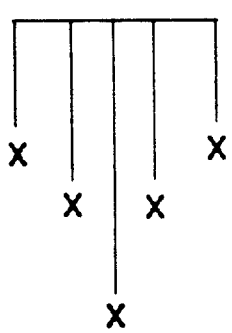
COST SHEET AND MATERIAL LIST GENERATION

PROJECT WORK SUBMITTED IN
PARTIAL
FULFILMENT OF THE
REQUIREMENTS
FOR THE DEGREE OF

**BACHELOR OF
APPLIED SCIENCE IN
COMPUTER TECHNOLOGY
OF THE BHARATHIAR
UNIVERSITY**



SUBMITTED BY

NARAYANAN.K
RAJESH KUMAR.K
SENTHIL KUMAR.A
VIGNESH BABU B.M.

**GUIDED BY
Dr.S. THANGASWAMY Ph.D**

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

KUMARAGURU COLLEGE OF TECHNOLOGY

(Affiliated to Bharathiar University)
COIMBATORE-641006

KUMARAGURU COLLEGE OF TECHNOLOGY

COIMBATORE-641006

Department Of Computer Science And Engineering

Certificate

This is to Certify that this Project Entitled

COST SHEET AND MATERIAL LIST GENERATION

FOR TAMIL NADU ELECTRICITY BOARD

has been submitted by

Mr. NARAYANAN K., RAJESH KUMAR K., SENTHIL KUMAR A., VIGNESH BABU B.M.

in the partial fulfillment of the requirement for the award of Degree of

Bachelor of Science Applied Science Computer Technology

Of the Bharathiar University, Coimbatore-641046

During the academic year 2000-2001

S. Thanga 13/3/01
(Guide)

S. Thanga 13/3/01
(Head Of Department)

Certified that Candidate was Examined by us in the Project Work.

Viva-Voce Examination held on 15-03-2001

University Register Number 9827801 38, 9927801 49, 9827801 62
9927801 69

(Internal Examiner)

15/3/2001
(External Examiner)

TAMIL NADU ELECTRICITY BOARD

T. Sampath Kumar,
Assistant Executive Engineer,
Sub Station,
Mettupalayam.

Whom so ever it may concern.

This is to certify that the following students of Final BSc (Computer Technology), Kumaraguru College Of Technology:

Mr. Narayanan K.

Mr. Rajesh Kumar K.

Mr. Senthil Kumar A.

Mr. Vignesh Babu B.M.

have successfully completed the project "COST SHEET AND MATERIAL LIST GENERATION" for the Tamil Nadu Electricity Board.

The software has helped us to improve our response time to new service requests from customers.

10/3

(T. Sampath Kumar)
Assistant Executive Engineer,
Sub Station,
Mettupalayam.

We wish to express our heartfelt gratitude to our principal *Dr.K.K.PADMANABHAN, B.Sc(Engg), M.Tech., Ph.D* for his patronage & the excellent facilities afforde for carrying out this project.

We express our multiplicity of thanks to ***Dr.S.THANGASWAMY Ph.D. Head Of The Department –Computer Science & Engineering*** and *Mr.S.ANDREWS,M.Sc., Course Co-ordinator --B.Sc[Computer Tech]* for the constant encouragement and help during the course of this project.

We are indebted to express our sense of gratitude to our project guide ***DR.S.THANGASWAMY Ph.D.,HOD-Computer Science And Engineering*** for giving us valuable and continuous guidance, suggestion, constructive criticism and consistent encouragement that contributed immensely in making the project to great success.

We register our heartfelt thanks to all the teaching and non-teaching staffs of our department for their rendering of the invaluable help, tremendous encouragement and perennial assistance for the successful emergence of this project.

The acknowledgement would be incomplete if we fail to mention our gratitude to our ***Management*** which has provided us valuable and comfortable facilities for taking over this project.

Finally, we express our gratitude to one and all who have helped us to stumble upon the unpaved paving stones and paved the way for victorious completion of this project.

Today the Electrical Engineers of the Tamil Nadu Electricity Board are undergoing a tedious job in providing a new service to the customers. Their entire work is done manually from drawing the rough sketches of the layouts, checking the capacities of the appropriate transformers and generating the cost sheet and material lists.

The Engineers should also calculate the regulation percentage value and make sure that it lies within norms set by the Board for the benefit of the customer.

Owing to the above factors, it is difficult for the Engineers to provide the service to the customer within the stipulated 24 hr limit.

So, as the first phase of automation, we provide a GUI based interface to generate the Cost Sheet and Material List for a given layout diagram.

To perform the above task VB 6.0, VC++ 6.0 and MS Access 2000 have been used.

1. INTRODUCTION

2. REQUIREMENTS SPECIFICATION

2.1. Introduction

2.1.1. Purpose
2.1.2. Scope
2.1.3. Definitions
2.1.4. Abbreviations
2.1.5. References
2.1.6. Overview

2.2. General Description

2.2.1. Product Perspective
2.2.2. Product Functionality
2.2.3. User Characteristics
2.2.4. General Constrains

2.3. Functional Requirements

2.3.1. Introduction
2.3.2. List of Inputs
2.3.3. Information Processing

2.4. Performance Requirements

2.4.1. Security
2.4.2. Capacity

2.5. Design Constrains

2.5.1. Hardware Limitations
2.5.2. User Interface and Screen Formats

3. SOFTWARE DESIGN

3.1. Material List Generation

3.2. Cost Sheet Generation

3.3. Database Updation

3.4. Tools Used

3.5. Customer Site Adaptation

3.6. Program Flow

3.7. Screen Shots

3.8. Performance

4. SOURCE CODE

5. BIBLIOGRAPHY

This project is being done for the Tamil Nadu Electricity Board, Mettupalayam Substation. The Mettupalayam Sub-station is serving about 75 industrial connections, 200 agricultural connections and 300 non-commercial connections. Mr.Sampath Kumar, ADE, heads the Mettupalayam Sub-station. This project has been done in order to meet his requirements.

