

# **Employee Management System for Shuvo Food Processing Industries Ltd**

A Practicum Report Submitted By

**Md. Murad Hossain Tuhin**

ID# 13103032

In Partial Fulfillment of the Requirements for the Award of  
Bachelor of Computer Science and Engineering



**Department of Computer Science and Engineering**

College of Engineering and Technology

IUBAT – International University of Business Agriculture and Technology

**Fall 2017**

Employee Management System  
For Shuvo Food Processing Industries Ltd

Md. Murad Hossain Tuhin

A practicum report submitted in partial fulfillment of the requirements for the degree of  
Bachelor of Computer Science and Engineering (BCSE)

The practicum has been examined and approved,

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Fall 2017

# **Abstract**

The “Employee Management System for Shuvo Food Processing Industries Ltd.” has been developed to override the problems prevailing in the practicing manual system. The goal is to eliminate and in some cases reduce the hardship faced by the existing system. This software is designed for the particular need of the organization to carry out daily operations like employee attendance, project management smoothly. It maintains the information about their employees, daily attendance, leave management and the details about the payroll system. In this system authorized members will be able to maintain department, employee information, payroll information. These modules provide efficient way in managing the organization. This software package is developed using core php which is a popular server scripting language and MySQL database. For the front end development HTML and CSS are used. This system is very user friendly and accurate. Up-to-date information recorded by this system are very helpful for the management committee of the organization.

# Letter of Transmittal

17<sup>th</sup> December, 2017

Chairman, Practicum and Placement Board

College of Engineering and Technology - CEAT

IUBAT - International University of Business Agriculture & Technology 4 Embankment Drive  
Road, Sector-10

Uttara Model Town, Dhaka-1230, Bangladesh

Subject: **Letter of Transmittal.**

Sir,

With due respect, I would like to approach you that it is a great opportunity as well as immense pleasure for me to submit this report titled “**Employee Management System for Shuvo Food Processing Industries Ltd.**” for the fulfillment of my Practicum course. I have tried my best to make the project successful on time. After completing my project. I have written this report which describe what I developed in last three months and detail analysis of my project.

It was undoubtedly a splendid opportunity for me to work on this project to actualize my theoretical knowledge and has an enormous exposure with the corporate culture of a renowned IT firm. Now I am looking forward for your kind appraisal regarding this practicum report.

I shall remain deeply grateful to you if you kindly go through this report and evaluate my performance.

Sincerely

---

Md. Murad Hossain Tuhin

ID# 1313032

Program: BCSE

Enclosure: Project Report

## Student's Declaration

I am **Md. Murad Hossain Tuhin**, student of IUBAT-International University of Business Agriculture & Technology, declaring that this project paper on the stated topic has only been prepared for the fulfillment of **CSC-490(Practicum)**, as partial fulfillment of “Bachelor of Computer Science & Engineering.”

It has not been prepared for any other purpose, reward or presentation.

.....

Md. Murad Hossain Tuhin

ID-13103032

Program-BCSE

# Acknowledgements

*In name of the Allah who is the most merciful and the most grateful.*

It's our pleasure to take this occasion to thank a few people, who have assisted, encouraged directed and supported us throughout our practicum program.

Firstly, I want to thank my parents, who have endowed their support and encouragement to attain this exquisite event of my life.

We are very appreciative to **Dr. Abdur Rab** (Vice Chancellor of IUBAT) and **Dr. Utpal Kanti Das** (Course coordinator of CSE) for their unrelenting direction and sustain throughout the semester. I would also like to thank all of the faculties of IUBAT for their support and wisdom.

Especially I am thankful to my practicum supervisor **Umme Fawzia Rahim** (CEAT-College of Engineering & Technology) for helping me to prepare a report on “**Employee Management System**” and her continuous guidance. Her instruction and guidance have been of extreme help for me. I am also thankful for all the times I am consulted with her and she answered with utmost patience and perseverance.

I will always be grateful to Managing Director and all Members of “**solution2solution IT**” for their support throughout the whole project.

I also like to thank all of our friends for their valuable suggestions and comments.

## **Dedication**

To Mom and Dad, it's impossible to thank you adequately for everything you've done.

## Supervisor's Certification

This is to certify that Practicum report on “**Employee Management System for Shuvo Food Processing Industries Ltd.**” has been carried out by **Md. Murad Hossain Tuhin** bearing **ID: 1303032** of IUBAT-International University of Business Agriculture and Technology as a partial fulfillment of the requirement of practicum defense course. The report has been successfully prepared under my guidance. To the best of my knowledge and as per his declaration, no parts of this report has been submitted anywhere for any degree, diploma or certificate.

Now he is permitted to submit his report. I wish him all success in their future endeavors.

Practicum Supervisor

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**Umme Fawzia Rahim**

Faculty, Department of

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IUBAT- International University of Business Agriculture and Technology



# Department Certification

15 May, 2017

Md. Murad Hossain Tuhin

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4, Embankment Drive Road, Sector 10

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Subject: **Letter of Authorization.**

Dear Md. Murad Hossain Tuhin,

You will be happy to know that I have received your project proposal on “Employee Management System for Shuvo Food Processing Industries Ltd.” under my continue internship. Based on your proposal you will have to submit it as soon as possible. I hope you will successfully complete the project on time. After successful completion of the project, you are requested to write a report based on the project.

For any kind of needs don't hesitate to contact with me.

-----

Dr. Utpal Kanti Das

Practicum Coordinator Supervisor and Faculty,

Department of Computer Science & Engineering

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# **Chapter 1**

## **Introduction**

## 1.1 Project Overview

“**Employee Management System for Shuvo Food Processing Industries Ltd.**” is safe and very much secure, which is reliable, available, and easily accessible to users. There will be two types of users with authorization power for login the system.

System admin will handle the all information in the system. Admin have the permission to start a project, view attendance, generate salary. Employee can apply for leave, print pay slip, give attendance. The ultimate objective of the system is to provide facility to the user for management of a company. Security of this system is very high and the possibility of doing wrong in the calculation is low. The proposed system will involve computerized Apply system, database storage, retrieval (using defined functions), evaluation, agreement, modifications and decision making supports which will make all processes involving the system much faster and easier for the users.

## 1.2 Objectives

The objective of developing such a computerized system is to reduce the paper work and safe of time in employee management. There by increasing the efficiency and decreasing the work load.

The system provides user the information about employee, leave and related information. The system must provide the flexibility of generating the required documents on screen as well as on printer when required.

## 1.3 Broad Objectives

The broad objective of this project is to use my educational knowledge and experience acquired from IUBAT in the real life working environment by developing an “**Employee Management System for Shuvo Food Processing Industries Ltd.**” of solution2solution IT that has been assigned to me. This report is generated to describe the processes and works done in different levels of employee system. In this report I have described every part of the development segments with proper illustrations that can be used by the organization.

## 1.4 Specific Objectives

- To make an automated system that can handle update of every information including employee information, salary, project management, attendance system and leave management.
- To make a system that will be very user friendly.
- To manage organizational information.
- To reduce time wastage that occurred in manual system.

## 1.5 Scope of this project

The software ought to have capacity to deal with the employee information, their compensation, attendance, leave management and information backup. All approved individual can utilize the software with their username, password. Using this software package authority can keep track of the project. Software should have the feature of automatic calculation of the employee without any inconvenience.

## 1.6 Benefits of the system

- Admin can manage employee information.
- Admin can view attendance.
- Admin can manage department and designation.
- Admin can manage salary system.
- Admin can manage the leave.
- Employee can apply leave.
- Employee can view and print the salary information.
- Employee can view and update their profile.
- System can easily run in the web, desktop, laptop etc.

## 1.7 Methodology

The development process on “**Employee Management System**” through “*Agile Model*” will complete following the structure described later on Software Analysis & Design.

### 1.7.1 Data Sources

There are two sorts of data sources, from where I utilized the data to develop the software project and they are:

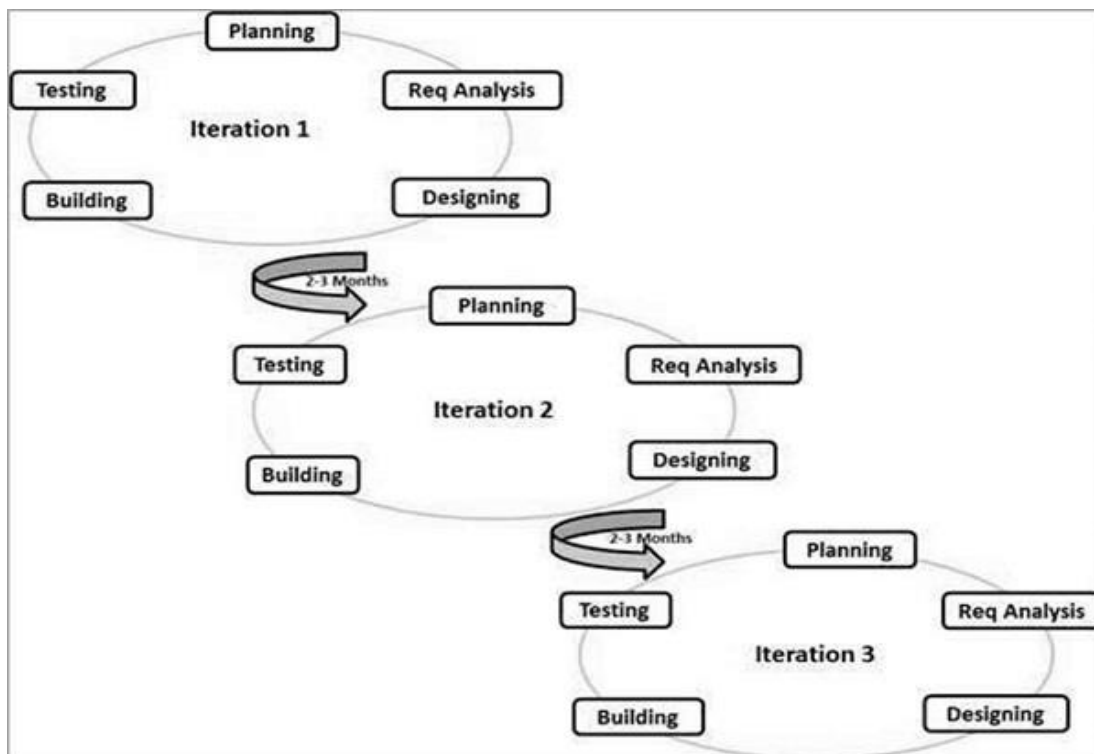
- **Primary data** are gathered from the organization. The organizations practical experience, observation and face-to-face interview with our own web developers helped me gather the primary data.
- **Secondary data** are gathered by studying diverse articles, blogs and websites.

## 1.8 Software Process Model

For developing a system or project I have to follow a particular process model. To find out the problem and select the appropriate solution I have followed the basic project management process model, which is Agile Model.

Agile process models in software development break away from the classic Waterfall Model and its variations [1]. The specification gradually occurs during implementation.

One important advantage of agile process models is the collaboration with the customer. The customer receives what he needs and not what he has specified. This is an important benefit for projects whose requirements are still unclear at the beginning or are subject to major changes caused by external influences.



**Fig 1.1:** Agile Model

### 1.8.1 Why Agile Model?

While the waterfall model has seen a slow phasing out in recent years in favor of more agile methods, it can still provide a number of benefits, particularly for larger projects and organizations that require the stringent stages and deadlines. Some key points are given below:

- Customer satisfaction.
- In agile process mostly meeting arranged before product release.
- More interaction maintained within developing and testing team in this agile process.
- Customers can change or add requirements at any stage.
- It concentrates on every process with expert team members.

## 1.9 Feasibility Study

The aims of a feasibility study are to find out whether a system is worth implementing and if it can be implemented, given the existing budget and schedule. The input to the feasibility study is a set of preliminary requirements, an outline description of the system and how the system is intended to support intended processes. There are many different types of feasibility studies; here is a list of some of the most important to develop the proposed system.

- Technical feasibility
- Economical feasibility
- Operational feasibility

### 1.9.1 Technical Feasibility

Technical feasibility addresses concern about hardware capability, reliability and availability and the skills of the development team. This study looks at the hardware and software available to perform the necessary steps for the proposed system.

Requirements for smooth software operations:

- *Processor:* Dual core or higher



- *Ram:* 2 GB or higher
- *Hard Disk Space:* 500 GB or higher
- *System:* Windows 7/8/8.1/10
- *Technology:* Server/Local server and MySQL
- *Software:* Any modern browser (e.g. Edge/Opera/Firefox/Chrome), Text Editor

### **1.9.2 Economical feasibility:**

Economic feasibility determines to what extent a new system is cost effective. We consider whether the company will be able to pay for redesigning and the project will be cost effective or not. The proposed system was within our budget for development.

### **1.9.3 Operational Feasibility**

Operational feasibility refers to the measure of solving problems with the help of a new proposed system. It helps in taking advantage of the opportunities and fulfills the requirements as identified during the development of the project. It takes care that the management and the users support the project. On this point of view, the proposed system is operationally feasible.

## **Chapter 2**

# **The Organization**

## **2.1 Organizational Overview**

Solution2solution IT is web and graphics solutions provider at its core with the highly qualified designers having experience of more than 3 years in various and complex designs. Other than core service like web design and development Solution2solution IT has satisfied the clients with the services like Mobile App Design and development, Software and Mobile Testing, SEO and Social Media Designing & Development. We are customer centric and divert our efforts to act as a one stop solution provider in the area of IT. In every area of our operations we work hard in understanding the Client's requirement and providing the solution.

## **2.2 Services**

- Android Application Development
- Web Design and Development
- Desktop Based Software Development
- Graphics Design

### **2.2.1 Android Application Development**

In recent years, application market is exploding. The demand for mobile apps is growing because of its portability and efficiency. Having an app for any business or promotion it may be can be a game changing marketing tool to drive traffic and revenue. So, to meet clients demand we develop applications that contains:

- Basic table functionality.
- Database driven custom functionality.
- Fully dynamic apps.

### **2.2.2 Web Design and Development**

At “**solution2solution IT**” we focus on creating search engine friendly, aesthetically appealing and interactive website designs. For small to large business, a website is essential now-a-days. We have high qualified web developers to design and develop a full functioning website.

### **2.2.3 Desktop Based Software Development**

At solution2solution IT we offer fully integrated software development and technical support solutions. We have great expertise in the development of custom software applications due to our professional team efforts in performing the work according to the need of our clients. We already

developed various software which are now used in RMG (Ready Made Garments) sector. We use to fulfill specific needs of our clients as per their convenience for their business.

### **2.2.4 Graphics Design**

Graphic design is an important tool that enhances how we communicate with other people. It serves to convey our ideas in a way that is not only effective, but also beautiful. That's why, our professional graphics designers make brand logo, promotional banner, custom art and so on.

## **2.3 Location**

House: 153 (6<sup>th</sup> Floor)

Road: 18

Sector: 10

Uttara, Dhaka-1230

Website: [www.solution2solution.com](http://www.solution2solution.com)

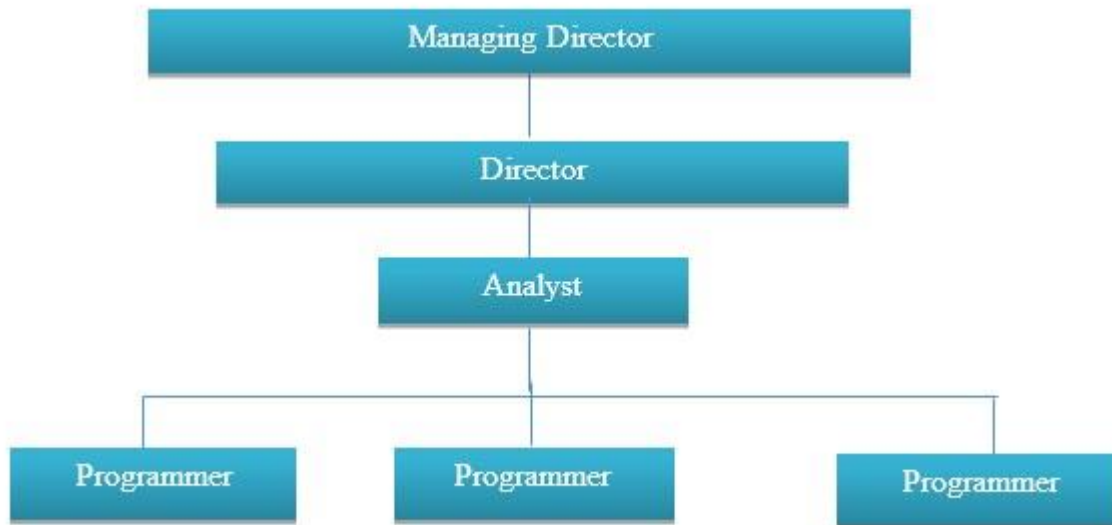
## **2.4 Vision**

- To build a trusted IT Companies in Bangladesh
- To be the most respected IT service brand
- To be the best choice for people when they like to Apps Development
- To be a world-class supplier of IT products and services

## **2.5 Mission**

- To achieve maximum customer satisfaction over the entire life cycle of our customer solution via our excellence of products and solutions.
- To consistently enhance our competitiveness and deliver profitable growth.
- To practice highest standards of corporate governance and be a financially sound company.
- To be a partner in nation building and contribute towards Bangladesh economic growth.
- To encourage ideas, talent and value systems and become the customers of choice.

## 2.6 Organizational Structure



*Fig 2.1:* Organizational structure of “**solution2solution IT**”

## **Chapter 3**

# **Requirement Engineering**

## **3.1 Requirement Engineering**

Requirements engineering is a process of gathering and defining of what the services should be provided by the system.

It focuses on assessing if the system is useful to the business (feasibility study), discovering requirements (elicitation and analysis), converting these requirements into some standard format (specification), and checking that the requirements define the system that the customer wants (validation).

In practice, requirements engineering isn't sequential process, it's an iterative process in which activities are interleaved. Designing and building an elegant computer program that solves the wrong problem serves no one's need. That's why it is important to understand what the client wants before we begin to design and build a computer-based system.

## **3.2 Requirement Analysis**

Typically, requirements are presented into two level of detail; user and system requirements, where user need a high-level statements of the requirements, while system developers need a more detailed system specification. So, user and system requirements just refer to different level of detail. In the following task phases the requirement analysis was done.

### **User requirement 1:**

- Admin can create department

### **System requirement 1:**

- System will store in database.

### **User requirement 2:**

- Admin can add new admin and Employee. It can be administrated by admin panel.

### **System requirement 2:**

- System will store the changes in database.

### **User requirement 3:**

- Employee and admin need to log in the system for performing tasks in the system.

### **System requirement 3:**

- System validates username and password and grant access.

**User requirement 4:**

- Leave Management is maintained by admin.

**System requirement 4:**

- System will response to user according to need

**User requirement 5:**

- Project Management is maintained by admin.

**System requirement 5:**

- System will show the user project information.

**User requirement 7:**

- Admin can manage salary system

**System requirement 7:**

- System will store new pay slip for individual employee

**User Requirement 8:**

- Admin can evaluate attendance

**System Requirement 8:**

- Daily attendance will be stored in database.

**User requirement 9:**

- Admin and employee update profile by adding additional information.

