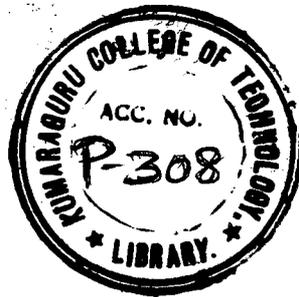
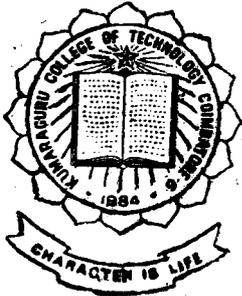


Company Analysis Package

Project Report 1997-98



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In partial fulfilment of the requirements
for the award of the Degree of
BACHELOR OF ENGINEERING
IN COMPUTER SCIENCE AND ENGINEERING
of Bharathiar University

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Project Work 1997 - 98



Name Register No.

Certified that this is the Bonafide Record of the
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In partial fulfilment of the requirements for the
award of the Degree of Bachelor of Engineering
in Computer Science and Engineering
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SYNOPSIS

COMPANY ANALYSIS is a sophisticated and user friendly application developed using POWER BUILDER 5.0 intended for the use of the various departments of the Company.

There are five different modules in the package. Each one intended to handle various situations in the Company. The Attendance Maintenance Module is designed to assist the Payroll Automation Module to calculate the salary for the particular month. The Payroll Automation Module is extremely comprehensive and allows for any complex compensation structure. All the inundating employee details, which include department details, leave details, salary details to mention a significant few, and payroll management are profoundly handled by this package. The Purchase Order System Module manages the material planning, purchasing and stock maintenance operations. The Demand Forecasting Module and the Market Analysis Module provide the top management with valuable suggestions for complete strategic planning implementation.

On the whole, the COMPANY ANALYSIS Application Package appraises the company's own strengths and weaknesses relative to competitions in such areas as technology, financial resources, manufacturing skills, marketing strengths, and the existing base of customers apart from providing the user, place to manage the payroll and purchase in the company. The core features are, event-driven style and online help. Ipsofacto it enhances the user friendliness and productivity of the system. Intoto, for managing the company the user needs to strain nothing other than his finger tips.

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ABOUT THE SYSTEM

The efforts of computerisation of the Company's analysis part of management is made pragmatical by this system. Defacto, this system can also be integrated with MRP, ERP & SAP. This globalised package includes details about employees, customers, suppliers and competitors, to mention a few.

The enthrall of the system is its flexibility for on-line processing even when the branches & departments of the organisation are geographically dispersed. In addition, this system is pliable and adaptive to the departments of any concern, if the necessary simple modifications are made.

This package helps the top management in making significant contribution to the value of a Company's product, studying the various factors of the Company apart from maintaining a separate channel for Purchase Order System and Payroll Management.

PROBLEM DEFINITION

The prime objectives that the COMPANY ANALYSIS package aims at are:

- ♦ Maintaining the personal information about the employee in the database and using it to calculate his salary for the particular month.
- ♦ Managing the leave details of an employee, according to the norms of the Company and using it to calculate his salary for the particular month.
- ♦ Maintaining the product, raw material, customer, supplier and stock details and managing the material planning, purchasing and stock maintenance operations.
- ♦ Maintaining the turnover details of the Company in the database and using it in estimating the demand in the forecast period using the Trend Method under which extrapolation of historical data is attempted through estimation of alternative trend equations.
- ♦ Appraising the Company's own strengths and weaknesses relative to competitors in such areas as product, advertising strategies, technology, sales, marketing strengths, employee motivation, manufacturing skills, government policies, the existing base of customers, etc. and provide the top management with valuable suggestions for strategic market planning.

NEED FOR COMPUTERISATION

Practically speaking computers today have much altered every field and hence computing the activities of the Company is not an exception. This software for the very first time aims at storing, retrieving and manipulating tremendous amount of data related with the proceedings of the organisation.

The benefits or the need for computerisation over the manual system is many fold. The benefits can be stated as follows:

SPEED:

Computers enable us to do arithmetical calculation with enormous speed and ease. It is possible to do things which so far no one could think of attempting ,in a manual system. Tasks involving large voluminous data processing are thus done with much accuracy and speed by the computers than by the manual system.

ACCURACY:

One of the greatest benefits which computers can give us is that of accuracy. Practical experience has already shown that these machines are capable of achieving the degree of accuracy which hitherto has been unattainable in certain accounting processes into which the human brain enters too many stages of the complete cycle of operations.

