

**DEVELOPMENT OF A HUMAN RESOURCE  
MANAGEMENT SYSTEM FOR SMALL  
SCALE SOFTWARE COMPANY**

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**M. Engineering Thesis**



**DEPARTMENT OF COMPUTER SCIENCE AND  
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MILITARY INSTITUTE OF SCIENCE AND TECHNOLOGY  
DHAKA, BANGLADESH**

**SEPTEMBER, 2022**

# DEVELOPMENT OF A HUMAN RESOURCE MANAGEMENT SYSTEM FOR SMALL SCALE SOFTWARE COMPANY

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A Thesis Submitted in Partial Fulfillment of the Requirements for the  
Degree of Master of Engineering in Computer Science and Engineering



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# DEVELOPMENT OF A HUMAN RESOURCE MANAGEMENT SYSTEM FOR SMALL SCALE SOFTWARE COMPANY

## DECLARATION

I hereby declare that this project is my original work and it has been written by me in its entirety. I have duly acknowledged all the sources of information that have been used in the project. The project (fully or partially) has not been submitted for any degree or diploma at any university or institute previously. I hereby declare that this project is my original work and it has been written by me in its entirety. I have duly acknowledged all the sources of information that have been used in the project. The project (fully or partially) has not been submitted for any degree or diploma at any university or institute previously.

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## ABSTRACT

### Development of A Human Resource Management System For Small Scale Software Company

Every organization has its own human resources department to carry out both internal and external human resource functions. The most important responsibility for any HR is managing the human capital, or the workers, out of all the operations related to human resources. HRMS software should be maintained by organizations with a large number of client-server applications, service providers, and control tools. This human resource management system will allow the HR to manage the employee payrolls, the timings of employee work, employee information systems, employee training and performance appraisals, employee service and employee attendance. This project is a web applications. The HR role is to keep track of data of the current employees, which often includes information about their backgrounds, expertise, accomplishments, salaries, attendance and leave records. Employee engagement, employee motivation, employee growth, and employee retention are all supported by effective employee management and leadership. The traditional system have several issues, including data duplication and inconsistency, as well as an excessive amount of paperwork that costs time and money. In light of this, we have developed a very user-friendly Web Application called "(Active HRMS)". This software provides the facilities for storing and managing all the information of the employees electronically, thereby making it easier and faster to manage the HR system.

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# CHAPTER 1

## INTRODUCTION

Every organization has their own human resources in order to perform internal and external human resource activities. Among the total human resource activities, managing human capital, i.e., employees, is the most significant task for any HR. Human Resource Management System software acts as a bridge between the HR department and the development department in software companies. HRMS looks after overall technical and non-technical work details that are carried out in organizations. Organizations should maintain HRMS software with a huge number of client-server applications, service providers, and control tools. But this application is a cost-effective one that allows them to manage their employees' data in a simple manner. This project belongs to the category of web applications.

There are challenges that are faced in the practice of HRM. The main challenges of HRM are environmental challenges, management systems, changing markets, social issues, organizational culture, leadership development, decentralized work sites, etc. Therefore, we started our work to develop an HRM system for a small-scale software company. We were expecting to develop a platform-independent system to manage human resources more efficiently for the betterment of the company.

### **Specific Objectives and possible outcomes**

The objectives of the project are:

- To identify the suitable functionalities of a HRMS through a comparative study.
- To design and developing a prototype of a HRMS.
- To validate the functionality of the developed HRMS.

The possible outcomes of this project are:

- A comparative study report presenting suitable functionalities and recent gaps in existing HRMS.
- A HRMS for a small -scale software company.

### **1.1 Methodology**

The methodology can be summed up in the following steps:

For the mentioned HRMS, a developing environment will be designed that starts with a literature study to determine the current level of technology and to identify existing HRMS. Determine compatible applications and gaps between various HRMS. Assemble design requirements and investigate concepts for selecting a preferred concept and finally design and development of HRMS with several important sub modules such as payroll management, leave management, etc., following software development life cycle steps.

### **1.3: Tools and Language used**

Hardware Specification for Users

Computer : PC, PC-AT

Processor : INTEL DUEL CORE and above

RAM : 1GB and above

Input Device : Mouse or Keyboard

Output Device: VDU (minimum VGA, SVGA support)