The State Government has advised that all service requests for LT distribution lines must be processed and sanctioned within 24 hours of submission of the request application. The Cost Sheet and Material List Generation software developed by us would help them to fulfill the Government order with maximum efficiency and accuracy.

The tools used for developing the software project are Visual Studio 6.0 – Visual Basic 6.0 was used extensively for the user interfaces and to connect with databases, Visual C++ has been used to specify the links between each object. The backend for storing the databases is MS Access.

2.1. Introduction:

The following are the requirements specified by the user.

2.1.1.Purpose:

The purpose of this project is to simplify the job of processing new LT service requests. The following were the key points in the requirements for the Board:

- A GUI based interface for drawing the layout
- Generation of Cost Sheet
- Generation of Material List

This software should reduce the response time of the staff in processing the new requests to the minimum.

2.1.2.Scope:

The main background of our project is to computerize the process of Cost Sheet Generation and Material List Generation for a new LT service. This has been done manually so far.

Thus this project enables the engineers to estimate the cost of a new LT service layout within a short time.

As already mentioned, the state government has given orders for the Tamil Nadu Electricity Board to provide the service for any LT line within 24 hours from the time of submission of the application. This makes the job tedious for the engineers. It makes it difficult for them to make the layouts, generate the cost and material list conforming to various restrictions like to-scale drawings and strict load checks.

Our project provides the necessary tools to the engineers at TNEB to perform the necessary steps in processing an LT service request at the earliest.

2.1.3.Definitions:

- TNEB – Tamil Nadu Electricity Board

  A state government run organization for generating and distributing electricity to people of Tamil Nadu.

- Cost Sheet – It is a report that displays the cost of the new LT service to be laid in a categorized manner incurred by the customer.

- LT line – Low Tension distribution line

  It is a type of connection that is provided for house hold uses. It can be single phased or three phased.

- Transformer – it is a device used for stepping up or stepping down the voltage accordingly.

- Overhead Line Materials – this includes the conductors and insulators that are used for carrying power to the customers.

- Voltage Regulation – It is the maximum deviation from the nominal value at the customer side, expressed as percentage.

- Regulation percentage – This is factor set by the Electricity Board for the benefit of the customer. The power regulation percentage has been set at 6percent. If any service doesn't conform to this then the material used or the transformer used must be modified.

2.1.4.Abbreviations:

AAAC – All Aluminum Alloy Conductor

ACSR – Aluminum Conductor Steel Reinforced

HG – Horn Gap

AB switches – Air Break Switches

LT – Low Tension Service

LA – lightening arrester

LS– line support

PSC – Pre Stressed Concrete

Cond – conductor

Line – line materials

CAF – cross arm fittings

Chk – check box

Cbo – combo box

Opt – option button

Cmd – command button

Frm – frame

Lbl – label

2.1.5. References:

Tamil Nadu Electricity Board Cost Data Book (1999-2000)

2.1.6. Overview:

This software must assist an Engineer involved in the processing of a request for a new LT service. It must help in the generation of the layout drawing by providing a Graphical User Interface for making the drawings. The drawing must be used to generate the List of Materials necessary for that particular service, followed by the Cost Sheet generation. The data for the generation of

the above tables must be from the Cost Data provided. The software must also provide easy interfaces to perform data updating, adding and deleting to the central database of the material data.

2.2.General Description:

2.2.1.Product Perspective:

The product must be easily extendable – it must be able to incorporate new features. In the future the software might be used for enhancements as follows:

- View maps as well as facility designs, engineering drawings, substation diagrams, photographs, aerial photos, and more.
- Issue new customer accounts with automatic engineering requests tied to equipment maps.
- Monitor outages and their status in near real time with automatic updates.

- Identify marketing targets by querying demographic and customer information through the browser.
- Show transformer use on map displays with associated technical data for each device.
- Print reports that combine high-quality maps with attribute data from databases.
- Display historical outage data in color-coded maps.
- Generate detailed or summary reports on facilities, user-defined areas, or other map features.
- Show real-time service and maintenance vehicle locations.
- Web-enable existing mainframe applications such as customer information and facilities inventory.

2.2.2. Product Functionality:

The software must provide the following functionalities to the user

- GUI based interface
- Assisted layout drawing
- Material list generation
- Cost sheet generation

Once the user has visited the customers' site he would have a general idea as to the path that the line has to take. This the user would feed to the software.

The software should provide a GUI based interface for the user to draw the service's layout. He must be able to select the object from the menu; choose a transformer or a post and place them on the user area.

From the user area itself he must be able to change the property of each of the objects on the screen. On choosing any object on the screen a property box must be shown on the screen from where he can make the changes. These objects should have most of their properties set by default.

On completion of the layout, the user must be able to ask the software to check the loads. The software should check the existing capacity of the transformer being used and compare it with the new load due to the new service and then the regulation percentage must be calculated using the total length of overhead lines used and the constant corresponding to that type of material. If the regulation percentage comes below 6percent then the service should be accepted. Otherwise the software must suggest that the user change the overhead line type to bring the regulation percentage down.

After verifying the regulation percentage, the software must go ahead with the generation of the material list, which contains all the materials necessary to provide the service. The material list must be generated from the diagram that was created by the Engineer for the layout. From the materials list the software must

be able to generate the corresponding cost sheet. The cost data for the cost sheet must be taken from the Cost Data Book, which must also be computerized.