FLEXIBILITY:

Flexibility in use is another important advantage of computers. Output can be obtained almost in whatever form it is most suitable.

MISCELLANEOUS:

These include economics resulting from better managerial control, saving in labour because it is fully automatic.

PROGRAMMING TOOL

The COMPANY ANALYSIS Package has been developed on a Windows platform in POWER BUILDER Enterprise 5.0 -32 bit version. This has made the implementation of the project easier and has enhanced the comprehensiveness of the project. As the project has to work upon bulky amounts of data, an efficient and conventional tool like POWER BUILDER on a Windows platform is chosen.

WHY POWER BUILDER?

PowerBuilder is a graphical client/server application development environment. Using PowerBuilder, you can easily develop powerful graphical applications that access databases. PowerBuilder provides all the tools you need to build industrial-strength applications, such as order entry, accounting, and manufacturing systems. The advantages in using POWER BUILDER are:

- ◆ Developers can become productive in a very short period of time with PB. It requires less training to produce a finished product than would be required with some of the other development tools.
- ◆ PB provides developers with a means to write event-driven applications in an object oriented manner or to produce procedural applications.

- ♦ Applications can be developed very rapidly by experienced developers. By taking advantage of PB's intuitive environment, developers can participate in Rapid Applications Development (RAD) sessions to quickly produce functioning prototypes that end user's can touch and feel. This is further aided by use of numerous reusable objects that can be built with PB.
- ♦ Probably one of the biggest selling points of PB is the data window .This object is the focal point of data interaction in PB and is used for reporting as well as data entry tasks.
- ♦ Data windows have numerous built in functions such as handling communications with the database server ,data validation and complex report presentations.
- ♦ Integral with the database communication is submission of SELECT statements to retrieve data and the appropriate generation of databas UPDATE, INSERT and DELETE statements to reflect the data changes made by an end user. This might be reason enough to make use of a data window, but it also offers a number of other advantages.
- ♦ Using other development tools, a number of controls must be used to construct a data entry screen, whereas the data window is one control with simply a graphical representation of the desired controls.

- ♦ Another attractive feature of PB is Powersoft's commitment to provide a multiplatform tool that requires little or no additional code to run .PB is currently available for 16 bit WINDOWS, WINDOWS 95, WINDOWS NT MACINTOSH, and UNIX. Objects in library files can be accessed directly by PB running on each platform without any migration.
- ♦ PB supports Object Linking and Embedding (OLE) version 2.0 as well as version 1.0, Dynamic Data Exchange(DDE), ACCESS to external functions and objects , VBX support and standard file I/O generations.
- ♦ All these features make PB a very scaleable Product, more so than the majority of the other client/server tools available.

WHAT'S NEW IN POWERBUILDER 5.0 ?

- User Interface changes
- Code generation
- Distributed PowerBuilder
- Inbound OLE automation
- PowerBuilder Foundation Class Library
- Enterprise Object Library
- DataWindow Enhancements
- Database Changes
- Object-oriented enhancements
- Internationalisation
- PowerScript enhancements

HARDWARE CONFIGURATION

HARDWARE CONFIGURATION

The minimum hardware requirements for the COMPANY

ANALYSIS package are :

Processor	:	80486 DX-2
Speed	:	66 MHz
Main Memory	:	640 KB
Extended Main Memory	:	3072 KB
Hard Disk Capacity	:	540 KB
Video Display	:	VGA
Keyboard	:	101 Keys
Drive A	:	1.44 MB 3.5"

SOFTWARE CONFIGURATION

The COMPANY ANALYSIS package has been developed with the following software configuration.

Platform used : Windows NT/Windows 95
Tool used : POWERSOFT POWERBUILDER 5.0
Enterprise Edition/32 bit version
Database management by: Sybase SQL Anywhere

ABOUT THE TOOL USED

What is Power Builder ?

- ◆ A visual development environment
- ◆ An object-oriented tool
- ◆ A powerful language
- ◆ An open system
- ◆ An enterprise client / server development solution
- ◆ Graphical user interfaces
- ◆ Event-driven programming

Special Features of The Power Builder

- ◆ It's object-oriented
- ◆ It's SQL smart
- ◆ It's enterprise enabled
- ◆ It's developer designed

PB Application Objects:

◆ Application object

An application object is an entry point into an organised collection of windows and other objects to perform various activities.

◆ Window object

Window is a visual object that provides the main interface between the user and the application. Windows can display information, accept values, respond to mouse click and keyboard activities.

