

# **Dr. AMBEDKAR INSTITUTE OF TECHNOLOGY**

Near Jnana Bharathi Campus, Bengaluru-560 056.

(An Autonomous Institution, Aided by Government of Karnataka)



Aided By Govt. of Karnataka

## **PROJECT REPORT ON “ENTERPRISE RESOURCE PLANNING”**

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**Department of Computer Science & Engineering  
2016-17**

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## **CERTIFICATE**

This is to certify that the project entitled "**Enterprise Resource Planning**" submitted in the partial fulfillment of the requirement of the 5th semester DBA laboratory curriculum during the year 2016 is a result of bonafied work carried out by

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## Chapter 1

### Introduction

#### ENTERPRISE RESOURCE PLANNING:

ERP is most widely used approach in business software systems which are mostly implemented in industries and organization. ERP is the acronym for Enterprise Resource Planning. This system is an integration of both software and business strategies.

#### Defining the problem

ERP is a business management system that integrates all facets of the business, including planning, manufacturing, sales and marketing. As ERP has become more common in the business world, software application modules have emerged to facilitate business activities across functional departments.

#### Benefits of ERP

ERP integrates the whole business, its departments and various tasks heads as an unified enterprise. The major benefits of ERP are improved co-ordination across functional departments, increased efficiencies of doing business and to facilitate day-to-day management.

#### Advantages of ERP:

- Information Integration.
- Reduction of lead time.
- On time shipment.
- Cycle time reduction.
- Better customer satisfaction.
- Reduced Quality cost.
- Improved information accuracy and decision making capabilities.
- Use of latest technology.

## Chapter 2

### Requirement Specification

#### 2.1 Hardware Requirements

Processor : core i5-3320M

RAM : 512MB recommended

Hard disk capacity : 1TB

Display type : HD WLED backlit TN Glare Flat EDP Display

#### 2.2 Software Requirements

Operating System : Windows 10

Backend : ORACLE 10g

#### ORACLE 10g :

The software required to store data in the database is ORACLE 10g(and above) as the backend.

The advantage of using ORACLE is that it greatly speeds up creating and querying facilities.

Added to this Oracle has 95%(apprx.) of the market share in RDBMS. So it has been time tested to give efficient results.

#### Structured Query Language(SQL) :

SQL (Structured Query Language) is a standardized programming language used for managing relational databases and performing various operations on the data in them. Initially created in the 1970s, SQL is regularly used by database administrators, as well as by developers writing data integration scripts and data analysts looking to set up and run analytical queries.

The uses of SQL include modifying database table and index structures; adding, updating and deleting rows of data; and retrieving subsets of information from within a database for transaction processing and analytics applications. Queries and other SQL operations take the form of commands written as statements -- commonly used SQL statements include select, add, insert, update, delete, create, alter and truncate.

## Chapter 3

# Design

### 3.1 System Design

Design is the first step into the development phase for any engineered product or system. Design is a creative process. A good design is the key to effective system. The term design is defined as the process of applying various techniques and principles for the purpose of defining a process or a system in sufficient detail to permit its physical realization. It may be defined as a process of applying various techniques and principles for the purpose of defining a device, a process or a system in sufficient detail to permit its physical realization. Software design sits at the technical kernel of the software engineering process and is applied regardless of the development paradigm that is used. The system design develops the architectural detail required to build a system or product. As in the case of any systematic approach, this software too has undergone the best possible design phase fine tuning all efficiency, performance and accuracy levels. The design phase is a transition from a user oriented document to a document to the programmers or database personnel. System design goes through two phases of development: Logical and Physical Design.

#### **Input Design:**

The design of input focuses on controlling the amount of input required, controlling the errors, avoiding delay, avoiding extra steps and keeping the process simple. The input is designed in such a way so that it provides security and ease of use with retaining the privacy. Input Design considered the following things: What data should be given as input? Now the data should be arranged or coded? The dialog to guide the operating personnel in providing input. Methods for preparing input validations and steps to follow when error occur Department of CSE, Dr. A.I.T

#### **3.2 ER-Diagram:**

An entity-relationship diagram (ERD) is a graphical representation of an information system that shows the relationship between people, objects, places, concepts or events within that system. An ERD is a data modeling technique that can help define business processes and can be used as the foundation for a relational database.

While useful for organizing data that can be represented by a relational structure, an entity-

relationship diagram can't sufficiently represent semi-structured or unstructured data, and an ERD is unlikely to be helpful on its own in integrating data into a pre-existing information system.

