project Code or Press Enter Key on Project Code To Exit"
  @23,(80-len(fb))/2 say fb
  xprojccode=space(04)
  @11,35 get xprojccode pict "9999"
  read
  if xprojccode=space(04)
    clear
    close all
    return
  endif
  use project
  index on projccode to projccode
  go top
  seek xprojccode
  if .not. found()
    @23,02 clea to 23,77
    fb="PROJECT CODE DOES NOT EXIST, Press Any Key To Retry"
    @23,(80-len(fb))/2 say fb
    set cons off
    wait " "
    loop
    set cons on
  endif
  xprojcname=projcname
  xclientname=clientname
  xsponsorer=sponsorer
  xlocation=location
  exit
Enddo
  @13,35 get xprojcname pict "@"!
  @15,35 get xclientname pict "@"!
  @17,35 get xsponsorer pict "@"!
  @19,35 get xlocation pict "@"!
  clea gets
*----- Saving Staff Record -----*
  @22,02 clea to 23,77
  set proc to saver
  do jara
    x=0
    do while x=0
```

```

x=inkey()
if upper (chr(x)) $ "MRA"
  exit
endif
x=0
enddo
if upper (chr(x)) $ "R"
  @07,03 clea to 19,77
  @22,02 clea to 23,77
  fb="Enter 4-Digit for Stock Code or Press Enter Key on Stock Code To Exit"
  @23,02 clea to 23,77
  @23,(80-len(fb))/2 say fb
  loop
endif
if upper (chr(x)) $ "A"
  clear
  close all
  return
endif

```

----- Modification Commences Here -----

```

do while .t.
  @23,02 clea to 23,77
  fb="Enter Project Name"
  @23,(80-len(fb))/2 say fb
  xprojecname=space(30)
  @13,35 get xprojecname pict "@!"
  read
  if xprojecname=space(30)
    @23,02 clea to 23,77
    fb="PROJECT NAME CANNOT BE EMPTY, Press Any Key To Retry"
    @23,(80-len(fb))/2 say fb
    set cons off
    wait " "
    loop
    set cons on
  endif
  exit
Enddo
do while .t.
  @23,02 clea to 23,77
  fb="Enter Client Name"
  @23,(80-len(fb))/2 say fb
  xclientname=space(30)
  @15,35 get xclientname pict "@!"
  read
  if xclientname=space(30)
    @23,02 clea to 23,77
    fb="CLIENT NAME CANNOT BE EMPTY, Press Any Key To Retry"
    @23,(80-len(fb))/2 say fb
    set cons off
    wait " "
    loop
  endif
endif

```

```

    set cons on
  endif
  exit
Enddo
do while .t.
  @23,02 clea to 23,77
  fb="Enter Sponsor's Name"
  @23,(80-len(fb))/2 say fb
  xsponsorer=space(30)
  @17,35 get xsponsorer pict "@"!
  read
  if xsponsorer=space(30)
    @23,02 clea to 23,77
    fb="SPONSORER'S NAME CANNOT BE EMPTY, Press Any Key To Retry"
    @23,(80-len(fb))/2 say fb
    set cons off
    wait " "
    loop
    set cons on
  endif
  exit
Enddo

```

```

do while .t.
  @23,02 clea to 23,77
  fb="Enter Location \ Site Address"
  @23,(80-len(fb))/2 say fb
  xlocation=space(30)
  @19,35 get xlocation pict "@"!
  read
  if xlocation=space(30)
    @23,02 clea to 23,77
    fb="LOCATION OF PROJECT CANNOT BE EMPTY, Press Any Key To Retry"
    @23,(80-len(fb))/2 say fb
    set cons off
    wait " "
    loop
    set cons on
  endif
  exit
Enddo

```

----- Saving Staff Record -----

```

@22,02 clea to 23,77
set proc to saver
do boye
  x=0
  do while x=0
    x=inkey()
    if upper (chr(x)) $ "SRA"
      exit
    endif
    x=0
  cnddo

```

