A DATABASE FOR MANAGING PETROLEUM INFORMATION
(A CASE STUDY OF CORPORATE PLANNING AND DEVELOPMENT DIVISION OF NNPC)

by

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PGD/MCS/2001/2002/1102

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A PROJECT SUBMITTED TO THE DEPARTMENT OF MATHEMATICS/COMPUTER SCIENCE FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA, NIGERIA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A POST-GRADUATE DIPLOMA IN COMPUTER SCIENCE

DEDICATION

This project is dedicated to the Almighty God.

ACKNOWLEDGEMENT

ABSTRACT

This project is an attempt to solve the conventional problems associated with using a spreadsheet to process and manage data in the Corporate Planning and Development Division (CPDD) of the NNPC. The vision of CPDD is "to be the think tank" of the corporation while its mission is to assist management of the NNPC to provide strategic direction for the corporation. The existing information system in the division is not efficient. Retrieval and access to information is time consuming. Poor data organization which might lead to inaccurate and inconsistent data. The problem identified above were crucially investigated and a possible solution was designed in this project. A database system was developed to take over from the laborious use of Microsoft Excel in data entry and retrieval.

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CHAPTER ONE

INTRODUCTION

We are in an information-driven world, an information age. The world is indeed, a global village and information is the medium of exchange. If knowledge is power, therefore the ease with which an organization or group can mobilize information and deploy it to achieve the set goal, often determines their success or failure.

Data are raw facts about the organization and its business transactions while the information is a resource created from the data to serve the management and the decision making needs of the organization. The database will contain the facts of interest to the organization. The information system will transform the data and present these facts accurately, in a way relevant to the appropriate recipient, in the correct level of detail, and when required. Information technology has significantly expanded the power and potential of most information systems.

In this high-tech world of 0_s and 1_s, for any organization to survive and be relevant, it must have the right information, at the right time, at its finger-tips – with the press of a button or click of a mouse.

1.1 BACKGROUND TO THE STUDY

For an organization to be successful in actualizing its aspiration, it must have a virile, dynamic and proactive planning outfit. Such an outfit in the Nigerian National Petroleum Corporation is the Corporate Planning and Developments Division (CPDD). CPDD is responsible for the overall planning and development

of the strategic direction and focus for the Corporation. A Group General Manager (GGM), who reports directly to the Group Managing Director (GMD) of NNPC heads the Division. In order for the division to realize its mission, the division is structured into five departments. The departments with their core functions are as follows:

1.1.1 CORPORATE PLANNING DEPARTMENT (CPD)

The department is responsible for planning the strategic and capital investment activities, and for monitoring the performance of the corporation and its subsidiaries. The department also prepares the long range and short-term strategic plan and the annual capital budget of the corporation. It administrates the processing fee and tariffs with the Refineries and Pipelines and Product Marketing Company (PPMC).

1.1.2 ECONOMICS RESEARCH &INTELLIGENEC DEPARTMENT (ERID)

This department is responsible for economic energy and oil industry research. It scans documents and present the corporation business environment as well as defines alternative scenarios and key assumption for long range planning. The department maintains NNPC's relations with government agencies and third party – Local, Regional and International Organizations. The department is also NNPC's center for economic evaluation of all activities and reliable source of economics energy and oil industry technical papers.

1.1.3 BUSINESS DEVELOPMENT DEPARTMENT (BDD)

BDD is responsible for the development of new business activities both upstream and downstream. It is the clearing house of all negotiation and discussion with third parties interested in going into business partnership with the NNPC, at the conclusion and establishment of a new venture, the newly developed business is passed on to the investment division to manage and monitor.

1.1.4 GAS DEVELOPMENT DEPARTMENT (GDD).

The GDD is responsible for the development of new business activities in the gas sector of the petroleum industry.

1.1.5 GROUP MANAGEMENT INFORMATION SYETEMS
DEPARTMENT (GMIS)

GMIS is responsible for managing various data sets on all areas of NNPC business while providing timely and accurate data to NNPC top management for decision making. Information systems management has always attracted the attention of CPDD management even before the Economics and Corporate Planning Division (ECPD) was transformed into CPDD in 1988. In a series of workshops that culminated in the re-organization of the NNPC in1988, a micro support team consisting of ECPD staff and the consultants of Arthur Anderson and co. was established to provide necessary information systems services. The ECPD Staff, of the support team, formed the core staff of the systems analysis

section when CPDD was formed and the section reports directly to the head of the division. This section was later merged with ERID in 1991. Still in the search for a viable option of providing the division with information system outfit, GMIS department was created in 1993.

1.2   AN OVERVIEW OF THE PROBLEM

As mentioned earlier, CPDD is responsible for effectively overseeing the overall planning activities of the NNPC within a framework consistent with NNPC's mission and vision. A division with such enormous responsibilities is quite naturally expected to be equipped with effective and efficient information systems. However, this is not the case in CPDD.

CPDD uses Spreadsheet (Microsoft Excel) for processing and management of its data. The same data are stored in different places in varieties of formats and as a result the retrieval of information is time consuming. New spreadsheets are always created to keep information. Data processing and dissemination of planning information is becoming increasingly difficult with Microsoft Excel due to increase in the volume of data to be processed and shortage of skilled hands to do the job. Moreover, the NNPC's operating environment is challenging and faces fierce competition. Therefore, quick accessibility and retrieval of information is urgently needed at the moment. This is the reason for the need to develop software that will carry-out this enormous task.

1.3 SIGNIFICANCE OF THE STUDY

With the above problems in mind, one begins to appreciate the need for a study of this nature. This study is significant because the scope of the CPDD planning responsibilities especially its role as the corporate "think – tank" is such that, often requests for information call for quick-in-depth response, accuracy and reliability. It may also call for specific details, specific formats and even trend analysis

It is our hope, to call the attention of the management of CPDD to the dangers posed by inadequate petroleum information systems in the division and the benefits of equipping the Division with adequate and appropriate information system.

1.4. OBJECTIVE OF THE STUDY

i.   To develop a database that will address these identified problems, and rectify them so that GMIS would be more efficient in providing accurate and timely information. The existing problems include:

     a. Limitation of Microsoft Excel in Data Processing

     b. Increase in volume of data to process

     c. Data retrieval is difficult

     d. Duplication of data

     e. Lack of data security and integrity

     f. Difficulty in searching for information

ii.   To establish a culture of effective and efficient information systems development and maintenance in CPDD.

1.5.   SCOPE OF THE STUDY

The study focuses primarily on CPDD. Since the divisions responsibilities extends to operations the subsidiaries, the study included the development of a Database System, that would help CPDD improve its information systems with regards to the Downstream Petroleum Information in order to become more effective in carrying out its responsibilities.

CHAPTER TWO

LITERATURE REVIEW

According to the NNPC'S Annual Statistical Bulletin (2002), the domestic refining companies – KRPC, PHRC and WRPC received a total of 78, 075, 205 barrels of crude oil from PPMC for processing. The companies had opening stocks of 5,660,301 barrels of crude oil. Of the total 83,735,506 barrels of crude oil available for processing, 79,556,558 barrels were processed, showing a decrease of 1,955,542 or 24% over year 2001's processed level of 81,512,100 barrels. The decrease is not significant to say that the gains made in the domestic refining sector in that year could not be sustained. Closing stock as at end of the year was 4, 178, 949 barrels. The break down of the processed crude oil is as follows.

QUANTITY OF CRUDE OIL PROCESSED IN 2002

REFINERY	CRUDE OIL PROCESSED (MT)
KRPC	1, 922, 211
PHRC	5, 403, 324
WRPC	3, 420, 650
TOTAL	**10, 746, 185**

The three domestic refineries produced 9,754,505mt of various petroleum products. The products measured in metric tons includes - PMS: 2,603,389, DPK: 1,532,409; AGO: 2,515,872; Fuel oil: 2,577,593. The level of fuel oil produced in that year declined by 138,468mt or 5.1% when compared with that of the previous year. This was an encouraging development, more so, taking

cognizance of the fact that the refining companies processed less crude oil in the year to produce more of PMS than they did in the previous years.