Three main components of an ERD are the entities, which are objects or concepts that can have data stored about them, the relationship between those entities, and the cardinality, which defines that relationship in terms of numbers.

The three main cardinal relationships are:

- **One-to-one (1:1).** For example, if each customer in a database is associated with one mailing address.
- **One-to-many (1:M).** For example, a single customer might place an order for multiple products. The customer is associated with multiple entities, but all those entities have a single connection back to the same customer.
- **Many-to-many (M:N).** For example, at a company where all call center agents work with multiple customers, each agent is associated with multiple customers, and multiple customers might also be associated with multiple agents.

## Enterprise Resource Planning

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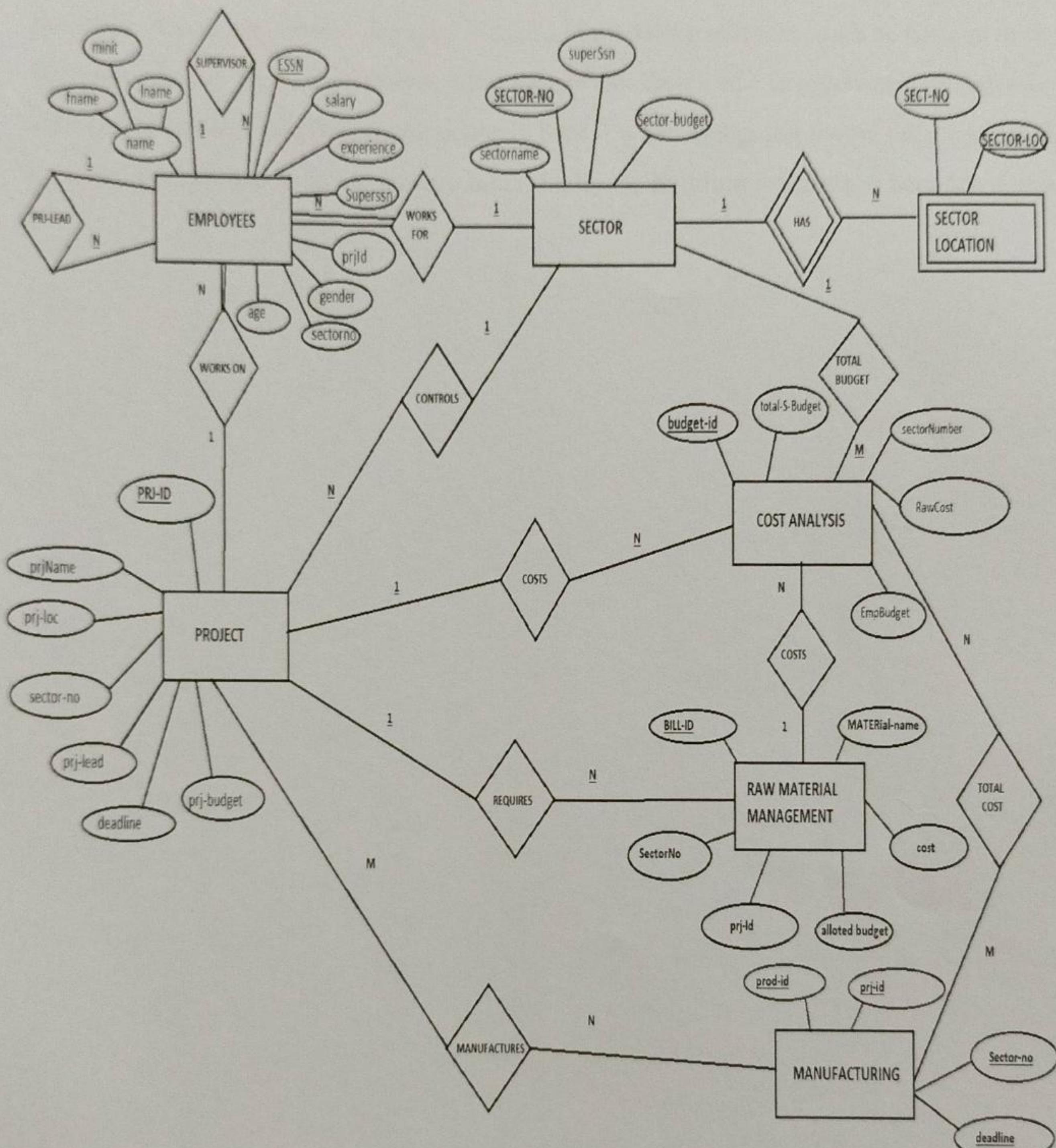


Fig 3.1:ER Diagram for ERP

### **3.3 Relational Schema:**

A relational database schema is the tables, columns and relationships that make up a relational database. A schema is often depicted visually in modeling software such as ERwin or drawing software such as Viso. A relational database schema helps you to organize and understand the structure of a database. This is particularly useful when designing a new database, modifying an existing database to support more functionality, or building integration between databases.