**System requirement 9:**

- System will store updated picture.
- System will store additional information of user.



### 3.3 Functional Requirements

Functional requirement specifies a function that a system or system component must be able to perform. In this software, they are:

- Admin will get employee information
- Admin can add, delete and update employees.
- Admin will get the total amount of salary to be paid for an employee from the pay slip.
- Employee can view and print salary slip.
- Admin can view attendance.
- Employee will be able to apply for leave
- Admin will issue leave.
- Admin and Employee can give attendance.

### 3.4 Non Functional Requirement

#### Security requirements:

- Employee salary information should remain confidential.
- Employee leave system and Project system is very confidential

#### Reliability requirements:

- The system should be consistent and should give the desired results.

#### Efficiency requirements:

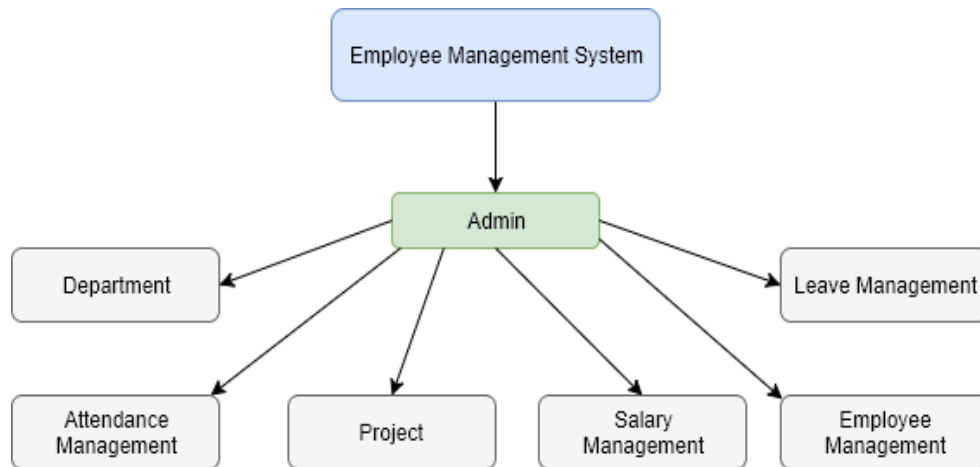
- The software should be efficient enough to take less memory of the computer system; there should not be any performance degradation.

#### Usability requirements:

- The system should be easily usable by the staff of the employee so that any internee with basic learning of computer systems can operate it.

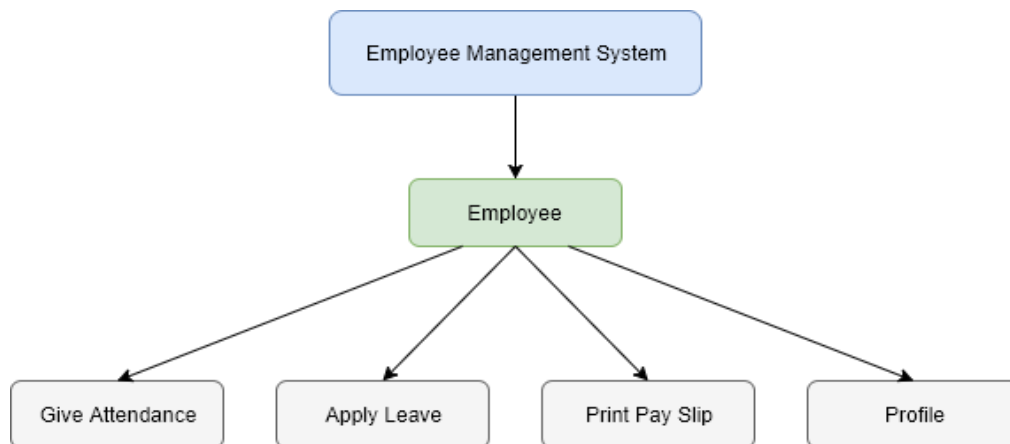
## 3.5 User Hierarchy

### 3.5.1 Admin Hierarchy



**Fig 3.1:** Admin Hierarchy

### 3.5.2 Employee Hierarchy



**Figure 3.2:** Employee Hierarchy

# **Chapter 4**

## **System Planning**

## 4.1 Functions of Proposed Plan:

**Table I.** Functions of proposed plan

Function Name	Synonym
Login	F1
Add Department	F2
Add Employee	F3
Generate Salary	F4
Attendance	F5
Project Management	F6
Leave Request	F7
Leave Management	F8
Update Employee	F9
Login Time Checking	F10

## 4.2 Functions Description

### Login:

**Input:** Email, Password

**Output:** Login successful or login failed

**Use table of the Database:** user

### Add Department:

**Input:** Name of the department

**Output:** Successfully Created or Failed to create department

**Use table of the Database:** tb\_department

**Add Employee:**

**Input:** Employee Information

**Output:** Successfully Added to the system or Failed to Add Employee

**Use table of the Database:** user

**Generate Salary:**

**Input:** employee, month, incentive

**Output:** Pay Slip has been issued

**Use table of the Database:** tb\_salary

**Attendance:**

**Input:** Current Arrival Time, Current Departure Time

**Output:** Attendance taken for today, successfully logged out

**Use table of the Database:** attendance

**Project Management:**

**Input:** Project name, assigned employee, Duration, Estimated Cost

**Output:** Project Added Succssfully

**Use table of the Database:** tb\_project

**Leave Request:**

**Input:** Starting Date, Ending Date, Reason

**Output:** Request Sent

**Use table of the Database:** leave\_emp

**Leave Management:**

**Input:** Accept leave request or Reject leave request

**Output:** Request Accepted or Rejected

**Use table of the Database:** leave\_emp

**Update Employee:**

**Input:** Updated Employee Information

**Output:** Update Successful

**Use table of the Database:** user

**Login Time Checking:**

**Input:** Current Arrival Time

**Output:** Late Arrival and Departure

**Use table of the Database:** attendance

## **4.3 Project Planning**

Before starting any project, it is compulsory to estimate the work to be done, the resources that will be required, the time that will elapse from start to finish and to analyze the project to determine whether it is feasible or not.

The following activities of software project planning that have followed in this project are:

- Estimation of the software project
- Task scheduling
- Personnel requirements
- Resource requirements
- Estimation of the software cost
- Costs benefit analysis

## **4.4 Function Point Estimation**

The task of counting function points should be included as part of the overall project plan. That is, counting function points should be scheduled and planned. The first function point count should be developed to provide sizing used for estimating.

### 4.4.1 Five Major Components of FP

**External Inputs (EI)** - is an elementary process in which data crosses the boundary from outside to inside. This data may come from a data input screen or another application. The data may be used to maintain one or more internal logical files. The data can be either control information or business information.

**External Outputs (EO)** - an elementary process in which derived data passes across the boundary from inside to outside. Additionally, an EO may update an ILF. The data creates reports or output files sent to other applications. These reports and files are created from one or more internal logical files and external interface file.

**External Inquiry (EQ)** - an elementary process with both input and output components that result in data retrieval from one or more internal logical files and external interface files. The input process does not update any Internal Logical Files, and the output side does not contain derived data.

**Internal Logical Files (ILF's)** - a user identifiable group of logically related data that resides entirely within the applications boundary and is maintained through external inputs.

**External Interface Files (EIF's)** - a user identifiable group of logically related data that is used for reference purposes only. The data resides entirely outside the application and is maintained by another application. The external interface file is an internal logical file for another application.

### 4.4.2 Un-adjust Function Point (UFP) Estimation

**Record Element Type (RET):** A RET is user recognizable sub group of data elements within an ILF or an EIF. It is best to look at logical groupings of data to help identify them. The concept of RET will be discussed in detail in the chapters that discuss internal logical file and external interface files.

**File Type Referenced (FTR):** A FTR is a file type referenced by a transaction. An FTR must also be an internal logical file or external interface file.

**Data Element Type (DET):** A DET is a unique user recognizable, non-recursive (non-repetitive) field. A DET is information that is dynamic and not static. A dynamic field is read from a file or created from DETs contained in a FTR. Additionally, a DET can invoke transactions or can be additional information regarding transactions. If a DET is recursive then only the first occurrence of the DET is considered not every occurrence.

Universal Reference Tables for function calculation are given below [2]:

### **EI and EQ:**

**Table II.** EI & EQ Reference Table

File Type Referenced (FTR)	Data Elements Type (DET)		
	1-4	5-15	Greater than 15
<b>Less than 2</b>	Low (3)	Low (3)	Average (4)
<b>2 or 3</b>	Low (3)	Average (4)	High(6)
<b>Greater Than 3</b>	Average (4)	High(6)	High(6)

### **EO:**

**Table III.** EO Reference Table

File Type Referenced (FTR)	Data Elements Type (DET)		
	1-4	5-15	Greater than 15
<b>Less than 2</b>	Low (4)	Low (4)	Average (5)
<b>2 or 3</b>	Low (4)	Average (5)	High(7)
<b>Greater Than 3</b>	Average (5)	High(7)	High(7)



**ILF:****Table IV. ILF Reference Table**

<b>Record Element Type (RET)</b>	<b>Data Elements Type (DET)</b>		
	1-19	20-50	51 or more
<b>1</b>	Low (7)	Low (7)	Average (10)
<b>2 to 5</b>	Low (7)	Average (10)	High(15)
<b>Greater Than 5</b>	Average (10)	High(15)	High(15)

**EIF:****Table V. EIF Reference Table**

<b>Record Element Type (RET)</b>	<b>Data Elements Type (DET)</b>		
	1-19	20-50	51 or more
<b>1</b>	Low (5)	Low (5)	Average (7)
<b>2 to 5</b>	Low (5)	Average (7)	High(10)
<b>Greater Than 5</b>	Average (7)	High(10)	High(10)

**FP Count for transaction functions:****Table VI. Transaction Functions Count**

<b>Transaction Function</b>	<b>FTR</b>	<b>DET</b>	<b>Complexity</b>	<b>FP</b>
<b>Login (EI)</b>	1	3	Low	3
<b>Add Employee (EI)</b>	1	11	Low	3
<b>Add Department(EI)</b>	1	3	Low	3
<b>Give Attendance(EI)</b>	1	5	Low	3
<b>Add Project(EI)</b>	1	7	Low	3

<b>Apply leave (EI)</b>	1	4	Low	3
<b>Generate Salary (EI)</b>	1	4	Low	3
<b>Organization info (EI)</b>	1	5	Low	3
<b>Organization Logo/favicon (EI)</b>	1	2	Low	3
<b>View Department (EO)</b>	1	2	Low	4
<b>View Employee (EO)</b>	1	6	Low	4
<b>View Attendance(EO)</b>	1	4	Low	4
<b>View Project(EO)</b>	1	6	Low	4
<b>View Leave Req.(EO)</b>	1	6	Low	4
<b>View Profile (EO)</b>	1	8	Low	4
<b>View Salary List (EO)</b>	1	6	Low	4
<b>View Employee on Leave (EO)</b>	1	6	Low	4
<b>View picture (EO)</b>	1	1	Low	4
<b>View Individual employee (EQ)</b>	1	9	Low	3
<b>Department-wise Total Employee (EQ)</b>	2	4	Low	3
<b>Search Employee (EQ)</b>	1	6	Low	3
<b>Completed Project (EQ)</b>	2	7	Average	4
<b>Pending Project(EQ)</b>	2	7	Average	4
<b>Attendance query (EQ)</b>	2	4	Low	3
<b>Month wise Salary (EQ)</b>	2	6	Average	4
<b>Check Login Time (EQ)</b>	1	2	Low	3
<b>Leave Approval/ Rejection (EI)</b>	1	4	Low	3
<b>View Leave Status (EO)</b>	1	3	Low	4
<b>Update Profile Picture (EI)</b>	1	2	Low	3
<b>Total Employee (EQ)</b>	1	1	Low	3
<b>Salary Slip (EQ)</b>	2	6	Low	3

<b>Update Password (EI)</b>	1	2	Low	3
<b>Leave List for Individual Employee(EQ)</b>	1	4	Low	3
<b>Update Profile Information(EI)</b>	1	5	Low	3
<b>Present Today(EQ)</b>	1	1	Low	3
<b>Total</b>				118

**FP count for data functions:**

**Table VII.** Data Functions Count

<b>Data Function</b>	<b>RET</b>	<b>DET</b>	<b>Complexity</b>	<b>FP Count</b>
<b>Department (ILF)</b>	1	2	Low	7
<b>Employee (ILF)</b>	3	12	Low	7
<b>Project (ILF)</b>	2	7	Low	7
<b>Attendance(ILF)</b>	1	5	Low	7
<b>Salary(ILF)</b>	2	4	Low	7
<b>Leave</b>	2	7	Low	7
<b>General</b>	2	6	Low	7
<b>Total</b>				49

### 4.4.3 Value Adjust Factor (VAF)

Rating each factor ( $F_i$ ,  $i=1$  to 14) on a scale of 0 to 5:



**Fig 4.1:** Rate of factor

**Table VIII.** Value Adjust Factor

Number	Factor	Value
1	Does the system require reliable backup and recovery?	3
2	Are specialized data communications required?	0
3	Are there any distributed processing functions?	0
4	Is performance critical?	1
5	Does the system run in existing operational environment?	3
6	Does the system require on-line data entry?	0
7	Input transaction over multiple screens	1
8	Are the ILFs updated on-line?	0
9	Are the input, output, files or inquiries complex?	3
10	Is the internal processing complex?	3
11	Is the code designed to be reusable?	1
12	Are conversation and installation included in the design?	3
13	Is the system designed for multiple installations?	0
14	Is the system designed to facilitate change and ease of use?	2
	$\Sigma (F_i)$	20

$$\text{VAF} = \text{Total divided by } 100 = 20/100 = 0.20$$

The factor of VAF varies in range from 0.65 (when all GSCs are low) to 1.35 (when all GSCs are high).

$$\text{FPC} = \text{UFP} * [0.65 + \text{VAF}]$$

$$= 167 * [0.65 + 0.20]$$

$$= 141.95$$

$$= 142 \text{ (Approximate)}$$

$$\text{Effort} = \text{FP} / \text{total no of function}$$

$$= 142/10$$

$$= 14.2$$

$$= 14.2/4 \text{ [4 months of project duration]}$$

$$= 3.55$$

$$= 3.5 \text{ person-month (Approximate)}$$

## 4.5 Process Based Estimation

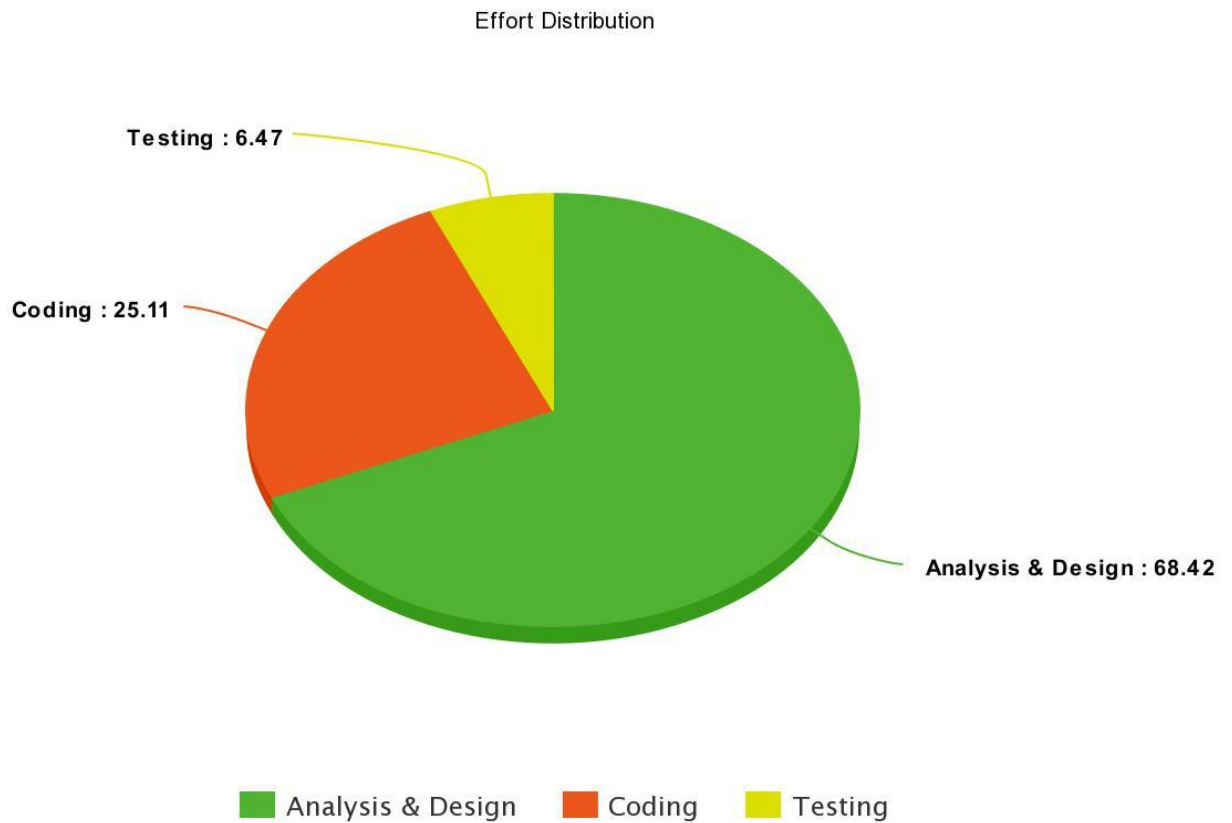
In process-based estimation, process is decomposed into a relatively small set of tasks and the effort required to accomplish each task is estimated. Process based estimation begins with a delineation of software functions obtained from the project scope. A series of software process activities must be performed for each function.