In year 2002, PPMC evacuated 10, 480, 533mt of petroleum products for distribution. The breakdown of the evacuated products is given below:

Product	Quantity (Mt)
LPG	80, 804
PMS	3, 230, 148
DPK	1, 525, 797
AGO	2, 484, 052
Fuel oil	2, 592, 929
LRS	350, 686
Intermediate product	216, 117

In addition to the above, PPMC imported PMS, DPK, and AGO totaling 4,535,732.37mt to meet the domestic demand in the year. This represents a marginal increase 68,948mt or 1.54% when compared with imports level of 4, 466,783.97mt in the year 2001. The imports were made up of metric tons of PMS: 4,036,484.22; DPK: 404, 896.79 and AGO: 94, 351.36. PPMC recorded about 14, 279, 256 million litres of petroleum products sales in the year under consideration. The products sold in million litres include; PMS - 8, 580.351; DPK - 1,815.901; ATK - 342.722; AGO - 2, 796.103; LPFO - 276.975.

In the same year PPMC exported petroleum products to the tune of 2,585.058 million litres. These include 1,885.098 million liters of HPFO and 577.166 million

liters of LPFO. The exports were valued at approximately ₦39. 474billion. The exponential increase in exports in the reporting year when compared with the figures for the preceding years is as a result of the memorandum of understanding (MOU) the Federal Government of Nigeria had with some west African countries.

2.1 TYPES OF DATA GENERATED IN DOWNSTREAM SECTOR OF THE OIL AND GAS INDUSTRY

Downstream activities cover gas treatment, crude oil and gas conversion into refined and petrochemical products and finer chemicals (solvents, etc) as well as transportation and marketing of the products. The types of data generated in the Downstream Sector are:

1. Refinery configuration data:

    Installed capacity of the Process Plants:

    a. CDU I & II

    b. NHU

    c. KHU

    d. GP

    e. VDU

    f. FCCU

    g. VRU

    h. HFAU, ETC.

2. **Quality of Crude:**

   a. Base (parafinic or naphtenic, waxy or non-waxy)

   b. API Gravity

   c. Viscosity

   d. Pour point

   e. BS&W

   f. Yield of primary products on topping

   g. Properties of products vis-à-vis product specifications.

3. **Product quality**

   a. Octane No. & Sulphur content of light SRN

   b. High smoke point for kerosene

   c. Sulphur content, cloud point & diesel index of gas oil

   d. Sulphur/Metal content of atmospheric & vacuum residues

4. **Operating statistics (Performance):**

   a. Operating Capacity of the process plants

   b. Products:

      ✓ LPG

      ✓ PMS

      ✓ DPK (HHK, ATK)

      ✓ AGO

      ✓ FUEL OILS (LPFO, HPFO)

      ✓ LRS

      ✓ BASE OIL

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✓ WAXES

✓ BITUMEN

✓ ASPHALTS

✓ SULPHUR, ETC.

5. <u>Products Supply & Distribution:</u>

a. Available products

- o Refinery Production

- o Products Imports

> Quantity and value

> Cost of Importation

> Vessel No.

> Arrival date

> Shipment Date

b. Mode of Distribution of Products:

> Road

> Sea

> Railway

> Pipeline

>

c. Products Liftings

> Evacuation of products from refinery to the depots

> Liftings of products from depots to retail outlets

d. Distribution of products by Marketers:

> Major Marketers sales

  I. Consumption of products by states (36 states and FCT)

  II. Consumption of products by type (conventional & non conventional)

  > Independent Marketers sales by states by type

f. Products Exports:

  > Quantity and value

  > Destination

  > Vessel name

  > Billing date

g. Stocks at importers and exporters

6. <u>Product Pricing</u>:

  a. Cost of crude oil

  b. Cost of refining the crude

  c. Refiner's margin

  d. Marketers' margin

  e. Distribution margin

  f. Pipeline charges

  g. Excise tax

7. <u>Petrochemicals Plant</u>:

  a. Plant Capacity

  b. Throughput

c. Petrochemical products

> Domestic sales

> Exports

> Stock changes

8.   <u>Petrochemical plant:</u>

a. Install capacity of the plants:

> Carbon black plant

> Polypropylene plant

> Olefins plant

b. Operating capacity of the plants

c. Feedstock type:

> NGL

> PRF

> Raw kerosene

> Hydrogen

> Others

d. products

> Carbon black

> Polypropylene

> Polyethylene

> Virgin C_5^+

> Cracked C_5^+

> Others

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e. Products distribution:

  ➢ Domestic Sales

  ➢ Stock changes

CHAPTER THREE

SYSTEM ANALYSIS AND DESIGN

System Analysis and Design involves investigation and understanding of the work methods and procedure used in an organization with the view of making better recommendations on how to improve on the current situation and bring in better methods.

3.1   Feasibility Study

The essence of a feasibility study is to find out how the preferred solution will fit in and how workable it will be in the new environment. The current system which is the use of Excel for data entry and retrieval is quite slow and laborious. That is why the use of special software to undertake this task is more than overdue. The software is to help CPDD/GMIS in the work of entry and retrieval of crude oil refining records for as long as possible.

Feasibility study is very necessary as it helps to prevent time wastage, the wastage of efforts and other resources.

3.2   Analysis of Existing System

In studying the already existing system, it was discovered that Microsoft Excel spreadsheet was used for the processing and management of data in the

Division. There are a number of problems identified with the use of spreadsheets to collate, store, generate and disseminate information. These are:-

1.   It does not allow for easy and quick gathering of information.

2.   Inability to ensure confidentiality of records.

3.   Excel does not provide the depth of functions that ensure good data such as restricting data to specific range or formats and maintaining links among related data.

4.   Errors and omission may occur and this may lead to inaccurate information.

5.   Inability of the system to subject itself to modern day procedures.

These problems can be eliminated by creation of a Database. Database has the following advantages and this answers the question of its necessity:

1.   Creation of a database will enhance efficient and   effective handling of data of any size.

2.   It will allow for easy data access.

3.   It will facilitate easy data interaction between and within various levels of management since every member of staff at a defined level will have easy access to records.

4.   It will lead to easy storage and quick retrieval of data; thereby eliminating misplacement of records.

5.   Data will be more reliable, since errors and omissions will be at a minimum.

3.3   System Design

System design involves putting, formulating together the analyzed problem or already existing design and formulating a new design in order to improve on the object of the organization. As such, alternative design is total computerization, but the question that comes up is what method of design is to be used? System design however requires the consideration of the following elements:

a.   input

b.   output

c.   files

d.   procedures

3.3.1   INPUT

The type of inputs will be influenced greatly by the desired output e.g. the necessity for quick response from the system would determine the need for an on - line type of input. We would need to put the following into consideration:

i.   Data collection method and validation

ii.   Types of input media available

iii.   Volumes of input documents

iv.   Design of input layouts.

3.3.2 Output

It is necessary to consider what is required from the system before deciding how to set about developing it. These requirements would have become clear as the project progress. We would need to consider:

    a.   Forms

    b.   Types

    c.   Volume and frequency of reports and documents

    d.   Choice of output media

3.3.3 Files

This element is very much linked to input and output. Input is processed against the files to produce the necessary output.

Consideration involves in designing files are:

    a.   storage media

    b.   method of file organization and access

    c.   file security

    d.   record layout

3.3.4 Procedures

These are the steps which unify the whole process, which link everything together to produce the desired output. This will involve both computer and clerical procedure. They will start with the organization with the source document and end with the output document being distributed.

3.4 CHANGEOVER PROCEDURES

System conversion is a vital activity and it requires careful handling of data. Conversion involves switching from old data files into the new system.

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

- Direct
- Parallel Running
- Pilot Running, and
- Staged Changeover.

3.4.1. Direct Changeover

This implies the processing of current data by the new system while discontinuing the old system. It is a bold move which should be undertaken only when everyone concerned has confidence in the new system. When a direct changeover is planned, system tests and training should be comprehensive, and the changeover itself planned in detail. This method is potentially the least expensive but the most risky.

3.4.2 Parallel Running

This means processing current data with both old and the new system to cross check the results.

The main advantage lies in the fact that it allows for the old system to be kept alive and operational until the new system has been proved. It allows the result of the new system to be compared with the old system before acceptance by the user, thereby promoting user confidence.

It however, has the disadvantage of extra cost, compiled with the difficulties. Sometimes users have to carry out the different clerical operations for the two systems (old and new) on the time available for one.