```

if upper (chr(x)) $ "R"
  @07,03 clea to 19,77
  @22,02 clea to 23,77
  fb="Enter 4-Digit for Stock Code or Press Enter Key on Stock Code To Exit"
  @23,02 clea to 23,77
  @23,(80-len(fb))/2 say fb
  loop
endif
if upper (chr(x)) $ "A"
  clear
  close all
  return
endif
seek xprojccode
repl regdate with date()
repl regtime with time()
repl projccode with xprojccode
repl projecname with xprojecname
repl clientname with xclientname
repl sponsorer with xsponsorer
repl location with xlocation

```

```
@07,03 clea to 19,77
```

```
@22,02 clea to 23,77
```

```
enddo
```

```
return
```

```
*\----- VPROJECT1.PRG -----*
```

```
proc vproject1
```

```
do while .t.
```

```
@ 22,03 clear to 23,77
```

```
do title1
```

```
xregdate=dtoc(date())
```

```
xregtime=time()
```

```
@07,35 get xregdate pict "99/99/99"
```

```
@09,35 get xregtime pict "99:99:99"
```

```
clea gets
```

```
do while .t.
```

```
@23,02 clea to 23,77
```

```
fb="Enter 4-Digit for Project Code or Press Enter Key on Project Code To Exit"
```

```
@23,(80-len(fb))/2 say fb
```

```
xprojccode=space(04)
```

```
@11,35 get xprojccode pict "9999"
```

```
read
```

```
if xprojccode=space(04)
```

```
  clear
```

```
  close all
```

```
  return
```

```
endif
```

```
use project
```

```
index on projccode to projccode
```

```
go top
```

```
seek xprojccode
```

```
if .not. found()
```

```
@23,02 clea to 23,77
fb="PROJECT CODE DOES NOT EXIST, Press Any Key To Retry"
@23,(80-len(fb))/2 say fb
set cons off
wait " "
loop
set cons on
endif
xprojecname=projecname
xclientname=clientname
xsponsorer=sponsorer
xlocation=location
exit
```

Enddo

```
@13,35 get xprojecname pict "@"!
@15,35 get xclientname pict "@"!
@17,35 get xsponsorer pict "@"!
@19,35 get xlocation pict "@"!
clea gets
```

----- Saving Staff Record -----

```
@22,02 clea to 23,77
set proc to saver
do duba
  x=0
  do while x=0
    x=inkey()
    if upper (chr(x)) $ "VRA"
      exit
    endif
    x=0
  enddo
  if upper (chr(x)) $ "R"
    @07,03 clea to 19,77
    @22,02 clea to 23,77
    fb="Enter 4-Digit for Stock Code or Press Enter Key on Stock Code To Exit"
    @23,02 clea to 23,77
    @23,(80-len(fb))/2 say fb
    loop
  endif
  if upper (chr(x)) $ "A"
    clear
    close all
    return
  endif
```

```
@07,03 clea to 19,77
```

```
@22,02 clea to 23,77
```

enddo

return

\----- DPROJECT1.PRG -----

proc dproject1

```

do while.t.
@ 22,03 clear to 23,77
do title1
xregdate=dloc(date())
xregtime=time()
@07,35 get xregdate pict "99/99/99"
@09,35 get xregtime pict "99:99:99"
clea gets
do while .t.
@23,02 clea to 23,77
fb="Enter 4-Digit for Project Code or Press Enter Key on Project Code To Exit"
@23,(80-len(fb))/2 say fb
xprojeccode=space(04)
@11,35 get xprojeccode pict "9999"
read
if xprojeccode=space(04)
clear
close all
return
endif
use project
index on projeccode to projeccode
go top
seek xprojeccode
if .not. found()
@23,02 clea to 23,77
fb="PROJECT CODE DOES NOT EXIST, Press Any Key To Retry"
@23,(80-len(fb))/2 say fb
set cons off
wait " "
loop
set cons on
endif
xprojecname=projecname
xclientname=clientname
xsponsorer=sponsorer
xlocation=location
exit
Enddo
@13,35 get xprojecname pict "@!"
@15,35 get xclientname pict "@!"
@17,35 get xsponsorer pict "@!"
@19,35 get xlocation pict "@!"
clea gets
*----- Saving Staff Record -----
@22,02 clea to 23,77
set proc to saver
do kashe
x=0
do while x=0
x=inkey()
if upper (chr(x)) $ "DRA"

```

