Development of Payroll Management System for Kansai Nerolac Paints Bangladesh Ltd.

A Practicum Report Submitted By

Jannatul Ferdous

ID: 18303002

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

Fall 2022

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A Practicum in the Partial Fulfillment of the Requirements for the Award of
Bachelor of Computer Science and Engineering (BCSE)

The Project has been examined and approved,

_____

Prof. Dr. Utpal Kanti Das
Chairman and Professor

_____

Dr. Hasibur Rashid Chayon
Coordinator and Associate Professor

_____

D.M. Arif Afsar

Lecturer

Department of Computer Science and Engineering
College of Engineering and Technology
IUBAT – International University of Business Agriculture and Technology

Fall 2022

Letter of Transmittal

15th December, 2022

To

The Chairman, Practicum and Placement Board

College of Engineering and Technology - CEAT

IUBAT - International University of Business Agriculture and 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 "Payroll Management system" for the fulfillment of my Practicum course.

Without a doubt, working on this project gave me the chance to put my academic knowledge into practice and gain valuable experience with a recognized company's corporate culture. I'm now expecting your thoughtful review of this practicum report.

If you would kindly review my report and comment on my performance, I would be immensely grateful.

Thanking you

_____

Jannatul Ferdous

ID: 18303002

Program: BCSE

Student's Declaration

I am Jannatul Ferdous student of BCSE - Bachelor of Computer Science and Engineering program, under the College of Engineering and Technology (CEAT) of IUBAT- International University of Business Agriculture and Technology declaring that, this report on the topic of Development Payroll Management System has been prepared for the fulfillment of the internship CSC 490, Practicum as well as the partial requirement of BCSE-Bachelor of Computer Science and Engineering degree.

The report and the project on Development of Payroll Management System is originally prepared by me. All modules and procedure of this project are being made after proper inspection and internet information.

It has not been prepared for any other purposes, rewards or presentations.

…….

Jannatul Ferdous

ID: 18303002

Program: BCSE

Supervisor's Certification

This is to certify that Practicum report on "Payroll Management System" has been carried out by Jannatul Ferdous bearing ID. 18303002, of IUBAT –International University of Business Agriculture and Technology as a partial fulfillment of the requirement of practicum defense course. The report has been prepared under my guidance and is a record of the accomplished work carried out successfully. To the best of my knowledge and as per her declaration, no parts of this report has been submitted anywhere for any degree, diploma or certification.

Now she is permitted to submit the report. I wish her success in all future endeavors.

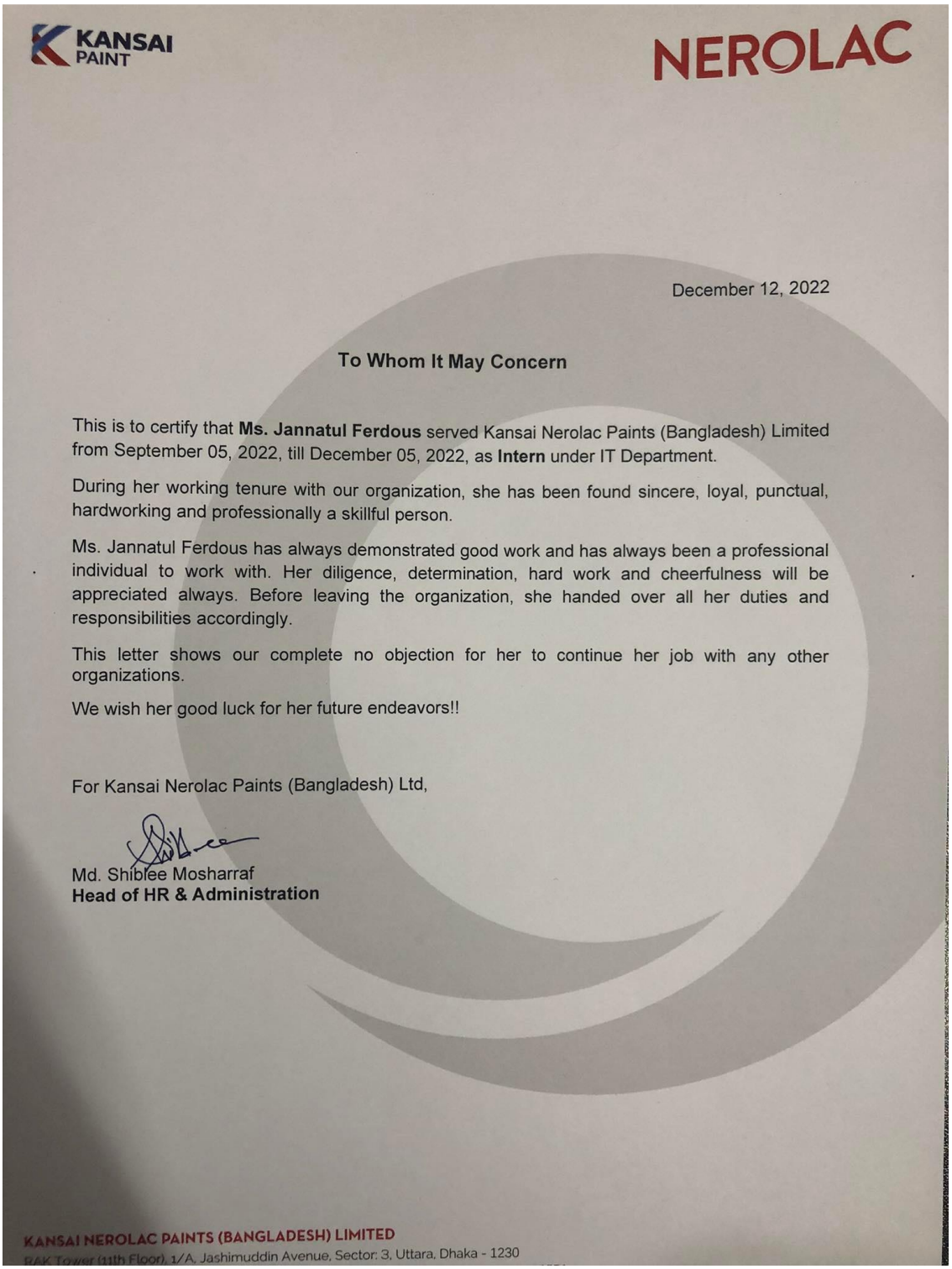
D.M. Arif Afsar

Supervisor and Lecturer

Department of Computer Science and Engineering

IUBAT- International University of Business Agriculture and Technology

Organizational Certification



KANSAI PAINT

NEROLAC

December 12, 2022

To Whom It May Concern

This is to certify that **Ms. Jannatul Ferdous** served Kansai Nerolac Paints (Bangladesh) Limited from September 05, 2022, till December 05, 2022, as **Intern** under IT Department.

During her working tenure with our organization, she has been found sincere, loyal, punctual, hardworking and professionally a skillful person.

Ms. Jannatul Ferdous has always demonstrated good work and has always been a professional individual to work with. Her diligence, determination, hard work and cheerfulness will be appreciated always. Before leaving the organization, she handed over all her duties and responsibilities accordingly.

This letter shows our complete no objection for her to continue her job with any other organizations.

We wish her good luck for her future endeavors!!

For Kansai Nerolac Paints (Bangladesh) Ltd,

Md. Shiblee Mosharraf
Head of HR & Administration

KANSAI NEROLAC PAINTS (BANGLADESH) LIMITED
RAK Tower (11th Floor), 1/A, Jashimuddin Avenue, Sector: 3, Uttara, Dhaka - 1230

Departmental Declaration

On behalf of the Department of Computer Science and Engineering of International University of Business Agriculture and Technology (IUBAT) we, the undersigned, certify that this practicum report on "Development of Payroll Management System" for the award of Bachelor of Computer Science and Engineering (BCSE) degree was duly presented by Jannatul Ferdous (ID No. 18303002) and accepted by the department.

_____

Dr. Utpal Kanti Das

Chairman and Professor

Dept. of Computer Science and Engineering

IUBAT–International University of Business Agriculture and Technology

_____

Dr. Hasibur Rashid Chayon

Coordinator and Associate Professor

Dept. of Computer Science and Engineering

IUBAT–International University of Business Agriculture and Technology

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D.M. Arif Afsar

Supervisor and Lecturer

Dept. of Computer Science and Engineering

IUBAT–International University of Business Agriculture and Technology

Dedication

This little undertaking, the outcome of my reflection and research, is dedicated to everyone who has ever been encouraging and supportive of me, but especially to my wonderful parents, whose love, affection, and tireless prayers have made it possible for me to complete this assignment.

Additionally, this a dedication to my friends, who have encouraged me during my time at university.

Acknowledgement

I would like to use this opportunity to thank a select group of people who have encouraged, supported, aided, and motivated me throughout my practicum.

I want to begin by thanking my parents for all of their inspiration and support in helping me achieve this fantastic life milestone.

My deepest gratitude goes out to Dr. Abdur Rab, our vice chancellor, for giving me the chance to submit this report.

Dr. Hasibur Rashid Chayon, my co-supervisor and coordinator of the department of computer science and engineering, IUBAT-International University of Business Agriculture And Technology has given me the opportunity to work on this project, and I owe him my deepest appreciation for that.

I would like to express my gratitude to my faculty supervisor, D.M. Arif Afsar, Lecturer of Computer Science & Engineering Department, who has provided me with the opportunity to write this report throughout my academic career at IUBAT- International University of Business Agriculture and Technology by offering her insightful suggestions and guidelines at any time, in any circumstance. Only with her guidance would I be able to complete this report effectively and correctly.

They gave me the courage and perseverance I needed to successfully complete the internship and project since they never stopped encouraging and supporting me.

Abstract

One of the most important operational parts of a firm today is payroll management. Every company with more than one is required to have a payroll system. Paying employees on time and consistently has an effect on their morale as well as how stable the business' finances are. Additionally, it is necessary for abiding by the both federal and state laws. Despite the complexity of the process, centralizing and streamlining the payroll process are made possibly by an effective system. Financial records that detail salaries, bonuses, deductions, and net pay will be provided by this project, Development of Payroll Management System. In this system, there are three different user types: employees, super administrators, and admins. Admin can maintain department and add, view and delete employee records. Employees will apply for leave and see the status whether leave has been accepted or rejected. Admin can view and approve or reject leave applications. They may include a yearly pay increase. The admin can control attendance. For each employee, a salary slip and an attendance record will be generated automatically by the system. Additionally, based on the number of absences, the system will automatically reduce salary from the monthly salary. Super admin can lock the salary process of a particular month and it cannot be edited further. On the other side, employees can view their monthly salaries, and view an attendance record. The database contains all the information of each module. The system will reduce system paperwork and omit manual process of the tasks that can be automated with software to save time and minimize the risk of error. PHP, Hypertext Markup Language, Flowing Style Sheet, Bootstrap, Structure Query Language, and JavaScript were used to build the project.

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Chapter: 01
Project Introduction

1 Project Introduction

1.1 Introduction

Payroll Management System, a user-friendly based software, has been built for organizations, keeping in mind the needs of employees to prepare salary. The project's goal was to computerize the payroll system, which was previously handled manually. Safety measures have been taken at every stage of the intricate process of payment creation. Using a back-end tool, all the records required for the procedures involved in salary computation are kept in a computer-based record keeping system. Using a front-end, all process handling is completed there. Users of the project can use demonstration facilities. The most crucial features are report creation and printing, which give users access to hard copies of the data as well.

Payroll management software is highly straightforward, adaptable, and user-friendly. All of your needs in terms of accounting and managing employee payroll are met by doing this. Payroll maintains complete employee records, creates play-slips and attendance records, calculates all allowances and deductions, and produces all required reports. The only software processing that has a strong and diverse consumer across industries is payroll. It provides extremely high flexibility when creating different allowances, deductions, leave policies, etc. for the employees, and all P.F. formulas, among others, are defined and changed at the user's end. The goal of the payroll application is to keep track of the many allowances and deductions that must be made available to the organization's employees. Additionally, it creates a salary sheet for each employee of the company, which benefits the accounts department in many ways.

1.2 Background of Study

Payroll system software can help small businesses diminish errors in the payroll process and the work required to calculate employee hours, wages, and tax withholdings. Payroll software is user-friendly and frequently highly cost-effective for small enterprises. Payroll processing software can sometimes be more cost-effective for small firms than other options. Small business owners can buy a cheap system that they can access on their personal computer or through a cloud service, frequently employing a pay-as-you-go business model. Payroll processing can be done without spending money on an internal accountant by purchasing software. By maintaining the data internally, businesses can

also avoid collaborating with a third party for payroll processing. Finally, adopting software gives small business owners more control over the payroll procedure. With payroll software, the company

may create reports at their own pace and react promptly to changing circumstances. Compared to manually creating reports or contacting a third-party payroll business to make changes, this may be more effective.

1.3 Objective

The Payroll System's main objective is to process payroll data in an online setting so that particular online operations can be carried out in seconds as opposed to the hours needed by conventional batch techniques of computer processing. By providing a thorough and accurate record of all payroll transactions, this PR system accomplishes the fundamental payroll objectives.

1.4 Broad Objective

My objective is to design an approachable framework for the space that will make the cycles simple and hassle-free. This Payroll Management System can help users save a lot of time.

1.5 Specific Objectives

- It is more convenient
- Streamline all relevant components of each employee's net compensation, including salaries, bonuses, deductions, taxes, and other expenses.
- It is cost-effective and time-effective.
- Automatically generated pay slip of employees.
- Avoid Calculation Mistakes.
- Requires less manpower
- It saves Process time
- It helps employees to focus on other profitable activities of the organization.

1.6 Proposed System Benefits

Many advantages are provided by payroll accounting software for the user (HR and/or payroll administration), the workers, and the company.

Here are some of the most evident advantages of switching to small business online payroll software:

- Quickly complete payroll computations and deductions
- Create precise pay slips.
- Easily calculate bonuses, costs, holiday pay, and other items.
- Print and other forms for employees, and send returns to HMRC
- Lighten the compliance burden
- Keep information, such as pay stubs and annual reports, in a system that is safe and simple to use.

1.7 Methodology

As currently expressed task in data variety stage I accumulated fundamental and helper data. Kansai Nerolac Paints Bangladesh Limited outfitted with all kind of fundamental and discretionary data anticipated to encourage the structure. The master plans and cycles such I observed to foster here framework indistinguishable obviously portrayed in the Investigation and Blueprint part amongst outlines.

1.8 Data Sources

Considering that venture in information assortment stage I gathered two sorts of information

- Essential Data
- Auxiliary Data

Essential Data: Initial information are produced inside the association. The association's experience, discussion with the mentors and web directors assist us with creating essential information. Essential information gathered through the meetings and down to earth insight.

Optional Data: Secondary material is created by actual experience and is based on numerous articles, papers, and exam papers, as well as undoubtedly data acquired online. The details allowed us to comprehend the project more clearly, truths, and insights we learned from different plots and roots.

1.9 Limitation

Although the software offers a wide variety of options to its customers, some complex options could not be included in it for logistical and/or technological reasons.

List of limitations which is available in the Payroll Management System:

- Attendance system is not automated
- Tax deduction process has not been implemented due of the complexity of the whole process
- Due to some criticality, Excel export has not been produced for Employee, Employee salary.
- Batch mode execution prevents the generation of off-line reports for employees who take leaves or pay lip

1.10 Process Model

In some circumstance the product necessities are obvious; however it happens that client need that product rapidly. For this situation gradual cycle model is a decent choice. In this technique we can deliver programming to a limited extent by part. The usefulness of the product can extend in later updates. Clients can utilize the product and give input on the functioning part. It includes the both turn of events and support. The item characterizes as completed when it satisfies all prerequisites.

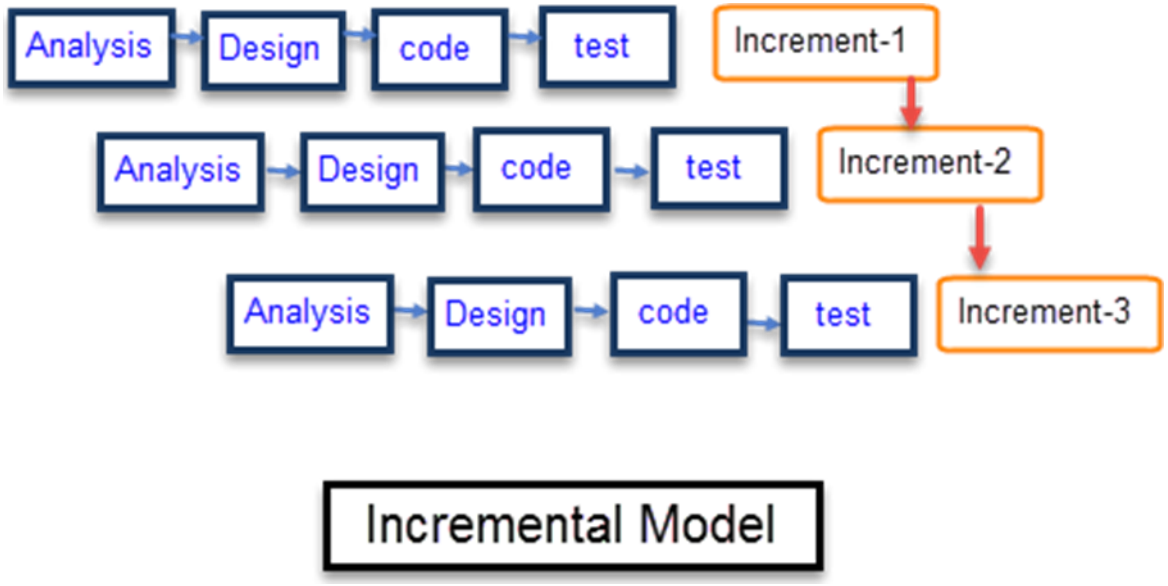

Figure 1.1: Incremental Process Model

Reasons for selecting the incremental process model

- Offer better help for process cycle.
- Diminish revise on a section.
- Permit simple convey of part of item.
- Conveyance process is more straight forward
- As it decreases revise in coding, it is time proficient.
- Upholds more straightforward reconciliation of sub-frameworks.
- Lower chance of undertaking disappointment
- Conveyance needs can be all the more effectively set.

1.11 Feasibility Study

A plausibility takes a gander at is made to appearance assuming the test on last little detail will serve the intention of the organization for how much work, endeavor and the time that spend on it. Practicality have a take a notice we might the designer at some point predict the predetermination of

the test and the convenience. A possibility investigation of a framework thought is with regards to its functionality, that is the effect at the organization, the capacity to fulfill their customer wishes and the successful utilization of assets. Subsequently, while a fresh out of the box new programming is proposed it generally is going through a practicality examine before it's far approved for improvement. The record the plausibility of the undertaking this is being planned and records assorted regions that had been thought about circumspectly eventually of the practicality take a gander at of this challenge comprising of specialized, financial and functional possibility. Coming up next are its elements:

Achievability research determines whether or not the association can make that arrangement work. This suggests if the tasks we will complete are appropriately worthwhile or not. Three main areas can be examined and where ideas for a different framework can be generated. Three important considerations are handled when focusing on the framework's viability to determine whether the robotization of the framework is conceivable.

- Technical achievability
- Economic achievability
- Operational achievability

1.12 Technical Feasibility

The device should be rated out of through the esoteric component of view earliest. The mission about already stated possibility should base on a characterize design of the device necessity in expressions of information, result, projects, and methodology. Having perceived and depiction contraption, the examination should pass to show the breed of gear, vital way expanding the contraption, of jogging the contraption when it's takes place to plane. Specialized subjects are marking up throughout the examination are:

- Is it conceivable to foster the advanced framework utilizing the ongoing specialized asset?
- In the event that not, could current specialized assets at any point be overhauled or added to in a way that satisfies the solicitation viable?
- Is there innovation in presence that meets the particulars?