### **Software Specification for Servers**

Operating System : Windows 7, 8, 10, Linux Ubuntu

Compatible Browsers : IE11, Firefox, Safari, Opera, Chrome

Web Server : Apache



## **Project Category**

### **Tools and Language Usage**

Software Framework : Laravel

Software Version : PHP 7.x

Front End : JavaScript JS, HTML, CSS

Database Used : MySQL

Web Server : Apache

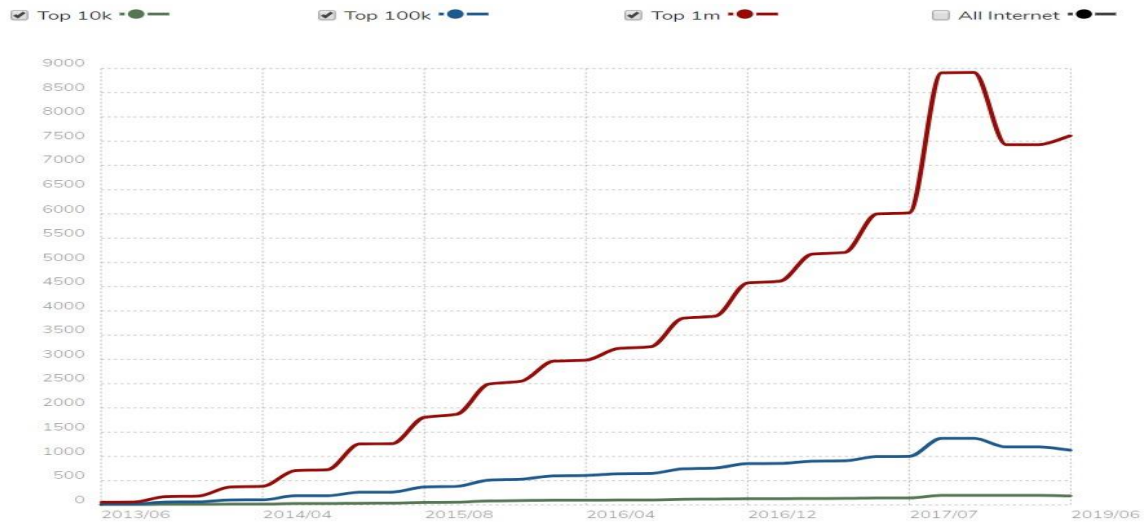
### **Advantages of PHP over Other Languages**

- It is simple and easy to grab.
- PHP is an open-source and widely used programming language.
- It has flexibility and freedom because it runs on Linux, Mac OS X, Windows, UNIX, and other operating systems.
- PHP is utilized in a wide range of web applications. Memcache, MongoDB, and Pusher are all well-integrated.
- The term "scalability" is a huge deal in the IT sector. It provides you with a platform for further development.
- A PHP-based website can be extensively altered.

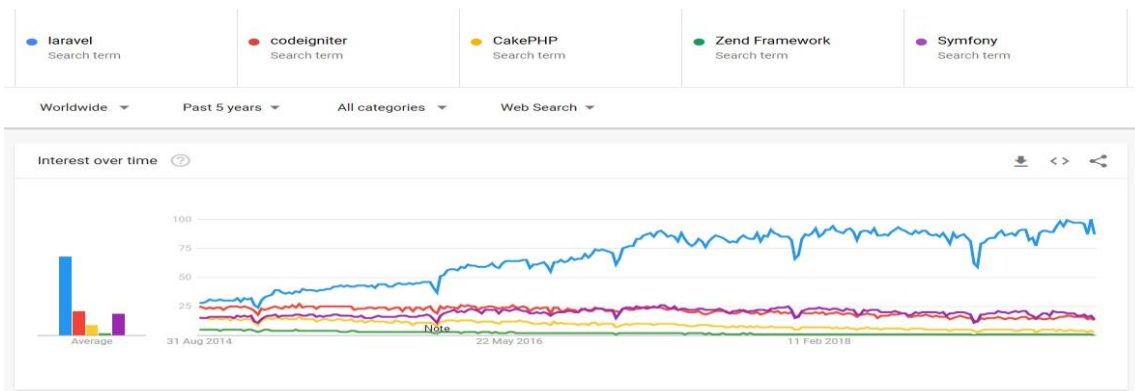
### **The advantages of using Laravel over other frameworks**

PHP is a framework that promises to speed up the website development process. Many object-oriented programming frameworks employ full-stack model design for MVC (Model View Controller) design nowadays. The development efficiency of a web design method based on the Laravel framework is higher compared to a traditional web design method based on the CI framework [1].

Laravel is used to create over 1.1 million websites around the world (Builtwith, 2019), and that number is growing every day.



Before we get into the advantages of utilizing Laravel, it's important to note that it's not the only PHP framework available. You could, for example, utilize CodeIgniter, CakePHP, or the Zend Framework. However, Laravel is unquestionably one of the most popular PHP frameworks—consider its popularity over time (as revealed by GoogleTrends):



Laravel is one of the few PHP frameworks that has grown in popularity over the last five years, making it a popular choice for many website developers and enterprises worldwide.

## **Benefits of the Laravel Framework**

Now, you must be wondering why your next website should be built in Laravel and what the advantages of the Laravel framework over others. Here are eight reasons why you should use Laravel for your next project to get you started:

- It is quick and simple.
- Security is key.
- It has better website performance.
- It is great for traffic-handling.
- It's really flexible.
- It has easy third-party integration facilities.
- Website maintenance is simple

## **Database (MySQL) - An Overview**

A database is a single organized collection of structured data stored with a minimum of duplication of data items to provide a consistent and controlled pool of data. This data is common to all users of the system but is independent of programs that use it. The independence of databases and programs using them means that they can be changed without changing each other. The users of the database may find it convenient to imagine that they are using an integrated file system. Database design is a step in the database development process that entails analyzing a problem definition (specifications and requirements) and supplying the required information for constructing a logical structure of data [2].

## **A Relational Database Management System (RDBMS)**

RDBMS is an acronym for a relational database management system and can be defined as a data program for general-purpose data storage and retrieval that organizes data into a table consisting of the same set of data items (columns). To ensure data security, the data is stored in the kernel. Multiple tables in an RDBMS can be linked or correlated with one

another based on similar data items or files within the tables. RDBMS allows you to complete activities in an understandable and straightforward manner. A name and address file, for example, might include columns for name, street, city, state, pin, and phone number. Filling out each field creates a record for each person. Another table consists of the name, employer's name, and department. Each person has an entity, which is represented by the two tables. The ability to construct a new file containing data from two linked files is one of the most important capabilities of RDBMS.