```

    exit
  endif
  x=0
enddo
if upper (chr(x)) $ "R"
  @07,03 clea to 19,77
  @22,02 clea to 23,77
  fb="Enter 4-Digit for Stock Code or Press Enter Key on Stock Code To Exit"
  @23,02 clea to 23,77
  @23,(80-len(fb))/2 say fb
  loop
endif
if upper (chr(x)) $ "A"
  clear
  close all
  return
endif
@07,03 clea to 19,77
@22,02 clea to 23,77
enddo
return

```

----- PROJECT 2 -----

```

proc project2
  clear
  set color to w+/b
  set proc to header
  go head
  @07,02 clear to 19,77

  sele a
    use project
  index on projeccode to pc
  go top

  sele b
  use stockout
  index on projeccode to projeccode
  go top

  sele c
    use builder
  index on projeccode to projecc
  go top

  @22,02 clea to 23,77
  outer="[P]rocess      [C]ancel"
  @23,(80-len(outer))/2 say outer
  x=0
do while x=0
  x=inkey()
  if upper (chr(x)) $ "PC"
    exit

```

----- PROJECT REGISTRATION -----

```

roc pr_rep
  @22,02 clea to 23,77
  outer="[S]creen      [P]rinter"
  @23,(80-len(outer))/2 say outer
  x=0
  do while x=0
    x=inkey()
    if upper (chr(x)) $ "SPC"
      exit
    endif
    x=0
  enddo
if upper (chr(x)) $ "P" && ----- Generating Printer Printng-----
  *clea
  use project
  index on projeccode to projeccode
  @22,02 clea to 23,77
  outer="[P]rinting      [C]ancel"
  @23,(80-len(outer))/2 say outer
  x=0
  do while x=0
    x=inkey()
    if upper (chr(x)) $ "PC"
      exit
    endif
    x=0
  enddo
if upper (chr(x)) $ "C"
  clear
  close all
  return
endif
  set device to print
  fouter="DATABASE OF A HOUSING DEVELOPMENT SCHEME"
  souter="REPORT ON ALL THE AVAILABLE PROJECT UNDERTAKEN SO FAR"
  @01,(80-LEN(fouter))/2 say fouter
  *@01,67 say "Date : "+dtoc(date())
  @02,(80-LEN(souter))/2 say souter
  *@02,67 say "Time : "+time()
  @04,01 say "S/NO"
  @04,06 say "P/CODE"
  @04,22 say "PROJECT NAME"
  @04,50 say "CLIENT NAME"

  @05,01 say repl ("=",77)
  xpage=1
  row=06
  mrow=62
  xsno=1
  go top
  do while .not. cof()

```

```

if row>mrow
  eject
  clear
  xpage=xpage+1
  row=08
  set device to print
  fouter="DATABASE OF A HOUSING DEVELOPMENT SCHEME"
  souter="REPORT ON ALL THE AVAILABLE PROJECT UNDERTAKEN SO FAR"
  @01,(80-LEN(fouter))/2 say fouter
  @01,67 say "Date : "+dtoc(date())
  @02,(80-LEN(souter))/2 say souter
  @02,67 say "Time : "+time()
  @04,01 say "S/NO"
  @04,06 say "P/CODE"
  @04,22 say "PROJECT NAME"
  @04,50 say "CLIENT NAME"
  @05,01 say repl ("=",77)
endif
xprojccode=projccode
xprojcname=projcname
xclientname=clientname

@row,01 say xsno    pict "999"
@row,07 say xprojccode pict "@"!
@row,15 say xprojcname pict "@"!
@row,50 say xclientname pict "@"!

row=row+2
xsno=xsno+1
skip
enddo
eject
use
set device to scree
jobend="PROJECT EXECUTOR HAS COMPLETED PRINTING JOB, Press Any Key To Continuc..."
@22,02 clea to 23,77
@22,05 say "MESSAGE" color "w+*/r"
@23,(80-len(jobend))/2 say jobend
set cons off
wait " "
set cons on
clea
return

```

```
endif
```

```
**----- PROJECT REGISTRATION -----**
```

```
proc si_rep
```

```

@22,02 clea to 23,77
outer="[S]screen      [P]rinter"
@23,(80-len(outer))/2 say outer
x=0
do while x=0
  x=inkey()

```