2.2.3.User Characteristics:

The Assistant Engineer will use this software while he is designing the new service layout. This relieves him of the tedious process of manually drawing the layout to scale.

As all the users will basically come from Electrical Engineering background, they cannot be expected to be well versed in computers. So the software must be made as simple as possible. The interface must be made with such a user in mind. Moreover the government has begun computerizing the Electricity Board at a moderate pace. So the software can be expected to be very widely used.

2.2.4.General Constraints:

The end user is powerly using a low-end system –

Celeron 366

32MB RAM

4GB hdd

Windows 98.

This configuration puts up a few constraints regarding the graphical user interface – the interface will have to be very low on resource usage. Moreover such a software will tend to use huge amounts of memory with increase in the number of objects used. This is one problem that will have to be taken care of in the near future.

2.3.Functional Requirements:

The following define the functionalities of the product.

2.3.1.Introduction:

The prime requirement of our client (TNEB) is to process their client's information such as providing service by calculating the availability of the line capacity and then drawing a rough sketch of the line layout from the transformer to their client's site.

In connection with computerization, the cost sheet and material list generation is to be done. Finally the report of the cost for laying the line and the material list for the items to be used is printed and reviewed.

Material List Generation:

This module needs to do the job of generating the line materials list that would be used for laying that particular service. Such information would be included like the number of posts,

length of overhead lines, fuses, insulators etc. that would be used in laying that line.

Cost Sheet Generation:

In this module the client requires the function of getting the total cost for the laying of that particular service. The cost data for the sheet is obtained from the cost data book.

2.3.2. List Of Inputs:

The inputs for cost sheet generation are as follows:

The type of phase:

This includes the type of phase whether single phase, double phase or three phase power that the customer requires.

Length :

This is to indicate the total length of the overhead line layout (i.e. the distance between the transformer and the customer site)

Transformer Capacity:

This indicates the free capacity that is currently available from a particular transformer.

Customer Load Requirement:

This is the input regarding the amount of line capacity that the customer requires.

The inputs that are needed for the material list generation are as follows:

Transformer Type:

This is to select the type of transformer that is either conventional type or fail safe type that the client needs.

Conductors:

This is to select the type of conducting material depending on the line capacity that the customer wants and the distance.

Insulators:

This is to select the type of insulating materials.

Line Support And Other Fittings:

This is to select the type of line support such as RCC poles and PSC poles and fittings such as cross arm and clamps/stays/base plates and stay set, earthing device.

2.3.3. Information Processing Required

Voltage Regulation Calculation:

The voltage regulation is set by the Electricity Board in order to make sure that the service to the customer would be of high quality. Adding all the lengths of the cables and multiplying the total length by a constant set for a particular type of load gives the Voltage Regulation percentage.

Type	Const.
7/2.59	0.5277/m
7/3.35	0.3558/m

These are the most widely used types of cables for the domestic services. The power standard is 6percent. If the service does not come within that then the user must change the type of cable. If still the value isn't within the limit, then the user must go for another transformer with more free capacity.

Material List Generation:

For this the software gets the inputs of the different materials used in designing the layout from the database. These materials are listed in a format pre defined by the TNEB. The software stores details of each of the post or transformer added to the service to a database. Later while generating the material list the software looks up the database and produces list of the items in the format specified by the Board.

Cost Sheet Generation:

Getting all the inputs such as load, length etc. from the user, the software performs calculation to generate the cost sheet.

Information is retrieved from the database that has been created and calculations performed by depending on the user requirements. Thus the cost sheet and the material list for thelaying of LT line is generated and printed as a report accordingly.

2.4. Performance Requirements

2.4.1.Security:

As our software is going to be used in only a single system and will not be on networks, moreover only a few users would be using it, hence no special security features have been requested by the customer.

2.4.2.Capacity:

The database can be updated only within the already available categories i.e. no new item under a completely new category can be added. The user can keep adding items within the already existing categories.

2.5.Design Constraints:

These are the limitations that can possibly affect the software.

2.5.1.Hardware Limitations:

- ✓ The Board is widely using PII 300,
- ✓ 32 Mb Random Access Memory
- ✓ 4 GB Hard Disk Drive
- ✓ Windows 98
- ✓ Access 2000

Such configurations cannot use large databases.

2.5.2.User Interface, Screen Formats:

A very simple user interface must be provided and the user interactions must be through two modules – the Guided Drawing module – this module must help the user create the layouts. The property pages that pop-up for each object on the user area should help the user to update any changes that he needs to incorporate in the object's configuration. A separate module must be present to help the user in updating the database periodically.

3.1. Material List Generation:

The Assisted Drawing module lets the users to draw the layout design. As the objects are appended to the user area, the new objects data are stored in a temporary table. The user can change the properties of each object using the property box being displayed for each of the item.

The property box contains 6 combo boxes for a transformer and 5 combo boxes for the poles. Each of the combo boxes are linked to the database that contains the material list from the Electricity Board. As the user makes changes to the properties of an object the changes are updated to a temporary database. This information from the table is used to generate the Material List. The material list is generated using MS Access' report generation facility.

This list is stored in the system for further use by the customer on a later date. It is stored in Ms Access format.

3.2 .Cost Sheet Generation:

The once the drawings have been made and the final layout verified, the software is asked to generate the cost sheet for the service. The data from the material list generation is used to calculate the total amount that would be incurred for a service using the per-item cost. Then a report is generated using these data.

The data from the material list is used to get the total materials required. This information is linked to the Cost Data book given by the Electricity Board and thecost of each item is retrieved. This information is summarized onto a table using MS Access' report Generation facility. This table is again stored in the MS Access format, so that the customer may use it in the future if need arises.

