# VISVESVARAYA TECHNOLOGICAL UNIVERSITY

## JNANA SANGAMA, BELAGAVI – 590 018



**A Mini Project Report on**

## *Company Management System*

*Submitted in partial fulfillment of the requirement as a part of the DBMS Lab for the V Semester of degree of **Bachelor of Engineering in Information Science and Engineering** of Visvesvaraya Technological University, Belgavi*

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## Department of Information Science and Engineering
## RNS Institute of Technology

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2019 – 2020

# RNS Institute of Technology

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## DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING



## CERTIFICATE

This is to certify that the Mini project report entitled ***COMPANY MANAGEMENT SYSTEM*** has been successfully completed by **Shubham Sinha** bearing USN **1RN17IS092** and **Shivam Tiwari** bearing USN **1RN17IS087**, presently V semester students of **RNS Institute of Technology** in partial fulfillment of the requirements as a part of the DBMS Laboratory for the award of the degree ***Bachelor of Engineering in Information Science and Engineering*** under **Visvesvaraya Technological University, Belagavi** during academic year 2019 – 2020. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The mini project report has been approved as it satisfies the academic requirements as a part of DBMS Laboratory for the said degree.


_____          _____          _____

**Dr. Sathish Kumar S**                  **Mrs. Kusuma S**                       **Dr. M V Sudhamani**
  **Faculty Incharge**                      **Lab Incharge**                     **Professor and HOD**


**External Viva**

**Name of the Examiners**                                              **Signature with date**

1.  _____                                                    _____

2.  _____                                                    _____

# DECLARATION

I, SHUBHAM SINHA [USN: 1RN17IS092] and SHIVAM TIWARI [USN: 1RN17IS087] student of V Semester BE, in Information Science and Engineering, RNS Institute of Technology hereby declare that the Mini Project entitled *Company Management System* has been carried out by us and submitted in partial fulfillment of the requirements for the *V Semester degree of* **Bachelor of Engineering in Information Science and Engineering** of *Visvesvaraya Technological University*, *Belagavi* during academic year 2019-2020.

**Place : Bengaluru**

**Date :**

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# ABSTRACT

A well planned, systematically executed industrial exercise helps a great deal in maintaining a good work culture. The project entitled Company Management System (CMS) is a DBMS mini project designed to maintain the details of employees working in organization, their departments, the projects being worked on by the departments and other details.

It is simple to understand and can be used by anyone who is not even familiar with simple employees' system. It is user friendly and just asks the user to follow step by step operations by giving them a few options. It can be used by an organization in an efficient and reliable way.

# ACKNOWLEDGMENT

The fulfillment and rapture that go with the fruitful finishing of any assignment would be inadequate without the specifying the people who made it conceivable, whose steady direction and support delegated the endeavors with success.

We would like to profoundly thank **Management** of **RNS Institute of Technology** for providing such a healthy environment to carry out this Project work.

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We would like to thank all other teaching and non-teaching staff of Information Science & Engineering who have directly or indirectly helped me to carry out the project work.

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# ABBREVIATIONS

DBMS     -       Database Management System

HTML      -       Hyper Text Markup Language

CSS       -       Cascading Style Sheets

JS        -       Java Script

PHP      -       PHP Hypertext Preprocessor

SQL      -       Structured Query Language

# Chapter 1

# INTRODUCTION

## 1.1 Background

Databases and database technology have a major impact on the growing use of computers. It is fair to say that databases play a critical role in almost all areas where computers are used, including business, electronic commerce, engineering, medicine, genetics, law, education, and library science. The word database is so commonly used that we must begin by defining what a database is. Our initial definition is quite general. A database is a collection of related data. By data, we mean known facts that can be recorded and that have implicit meaning. For example, consider the names, telephone numbers, and addresses of the people you know. You may have recorded this data in an indexed address book or you may have stored it on a hard drive, using a personal computer and software such as Microsoft Access or Excel. This collection of related data with an implicit meaning is a database. The preceding definition of database is quite general; for example, we may consider the collection of words that make up this page of text to be related data and hence to constitute a database. However, the common use of the term database i usually more restricted.

A database has the following implicit properties:

- A database represents some aspect of the real world, sometimes called the miniworld or the universe of discourse (UoD). Changes to the miniworld are reflected in the database.

- A database is a logically coherent collection of data with some inherent meaning. A random assortment of data cannot correctly be referred to as a database.

- A database is designed, built, and populated with data for a specific purpose. It has an intended group of users and some preconceived applications in which these users are interested.

A Database Management System (DBMS) is a collection of programs that enables users to create and maintain a database. The DBMS is a general-purpose software system that facilitates the processes of defining, constructing, manipulating, and sharing databases among various users and applications. Defining a database involves specifying the data types, structures, and constraints of the data to be stored in the database. The database definition or descriptive information is also stored by the DBMS in the form of a database catalog or dictionary, it is

called meta-data. Constructing the database is the process of storing the data on some storage medium that is controlled by the DBMS. Manipulating a database includes functions such as querying the database to retrieve specific data, updating the database to reflect changes in the miniworld, and generating reports from the data. Sharing a database allows multiple users and programs to access the database simultaneously.

## History of DBMS

In 1959, the TX-2 computer was developed at MIT's Lincoln Laboratory. The TX-2 integrated a number of new man-machine interfaces. A light pen could be used to draw sketches on the computer using Ivan Sutherland's revolutionary Sketchpad software. Using a light pen, Sketchpad allowed one to draw simple shapes on the computer screen, save them and even recall them later. The light pen itself had a small photoelectric cell in its tip. This cell emitted an electronic pulse whenever it was placed in front of a computer screen and the screen's electron gun fired directly at it. By simply timing the electronic pulse with the current location of the electron gun, it was easy to pinpoint exactly where the pen was on the screen at any given moment. Once that was determined, the computer could then draw a cursor at that location. Also, in 1961 another student at MIT, Steve Russell, created the first video game, E. E. Zajac, a scientist at Bell Telephone Laboratory (BTL), created a film called "Simulation of a two-giro gravity attitude control system" in 1963.