**Table IX.** Process Based Estimation

Activity	CC	Planning	Risk Analysis	Engineering		Construction		CE	Total
Function				Analysis	Design	Code	Test		
<b>F1</b>	0.25	0.25	0.5	2	3	2	0.05	n/a	8.05
<b>F2</b>	0	0.25	0	2	2	1	0.5	n/a	5.75
<b>F3</b>	0.5	0.25	0	2	2	1.5	0.4	n/a	6.65
<b>F4</b>	1	0.25	0.5	1	4	1	0.8	n/a	8.55
<b>F5</b>	0	0.5	0	1	1	3	0.5	n/a	6
<b>F6</b>	0.25	0.25	0	1	1.5	1	0.2	n/a	4.2
<b>F7</b>	0	0.25	0	1.5	1.2	1	0.4	n/a	4.35
<b>F8</b>	0.25	0.25	0	2	2	2	0.5	n/a	7
<b>F9</b>	0	0.25	0	1	1.5	1	0.2	n/a	3.95
<b>F10</b>	.5	2	0	4	1	3	0.7	n/a	11.2
<b>Total</b>	2.75	4.5	1	17.5	19.2	16.5	4.25	0	65.7
<b>Effort</b>	<b>4.19%</b>	<b>6.85%</b>	<b>1.52%</b>	<b>26.64%</b>	<b>29.22%</b>	<b>25.11%</b>	<b>6.47%</b>	<b>0%</b>	<b>100%</b>

## 4.6 Effort Distribution

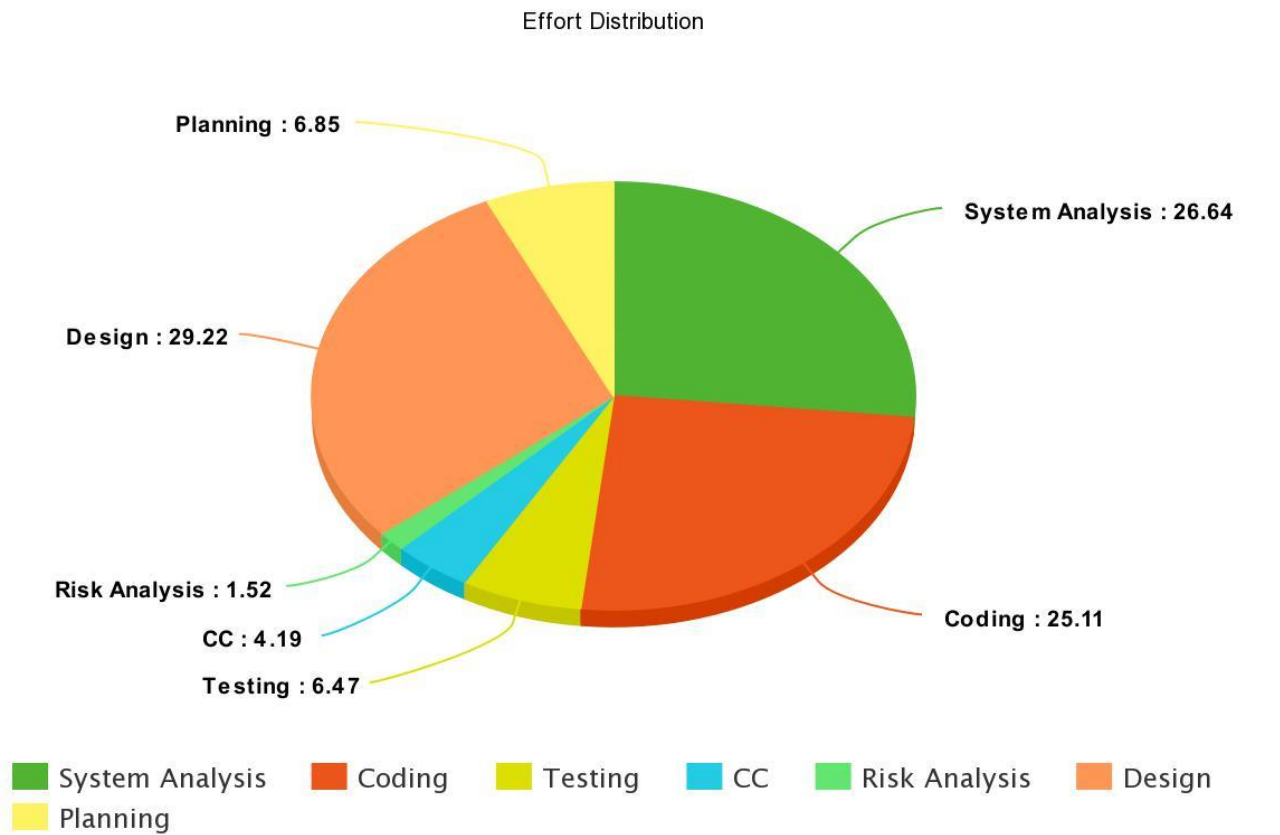
The project estimation technique leads to estimates of work units required to complete the software development. A recommended distribution of effort across the definition and development phases referred as the 40-20-40 rule [3]. Forty percent of all effort allocated to front-end analysis and design, twenty percent allocated to coding and the remaining forty percent allocated to back-end testing. This rule used as a guideline only. But in this software, the percentages are given below.



meta-chart.com

**Fig 4.2:** Overall Effort Distribution

### 4.6.1 Detail Effort Distribution

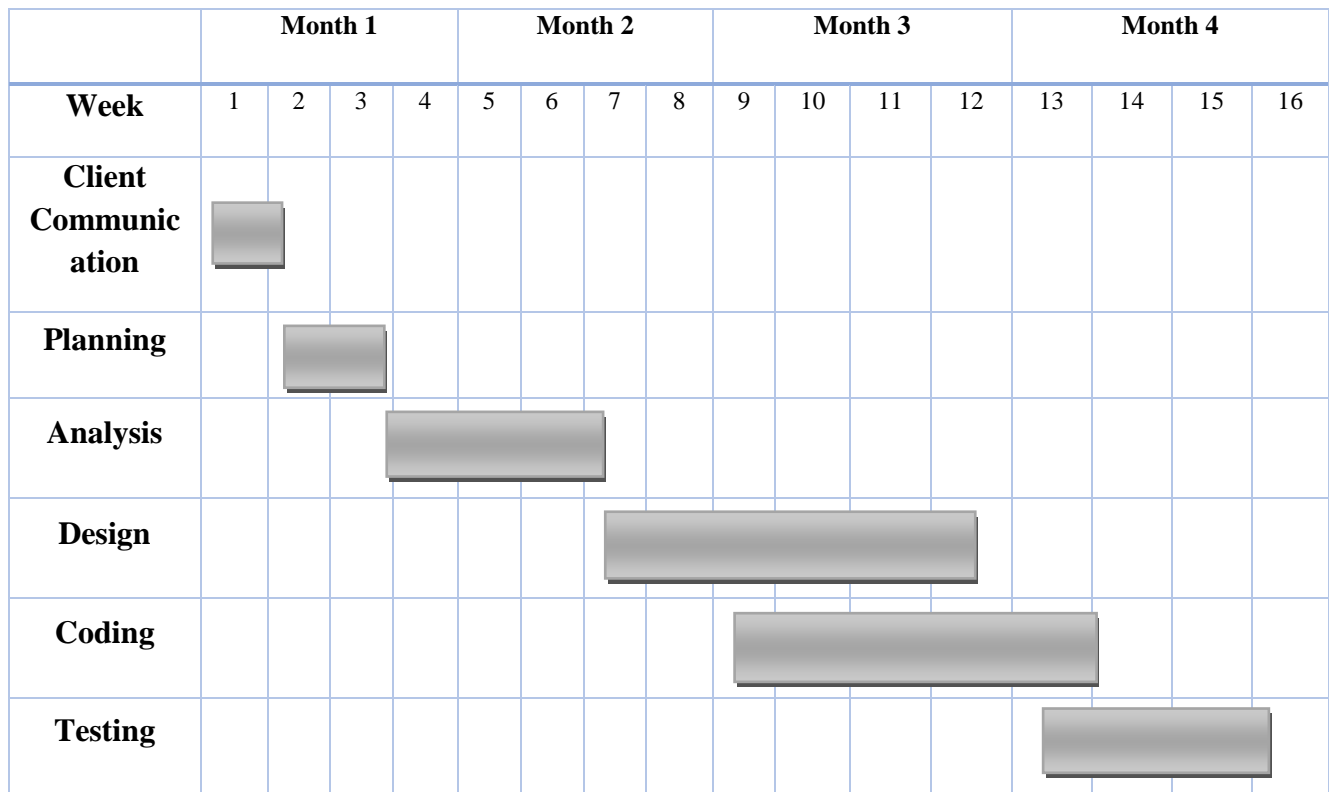


meta-chart.com

**Fig 4.3:** Detailed Effort Distribution



## 4.7 Project Scheduling Chart:



*Fig 4.4:* Project Scheduling

## 4.8 Personnel Requirement Chart

Month	Month 1				Month 2				Month 3				Month 4			
Week	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16
Business Modeling	CC															
Analysis		System Analyst														
Design							Designer									
Coding									Coder							
Testing & QA													Tester			

*Fig 4.5:* Personnel Requirement

## 4.9 Cost Estimation

Software cost: It is the cost of the software is which used in this project

Hardware cost: cost of the computer that used to complete the project.

Other cost: Other cost includes the cost of the house rent, telephone bill, electricity bill, convenience and so on.

- Number of days in a year = 365
- Number of government holidays in a year = 24
- Number of weekly holidays in a year = 52
- Total number of working days to develop the project in a year =  $365 - (52 + 24) = 289$  day
- Total number of working days per months to develop the project =  $289 / 12 = 24.08$  days
- Organization working hours per day = 8 hours
- Organization working hours per month =  $24.08 * 8 = 192$  hours
- Organization working hours per week =  $192 / 4 = 48$  hours
- Duration of the project = 4 months
- Total working hours for the project =  $192 * 4 = 768$  hours

### 4.9.1 Personnel Cost Estimation

**Table X.** Personnel Salary Per Month

Position	Salary/ Month	Salary /Hour
System Analyst	30,000	130
Senior Developer	25,000	109
Junior Developer	15,000	76
Coder/ Graphics Designer	15,000	50
Tester	20,000	60
Customer Communicator	10,000	50

It is very common to a single personnel of an IT office works in at least two to four projects in parallel. So, I am assuming the average is three projects and cost is divided to every project. In this scenario:

**Table XI.** Personnel Cost for Project

<b>Designation</b>	<b>Number of Person</b>	<b>Working week</b>	<b>Cost</b>	<b>Per Personnel Cost</b>
<b>System Analyst</b>	1	6	$(6*48*130)/3$	12480
<b>Designer</b>	1	6	$(6*48*109)/3$	10464
<b>Coder/ Developer</b>	1	5	$(5*48*100)/3$	8000
<b>Tester</b>	1	4	$(4*48*90)/3$	5760
<b>Customer Communicator</b>	1	2	$(2*48*50)/3$	1600
			<b>Total</b>	<b>38304</b>

## 4.9.2 Hardware Cost

It is expected that the life of hardware is 5 years. So, an asset with a life of 5 would have a sum of digits as follows:  $5 + 4 + 3 + 2 + 1 = 15$ .

The percentage of month is:  $1/15 = 6.67\% = 0.0667$

The depreciation cost of Computer is  $= (30000 * 0.0667) = 2001$

The depreciation cost of Scanner is  $= (1800 * 0.0667) = 120.06$

The depreciation cost of Printer is  $= (2200 * 0.0667) = 146.74$

**Table XII.** Hardware Cost

Name	Amount	Depreciation Cost
<b>1 laptops</b>	30000	2001
<b>Scanner</b>	1800	120.06
<b>Printer</b>	2200	146.74
	Total	2267.8

### 4.9.3 Software Cost

**Table XIII.** Software Cost

<b>Name</b>	<b>Amount</b>
<b>MS Windows 10</b>	50.00
<b>MS Office 2013</b>	50.00
<b>XAMPP</b>	Free
<b>MySQL</b>	Free
<b>Adobe Dreamweaver</b>	50.00
<b>Adobe Photoshop</b>	50.00
<b>Total</b>	200.00

### 4.9.4 Other Cost

**Table XIV:** Other Cost

<b>Name/Utility</b>	<b>Monthly Bill Rate</b>	<b>Bill Calculated for 4 months</b>	<b>Total</b>
<b>Electricity Bill</b>	800	3200	7200
<b>Internet Bill</b>	1000	4000	

## 4.9.5 Total Cost Estimation

**Table XV.** Total Cost

<b>Personnel Cost</b>	<b>Hardware Cost</b>	<b>Software Cost</b>	<b>Others Cost</b>	<b>Total Cost (BDT)</b>
38304	2267.8	200	7200	47971.8 TK

# **Chapter 5**

## **Risk Engineering**



## 5.1 Risk Management

A risk is a potential problem that might or might not happen. It is necessary to analyze the potential risks in a project. If the risks of a software project are not properly analyzed and estimated, many problems can plague the software project. Risk analysis and management are a series of steps that help a software team to understand and manage uncertainty.

## 5.2 Risk Identification

Risk Type	Possible Risks
Technology	<ul style="list-style-type: none"><li>• Security of the system.</li><li>• Reusable software components may contain defects and cannot be reused as planned.</li></ul>
People	<ul style="list-style-type: none"><li>• Key staff are ill and unavailable at critical times.</li><li>• Required training for staff is not available.</li></ul>
Organizational	<ul style="list-style-type: none"><li>• Organizational financial problems force reductions in the project budget.</li></ul>
Requirement	<ul style="list-style-type: none"><li>• Changes to requirements that require major design rework are proposed.</li><li>• Customers fail to understand the impact of requirements changes.</li></ul>

### 5.3 Risk Analysis

<b>Risk</b>	<b>Probability</b>	<b>Effects</b>
Organizational financial problems force reduction in the project budget	Low	Disastrous
Security of the system	High	Serious
Reusable software components contain defects that means they cannot be reused as planned.	Moderate	Serious
Changes to requirements that require major design rework are proposed.	Moderate	Serious
Required training for staff is not available.	Moderate	Tolerable
Customers fail to understand the impact of requirements changes.	Moderate	Tolerable

### 5.4 Risk Planning

<b>Risk</b>	<b>Strategy</b>
Security	Investigate the possible security leaks and measurements.
Organizational financial problem	Prepare a briefing documents for senior management showing how the project is making a very important contribution to the goals of business and presenting reasons why cuts to the project budget would not be

	cost-effective.
Requirements problems	Alerts customer to potential difficulties and possibilities of delay, investigate buying in components
Staff illness	Reorganize them so that there is more overlap work and people therefore understand each other jobs.
Defective component	Replace defective potential components with bought in component of know reliability.
Requirements change	Replace defective potential component with bought in component of know reliability.
Requirement changes	Derive traceability information to access requirements, change impact, maximizing information hiding in the design.

## 5.5 Risk Monitoring

A re-planning of the project occurs. New task schedule and milestones are defined. Staffs work on their assigned jobs within the new timelines. In order to prevent this happening, the software will develop for the end user.

The user interface will design in a way to make of the program convenient and pleasurable.

Meetings (formal and informal) will be the client regularly. This ensures that the software we are developing solves problems.

The development cost of the software may increase by 20%. During development it is advised to consult with the system analyst during the system analysis, design testing phase of the software project.

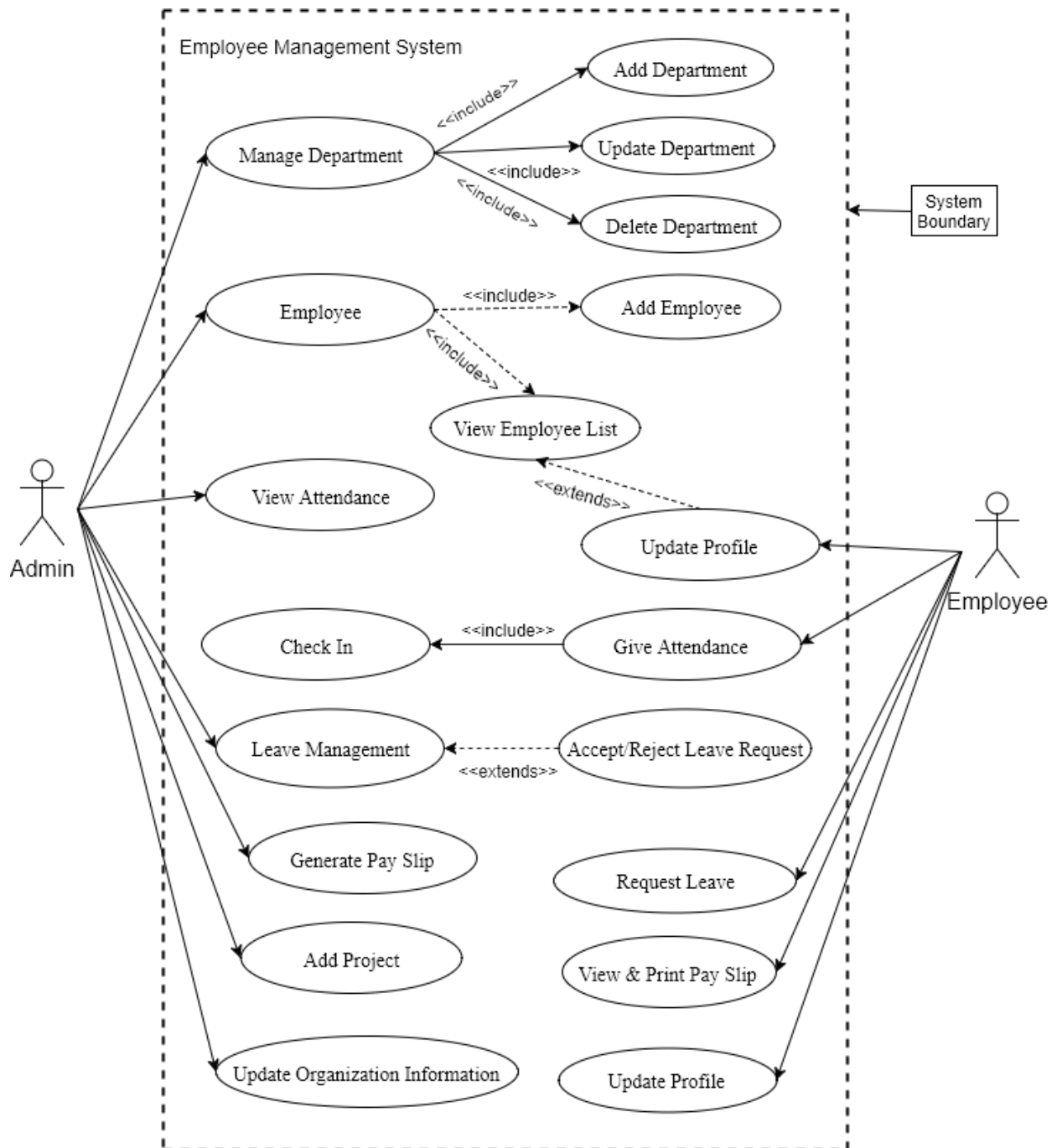
Proper coding grammar is followed to make sure that the codes are easily understandable and reusable.

Cost and time will increase and project will be updated. Everything will be at where it all started.