### **Functions of RDBMS**

- The following are the most important RDBMS functions:
- defines database
- modifies the structure of the database.
- queries the database.
- adds and deletes the database.
- controls the database.
- Secure Access from the General Public
- Communicate within the network.
- export and import of data.

### **1.4 Organization of the Remaining Chapters**

- The rest is organized in the following order:
- In Chapter 2, background study, suitable functions of the HRMS, recent gaps in existing HRMS, and advantages of this HRM system over other HRMS are discussed.
- In Chapter 3, the requirements specification and feasibility are discussed.
- In Chapter 4, system design and implementation details are presented.
- In Chapter 5, testing details are presented.
- In Chapter 6, the project maintenance part is discussed.
- In Chapter 7, the project summary is discussed.

## CHAPTER 2

### LITERATURE REVIEW

Human resource management (HRM) includes all management decisions and practices that affect the employees of an organization (Bhatt and Reddy, 2011). There have been many definitions of human resource management used by different scholars. Daud (2006) defined HRM as a system, policy, and practices that can affect folks that work in an organization. In addition, Shahnawaz and Juyal (2006) defined human resources management (HRM) as all decisions and practices that influence workers within organizations. De Cieri, et al. (2008) explained HRM as "the policies, practices, and systems that influence employees' behavior." While Hussain and Ahmad (2012) considered HRM to be a system that attempts to realize an active balance between the personal interests of people and their economic added value, Lastly, Burma (2014) viewed HRM as a strategic and clear approach for the organization's most valued assets, the employees. Human resources management is considered to be the most important factor that helps the organization achieve a competitive advantage (Obeidat et al., 2012, 2013, 2014; Masa'deh et al., 2019). This is due to the fact that managers in both public and private organizations consider human resources to be the main source of sustaining competitive advantage; this is done by having the "best of the best" human resource systems for recruiting, selecting, motivating, and efficiently managing their people (Mesch, 2010). Pankaj and Saxena (2012) define HRM practices as "organizational activities directed at managing the pool of human resources and ensuring that the resources are employed towards the fulfillment of organizational goals" (Pankaj and Saxena, 2012, p. 671). However, it must be taken into consideration that human resource management practices are not fixed; they differ from one country to another (Ozutku and Ozturkler, 2009; Tiwari and Saxena, 2012). A significant body of research focuses on several specific human resource management practices. Such practices include staffing, training and development, performance appraisal, compensation management, safety and health, industrial relations, and recruitment and selection (Ferguson's, 2006). Singh (2009) worked on the addition of a number of HRM practices, including

planning, performance evaluation, career management, and rewards. Karunesh and Pankaj (2009) examined the HRM practices implemented and identified some other practices, such as employer-employee relations, recognition through rewards, culture building, career development, and benefits. Furthermore, Pahuja and Chander (2012) added a few other practices: inculcating the right skills, knowledge, and attitude; having a congenial work environment; and maintaining good employee relationships. In Hussain and Ahmad (2012)'s work, other HRM practices are mentioned, namely staffing, training and development, performance appraisal, compensation management, safety and health, and industrial relations. In addition, Obeidat et al. (2014) included the practices of job design and teamwork as important HRM practices. This study focuses on four HRM practices based on a comprehensive literature review: recruitment and selection, performance appraisals; training and development; and compensation and reward. The rationale behind selecting the practices is that these practices occur relatively frequently in HRM literature for manufacturing and service industries. [3]

## **2.1 Background**

A Human Resources Management System (HRMS) is a software application that supports many functions of a company's human resources (HR) department. HRM is the process of recruiting, selecting, and inducting employees; providing orientation; imparting proper training; and developing skills [4]. HR operations contribute significantly to the success of an organization. The HR management process ensures that the organization leads by example and that the company's activities fall in line with its vision [5]. Therefore, an efficient HRM system can give companies an edge over their competitors. HRM is a combination of people-oriented management practices and its main aim is to create and maintain a skillful and committed workforce to gain competitive advantage [6]. It is critical to integrate human resource management into organizational strategic management, to develop human resource practices for line managers, and to take a strategic approach to employee selection, training and development, performance appraisal, compensation, and other aspects that improve effective organizational performance [7]. An effective HRMS helps to store all this information efficiently, safely, and securely so that it can be retrieved for administrative purposes. A HRM system may automate the workplace to transform time-consuming and repetitive duties associated with HR management [8]. Due to the many

challenges that are faced by HR departments, such as emotional and physical stability of employees, balance between management and employees, and performance appraisal, there is a need for organizations to adopt correct and workable system that will not only ensure they alleviate these challenges but also develop mechanisms to deal with such challenges in case they occur in the future [9]. Developing a proper HRMS could be an effective solution for them.

## **2.2 Suitable Functions of the HRMS**

Human Resources departments serve an administrative function that is not shared by all enterprises. Selection, assessment, and payroll processes may be codified in some organizations. The efficient and successful management of "human capital" has become a more critical and complex process. HR is responsible for keeping track of existing employee data, which often includes personal histories, skills, capabilities, accomplishments, and remuneration. Organizations began to electronically automate many of these operations to minimize the manual labor of these administrative activities by implementing specialized Human Resource Management Systems. HR executives use internal or outsourced IT professionals to create and manage an integrated HRMS. Many HR automation activities were limited to mainframe computers that could handle massive quantities of data transfers until the client-server architecture emerged in the late 1980s. These internally-developed HRMS are available to enterprises with a great number of resources due to the minimal capital investment required to buy or program proprietary software. Human Resource Management Systems became more administratively controlled as client-server, application service provider, and software as a service (SaaS) systems became more common. Currently, human resource management systems encompass:

- Payroll
- Work Time
- Benefits Administration
- HR Management Information System
- Training/Learning Management System

- Performance Record
- Employee Self-Service
- Report Generation

The payroll module automates the pay process by collecting data on employee time and attendance, calculating various deductions and taxes, and generating monthly pay cheques and employee tax reports. Data is generally fed from human resources and time-keeping modules to calculate automatic deposit and manual check-writing capabilities. This module can handle all employee transactions and interact with existing financial management software.