During 1970s, the first major advance in 3D computer graphics was created at UU by these early pioneers, the hidden-surface algorithm. In order to draw a representation of a 3D object on the screen, the computer must determine which surfaces are "behind" the object from the viewer's perspective, and thus should be "hidden" when the computer creates (or renders) the image.

In the 1980s, artists and graphic designers began to see the personal computer, particularly the Commodore Amiga and Macintosh, as a serious design tool, one that could save time and draw more accurately than other methods. In the late 1980s, SGI computers were used to create some of the first fully computer-generated short films at Pixar. The Macintosh remains a highly popular tool for computer graphics among graphic design studios and businesses. Modern computers, dating from the 1980s often use graphical user interfaces (GUI) to present data and information with symbols, icons and pictures, rather than text. Graphics are one of the five key

elements of multimedia technology.

3D graphics became more popular in the 1990s in gaming, multimedia and animation. In 1996, Quake, one of the first fully 3D games, was released. In 1995, Toy Story, the first full-length computer-generated animation film, was released in cinemas worldwide. Since then, computer graphics have only become more detailed and realistic, due to more powerful graphics hardware and 3D modelling software.

## Application of DBMS

Applications where we use Database Management Systems are:
- **Telecom:** There is a database to keeps track of the information regarding calls made, network usage, customer details etc. Without the database systems it is hard to maintain that huge amount of data that keeps updating every millisecond.
- **Industry:** Where it is a manufacturing unit, warehouse or distribution centre, each one needs a database to keep the records of ins and outs.
- **Banking System:** For storing customer info, tracking day to day credit and debit transactions, generating bank statements etc. All this work has been done with the help of Database management systems.
- **Education sector:** Database systems are frequently used in schools and colleges to store and retrieve the data regarding student details, staff details, course details, exam details, payroll data, attendance details, fees details etc. There is a hell lot amount of inter-related data that needs to be stored and retrieved in an efficient manner.
- **Online shopping:** You must be aware of the online shopping websites such as Amazon, Flipkart etc. These sites store the product information, your addresses and preferences, credit details and provide you the relevant list of products based on your query. All this involves a Database management system.

## 1.2 Introduction to Company Management

## Introduction

Company Management System is a software developed for maintaining databases of a company efficiently. It facilitates to access the detailed information of all employees in a particular

company.

## Purpose

In this world of growing technologies everything has been computerized. With large number of works opportunities, the Human workforce has increased. Thus, there is a need of a system which can handle the data of such a large number of employees. Therefore, we developed the company management system to simplify the management of all the details of an enterprise in an efficient and organized way.

## Scope

The scope of this project will be limited to the following:

- **Employees profile:** The profile of the employees can be accessed and it will also be possible to edit their details.

- **Project Management:** Assign task and projects to employees of a particular department.

- **Services Management:** Apart from projects, services that are being provided by the departments can also be managed.

## 1.3 Disadvantages of Present Working System

- **Security Flaws:** As there is no encryption in proposed system, the data stored is not fully secured.

- **Difficulty in report generating:** We require more calculations to generate the report, so it is generated at the end of the session.

- **Time consuming:** Most of the work is done manually so we cannot generate report in the middle of the session or as per the requirement because it is very time consuming.

## 1.4 Characteristic of the Proposed System

- **Ease of Usage:** It is extremely easy to operate this application as it is very interactive and is presented in an organized manner.

- **Computer Operator Control:** Computer operator control will be there so no chance of errors. Moreover, storing and retrieving of information is easy. So, work can be done speedily and in time.

- **Very less Paper Work:** The proposed system requires very less paper work. All the data is feted into the computer immediately and reports can be generated through computers. Moreover, work become very easy because there is no need to keep data on papers.

# Chapter 2

# E R Diagram and Relational Schema Diagram

This chapter focuses on the ER Diagram and schema diagram of the database

## 2.1 E R Diagram

An entity relationship diagram, also known as an entity relationship model, is a graphical among people, objects, places, concepts representation of an information system that depicts the relationships, events within that system.

- Entity type like Employee, Department, Project, Customer, Services, Dependent are represented using rectangular boxes in the e-r diagram.
- The attributes which characterize the entities are represented in ovals, each attached to the entity type using a straight line. The attribute which is designated as the primary key is identified by underlining it within the oval.
- Relationship like 'Manages' are represented in diamond boxes which are attached to the entity type participating in the relationship using straight lines.
- The total participation of the entities participating in the relationship represented inside the rhombus is identified by two straight lines from the entity type to the diamond.Whereas, the partial participation is identified by single straight lines from the entity type to the diamond.
- There is a multi-attribute of entity Employee named as Contact which contains the location of the department.
- The cardinality ratio are as follows:

    1. Department: Employee is of ratio 1:N as each department can have N employees.
    2. Employee: Dependent is of ratio 1: N as each employee can have more than 1 dependent.
    3. Department: Projects is of ratio 1: N as a department can have N projects.
    4. Customer: Projects is of ratio 1: N as a customer may order more than 1 project.