◆ Menu Object

A menu is also an visual object that provides the user, an alternate way for selection from a list of commands.

◆ Data window object

The data window is an intelligent object, which is unique to the Power Builder. This object combines the user interface with the data access intelligence.

This object understands the SQL request and brings the data from the server to the client level, and helps the user to manipulate data.

This intelligent object manipulates data from the relational database without any need to code SQL.

◆ Query object

A query is a non-visual object, which contains only the SQL statement that associate with the datawindow object as a data source

◆ Function object

Function consists of a set of power script statements which perform some processing and returns some value.

◆ Structure object

A structure object is nothing but a collection of one or more related variables of same or different datatypes by which all the variables can be collectively accessed at any time, as a unit, by the name of the structure.

◆ User object

User objects are custom objects which you build. They consist of one or more standard PowerBuilder objects with scripts written for particular events to perform processing frequently used in your application. User objects can either be visual or non-visual.

ABOUT THE DATABASE

Sybase SQL Anywhere is a complete client/server DBMS that ships with PB. SQL Anywhere is the replacement for Watcom SQL and has become the desktop DBMS for Sybase, Inc.

Sybase SQL Anywhere is a complete client / server DBMS that ships with PowerBuilder. SQL Anywhere is the replacement for Watcom-SQL and has become the desktop DBMS for Sybase, Inc. The standalone SQL Anywhere is available for Windows 3.x, Windows 95, Windows NT, OS/2, Netware, and DOS. In addition to the all the features that SQL Anywhere delivers, the best part is the relatively low cost of the product. The standalone is packaged with PowerBuilder.

Features

The SQL Anywhere Database includes stored procedures; before and after action triggers; cascading updates and deletes; bidirectional, scrollable, updatable cursors; row-level locking; and updatable multiple views.

The SQL Anywhere engine was compiled to use the 32-bit instruction set and designed to take advantage of instruction pipelining and superscalar architecture of 486 and PENTIUM processors.

SQL Anywhere includes extensive data type conversions. Data types can be compared with or used in any expression with all other data types.

SQL Anywhere supports entity and referential integrity, which is specified in the `CREATE TABLE` and `ALTER TABLE` commands. To reduce the complexity of the `WHERE` clause, automatic joins can be used based on foreign-key relationships.

SQL Anywhere also includes save points or subtransactions. A savepoint acts as a check point within a transaction. Changes can be made after a savepoint and can be undone by rolling back to that savepoint (multiple savepoint can be defined for one transaction).

An SQL Anywhere database can be up to 12TB (terabytes) in size. Each table can be up to 1024 GB in size, with a potential 999 columns.

FEASIBILITY STUDY

During the Feasibility study, it was found that in the manual system the following problems existed:

- ♦ The entries made for any particular transaction into the respective ledger took a fairly long duration of time.
- ♦ The accuracy of the entries made were doubtful.
- ♦ Normal Reports took to the minimum atleast a day to be prepared. This hindered in the quick desicion making of the management. Sometimes, this led to the losing of good profitable opportunities. The effort and time spent in developing a new system is less when compared to the operating of the present manual system.