3.4.3 Pilot Running

This is similar in concept to parallel running data from one or more previous periods for the whole or part of the system is run on the new system after results have been obtained from the old system, and the new results are compared with those from the old system.

It is not as disruptive as parallel operation, since timing is less critical. This method is more like an extended system test, but it may be considered a more practicable form of changeover for organizational reasons. **The pilot changeover method is chosen for a start in this work. Later it is hoped that a total changeover will be implemented.**

3.4.4 Stage Changeover

This involves a series of limited size direct changeover's, the new system being introduced piece by piece.

A complete part or logical section is committed to the new system while the remaining part or sections are processed by the old system. Only when the selected part is operating satisfactorily is the remainder transferred.

This method reduces the risk inherent in a direct changeover of the whole system and enables the analyst and users to learn from mistakes made as the changeover progresses.

Stayed changeover has its disadvantaged in the control of the selected part of the old and new system. It also tends to prolong the implementation period.

3.5   SYSTEM REQUIREMENT FOR THE PROJECT

The specification below represents configuration that should work well for the database application we are going to develop.

- An IBM or 100% compatible PC with an Pentium IV system processor or better

- A CD Rom drive functioning as a logical drive (for installation only).

- 256MB RAM for one routine component and 16MB for each additional routine component you want to run concurrently.

3.6   DATABASE APPLICATION

The Database Application developed is called the Petroleum Information. The application would be used for the entry of data on refineries operations. It can generate report on monthly basis as well as annually. It automatically cumulates monthly data to produce the annual data. As you are entering data the system

updates itself automatically. It is designed to work on a stand alone computer but can also run on a network.

CHAPTER FOUR

SOFTWARE DEVELOPMENT AND IMPLMENTATION

4.1   PROGRAM OVERVIEW

Below is the main user-interface form that is incorporated into the package. The application is developed using Visual basic but uses a Microsoft Access Database. The main form (**Form1**) consists of one drop-down menu (**Utility**) that contains four sub-menus. Choices are made as to which operation needs to be performed. The different operations that can be performed with this database application are data entry and report generation from the following templates

1.   Crude Oil Received

2.   Crude oil Processed

3.   Output from Domestic Refineries

4.   Domestic Petroleum Products Sales

Form1

Utility
Crude Oil Received   ▶
Crude Oil Processed   ▶
Output from Domestic Refineries   ▶
Domestic Petroleum Products Sales ▶
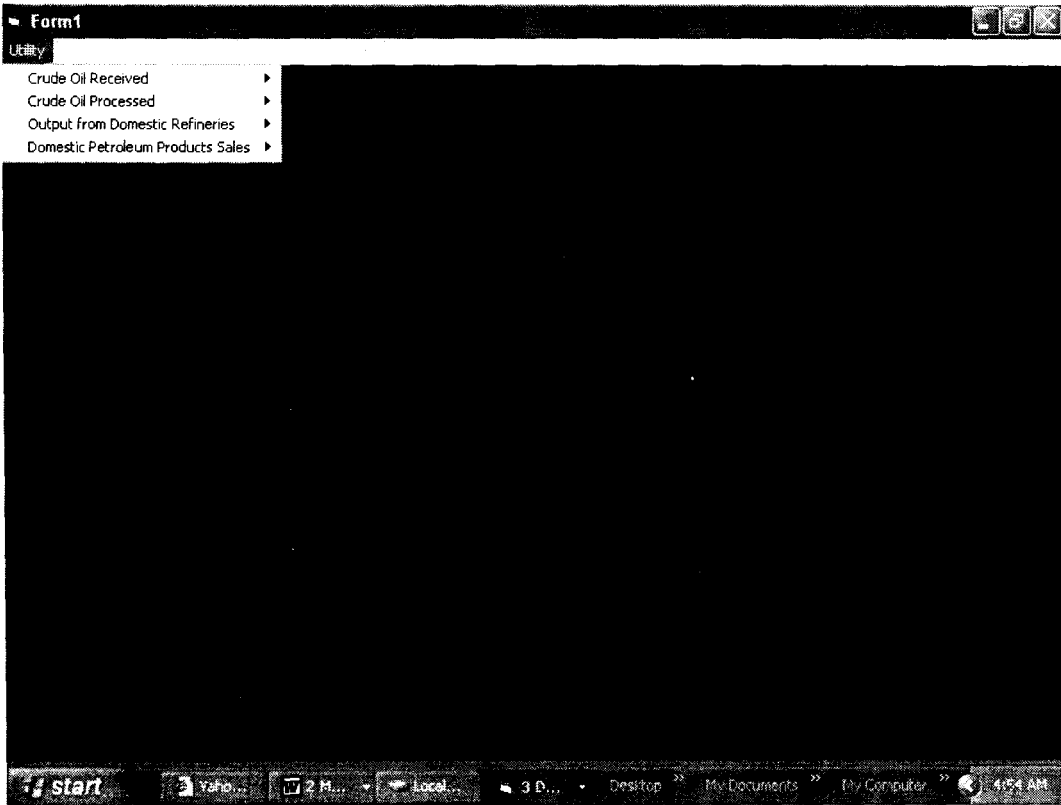
1.   CRUDE OIL RECEIVED TEMPLATE

It consists of three panes and the panes are:

    a. Crude oil Received pane

    b. List of Transaction pane

    c. Actions Buttons pane

The fields for each record are:

- Crude type

- Month

- Year

- Quantity received

Once the records are entered, they are stored in the database on a real time basis.
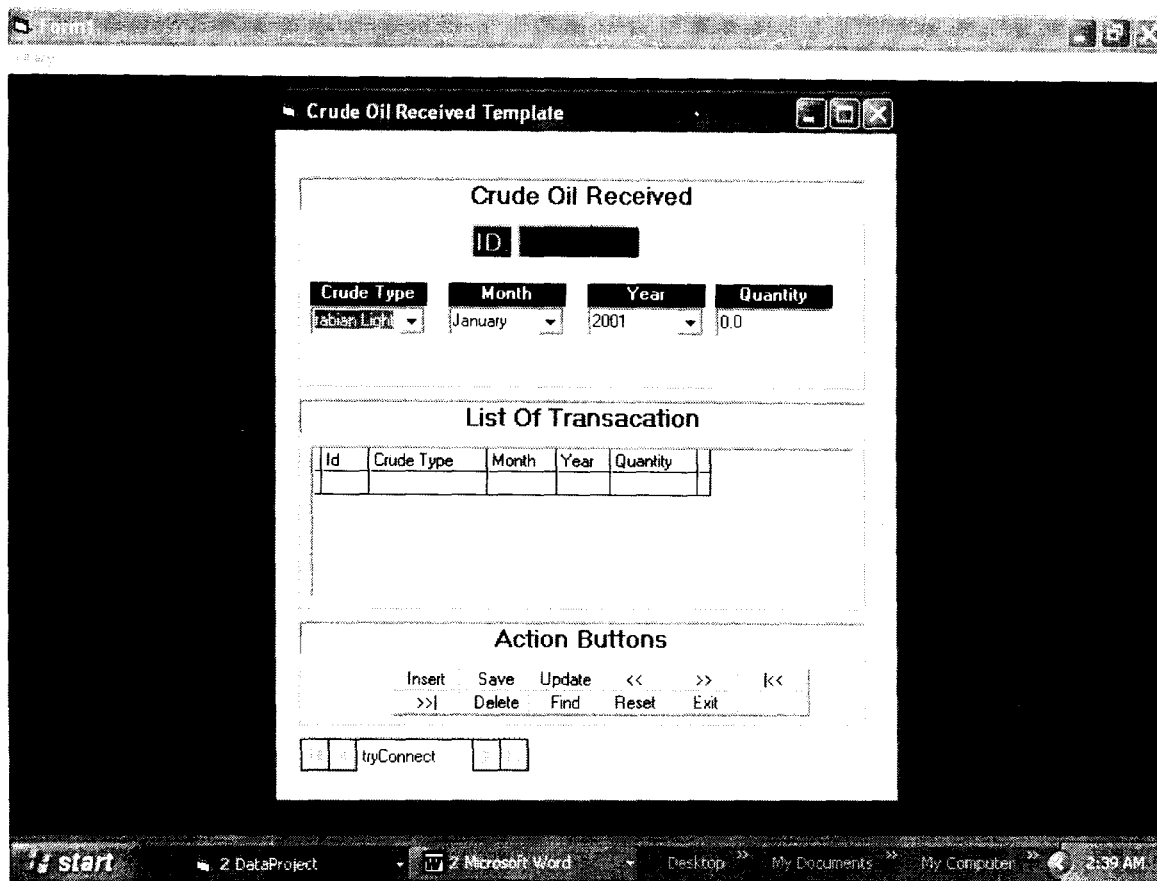
Crude oil Received pane

Here crude oil received is recorded for each transaction.