# **Chapter 6**

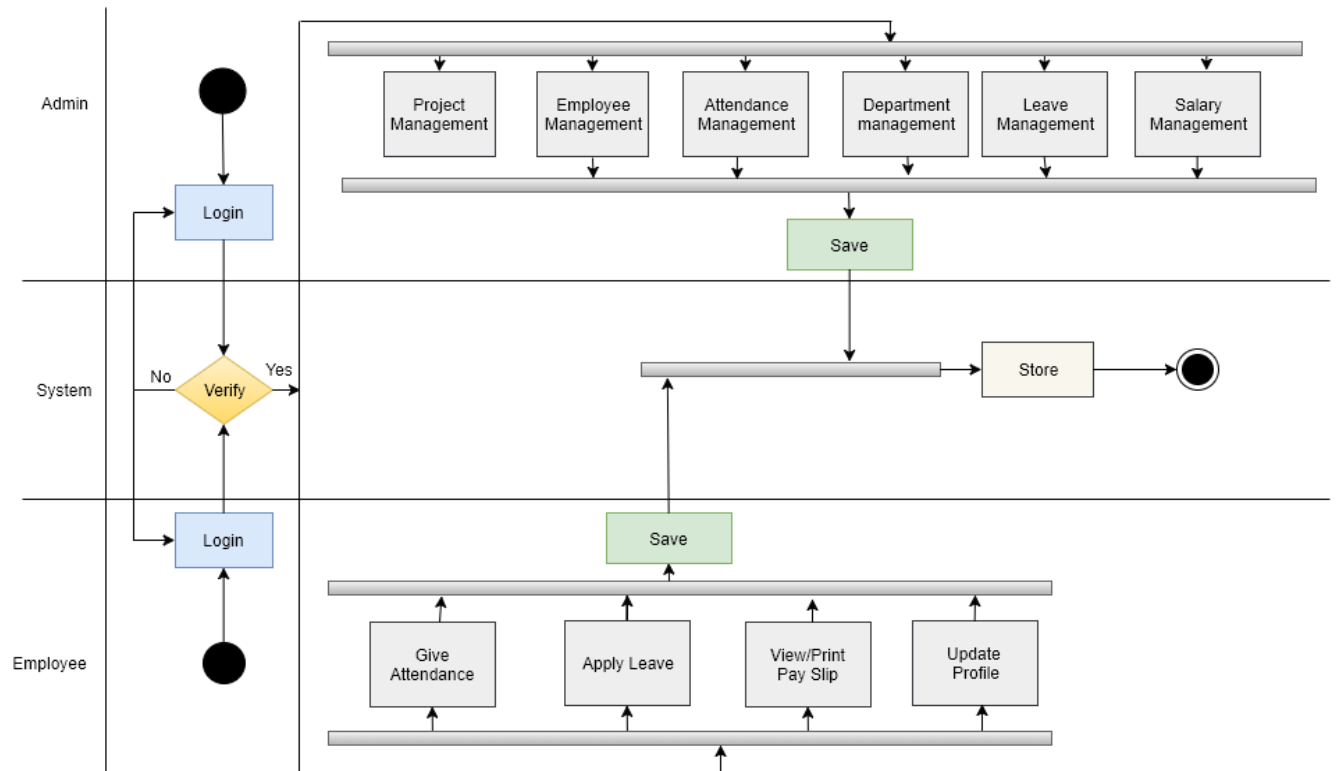
## **Analysis and Design**

## 6.1 Use Case Diagram



**Fig 6.1:** Use Case Diagram

## 6.2 Swim Lane Diagram

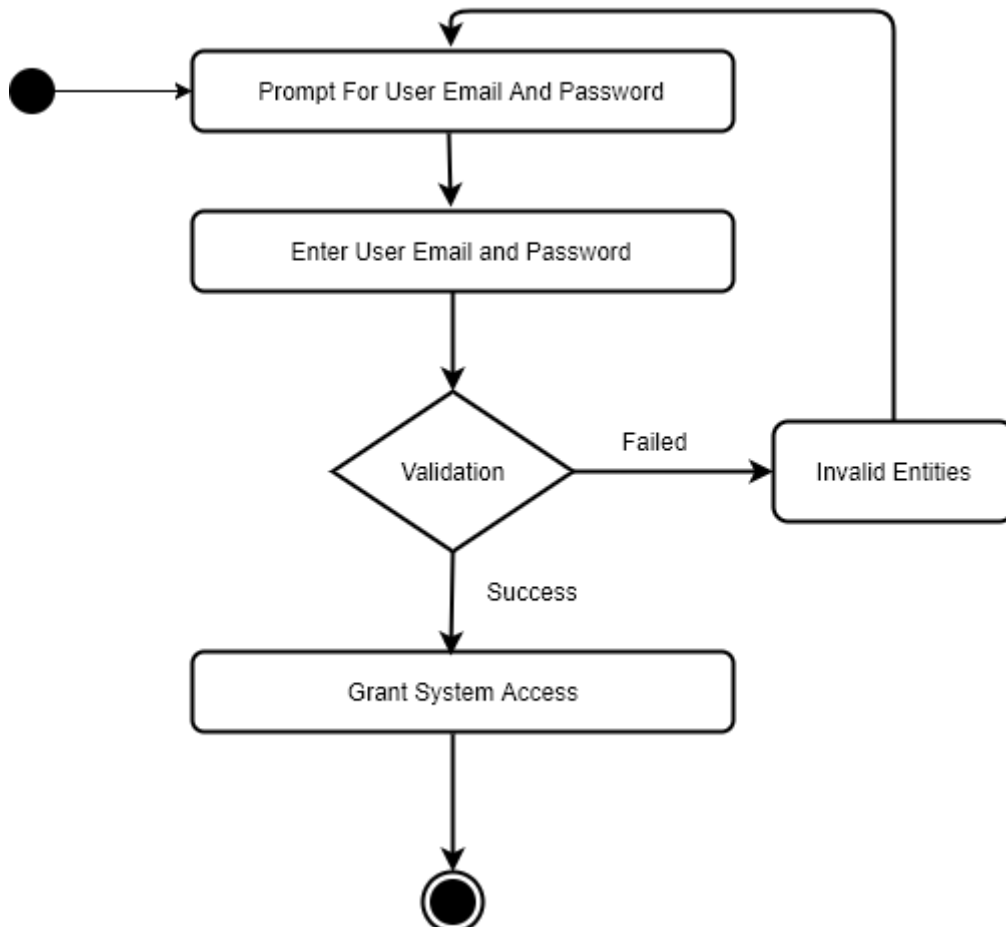


*Fig 6.2:* Swim Lane Diagram

## 6.3 Activity Diagram

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency [4]. In the Unified Modeling Language, activity diagrams are intended to model both computational and organizational processes (i.e. workflows). Activity diagrams show the overall flow of control.

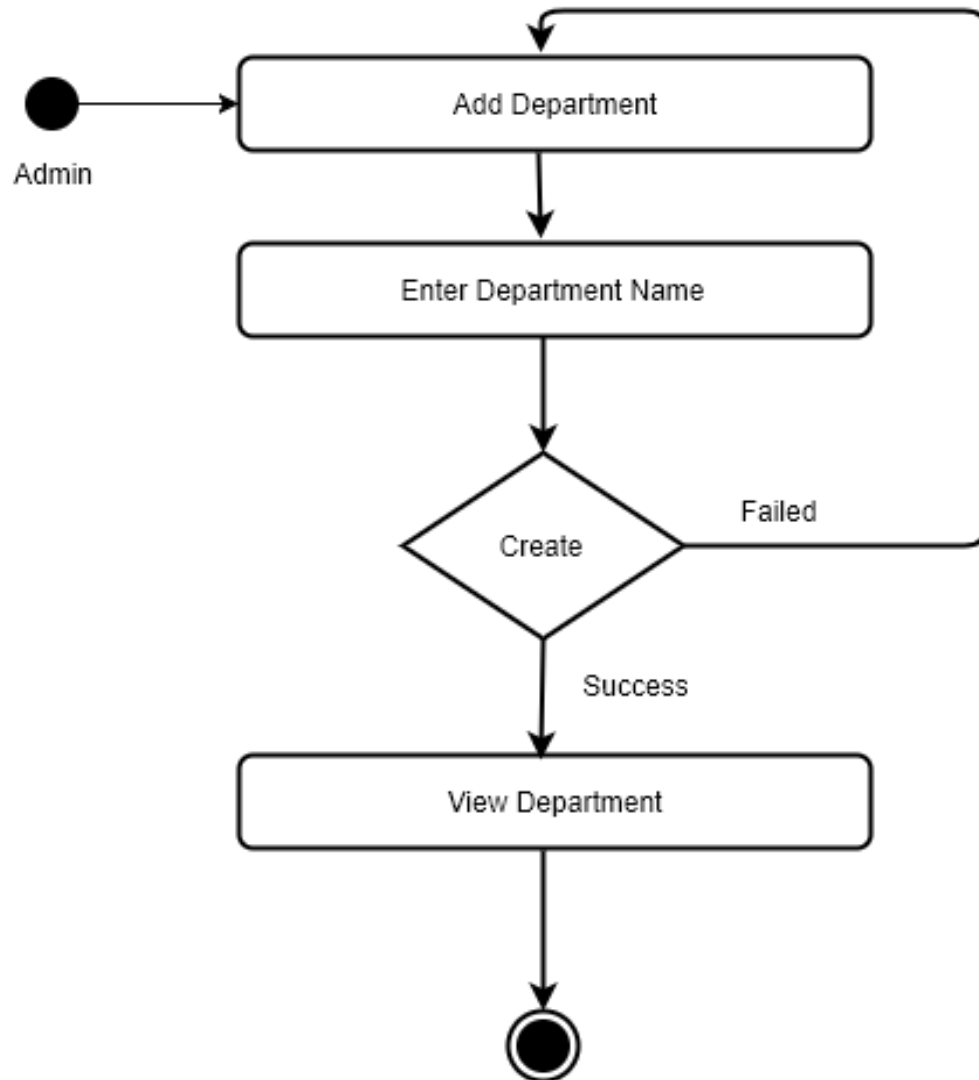
### 6.3.1 Activity Diagram for User Login



**Fig 6.3:** Activity Diagram for User Login

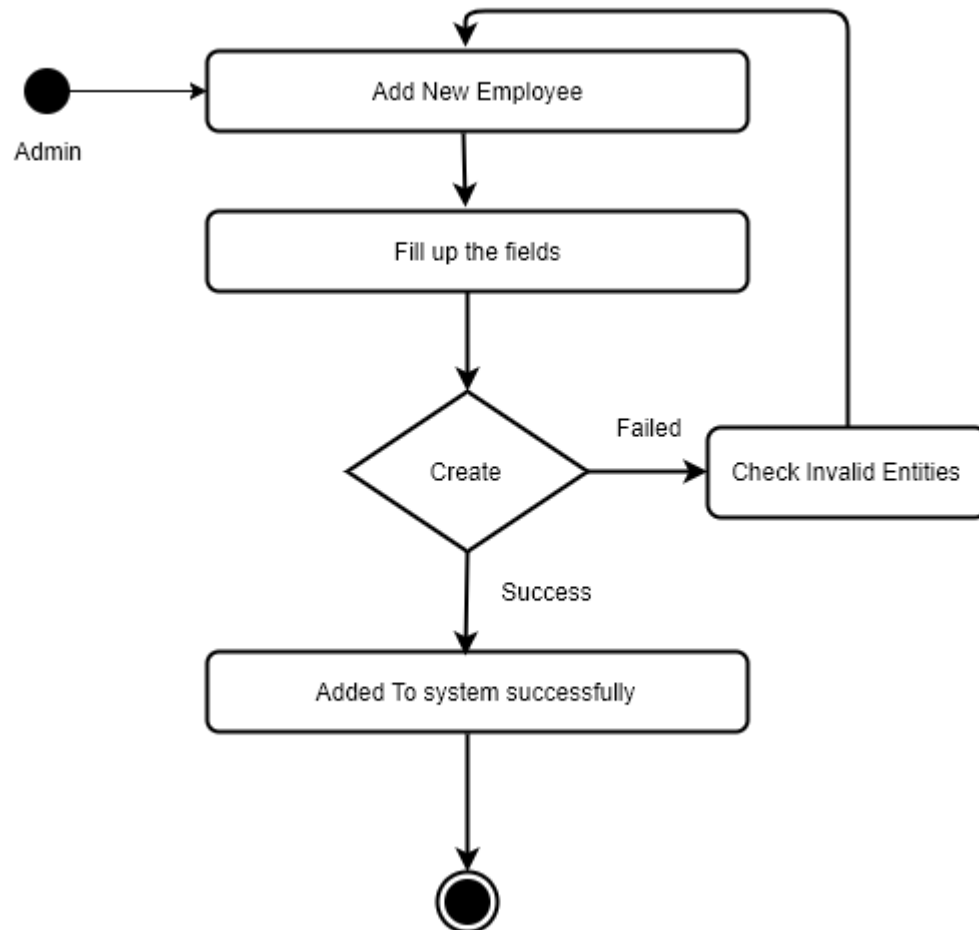


### 6.3.2 Activity Diagram for Adding Department



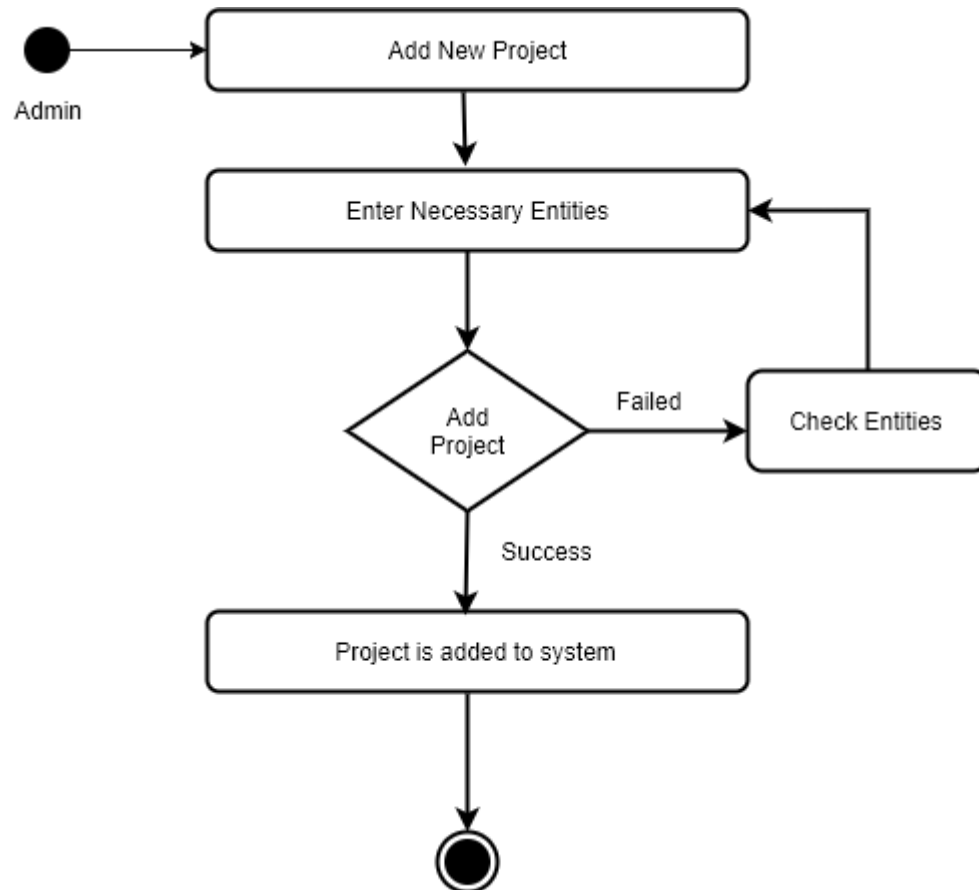
**Fig 6.4:** Activity Diagram for Adding Department

### 6.3.3 Activity Diagram for Adding New Employee



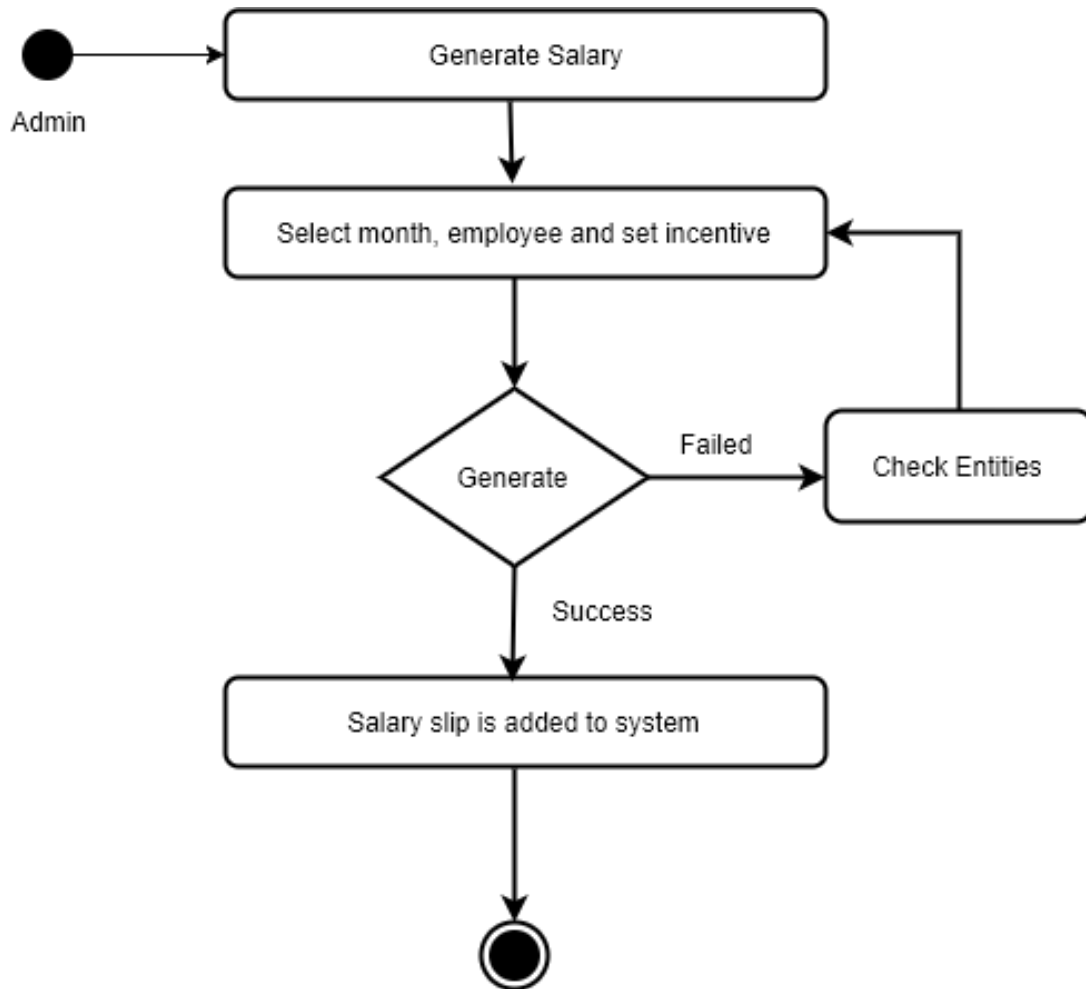
**Fig 6.5:** Activity Diagram for Adding New Employee