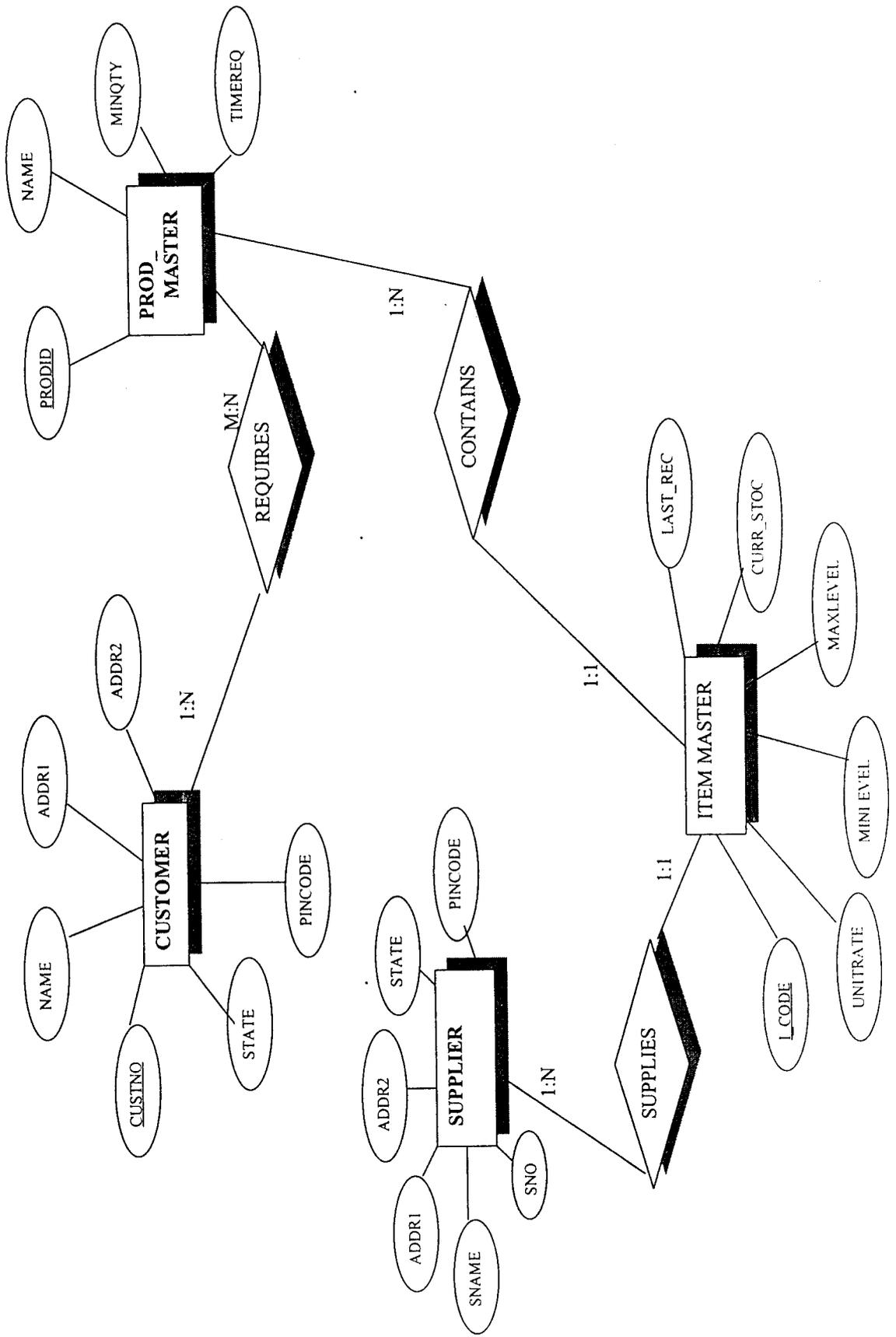
The results from the feasibility study has shown a computerised system is in wanting.

PROPOSED SYSTEM

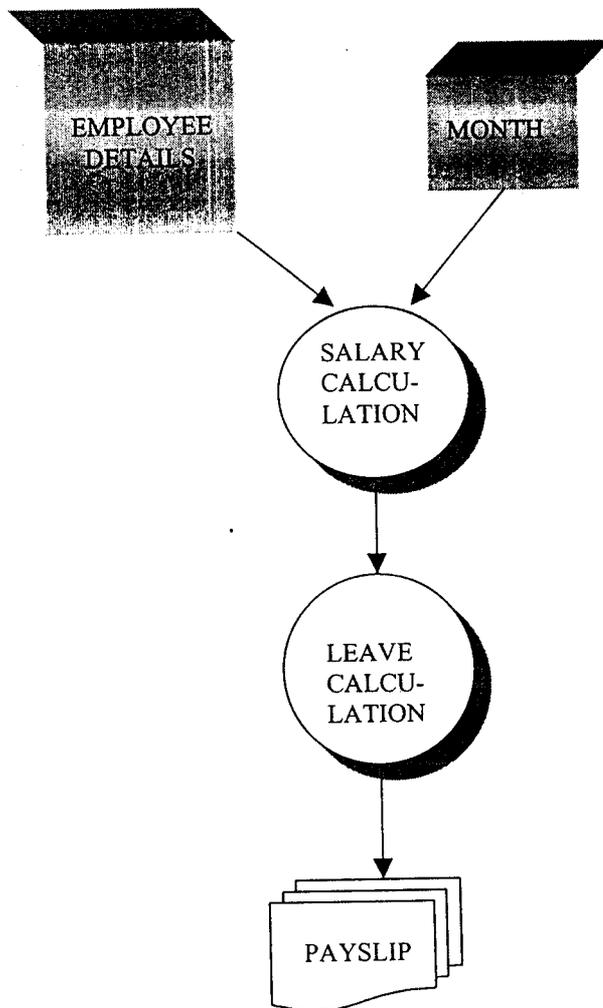
The proposed system has been developed in such a way as to solve the above problems faced by the present manual system. For this, the ideal environment was the WINDOWS environment ,as it is the most popular multitasking system available today. The programming language or tool used is POWER BUILDER 5.0, for its flexibility and versatility.