Work time collects standardized time and efforts linked to work. The most advanced modules provide broad flexibility in data collection methods, labor distribution capabilities, and data analysis features, but they are outdated. The major functions are cost analysis and efficiency measurements.

Organizations can use the benefits administration module to administer and track employee participation in benefit programs. Insurance, compensation, profit sharing, and retirement are common examples.

Different types of report generation are a necessary module for increasing performance and employee management within a short time.

The **HR management module** is a component that covers a wide range of HR topics, from hiring through retirement. Basic demographic and address information, selection, training and development, capability and skill management, compensation planning records, and other relevant actions are all recorded in the system. Leading-edge technologies can "read" applications and enter pertinent data into database fields, notify employers, and give position management and control while they are not in use. The recruiting, placement, appraisal, compensation, and development of an organization's personnel are all part of the human resource management function. Initially, businesses used computer-based information systems to



- produce paychecks and payroll reports.
- maintain personnel records.
- Invest in Talent Management

Organizations can use the training module to administer and track staff training and development efforts. Delegates and training resources can thus be mapped and managed within the same system, and courses can be delivered in timed sessions. Employees can use the Employee Self-Service module to query HR data and complete some HR operations through the system. Employees may query their attendance records from the system without asking for information from HR personnel. The module also lets supervisors approve O.T. requests from their subordinates through the system without overloading the HR department. Many companies have built human resource management information systems that assist in recruitment, selection, hiring, job placement, performance reviews, employee benefit analysis, health, safety, and security, while others have incorporated outsourced services. An applicant tracking system covers a subset of the above.

### **2.3 Recently Discovered Gaps in Existing HRMS**

HRMS is an organizational tool that intends to contribute to the development of stability, coherence, and justice in organizations through the unification of their procedures and culturally accepted behaviors. The importance of the HR (Human Resource) function and HRMS in organizations is commonly accepted as positive and crucial. Sustainable HRMS relates to sustainability, having as common features the association with positive results for employees and developing organizational sustainability through HRMS [10]. Sustainable HRM explicitly intends to foster the impact of HRMS not only on performance but instead, on internal and external outcomes, not necessarily economic.

### **2.4 Benefits of this HRM System over Others**

- An efficient dashboard to get an overview of important business aspects
- An effective way of generating payslips and calculating salary components
- This tool allows you to maintain data on an employee.

- It offers ease from the managerial point of view of leaves, attendance, and timesheets.
- One of the most proficient ways of managing events and meetings is
- It facilitates ease in calculation and management of finance in regards to business activities.
- The comprehensive constant settings allow you to customize the parameters of these tools as per your organization's needs.
- It allows you to assign staff or users with restricted permissions.
- Simple to Set Up

## CHAPTER 3

### REQUIREMENTS SPECIFICATION AND FEASIBILITY STUDY

#### 3.1 Requirements Specification

The basic criteria for the system to be developed are outlined in the specification. These can be broadly classified into two types.

1. Performance requirements.
2. Functional Requirements

Understanding the requirements specification is critical for the project's success; otherwise, the system does not get developed according to the user's wishes.

##### 3.1.1 Requirements for Performance

The system should be developed in such a way that

- It is unaffected by the database type utilized.
- Rapid response is required.
- It provides high throughput.
- Data should be secure to the point where no intruder can tamper with it.

##### 3.1.2 Functional Requirements

Here the HR Manager will do the following jobs:

- They can see employee and project information.
- They can update employee and project information.
- They can remove any particular information.

- They can add new information about the employee and the project.

### 3.2. Logical Data Flow Diagram

The following logical data flow diagram of the system depicts the data and process flow behind the system after examining it:

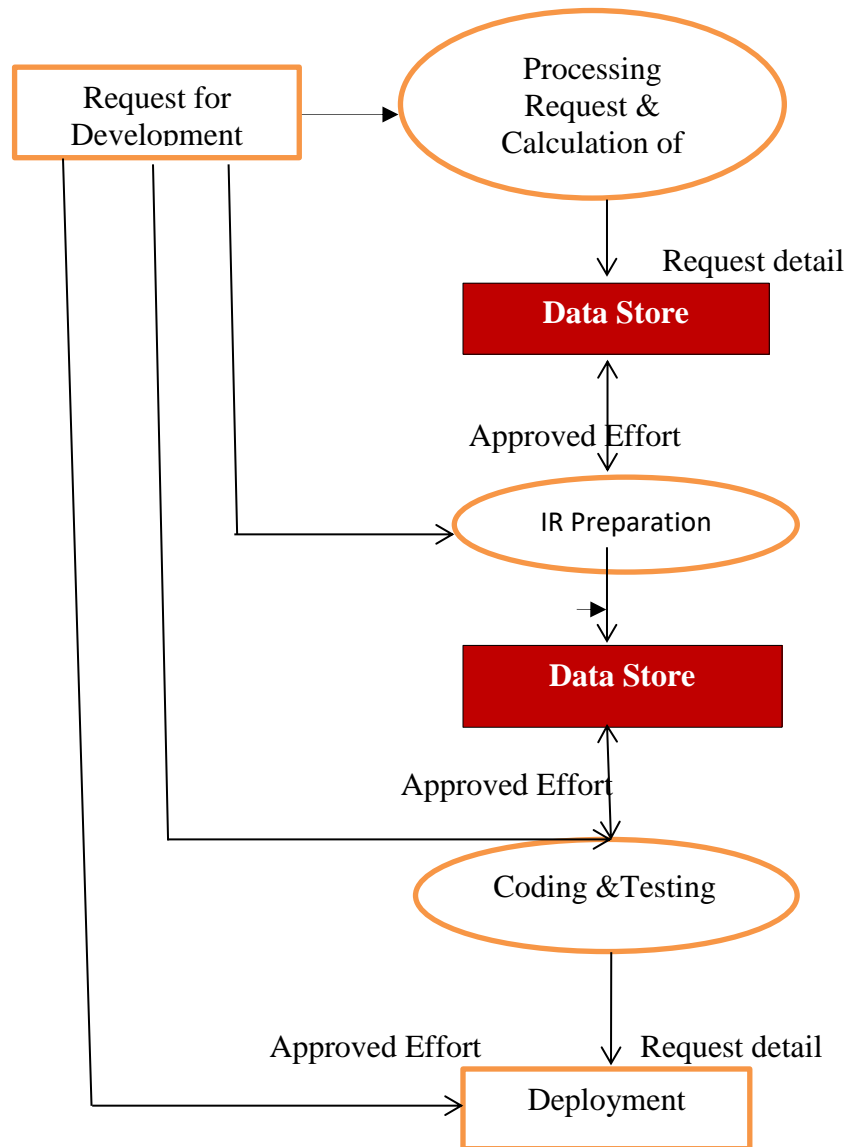


Figure 3.1: Logical Data Flow Diagram

The system interacts with the user through some front-end **forms**. To enter the system, a **login form** will appear where an email **ID** and **password** will have to be entered to log in to the system, and then this will check for the registration of the user. According to permission, the system is loaded.

### **3.3 Feasibility Study.**

Software engineering often no longer involves building systems from scratch, but rather integrating functionality from existing software and components or implementing packaged software [11].

The feasibility studies are conducted as follows:

#### **3.3.1 Economic Suitability**

More commonly known as Cost-Benefit Analysis. The technique entails calculating the projected benefits and savings from a prospective system and comparing them to the associated costs. If the benefits outweigh the costs, then a decision is made to design and implement the system. Considering the facts, it is becoming evident that the system will be economically feasible both for the developer as well as for the client's respect.

#### **3.3.2 Technical Feasibility**

The present computer system (hardware, software, etc.) and how well it can handle the proposed addition are the focus of technical feasibility. If the budget is a significant barrier, the project is deemed unworkable. This does not present a problem in our circumstances.

#### **3.3.3. Legal Feasibility**

A determination of any infringement, violation, or liability that may arise as a result of the system's development. But the system to be developed will be 100% legal.

#### **3.3.4. Operational feasibility**

The managers and operators want to be well-versed in the necessary skills. Most of the members of the development team have a technical expectation here.

### **3.3.5. Time feasibility**

The management and operators here are concerned about whether the project will be completed on time or not. However, based on the information we have gathered about our project, we can confidently predict that it will be completed within the stipulated time range.

## CHAPTER 4

### SYSTEM DESIGN AND IMPLEMENTATION

The Human Resources Management System is one of the important parts of the electronic approach that uses web applications designed using PHP, MySQL, JavaScript, HTML, and CSS. HRMS could be used in institutions and companies to organize and arrange the personnel files as well as manage and organize the employees' salaries and undergo updates during the year [12].

#### 4.1: System Hierarchy

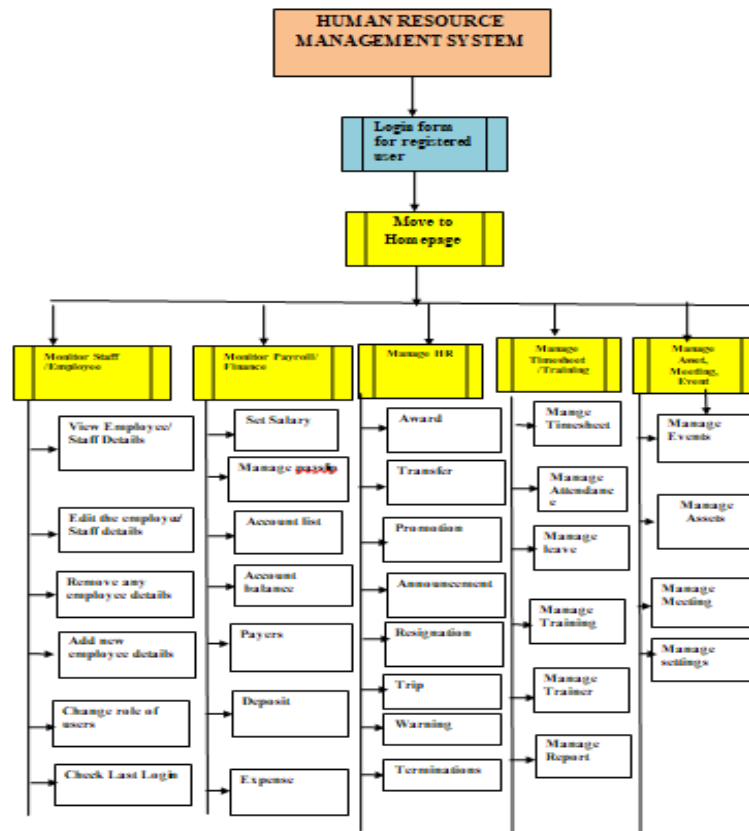


Figure 4.1: System hierarchy of developed HRMS

The HRM system consists of five major processes, as indicated in Figure (4.1). These processes are:

### **Manage Staff/Employee**

This process is used to add, update, delete, and search for a specific employee.