The endeavor have developed with the close intention that the basic elements and generally crucifixion are achieved inner the requirements. The endeavor is advanced interior the pristine age. Across the age could likewise furthermore arise as obsolete after a couple of lengths of time, in view of the truth that the more current model of the equivalent programming program helps more established traditions, the gadget could likewise furthermore regardless be utilized. Along these lines, there might be least standard stressed with this endeavor. The gadget has advanced the utilization of PHP the endeavor is actually conceivable turn of events. Particular chance will in general stress over gear capacity, trustworthiness and openness and the capacities of the improvement bunch. Subsequently, I saw that this model is truth be told conceivable, since this can be made by the going with lines. To encourage this endeavor, need a huge level programming language like HTML, CSS, Bootstrap, PHP. For data base like Xampp Server. To store data and an IDE (Sublime Text, VS code or PHP storm) need a cloud server and a handling device like a PC or Smartphone with a clear plan and data affiliation. All the development which is notice above is ready to use. Hence, our errand is truth be told possible.

1.13 Economic Feasibility

Financial considerations determine if a speculation's value outweighs the associated effort and expense. The primary resources we take into account when estimating the time it will take to complete a framework examination are the season for clients and representatives of the company we work with, the assessed cost of the equipment, and the assessed cost of any programming, development, or customization of the programming. The framework that is being developed should make financial sense. The cost involved in developing new frameworks is one task center indicator that has an impact. During the initial assessment, the following were listed as some of the immediate financial needs:

- The expense directs a full framework examination.
- The expense of equipment and programming.
- The advantages of diminished costs or less exorbitant blunders

Since the proposed scheme is being developed as a piece of responsibility labor, there might not be a helper fee associated with it. Additionally, the assets are mostly available, providing evidence that the creation of the gadget is financially feasible. Our sophisticated device is affordable. We understand that our supporter might profit from the device when we take into account the total cost and benefits at that time. What determines how practical a different framework is financially. My offering makes financial sense. I've noticed that I actually just want one operating framework, IDE, and program. The price will be lower as a result. In contrast, this will reduce our paper costs.

1.14 Operational Feasibility

Functional practicality decides whether the net style is to be needed to work the gadget when it's been introduced. Clients that needn't bother with a fresh out of the box new gadget may likewise save you

it from transforming into functionally plausible. In the event that clients are plainly utilize the current gadget, see no issue with it and commonly now never again contain in requesting for a pristine gadget, protection from forcing the spic and span gadget might serious areas of strength for be. The new gadget has low danger to come to be functional.

This incorporates the accompanying inquiries:

- Will the proposed structure really hurt?
- Is there sufficient assistance for the clients?

The endeavor would be valuable considering the way that it satisfies the objectives when made and presented. All friendly perspectives are pondered circumspectly and assume that the endeavor is ordinarily conceivable. It is functionally attainable. Anybody can undoubtedly grasp the course of our product.

Chapter: 02
Organizational Part

2 The Organization

Section 2 covers the organization's hierarchy, as well as its mission, vision, and several administrations. The authoritative outline, the hierarchical structure, and my role as a subordinate are all examined in this section.

2.1 Organization Overview

Kansai Nerolac Paints (Bangladesh) Limited is a subsidiary of Kansai Paint Japan. Having operations in 80 nations across Asia, Europe, America, and Africa, Kansai Paint ranks as the eighth-largest paint manufacturer in the world. The second-largest coating business in India and the market leader for industrial coatings is Kansai Nerolac Paints Ltd. Its Industrial Coatings provides a wide range of products for the automobile, powder, general industrial, and high performance coatings industries. The widely recognized brand of decorative paints is called Nerolac Paints.

Kansai Paint Company Limited, one of the top ten coating companies in the world with its headquarters in Japan, is the owner of Kansai Nerolac Paints Ltd. Kansai's technology advantage enables them to consistently innovate and create goods that address gaps in consumer demand. Kansai

• Technolog.

• Research & Development

• Innovations

• Quality

2.2 Organization Services

For its personnel worldwide, Kainsai Nerolac offers the most responsive, comprehensive dynamic functionality, and customizable design Software. Our experts are capable of creating any type of software to make your daily life more effective and simple.

2.3 Organization Location

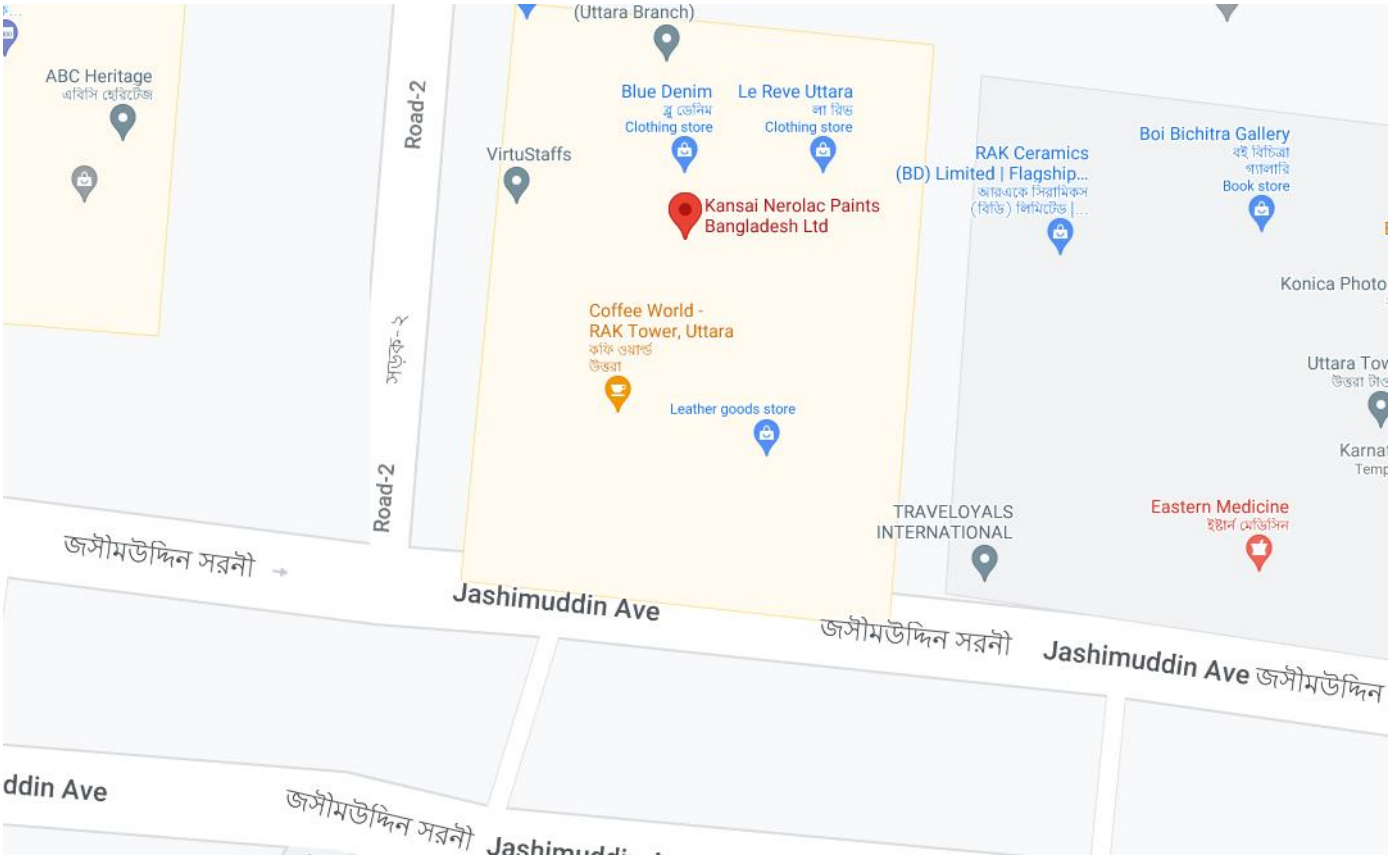

Figure 2.1: Organization Location

2.4 Organization Vision

To provide software that simplifies daily life for people and facilitates efficient organization-wide business. We will be known for offering an industry-leading, user-friendly, and highly skilled IT service.

2.5 Organization Mission

Surpass clients' expectations by offering superior Web solutions that turn data into knowledge and help them solve problems by going above and beyond software.

2.6 My Position in this Organization

As an intern for this company, I do programming. I receive monitoring from a management at this company. He is quite helpful and enlightening. He has a lot to teach me. My project was finished properly and on schedule. Only with my supervisor’s direction was it made achievable. Maintaining the work schedule was a crucial skill I learned. I also follow all of the other company policies. I am excited to be a part of this office. Without a doubt, it has helped me get ready for the start of my profess

2.7 Organizational Structure

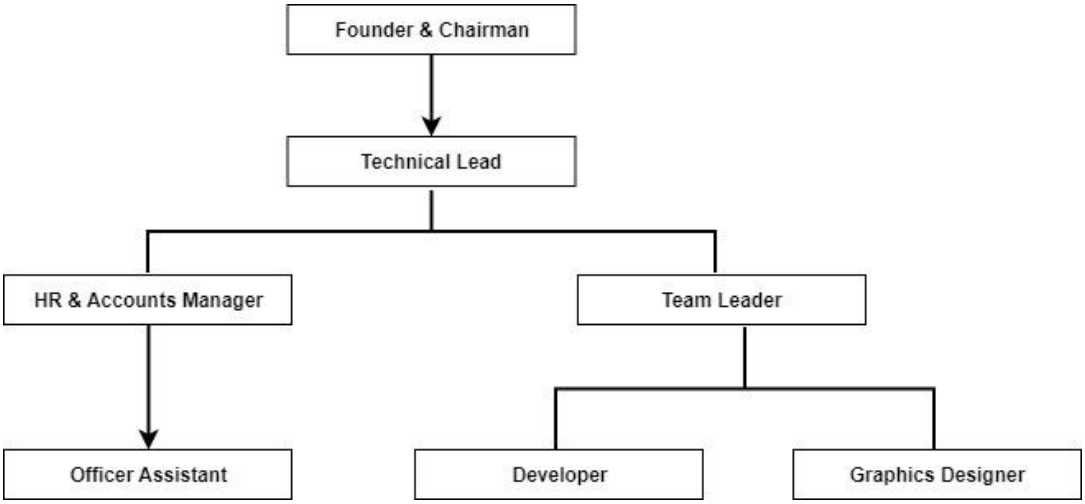

Figure 2.2: Organization Structure

Chapter: 03
Requirement Engineering

3 Requirement Engineering

Part 3 compiles all of the necessities for moving the project forward. This section covers each requirement in detail and includes a use case graphic in order to help the reader better comprehend the project and match the numerous requirements of the activities to be performed.

3.1 Requirement Analysis

Between machine designing and machine planning, there is an endeavor called prerequisites assessment in product program designing. The product program expert may create the product program allocation and build the module of the information, practical, and social area names to manage through programming program by assessing the needs.

The data, element, and lead of the machine to the product program style dressmaker are broken down by prerequisite analysis. An essential phase in the process of enhancing a program or product is the evaluation of requirements. It involves the tasks of identifying the requirements or conditions to meet for a novel, contemporary, or alternative item and evaluating the potential conflict demands of diverse coworkers as well as recipients or clients. The investigation of the necessity is crucial to the project's growth. Preconditions need to be noticeable, significant, and verifiable, linked to a known business undertaking necessity or potential opportunities, and depicted in detail enough for machine planning.

3.2 Requirement Engineering

Precondition design, as its name implies, is the field of designing that defines particular needs and provides programming program frameworks. There are several explanations of requirements engineering, but all of them part the underlying idea that requirements entail figuring out what users need from a computer system and comprehending what their wishes indicate in terms of design. Necessity designing is methodically associated to programming program designing, which concentrates more on the strategy for structuring the gadget that clients need. The specifications for each category of my projects are listed below:

- Client necessities
- Framework necessities
- Utilitarian prerequisites
- Non-utilitarian prerequisit

- Equipment requirements
- Programming Requirements

3.2.1 User Requirement

- **Admin:-**
  - **User Requirement 1:-** Admin should login to gain admittance to dashboard.
  - **User Requirement 2:-** can manage department and employee information.
  - **User Requirement 3:-** can manage leave type.
  - **User Requirement 4:-** can accept or decline leave request.
  - **User Requirement 5:-** can see attendance record and generate attendance report.
  - **User Requirement 6:-** can process employee monthly salary.
  - **User Requirement 7:-** can generate salary report and lock salary process.
- **User:-**
  - **User Requirement 1:** should login to gain admittance to the client dashboard.
  - **User Requirement 2:** can apply for leave and see leave status.
  - **User Requirement 3:** can generate monthly salary slip.

3.2.2 System Requirement

- **System Requirement 1:** can add and edit department.
- **System Requirement 2:** can add edit employee and employee information.
- **System Requirement 3:** can add and edit leave type.
- **System Requirement 4:** can track attendance details through login system.
- **System Requirement 5:** keep track of leave details.
- **System Requirement 6:** can edit and generate monthly salary slip.

3.2.3 Functional Requirements

- **Admin**
  - Login
  - Logout
  - Update, delete, view and add department.
  - Update, delete, view and add employee.
  - Update, delete, and add Leave type.
  - Approve or decline leave request.
  - View Attendance Details.
  - Generate Attendance Report.
  - Process and lock monthly Salary.
  - Generate salary report.
- **User**
  - Login
  - Logout
  - Apply for leave.
  - View salary slip.

3.3 Non Functional Requirements

Usability: The system's user interface is simple to understand, so anyone who is accustomed to using Windows activities may use it.

Reliability: Depending on client needs, the online payroll administration system can be accessed, and it works correctly and efficiently. All information is only accessible to and managed by the administrator.

Performance: The online payroll administration system may be used by each client individually or concurrently, and it operates at full capacity in little under two seconds. The system has the capacity to store employee data such as attendance, pay, and more.

Operation: The HR manages and controls the online payroll management system to ensure safe work.

Supportability: Any Windows operating system version supports this online payroll administration solution. The administrator of the online payroll management system can easily maintain the program by using the pre-arranged report of the system.

Safety: without login nobody will be able to see any kind of details**.**

3.4 Software Requirements

- Windows 10
- Xampp server
- Visual Studio Code
- Web browser(Google chrome or Mozilla firefox)

3.5 Hardware Requirements:

The equipment recorded in no way, shape or form a base prerequisite to dash the framework, yet kind of a ground cutoff for scamper the framework easily moreover serenely. This is likewise contemplate the expected measure of vehicles that might set off around the staff.

- 4 GB (DDR3) RAM
- 128 GB SSD
- Web association Program conditions
- Web Server: Xampp Server Bitnami 8.0.10
- Server-Side Scripting: PHP
- Data set Engine: MySQL
- Dataset Device: MySQL Administrator, MySQL Query Browser
- Planning Apparatus: Draw.io

- Word processor: Sublime Text, Vs code, Php strome, Notepad se Case Diagram of the system.

3.6 Use Case Diagram of the System

An outline of a use case basically shows how a client interacted with a cycle that demonstrated the relationship between the client and other use cases where the client is unexpected.

A utilization occurrence graph can recognize the various sorts of clients of a framework and the distinctive use demonstrations also do frequently be convey by different kinds of charts too. The utilization manifestation strategy is utilized to catch a framework's conduct prerequisites by itemizing situation guided strings across the practical necessities

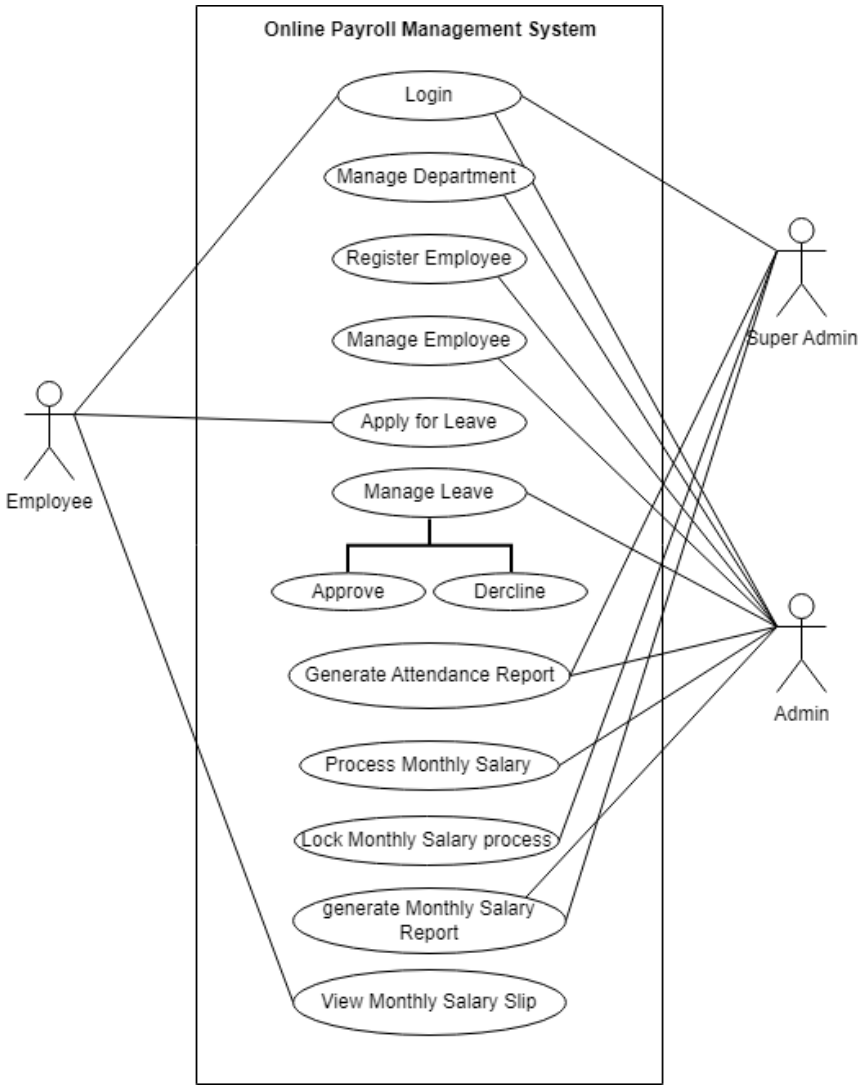

Figure 3.1: Use Case Diagram for PMS

3.7 Use Case Text

The "Online Payroll Management Systemmany "'s various role kinds and how they interact with it are tried to be illustrated in the project's use case diagram.

Use Case: Login

Actor: Super Admin, Admin and Employee

Description: All type of users need to login to the system in order to use it

Use Case: Manage Department

Actor: Admin

Description: Admin can add new department and edit and view existing departments.

Use Case: Manage Employee

Actor: Admin

Description: Admin will add new employee by registering account for them. Edit and view details on existing employees.