The proposed system utilises powerful relational database techniques offered by Sybase SQL Anywhere .The system is very user-friendly and event-driven. Enough securities are offered for the database so that only authorised persons can use the system.

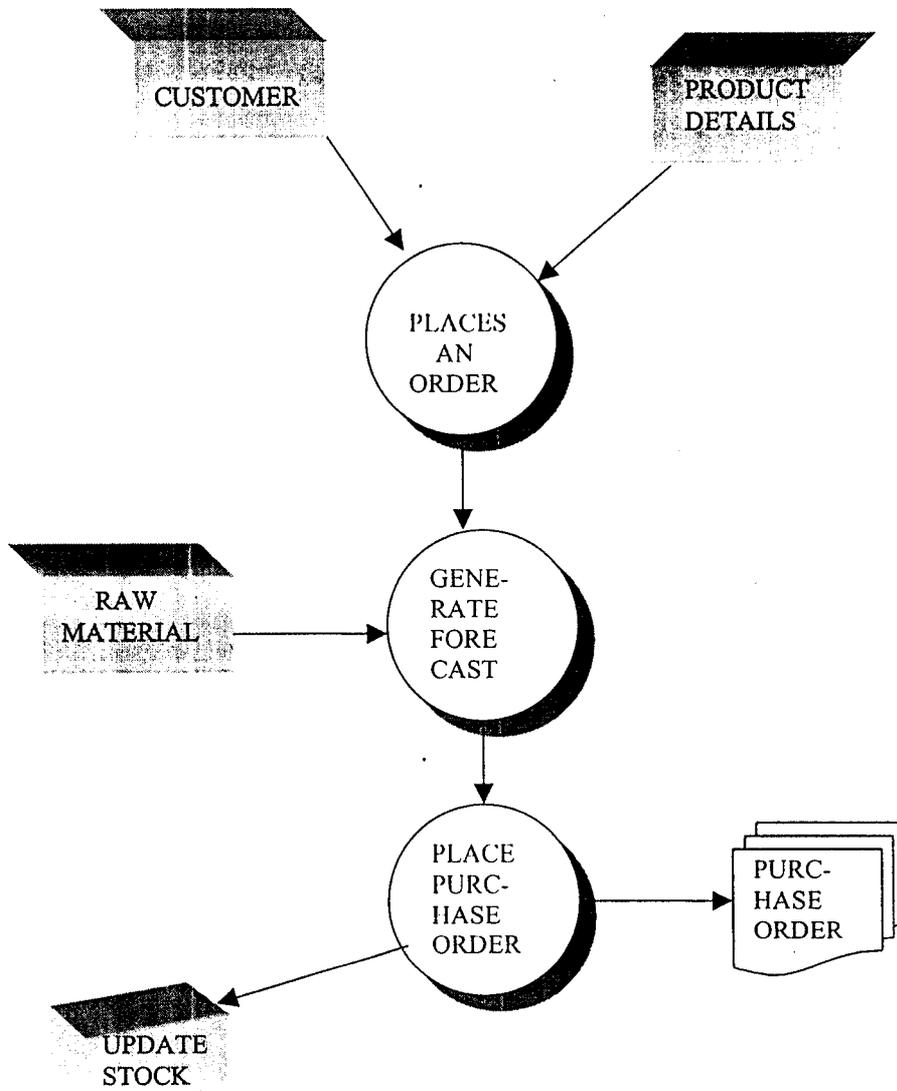
The system concentrates a lot on the report generation part. Normal reports as well as adhoc reports can be generated in a matter of minutes. The reports layout have been so designed such that the important matters can be grasped quickly.