## Enterprise Resource Planning

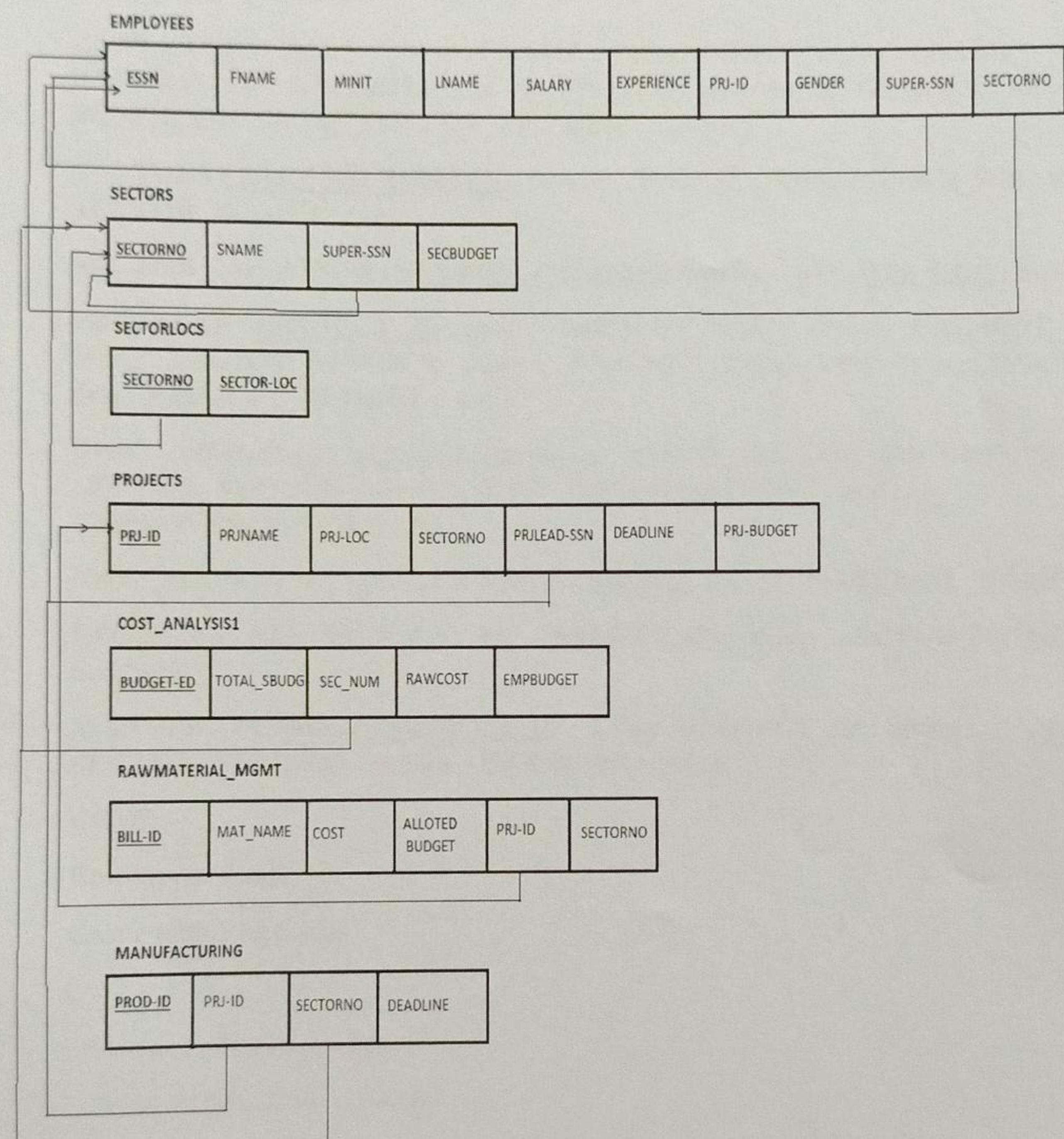


Fig 3.2: Schema Diagram for ERP System

## Chapter 4

### Coding

#### 4.1 Creating Tables

EMPLOYEES ( ESSN : String , FNAME : String , MINIT : String , LNAME : String ,  
SALARY : real , EXPERIENCE : int , PROJECT\_ID : String , GENDER : String ,  
SUPER\_SSN : String , SECTOR\_NUMBER : number )