Use Case: Apply for Leave

Actor: Employee

Description: Employee can apply for leave which includes leave type and duration of leave

Use Case: Manage Leave

Actor: Admin

Description: Admin can approve or decline leave requests

Use Case: Generate Attendance Report

Actor: Admin, Super Admin and Employee

Description: Admin and super admin can generate attendance report of all employees on selected dates whereas employees can only view their own attendance report on a selected date

Use Case: Process Monthly Salary

Actor: Admin

Description: Admin can process monthly salary of the employees of a selected month

Use Case: Lock processed salary

Actor: Super Admin

Description: Super admin can lock the process salary and once it's locked it cannot be edited

Use Case: View salary report

Actor: Admin, Super Admin and Employee

Description: Admin and super admin can view monthly salary report and employees can see their own salary report

Use Case: View Salary Slip

Actor: Employee

Description: Employees can see their own salary sleep

Chapter: 04
System Planning

4 System Planning

The project planning chapter includes examples of the "Payroll Management System" functions. The effort allocation, function point estimation, and project schedule diagram are also included in this chapter.

4.1 System Project Planning:

It's significant to assess how much work will be involved before beginning any project, what resources will be required, how long it will take to finish, and whether the project is even doable.

The activities of this project's software project planning that have come after are as follows:

- System Project Estimation
- Function Oriented Metrics
- Process Based Estimation
- Effort Distribution
- Task Scheduling
- Project Schedule Chart
- Cost Estimation

4.1.1 System Project Estimation:

The correctness of a software project estimate depends on a numeral of variables, including:

- Precisely predicted the scope of the finished object.
- The ability to translate the size estimate into work hours, calendar days, and money.
- The degree to which the project plan accurately reflects the engineering team's or software team's skills.
- Stability of the product specifications and the environment that facilitates the software engineering process

The most crucial decision I must make while working on the software project is the size estimation. If the software size is not computed properly, scheduling concerns, financial issues, and other problems may occur. Before estimating the software size, I must confirm that the software choice is constrained as the project moves forward.

4.1.2 Function Oriented Metrics

The material area values are prioritized over the software value sin function point-based estimates. Function points are figured by comparing five information domain features

The information domain values are as follows:

- **External Inputs (EI) –** The program adds up each user input that results in distinctive application-oriented data. It is more important to distinguish between inputs and questions.
- **External Outputs (EO) –** entail the volume of user outputs that supply data intended for applications. User's private information is obtained
- **Number of external inquiries (EQ) –** an inquiry is a software response to an online request that produces an online output. The total number of original questions was determined.
- **The number of internal logical files (ILF) –** was tallied for every logical master file. Database table that receives input from the software and is modified.
- **External interfaces files (EIF) –**the quantity of machine-readable interfaces being utilized to transfer data to other systems was counted. The appropriate table location contains the predetermined domain weights.

In accordance with the system's functionality. They are basic, typical, and complex. Each component is a part of the broader system, which is a complex system. After the figures has been grouped, a complexity number is given to each count. The following formula is used to calculate the number of FPs (Function Points), Value Adjustment Factor (VAF) = (0.65+(.01X TDI))

UFP = UFP (Data fn) + UFP (Transaction fn)

Adjusted Function point count (AFP) = UFP X VAF

Effort for PHP = AFP x Productivity

4.2 Function Point Estimation

The table shows the capabilities with user input and outp

Table 4.1: Functional point Estimation (Admin)

Functionality	**Input**	**Output**
Login	Email, password	Access the admin dashboard
Manage Department	Click on add, edit, delete	Department name
Manage Employee	Click on Add, edit, delete	Employee name, date of birth, department, phone, email, joining date, permanent_address, present_address, basic,
View leave requests	Click on Leave module	Leave requests shown
Accept or decline leave requests	Click on dropdown, choose options	Leave status will be updated
View attendance	Click on attendance module	Employee name, id, login_day, login_time, logout_time, date, status
View attendance report	Click on attendance report, select specific date	Employee attendance details
Process Monthly Salary	Select date, click on process button	Employee name, id, attend_days, absent_days, totat days in a month, process_date, total_salary
Lock Salary Process	Click on salary module, click on Lock button	Edit button will be removed

View salary report	click on salary report module, select specific date	Salary details will be shown

Table 4.2: Functional Point Estimation (Employee)

Functionality	**Input**	**Output**
Login	Email, password	Access the employee dashboard
Apply for a leave	Click on leave module, click on apply button	Display leave form
Submit leave form	Leave_type, from_date, to_date, click on submit	Form submitted
View leave request status	Click on leave module	Leave details will be shown
View attendance report	Click on attendance report module, select specific date	Display attendance details
View salary Report	Click on salary module, select specific date	Display salary details

4.3 Identify Complexity

The overall project plan must include the tedious task of counting function points, it is advisable to plan and prepare for this function point counting. To provide sizing for estimating, development should be fist function point count.

Transactional Functions:

- External inputs [EI]
- External Outputs [EQ]

- External Queries [EQ]

Data Functions:

- Internal Logical Files [ILF]
- External interface files [EIF]

Additionally, FETs, DET, RET and FTR have been used for analysis of transactional and data functionn

Table 4.4: Identify Complexity (Admin)

Transition Function	**Field/ file involvement**	**FTRs**	**DETs**
Login (EI)	**Fields-** email, password **File-** users	1	2
Manage Department (EI)	**Fields-** department_name, id **File-** Department list	1	2
Manage Employee (EI)	**Fields-** emp_name, employee_id, departemnt, gender, dob, phone, email, present_address, permanent_address, basic, medical_allowance, transport, mobile **File-** Employees	1	13
View Leave Request (EQ)	**Fields-** name, employee_id, from_date, to_date, leave_type **File-** Leave	1	5

Update Leave Request status (EI)	**Fields-** approve, decline **File-**leave	1	2
View Attendance (EQ)	**Fields-**name, employee_id, login_day, login_time, logout_time, date, status **File-**attendance page	1	7
Process Salary (EI)	**Fields**- name, id, total_absent_days, total_attend_days, total_days_in_month, total_salary, process_date **File**-Salary	1	7
View Salary Report (EQ)	**Fields-** name, id, total_absent_days, total_attend_days, total_days_in_month, total_salary **File-** Salary	1	6

Table 4.5: Identify Complexity (User)

Transition Function	Field/file involvement	FTRs	DETs
Login (EI)	**Fields –** email, password **File -** users	1	2
Apply for Leave (EI)	**Fields**-leave_type, from_date, to_date, Description **File-** Leave	1	4
View Attendance Report (EQ)	**Fields**-name, employee_id, login_day, login_time, logout_time, date, status **File-**attendance page	1	7
View Salary Report (EQ)	**Fields**- name, id, total_absent_days, total_attend_days, total_days_in_month, total_salary **File-** Salary	1	6

4.4 Identity Complexity of Data Function

Table 4.7: Identify Complexity (DF)

Transition Function	Field/file involvement	RETs	DETs
Login (ILF)	email, password	1	5
Manage Department (EI)	Name, id	1	2
Manage Employee (EI)	employee_name, employee_id, departemnt, gender, dob, phone, email, present_address, permanent_address, basic, medical_allowance, transport, mobile	1	13
Manage Leave (EI)	Approve, decline, name, id, from_date, to_date, leave_type, status, description	1	9
Apply for leave (EQ)	from_date, to_date, leave_type, description	1	4
Process Salary (EI)	name, id, total_absent_days, total_attend_days, total_days_in_month, total_salary, process_date	1	6
View Attendance Report (EQ)	name, employee_id, login_day, login_time, logout_time, date, status	1	7

View Salary Report (EQ)	name, id, total_absent_days, total_attend_days, total_days_in_month, total_salary	1	6

4.5 Unadjusted Function point Contribution

Table 4.10: Unadjusted Function Point contribution for Transaction Fucntion

Transition Function	**FTRs**	**DETs**	**Complexity**	**UFP**
Login (EI)	1	2	Low	3
Manage Department (EI)	1	2	Low	3
Manage Employee (EI)	1	13	High	6
Manage Leave (EI)	1	9	Low	3
Apply for leave(EQ)	1	4	Low	3
View Attendance (EQ)	1	7	Low	3
Process Salary (EI)	1	6	Low	5
View Attendance Report (EQ)	1	7	Low	3
View Salary Report (EQ)	1	6	Low	3
Total				32

4.6 Unadjusted Function Point Contribution

Table 4.11: Unadjusted Function Point Contribution for Data Function

Transition Function	**RETs**	**DETs**	**Complexity**	**UFP**
Login (ILF)	1	2	Low	7
Department List (ILF)	1	2	Low	7
Employee List (ILF)	1	13	High	7
Leave (ILF)	1	7	Low	7
Attendance (EIF)	1	7	Low	5
Salary (EID)	1	6	Low	7
Total 40				

4.7 Performance and Environment Impact

Table 4.12: Performance and Environment Impact

General system characteristics (GSC)	Degree of Influence (DI)
1. Data communication	3
2. Distributed Data processing	0
3. Performance	4
4. Heavily used configuration	4
5. Transaction Rate	3
6. Online Data Entry	0
7. End-User Efficiency	3
8. Online update	3
9. Complex Processing	0
10. Reusability	0
11. Installation Ease	3
12. Operational Ease	3
13. Multiple sites	0
14. Facilitate Change	3
Total Degree of Influence (TDI)	**30**

Value Adjustment Factor (VAF) = (0.65+().01 xTDI))

= (0.65+ (0.01 × 30))

= 0.95

UFP = UFP (Data fn) + UFP (Transaction fn)

= (32+40)

= 72

Adjusted Function Point Count = (UFP xVAF)

= (72× 0.95)

=68.4

Efforts for PMS= AFP x Productivity

= 76.95× 15.5 [PHP= 15.5]

= 1192.725 –per hours/10

=119.2725 –person days/30

= 3.97575 – person months

Language	Hours Per Function Point
ASP*	06.1
Visual Basic	08.50
Java	10.6
SQL	10.8
C++	12.4
C	13.0
C#	15.5
PHP	15.5

Time Frame Calculation = 3.97575 ≈ 4 months needed for 1 person.

4.8 Project Schedule Chart

There are abundant tasks involved in construction of a whole system. These tasks need to be finished quickly and in the right order. The project schedule helps as a direction for the system developer. The following table shows the project's schedule:

Week Activities	W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-8	W-9	W-10	W-11	W-12	W-13	W-14	W-15	W-16
Requirements Gathering																
Planning																
Analysis																
Design																
Coding																
Testing																
Implementation																

Figure 4.1 Project Schedule Chart

4.9 Cost Estimation

Cost estimation is the process of approximating a program's cost. There are aspects in this project that need to be examined and their costs determined. As shown below,

- Personnel cost
- Software cost
- Hardware cost
- Other cost

4.9.1 Personnel cost-

- 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 = 365-(52+24) = 289 days
- Total number of working days per months to develop the project = 289/12 = 24.083 days
- Organization working hours per day = 9 hours
- Organization working hours per month = 24.083 *9= 216.747 hours

Table 4.11: Personnel Cost

Type	**No of Members**	**Months**	**Salary**
Coder	1	1	10,000
Total			**40,000**

4.9.2 Hardware Cost-

The price of the computer utilized to do the project.

Table 4.12: Hardware Cost

Name	Number	Price	Description	Total
Computer	1	50,000	Laptop	50,000

Total Hardware Cost = 50000tk

4.9.3 Software Cost

Table 4.13: Software Cost

SL	Software	Number	Amount	Total
1	OS (Windows 10)	1	100 Tk.	100tk
2	MS Office 2016	1	Free	
4	Xampp	1	Free	

4.9.4 Other Cost

Table 4.14: Other cost

Name	Price
Pen and paper	300 Tk.
Mobile	200 Tk.
Transport	500 Tk.
Total	**1000 Tk.**

4.9.5 Total Cost

Table 4.15: Total cost

Particulars	**TK**
Salary-	
• Coder	40,000
	40,000
Hardware Cost – • ASUS Laptop	50,000
	50,000
Software Cost –	
• OS (Windows 10)	100.00
• MS Office 2016	Free
• Xampp	Free
	100.00
Other Costs-	
• Pen and paper	300.00
• Mobile	200.00
• Transport	500.00
	1000
Total cost	**91100 Taka**

Chapter: 05
Risk Engineering

5 Risk Engineering

Whether it occurs or not, a risk is a potentially dangerous condition. A projects potential hazards must be estimated. Numerous concerns could rise if the risks related to a software project are not accurately evaluated and measured. Anyone who works on any form of system will encounter into, so it needs to be handled.

5.1 Risk Management

A software team can examine and manage improbability via risk management and analysis. Several problems could come up while developing software. A risk is a possible danger that could happen or not. Irrespective of the outcome, it's a good idea to identify the issue, assess the chances of it happening, compute its impact, and generate a backup plan in case it does. A collection of methods called risk analysis and management help software developers understand and manage vagueness.

The following stages are taken to create a risk management model:

- **Identification:** It is the practice of identifying prospective risks or dangers through data collection. There are numerous methods and tools for gathering and modifying data. The team is using both automated and human approaches to gather data and start identifying potential risks to Web services. One of the most effective methods for gathering information on the condition of Web pages and sites is web crawling.

- **Classification:** Risk categorization is the process of creating a structured model to categorize risk and fitting observable risk characteristics and occurrences into the model. The team combines quantitative and qualitative approaches to examine and identify dangers to Web pages, Web sites, and hosting servers.

- **Assessment:** The process of determining relevant risk scenarios or sequences of events that potentially result in harm or loss, as well as the chance of these occurrences, is known as risk assessment. A universal risk assessment criteria should be "transparent, coherent, consistent, complete, thorough, unbiased,

uniform, balanced, defensible, durable, adaptive, and supported by relevant and sufficient instruction," according to Rosenthal.

- ➢ **Analysis:** A risk analysis's findings are used to determine how risk patterns or scenarios may affect future loss amounts and recovery costs, both directly and indirectly. Through the analysis of vulnerabilities and the development of mitigation solutions, this process also considers the organization's willingness to accept risk in light of potential consequences.
- ➢ **Implementation:** the procedures, guidelines and methods used to manage and address risks that have been identified are referred to as risk management implementation. The program that is actually implemented should strike balance between the value of assets and direct and indirect expenses of avoiding or recovering from damage or loss.

To properly maintain a web-based system, the following factors must be taken into account:

- ➢ Hardware and software configuration examples include updating the operating system and web server, adding security updates, removing unreliable services, utilizing firewalls, etc.
- ➢ Contracting with reliable service providers, renewing domain name registration, and other administrative processes are examples.
- ➢ Traffic management, load balancing, and usage monitoring are further aspects of network configuration and maintenance.
- ➢ Backup archiving policies and methods, such as the choice of backup media, frequency of media replacements, total number of backups produced, and storage location.

A range of risk categories should be taken into consideration for every software project. For this software, the aforementioned risk categories have been considered.

- ➢ **Project risks:** these risks put project plan at risk. If these risks come to pass, it's probable that the project's timeline may slip and expenses would increase. Potential problems with budget. Schedule, personnel, resources, clients, and requirements of the software project are identified as project risks.
- ➢ **Technical risks:** These risks compromise the forthcoming software production's quality and timeliness. In the even a technology risk materializes implementation

may become difficult or impossible. Technical hazards identify potential problems with design, implementation, interface, verification, and maintenance. Risk issues also include ambiguity in the definition, technological uncertainty, and technology obsolescence.

- **Business risks:** The long-term viability of the software is questioned in light of these hazards. Market risks and developing a solution that no one truly wants are examples of business hazards. Designing a system that no longer supports the company's overall business plan is one example of a strategic risk. Due to a shift in people or priorities, management runs the danger of losing the support of senior management. Budget risks resources cuts, or changes in employee commitment.

5.2 The RMMM Plan:

- **Risk Mitigation:** Making preparations in advance to reduce risk.
- **Risk Monitoring:** Evaluating whether or not anticipated risks materialize, confirming that preventative measures are being followed correctly, gathering data for upcoming risk analysis, and making an effort to identify which risks were responsible for which issue.
- **Risk Management:** what should be done if risk reduction efforts have failed and the issue ha materialized?

Type of Impact: Catastrophic (1), Marginal (2), Tolerable (3), Critical (4).

Type of Probability: very low (75%).

Table 5.1: Project Risk (P01)

Project Risk (P01)	**Date: 12-11-2022**
Name	Alter the specifications
Probability	Low (25%)
Impact	Marginal (2)
Description	The customer may alter their specifications.

Mitigation and Monitoring	The company redefines standards as a result of time restraints or operational needs. The company and I will meet frequently. This guarantees that the problem our solution is meant to tackle actually exists.
Management	Both sides urgently met to discuss the objectives and requirements of the new project.
Status	Did not happen

Table 5.2: Project Risk (P02)

Project Risk (P02)	**Date: 15-11-2022**
Name	Poorly written documents
Probability	Low (15%)
Impact	Catastrophic (1)
Description	The members' paperwork is of poor quality.
Mitigation & Monitoring	There will be regular gatherings to talk about prospective topics and ideas for documentation. A monitor for the status of the documentation will be present at each meeting as well.
Management	The task of adding new subjects or removing ones that are unnecessary from the documentation will be assigned to the responsible person.
Status	Observing it

Table 5.3: Project Risk (P03)

Project Risk (P03)	**Date: 19-11-2022**
Name	Insufficient development experience
Probability	Moderate (30%)
Impact	Catastrophic (1)
Description	The members' lack of developing experience.
Mitigation & Monitoring	Each member of the team needs to be on the lookout for any potential weak points in their teammates.
Management	The team members with the most expertise in that field will be required to assist in resolving any issues that may arise due to the risk.
Status	We have not yet run into such problems.

Table 5.4: Project Risk (TR04)

Project Risk (P04)	**Date: 22-11-2022**
Name	Inadequate code comments
Probability	Low (15%)
Impact	Marginal (2)
Description	The code of the created system is subpar
Mitigation & Monitoring	To guarantee the caliber of comments in all code, a formal documented standard needs to be set.
Management	To solve this issue and raise the standard of code comments, we should schedule a meeting with the development team.
Status	We're keeping an eye on it.

Technical Risks: quality if the final product and timeliness of the schedule are at jeopardy. These kinds of hazards must be adequately managed because this is my practicum report.

Table 5.5: Technical Risk (TR01)

Technical Risk (TR01)	**Date: 24-11-2022**
Name	Ratio of Computer Crashes
Probability	Moderate (25-40%)
Impact	Catastrophic (1)
Description	A computer crash can be brought on by numerous things.
Mitigation & Monitoring	Computers must be properly watched over. Additionally, we have IPS to guard against unexpected shutdowns and constantly backup our data.
Management	If our computer crashes, we'll restore the backup.
Status	We have not come across such a problem

Table 5.6: Technical risk (TR02)

Technical Risk (TR02)	**Date: 25-11-2022**
Name	Technology falls short of specifications
Probability	Low (25%)
Impact	Catastrophic (1)
Description	The technology does not meet the expectations of the consumer.
Mitigation & Monitoring	We can ensure that the product we are producing and customer's specifications are identical by doing this.
Management	As soon as possible, the client should be informed, and whatever actions are required to fix the issue should be taken. The development team and the customer should ideally meet to go over this issue in more detail.
Status	We have not yet come across such a problem.

Table 5.7: Technical Risk (TR03)

Technical Risk (TR03)	**Date: 26-11-2022**
Name	Poor Training Skill in Team Members.
Probability	Medium (30%)
Impact	Catastrophic (1)
Description	Team members' inability to train clients due to poor training skills.
Mitigation & Monitoring	The training crew must be knowledgeable with the complete functionality of the product. The system analysts need to be sure to keep an eye on the training session as soon as it starts
Management	We need to set up a meeting with the train team so we can resolve this issue.
Status	Such a problem has not yet arisen for us.