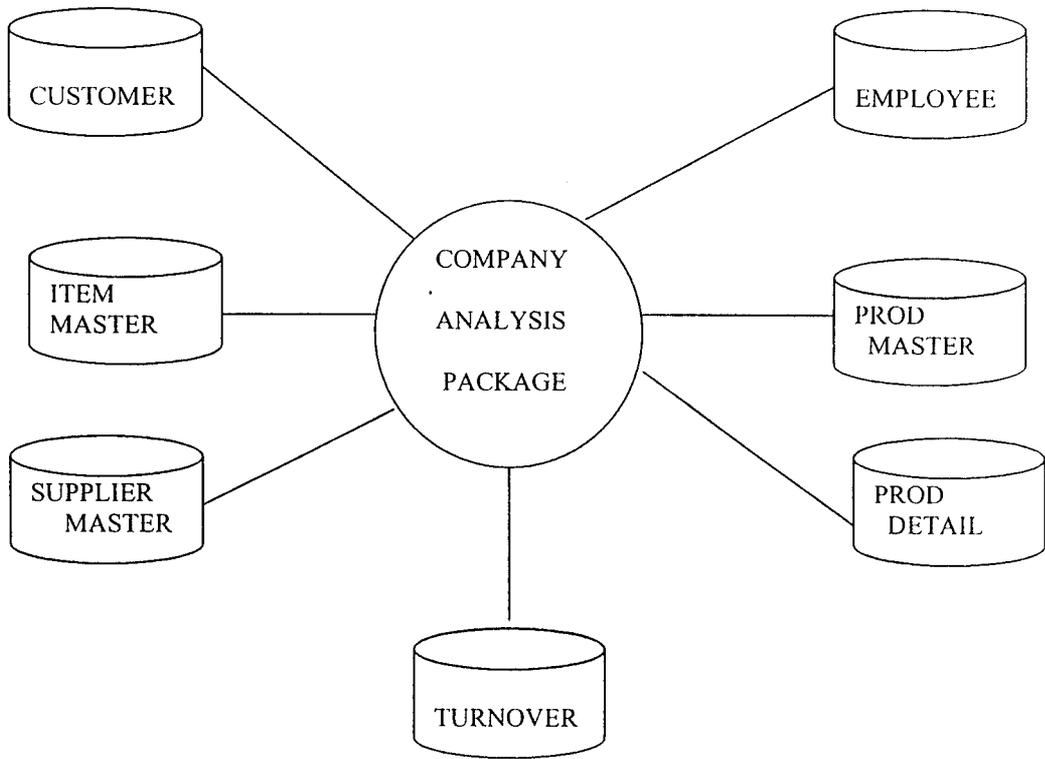


PAYROLL AND ATTENDANCE



PURCHASE ORDER SYSTEM





TABLES

1)Emp:

This table maintains the details about the employees.

name	varchar (30)
eno	varchar (8)
qual	varchar (25)
doj	date
dob	date
dept	varchar (30)
desgn	varchar (20)
sal	numeric (8,2)
sex	varchar (6)
dor	date
service	integer
joined_as	varchar (20)
proms	integer
sno	integer

2)Customer_master:

This db table consists details about the customer.

customer_no	varchar (10)
customer_name	varchar (70)
address1	varchar (60)
address2	varchar (20)
state	varchar (20)
pincode	numeric(6,0)

3) Prod_master:

This DB table consists of the product details:

prod_id	varchar(8)
prod_name	varchar(30)
min_qty	integer
time_req	integer

4)Prod_detail:

The above table maintains the details regarding the raw materials required for each product.

prod_id	varchar(8)
raw_id	varchar(8)
raw_name	varchar(60)
est_qty	integer

5) Item master:

This DB table provides us with the details of each raw material in the stock room.

i_code	varchar(8)
unit_rate	numeric(7,2)
min_level	numeric(7,2)
max_level	numeric (7,2)
curr_stock	numeric(7,2)
last_rec	date

6) Supplier_master:

The above table gives the data regarding the supplier of the various raw materials.

s_code	varchar(8)
s_name	varchar (50)
address1	varchar (30)
address2	varchar (20)
state	varchar (20)
pincode	numeric(6,0)

6) Supplier_detail:

This DB table furnishes the supplier for each raw material.

s_code	varchar(8)
i_code	varchar(8)

7) **Gra :**

This table contains information about the company's turnover.

sno	integer
year	integer
turn	integer

ORGANISATIONAL DETAILS

The modules included in the project are:

- ♦ Market analysis
- ♦ Demand forecasting
- ♦ Purchase order system
- ♦ Payroll system automation
- ♦ Attendance record maintenance

Market Analysis Module:

This module would analyse the demand for forecoming years and would give proper information regarding

- Whether to extend to other places other than already existing ones
- Whether to still improve the communication between or with the order given
- Existing competition and whether to alter the course of action.