SECTORS ( SECTOR NUMBER : number , SNAME : String , SUPER\_SSN : String ,  
SECTOR\_BUDGET : real )

SECTOR\_LOCATION ( SECTOR NUMBER : number , SECTOR LOC : String )

PROJECTS ( PROJECT ID : String , PROJECT\_NAME : String , PROJECT\_LOC :  
String , SECTOR\_NUMBER : number , PROJECT LEAD SSN : String , DEADLINE :  
date , PROJECT\_BUDGET : real )

COST\_ANALYSIS ( BUDGETED : String , TOTAL\_SECTOR\_BUDGET : real ,  
SECTOR\_NUMBER : number , RAW\_MATERIAL\_COST : real ,  
EMPLOYEE\_BUDGET : real )

RAW\_MATERIAL\_MANAGEMENT ( BILLID : String , MATERIAL\_NAME : String ,

COST : real , ALL\_BUDGET : real , PROJECT\_ID : String , SECTOR\_NUMBER :  
number )

MANUFACTURING ( PRODUCT\_ID : String , PROJECT\_ID : String ,  
SECTOR\_NUMBER : number , DEADLINE : date )

CODE:

Employees Table

Create table employees

(

essn char(9) primary key,

fname varchar2(20) not null,

minit varchar2(5) null,

lname varchar2(20) not null,

salary real ,

experience int not null,

prjid char(3) not null,

gender char(7) not null,

## Enterprise Resource Planning

---

```
superssn char(9) not null,  
sectorino number(2) not null  
);
```

### Sectors Table

```
create table sectors  
(  
sname varchar2(10) not null,  
sectorino number(2) primary key,  
superssn char(9) not null,  
sectorbudget real not null,  
foreign key(superssn) references employees(essn)  
);
```

### Sector Location Table

```
create table sectorlocs  
(  
sectorino number(2),  
sectorloc varchar2(15),  
primary key(sectorino,sectorloc),  
foreign key(sectorino) references sectors(sectorino)  
);
```

### Projects

```
create table projects  
(  
prjid char(3) primary key,  
prjname varchar2(30) not null,  
prjloc varchar2(15) not null,  
sectorino number(2),
```

```
prjleadssn char(9),
deadline date not null,
prjbudget real not null,
foreign key(prjleadssn) references employees(essn),
foreign key(sectorno) references sectors(sectorno)
);
```

### **Cost Analysis Table**

```
create table costanalysis1
(
    budgeted char(4) primary key,
    totalsbudget real not null,
    secnum number(2) not null,
    rawcost real,
    empbudget real not null,
    foreign key(secnum) references sectors(sectorno)
);
```

### **Raw Material Management**

```
create table rawmanagement
(
    billid char(3) primary key,
    mname varchar2(20) not null,
    cost real not null,
    allbud real not null,
    prjid char(3) not null,
    sectorno number(2) not null,
    foreign key(prjid) references projects(prjid),
    foreign key(sectorno) references sectors(sectorno)
);
```

## Manufacturing

```
create table manufg
(
    prodid char(3) primary key,
    prjid char(3) not null,
    sectorno number(2) not null,
    deadline date not null,
    foreign key(prjid) references projects(prjid),
    foreign key(sectorno) references sectors(sectorno)
);
```