3.3.Database Updating:

A module for updating the database is also provided. This module has a very simple user interface. It displays all the contents of the database that is used for storing the list of materials available from the Board and their corresponding costs. These materials can be directly modified in the database using this interface. This would help the user to keep the database updated and hence enable the software to produce accurate results.

3.4. Tools Used:

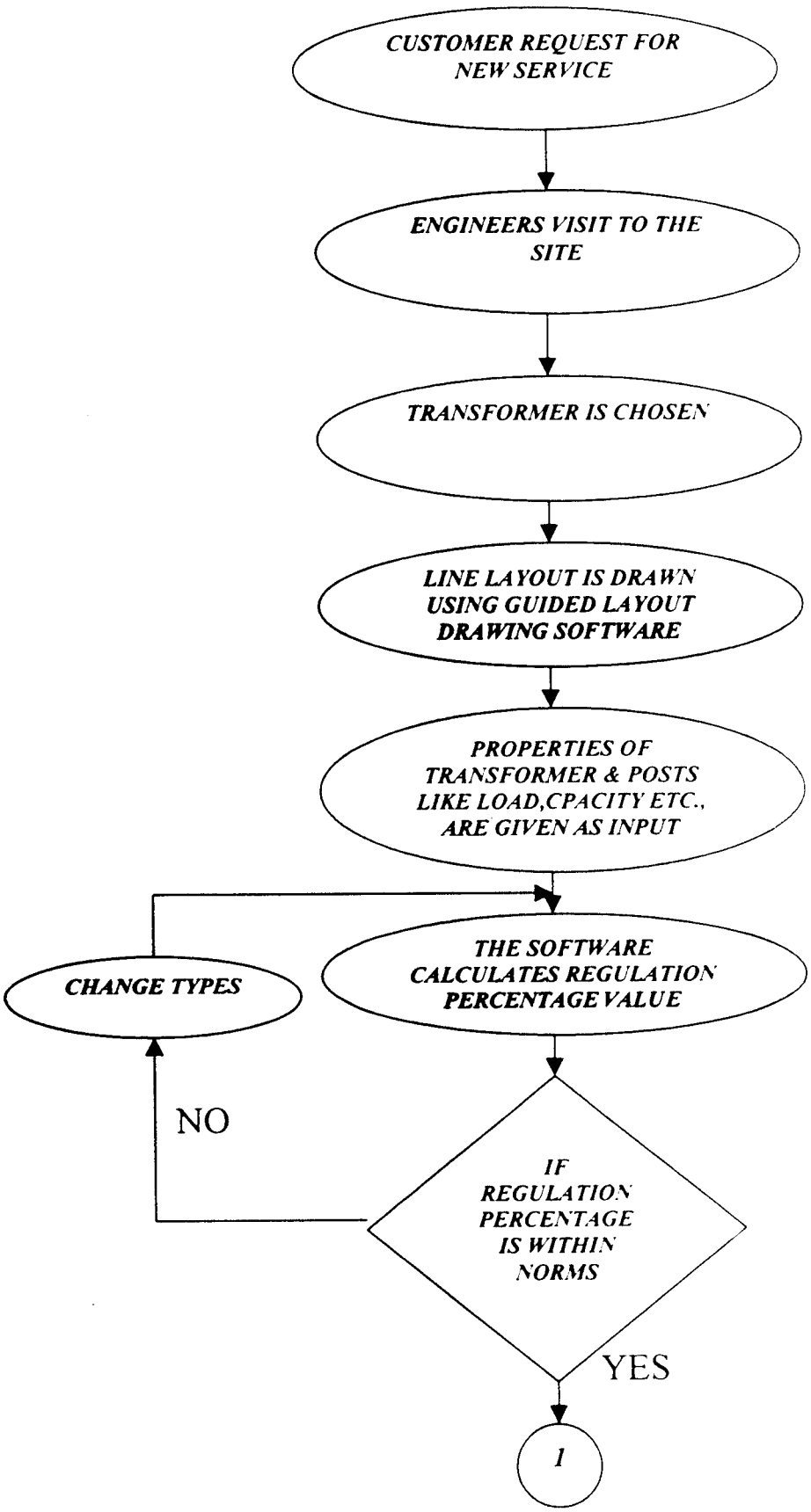
The following tools were used for the development of the project:

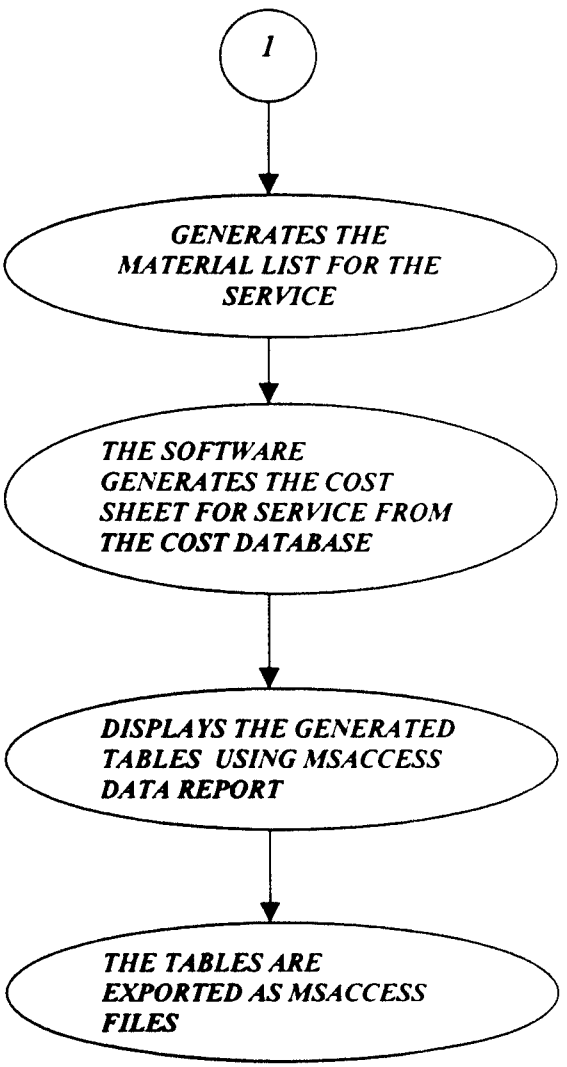
VB 6.0 – for developing simple, Graphical User Interfaces. VB6.0 is being used due to the ease of development of such GUI interfaces in VB. It is also quite easy to connect VB to databases compared to the other Visual Studio tools.