Demand Forecasting Module:

This module helps the firm to produce the required quantities at the required time and arrange well in advance for the various factors of production namely, equipments, machineries, accessories, labour, buildings, etc. This module would use a combination of Historical analogy method and Trend

projection method. This module will provide a very rough demand forecast excluding the four factors of fluctuation ,viz.

--Trend

--Seasonal variation

--Cyclic fluctuations

--Irregular or random Forces

Purchase Order System Module:

The manufacturing lot-size model is employed here. There is a finite replenishment or production rate ,where $R > D$. The model for the case where the shortages are not allowed is developed. Here a finite minimal level stock is maintained and on reaching this level, the stock is replenished.

Payroll Automation Module:

This module would maintain and determine the salary to be paid to each employee in the firm after retaining the deductions, loans given and payment cuts, which will depend upon the attendance module.

Attendance Record Maintenance Module:

This module will keep track of the attendance of all the employees in the firm which will help in the payment of the salary for the employees.

CODING

Attendance and Payroll Module:

Window(w_attend):

```
int c
int i,m
string r,j
select count(*) into :c from emp;
for i=1 to c
    select emp.eno,emp.sal into :r,:j from emp
where emp.sno=i;
    if isnull(j) then
        j=" "
    else
        ddlb_1.additem(r)
    end if
next

real xx
xx=real(ddlb_2.text)
choose case ddlb_2.text
case "January"
    xx=20.5
case "February"
    xx=22.
case "March"
    xx=25.5
case "April"
    xx=21.5
case "May"
    xx=24.5
case "June"
    xx=23.5
case "July"
    xx=24.5
case "August"
```

```

        xx=24.5
case "September"
        xx=22.5
case "October"
        xx=22.5
case "November"
        xx=23.5
case "December"
        xx=24.5
end choose
sle_6.text=string(xx)
close(parent)

```

Window (w_sal):

```

sle_1.text=w_attend.sle_2.text
sle_2.text=w_attend.ddlb_1.text
sle_3.text=w_attend.sle_4.text
sle_8.text=w_attend.sle_5.text

```

```

real r,b
select emp.sal into :r from emp where emp.eno=:sle_2.text;
b=r/1.39
sle_4.text=string(round(b,2))
sle_5.text=string(round(b*0.1,2))
sle_6.text=string(round(b*0.25,2))
sle_7.text=string(round(b*0.04,2))
open(w_leave)

```

Window (w_leave):

```

sle_1.text=w_attend.ddlb_1.text
dec tot
tot=dec(ddlb_1.text)+dec(ddlb_2.text)+dec(sle_2.text)
sle_3.text=string(tot)

```

```

dec leav,l
w_attend.sle_7.text=w_leave.sle_3.text
w_attend.sle_8.text=string(dec(w_attend.sle_6.text)-dec(w_attend.sle_7.text)
)
leav=dec(w_attend.sle_7.text)-1.5

```

```

if leav < 0.0 then
    leav= 0.0
end if
l=0.1*(dec(w_sal.sle_4.text)+dec(w_sal.sle_6.text))
w_attend.sle_9.text=string(round(dec(w_attend.sle_5.text)*0.05*(leav)+1,2))
w_attend.sle_10.text=string(round(dec(w_attend.sle_5.text)-
dec(w_attend.sle_9.text),2))
close(w_leave)
close(w_sal)

```

Purchase Order System Module

Window(w_order):

```

dw_1.settransobject(sqlca)
dw_2.settransobject(sqlca)
dw_1.insertrow(0)
sle_8.text=string(Today(),"mm/dd/yy")
string v;
if ddlb_1.text="NEW CUSTOMER" then
    open(w_newcust)
else
    select customer_master.customer_no into :v from customer_master
    where customer_master.customer_name=:ddlb_1.text;
    dw_1.retrieve(v)
    gv3=v;
end if
dw_2.retrieve(ddlb_2.text)
if integer(sle_9.text) >= integer(sle_1.text) then
    cb_1.setfocus();
else
    messagebox("error","Product not manufacturable");
end if
gv1=sle_2.tex
tgv4=sle_7.text
gv2=ddlb_2.text
open(w_forecast)

```

Window(w_forecast):

```

sle_1.text= w_order.ddlb_2.text

```

```

sle_3.text= w_order.ddlb_1.text
dw_2.settransobject(sqlca)
dw_1.settransobject(sqlca)
dw_3.settransobject(sqlca)
dw_2.retrieve(sle_1.text)
dw_3.retrieve(sle_3.text)
sle_4.text=w_order.sle_7.text
sle_5.text=w_order.sle_8.text
integer k;
k=integer(sle_4.text);
y=dw_2.getitemstring(dw_2.getrow(),1);
idl=y;
dw_1.retrieve(y,k)
open(w_indent)