## 4.2 Description of Tables

### Employees Table

```
desc employees;
```

Object Type TABLE Object EMPLOYEES

| Table     | Column            | Data Type | Length | Precision | Scale | Primary Key | Nullable | Default | Comment |
|-----------|-------------------|-----------|--------|-----------|-------|-------------|----------|---------|---------|
| EMPLOYEES | <u>ESSN</u>       | Char      | 9      | -         | -     | 1           | -        | -       | -       |
|           | <u>FNAME</u>      | Varchar2  | 20     | -         | -     | -           | -        | -       | -       |
|           | <u>MINIT</u>      | Varchar2  | 5      | -         | -     | -           | ✓        | -       | -       |
|           | <u>LNAME</u>      | Varchar2  | 20     | -         | -     | -           | -        | -       | -       |
|           | <u>SALARY</u>     | Float     | 22     | 63        | -     | -           | ✓        | -       | -       |
|           | <u>EXPERIENCE</u> | Number    | -      | -         | 0     | -           | -        | -       | -       |
|           | <u>PRJID</u>      | Char      | 3      | -         | -     | -           | -        | -       | -       |
|           | <u>GENDER</u>     | Char      | 7      | -         | -     | -           | -        | -       | -       |
|           | <u>SUPERSSN</u>   | Char      | 9      | -         | -     | -           | -        | -       | -       |
|           | <u>SECTORNO</u>   | Number    | -      | 2         | 0     | -           | -        | -       | -       |

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### Sectors Table

```
desc sectors;
```

Object Type TABLE Object SECTORS

| Table   | Column              | Data Type | Length | Precision | Scale | Primary Key | Nullable | Default | Comment |
|---------|---------------------|-----------|--------|-----------|-------|-------------|----------|---------|---------|
| SECTORS | <u>SNAME</u>        | Varchar2  | 10     | -         | -     | -           | -        | -       | -       |
|         | <u>SECTORNO</u>     | Number    | -      | 2         | 0     | 1           | -        | -       | -       |
|         | <u>SUPERSSN</u>     | Char      | 9      | -         | -     | -           | -        | -       | -       |
|         | <u>SECTORBUDGET</u> | Float     | 22     | 63        | -     | -           | -        | -       | -       |

1 - 4

### Sector Location Table

```
desc sectorlocs;
```

## Enterprise Resource Planning

### Object Type TABLE Object SECTORLOCS

| Table      | Column    | Data Type | Length | Precision | Scale | Primary Key | Nullable | Default | Comment |
|------------|-----------|-----------|--------|-----------|-------|-------------|----------|---------|---------|
| SECTORLOCS | SECTORNO  | Number    | -      | 2         | 0     | 1           | -        | -       | 1 - 2   |
|            | SECTORLOC | Varchar2  | 15     | -         | -     | 2           | -        | -       |         |

## Projects Table

desc projects;

### Object Type TABLE Object PROJECTS

| Table    | Column     | Data Type | Length | Precision | Scale | Primary Key | Nullable | Default | Comment |
|----------|------------|-----------|--------|-----------|-------|-------------|----------|---------|---------|
| PROJECTS | PRJID      | Char      | 3      | -         | -     | 1           | -        | -       | 1 - 7   |
|          | PRJNAME    | Varchar2  | 30     | -         | -     | -           | -        | -       |         |
|          | PRJLOC     | Varchar2  | 15     | -         | -     | -           | -        | -       |         |
|          | SECTORNO   | Number    | -      | 2         | 0     | -           | ✓        | -       |         |
|          | PRJLEADSSN | Char      | 9      | -         | -     | -           | ✓        | -       |         |
|          | DEADLINE   | Date      | 7      | -         | -     | -           | -        | -       |         |
|          | PRJBUDGET  | Float     | 22     | 63        | -     | -           | -        | -       |         |

## Cost Analysis Table

desc costanalysis1;

### Object Type TABLE Object COSTANALYSIS1

| Table         | Column       | Data Type | Length | Precision | Scale | Primary Key | Nullable | Default | Comment |
|---------------|--------------|-----------|--------|-----------|-------|-------------|----------|---------|---------|
| COSTANALYSIS1 | BUDGETED     | Char      | 4      | -         | -     | 1           | -        | -       | 1 - 5   |
|               | TOTALSBUDGET | Float     | 22     | 63        | -     | -           | -        | -       |         |
|               | SECNUM       | Number    | -      | 2         | 0     | -           | -        | -       |         |
|               | RAWCOST      | Float     | 22     | 63        | -     | -           | ✓        | -       |         |
|               | EMPBUDGET    | Float     | 22     | 63        | -     | -           | -        | -       |         |

## Raw Material Management Table

desc rawmanagement;

### Object Type TABLE Object RAWMANAGEMENT

| Table         | Column   | Data Type | Length | Precision | Scale | Primary Key | Nullable | Default | Comment |
|---------------|----------|-----------|--------|-----------|-------|-------------|----------|---------|---------|
| RAWMANAGEMENT | BILLID   | Char      | 3      | -         | -     | 1           | -        | -       | 1 - 6   |
|               | MNAME    | Varchar2  | 20     | -         | -     | -           | -        | -       |         |
|               | COST     | Float     | 22     | 63        | -     | -           | -        | -       |         |
|               | ALLBUD   | Float     | 22     | 63        | -     | -           | -        | -       |         |
|               | PRJID    | Char      | 3      | -         | -     | -           | -        | -       |         |
|               | SECTORNO | Number    | -      | 2         | 0     | -           | -        | -       |         |