### 6.3.4 Activity Diagram for Adding New Project



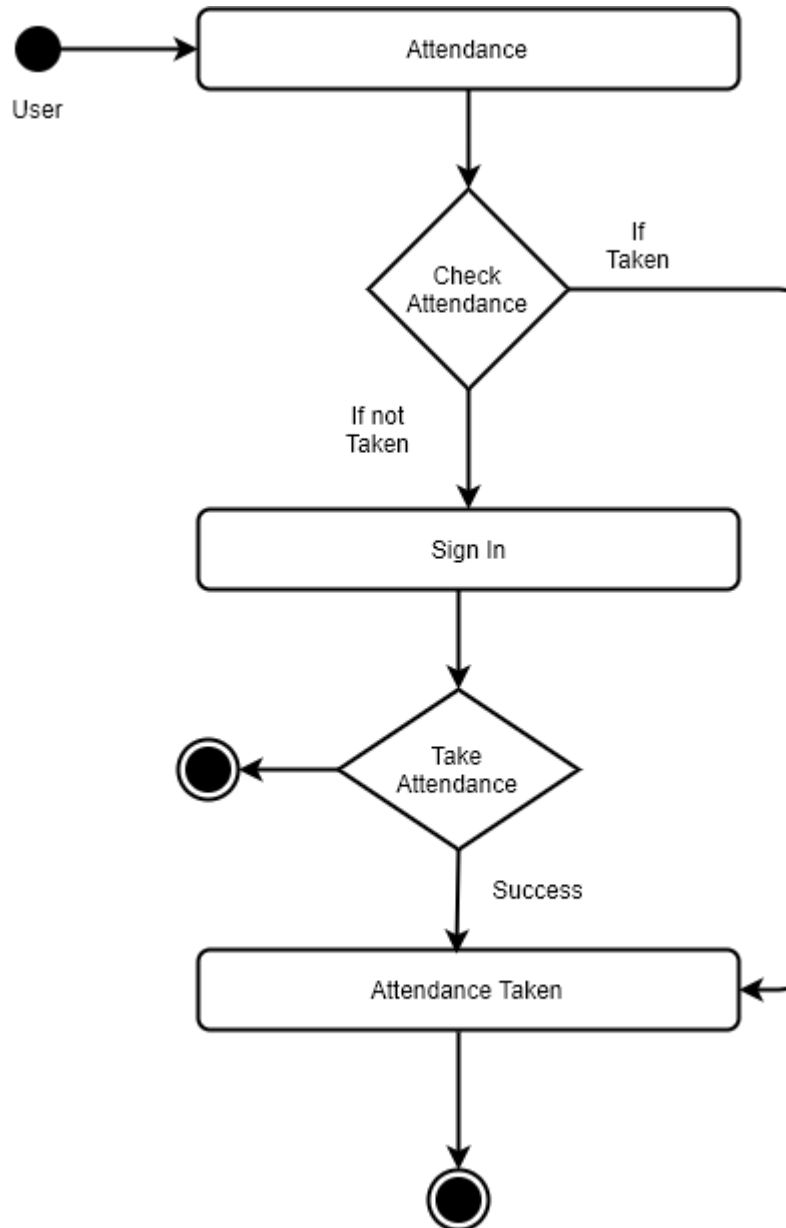
**Fig 6.6:** Activity Diagram for Adding New Project

### 6.3.5 Activity Diagram for Generating Salary



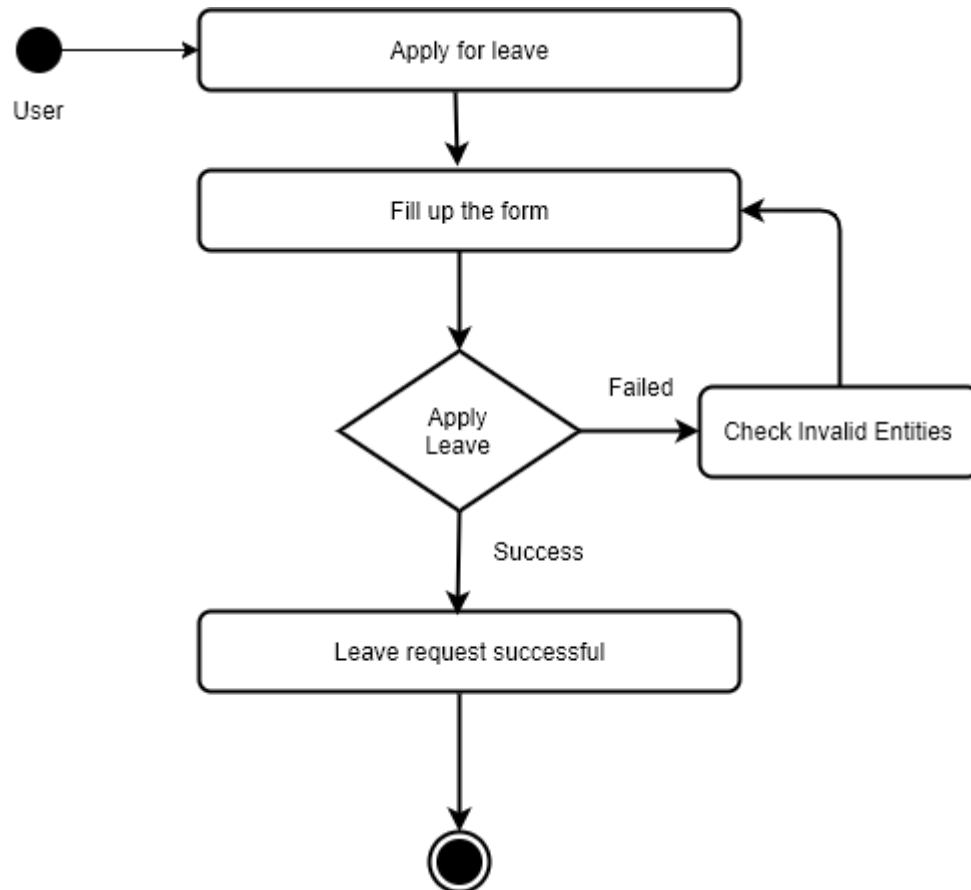
**Fig 6.7:** Activity Diagram for Generating Salary

### 6.3.6 Activity Diagram for Attendance



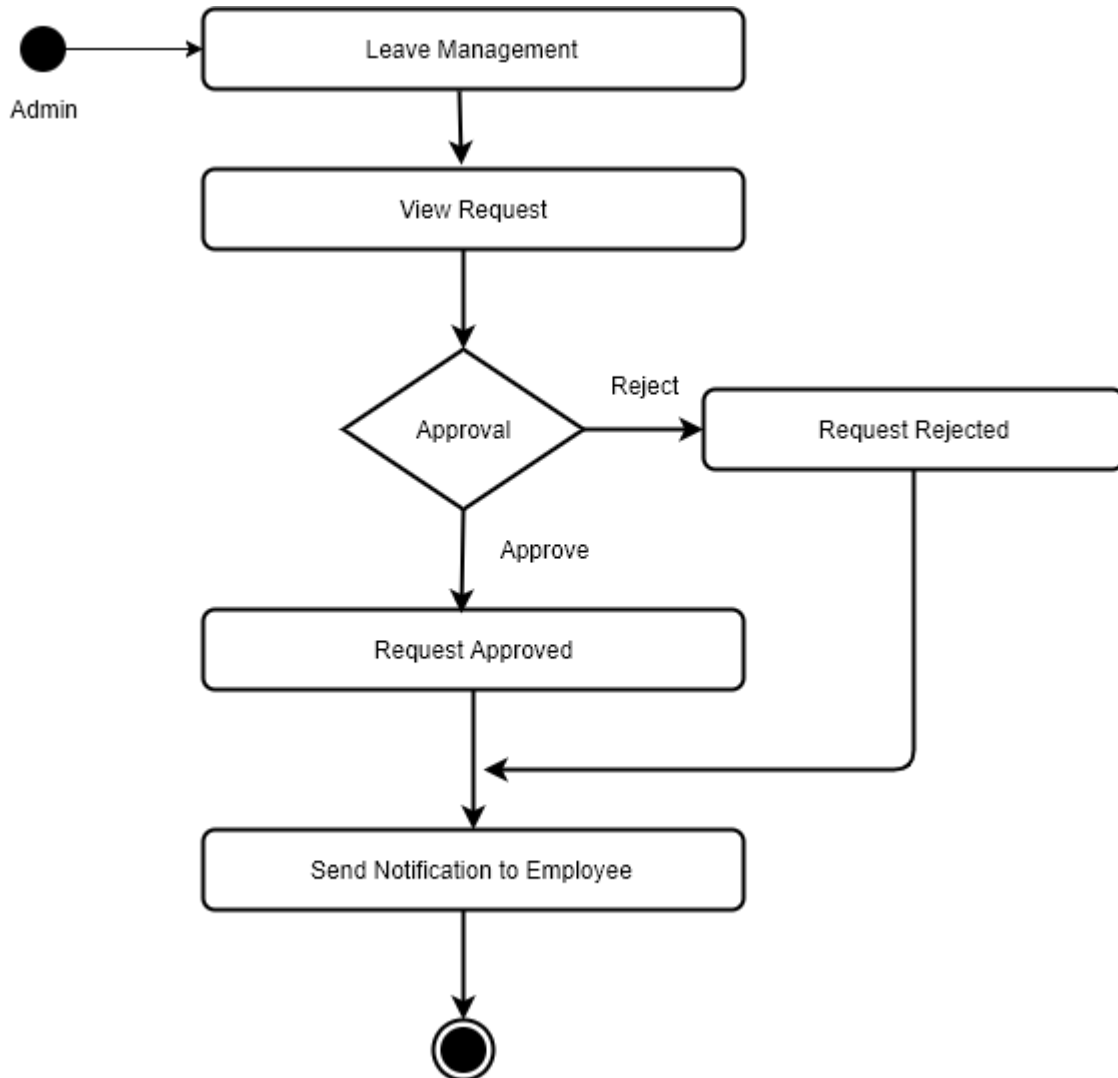
*Fig 6.8:* Activity Diagram for Attendance

### 6.3.7 Activity Diagram for Applying Leave



**Fig 6.9:** Activity Diagram for Applying Leave

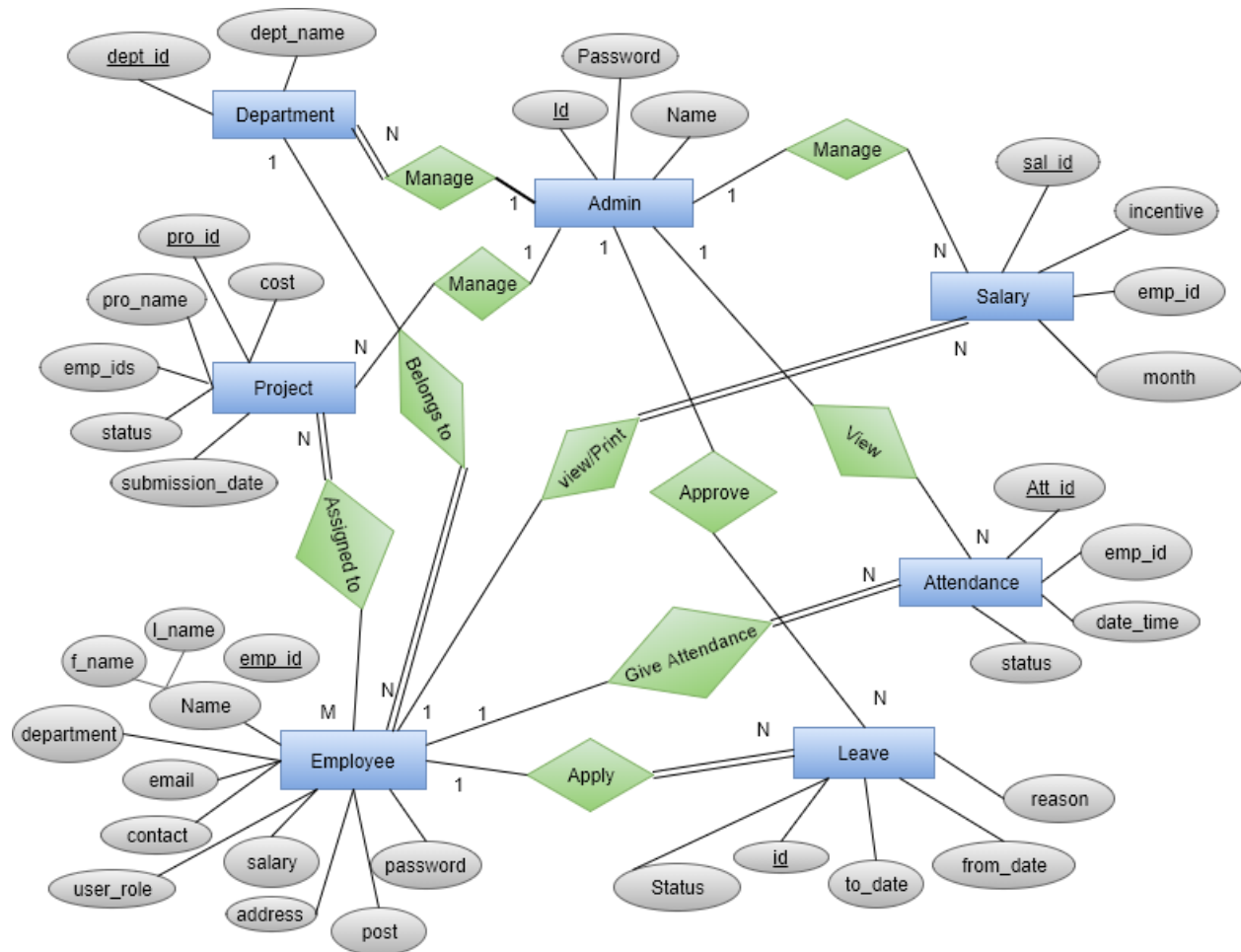
### 6.3.8 Activity Diagram for Leave Management



**Fig 6.10:** Activity Diagram for Leave Management

## 6.3 Entity Relationship Diagram

An entity relationship model, also called an entity-relationship (ER) diagram, is a graphical representation of entities and their relationships to each other, to the organization of data within databases or information systems. An entity is a piece of data—an object or concept about which data is stored.



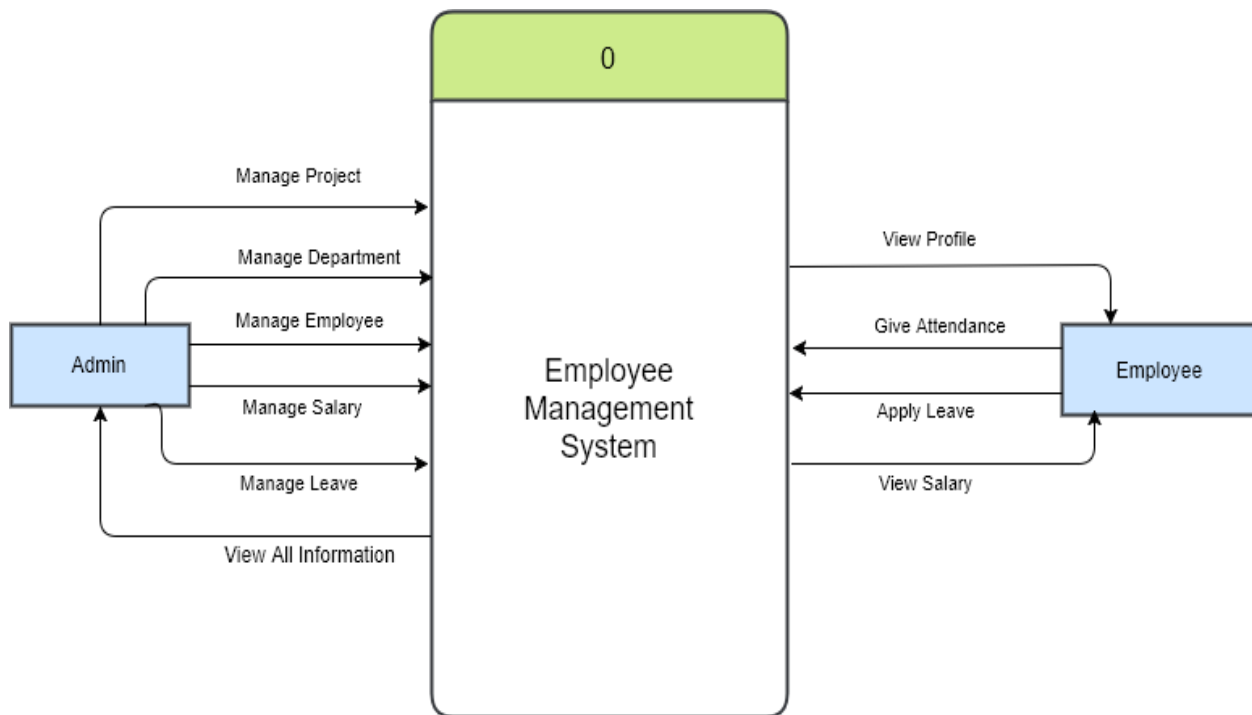
*Fig 6.11: ER Diagram*



## 6.4 Data Flow Diagram

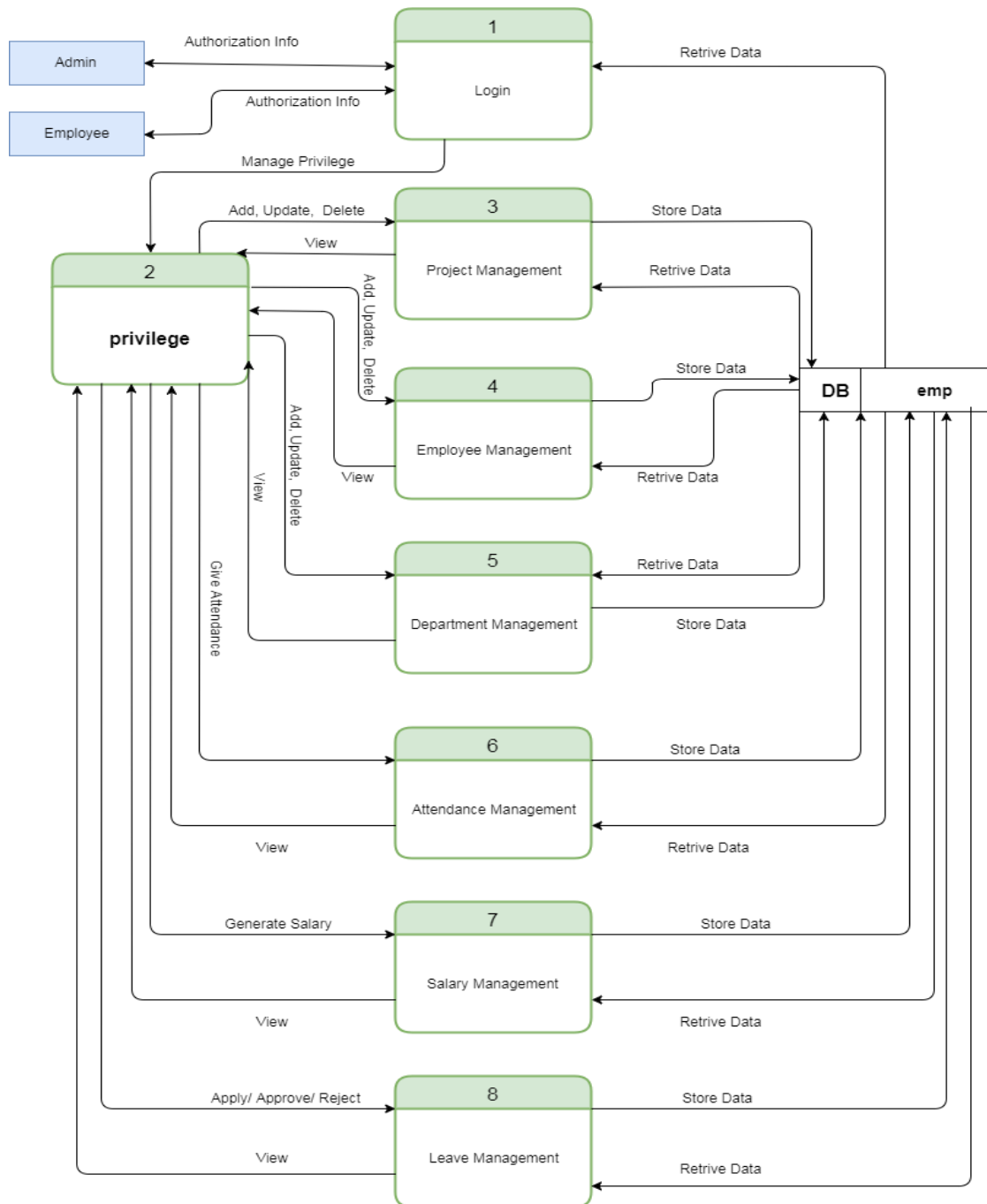
Also known as DFD, Data flow diagrams are used to graphically represent the flow of data in a business information system. DFD describes the processes that are involved in a system to transfer data from the input to the file storage and reports generation [5].