3.5. Customer Site Adaptation:

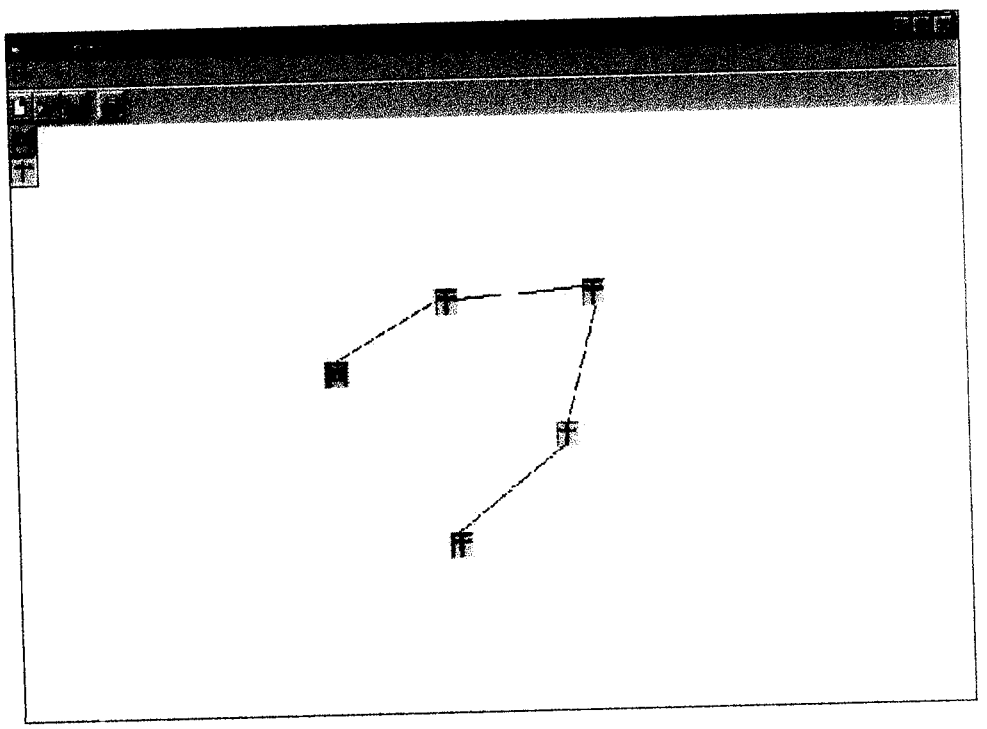
The customer was earlier using Access 97. But as our databases are in the MS Access 2000 format, the software was not working on the machines. So the application was modified to use the database in the previous versions format i.e. Access 97.

3.6.Program Flow:

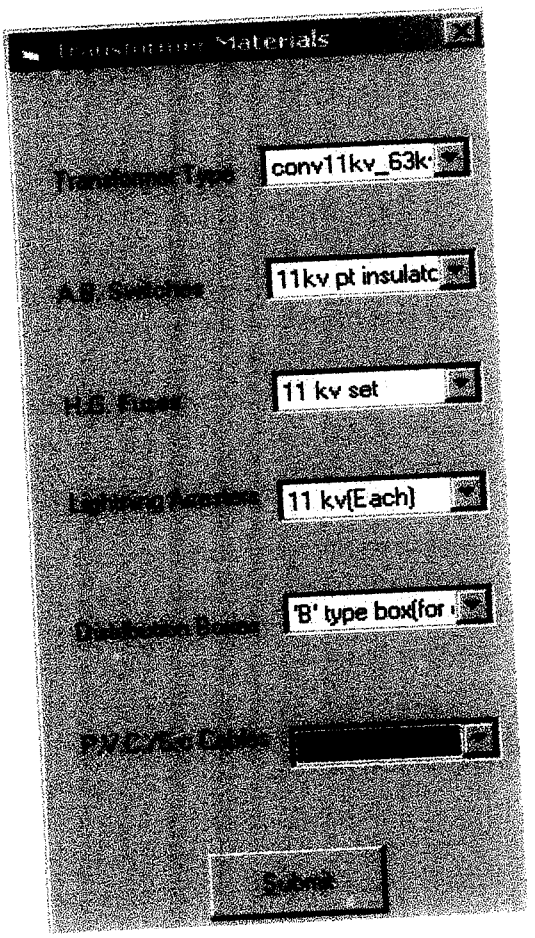



1
GENERATES THE MATERIAL LIST FOR THE SERVICE
THE SOFTWARE GENERATES THE COST SHEET FOR SERVICE FROM THE COST DATABASE
DISPLAYS THE GENERATED TABLES USING MSACCESS DATA REPORT
THE TABLES ARE EXPORTED AS MSACCESS FILES