## Manufacturing Table

desc manufg;

Object Type TABLE Object MANUFG

| Table  | Column   | Data Type | Length | Precision | Scale | Primary Key | Nullable | Default | Comment |
|--------|----------|-----------|--------|-----------|-------|-------------|----------|---------|---------|
| MANUFG | PRODID   | Char      | 3      | -         | -     | 1           | -        | -       |         |
|        | PRJID    | Char      | 3      | -         | -     | -           | -        | -       |         |
|        | SECTORNO | Number    | -      | 2         | 0     | -           | -        | -       |         |
|        | DEADLINE | Date      | 7      | -         | -     | -           | -        | -       | 1 - 4   |

### 4.3 Inserting Tuples

**Inserting into Employees table:**

insert all

into employees values('001-003NH','Shane','A','Warne',30000,20,'A01','male','050-134NY',01)

into employees values('004-007ME','Steve','B','Smith',20000,15,'A02','male','050-134NY',01)

into employees values('008-009YT','Wayne','C','Johnson',10000,10,'A07','male','050-134NY',04)

into employees values('010-034MA','Jonny','D','Brown',15000,12,'A01','male','050-134NY',01)

into employees values('035-039RI','Thomas','E','Miller',7000,8,'A08','male','050-134NY',04)

into employees values('040-041CT','Ross','F','Geller',11000,11,'A07','male','050-134NY',04)

into employees values('050-134NY','Rachel','S','Green',30000,20,'A03','female','001-003NH',02)

into employees values('135-158NJ','Emilia','T','Clarke',20000,15,'A05','female','001-003NH',03)

into employees values('318-361IL','Joey','U','Tribeanni',10000,10,'A06','male','001-003NH',03)

into employees values('362-386MI','Mathew','V','Adams',15000,12,'A04','male','001-003NH',02)

into employees values('387-399WT','Lewis','W','Parker',7000,8,'A05','male','001-003NH',03)

select \* from dual;

**Inserting into Sectors table:**

insert all

```
into sectors values('Design',01,'050-134NY',100000)
into sectors values('Manufact',02,'001-003NH',500000)
into sectors values('Packaging',03,'001-003NH',250000)
into sectors values('Accounts',04,'050-134NY',150000)
select * from dual;
```

**Inserting into Sector\_Location table:**

```
insert all
into sectorlocs values(01,'BlockA')
into sectorlocs values(01,'BlockC')
into sectorlocs values(02,'BlockB')
into sectorlocs values(02,'BlockD')
into sectorlocs values(03,'BlockE')
into sectorlocs values(03,'BlockF')
into sectorlocs values(04,'BlockA')
select * from dual;
```

**Inserting into Projects table:**

```
insert all
into projects values('A01','Ceramics','BlockA',01,'050-134NY','01-Jan-2018',30000)
into projects values('A02','Vitrified','BlockC',01,'050-134NY','01-Jan-2018',70000)
into projects values('A03','Ceramics','BlockB',02,'001-003NH','01-Apr-2018',200000)
into projects values('A04','Vitrified','BlockD',02,'001-003NH','20-Mar-2018',300000)
into projects values('A05','Ceramics','BlockE',03,'001-003NH','25-Apr-2018',100000)
into projects values('A06','Vitrified','BlockF',03,'001-003NH','15-Apr-2018',150000)
into projects values('A07','Ceramics','BlockA',04,'050-134NY','15-May-2018',50000)
into projects values('A08','Vitrified','BlockA',04,'050-134NY','10-May-2018',100000)
select * from dual;
```

**Inserting into Cost\_Analysis table:**

```
insert all
```

```
into sectors values('Design',01,'050-134NY',100000)
into costanalysis1 values('B01',100000,01,35000,65000) into costanalysis1
values('B02',500000,02,150000,350000)
into costanalysis1 values('B03',250000,03,90000,160000)
into costanalysis1 values('B04',150000,04,80000,70000)
select * from dual;
```