Business Risk: Endanger the capacity to successfully develop the software (market risks, strategic risks, management risks, budget risks). My project won't contain any conventional commercial hazards because in developing it independently for my practicum. Therefore, it is decided that there is a low probability for all business hazards.

Table 5.8: Business Risk (B01)

Business Risk (B01)	**Date: 28-11-2022**
Name	Budgetary constraints
Probability	Low (10%)
Impact	Marginal (2)
Description	Low finance could make it impossible to complete the project
Mitigation & Monitoring	In order to lower the risk to the budget, the project requires expensive to set up streaming servers and services.
Management	A clearer project objective. A fresh approach to spending restraint.

Status	not found

Table 5.9: Business Risk (B02)

Business Risk (B02)	**Date: 02-12-2022**
Name	Customers accept the system
Probability	Low (10%)
Impact	Critical (4)
Description	Users are unable to trust the system.
Mitigation & Monitoring	The software will be made with the end user in mind during development to avoid this from happening. The user interface will be created in a way that makes using the program easy and enjoyable.
Management	To become used to the new system, users must obtain training. Patches and bug fixes are released to enhance user experience.
Status	The risk has not yet materialized.

Table 5.10: Business Risk (B03)

Business Risk (B03)	**Date: 04-12-2022**
Name	Not paying the software cost installment.
Probability	Very Low (05%)
Impact	Catastrophic (1)
Description	The cost of the software installation is not covered by the customer.
Mitigation & Monitoring	We must guarantee effective client communication and timely completion of the entire installment.
Management	Finding the cause and offering a solution would be the only available course of action.
Status	not observed.

Table 5.11: Business Risk (B04)

Business Risk (B04)	**Date: 07-12-2022**
Name	Project delivery delayed
Probability	Very Low (05%)
Impact	Catastrophic (1)
Description	The project might take longer than expected to complete
Mitigation & Monitoring	The project's scope was determined in order to take the necessary precautions to guarantee timely delivery.
Management	The only option would be to approach the customer and ask for a deadline extension.
Status	My project was finished on schedule.

Chapter: 06
Analysis Modeling

6 Analysis Modeling

In order to describe data, function, and behavior requirements in a style that is easy to understand and, more significantly, easy to assess for accuracy, completeness, and consistency, analysis modeling blends textual and diagrammatic forms. Links to resources for conventional, object-oriented analysis (OOA), and UML are provided in this area.

6.1 Analysis Modeling

Model analysis objectives

- Analyzing Domains
- Clearly state the client's need
- Set the stage for developing a software design.
- Establish a set of standards that can be verified when the product is built.

6.2 Activity Diagram

Activity diagrams are graphical representations of processes that permit choice, iteration, and concurrency in stepwise activities and actions. Both organizational and computational activities are represented by activity diagrams in the Unified Modeling Language

6.2.1 Activity Diagram (Admin)

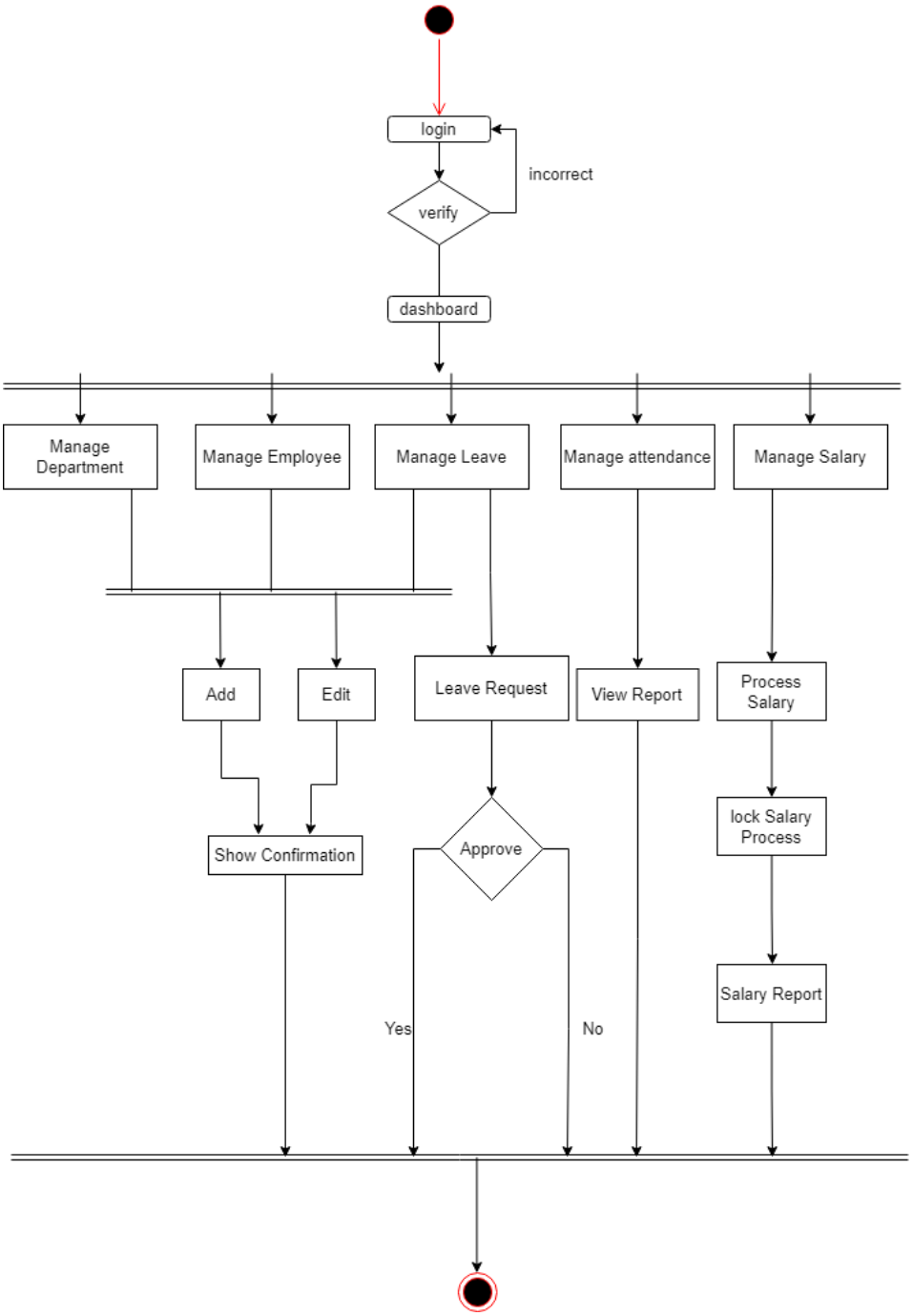

Figure 6.1: Activity Diagram for Admin

6.2.2 Activity Diagram for (User)

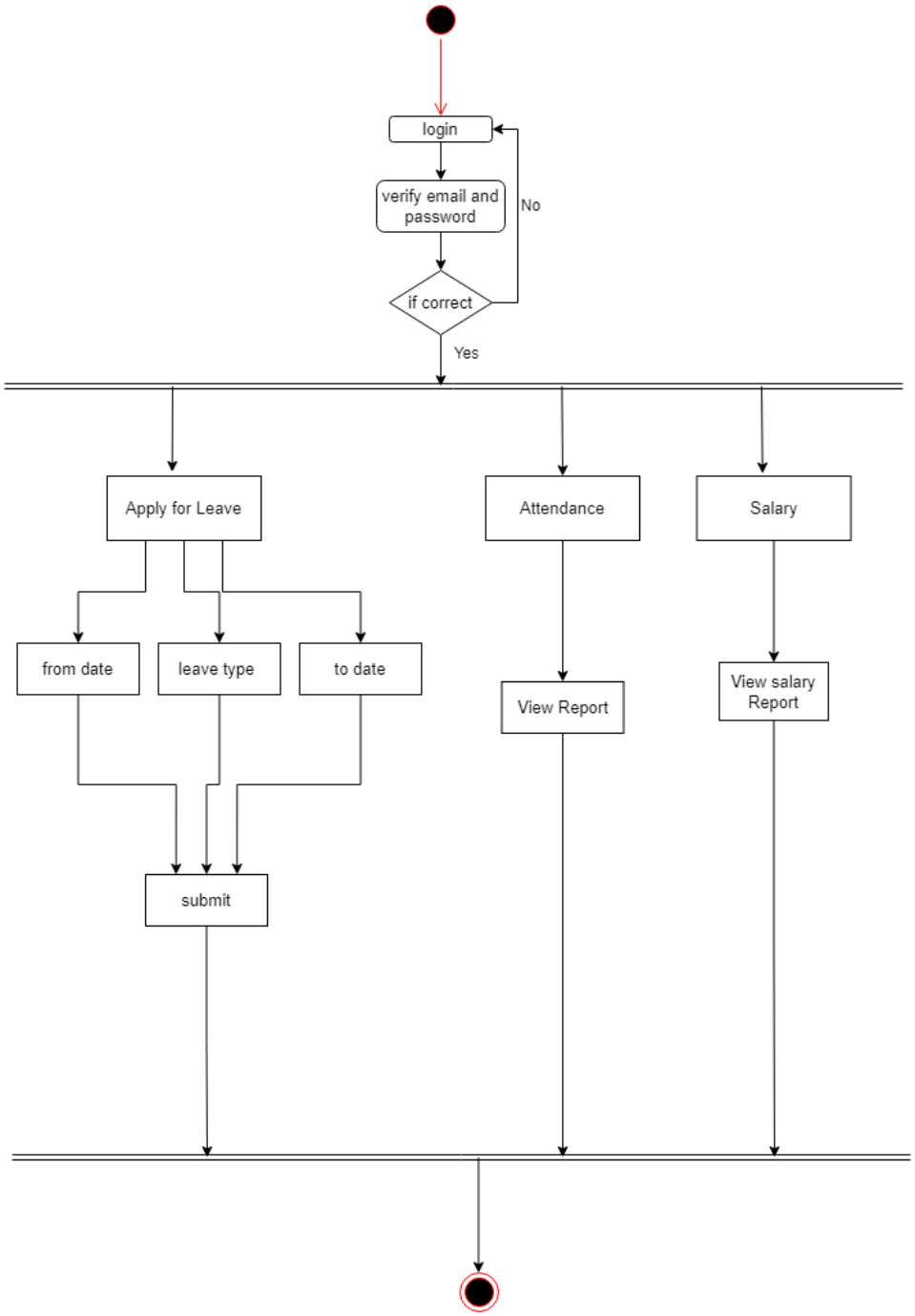

Figure 6.2: Activity Diagram for User

6.3 ER Diagram

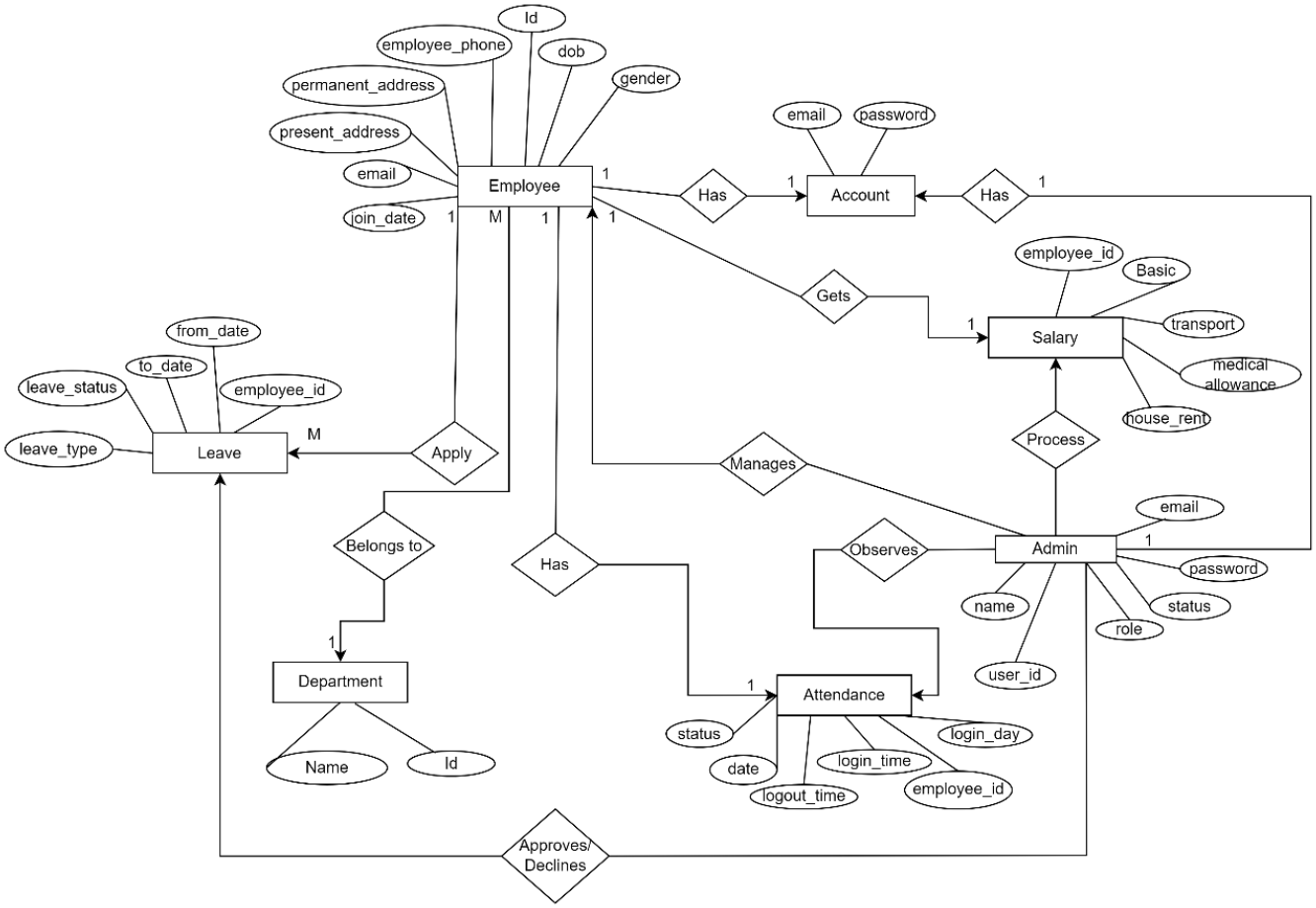

Figure 6.4: ER Diagram of PMS

6.4 Data Flow Diagram (DFD)

A data flow diagram (DFD) is a visual representation of how data "flows" through a data system that also serves as a model for processing features. The first step in creating a systemic perspective that can be later enhanced is frequently DFD. Data processing can also be shown using data flow diagrams (DFDs). The data flow diagram (DFD) illustrates the many kinds of data that will be input into the system and retrieved from it, as well as where the data will appear, go, and be kept. It is not specified how long it will take for each treatment to finish or whether they will operate simultaneously or similarly. All of the data flow diagrams in Bellow Standards are available.