Once the records are entered, they are stored in the database on a real time basis. Real time means that the records of the database are updated as the records are entered into the system. This is unlike batch processing where all records are first gathered and the master file updated once and for all.

List of Transaction Pane

This pane is where all records pertaining to crude oil received can be found. It comprises of fields such as id, Crude type, Month (of transaction), Year (of transaction) and Quantity (of crude oil).

Action Buttons Pane

This pane is where the various actions that are to be carried out on the form are initiated. It consists of the following buttons:

- **Insert**: Clicking this button clears the form in readiness for a new entry, as can be seen below.
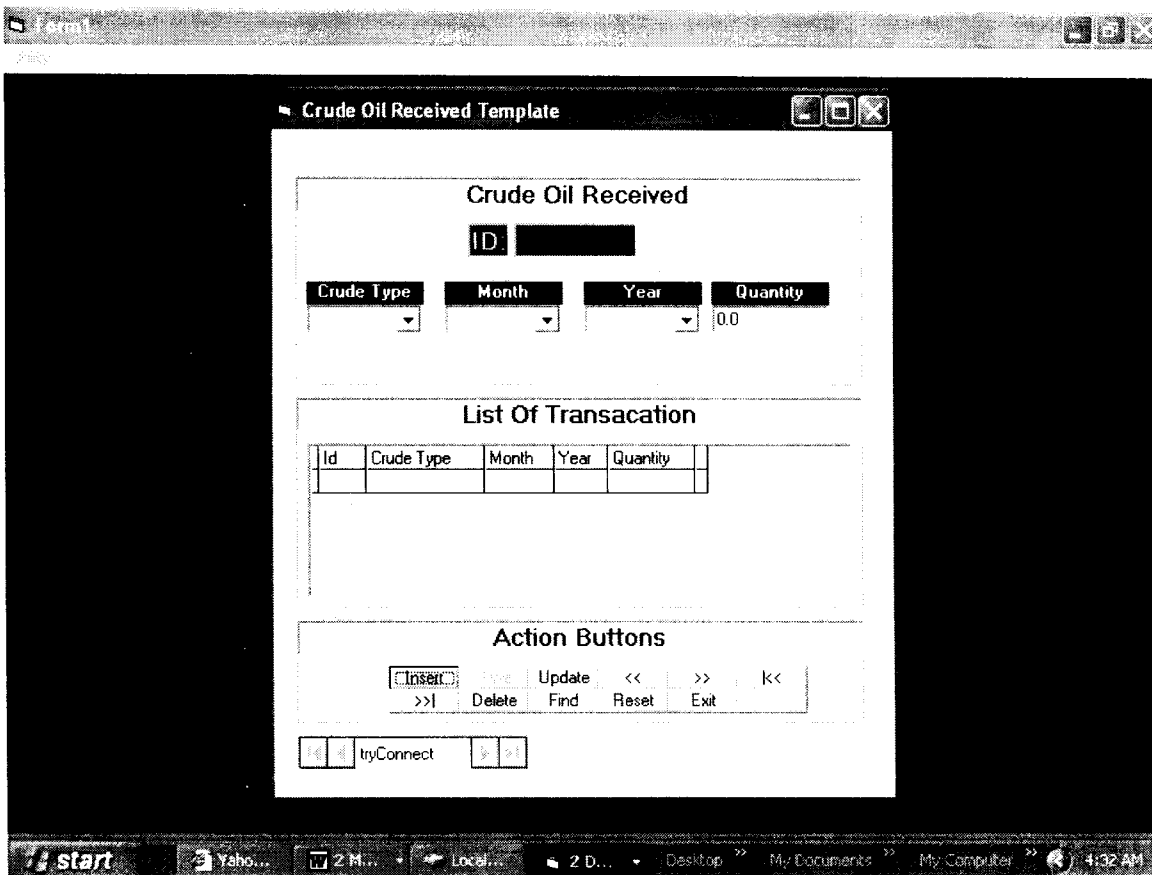
- **Save**: Clicking this button saves the new entry into the database

- **Delete:** Clicking on this button, erases a specified record from the database.

- **Find:** Clicking on this button, enables one to locate any particular record in the database.

- **Reset:** Takes the form back to the position it was before the last action was performed.

- **Exit:** This button terminates the program.

2. CRUDE OIL PROCESSED TEMPLATE

This is where the records for all processed crude oil are kept.
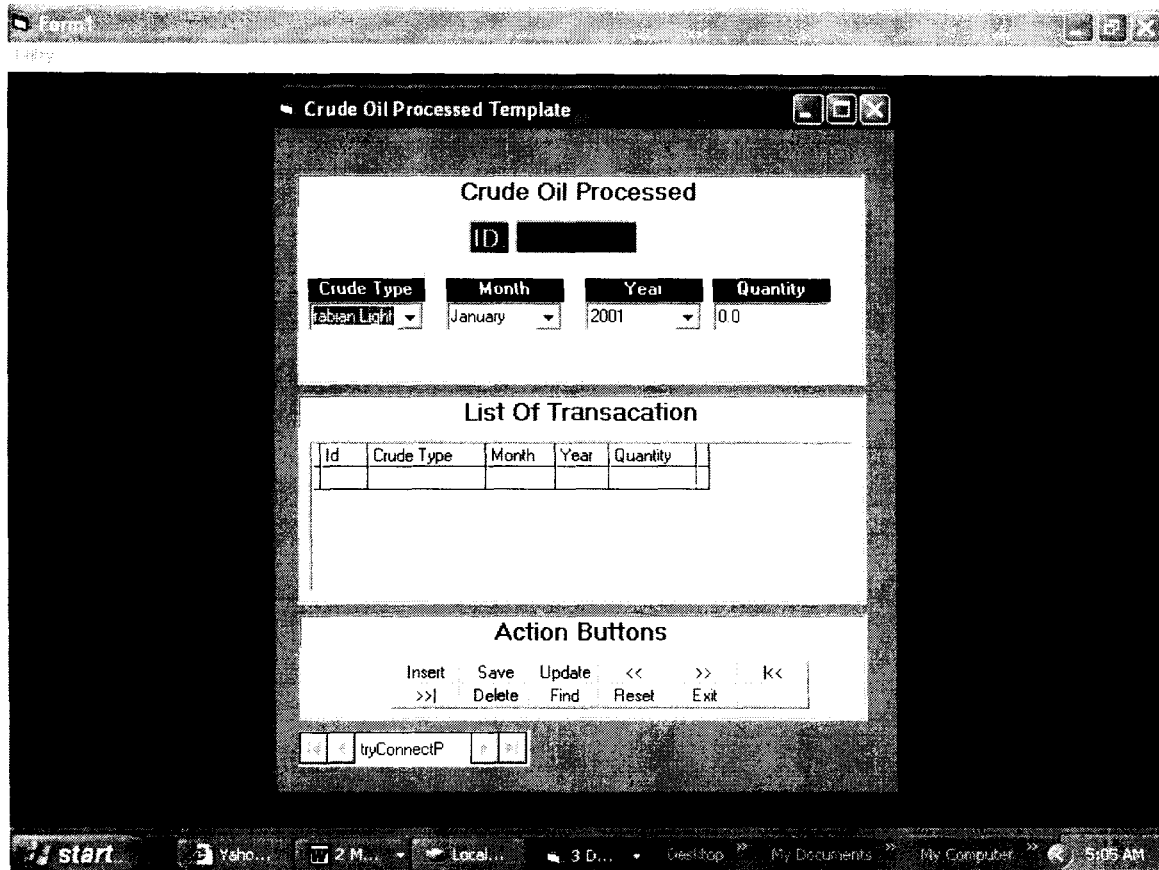
As you can see from the picture above the features of this template are similar to crude oil received template. And as such the action buttons perform the same

operations. In general, the action buttons perform the same operations in all the templates.