5. Customer: Services is having ratio 1: N as a customer may avail more than 1
   service of the company.

6. Department: Services is of ratio 1: N as a department can have N services.
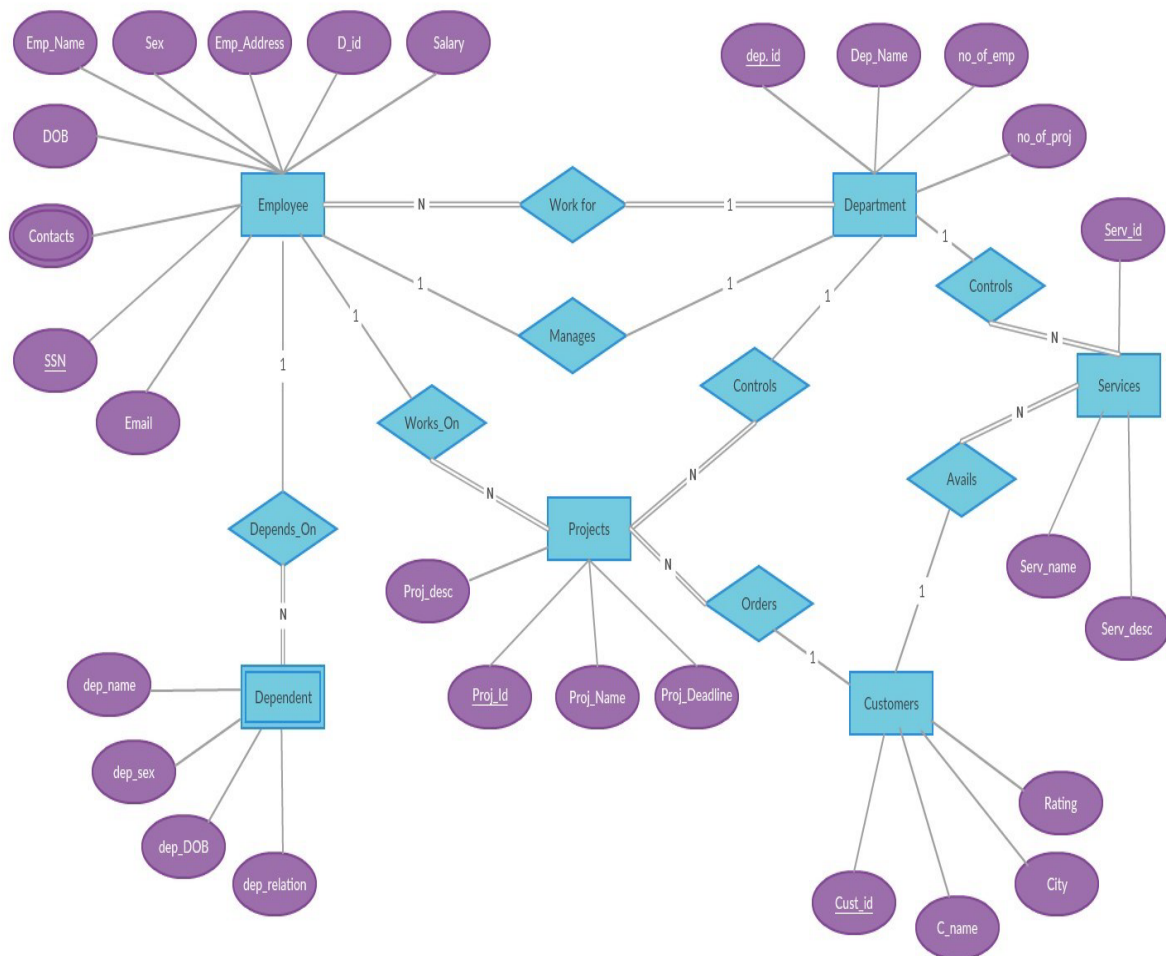
**Fig 2.1 E R Diagram For Company Management System**

## 2.2 Schema Diagram

A schema is the Skeleton structure that represents the logical view of the entire database. A database schema defines the entities and relationship among them.

Employee (SSN, Name, Sex, DOB, Contact, Email, Address, D_id, Salary)

Department (D_id, D_name, D_manager, no_of_emp, no_of_proj)

Project (Proj_id, Proj_name, Proj_deadline, D_id, Cust_id)

Dependent (Superssn, Dep_name, dep_sex, dep_DOB, dep_relation)

Service (Serv_id, Serv_name, Serv_Desc, Dep_id)

Customer (Customer_id, C_name, rating, City, Serv_id)
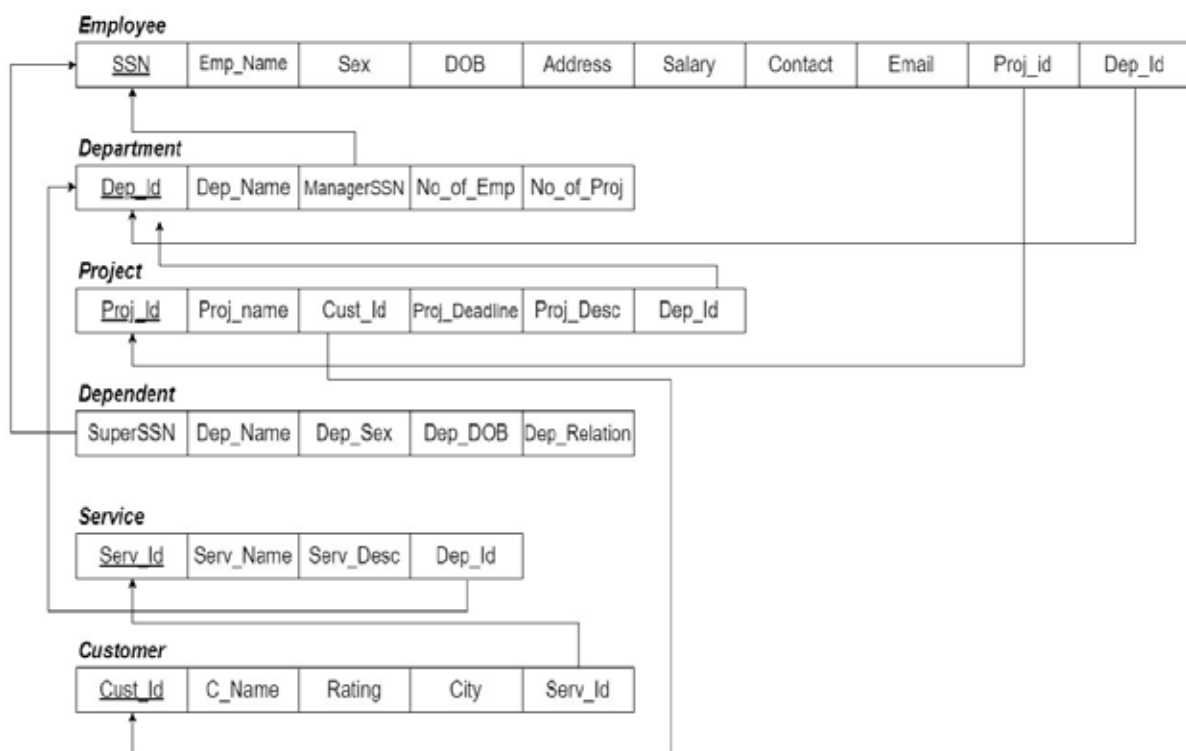