**Inserting into Raw\_Material\_Management table:**

```
insert all
into rawmanagement values('BL1','Alumina',1000,1500,'A03',02)
into rawmanagement values('BL2','Kaolinite',3000,3500,'A04',02)
into rawmanagement values('BL3','K-Feldspar',5000,5000,'A03',02)
into rawmanagement values('BL4','BallClay',2000,2500,'A04',02)
into rawmanagement values('BL5','SodaFeldspar',5000,5000,'A03',02)
into rawmanagement values('BL6','Quartz',3000,4000,'A04',02)
into rawmanagement values('BL7','ChinaClay',6000,6000,'A03',02)
into rawmanagement values('BL8','Talc',2000,2500,'A04',02)
into rawmanagement values('BL9','SCardbrd',2000,2000,'A05',03)
into rawmanagement values('BL0','LCardbrd',3000,3000,'A06',03)
select * from dual;
```

**Inserting into Manufacturing Table:**

```
insert all
into manufg values('CE1','A03',02,'01-Apr-2018')
into manufg values('VII','A04',02,'20-May-2018')
select * from dual;
```

## Chapter 5

### Snapshots

#### 5.1 Select Statements

##### EMPLOYEES

select \* from employees;

| ESSN      | FNAME  | MINIT | LNAME     | SALARY | EXPERIENCE | PRJID | GENDER | SUPERSSN  | SECTORNO |
|-----------|--------|-------|-----------|--------|------------|-------|--------|-----------|----------|
| 001-003NH | Shane  | A     | Warne     | 30000  | 20         | A01   | male   | 050-134NY | 1        |
| 004-007ME | Steve  | B     | Smith     | 20000  | 15         | A02   | male   | 050-134NY | 1        |
| 008-009YT | Wayne  | C     | Johnson   | 10000  | 10         | A07   | male   | 050-134NY | 4        |
| 010-034MA | Jonny  | D     | Brown     | 15000  | 12         | A01   | male   | 050-134NY | 1        |
| 035-039RI | Thomas | E     | Miller    | 7000   | 8          | A08   | male   | 050-134NY | 4        |
| 040-041CT | Ross   | F     | Geller    | 11000  | 11         | A07   | male   | 050-134NY | 4        |
| 050-134NY | Rachel | S     | Green     | 30000  | 20         | A03   | female | 001-003NH | 2        |
| 135-158NJ | Emilia | T     | Clarke    | 20000  | 15         | A05   | female | 001-003NH | 3        |
| 318-361IL | Joey   | U     | Tribeanni | 10000  | 10         | A06   | male   | 001-003NH | 3        |
| 362-386MI | Mathew | V     | Adams     | 15000  | 12         | A04   | male   | 001-003NH | 2        |

##### SECTORS

select \* from sectors;

| SNAME     | SECTORNO | SUPERSSN  | SECTORBUDGET |
|-----------|----------|-----------|--------------|
| Design    | 1        | 050-134NY | 100000       |
| Manufact  | 2        | 001-003NH | 500000       |
| Packaging | 3        | 001-003NH | 250000       |
| Accounts  | 4        | 050-134NY | 150000       |

##### SECTOR\_LOCATION

select \* from sectorlocs;

| SECTORNO | SECTORLOC |
|----------|-----------|
| 1        | BlockA    |
| 1        | BlockC    |
| 2        | BlockB    |
| 2        | BlockD    |
| 3        | BlockE    |
| 3        | BlockF    |
| 4        | BlockA    |

##### PROJECTS

select \* from projects;

| PRJID | PRJNAME   | PRJLOC | SECTORNO | PRJLEADSSN | DEADLINE  | PRJBUDGET |
|-------|-----------|--------|----------|------------|-----------|-----------|
| A01   | Ceramics  | BlockA | 1        | 050-134NY  | 01-JAN-18 | 30000     |
| A02   | Vitrified | BlockC | 1        | 050-134NY  | 01-JAN-18 | 70000     |
| A03   | Ceramics  | BlockB | 2        | 001-003NH  | 01-APR-18 | 200000    |
| A04   | Vitrified | BlockD | 2        | 001-003NH  | 20-MAR-18 | 300000    |
| A05   | Ceramics  | BlockE | 3        | 001-003NH  | 25-APR-18 | 100000    |
| A06   | Vitrified | BlockF | 3        | 001-003NH  | 15-APR-18 | 150000    |
| A07   | Ceramics  | BlockA | 4        | 050-134NY  | 15-MAY-18 | 50000     |
| A08   | Vitrified | BlockA | 4        | 050-134NY  | 10-MAY-18 | 100000    |