It consists of three panes and the panes are:

    a. Crude oil Processed pane

    b. List of Transaction pane

    c. Actions Buttons pane

The fields for each record are:

- Crude type

- Month

- Year

- Quantity processed

Crude Oil Processed Pane

Here crude oil processed is recorded for each transaction.

List of Transaction Pane

This pane is where all records pertaining to crude oil processed can be found. It comprises of fields such as id, Crude type, Month (of transaction), Year (of transaction) and Quantity (of crude oil).

3.   OUTPUT FROM DOMESTIC REFINERIES TEMPLATE

This is where the records for all outputs from local refineries are kept.
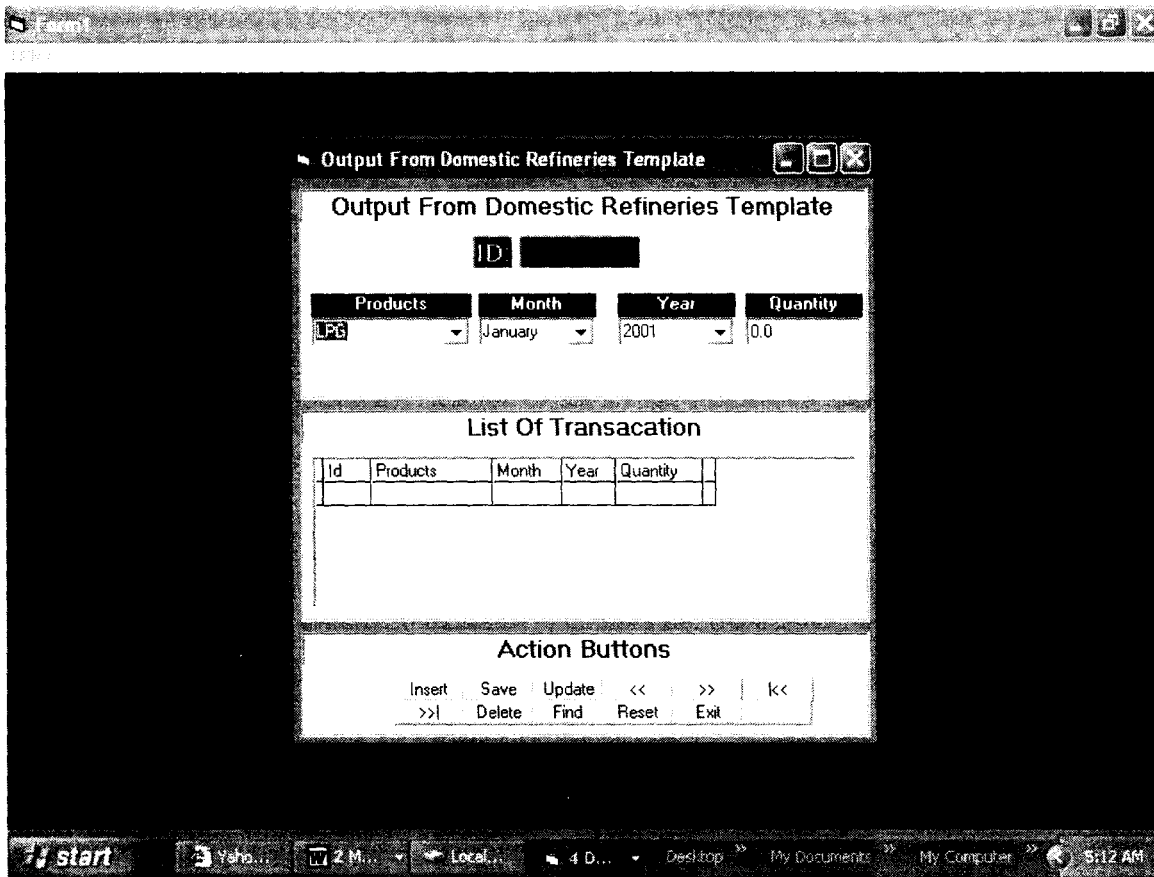
It consists of three panes and the panes are:

a. Output from Local refineries pane

b. List of Transaction pane

c. Actions Buttons pane

The fields for each record are:

- Products

- Month

- Year

- Quantity

Once the records are entered, they are stored in the database on a real time basis.

Output from Local Refineries pane

Here the quantity of products produced are recorded.

List of Transaction Pane

This pane is where all records pertaining to processed crude oil output from the refineries can be found. It comprises of fields such as id, Products, Month (of transaction), Year (of transaction) and Quantity (of products produced).

4.   Domestic Petroleum Product Sales

This is where the records for all domestic sales of petroleum products are kept.
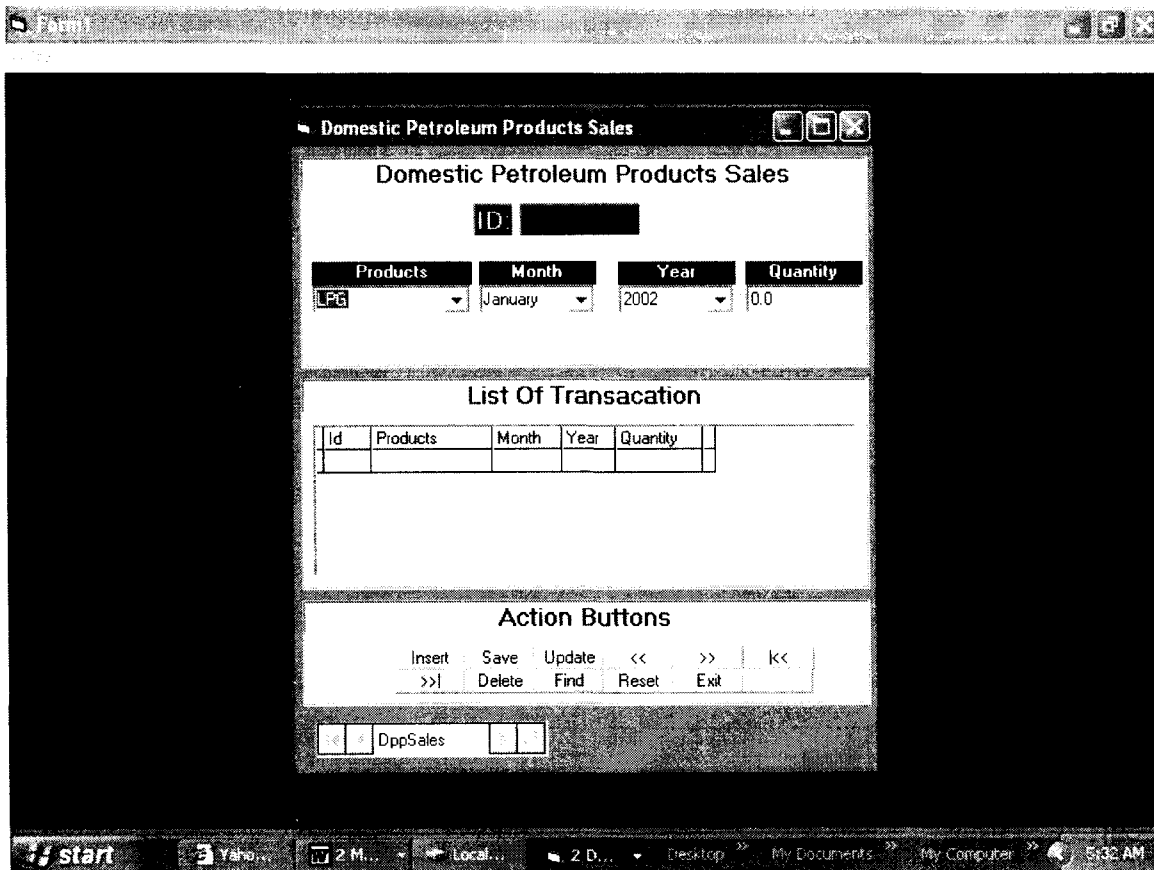
It consists of three panes and the panes are:

a. Domestic Petroleum Sales pane

b. List of Transaction pane

c. Actions Buttons pane

The fields for each record are:

- Products (Contains a drop-down list of all available petroleum products)

- Month (Contains a drop-down list of all the months of the year)

- Year (2001-2010)

- Quantity

Once the records are entered, they are stored in the database on a real time basis.