**Fig 2.2 Schema Diagram for Company Management System**
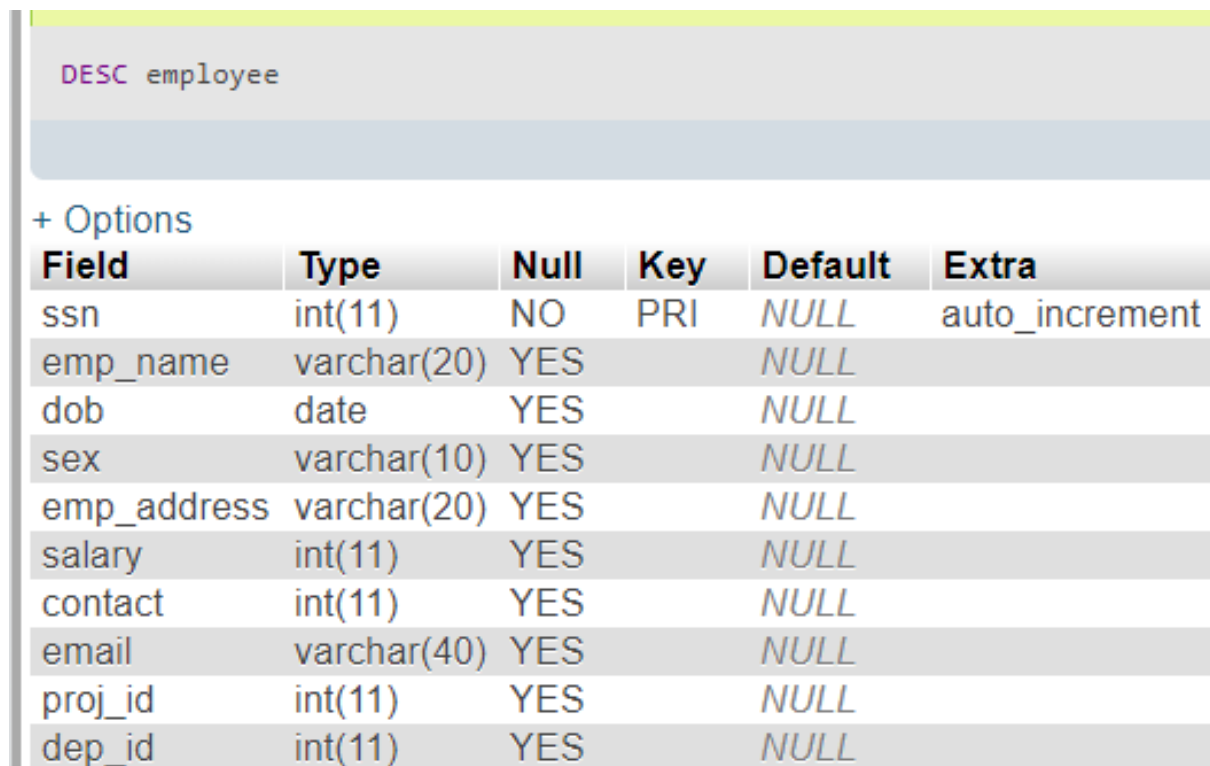
# Chapter 3

# SYSTEM DESIGN

## 3.1 Table Description

There are 6 tables following

### 1. Employee



```
DESC employee
```

+ Options

| Field | Type | Null | Key | Default | Extra |
|---|---|---|---|---|---|
| ssn | int(11) | NO | PRI | *NULL* | auto_increment |
| emp_name | varchar(20) | YES | | *NULL* | |
| dob | date | YES | | *NULL* | |
| sex | varchar(10) | YES | | *NULL* | |
| emp_address | varchar(20) | YES | | *NULL* | |
| salary | int(11) | YES | | *NULL* | |
| contact | int(11) | YES | | *NULL* | |
| email | varchar(40) | YES | | *NULL* | |
| proj_id | int(11) | YES | | *NULL* | |
| dep_id | int(11) | YES | | *NULL* | |

**Fig 3.1: Employee Table**

In the above fig 3.1, the employee table holds the information about the employees. This table contains ssn as the primary key and proj_id and dep_id as foreign key.

**2. Department**

```
desc department
```

+ Options

| Field | Type | Null | Key | Default | Extra |
|-------|------|------|-----|---------|-------|
| dep_id | int(3) | NO | PRI | NULL | |
| dep_name | varchar(20) | YES | | NULL | |
| no_of_emp | int(11) | YES | | NULL | |
| no_of_proj | int(11) | YES | | NULL | |
| mgrssn | int(11) | YES | | NULL | |

**Fig 3.2: Department Table**

In the above figure 3.2, the department table holds the information about the departments in the company where dep_id is the primary key.