```
if upper (chr(x)) $ "SPC"  
  exit  
endif  
x=0  
cnddo
```

```
if upper (chr(x)) $ "P" && ----- Generating Printer Printng-----
```

```
*clea  
use stockin  
index on stockcode to stockcode  
@22,02 clea to 23,77  
outer="[P]rinting      [C]ancel"  
@23,(80-len(outer))/2 say outer  
x=0  
do while x=0  
  x=inkey()  
  if upper (chr(x)) $ "PC"  
    exit  
  endif  
  x=0  
enddo
```

```
if upper (chr(x)) $ "C"
```

```
  clear  
  close all  
  return  
endif
```

```
*clea
```

```
  set device to print  
  fouter="DATABASE OF A HOUSING DEVELOPMENT SCHEME"  
  souter="REPORT ON ALL THE AVAILABLE STOCK\BUILDING MATERIAL"  
  @01,(80-LEN(fouter))/2 say fouter  
  *@01,67 say "Date : "+dtoc(date())  
  @02,(80-LEN(souter))/2 say souter  
  *@02,67 say "Time : "+time()  
  @04,01 say "S/NO"  
  @04,06 say "STOCK CODE"  
  @04,18 say "STOCK NAME"  
  @04,40 say "QUANTITY"  
  @04,52 say "UNIT PRICE"  
  @04,70 say "AMOUNT"
```

```
@05,01 say repl ("=",77)
```

```
xpage=1  
row=06  
mrow=62  
xsno=1  
go top  
do while .not. cof()  
  if row>mrow  
    eject  
    clear
```

```

xpage=xpage+1
row=08
set device to SCREEN
fouter="DATABASE OF A HOUSING DEVELOPMENT SCHEME"
souter="REPORT ON ALL THE AVAILABLE STOCK\BUILDING MATERIAL"
@01,(80-LEN(fouter))/2 say fouter
@01,67 say "Date : "+dtoc(date())
@02,(80-LEN(souter))/2 say souter
@02,67 say "Time : "+time()
@04,01 say "S/NO"
@04,06 say "STOCK CODE"
@04,18 say "STOCK NAME"
@04,40 say "QUANTITY"
@04,50 say "UNIT PRICE"
@04,65 say "AMOUNT"
@05,01 say repl ("=",77)

endif
xstockcode=stockcode
xstockname=stockname
xquantity=quantity
xunitprice=unitprice
xamount=(xunitprice * xquantity)
@row,01 say xsno    pict "999"
@row,07 say xstockcode pict "@"
@row,15 say xstockname pict "@"
@row,43 say xquantity pict "9999"
@row,52 say xunitprice pict "9,999,999.99"
@row,66 say xamount  pict "9,999,999.99"
row=row+2
xsno=xsno+1
skip
cnddo
use
set devi to scrce
jobend="PROJECT EXECUTOR HAS COMPLETED PRINTING JOB, Press Any Key To Continuc..."
@22,02 clea to 23,77
@22,05 say "MESSAGE" color "w+*/r"
@23,(80-len(jobend))/2 say jobend
set cons off
wait " "
set cons on
clea
return

endif
**----- PROJECT REGISTRATION -----**
proc so_rep
@22,02 clea to 23,77
outer="[S]creen      [P]rinter"
@23,(80-len(outer))/2 say outer
x=0
do while x=0

```

```

x=inkey()
if upper (chr(x)) $ "SPC"
  exit
endif
x=0
enddo
if upper (chr(x)) $ "P" && ----- Generating Printing Printng-----
*clea
use stockout
index on projeccode to projeccode
@22,02 clea to 23,77
outer="[P]rinting      [C]ancel"
@23,(80-len(outer))/2 say outer
x=0
do while x=0
  x=inkey()
  if upper (chr(x)) $ "PC"
    exit
  endif
  x=0
enddo
if upper (chr(x)) $ "C"
  clear
  close all
  return
endif
*clea
set device to print
fouter="DATABASE OF A HOUSING DEVELOPMENT SCHEME"
souter="LIST OF STOCK\BUILDING MATERIAL ISSUED OUT FOR CONSTRUCTION"
@01,(80-LEN(fouter))/2 say fouter
*@01,67 say "Date : "+dtoc(date())
@02,(80-LEN(souter))/2 say souter
*@02,67 say "Time : "+time()
@04,01 say "S/NO"
@04,07 say "P/CODE"
@04,16 say "S/CODE"
@04,27 say "STOCK NAME"
@04,45 say "DATE ORDERED"
@04,60 say "QTY."
@04,69 say "AMOUNT"
@05,01 say repl ("=",77)
xpage=1
row=06
mrow=62
xsno=1
go top
do while .not. eof()
  if row>mrow
    eject
    clear
    xpage=xpage+1

```