Domestic Petroleum Products Sale pane

Here records of domestic sales of petroleum products are kept.

List of Transaction Pane

This pane is where all records pertaining to domestic sales of petroleum products can be found. It comprises of fields such as id, Products, Month (of transaction), Year (of transaction) and Quantity (of crude oil).

Program for Refinery Production activities and Petroleum Product Sales.

```
Private Declare Function SendMessage Lib "user32.dll" Alias
"SendMessageA" (ByVal hwnd As Long, ByVal wMsg As Long,
ByVal wParam As Long, ByVal lParam As Long) As Long


Private Const WM_PAINT = &HF
Private Const WM_PRINT = &H317
Private Const PRF_CLIENT = &H4&      ' Draw the window's
client area
Private Const PRF_CHILDREN = &H10&  ' Draw all visible child
Private Const PRF_OWNED = &H20&      ' Draw all owned windows


Public Sub PrintPictureBox(Box As PictureBox, Optional X As
Single = 0, Optional Y As Single = 0)

      Dim rv As Long
      Dim ar As Boolean

      On Error GoTo Exit_Sub

      With Box
            'Save ReDraw value
            ar = .AutoRedraw

            'Set persistance
            .AutoRedraw = True

            'Wake up printer
            Printer.Print

            'Draw controls to picture box

            rv = SendMessage(.hwnd, WM_PAINT, .hDC, 0)
            rv = SendMessage(.hwnd, WM_PRINT, .hDC, _
                  PRF_CHILDREN Or PRF_CLIENT Or PRF_OWNED)

            'Refresh image to picture property
            .Picture = .Image

            'Copy picture to Printer
            Printer.PaintPicture .Picture, X, Y
            Printer.EndDoc

            'Restore backcolor  (Re-load picture if picture was
used)
```

```vb
        Box.Line (0, 0)-(.ScaleWidth, .ScaleHeight),
.BackColor, BF

        'Restore ReDraw
        .AutoRedraw = ar
    End With


Exit_Sub:
    If Err.Number Then MsgBox Err.Description, vbOKOnly,
"Printer Error!"



End Sub



Private Sub Form_Load()


    On Error Resume Next

    With connect22

        .ConnectionString = "Provider =
Microsoft.Jet.OLEDB.4.0;Data
Source=C:\COOOL\dbms\GeneralOil.mdb;Persist Security
Info=false"
        .RecordSource = "SELECT * FROM corec_tb ORDER BY
id_no"
        .Refresh

    End With
    '
    connect22.Recordset.MoveFirst



    'Dim Qty(1 To 10)    As String
    Dim crType(1 To 4) As String
    '
    '
    ' crtude oil type

    crType(1) = "Arabian Light"
```

```vb
    crType(2) = "Bonny Light"
    crType(3) = "Escravos Light"
    crType(4) = "Forcados Blend"


    'Qty(1) = Format(3938.43, "#,###.#0")
    'Qty(2) = Format(3778.77, "#,###.#0")
    'Qty(3) = Format(2965.63, "#,###.#0")
    'Qty(4) = Format(2773.24, "#,###.#0")
    'Qty(5) = Format(1282.73, "#,###.#0")


    '
    'with of label 1575


    For k = 1 To 4


        ' Label15.Caption = Label15.Caption & vbCrLf &
vbCrLf & Qty(k) & vbCrLf
        lblCrudeTpe.Caption = lblCrudeTpe.Caption & vbCrLf
& vbCrLf & crType(k) & vbCrLf


    Next k




End Sub

Private Sub Form_Unload(Cancel As Integer)

    'connect22P.Recordset.Close


End Sub

Private Sub mnuClose_Click()

    'connect22P.Recordset.Close

    ' testinP = 1
        'connect22P.Recordset.Close
```

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```
        Unload Me


End Sub

Private Sub mnuLeft_Click()
    movingA = movingA - 220
    Picture1.Left = movingA
End Sub

Private Sub mnuPrint_Click()

    Printer.Orientation = vbPRORLandscape

    PrintPictureBox Picture1, 250, 250

End Sub

Private Sub mnuSel_Click()


    Dim TotAra As Single
    Dim Bonny As Single
    Dim EscR As Single
    Dim Forca As Single
    '
    Dim genTotal  As Single

    'begin var for january....
    Dim janu(1 To 4) As String
    Dim jTypePd As String
    Dim jColTotal As Single

    'end var for january....
    '
    'begin var for feb....
    Dim fanu(1 To 4) As String
    Dim fTypePd As String
    Dim fColTotal As Single
    'end var for january....
    '
    'begin var for march....
    Dim manu(1 To 4) As String
    Dim mTypePd As String
    Dim mColTotal As Single
    'end var for march....
    '
```

```vb
'begin var for Apr....
Dim aanu(1 To 4) As String
Dim aTypePd As String
Dim aColTotal As Single
'end var for march....
'

'begin var for May....
Dim mayanu(1 To 4) As String
Dim mayTypePd As String
Dim mayColTotal As Single
'end var for may....
'

'begin var for jun....
Dim junanu(1 To 4) As String
Dim junTypePd As String
Dim junColTotal As Single
'end var for june....

'begin var for july....
Dim julanu(1 To 4) As String
Dim julTypePd As String
Dim julColTotal As Single
'end var for july....
'
'

'begin var for Aug....
Dim auganu(1 To 4) As String
Dim augTypePd As String
Dim augColTotal As Single
'end var for aug....
'

'begin var for sep....
Dim sepanu(1 To 4) As String
Dim sepTypePd As String
Dim sepColTotal As Single
'end var for sep....
'

'begin var for oct....
Dim octanu(1 To 4) As String
Dim octTypePd As String
Dim octColTotal As Single
'end var for oct....
'

'begin var for nov....
Dim novanu(1 To 4) As String
Dim novTypePd As String
Dim novColTotal As Single
```

```vb
'end var for nov....
'

'begin var for dec....
Dim decanu(1 To 4) As String
Dim decTypePd As String
Dim decColTotal As Single
'end var for dec....
'

Dim crdType(1 To 4) As String

Dim acceptYear As String

acceptYear = InputBox("Enter year to process", "Crude
Oil Received ????")
'


If Trim(acceptYear) = Trim("") Then

     MsgBox "Year cannot be empty please!!!", vbOKOnly +
vbCritical, "Error"
     Exit Sub

Else
     Label44.Caption = " Crude Oil Processed " &
acceptYear

     With connect22P
          .ConnectionString = "Provider =
Microsoft.Jet.OLEDB.4.0;Data
Source=C:\COOOL\dbms\GeneralOil.mdb;Persist Security
Info=false"
          .RecordSource = "SELECT * FROM crude_o_pro
WHERE yearDon = '" + acceptYear + "' ORDER BY monthRec"
          .Refresh
     End With
     '
     With connect22P.Recordset

          Do While .EOF = False

               If Trim(.Fields(2)) = Trim("January") Then

                    jColTotal = jColTotal + Val(.Fields(4))

                    jTypePd = .Fields(1)