**3. Dependent**

```
desc dependent
```

+ Options

| Field | Type | Null | Key | Default | Extra |
|-------|------|------|-----|---------|-------|
| superssn | int(11) | YES | | NULL | |
| depd_name | varchar(30) | YES | | NULL | |
| depd_sex | varchar(10) | YES | | NULL | |
| depd_dob | date | YES | | NULL | |
| depd_rel | varchar(20) | YES | | NULL | |

**Fig 3.3: Dependent Table**

In the fig 3.3, the dependent table holds the information about the dependent of the employees.

**4. Project**



```
desc project
```

| Field | Type | Null | Key | Default | Extra |
|---|---|---|---|---|---|
| proj_id | int(11) | NO | PRI | NULL | |
| proj_name | varchar(30) | YES | | NULL | |
| cust_id | int(11) | YES | | NULL | |
| proj_deadline | date | YES | | NULL | |
| proj_desc | varchar(240) | YES | | NULL | |
| dep_id | int(11) | YES | | NULL | |

**Fig 3.4: Project Table**

In the fig 3.4, the project table holds the information about the various projects of the departments where proj_id is the primary key with dep_id and cust_id as the foreign key.

**5. Services**



```
desc service
```
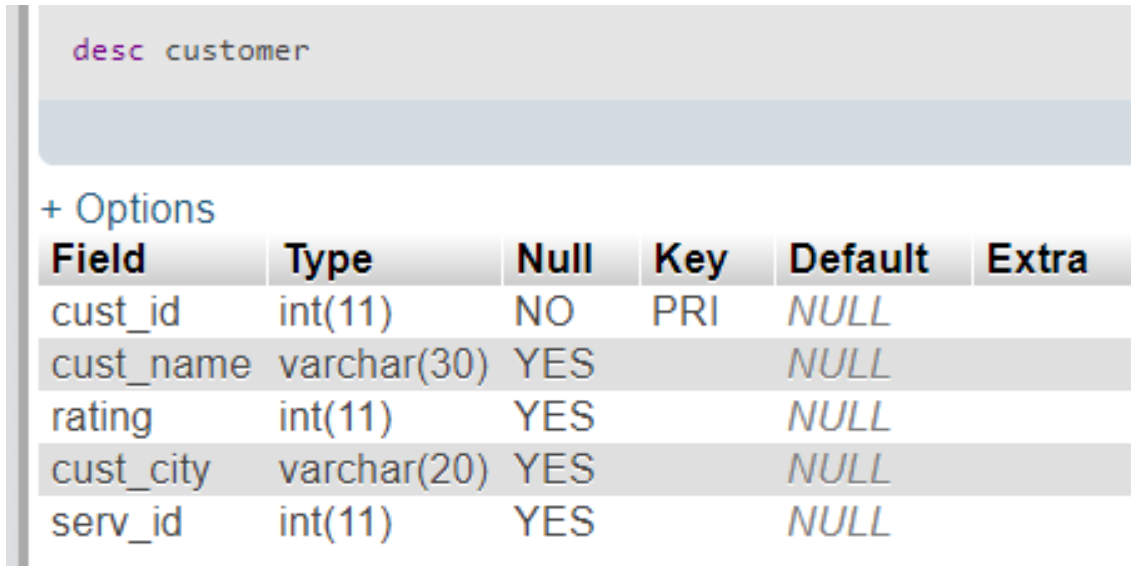
| Field | Type | Null | Key | Default | Extra |
|---|---|---|---|---|---|
| serv_id | int(11) | NO | PRI | NULL | |
| serv_name | varchar(30) | YES | | NULL | |
| serv_desc | varchar(240) | YES | | NULL | |
| dep_id | int(11) | YES | | NULL | |

**Fig 3.5: Services Table**

In the fig 3.5, the services table holds the information about the services provided by the departments where serv_id is the primary key and dep_id is the foreign key.

**6. Customer**



| Field | Type | Null | Key | Default | Extra |
|-------|------|------|-----|---------|-------|
| cust_id | int(11) | NO | PRI | NULL | |
| cust_name | varchar(30) | YES | | NULL | |
| rating | int(11) | YES | | NULL | |
| cust_city | varchar(20) | YES | | NULL | |
| serv_id | int(11) | YES | | NULL | |

**Fig 3.6: Customer Table**

In the fig 3.6, the customer table holds the information about the customers where cust_id is the primary key and serv_id is the foreign key.

## 3.2 PHP and Database Connection

- PHP provides built-in database connectivity for a wide range of databases – MySQL, PostgreSQL, Oracle, Berkeley DB, Informix, Lotus Notes, and more.
- Use either mysql_connect or mysql_pconnect to create database connection.
- mysql_connect: connection is closed at end of script (end of page).
- mysql_pconnect: creates persistent connection -connection remains even after end of the page.
- Connect to the MySQL server

    $connection = mysqli_connect ("localhost", "root", "password", "databasename");
- Access the database

mysql_select_db ("databasename", $connection);

- Perform SQL operations

  Example: $result = mysql_query ($query, $connection)

- Disconnect from the server

  mysql_close($connection);

## 3.3 Triggers



**Fig 3.7: Insert Trigger**

This trigger is used to update the number of employee count in department section after every new employee entry.

**Fig 3.8: Delete Trigger**

This trigger is used to update the number of employees in the department section after deletion of each employee from the employee table.