### **Monitor Payroll/Finance**

This process is so critical and fateful that we add allocation and presumption for a specific employee. Depending on these two factors, the salary is calculated for a specific employee or for all employees.

### **Manage HR**

This process is used to add, update, delete, and search for all types of HR-related issues.

### **Manage Timesheet/Training**

This process is used to add, update, delete, and search for all types of HR-related issues.

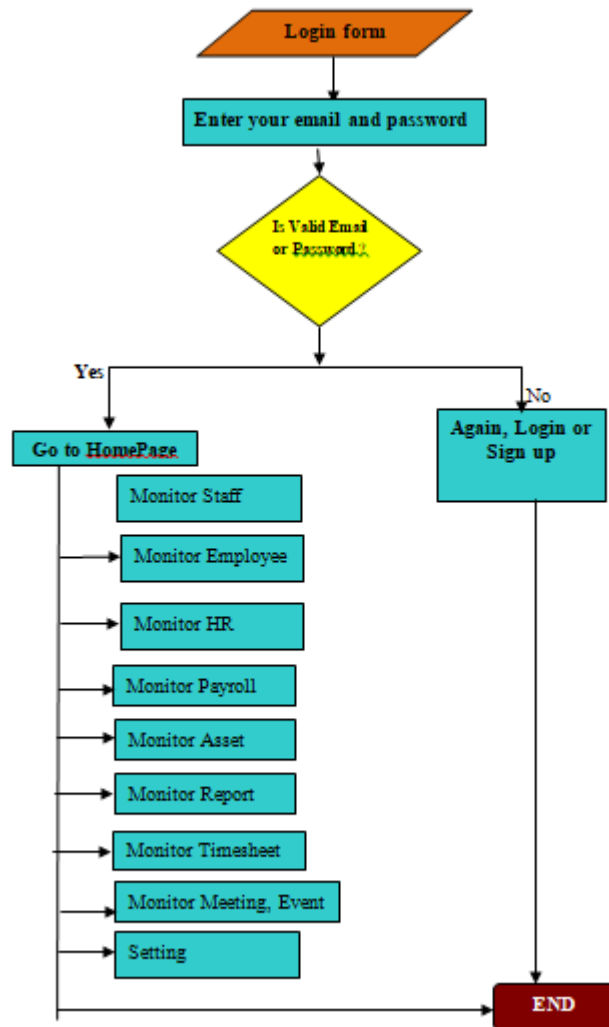
### **Asset Management, Meeting, and Event**

This process is used to add, update, delete, and search for company assets, meetings, and events.



## Structural System Analysis

### System Flow Chart



### Data Flow Diagrams:

A graphical tool used to describe and analyze the flow of data through a system, whether manual or automated, including the process, data stores, and system delays. Data Flow Diagrams are the core tool and the foundation for all other components. The logical translation of data from input to output through processes can be defined separately from

the physical components of the system. A data flow graph or a bubble chart is another name for the DFD.

### **Context Diagram**

A "context diagram" is a term used to describe the top-level diagram. It just contains one process, but it is critical to understanding the existing system. In the sense that it specifies the limits, the context diagram defines the system that will be researched. The system

study will exclude anything that is not part of the process specified in the context diagram. It depicts the complete program piece as a single bubble, with incoming and outgoing arrows indicating input and output data, respectively.

### **Types of Data Flow Diagrams**

There are two types of data flow diagrams:

- Physical DFD
- Logical DFD

### **Physical DFD**

According to structured analysis, the current system must first be correctly understood. The physical DFD is a model of the current system that is used to confirm that it has been well comprehended. Physical DFDs depict the current system's actual equipment, departments, and personnel, among other things.

### **Logical DFD**

The suggested system's model is a logical DFD. They should clearly describe the requirements that the new system should be built on. This is used as the foundation for developing the system's structure charts later on during the design process.

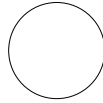
### **Basic Notation**

The following is the Basic Notation for creating DFDs:

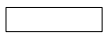
**Data Flow:** The movement of data from one location to another.



**Process:** Data is used or produced by people, procedures, or equipment. The physical component has not been identified.