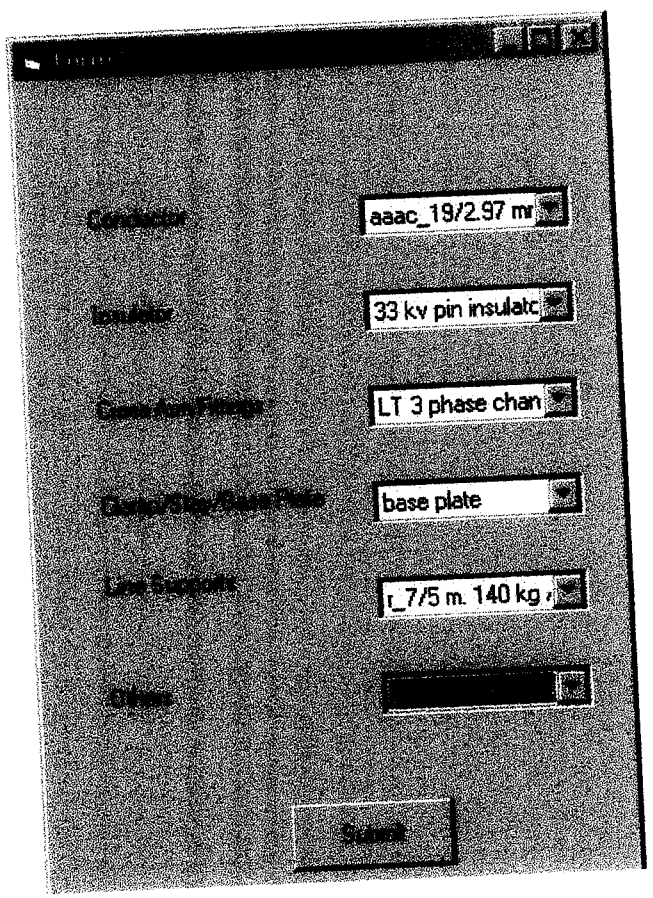
3.7.Screen Shots:



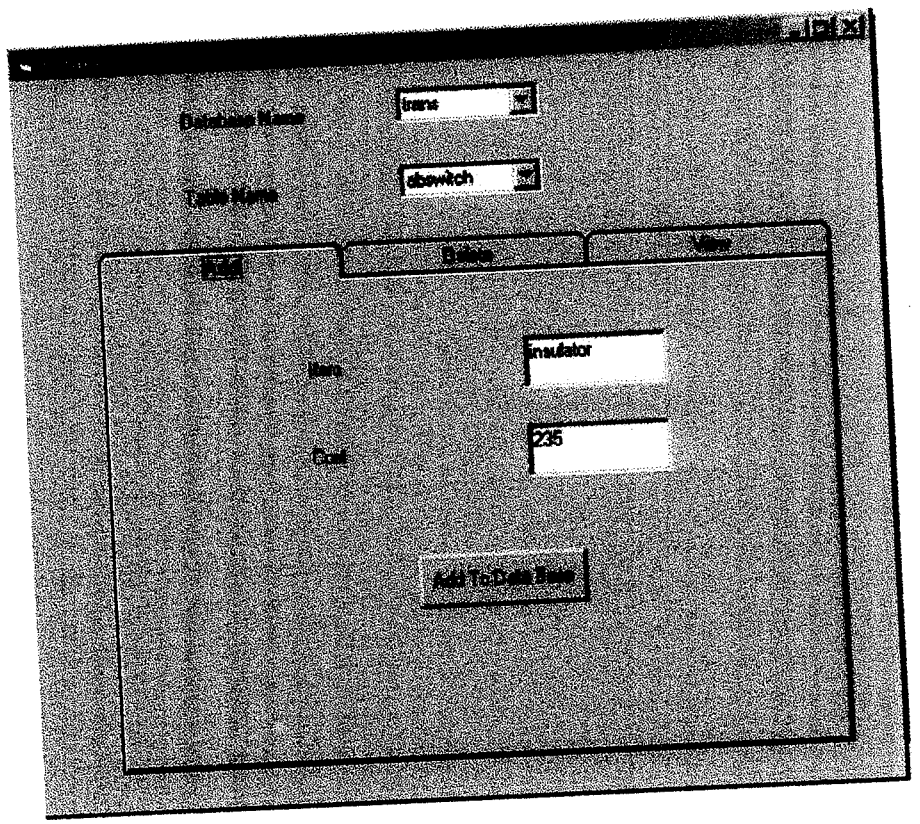
Transformer Material Properties:



Line Material Properties:



Database Updation:



Databases:

A.B.switches

item	cost
230kv(with earth)	85070
11kv pt insulator(each)	225
11kv/1200amps	11144
22kv/800amps	10842
11kv/200amps	5405
22kv/200amps	9360
110kv/1250amps	25200
110kv/1250amps(earth)	31750
22kv p.t.insulator	322
230kv(without earth)	61026

Distribution Boxes

item	cost
'A' type box	807
'B' type box(for credit estimate)	708
'C' type box(distribution type)	120
LT metering box	1020
LT metering box(Double compartment)	1100
HT metering box	3200
Triple comprtment metering box	1626
MS 'C' type boxes	95

H.G.fuses

item	cost
11 kv set	525
22 kv set	611

Lightning Arresters

Item	cost
L.T. set	282
11 kv(Each)	565
22 kv(Each)	875
11 kv(station type)	3785
22 kv	5060
33 kv	9465
110 kv	33352

PVC cables

Item	cost
2.65 sq.mm	268
6.00 sq.mm	399
25.00 sq.mm	960
50.00 sq.mm	1761
95.00 sq.mm	3188
120.00 sq.mm	3902
185.00 sq.mm	5810