# Chapter 4

# IMPLEMENTATION

## 4.1 Software and Hardware Requirements

**Software Requirements**

- Front End tools: HTML, CSS, PHP
- Back End tools: phpmyadmin
- Browser that supports HTML and JavaScript
- IIS or apache server
- MySQL database
- Xampp

**Hardware Requirements**

- Processor: Pentium IV and above
- Processor Speed: 1.4 GHz
- Cache size: 1024 KB
- RAM: 1 GB
- Hard Disk: 1 TB
- Apache Tomcat with port no. 8080

## 4.2 Description of Tools and Technologies

## HTML

Hypertext Markup Language (HTML) is the standard markup language for creating web pages and web applications. With Cascading Style Sheets (CSS) and JavaScript it forms a triad of cornerstone technologies for the World Wide Web.

HTML elements are the building blocks of HTML pages. With HTML constructs, images

and other objects, such as interactive forms, may be embedded into the rendered page.

It provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items. HTML elements are delineated by tags, written using angle brackets. Tags such as <img /> and <input /> introduce content into the page directly. Others such as <p>...</p> surround and provide information about document text and may include other tags as sub-elements. Browsers do not display the HTML tags, but use them to interpret the content of the page.

HTML can embed programs written in a scripting language such as JavaScript which affect the behavior and content of web pages. Inclusion of CSS defines the look and layout of content.

## CSS

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language. Although most often used to set the visual style of web pages and user interfaces written in HTML and XHTML, the language can be applied to any XML document, including plain XML, SVG and XUL, and is applicable to rendering in speech, or on other media. Along with HTML and JavaScript, CSS is a cornerstone technology used by most websites to create visually engaging web pages, user interfaces for web applications, and user interfaces for many mobile applications.

CSS is designed primarily to enable the separation of presentation and content, including aspects such as the layout, colors, and fonts. This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable multiple HTML pages to share formatting by specifying the relevant CSS in a separate .CSS file, and reduce complexity and repetition in the structural content.

## PHP Language

PHP is a server-side scripting language designed primarily for web development but also used as a general-purpose programming language. Originally created by RasmusLerdorf in 1994, the PHP reference implementation is now produced by The PHP Development Team. PHP originally stood for Personal Home Page, but it now stands for the recursive acronym PHP:

Hypertext Preprocessor.

PHP code may be embedded into HTML or HTML5 markup, or it can be used in combination with various web template systems, web content management systems and web frameworks. PHP code is usually processed by a PHP interpreter implemented as a module in the web server or as a Common Gateway Interface (CGI) executable. The web server software combines the results of the interpreted and executed PHP code, which may be any type of data, including images, with the generated web page. PHP code may also be executed with a commandline interface (CLI) and can be used to implement standalone graphical applications.

## Apache Server

Apache HTTP Server, colloquially called Apache, is free and open-source cross-platform web server software, released under the terms of Apache License 2.0. Apache is developed and maintained by an open community of developers under the auspices of the Apache Software Foundation.

Apache supports a variety of features, many implemented as compiled modules which extend the core functionality. These can range from server-side programming language support to authentication schemes. Some common language interfaces support Perl, Python, Tcl, and PHP.

Apache features configurable error messages, DBMS-based authentication databases, and content negotiation. It is also supported by several graphical user interfaces (GUIs).It supports password authentication and digital certificate authentication. Because the source code is freely available, anyone can adapt the server for specific needs, and there is a large public library of Apache add-ons.

## MySQL Database

MySQL is a Relational Database Management System (RDBMS). MySQL server can manage many databases at the same time. In fact, many people might have different databases managed by a single MySQL server. Each database consists of a structure to hold the data and the data itself. A data-base can exist without data, only a structure, be totally empty, twiddling its thumbs and waiting for data to be stored in it.

Data in a database is stored in one or more tables. You must create the data-base and the tables before you can add any data to the database. First you create the empty database. Then you add empty tables to the database. Database tables are organized like other tables that you're used in rows and columns. Each row represents an entity in the database, such as a customer, a book, or a project. Each column contains an item of information about the entity, such as a customer name, a book name, or a project start date. The place where a particular row and column intersect, the individual cell of the table, is called a field. Tables in databases can be related. Often a row in one table is related to several rows in another table. For instance, you might have a database containing data about books you own. You would have a book table and an author table. One row in the author table might contain information about the author of several books in the book table. When tables are related, you include a column in one table to hold data that matches data in the column of another table.

## MySQL

MySQL, the most popular Open Source SQL database management system, is developed, distributed, and supported by MySQL AB. MySQL AB is a commercial company, founded by the MySQL developers. It is a second-generation Open Source company that unites Open Source values and methodology with a successful business model.

- MySQL is a database management system.

  A database is a structured collection of data. To add, access, and process data stored in a computer database, you need a database management system such as MySQL Server. Since computers are very good at handling large amounts of data, database management systems play a central role in computing, as standalone utilities, or as parts of other applications.

- MySQL is a relational database management system.

  A relational database stores data in separate tables rather than putting all the data in one big storeroom. This adds speed and flexibility. The SQL part of "MySQL" stands for

"Structured Query Language." SQL is the most common standardized language used to access databases and is defined by the ANSI/ISO SQL Standard.

- MySQL software is Open Source.

  Open Source means that it is possible for anyone to use and modify the software. MySQL Server was originally developed to handle large databases much faster than existing solutions and has been successfully used in highly demanding production environments for several years.

- MySQL Server works in client/server or embedded systems.

  The MySQL Database Software is a client/server system that consists of a multi-threaded SQL server that supports different back ends, several different client programs and libraries, administrative tools, and a wide range of application programming interfaces (APIs).

## Xampp

Xampp installs a complete and ready-to-use development environment. Xampp allows you to fit your needs and allows you to setup a local server with the same characteristics as your production.

In case of setting up the server and PHP on your own, you have two choices for the method of connecting PHP to the server. For many servers PHP has a direct module interface (also called SAPI). These servers include Apache, Microsoft Internet Information Server, Netscape and iPlanet servers.