**Source:** External sources or destinations of data, which may be people, programs, organizations, or other entities.



**Data Store:** This is where data is stored or referenced by a system process.

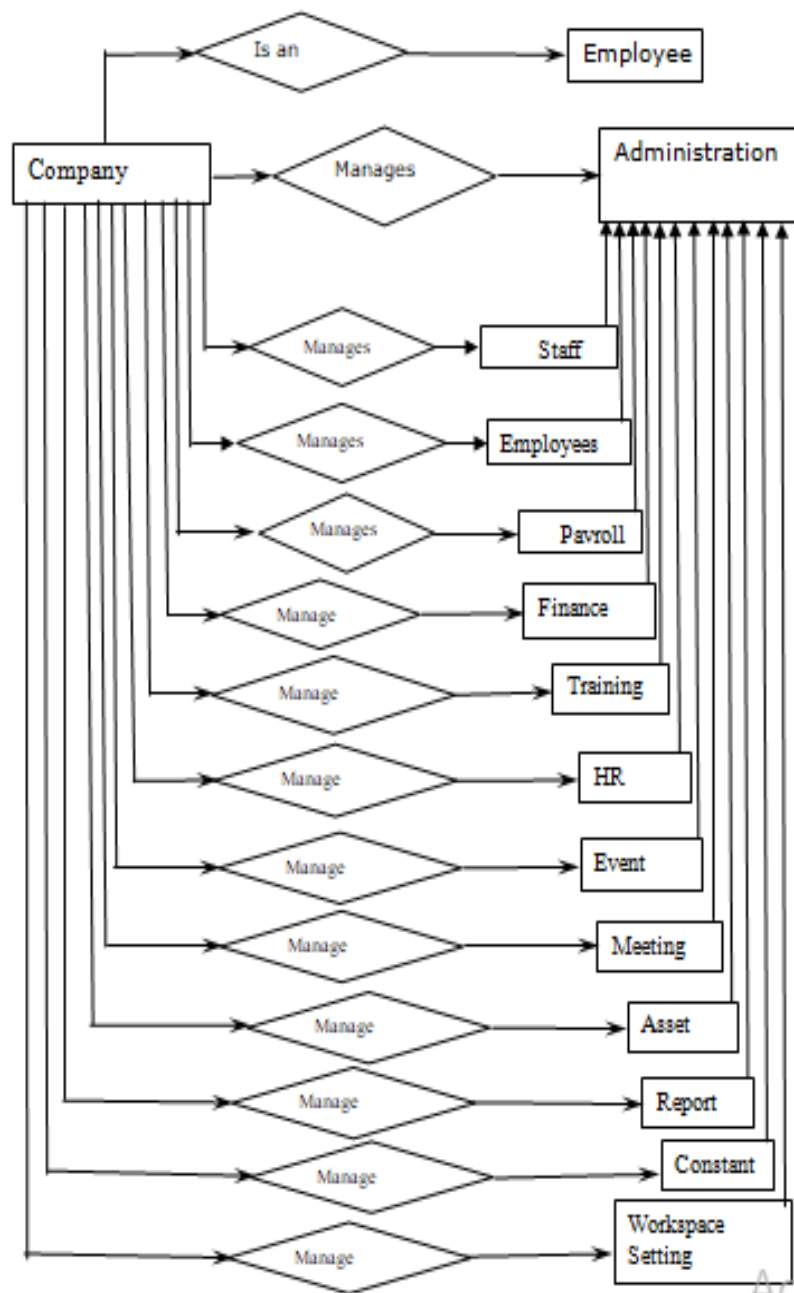


## **Design**

Moving from the problem domain to the solution domain begins with design. A product's design serves as a link between the requirements specification and the finished product.

The purpose of the design process is to create a model or representation of a system that can be used to build the system afterwards. The model created is known as the "Design of the System." It is a plan for a solution to the system.

## Process Flow Diagram

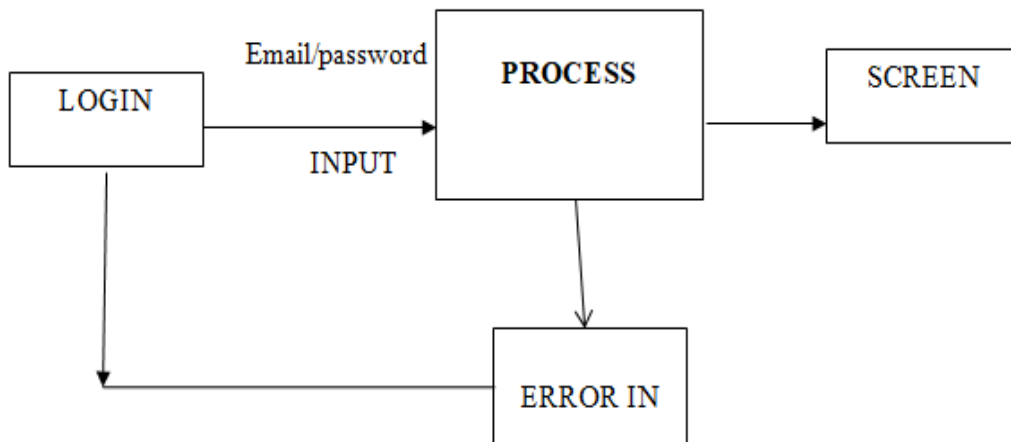


Activate W  
Go to Settings

## Context Flow Diagram

### Description

The context flow diagram shows us all of the inputs and outputs for a certain system. The basic goal of the system is to recognize a criminal's face. Our system's inputs are the operator and eyewitness, and the desired output is the criminal face.



### Description:

The inputs to the process are email and password, given by the developer to allow the software to be available for the admin environment. After giving the details to the inputs, check whether they are genuine or not. It displays a screen if a match occurs, otherwise an error message if they are not matched.