                    If jTypePd = "Arabian Light" Then
```

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```vb
                                TotAra = TotAra + Val(.Fields(4))
                                janu(1) = Format(Val(.Fields(4)),
"#,###.#0")


                    ElseIf jTypePd = "Bonny Light" Then
                        Bonny = Bonny + Val(.Fields(4))
                        janu(2) = Format(Val(.Fields(4)),
"#,###.#0")

                    ElseIf jTypePd = "Escravos Light" Then
                        EscR = EscR + Val(.Fields(4))
                        janu(3) = Format(Val(.Fields(4)),
"#,###.#0")

                    ElseIf jTypePd = "Forcados Blend" Then
                        Forca = Forca + Val(.Fields(4))
                        janu(4) = Format(Val(.Fields(4)),
"#,###.#0")

                    End If
                End If
                'jan comp. ends here
                '
                'feb compu starts here
                If Trim(.Fields(2)) = Trim("February") Then

                    fColTotal = fColTotal + Val(.Fields(4))

                    fTypePd = .Fields(1)

                    If fTypePd = "Arabian Light" Then
                        TotAra = TotAra + Val(.Fields(4))
                        fanu(1) = Format(Val(.Fields(4)),
"#,###.#0")

                    ElseIf fTypePd = "Bonny Light" Then
                        Bonny = Bonny + Val(.Fields(4))
                        fanu(2) = Format(Val(.Fields(4)),
"#,###.#0")

                    ElseIf fTypePd = "Escravos Light" Then
                        EscR = EscR + Val(.Fields(4))
                        fanu(3) = Format(Val(.Fields(4)),
"#,###.#0")

                    ElseIf fTypePd = "Forcados Blend" Then
                        Forca = Forca + Val(.Fields(4))
                        fanu(4) = Format(Val(.Fields(4)),
"#,###.#0")
                    End If
                End If
```

```vb
                        'feb comp. ends here
                        '
                        'mar compu starts here
                        If Trim(.Fields(2)) = Trim("March") Then

                            mColTotal = mColTotal + Val(.Fields(4))

                            mTypePd = .Fields(1)

                            If mTypePd = "Arabian Light" Then
                                TotAra = TotAra + Val(.Fields(4))
                                manu(1) = Format(Val(.Fields(4)),
"#,###.#0")

                            ElseIf mTypePd = "Bonny Light" Then
                                Bonny = Bonny + Val(.Fields(4))
                                manu(2) = Format(Val(.Fields(4)),
"#,###.#0")

                            ElseIf mTypePd = "Escravos Light" Then
                                EscR = EscR + Val(.Fields(4))
                                manu(3) = Format(Val(.Fields(4)),
"#,###.#0")

                            ElseIf mTypePd = "Forcados Blend" Then
                                Forca = Forca + Val(.Fields(4))
                                manu(4) = Format(Val(.Fields(4)),
"#,###.#0")

                            End If
                        End If
                        '
                        '
                        'apr. starts comp. here

                        If Trim(.Fields(2)) = Trim("April") Then

                            aColTotal = aColTotal + Val(.Fields(4))

                            aTypePd = .Fields(1)

                            If aTypePd = "Arabian Light" Then

                                TotAra = TotAra + Val(.Fields(4))
                                aanu(1) = Format(Val(.Fields(4)),
"#,###.#0")

                            ElseIf aTypePd = "Bonny Light" Then
                                Bonny = Bonny + Val(.Fields(4))
                                aanu(2) = Format(Val(.Fields(4)),
"#,###.#0")
```

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```
                              ElseIf aTypePd = "Escravos Light" Then
                                  EscR = EscR + Val(.Fields(4))
                                  aanu(3) = Format(Val(.Fields(4)),
"#,###.#0")

                              ElseIf aTypePd = "Forcados Blend" Then
                                  Forca = Forca + Val(.Fields(4))
                                  aanu(4) = Format(Val(.Fields(4)),
"#,###.#0")

                              End If
                          End If
                          'apr comp. ends here
                          '


                          'may. starts comp. here
                          If Trim(.Fields(2)) = Trim("May") Then

                              mayColTotal = mayColTotal +
Val(.Fields(4))

                              mayTypePd = .Fields(1)

                              If mTypePd = "Arabian Light" Then

                                  TotAra = TotAra + Val(.Fields(4))
                                  mayanu(1) = Format(Val(.Fields(4)),
"#,###.#0")

                              ElseIf mayTypePd = "Bonny Light" Then
                                  Bonny = Bonny + Val(.Fields(4))
                                  mayanu(2) = Format(Val(.Fields(4)),
"#,###.#0")
                              ElseIf mayTypePd = "Escravos Light"
Then

                                  EscR = EscR + Val(.Fields(4))
                                  mayanu(3) = Format(Val(.Fields(4)),
"#,###.#0")
                              ElseIf mayTypePd = "Forcados Blend"
Then

                                  Forca = Forca + Val(.Fields(4))
                                  mayanu(4) = Format(Val(.Fields(4)),
"#,###.#0")
                              End If
                          End If
                          'may comp. ends here
                          '
                          'june. starts comp. here
                          If Trim(.Fields(2)) = Trim("June") Then
```

```vb
Val(.Fields(4))              junColTotal = junColTotal +

                             junTypePd = .Fields(1)

                             If junTypePd = "Arabian Light" Then

                                 TotAra = TotAra + Val(.Fields(4))
                                 junanu(1) = Format(Val(.Fields(4)),
"#,###.#0")

                             ElseIf junTypePd = "Bonny Light" Then
                                 Bonny = Bonny + Val(.Fields(4))
                                 junanu(2) = Format(Val(.Fields(4)),
"#,###.#0")

                             ElseIf junTypePd = "Escravos Light"
Then

                                 EscR = EscR + Val(.Fields(4))
                                 junanu(3) = Format(Val(.Fields(4)),
"#,###.#0")

                             ElseIf junTypePd = "Forcados Blend"
Then

                                 Forca = Forca + Val(.Fields(4))
                                 junanu(4) = Format(Val(.Fields(4)),
"#,###.#0")

                             End If
                         End If
                         'june comp. ends here
                         '
                         'july. starts comp. here
                         If Trim(.Fields(2)) = Trim("July") Then

                             julColTotal = julColTotal +
Val(.Fields(4))

                             julTypePd = .Fields(1)

                             If julTypePd = "Arabian Light" Then

                                 TotAra = TotAra + Val(.Fields(4))
                                 julanu(1) = Format(Val(.Fields(4)),
"#,###.#0")