### **COST\_ANALYSIS**

select \* from cost\_analysis;

| BUDGETED | TOTALSBUDGET | SECNUM | RAWCOST | EMPBUDGET |
|----------|--------------|--------|---------|-----------|
| B01      | 100000       | 1      | 35000   | 65000     |
| B02      | 500000       | 2      | 150000  | 350000    |
| B03      | 250000       | 3      | 90000   | 160000    |
| B04      | 150000       | 4      | 80000   | 70000     |

### **RAW\_MATERIAL\_MANAGEMENT**

select \* from rawmanagement;

| BILLID | MNAME        | COST | ALLBUD | PRJID | SECTORNO |
|--------|--------------|------|--------|-------|----------|
| BL1    | Alumina      | 1000 | 1500   | A03   | 2        |
| BL2    | Kaolinite    | 3000 | 3500   | A04   | 2        |
| BL3    | K-Feldspar   | 5000 | 5000   | A03   | 2        |
| BL4    | BallClay     | 2000 | 2500   | A04   | 2        |
| BL5    | SodaFeldspar | 5000 | 5000   | A03   | 2        |
| BL6    | Quartz       | 3000 | 4000   | A04   | 2        |
| BL7    | ChinaClay    | 6000 | 6000   | A03   | 2        |
| BL8    | Talc         | 2000 | 2500   | A04   | 2        |
| BL9    | SCardbrd     | 2000 | 2000   | A05   | 3        |
| BL0    | LCardbrd     | 3000 | 3000   | A06   | 3        |

### **MANUFACTURING**

select \* from manufg;

| PRODID | PRJID | SECTORNO | DEADLINE  |
|--------|-------|----------|-----------|
| CE1    | A03   | 2        | 01-APR-18 |
| VI1    | A04   | 2        | 20-MAY-18 |

## 5.2 Queries

1. Retrieve names of all the employees whose supervisor's first name is Shane.

```
select distinct e.fname,e.minit,e.lname  
from employees e  
where e.superssn in(select f.essn  
from employees f  
where f.fname='Shane');
```

Output:

| FNAME  | MINIT | LNAME     |
|--------|-------|-----------|
| Rachel | S     | Green     |
| Joey   | U     | Tribianni |
| Emilia | T     | Clarke    |
| Mathew | V     | Adams     |
| Lewis  | W     | Parker    |

2. Retrieve the cost of the required raw materials and the cost of the employees working in Design sector.

```
select c.rawcost,c.empbudget  
from costanalysis1 c,sectors s  
where s.sectorno=c.secnum and  
s.sname='Design';
```

Output:

| RAWCOST | EMPBUDGET |
|---------|-----------|
| 35000   | 65000     |

1 rows returned in 0.00 seconds

3. Retrieve the sector locations of the Packaging sector.

```
select l.sectorloc  
from sectorlocs l,sectors s
```

where l.sectorno=s.sectorno and  
s.sname='Packaging';

**Output:**

| SECTORLOC |
|-----------|
| BlockE    |
| BlockF    |

**4. Retrieve the bill ids of the raw materials purchased for a project whose location is Block B.**

```
select distinct r.billid
from rawmanagement r,projects p
where r.prjid=p.prjid and
      r.sectorno=p.sectorno and
      p.prjloc='BlockB';
```

**Output:**

| BILLID |
|--------|
| BL5    |
| BL7    |
| BL1    |
| BL3    |

**5. Retrieve the names of the employees working on A07 project.**

```
select e.fname,e.minit,e.lname
from employees e
where prjid='A07';
```

**Output:**

| FNAME | MINIT | LNAME   |
|-------|-------|---------|
| Wayne | C     | Johnson |
| Ross  | F     | Geller  |

## CONCLUSION

ERP is a significant easy-to-install system. Linkage to other software systems like Supply Chain Management System, E-Commerce, Customer relationship management etc is easy and can be built on top of ERP system. Using ERP software reduces the delivery time ,time to complete a credit check. Also, organizations implement ERP packages on time and within budget and organizations centralize support groups within their IT Departments. So ERP based projects never lose their value in the market based on the enterprise we deal with. This project has shown the implementation of ERP for a Ceramic Enterprise also it can be used as a template to many other similar industries. Also our project is affordable to those with small industries, cottage industries etc and the same project can also be implemented by using free wares like my-SQL etc so that it can be made cost effective to those who cannot afford to buy ORACLE licenses.

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