```

Window(w_indent)

```

integer i;
sle_1.text= w_order.ddlb_1.text
sle_3.text= w_order.ddlb_2.text
dw_2.settransobject(sqlca)
dw_1.settransobject(sqlca)
dw_3.settransobject(sqlca)
dw_2.retrieve(sle_1.text)
dw_3.retrieve(sle_3.text)
sle_4.text=w_order.sle_7.text
sle_2.text=w_order.sle_8.text
i=integer(sle_4.text)
qty=integer(sle_4.text)
z=dw_3.getitemstring(dw_3.getrow(),1);
dw_1.retrieve(z,i);
qty=integer(sle_4.text)
open(w_supplier)

```

Window(w_supplier):

```

dw_1.settransobject(sqlca);
dw_2.settransobject(sqlca);
dw_1.insertrow(0);
dw_2.retrieve(qty,z);
pq=dw_2.getitemstring(dw_2.getrow(),1);

```

```
select supplier_detail.s_code into :y from supplier_detail where
supplier_detail.i_code=:pq;
dw_1.retrieve(y);
open(w_purchase)
```

Window(w_purchase):

```
dw_1.settransobject(sqlca);
dw_2.settransobject(sqlca);
dw_1.insertrow(0);
dw_2.retrieve(qty,z);
sle_2.text=string(Today(),"mm/dd/yy")
string pq;
pq=dw_2.getitemstring(dw_2.getrow(),1);
select supplier_detail.s_code into :y from supplier_detail where
supplier_detail.i_code=:pq;d
w_1.retrieve(y);
dd=sle_2.text
pono=sle_9.text
open(w_pos)
```

Window (w_stock):

```
dw_1.settransobject(sqlca);
dw_1.insertrow(0);
dw_1.retrieve()
open(w_receipt)
string ps;
dw_2.settransobject(sqlca)
dw_1.settransobject(sqlca)
dw_1.retrieve(id1,qty);
dw_2.retrieve(pq);
sle_2.text=pono;
sle_1.text=string(TODAY(),"mm/dd/yy")
open(w_inspect)
```

Window(w_inspect):

```
integer k;
dw_2.settransobject(sqlca)
dw_1.settransobject(sqlca)
```

```
close(parent)
open(w_interunit)
```

Demand Forecasting Module:

```
Window(w_gra):
```

```
int c,i,q,j,l;
c=integer(sle_1.text)
select count(*) into :i from gra;
select turn into :q from gra where sno=:i;
for j=1 to c
  insert into "gra"
    ( "sno",
      "year",
      "turn" )
    values ( :i+:j,
      1997 + :j,
      :q + :q * 0.15, ) ;
next
dw_1.retrieve()
delete gra where sno >:i;
close(parent)
```

CONCLUSION

Several project runs were made and the outputs verified and validated with real-time manual reports that exist. All efforts to make the project highly reliable and impeccable have been made. This project can handle monstrous amount of employee details, customer details, supplier details, market details, etc. Data accessing and processing have been made as lucid as possible.

This package has been developed so as to simplify most of the complex and tedious jobs, which the user should have performed otherwise. The project has been designed in such a way that it completely satisfies the requirements of the top management to make a 'COMPANY ANALYSIS'.

Some of the special features of this package are centralised database maintenance, extensive Help features, perspicuous presentation, etc. Apart from all these features the most important is that, not stopping with mere market analysis alone for the 'COMPANY ANALYSIS', an attempt to include other attributes like the employee motivation, supplier factors, customer satisfaction, product demand, etc. has been made.

Also, several other modules have been added. All provisions have been made to make the package compatible for future developments. Many more modules, which would help the top management to know all about the happenings in the Company at the touch of a few buttons, can also be added.

SCOPE FOR FUTURE ENHANCEMENT

A brief portrayal of the future developmental scope of this package is given below:

- ♦ This COMPANY ANALYSIS Package can be seamlessly integrated with Ledger management, Purchase management and Management Accounting and Maintenance System.
- ♦ This software can be developed in a world class client/server based EMS(Enterprise Management System).
- ♦ On-line usage of this package across countries is possible.
- ♦ The package can be made to prognosticate the level of expertise required,additional employees to be inducted etc. for the future expansion of the Company.

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