Transformer

Item	cost
Conv11kv_63kva	29,215.00
Conv11kv_100kva	35,420.00
Conv11kv_250kva	84,295.00
Conv11kv_500kva	175,896.00
Conv22kv_63kva	43,158.00
Conv22kv_100kva	54,738.00
Conv22kv_250kva	109,930.00
Conv22kv_500kva	190,305.00
fs11kv_100kva	82,252.00

Insulators

Item	cost(rate/metre)
LT pin insulator	6
11 kv pin insulator with pin	37
22 kv pin insulator with pin	109
33 kv pin insulator	210
LT shackle with hardware	18
11 kv strain set	276
11 kv post type insulator	196
22 kv post type insulator	305
33 kv post type insulator	560
LT guy insulator	8
230 kv cylindrical post insulator	10534
110 kv long rod insulator(8810 kg)	1035
110 kv long rod insulator	4483
110 kv long rod insulator(11500 kg)	1833
400 kv cylindrical post insulator	28650
11 kv antifog strain set 16mm (8810 kg)	243
11 kv antifog strain set 20mm(11500 kg)	310
110 kv solid core insulator	4256
22 kv strain disc with mp	469
11 kv strain disc with mp	276

Cross Arm Fittings

Item	cost(rate/each)
1068 mm(3'-6")V cross arm	296
1373 mm(4'-6")V cross arm	427
1525 mm(5'-6")V cross arm	490
LT 3 phase angle cross arm	208
LT 3 phase channel cross arm	201
LT single phase angle cross arm	56
LT single phase channel cross arm	73
aluminium knob	9
guarding cross arm	242
HT top insulator fittings	98
HT top insulator fitting	99
double channel cross arm	1440
cross bracing	1860
tapping channel cross arm	289
transformer structure materials 10' centre	4715
special type guarding xarm	445

AAAC Conductor

Item	cost(rate/km)
7/2.0 mm	7650
7/2.5 mm	11825
7/3.15 mm	18190
19/2.97 mm	26000

ACSR Conductor

Item	cost(rate/km)
squirrel 7/2.11 mm	7413
weasel 7/2.59 mm	11084
rabit 7/3.35 mm	18559
raccoon 6/4.09 & 1/4.09 mm	27134
dog 6/4.72 & 7/1.57 mm	36960
leopard 6/5.26 and 7/1.75	41202
panther 30/3 & 7/3 mm	78134

3.8.Performance:

The software was tested using various input types and formats and all the outputs were compared with the manually generated data. The data were found to be consistent and correct.

The customer has tried this software with sample databases on the material chosen. He has found the software satisfactory.

VC ++ Module:

conidx- is an array of objects storing information regarding each of the new connections to the particular node

*/

```
class node
{
        int index;
        int ccount;
        conidx *con;
        node *next;
public:

        node()
        {
                ccount=0;
        }
        void add(int i);//adds new nodes
        void update(int cc,int ci, int len,int lt)://update conidx objects
}*front,*curr,*temp;

void node::add (int i)
{
        if(!front)
```

```
        {
                front=new node;
                front->index=i;
                front->next =NULL;
        }

        else
        {
                curr=new node;
                curr->index =i;
                curr->next =NULL;
                front->next =curr;
                front=front->next;
        }
}

void node::update (int cc, int ci,int len, int lt)
{
        ccount++;
        con[ccount].index =ci;
        con[ccount].len = len;
        con[ccount].ohlt = lt;
}
```

```
/*
functions for gaining entry points into the dll
these help us in not needing to export the class itself to
the VB modules where they would be used
*/

extern "C" __declspec(dllexport) void add(int i)
{
        front->add (i);
}

extern "C" __declspec(dllexport) void updt(int cc, int ci, int len, int lt)
{
        front->update (cc,ci,len,lt);
}

BOOL APIENTRY DllMain( HANDLE hModule,
                       DWORD  ul_reason_for_call,
                       LPVOID lpReserved
                                              )
{
   return TRUE;
}
```

```
// stdafx.cpp : source file that includes just the standard includes
//	LnkMngr.pch will be the pre-compiled header
//	stdafx.obj will contain the pre-compiled type information

#include "stdafx.h"

// TODO: reference any additional headers you need in STDAFX.H
// and not in this file

// stdafx.h : include file for standard system include files,
//  or project specific include files that are used frequently, but
//	are changed infrequently
//

#if
!defined(AFX_STDAFX_H__DAE7B93D_AD60_45F5_8263_3A3298BF5D
63__INCLUDED_)
#define
AFX_STDAFX_H__DAE7B93D_AD60_45F5_8263_3A3298BF5D63__INC
LUDED_

#if _MSC_VER > 1000
#pragma once
#endif // _MSC_VER > 1000
```

```
// Insert your headers here
#define WIN32_LEAN_AND_MEAN		// Exclude rarely-used stuff from Windows headers

#include <windows.h>

// TODO: reference additional headers your program requires here

//{{AFX_INSERT_LOCATION}}
// Microsoft Visual C++ will insert additional declarations immediately before the previous line.

#endif		// !defined(AFX_STDAFX_H__DAE7B93D_AD60_45F5_8263_3A3298BF5D63__INCLUDED_)
```

VB Module:

Cost Sheet:

```
Dim p1(10) As Object

Dim p2(10) As Object

Dim i As Integer

Dim c As Integer

Private Sub Form_Load()


For i = 0 To 9

Set p1(i) = Picture1(i)

Set p2(i) = Picture2(i)

p1(i).Visible = False

p2(i).Visible = False

Next i

i = 0

c = 0

LoadResStrings Me

Me.Left = GetSetting(App.Title, "Settings", "MainLeft", 1000)

Me.Top = GetSetting(App.Title, "Settings", "MainTop", 1000)

Me.Width = GetSetting(App.Title, "Settings", "MainWidth", 6500)

Me.Height = GetSetting(App.Title, "Settings", "MainHeight", 6500)

End Sub
```

```
Private Sub Form_MouseDown(Button As Integer, Shift As Integer, x
As Single, y As Single)
    If Toolbar1.Buttons(1).Value = tbrPressed Then
    p1(i).Picture = LoadResPicture(201, 0)
    p1(i).Visible = True
    p1(i).AutoSize = True
    p1(i).Left = x
    p1(i).Top = y
    i = i + 1
    Else
    If Toolbar1.Buttons(2).Value = tbrPressed Then
    p2(c).Picture = LoadResPicture(202, 0)
    p2(c).Visible = True
    p2(c).AutoSize = True
    p2(c).Left = x
    p2(c).Top = y
    c = c + 1
    End If
    End If
    End Sub

    Private Sub Form_Unload(Cancel As Integer)
      Dim i As Integer
```

```
    'close all sub forms
    For i = Forms.Count - 1 To 1 Step -1
       Unload Forms(i)
    Next
    If Me.WindowState <> vbMinimized Then
       SaveSetting App.Title, "Settings", "MainLeft", Me.Left
       SaveSetting App.Title, "Settings", "MainTop", Me.Top
       SaveSetting App.Title, "Settings", "MainWidth", Me.Width
       SaveSetting App.Title, "Settings", "MainHeight", Me.Height
    End If
End Sub


Private Sub Picture1_Click(Index As Integer)
Select Case Index
Case 0
'MsgBox "picture1-1"
Form1.Show
Form1.Refresh
Case 1
'MsgBox "picture1-2"
Form1.Show
Form1.Refresh
Case 2
```

```
'MsgBox "picture1-3"
Form1.Show
Form1.Refresh
Case 3
'MsgBox "picture1-4"
Form1.Show
Form1.Refresh
Case 4
'MsgBox "picture1-5"
Form1.Show
Form1.Refresh
End Select
End Sub

Private Sub Picture2_Click(Index As Integer)
Select Case Index
Case 0
MsgBox "picture2-1"
Case 1
MsgBox "picture2-2"
Case 2
MsgBox "picture2-3"
Case 3
MsgBox "picture2-4"
Case 4
```

```
        MsgBox "picture2-5"
        End Select
        End Sub

        Private Sub tbToolBar_ButtonClick(ByVal Button As
MSComctlLib.Button)
          On Error Resume Next
          Select Case Button.Key
            Case "New"
              'ToDo: Add 'New' button code.
              frmMain.Cls
            Case "Open"
              mnuFileOpen_Click
            Case "Save"
              mnuFileSave_Click
            Case "Print"
              mnuFilePrint_Click
          End Select
        End Sub

        Private Sub mnuFileExit_Click()
          'unload the form
          Unload Me

        End Sub
```

```
Private Sub mnuFileSend_Click()
    'ToDo: Add 'mnuFileSend_Click' code.
    MsgBox "Add 'mnuFileSend_Click' code."
End Sub

Private Sub mnuFilePrint_Click()
    'ToDo: Add 'mnuFilePrint_Click' code.
    MsgBox "Add 'mnuFilePrint_Click' code."
End Sub

Private Sub mnuFilePrintPreview_Click()
    'ToDo: Add 'mnuFilePrintPreview_Click' code.
    MsgBox "Add 'mnuFilePrintPreview_Click' code."
End Sub

Private Sub mnuFilePageSetup_Click()
    On Error Resume Next
    With dlgCommonDialog
        .DialogTitle = "Page Setup"
        .CancelError = True
        .ShowPrinter
    End With

End Sub
```

```
Private Sub mnuFileProperties_Click()
   'ToDo: Add 'mnuFileProperties_Click' code.
   MsgBox "Add 'mnuFileProperties_Click' code."
End Sub

Private Sub mnuFileSaveAll_Click()
   'ToDo: Add 'mnuFileSaveAll_Click' code.
   MsgBox "Add 'mnuFileSaveAll_Click' code."
End Sub

Private Sub mnuFileSaveAs_Click()
   'ToDo: Add 'mnuFileSaveAs_Click' code.
   MsgBox "Add 'mnuFileSaveAs_Click' code."
End Sub

Private Sub mnuFileSave_Click()
   'ToDo: Add 'mnuFileSave_Click' code.
   MsgBox "Add 'mnuFileSave_Click' code."
End Sub

Private Sub mnuFileClose_Click()
   'ToDo: Add 'mnuFileClose_Click' code.
   MsgBox "Add 'mnuFileClose_Click' code."
End Sub
```

Material list Property:

```
Dim cmd As String
Dim cmdd As String
Dim sql As String
Dim a As String
Dim i As Integer
Dim cn As ADODB.Connection
Dim rs As ADODB.Recordset
Private Sub cmd_sub_Click()
Me.Hide
Form2.Show
Form2.Cls
For i = 0 To 5
If cbo_tm(i).Enabled = True Then
Form2.Print cbo_tm(i).Text
End If
Next i
End Sub

Private Sub Form_Load()
```

Bibliography:

The following proved very valuable as reference and guidance material in providing both the required knowledge and new coding techniques while developing this software –

- VB – 6 – From the Ground Up – Gary Cornell. Tata McGrawHill publication.
- VB – 6 – Unleashed – Sam's publication
- Special Edition Using VC++ 6 – Kate Gregory – Que publication
- Win32API Programming – NIIT courseware
- VB – 6 Radiant courseware