### 6.4.1 Context Level DFD



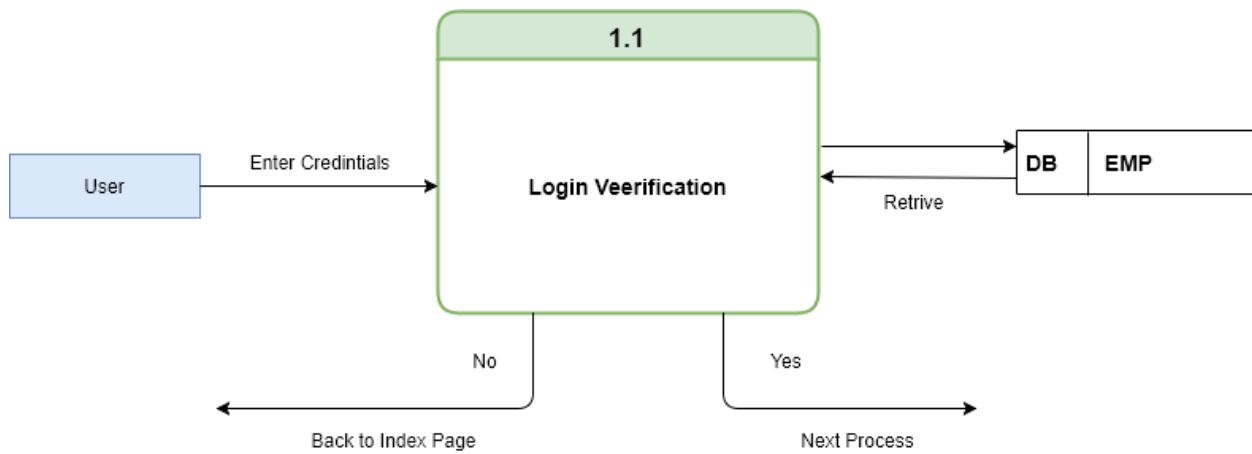
**Fig 6.12:** Context Level DFD

## 6.4.2 First Level DFD



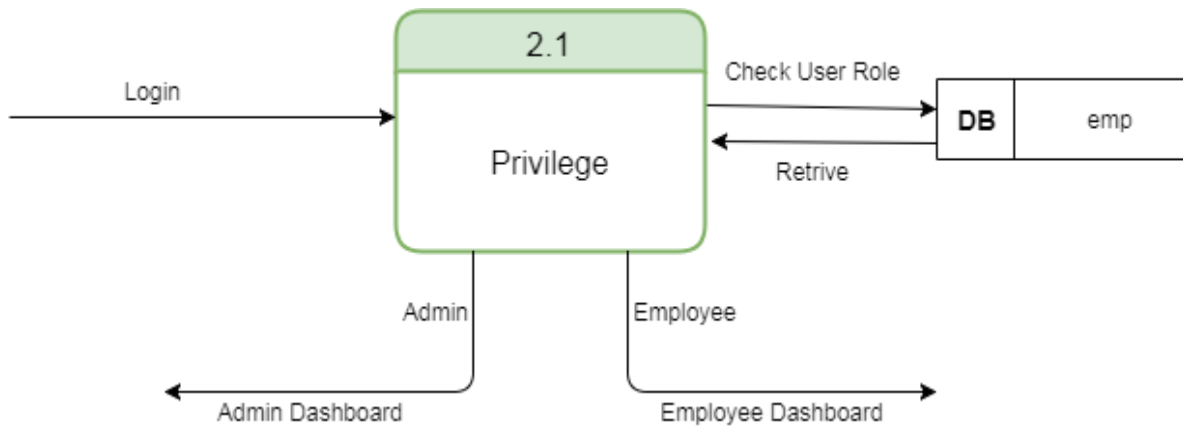
**Fig 6.13:** First Level DFD

### 6.4.3 Level 2 Process 1 (Login)



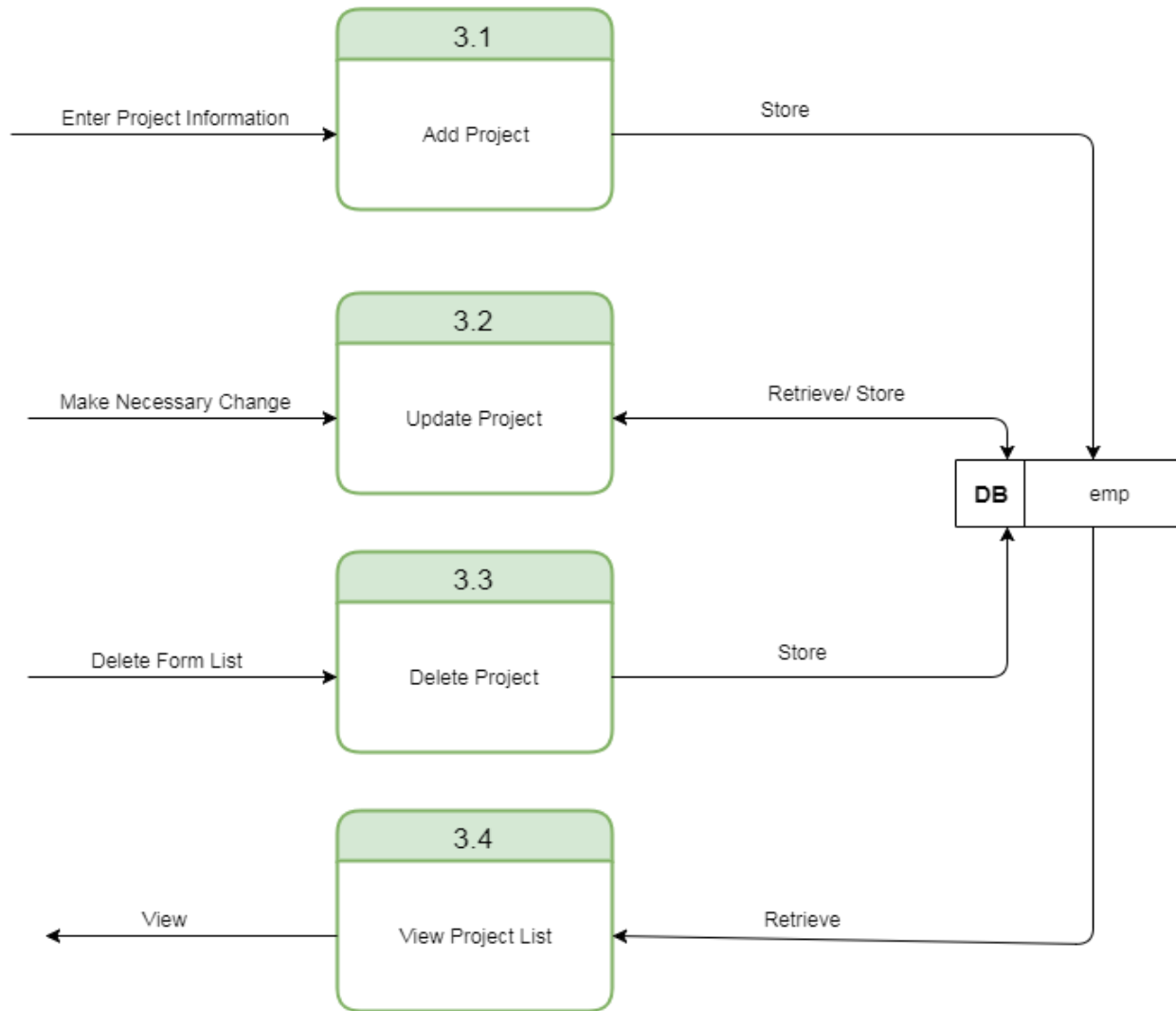
**Fig 6.14:** Level 2 Process 1 (Login)

### 6.4.4 Level 2 Process 2 (Privilege)



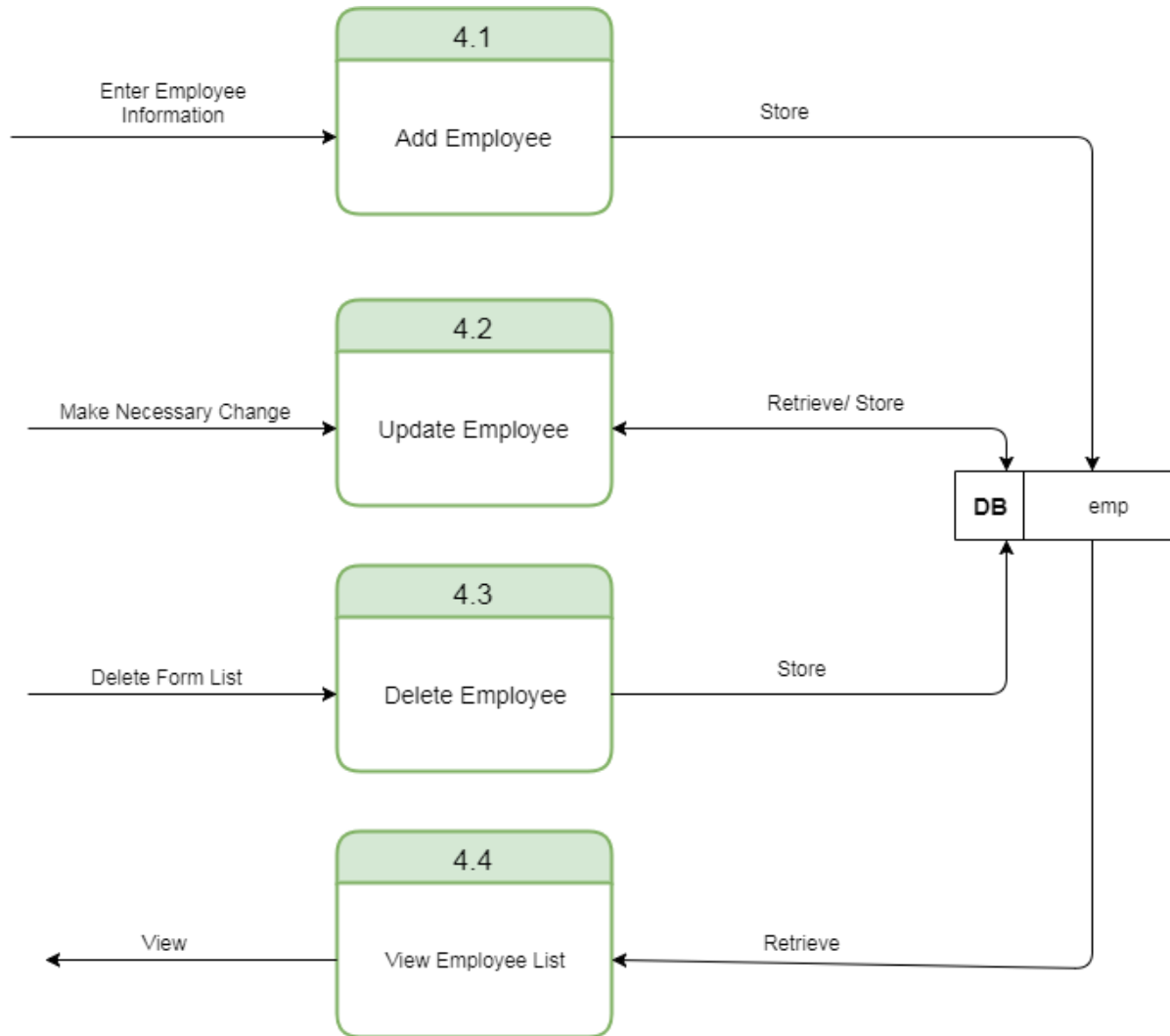
**Fig 6.15:** Level 2 Process 2 (Privilege)

### 6.4.5 Level 2 Process 3 (Project Management):



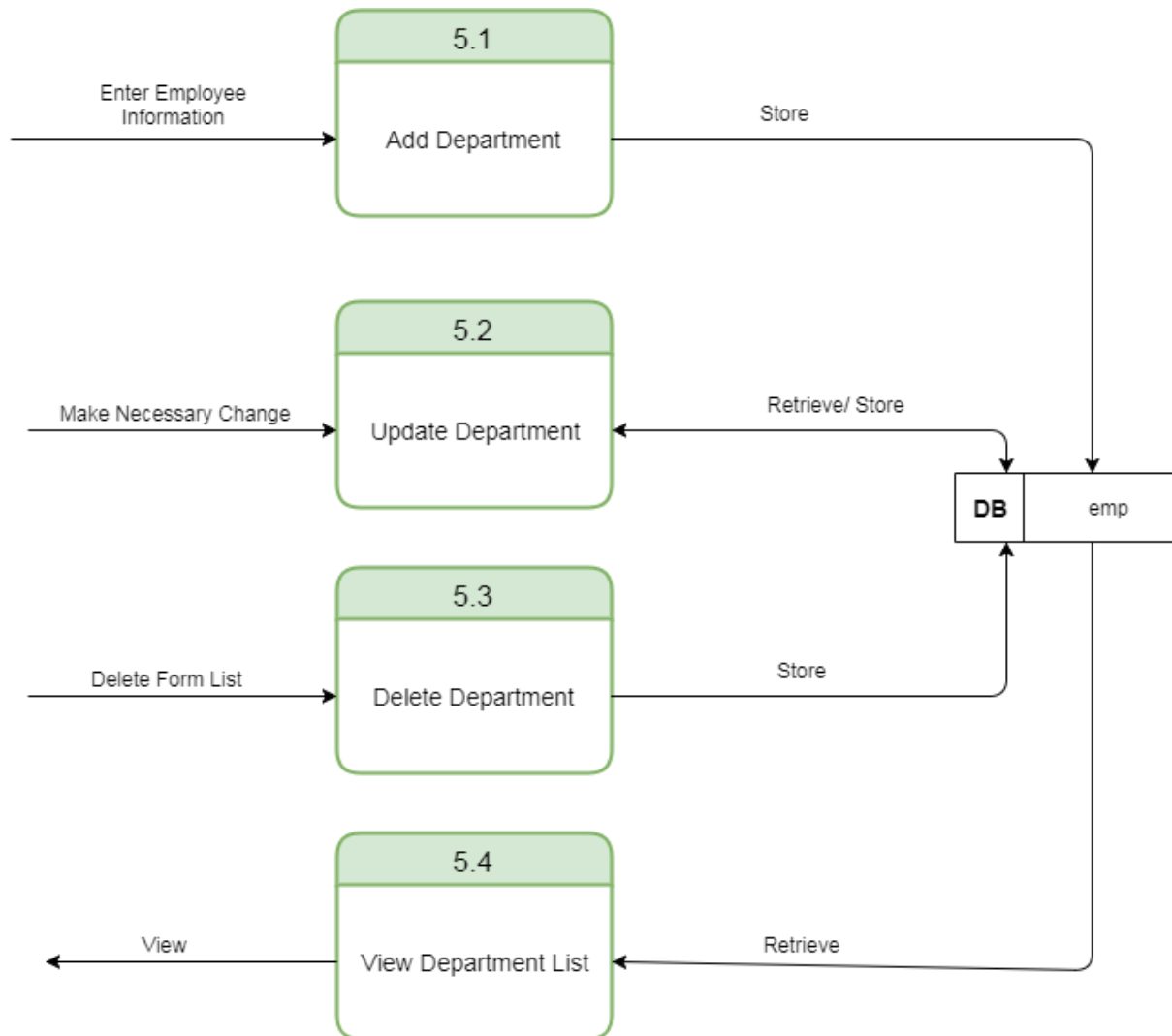
**Fig 6.16:** Level 2 Process 3 (Project Management)

#### 6.4.6 Level 2 Process 4 (Employee Management):



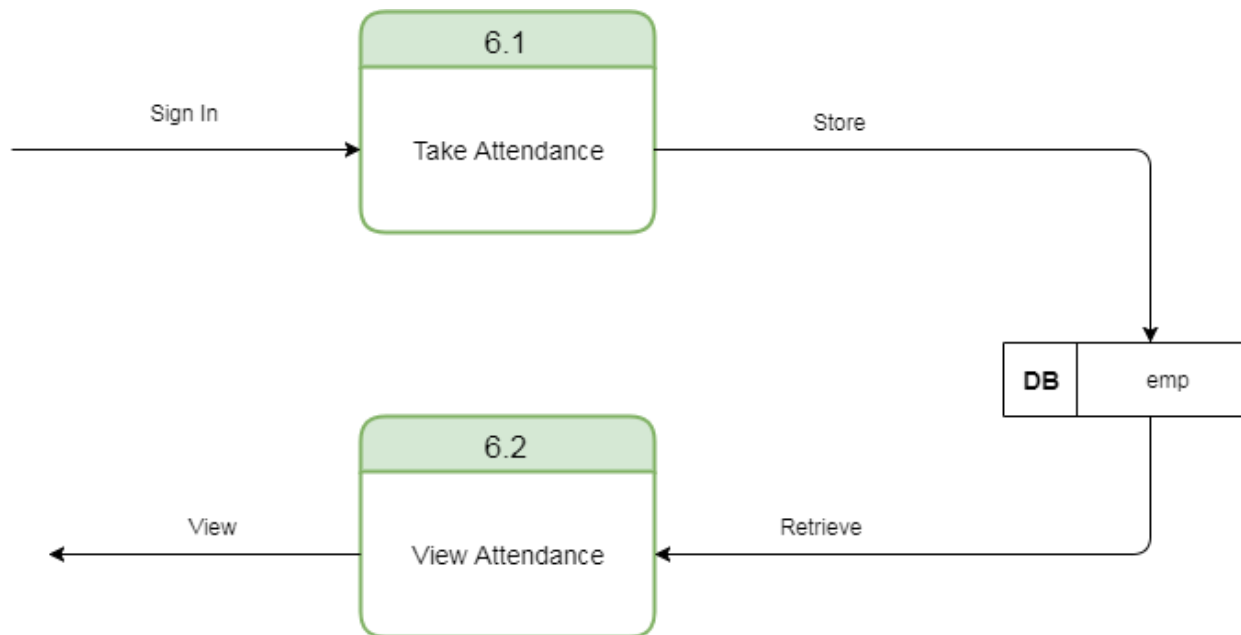
**Fig 6.17:** Level 2 Process 4 (Employee Management)