6.4.1 Context Level Diagram

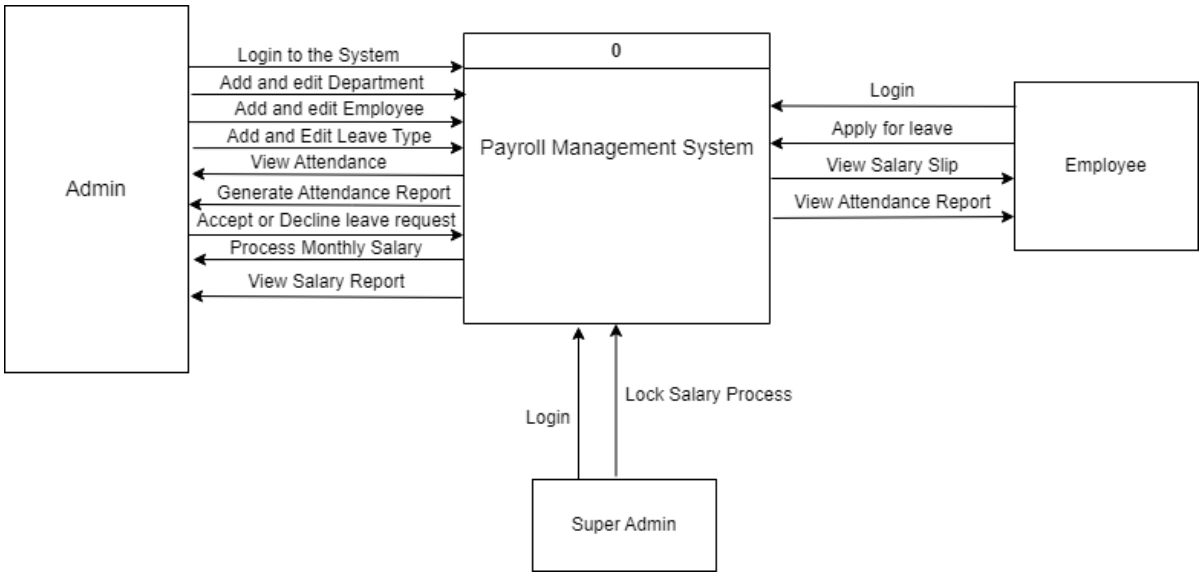

Figure 6.5: Context Level Diagram Payroll management System

6.4.2 Level 1 DFD

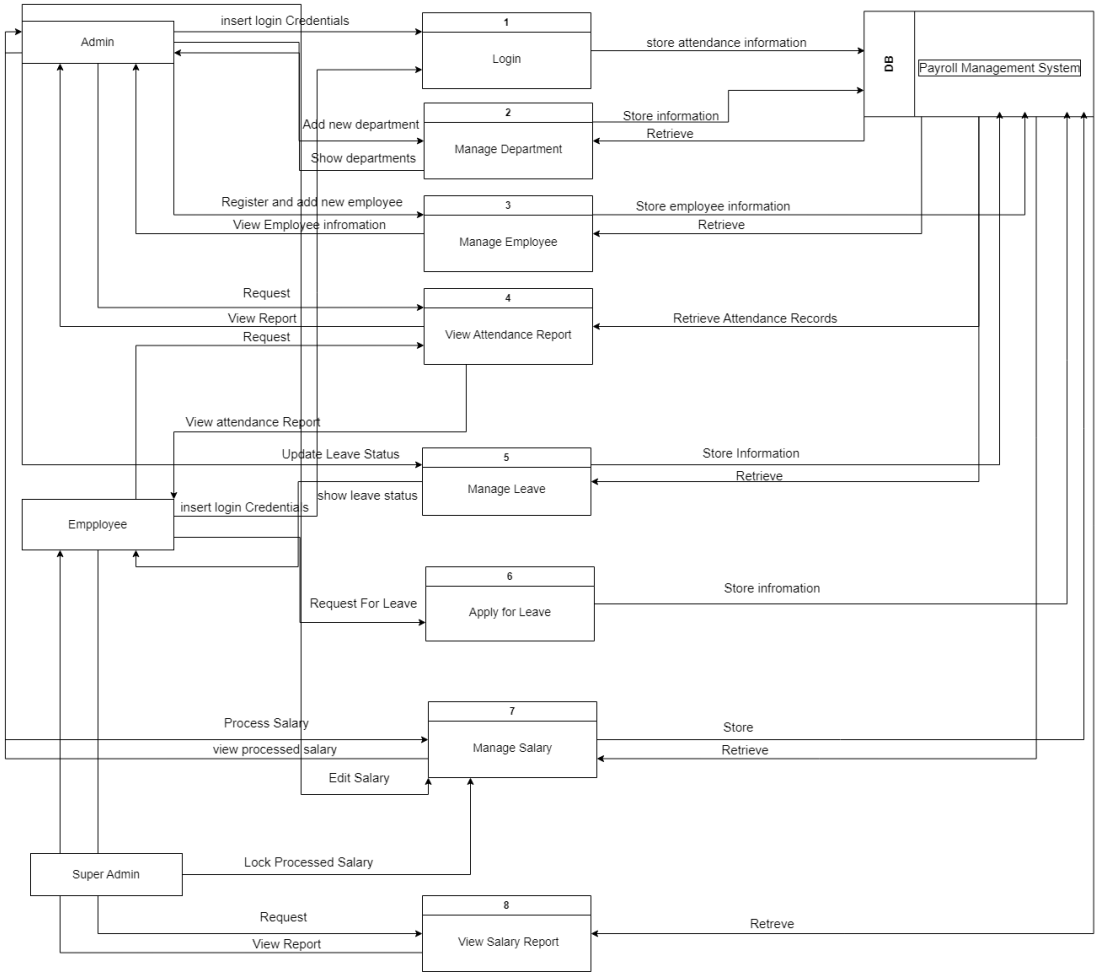

Figure 6.6: DFD Level-1

6.4.3 Level-2 Process 1 DFD (Login)

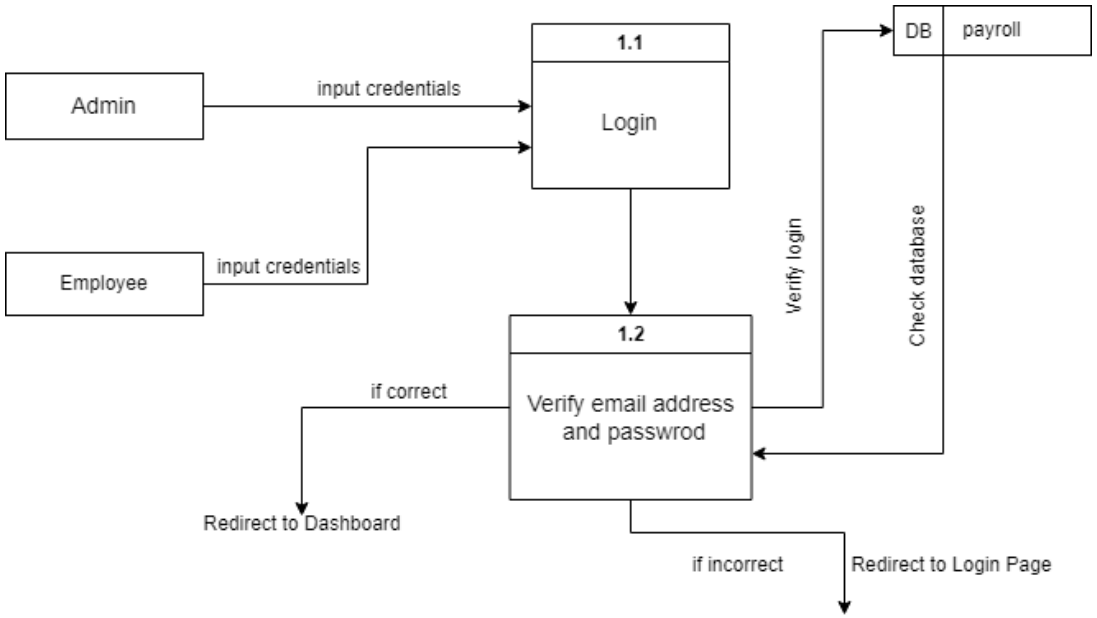

Figure 6.7: Level 2- Process 1 DFD

6.4.4 Level-2 Process 2 DFD (Manage Employee)

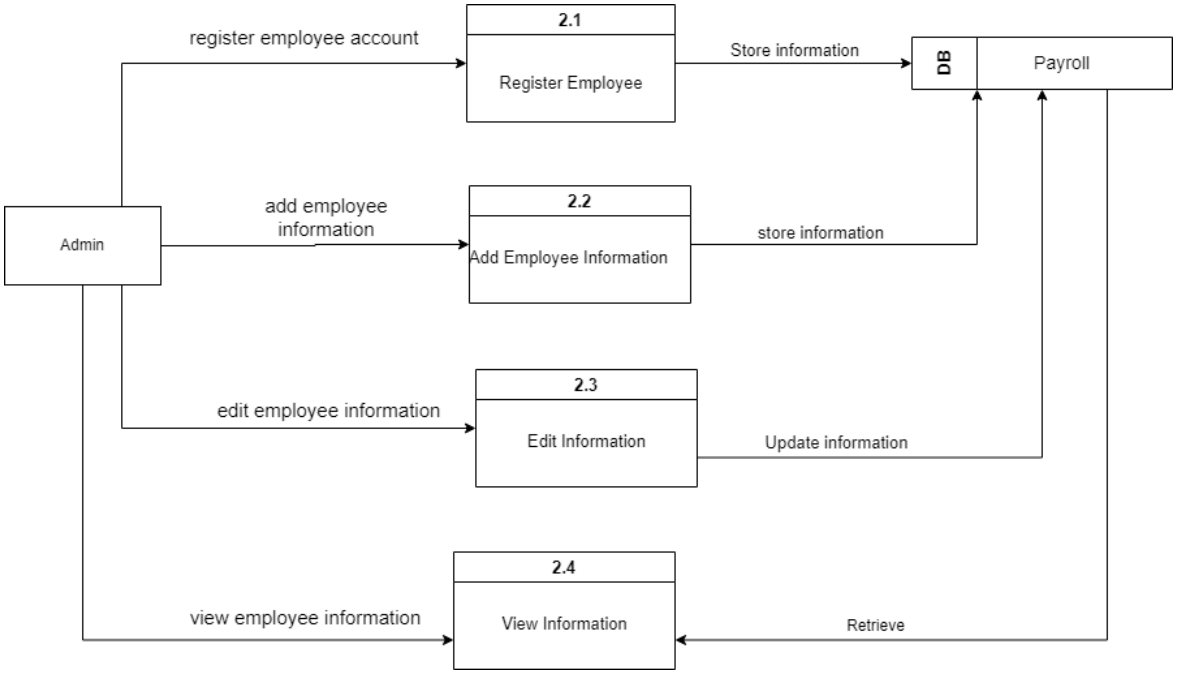

Figure 6.8: Level 2- Process 2 DFD

6.4.5 Level 2 Process 3 DFD (Leave)

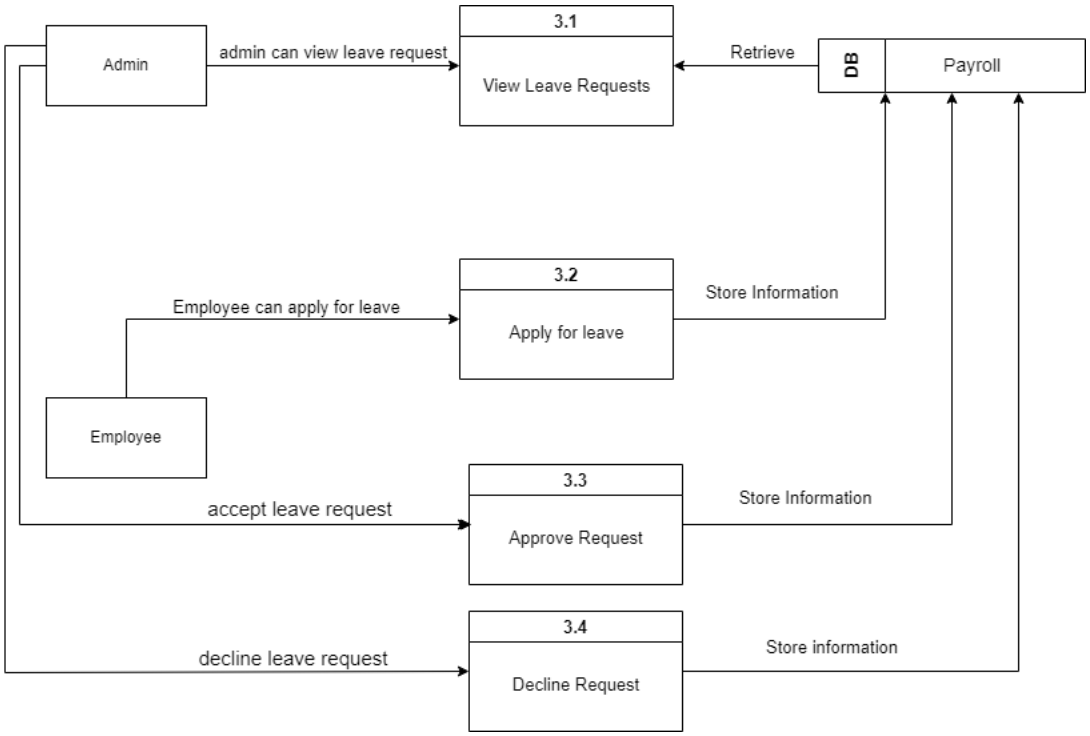

Figure 6.9: Level 2- Process 3 DFD

6.4.6 Level 2 Process 4 DFD (Attendance)

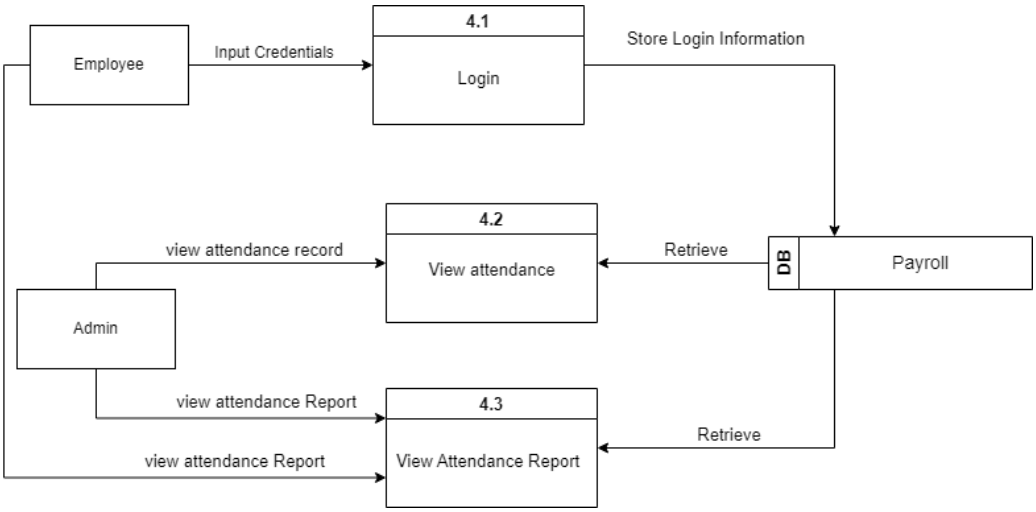

Figure 6.10: Level 2- Process 4 DFD

6.4.7 Level 2 Process 5 DFD (Salary)

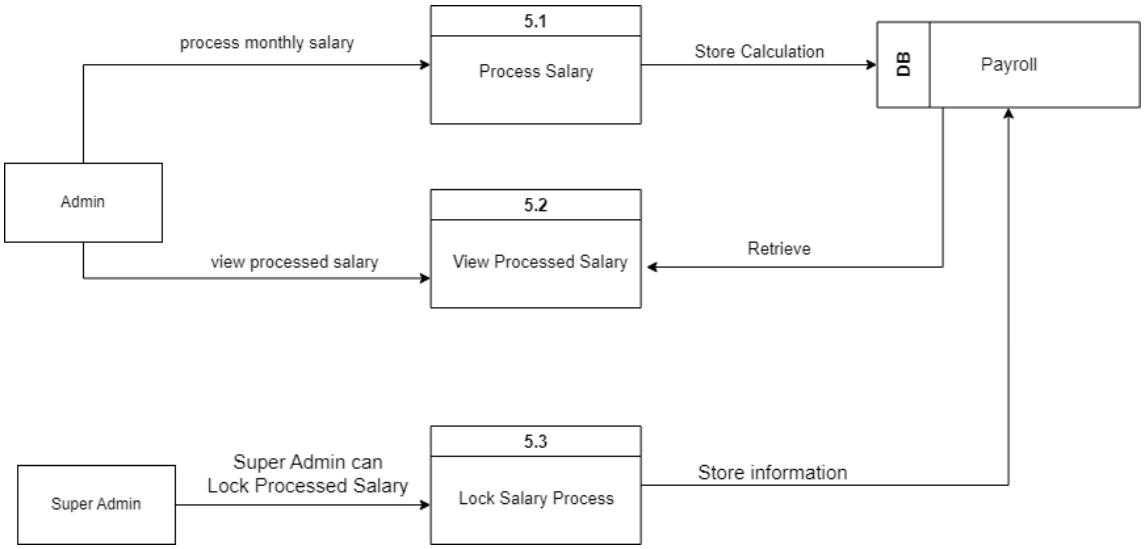

Figure 6.11: Level 2- Process 5 DFD

6.5 Swim Lane Diagram

A swim lane diagram is an illustration of a flowchart that indicates who is in charge of what during a procedure. Clarity and accountability are provided by a swim lane diagram, which shows the stages of a process inside the horizontal or vertical "swim lanes" of a particular user and system. The swim lane diagrams for my project are shown below:

6.5.1 Swim Lane Diagram for Payroll Management System:

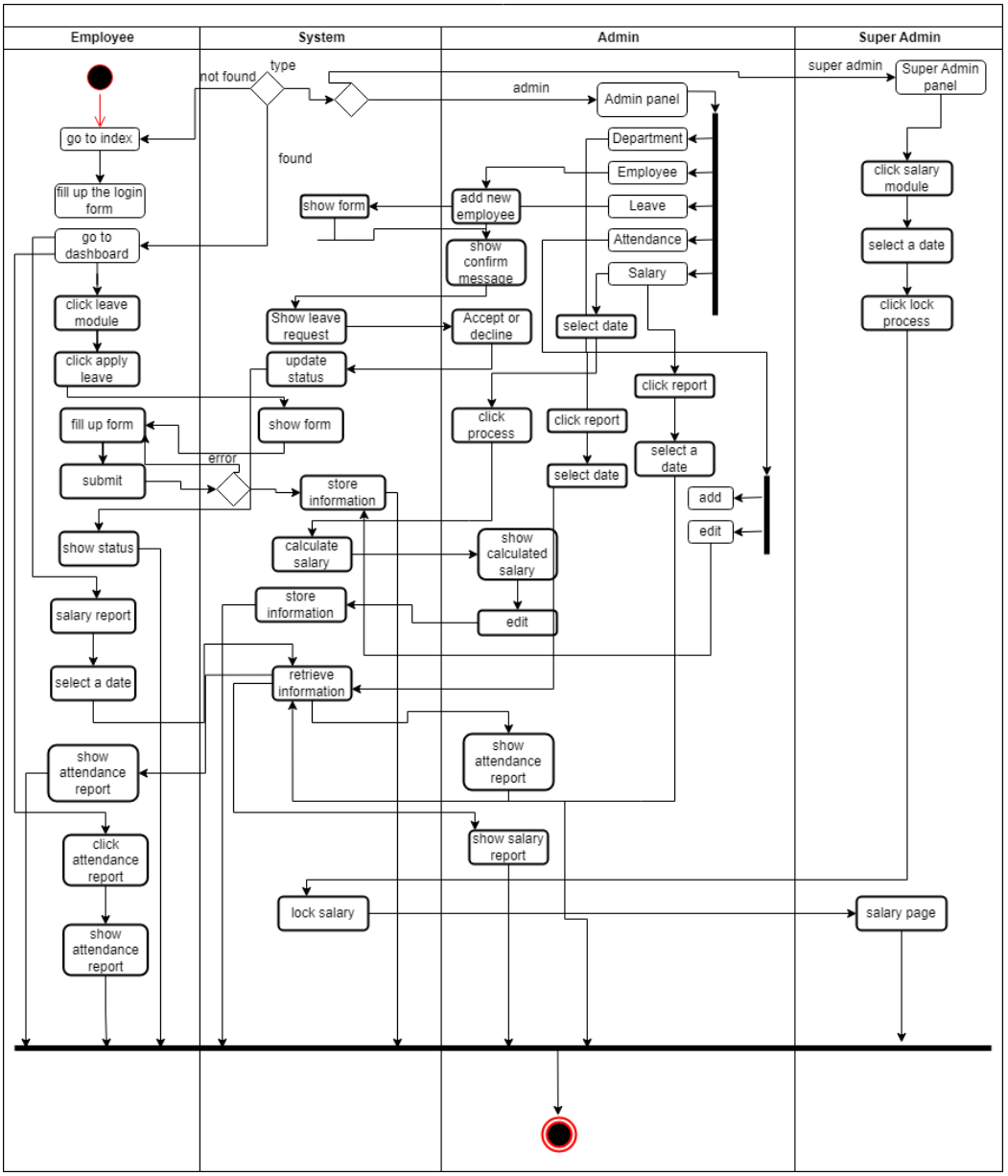

Figure 6.12: Swim Lane Diagram for Payroll Management System

Chapter: 07
Design

7 Database Field Design

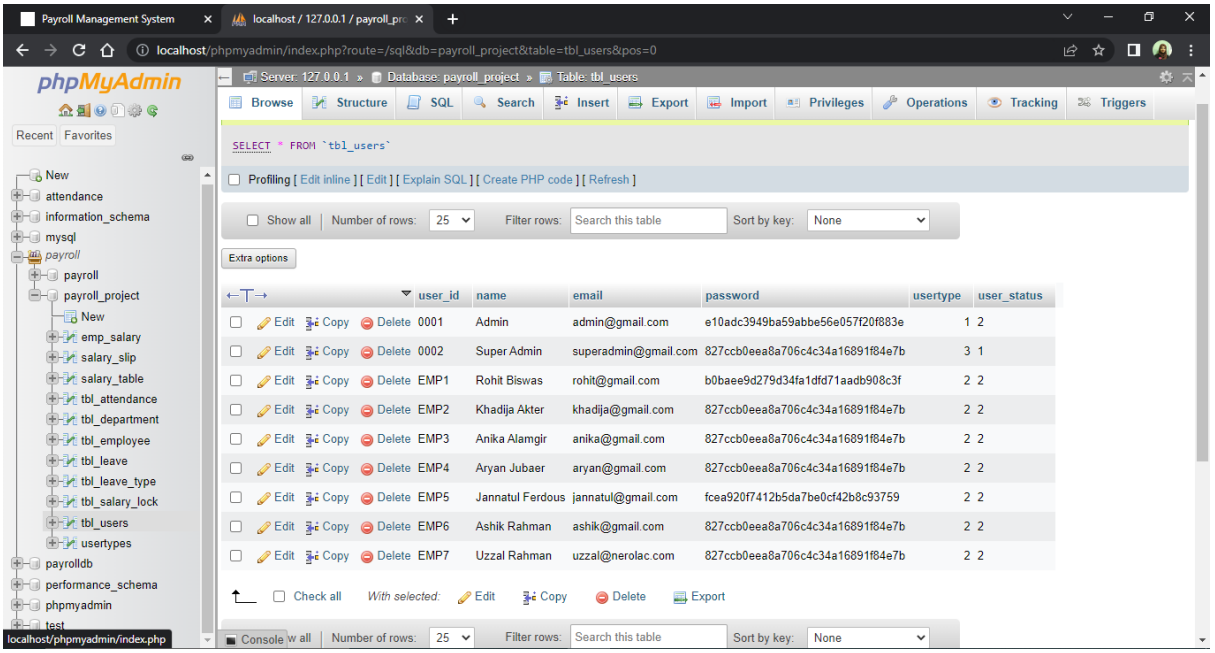

Figure 7.1: "Users" Table Structure

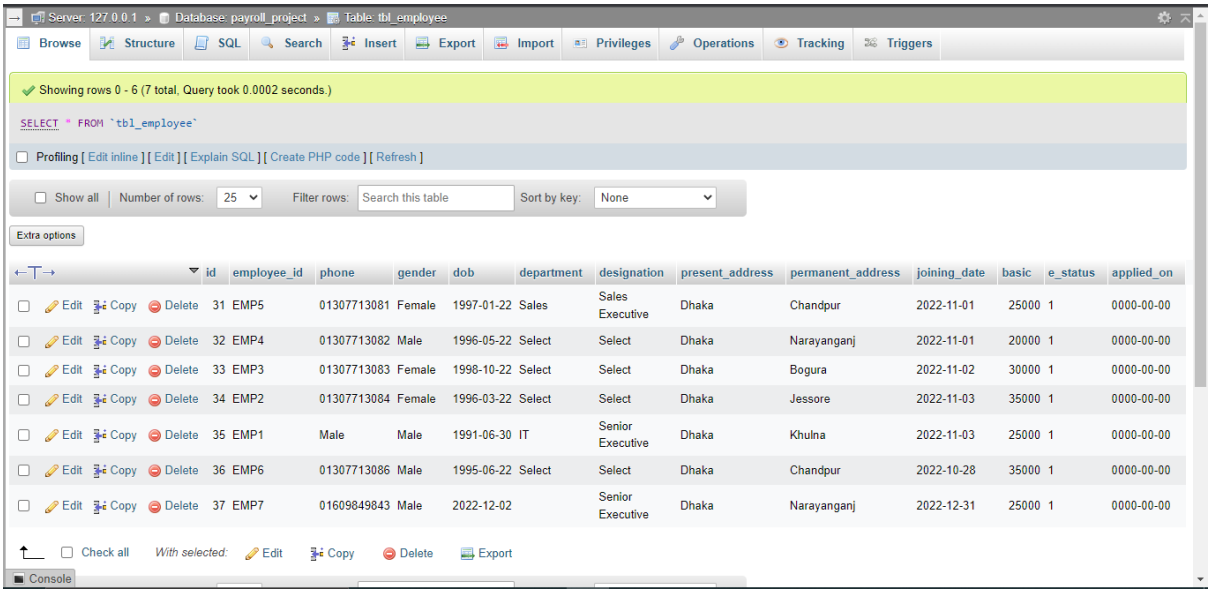

Figure 7.2: "Employee" Table Structure

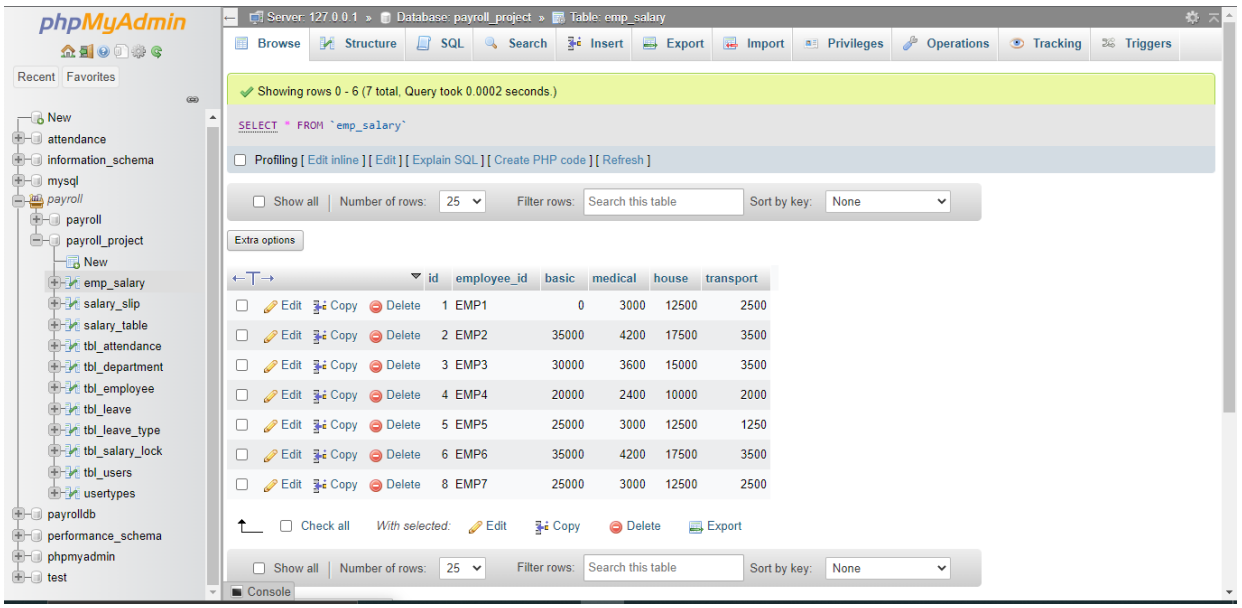

Figure 7.3: “Salary” Table Structure

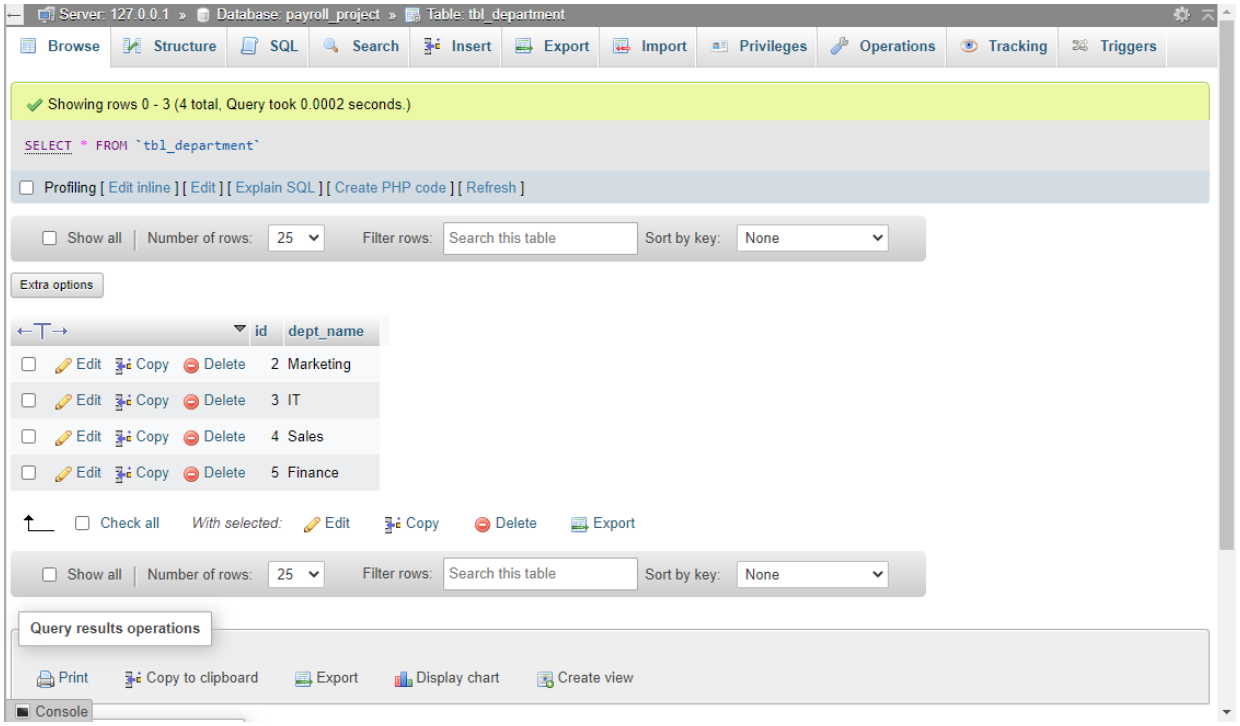

Figure 7.4: “Department” Table Structure

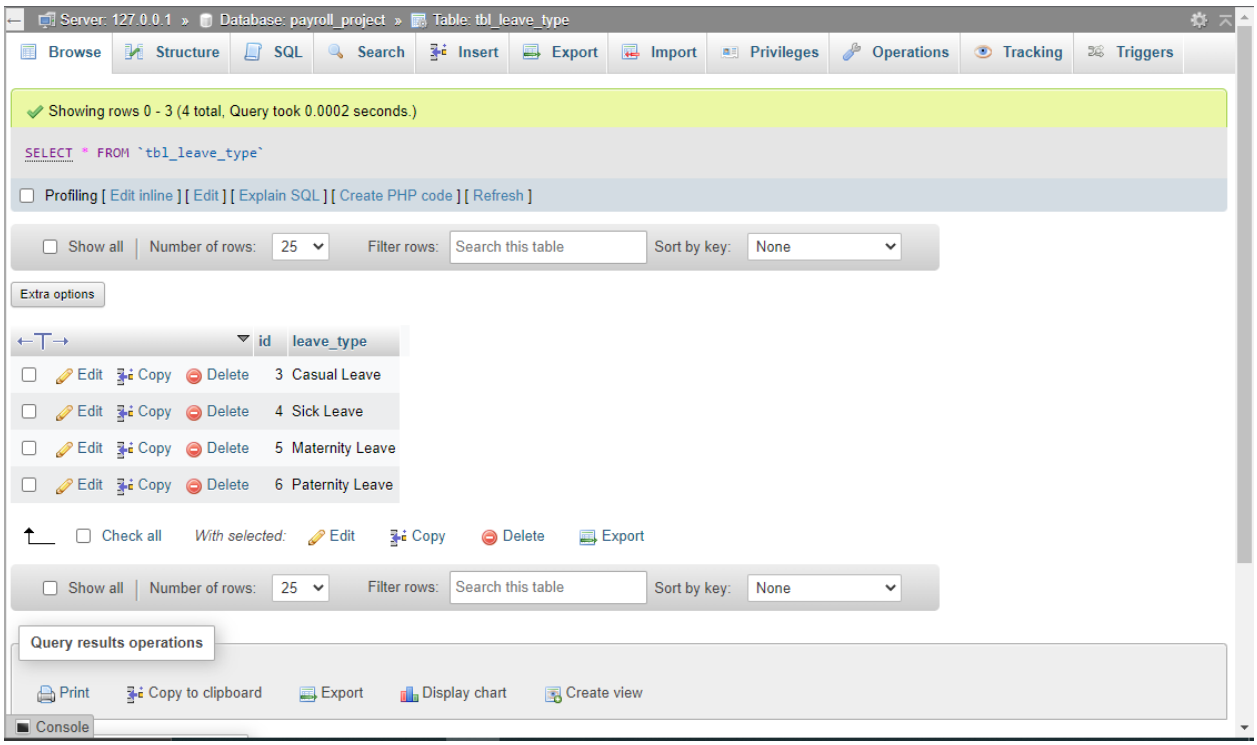

Figure 7.5 “leave type” Table Structure

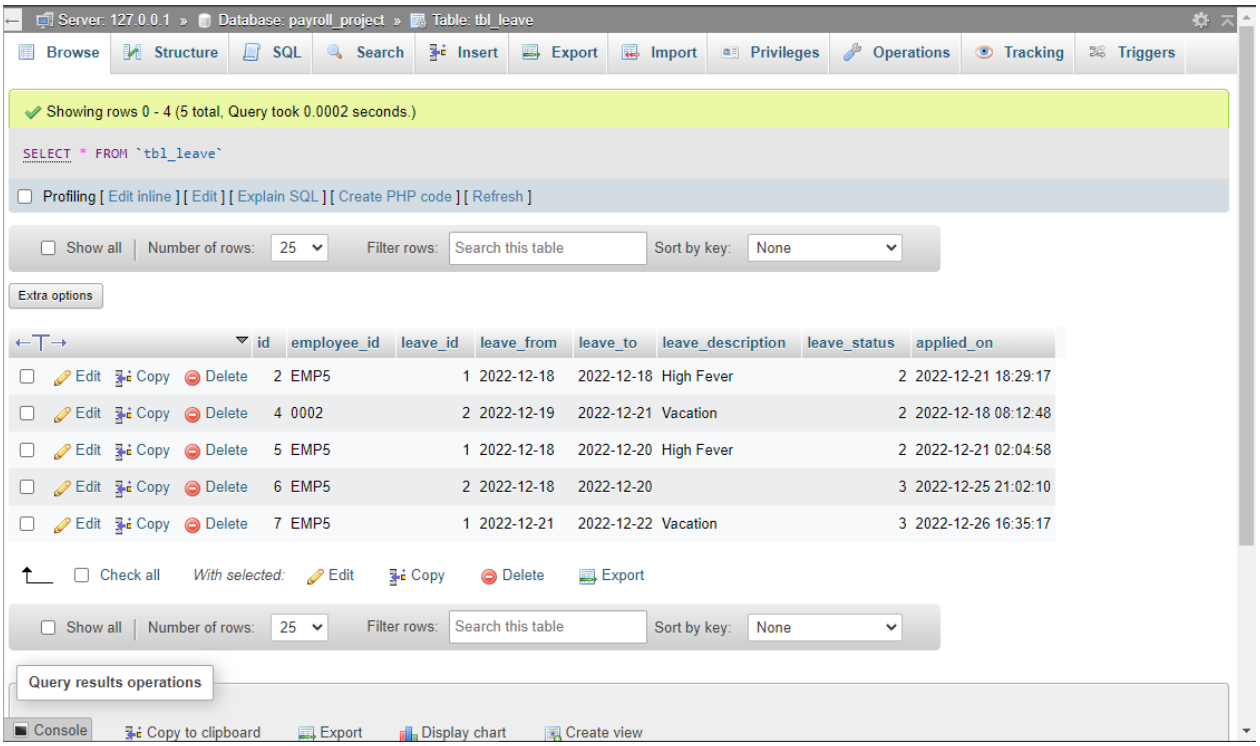

Figure 7.6: “Leave” Table Structure

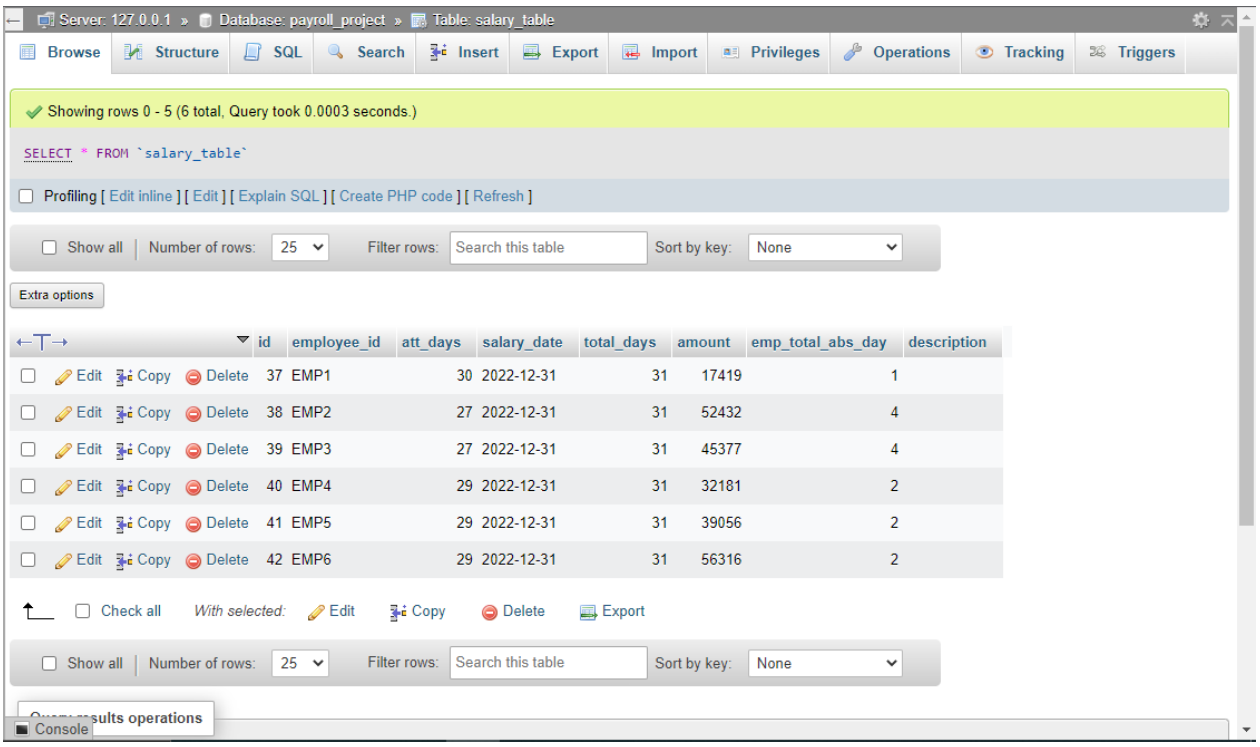

Figure 7.7: "Monthly Salary" Table Structure

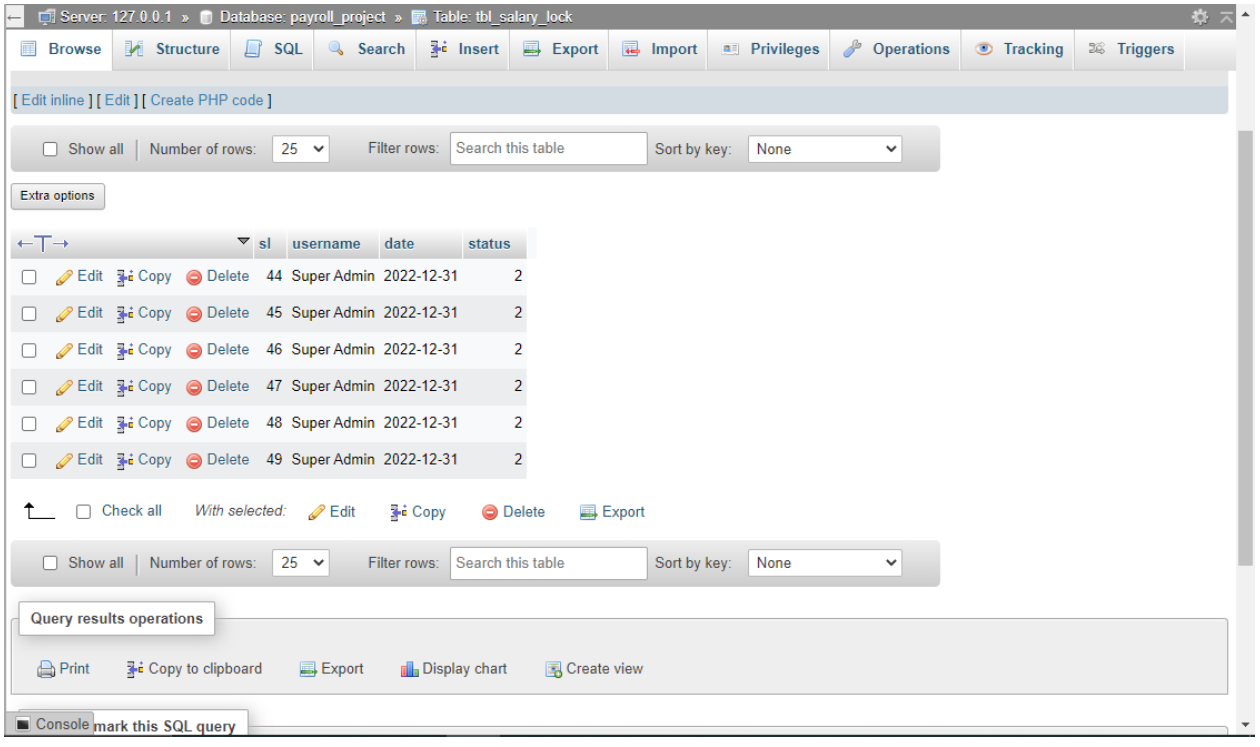

Figure 7.8: "salary lock" Table Structure

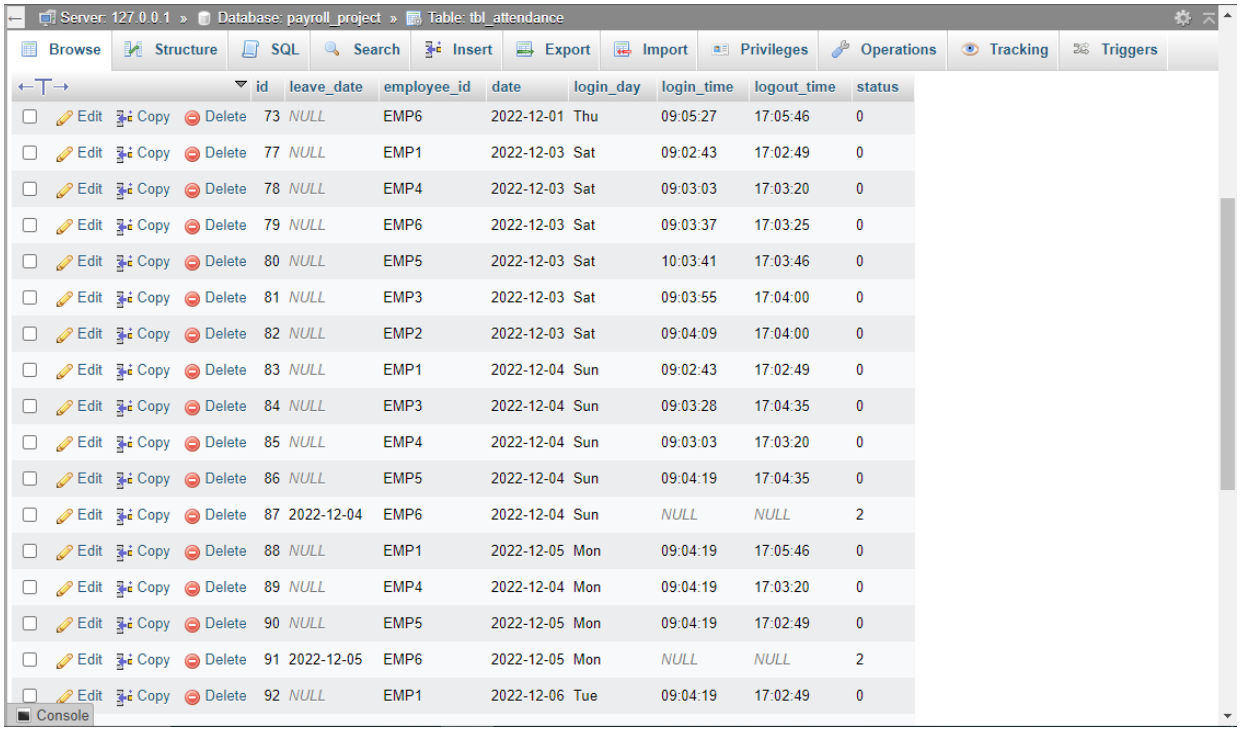

Figure 7.9: “Attendance” Table Structure

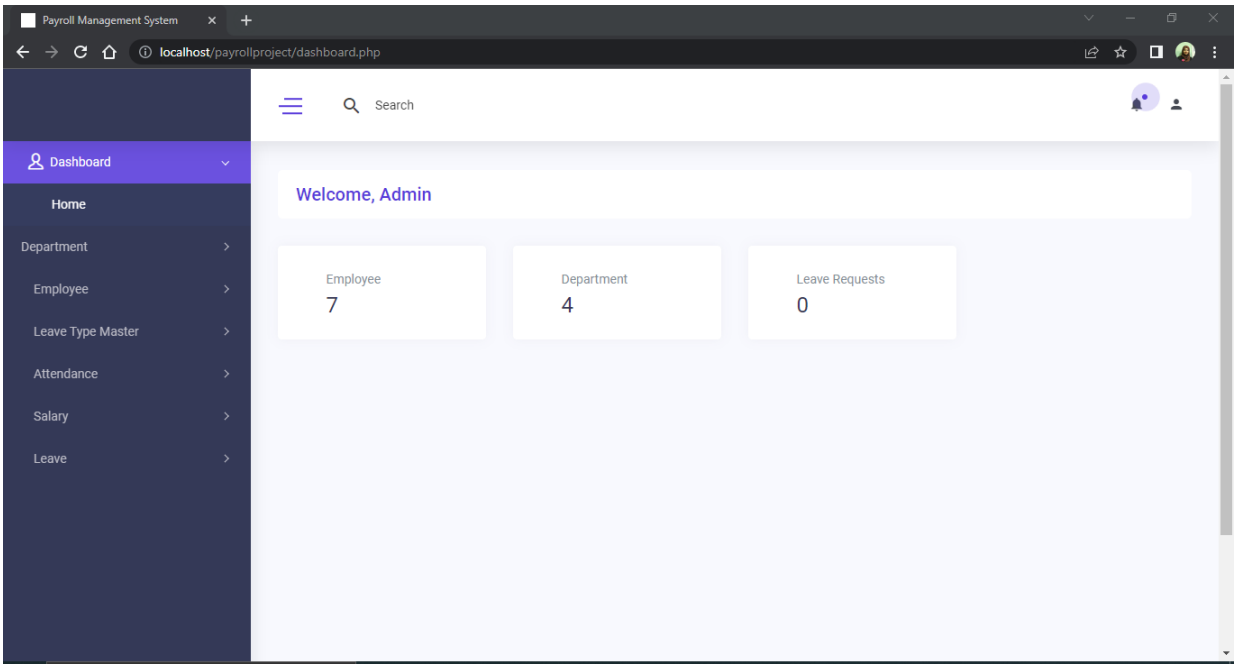

Figure 7.10: Admin Dashboard

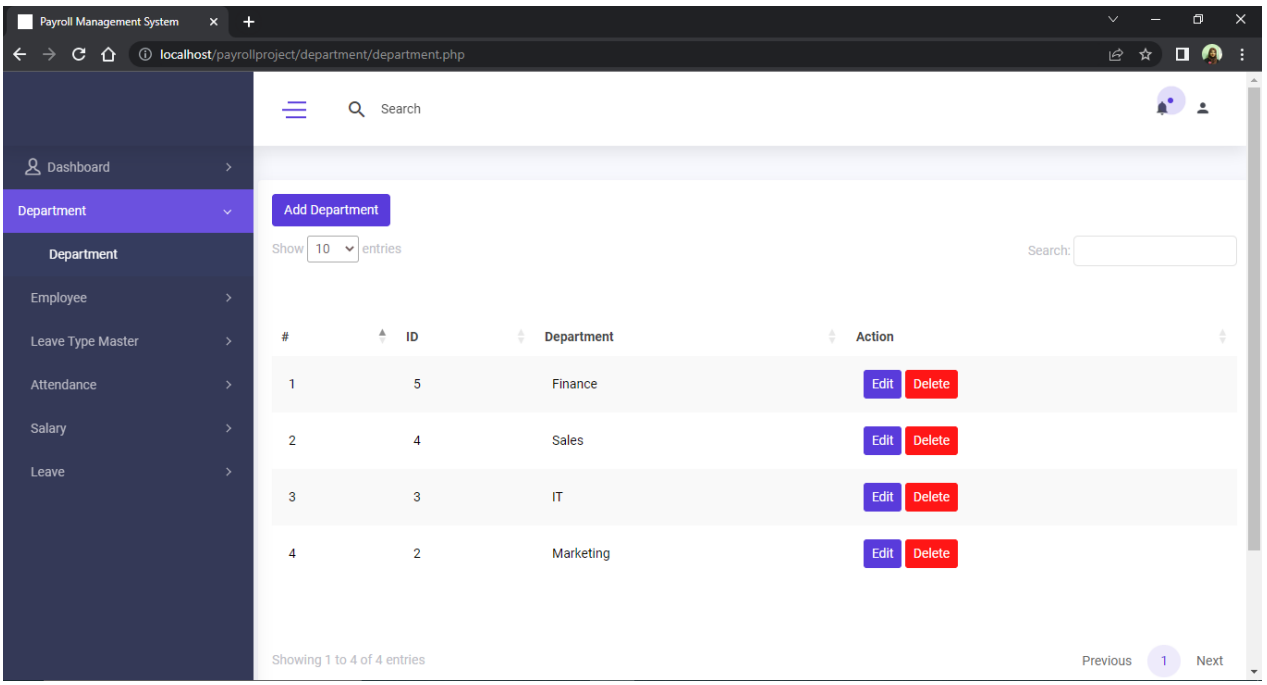

Figure 7.11: Department Module

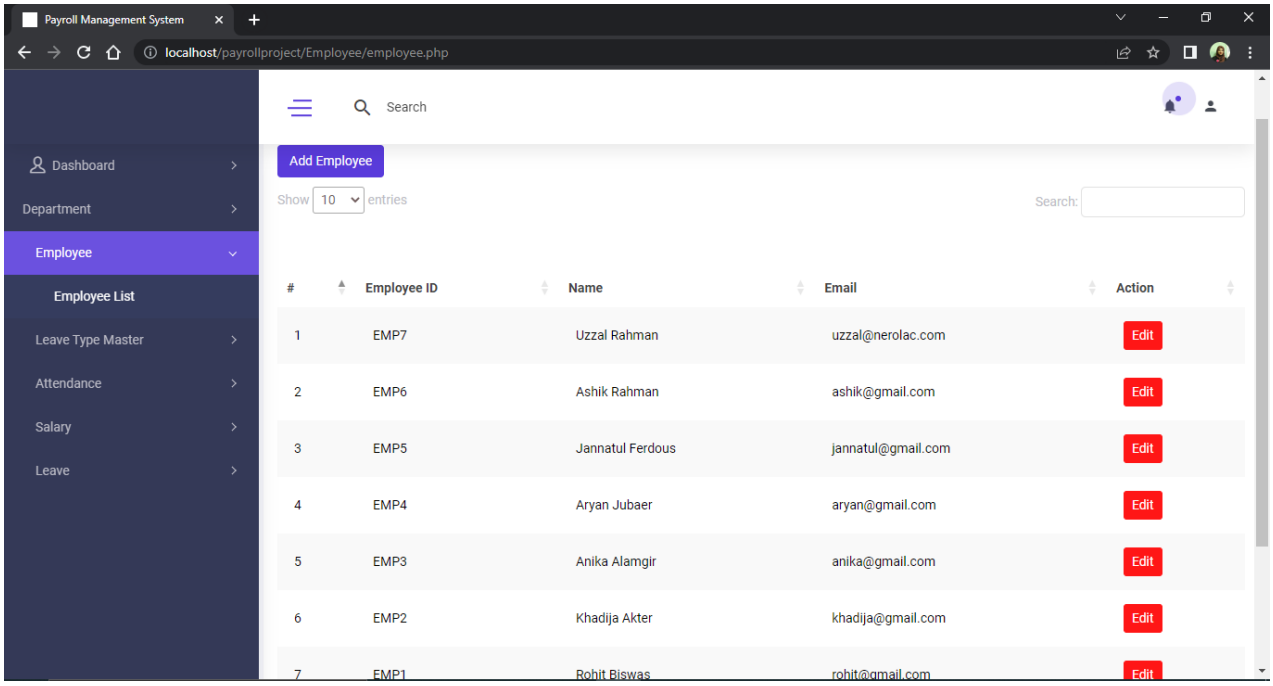

Figure 7.12: Employee Module

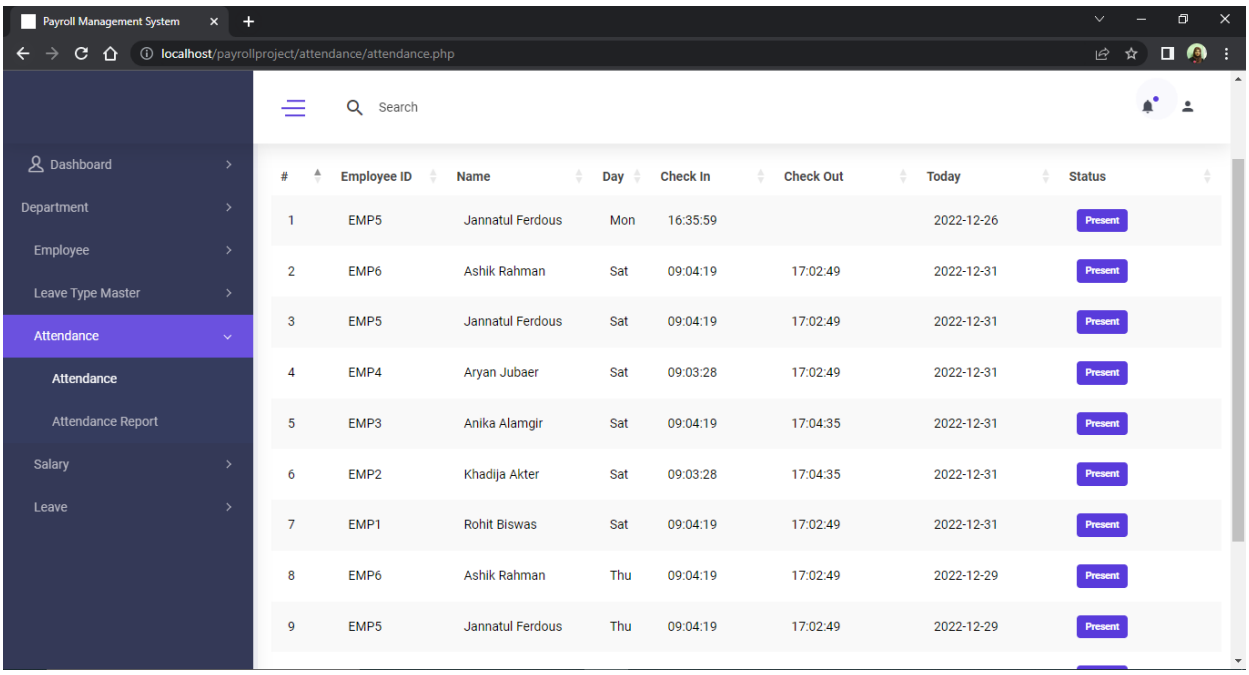

Figure 7.13: Attendance Module

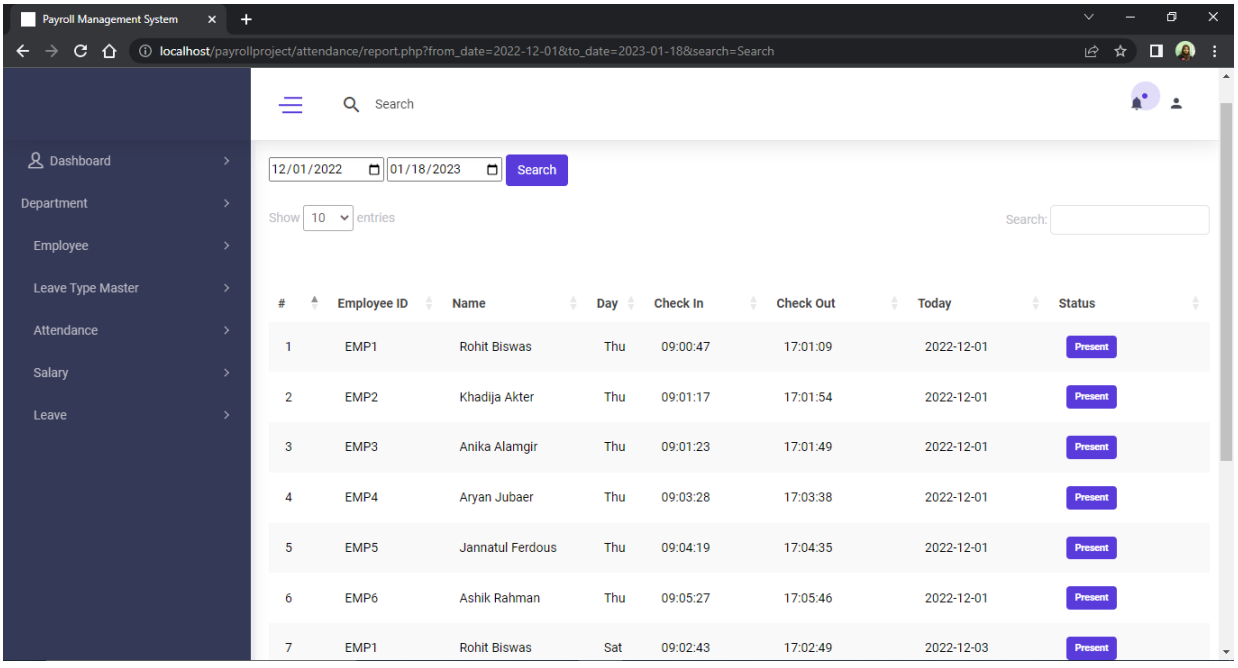

Figure 7.14: Attendance Report

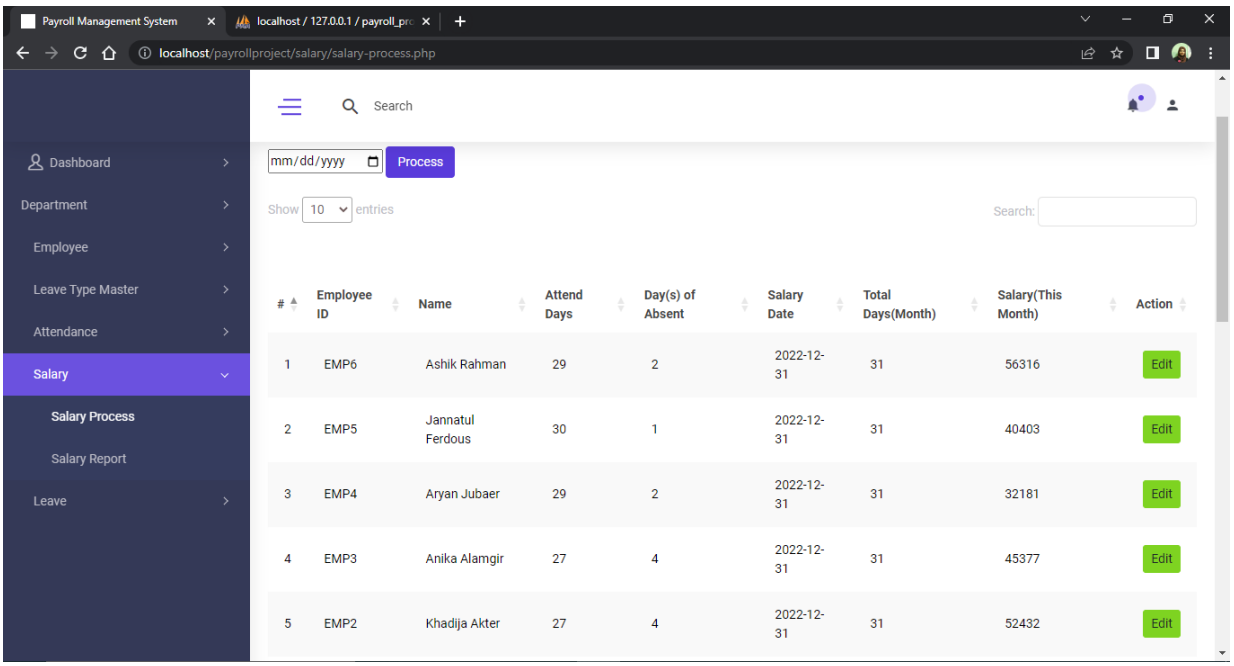

Figure 7.15: Monthly Salary Process

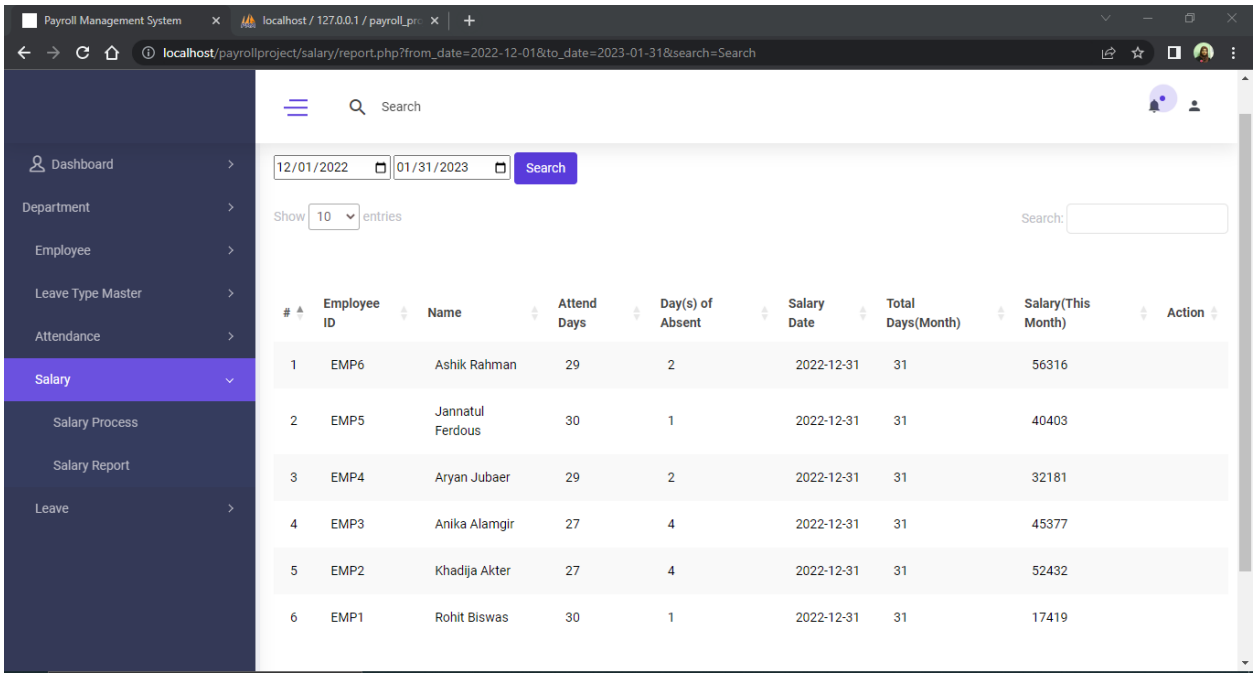

Figure 7.16: Salary Report

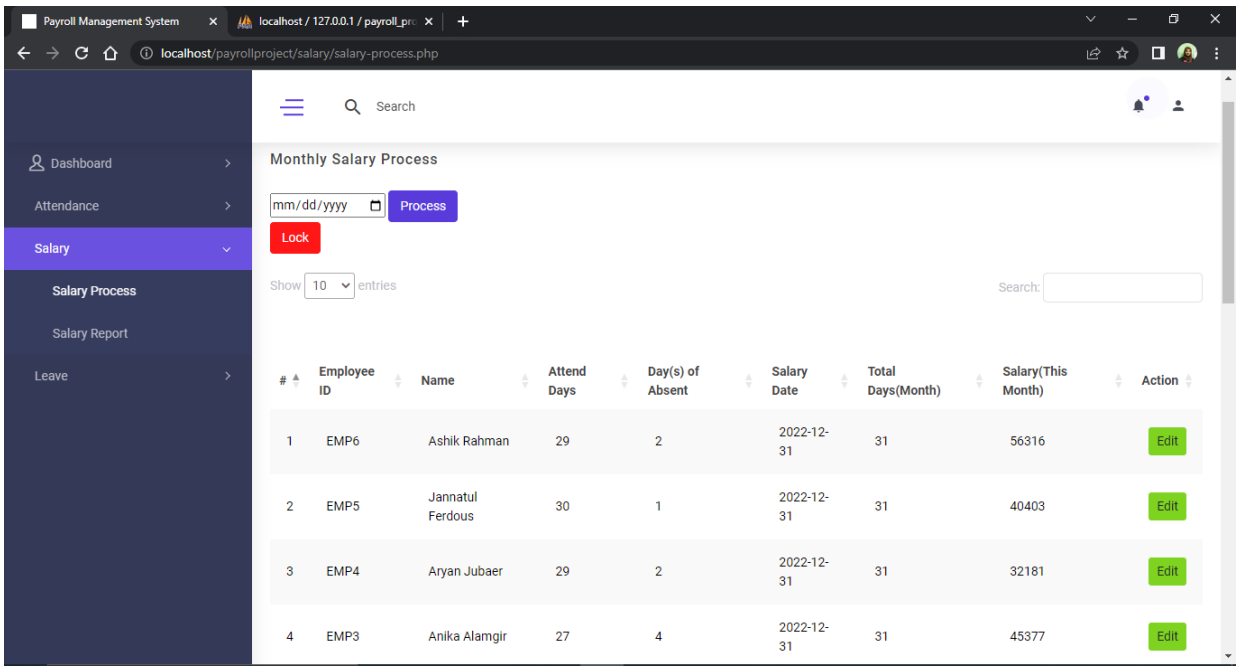

Figure 7.17: Salary Process Lock (Super Admin)

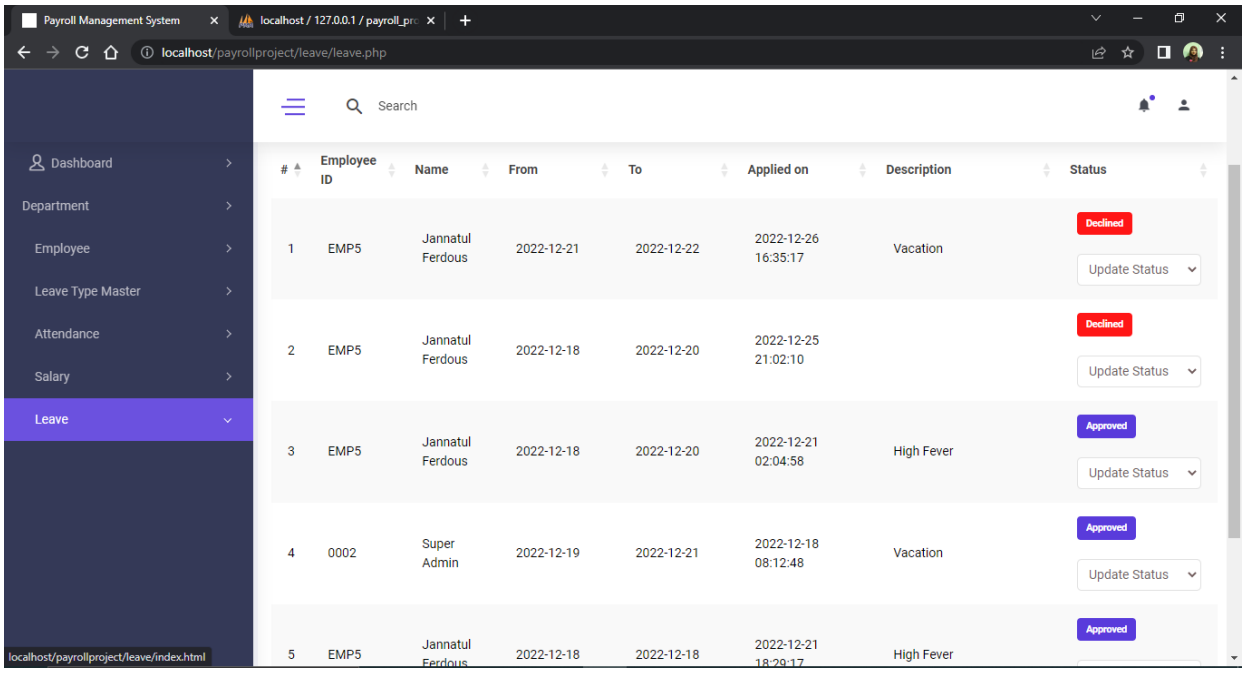

Figure 7.18: Leave Module (Admin)

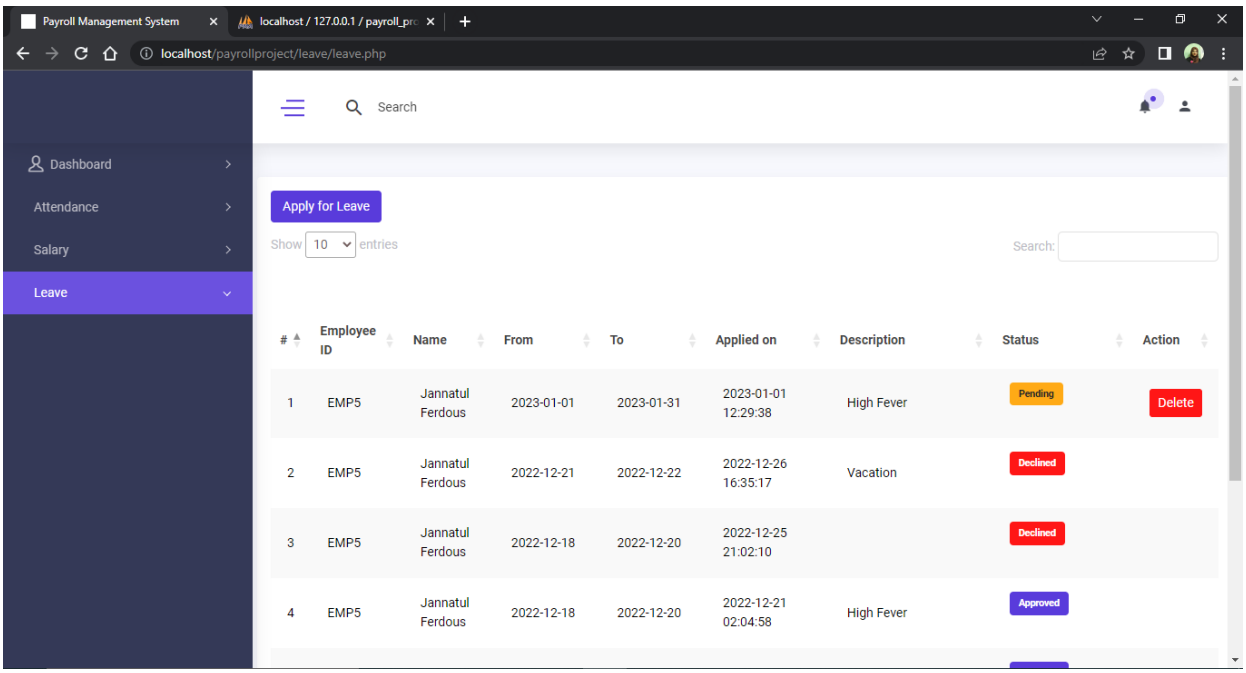

Figure 7.19: Leave Module (Employee)

Chapter: 08
System Testing

8 System Testing

Software testing is the process of analyzing a software product to identify discrepancies between the input that has been provided and the intended output, as well as to assess its features. The outcome of testing establishes a product's quality. A necessary phase in the development process is software testing. Software testing is, in other words, a process of validation and verification.

- **Verification:** It is a process used to ensure that the product adheres to the specifications set forth at the start of the development phase. In other words, we want to ensure that the product works as it is supposed to.
- **Validation:** Validation is the process of ensuring that, at the end of the development phase, the product meets the defined criteria. To put it another way, to ensure that the product is created to the specifications of the client. The objectives of software testing are as follows:

The following are the goals of software testing:

Running a program with the intention of finding errors is known as testing. A test case that has a good possibility of spotting an error that hasn't been found is ideal. A test that finds an error that hasn't been found is successful.

As challenging as the initial design of the product might be, so can the design of software testing. Software testing can be done in two ways:

- If it is known precisely which function the software is supposed to do, tests that thoroughly show each function and look for problems in each function can be run. This strategy is referred to as "black-box testing."
- By being aware of how software operates internally, you may run tests to verify that internal activities are carried out in accordance with specifications and that all internal components have been used to their full extent. This technique is known as “white box- testing”.

8.1 Software Testing Strategy