                             ElseIf julTypePd = "Bonny Light" Then
                                 Bonny = Bonny + Val(.Fields(4))
                                 julanu(2) = Format(Val(.Fields(4)),
"#,###.#0")
```

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```
                          ElseIf julTypePd = "Escravos Light"
Then

                              EscR = EscR + Val(.Fields(4))
                              julanu(3) = Format(Val(.Fields(4)),
"#,###.#0")

                          ElseIf julTypePd = "Forcados Blend"
Then

                              Forca = Forca + Val(.Fields(4))
                              julanu(4) = Format(Val(.Fields(4)),
"#,###.#0")

                          End If
                      End If
                      'jul comp. ends here
                      '
                      'Aug compu starts here

                      If Trim(.Fields(2)) = Trim("August") Then

                          augColTotal = augColTotal +
Val(.Fields(4))

                          augTypePd = .Fields(1)

                          If augTypePd = "Arabian Light" Then

                              TotAra = TotAra + Val(.Fields(4))
                              auganu(1) = Format(Val(.Fields(4)),
"#,###.#0")

                          ElseIf augTypePd = "Bonny Light" Then
                              Bonny = Bonny + Val(.Fields(4))
                              auganu(2) = Format(Val(.Fields(4)),
"#,###.#0")
                          ElseIf augTypePd = "Escravos Light"
Then

                              EscR = EscR + Val(.Fields(4))
                              auganu(3) = Format(Val(.Fields(4)),
"#,###.#0")

                          ElseIf augTypePd = "Forcados Blend"
Then

                              Forca = Forca + Val(.Fields(4))
                              auganu(4) = Format(Val(.Fields(4)),
"#,###.#0")
                          End If
                      End If
                      'aug comp. ends here
                      '
```

```vb
                        'sep compu starts here
                        If Trim(.Fields(2)) = Trim("September")
Then

                                sepColTotal = sepColTotal +
Val(.Fields(4))

                                sepTypePd = .Fields(1)

                                If sepTypePd = "Arabian Light" Then

                                    TotAra = TotAra + Val(.Fields(4))
                                    sepanu(1) = Format(Val(.Fields(4)),
"#,###.#0")


                                ElseIf sepTypePd = "Bonny Light" Then
                                    Bonny = Bonny + Val(.Fields(4))
                                    sepanu(2) = Format(Val(.Fields(4)),
"#,###.#0")


                                ElseIf sepTypePd = "Escravos Light"
Then

                                    EscR = EscR + Val(.Fields(4))
                                    sepanu(3) = Format(Val(.Fields(4)),
"#,###.#0")
                                ElseIf sepTypePd = "Forcados Blend"
Then

                                    Forca = Forca + Val(.Fields(4))
                                    sepanu(4) = Format(Val(.Fields(4)),
"#,###.#0")
                                End If
                        End If
                        'sep comp. ends here
                        '
                        'oct compu starts here
                        If Trim(.Fields(2)) = Trim("October") Then

                                octColTotal = octColTotal +
Val(.Fields(4))

                                octTypePd = .Fields(1)

                                If octTypePd = "Arabian Light" Then

                                    TotAra = TotAra + Val(.Fields(4))
                                    octanu(1) = Format(Val(.Fields(4)),
"#,###.#0")
```

```
                        ElseIf octTypePd = "Bonny Light" Then
                            Bonny = Bonny + Val(.Fields(4))
                            octanu(2) = Format(Val(.Fields(4)),
"#,###.#0")
                        ElseIf octTypePd = "Escravos Light"
Then

                            EscR = EscR + Val(.Fields(4))
                            octanu(3) = Format(Val(.Fields(4)),
"#,###.#0")

                        ElseIf octTypePd = "Forcados Blend"
Then

                            Forca = Forca + Val(.Fields(4))
                            octanu(4) = Format(Val(.Fields(4)),
"#,###.#0")

                        End If
                    End If
                    'oct end here
                    '

                    'nov. starts comp. here
                    If Trim(.Fields(2)) = Trim("November") Then

                        novColTotal = novColTotal +
Val(.Fields(4))

                        novTypePd = .Fields(1)

                        If novTypePd = "Arabian Light" Then

                            TotAra = TotAra + Val(.Fields(4))
                            novanu(1) = Format(Val(.Fields(4)),
"#,###.#0")

                        ElseIf novTypePd = "Bonny Light" Then
                            Bonny = Bonny + Val(.Fields(4))
                            novanu(2) = Format(Val(.Fields(4)),
"#,###.#0")
                        ElseIf novTypePd = "Escravos Light"
Then

                            EscR = EscR + Val(.Fields(4))
                            novanu(3) = Format(Val(.Fields(4)),
"#,###.#0")
                        ElseIf novTypePd = "Forcados Blend"
Then

                            Forca = Forca + Val(.Fields(4))
```

```vba
                    novanu(4) = Format(Val(.Fields(4)),
"#,###.#0")
                End If
            End If
            'nov comp. ends here
            '
            'dec . starts comp. here
            If Trim(.Fields(2)) = Trim("December") Then

                decColTotal = decColTotal +
Val(.Fields(4))

                decTypePd = .Fields(1)

                If decTypePd = "Arabian Light" Then

                    TotAra = TotAra + Val(.Fields(4))
                    decanu(1) = Format(Val(.Fields(4)),
"#,###.#0")

                ElseIf decTypePd = "Bonny Light" Then
                    Bonny = Bonny + Val(.Fields(4))
                    decanu(2) = Format(Val(.Fields(4)),
"#,###.#0")
                ElseIf decTypePd = "Escravos Light"
Then
                    EscR = EscR + Val(.Fields(4))
                    decanu(3) = Format(Val(.Fields(4)),
"#,###.#0")
                ElseIf decTypePd = "Forcados Blend"
Then
                    Forca = Forca + Val(.Fields(4))
                    decanu(4) = Format(Val(.Fields(4)),
"#,###.#0")
                End If
            End If
            'dec comp. ends here

        .MoveNext

    Loop

End With

End If

'
```

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```vb
crdType(1) = Format(TotAra, "#,###.#0")
crdType(2) = Format(Bonny, "#,###.#0")
crdType(3) = Format(EscR, "#,###.#0")
crdType(4) = Format(Forca, "#,###.#0")
'
'genTotal = Val(crdType(1)) + Val(crdType(2)) +
Val(crdType(3)) + Val(crdType(4))
genTotal = TotAra + Bonny + Forca + EscR

'
For k = 1 To 4

    Label15.Caption = Label15.Caption & vbCrLf & vbCrLf
& janu(k) & vbCrLf
    lblFebCol.Caption = lblFebCol.Caption & vbCrLf &
vbCrLf & fanu(k) & vbCrLf
    lblMarCol.Caption = lblMarCol.Caption & vbCrLf &
vbCrLf & manu(k) & vbCrLf
    lblAprCol.Caption = lblAprCol.Caption & vbCrLf &
vbCrLf & aanu(k) & vbCrLf
    lblMayCol.Caption = lblMayCol.Caption & vbCrLf &
vbCrLf & mayanu(k) & vbCrLf
    lblJunCol.Caption = lblJunCol.Caption & vbCrLf &
vbCrLf & junanu(k) & vbCrLf
    lblJulCol.Caption = lblJulCol.Caption & vbCrLf &
vbCrLf & julanu(k) & vbCrLf
        '
    lblAugCol.Caption = lblAugCol.Caption & vbCrLf &
vbCrLf & auganu(k) & vbCrLf
    lblSepCol.Caption = lblSepCol.Caption & vbCrLf &
vbCrLf & sepanu(k) & vbCrLf
    lblOctCol.Caption = lblOctCol.Caption & vbCrLf &
vbCrLf & octanu(k) & vbCrLf
    lblNovCol.Caption = lblNovCol.Caption & vbCrLf &
vbCrLf & novanu(k) & vbCrLf
    lblDecCol.Caption = lblDecCol.Caption & vbCrLf &
vbCrLf & decanu(k) & vbCrLf
        '
    lblToTType.Caption = lblToTType.Caption & vbCrLf &
vbCrLf & crdType(k) & vbCrLf

Next k

'display jCol total
lblJTotal.Caption = Format(jColTotal, "#,###.#0")
lblFTotal.Caption = Format(fColTotal, "#,###.#0")
lblMTotal.Caption = Format(mColTotal, "#,###.#0")
```

```
lblATotal.Caption = Format(aColTotal, "#,###.#0")
lblMayTotal.Caption = Format(mayColTotal, "#,###.#0")
lblJunTotal.Caption = Format(junColTotal, "#,###.#0")
lblJulTotal.Caption = Format(julColTotal, "#,###.#0")
lblAugTotal.Caption = Format(augColTotal, "#,###.#0")
lblSepTotal.Caption = Format(sepColTotal, "#,###.#0")
lblOctTotal.Caption = Format(octColTotal, "#,###.#0")
lblNovTotal.Caption = Format(novColTotal, "#,###.#0")
lblDecTotal.Caption = Format(decColTotal, "#,###.#0")
'
lblGenTot.Caption = Format(genTotal, "#,###.#0")



End Sub

Private Sub mnusR_Click()
    movingA = movingA + 220
    Picture1.Left = movingA
End Sub
```

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMEDNATIONS

5.1 SUMMARY

In this project work, we have attempted to evaluate the need for an efficient and effective information system for handling data on downstream operation of the oil industry.

In chapter one, we made an introduction of the need for Information and Communication Technology (ICT) compliance by organizations. We also highlighted the functions of the Corporate Planning and Development Division (CPDD), and its departments. The literature review of relevant documents was carried out in chapter two. In chapter three, we made a detailed layout of systems analysis and design; we also looked at the various components involved in system analysis and design. We also considered changeover procedures and what they entail. In chapter four, we gave a detailed overview of our proposed database program, with a detailed outline of how the project works.

5.2 CONCLUSION

The program was coded using Microsoft Visual Basic using Microsoft Access database engine. The methodology by which this program was developed is visual components environment (VDE). This provides an event-driven visually oriented way of developing a software application. Applications developed are

initially conceived based on their expected visual user to concentrate fully on the application forms rather than get lost coding.

Finally, the project aims and program specification has been met under the expected project time frame. A stand alone application software program has been created that is deployable on the existing information systems used in CPDD

5.3 RECOMMENDATIONS

In view of the limitations of the existing system as stated in chapter three, the following are recommended for the CPDD management to consider and implement.

1.   Use of the developed database Application: CPDD should adopt the use of this software program as effective database application for processing data on downstream activities.

2.   Relevant training for CPDD staff for effective maintenance and upgrading of the database, I would recommend relevant training should be organized for CPDD staff (on the job training, seminars and workshops).

3.   it is also recommended that this work should continue to be researched by others so as to continue the evolution of better software for the use of CPDD. This software represents only the first version.

It is believed that the acceptance and implementation of the recommendations by the management of the Division will go a long way in promoting efficient and effective information systems delivery in the division.

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