### 6.4.7 Level 2 Process 5 (Department Management):



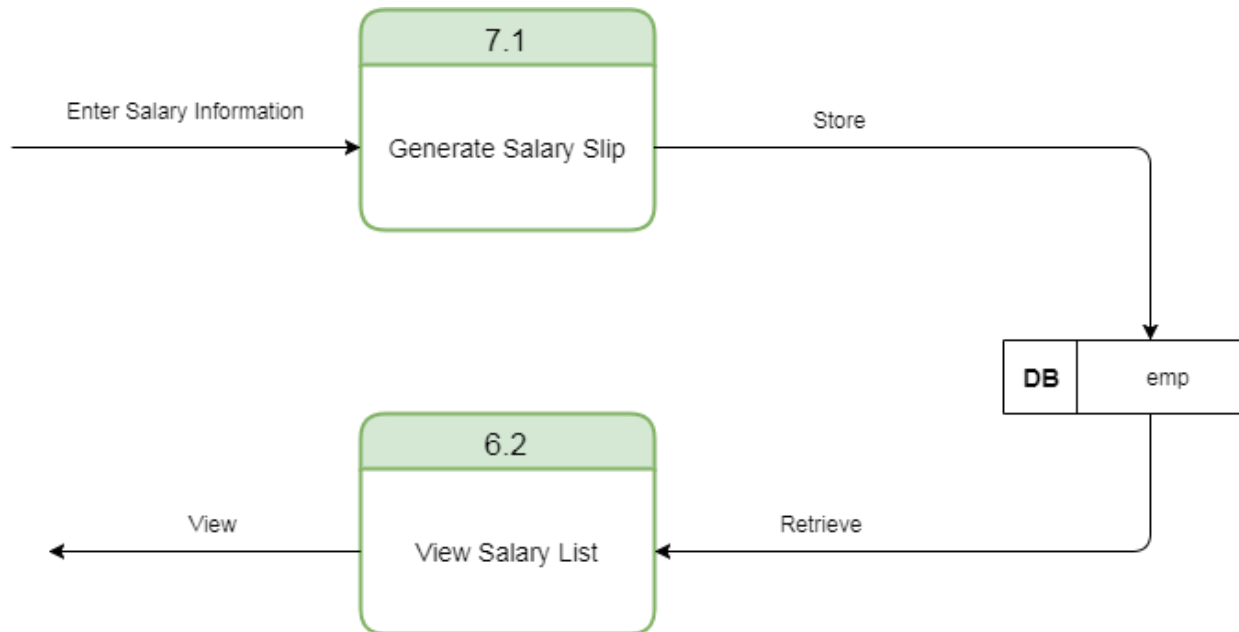
**Fig 6.18:** Level 2 Process 5 (Department Management)

#### 6.4.8 Level 2 Process 6 (Attendance Management)



**Fig 6.19:** Level 2 Process 6 (Attendance Management)

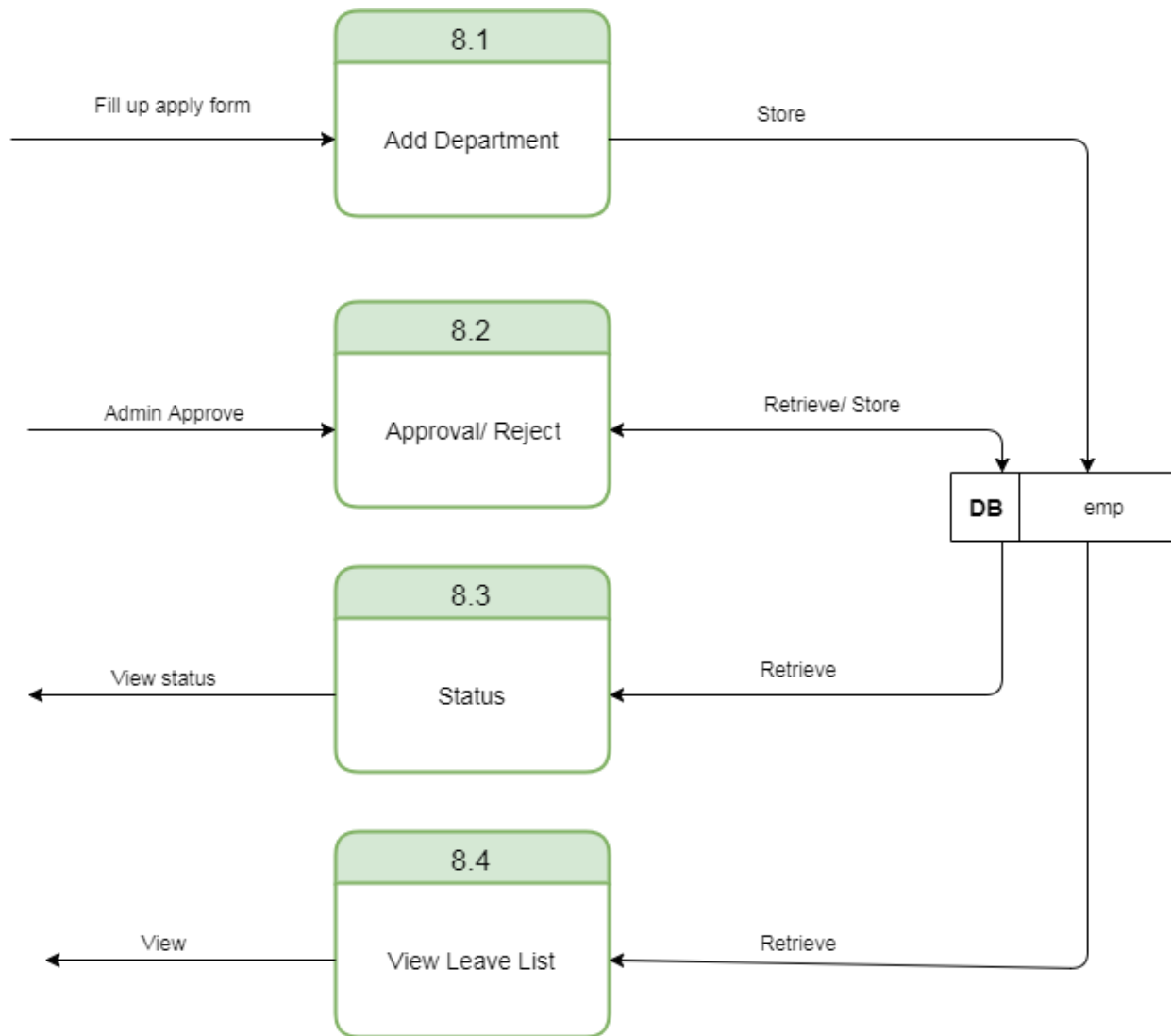
### 6.4.9 Level 2 Process 7 (Salary Management)



**Fig 6.20:** Level 2 Process 7 (Salary Management)



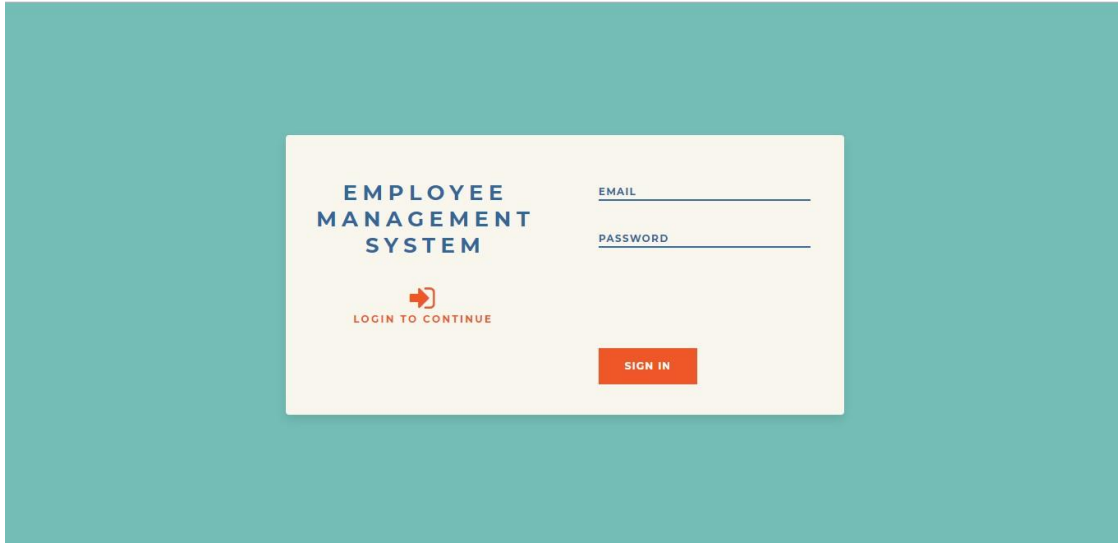
#### 6.4.10 Level 2 Process 8 (Leave Management)



**Fig 6.21:** Level 2 Process 8 (Leave Management)

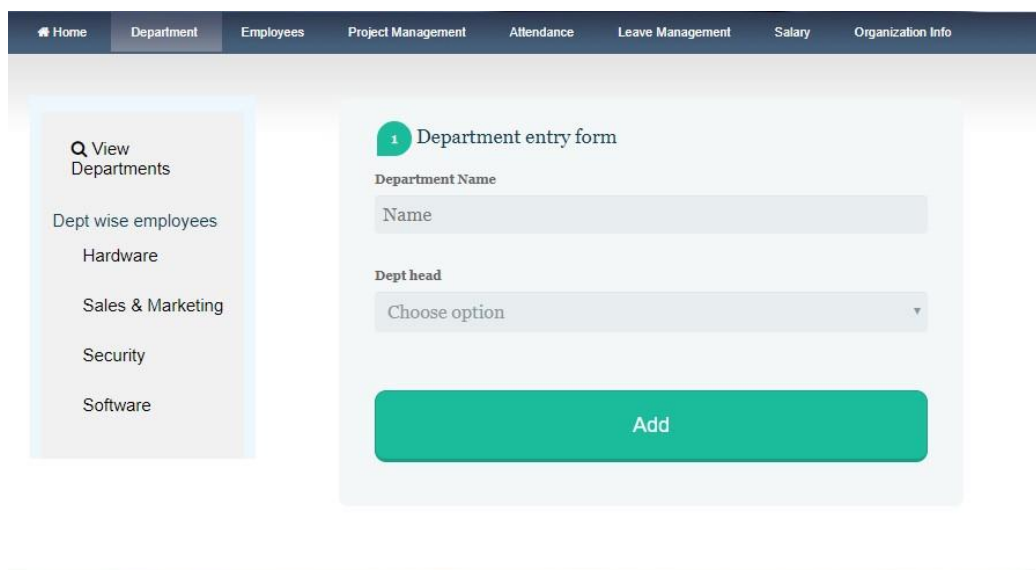
## 6.5 Interface

### 6.5.1 Login Page



*Fig 6.22:* Login Page

### 6.5.2 Add Department



*Fig 6.23:* Add Department

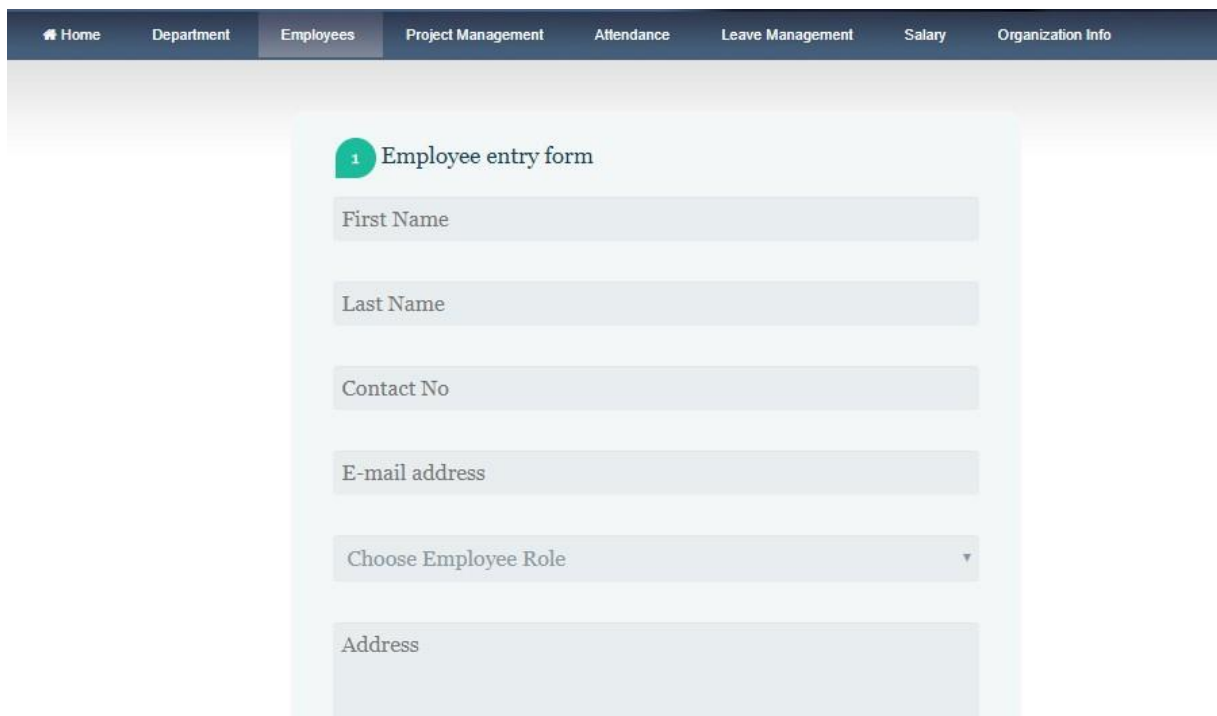
## 6.5.3 Department List



#	ID	Department Name	Head	Emp Num	Action
1	3	Hardware	↺		<a href="#">Edit</a> <a href="#">Delete</a>
2	4	Software	↺		<a href="#">Edit</a> <a href="#">Delete</a>
3	5	Sales & Marketing	↺		<a href="#">Edit</a> <a href="#">Delete</a>
4	6	Security	↺		<a href="#">Edit</a> <a href="#">Delete</a>

*Fig 6.24:* Department List

## 6.5.4 Employee Entry



1 Employee entry form

First Name

Last Name

Contact No

E-mail address

Choose Employee Role ▼

Address



## 6.5.6 Add Project

The screenshot displays a web application interface for adding a new project. At the top, a navigation bar contains links to Home, Department, Employees, Project Management (active), Attendance, Leave Management, Salary, and Organization Info. The main content area is divided into two sections. On the left, a sidebar titled 'Search Projects by' offers three search filters: 'All Project Records', 'Complete Project', and 'Pending Project'. The right section, titled '1 Project entry form', contains the following fields: 'Project Name' (Title/Name), 'Client Name' (Client), 'Project details' (project description), 'Assign to member' (Select member), 'Project Completion Deadline' (Completion Date), 'Project Status' (Progress), and 'Estimated Cost' (cost). An 'Add' button is located at the bottom of the form.

Home Department Employees **Project Management** Attendance Leave Management Salary Organization Info

**1 Project entry form**

**Search Projects by**

Search Project BY

- 🔍 All Project Records
- 🔍 Complete Project
- 🔍 Pending Project

**Project Name**

Title/Name

**Client Name**

Client

**Project details**

project description

**Assign to member**

Select member

**Project Completion Deadline**

Completion Date

**Project Status**

Progress



**Estimated Cost**

cost

**+ Add**

**Fig 6.27:** Add project

## 6.5.7 View Project

Home	Department	Employees	Project Management	Attendance	Leave Management	Salary	Organization Info
	Search Project						
#	Project Name	Description	Client	Makers	Cost	Status	Action
1	Shrimp Export	vjc	Mr.a	Akash Khan Md. Murad Hossain Tuhin	25	complete	 

*Fig 6.28:* View project

## 6.5.8 Attendance (Sign in)

Home	Department	Employees	Project Management	Attendance	Leave Management	Salary	Organization Info
------	------------	-----------	--------------------	------------	------------------	--------	-------------------

12/12/2017

**Attendance Queries**

Click on **Save Attendance** button to take attendance of employees today! Once the attendance has taken there is no way to retake the attendance!

Name	Contact No	E-mail	Action
Md. Murad Hossain Tuhin	01765294248	tuhin@gmail.com	Present

Sign In

*Fig 6.29:* Attendance (Sign In)

## 6.5.9 View Attendance

The screenshot shows a web application with a dark blue navigation bar at the top containing links: Home, Department, Employees, Project Management, Attendance (highlighted), Leave Management, Salary, and Organization Info. Below the navigation bar, there is a date selection field with a placeholder 'mm/dd/yyyy' and a 'Submit' button. To the left of the main content area, there is a light blue box titled 'Attendance Queries' with the text 'Choose date to view attendance from the top of the page'. The main content area displays the title 'Employee attendance for 2017-12-07' above a table. The table has four columns: '#', 'Employee info', 'Id', and 'Action'. It contains seven rows of employee data, with the last three rows having a 'Present' status in the 'Action' column.

#	Employee info	Id	Action
1	Akash Khan	10	
2	Tuhin Hossain	11	
3	mehedi hossain	15	
4	Md. Murad Hossain Tuhin	16	Present
5	Farhana Faruk	19	Present
6	Ferdous Taniya	20	Present
7	thdt htddb	21	

*Fig 6.30: View Attendance*

## 6.5.10 Apply Leave

The screenshot shows a web application with a dark blue navigation bar at the top containing links: Home, Department, Employees, Project Management, Attendance, Leave Management (highlighted), Salary, and Organization Info. On the left side, there is a sidebar with a list of menu items: 'Background info', 'Update Password', 'Leave Application', 'Your Leaves details', and a red 'Log off' button. The main content area is titled 'Apply for Leave' and contains three input fields: 'Date from' (placeholder 'date'), 'Date up to' (placeholder 'date'), and 'Reason to leave' (placeholder 'Reason'). A large green 'Apply' button is positioned at the bottom of the form.

*Fig 6.31: Apply Leave*

## 6.5.11 Generate Salary Slip

The screenshot shows a web application interface with a dark blue navigation bar at the top containing the following links: Home, Department, Employees, Project Management, Attendance, Leave Management, Salary, and Organization Info. The 'Salary' link is highlighted. Below the navigation bar, the page title 'Salary Slip For Employee' is centered. The main content area features a light blue rounded rectangle containing a form titled 'Project entry form' with a green circular icon. The form includes three input fields: 'Select Employee' with a dropdown menu showing 'Choose Employee', 'Select month from the dropdown' with a dropdown menu showing 'Choose option', and 'Incentive (%)' with a text input field containing a '%' symbol. A large green button labeled 'Generate Salary' is positioned at the bottom of the form.

**Fig 6.32:** Generate Salary



## 6.5.12 View Salary Slip

[Home](#) [Department](#) [Employees](#) [Project Management](#) [Attendance](#) [Leave Management](#) [Salary](#) [Organization Info](#)

Shuvo Food Processing Industries

PAY SLIP for September

**Name:** Md. Murad Hossain Tuhin

**Phone No:** 01765294248

**Department:** Software

**Designation:** System Admin

Earnings	Amount (BDT)	Deductions	Amount(BDT)
Basic	15000	Employee Provident Fund(E.P.F) (8%)	1200
Incentive (5%)	750		
Transport Allowance	2500		
Total Earnings	18250	Total Deductions	1200
Net Payable		17050 BDT	

Print Data!