## 4.3 Discussion of The Results

## Homepage

The figure 4.1 shown below represents the landing page of our project.



**Fig 4.1 Homepage**

## Tables

In the below fig 4.2, the user will be greeted with the option to select any of the tables of the database, i.e. the user can select from employee, department, projects, customer, services or dependent tables.
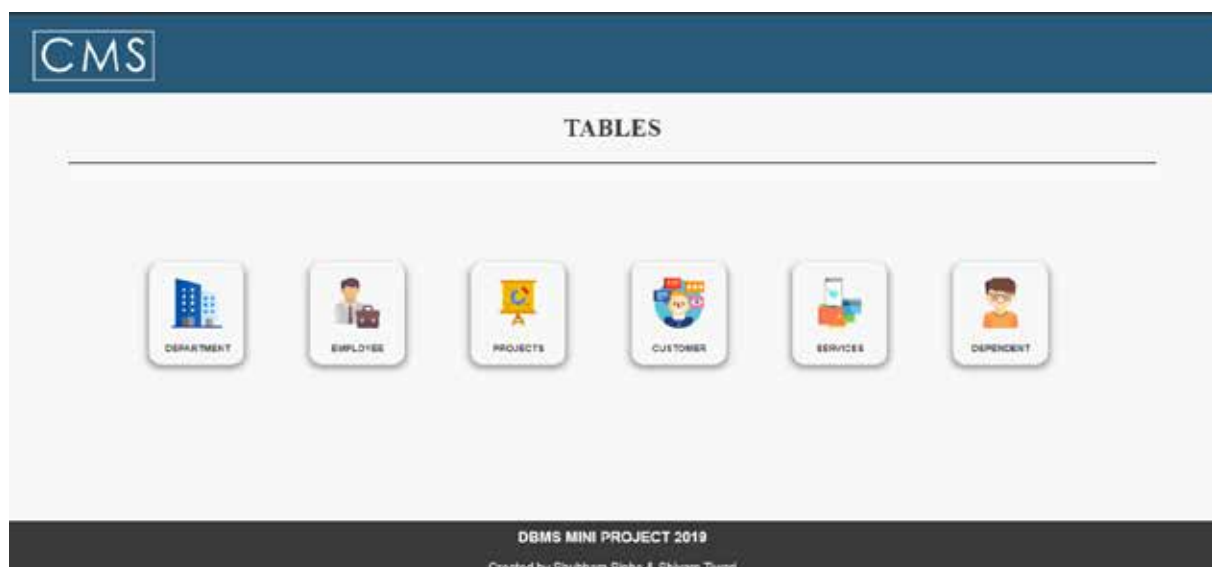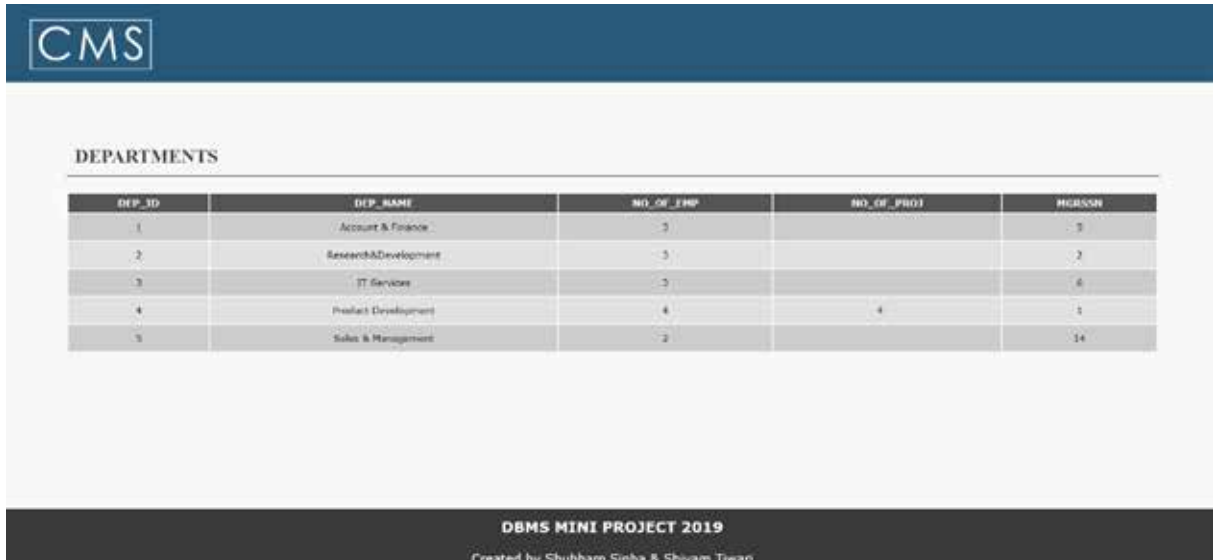