```

row=08
set device to print
fouter="DATABASE OF A HOUSING DEVELOPMENT SCHEME"
souter="REPORT ON ALL THE AVAILABLE STOCK\BUILDING MATERIAL"
@01,(80-LEN(fouter))/2 say fouter
@01,67 say "Date : "+dtoc(date())
@02,(80-LEN(souter))/2 say souter
@02,67 say "Time : "+time()
@04,01 say "S/NO"
@04,07 say "P/CODE"
@04,16 say "S/CODE"
@04,27 say "STOCK NAME"
@04,45 say "DATE ORDERED"
@04,60 say "QTY."
@04,69 say "AMOUNT"
@05,01 say repl ("=",77)
endif
xprojccode=projccode
xstockcode=stockcode
xstockname=stockname
xorder_date=order_date
xquan_order=quan_order
xamount=amount
@row,01 say xsno    pict "999"
@row,09 say xprojccode pict "@"
@row,18 say xstockcode pict "@"
@row,24 say xstockname pict "@"
@row,48 say xorder_date pict "99/99/99"
@row,59 say xquan_order pict "9999"
@row,65 say xamount    pict "9,999,999.99"
row=row+2
xsno=xsno+1
skip
enddo
use
set devi to scree
jobend="PROJECT EXECUTOR HAS COMPLETED PRINTING JOB, Press Any Key To Continue..."
@22,02 clea to 23,77
@22,05 say "MESSAGE" color "w+*/r"
@23,(80-len(jobend))/2 say jobend
set cons off
wait " "
set cons on
clea
return
endif

```

**APPENDIX II
PROGRAM OUTPUT**

STOCK IN REPORT FOR THE MONTH OF OCTOBER, 1999

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DATE	STOCK CODE	DESCRIPTION	QTY PURCHASED	UNIT PRICE
/10/99	B0001	CEMENT	250 BAGS	500.00
/10/99	B0002	EMULSION PAINT	40 DRUMS	2,500.00
1/10/99	B0003	TEXCOTE PAINT	60 DRUMS	3,500.00
2/10/99	B0004	CEILING BOARDS	450 SHEETS	250.00
3/10/99	B0005	SUPER SEVEN R.SHEET	750 SHEETS	500.00
4/10/99	B0006	ALUMINIUM R. SHEET	500 SHEETS	750.00

STOCK OUT REPORT FOR THE MONTH OF OCTOBER, 1999

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DATE	STOCK CODE	DESCRIPTION	QTY PURCHASED	UNIT PRICE
5/10/99	B00012	BLOCK (225mm)	1,000 UNITS	35.00
5/10/99	B00013	BLOCK (150mm)	650 UNITS	25.00
/10/99	B0001	CEMENT	80 BAGS	500.00
/10/99	B00017	12mm IRON ROD	30 KG	400.00
/10/99	B00019	6mm IRON ROD	18 KG	150.00
/10/99	B00020	GRAVEL	30 C. METRE	1,000.00
/10/99	B0001	CEMENT	20 BAGS	500.00

STOCK BALANCE REPORT FOR THE MONTH OF OCTOBER, 1999

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STOCK CODE	DESCRIPTION	STOCK BALANCE
B0001	CEMENT	150 BAGS
B0002	EMULSION PAINT	40 DRUMS
B0003	TEXCOTE PAINT	60 DRUMS
B0004	CEILING BOARDS	450 SHEETS
B0005	SUPER SEVEN R.SHEET	750 SHEETS
B0006	ALUMINIUM R. SHEET	500 SHEETS
B00012	BLOCK (225mm)	4,000 UNITS
B00013	BLOCK (150mm)	2,350 UNITS
B00017	12mm IRON ROD	120 KG
B00019	6mm IRON ROD	82 KG
B00020	GRAVEL	70 C. METRE