A well-planned series of procedures that lead to the effective building of a software are integrated into a strategy for software testing. The plan offers a step-by-step guide that outlines the procedures to be followed throughout testing. The testing approach for this software project will be as follows:

- Unit testing
- Integration testing
- Validation testing

8.2 System testing methodology

8.2.1 Black-box Testing

The functional requirements of the software are the main emphasis of black-box testing, commonly referred to as behavioral testing. It enables a software developer to produce groups of input scenarios that will carefully examine each program's functional requirement.

The LMS modules will be tested utilizing the black-box testing approach.

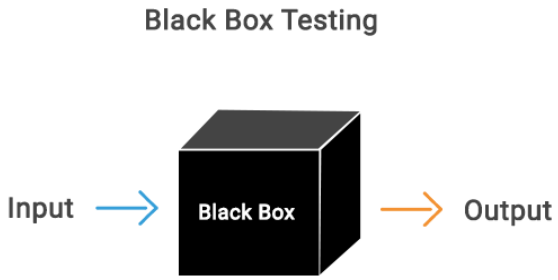

Figure 8.1: Black box testing

8.3 Testing

Table 8.1: System Testing Scenario 1

Testing scenario No: 1	
Scenario	User Login
Inputs	email, password
Desired outputs	Users will be sent to their individual dashboards based on their roles when all information is entered correctly.
Actual outputs	All roles in my system functions properly
Verdict	Finding the difference between desired and actual outputs determined that the login function of this system successful.

Table 8.2: System Testing Scenario 2

Testing scenario No: 2	
Scenario	Admin registers new employee
Input	Email, password, employee id
Desired output	New employee will be registered
Actual output	Employee registration works perfectly
Verdict	The system’s success for employee registration was determined by comparing desired and actual outputs.

Table 8.3: System Testing Scenario 3

Testing scenario No: 3	
Scenario	Admin can view leave requests
Inputs	Request to view leave requests
Desired Outputs	Show all leave requests
Actual Outputs	My system is flawless for displaying all leave requests.
Verdict	The procedure went off without a hitch.

Table 8.4: System Testing Scenario 4

Testing scenario No: 4	
Scenario	Admin can accept or decline leave requests
Inputs	Update leave request status
Desired Outputs	Status updated
Actual Outputs	For accepting or declining requests, my system works perfectly
Verdict	The procedure is successful and correct.

Table 8.5: System Testing Scenario 5

Testing scenario No: 5	
Scenario	System will take attendance through login
Inputs	User will login and attendance will be taken automatically
Desired Outputs	Attendance details will be shown in attendance module every time an employee will login and log out
Actual output	Attendance details are shown in attendance module
Verdict	The procedure is accurate and effective.

Table 8.6: System Testing Scenario 6

Testing scenario No: 6	
Scenario	Employee can apply for leave
Inputs	Leave type, from date, to date, description
Desired Outputs	Leave form will be submitted and will be shown leave request list
Actual Outputs	Every leave request will be shown in admin panel
Verdict	The process works correctly and successfully.

Table 8.7: System Testing Scenario 7

Testing scenario No: 7	
Scenario	Admin can Process Monthly Salary
Inputs	Select date and click process button
Desired Outputs	System will automatically calculated monthly salary and it will be shown in salary module
Actual Outputs	All processed salaries are shown with selected date
Verdict	The process works correctly and successfully.

Chapter: 09
Conclusion

9 Conclusion

9.1 Practicum and its Value Conclusion:

As in other facets of life, there is a clear connection between effort and reward in the development of our careers. By exposing students to engineering processes in a practical setting, practicum can, in my opinion serve as a bridge between engineering and non-engineering subjects.