**Fig 6.33:** View Salary Slip

### 6.5.13 View Profile

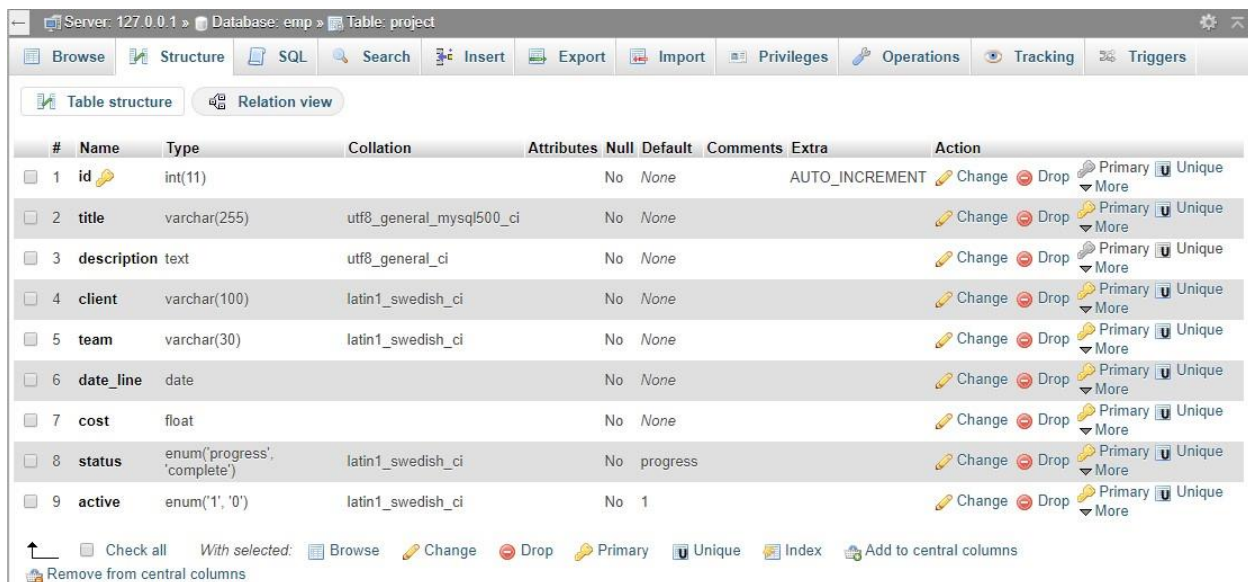


**Fig 6.34:** View Profile

## 6.6 Database Design

Database, often referred as DB is an essential part of software. There are various database platforms like MySQL, SQL Server, Oracle Database, MongoDB and so on. In my software, I have used MySQL as it is freeware, user friendly and can be run on local machine.

### 6.6.1 Table for “Project”



#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	int(11)			No	None		AUTO_INCREMENT	Change Drop Primary Unique More
2	title	varchar(255)	utf8_general_mysql500_ci		No	None			Change Drop Primary Unique More
3	description	text	utf8_general_ci		No	None			Change Drop Primary Unique More
4	client	varchar(100)	latin1_swedish_ci		No	None			Change Drop Primary Unique More
5	team	varchar(30)	latin1_swedish_ci		No	None			Change Drop Primary Unique More
6	date_line	date			No	None			Change Drop Primary Unique More
7	cost	float			No	None			Change Drop Primary Unique More
8	status	enum('progress', 'complete')	latin1_swedish_ci		No	progress			Change Drop Primary Unique More
9	active	enum('1', '0')	latin1_swedish_ci		No	1			Change Drop Primary Unique More

Check all With selected: Browse Change Drop Primary Unique Index Add to central columns Remove from central columns

Fig 6.35: Project Table

### 6.6.2 Table for “Department”



#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	int(11)			No	None		AUTO_INCREMENT	Change Drop Primary Unique Index Spatial More
2	name	varchar(120)	latin1_swedish_ci		No	None			Change Drop Primary Unique Index Spatial More

Check all With selected: Browse Change Drop Primary Unique Index Add to central columns Remove from central columns

Print Propose table structure Track table Move columns Improve table structure

Fig 6.36: Department Table

## 6.6.3 Table For “Employee”

Server: 127.0.0.1 » Database: emp » Table: user

Table structure Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	int(11)			No	None		AUTO_INCREMENT	Change Drop Primary Unique More
2	fname	varchar(50)	utf8_general_ci		No	None			Change Drop Primary Unique More
3	lname	varchar(50)	utf8_general_ci		No	None			Change Drop Primary Unique More
4	phone	varchar(30)	latin1_swedish_ci		No	None			Change Drop Primary Unique More
5	role	enum('employee', 'admin')	latin1_swedish_ci		No	employee			Change Drop Primary Unique More
6	address	text	latin1_swedish_ci		No	None			Change Drop Primary Unique More
7	email	varchar(150)	latin1_swedish_ci		No	None			Change Drop Primary Unique More
8	password	varchar(255)	latin1_swedish_ci		No	None			Change Drop Primary Unique More
9	salary	float			No	None			Change Drop Primary Unique More
10	dept	int(11)			No	None			Change Drop Primary Unique More
11	post	varchar(255)	latin1_swedish_ci		No	None			Change Drop Primary Unique More
12	is_logged_in	enum('1', '0')	latin1_swedish_ci		No	0			Change Drop Primary Unique More
13	active	enum('1', '0')	latin1_swedish_ci		No	1			Change Drop Primary Unique More
14	photo	varchar(1000)	latin1_swedish_ci		Yes	NULL			Change Drop Primary Unique More

Fig 6.37: Employee Table

## 6.6.4 Table for “Salary”

Server: 127.0.0.1 » Database: emp » Table: tb\_salary

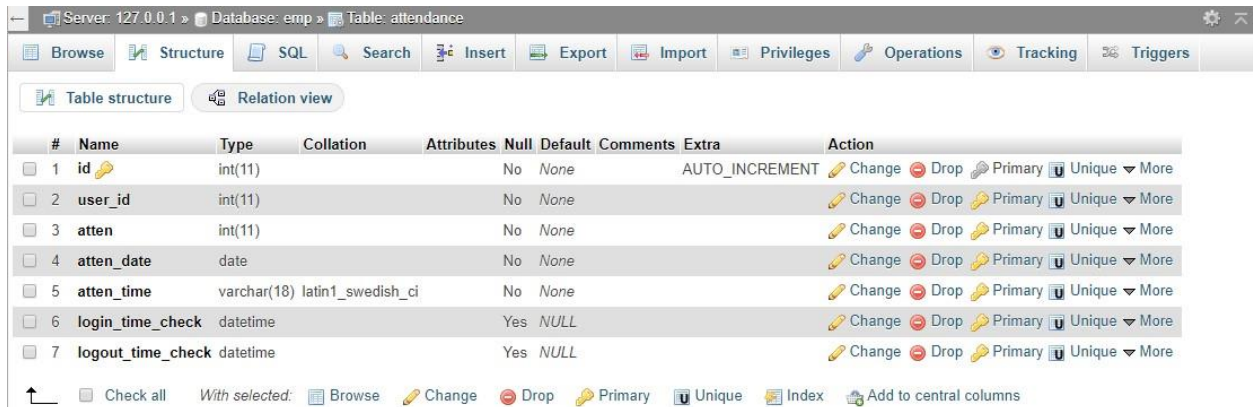
Table structure Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	s_id	int(50)			No	None		AUTO_INCREMENT	Change Drop Primary Unique Index More
2	emp_id	int(15)			No	None			Change Drop Primary Unique Index More
3	month	varchar(50)	latin1_swedish_ci		No	None			Change Drop Primary Unique Index More
4	incentive	int(10)			No	None			Change Drop Primary Unique Index More

☐ Check all    With selected: ☐ Browse ☐ Change ☐ Drop ☐ Primary ☐ Unique ☐ Index ☐ Add to central columns  
☐ Remove from central columns

Fig 6.38: Salary Table

## 6.6.5 Table For “Attendance”

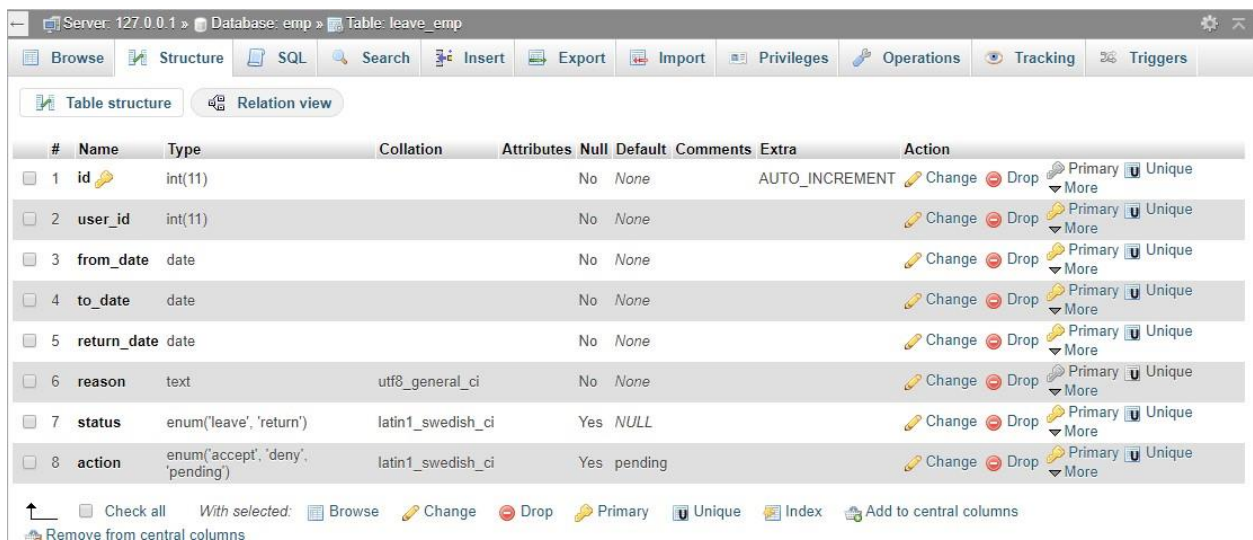


#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	int(11)			No	None		AUTO_INCREMENT	Change Drop Primary Unique More
2	user_id	int(11)			No	None			Change Drop Primary Unique More
3	atten	int(11)			No	None			Change Drop Primary Unique More
4	atten_date	date			No	None			Change Drop Primary Unique More
5	atten_time	varchar(18)	latin1_swedish_ci		No	None			Change Drop Primary Unique More
6	login_time_check	datetime			Yes	NULL			Change Drop Primary Unique More
7	logout_time_check	datetime			Yes	NULL			Change Drop Primary Unique More

Check all With selected: Browse Change Drop Primary Unique Index Add to central columns

**Fig 6.39:** Attendance Table

## 6.6.4 Table For “Leave”



#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	int(11)			No	None		AUTO_INCREMENT	Change Drop Primary Unique More
2	user_id	int(11)			No	None			Change Drop Primary Unique More
3	from_date	date			No	None			Change Drop Primary Unique More
4	to_date	date			No	None			Change Drop Primary Unique More
5	return_date	date			No	None			Change Drop Primary Unique More
6	reason	text	utf8_general_ci		No	None			Change Drop Primary Unique More
7	status	enum('leave', 'return')	latin1_swedish_ci		Yes	NULL			Change Drop Primary Unique More
8	action	enum('accept', 'deny', 'pending')	latin1_swedish_ci		Yes	pending			Change Drop Primary Unique More

Check all With selected: Browse Change Drop Primary Unique Index Add to central columns Remove from central columns

**Fig 6.40:** Leave Table

# **Chapter 7**

## **System Assurance & Testing**

## 7.1 Software Quality Assurance

Software quality assurance is a planned and systematic pattern of all actions necessary to provide adequate confidence that an item or product conforms to established technical requirements and a set of activities designed to evaluate the process by which the products are developed or manufactured. Contrast with: quality control.

A systematic, planned set of actions necessary to provide adequate confidence that the software development process or maintenance process of a software system product conforms to established functional technical requirements.

The quality of software is assessed by a number of variables. These variables can be divided into external and internal quality criteria. External quality is what a user experiences when running the software in its operational mode. Internal quality refers to aspects that are code-dependent, and that are not visible to the end-user. External quality is critical to the user, while internal quality is meaningful to the developer only.

### **External Quality (Functional):**

- Stability
- Speed
- Accuracy
- Features
- Robustness
- Ease-of-use

### **Internal Qualities (Structural):**

- Maintainability
- Flexibility
- Re-usability
- Readability
- Understandability

## **7.2 Software Quality Management Process**

Software quality management (SQM) is a management process that aims to develop and manage the quality of software in such a way so as the best ensure the product meets the quality standards expected by the customer while also meeting any necessary regulatory and developer requirements, if any. Software quality managers require software to be tested before it is released to the market, and they do this using a cyclical process-based quality assessment in order to reveal and fix bugs before release. The job is not only to ensure their software is in good shape for the consumer but also to encourage a culture of quality throughout the enterprise.

Some of the specific SQM processes are defined below in standard:

### **7.2.1 Quality Assurance Process**

Quality Assurance makes sure the project will be completed based on the previously agreed specifications, standards and functionality required without defects and possible problems. It monitors and tries to improve the development process from the beginning of the project to ensure this.

### **7.2.2 Verification & Validation (v&v) Process**

Verification and validation – These are the two important aspects of software quality management. Verification gives the answer to the question whether the software is being developed in a correct way and validation provides the answer whether the right software is being produced. In a nutshell, verification denotes precision whereas validation indicates value of the end or final product or software. Verification and validation is an important step used in various processes in different industries.

### **7.2.3 Review Process**

The purpose of a technical review is to evaluate a software product to determine its suitability for its intended use. The objective is to identify discrepancies from approved specifications and standards. The results should provide management with evidence confirming (or not) that the product meets the specifications and adheres to standards and that changes are controlled.

### **7.2.3 Audit Process**

The purpose of a software audit is to provide an independent evaluation of the conformance of software products and processes to applicable regulations, standards, guidelines, plans, and



procedures. The audit is a formally organized activity, with participants having specific roles, such as lead auditor, another auditor, a recorder, or an initiator, and includes a representative of the audited organization. The audit will identify instances of nonconformance and produce a report requiring the team to take corrective action.

## 7.3 Testing

Testing Scenario 1	
<b>Scenario</b>	User Login to the system
<b>Input</b>	Username, password of user
<b>Desired Output</b>	If credentials are valid, access to system.
<b>Actual Output</b>	For login, system works successfully.
<b>Verdict</b>	Getting result from Desired Output and Actual Output decides that this system is working correctly.

Testing scenario 2	
<b>Scenario</b>	Admin can create department
<b>Input</b>	Department name
<b>Desired Output</b>	Department will be created
<b>Actual Output</b>	For creating department, system works successfully.
<b>Verdict</b>	From Desired Output and Actual Output, it is decided that the system is working correctly.

<b>Testing scenario 3</b>	
<b>Scenario</b>	Admin can add employees
<b>Input</b>	Employee information for registration
<b>Desired Output</b>	After entering basic info correctly, employee will be added in the system.
<b>Actual Output</b>	Employee has added to system.
<b>Verdict</b>	From desired output and actual output, it is decided that the system is working correctly for employee registration.

<b>Testing scenario 4</b>	
<b>Scenario</b>	User can give attendance
<b>Input</b>	Sign in for attendance
<b>Desired Output</b>	If signed in, Attendance will be recorded in the system.
<b>Actual Output</b>	Attendance has taken to system.
<b>Verdict</b>	From desired output and actual output, it is decided that the system is working correctly for Attendance.

<b>Testing scenario 5</b>	
<b>Scenario</b>	Admin can generate salary slip.
<b>Input</b>	Fill up valid entities.
<b>Desired Output</b>	Salary slip will be added in the system.
<b>Actual Output</b>	Salary slip has added successfully.
<b>Verdict</b>	From desired output and actual output, it is decided that the system is working correctly for generating pay slip.

<b>Testing scenario 6</b>	
<b>Scenario</b>	User can apply for leave
<b>Input</b>	Fill up form correctly
<b>Desired Output</b>	Leave request sent to admin.
<b>Actual Output</b>	Leave request sent successfully.
<b>Verdict</b>	From desired output and actual output, it is decided that the system is working correctly for leave apply.

<b>Testing scenario 7</b>	
<b>Scenario</b>	Admin can add project
<b>Input</b>	Fill up form correctly
<b>Desired Output</b>	Project will be added in the system.
<b>Actual Output</b>	Project has added successfully.
<b>Verdict</b>	From desired output and actual output, it is decided that the system is working correctly for Adding project.

# **Chapter 8**

## **Conclusion**

## **8.1 Conclusion**

In four years' study of undergraduate program of IUBAT, what I have learnt from honorable, beloved teachers and supportive educational environment, I tried my best to implement those knowledge during my internship period. Since this project has been designed exclusively as an internship project, certain complexities those faced by any real life problem are considered in this project. But enhancement to the project can easily be made without changing the current design and programming structure.

# Glossary

**IUBAT:** International University of Business Agriculture and Technology.

**BCSE:** Bachelor of Computer Science and Engineering.

**Php:** Hypertext preprocessor that is a server side scripting language.

**DB:** Database

**Estimation:** A project planning activity that attempts to project effort project effort and cost for a project.

**Entity:** An entity is an object with physical existence or may be an object with conceptual existence.

**Attribute:** Attributes are the particular properties which are used to describe the entity.

**Function Point (FP):** A measure of the utility delivered by an application.

**External Inputs (EI):** An elementary process in which data crosses the boundary from outside to inside. This data may come from a data input screen or another application.

**External Outputs (EO):** An elementary process in which derived data passes across the boundary from inside to outside. Additionally, an EO may update an ILF.

**External Inquiry (EQ):** An elementary process with both input and output components that result in data retrieval from one or more internal logical files and external interface files.

**Internal Logical File (ILF):** A user identifiable group of logically related data that resides entirely within the applications boundary and is maintained through external inputs.

**External Interface Files (EIF):** A user identifiable group of logically related data that is used for reference purposes only.

**Entity Relationship diagram (ERD):** The Entity Relationship diagram describes data as entities, relationships and attributes. ERD is known as the graphical representation of the database.

**Primary Key:** A primary key is an attribute or collection of attributes that allow us to identify an entity uniquely.

**Data Flow Diagram:** Data Flow Diagram (DFD) is used to describe and analyze the movement of data through a system including the processes, stores of data.

# References

- [1] itemis.com, (n.d.). Agile Process Models. [Online] Available at:  
<https://www.itemis.com/en/agile/scrum/compact/fundamentals-of-project-management/agile-process-models> [Accessed 26 October. 2017].
- [2] softwaremetrics.com, (n.d.). Fundamentals of FPA. [Online] Available at:  
<http://www.softwaremetrics.com/fpafund.htm> [Accessed 29 October. 2017].
- [3] bcarocks.com, (2013). Effort Distribution. [Online] Available at:  
<http://www.bcarocks.com/notes/sem3-notes/software-engineering-notes/effort-distribution.html>  
[Accessed 30 October. 2017]
- [4] wikipedia.org, (2017). Activity diagram. [Online] Available at:  
[https://en.wikipedia.org/wiki/Activity\\_diagram](https://en.wikipedia.org/wiki/Activity_diagram) [Accessed 3 November. 2017]
- [5] visual-paradigm.com, (n.d.). What is Data Flow Diagram?. [Online] Available at:  
<https://www.visual-paradigm.com/guide/data-flow-diagram/what-is-data-flow-diagram/>  
[Accessed 5 November. 2017]