**Fig 4.2 Tables View**

## Department

When the user selects the department table to view, the table contents will be displayed as shown below:
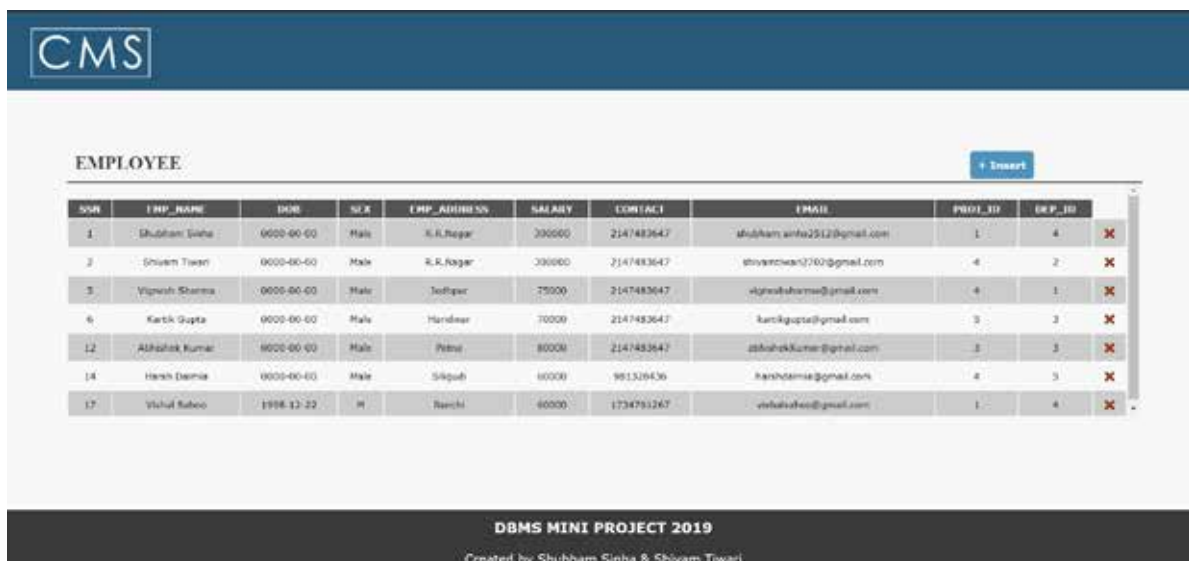


**Fig 4.3 Department**

## Employee

When the user selects employee table, the information about the employees will be displayed along with an option to delete and insert new data.



**Fig 4.4 Employee**

## Insertion of Data

If the user selects to insert data in the employee table, the following screen will pop-up giving the user an option to insert new data.



**Fig 4.5 Insertion of Data**



**Fig 4.6 Data Inserted**

## Deletion of Data

User can delete data by selecting the cross option given at the very end of each row of employee details. The employee with SSN=18 is deleted in the following



**Fig 4.7 Deleting Data**

## Projects

On selecting the projects tab, the information about the projects will be displayed with an option to delete or insert a row of data.



**Fig 4.8 Projects**

## Customers

If the user selects the customers tab, the system will display the details of all the customers having link with the company with an option to insert and delete more.
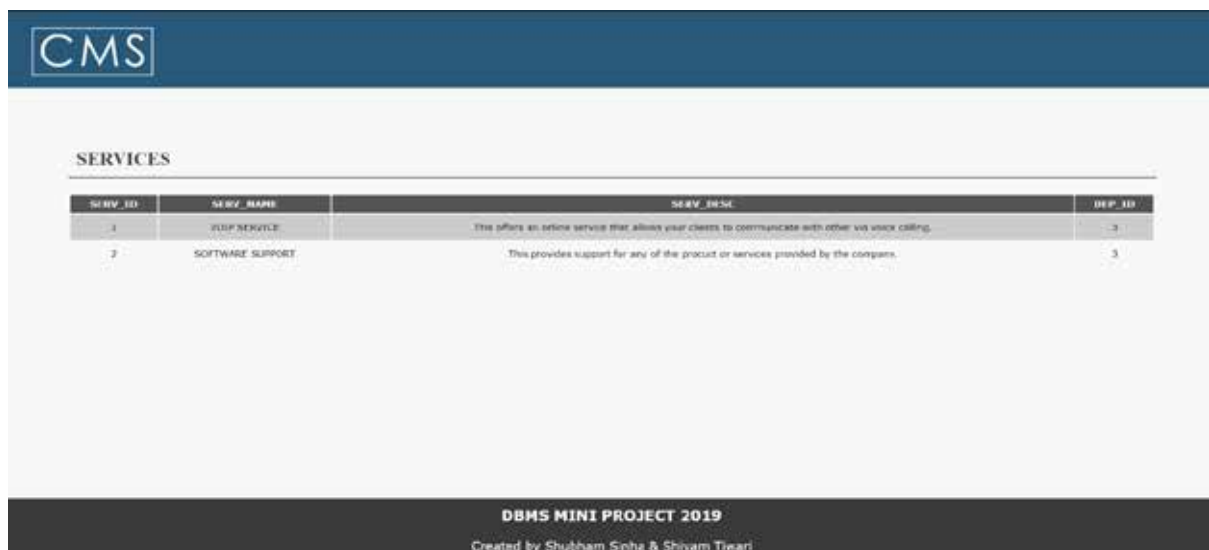


**Fig 4.9 Customers**

## Services

User can also see the available list of services provided the departments of the company.



**Fig 4.10 Services**

## Dependent

The user will also have an option to display the dependents of the employees in the company.
There will also be an option to add or delete a row of data from the dependent table.



**Fig 4.11 Dependents**

## 4.3.1 Discussion of The Results

- The user can access the details of the employees and add more details or delete an existing one.
- Similar to the employees' section, the customer, projects and dependents will also have an option to add or delete data.
- The SSN of the employee is set to auto-increment, so the user need not to enter the SSN when adding employee details.

# Chapter 5

# CONCLUSION AND FUTURE ENHANCEMENTS

## Conclusion

The front-end tools used in this project are mainly HTML, CSS and PHP which can be further enhanced in their effectiveness to create a fully-fledged webpage which can be accessed by the administrators from any workstation/computer. This project mainly focuses on the management of data of a company in an organized way. The user can view and insert new data but can't modify existing one as it has been restricted.

## Future Enhancements

The following are the future scope of project

- A login option can be given for better data security.
- Separate account can be created for users and staff to access different level of information.
- Data can be modified only by the authorized account and can only be viewed by the users.
- Project progress tracking feature can be added to track the progress of projects.

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