During the four years of undergraduate engineering study, students acquire both theoretical and practical knowledge. By utilizing such information and watching systems for live performances, the practicum program emphasizes those lessons that are "vital to another gifted true work ethic. In light of this, it brings us great pleasure to report that my task went off without a hitch.

Active employment experience is the only option. Students should be familiar with the practical applications of their main field of study before starting any work. Today's employers consider more than simply academic achievement, effective communication skills, and experience working part-time. They take the applicant's job history into careful consideration. Student job experience is correlated with higher employment possibilities.

Thanks to Kansai Nerolac Paints, I have the opportunity to work in a setting that is professional. I included all of the knowledge I learned in college into my training to ensure the effectiveness of my program. I used the lessons, strategies, tactics, and skills I had learned from my wonderful mentors when I was at IUBAT. General progress procedures, Software development success needs both enough engineering knowledge and a strong framework.

This practicum program, which carries a 6 credit hour weight and is offered to students in the College of Engineering and Technology (CEAT) at IUBAT, lasts for one semester and is typically taken after the completion of the course work.

9.2 Conclusion:

Being a part of the software design and implementation process is, in fact, the most rewarding aspect of working at Kansai Nerolac. I have discovered a ton of fresh information that I wasn’t previously aware of. Additionally, I have acquired certain technical abilities that will aid me in my future success. The following indicator will show some of the technical problems I've encountered and solutions I've learned through working on this project. I now understand how to design for a web project. A web-

based project's strategy has been examined by me. Creating and documenting my project has taught me a lot about software development and how to generate reports. To build the system, I utilized PHP as the back-end language. To create the interface, I used JavaScript, jQuery, and HTML5, CSS3, and Bootstrap 5. I have used xampp for database and software interface. I did everything I could to develop a user-friendly interface that can be utilized quickly and easily. Before beginning to build the project, I did a good deal of analysis. It enabled me to see the situation more clearly. It can be created in several ways with additional functionality. It might improve the effectiveness of the system. I intend to continue developing those features in the near future.

9.2.1 Limitations:

- Tax deduction process has not been implemented due of the complexity of the whole process
- Excel export has not been developed for Employee, Employee salary due to some criticality
- Off-line reports of employee, pays lip, leave cannot be generated due to batch mode execution

9.2.2 Future Work

- Calculating overtime and including it into monthly pay
- Implementing Tax deduction process
- Implementing Notification system

References

Rozario, M. (2018), ‘Project On Employee Database and Payroll Management System’

Silberschattz, Abraham, Korth, Henry F., &Sudrashan S. (2002). Database System Concepts. 4th ed. Boston: McGraw Hill.

Nishadha, (2012), Ultimate Guide to ER Diagrams. (2020, Apr 10). Available at: http://creately.com/blog/diagrams/er-diagrams-tutorial/

Khan, R. (2017). ‘Payroll Management System’, Studocu.com.

Zoraini, W.A, Chng, L.P. and Norziati, M. (2009) A Study on Learner Readiness for Mobile Learning at Open University Malaysia. IADIS International Conference Mobile Learning, Barcelona, 26-28 February 2009, 151-157.