## 4.2 Entity Relationship Diagram

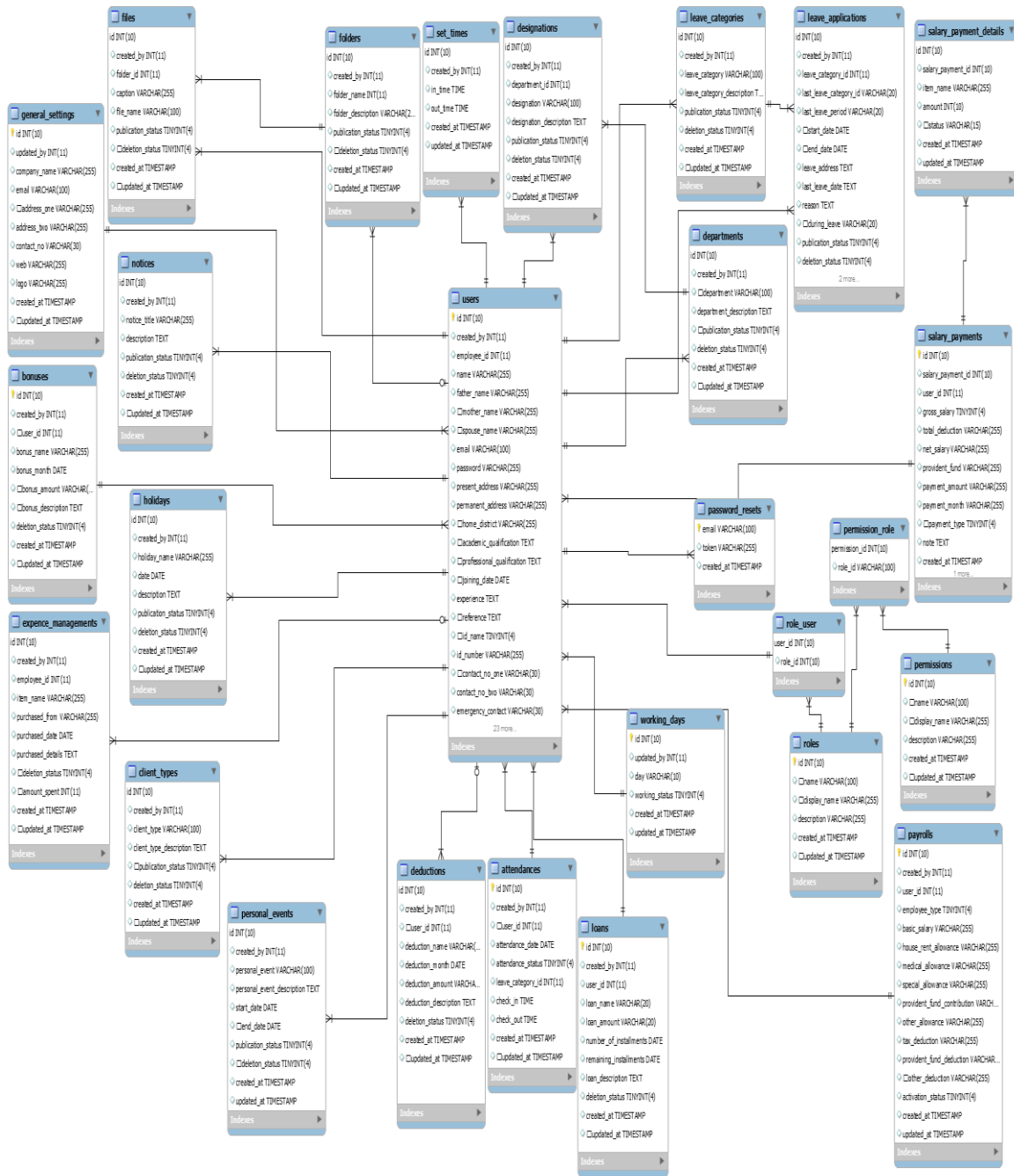


Figure 4.2: ER diagram

### 4.3: System Interface

We can manage all aspects of all the employees using the Active HRMS (Human Resource Management System) module for a small-scale software company.

Let's go through how this HRMS works. When we login as a user, company, or employee, we can see the dashboard according to role access.

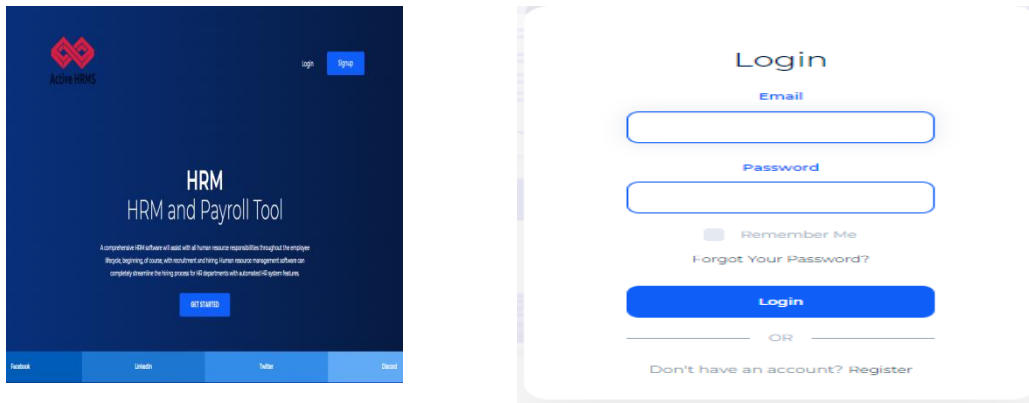


Figure 4.3: Homepage and login page

#### 4.3.1 Dashboard

The company authority, such as the company or HR manager, will show the total staff numbers, total account balance, payer number, payee number, today's employee not clocked in, announcement list, event list, and meeting schedule. Every employee will show event view, mark attendance (clock in/clock out), and see the announcement list and meeting list.

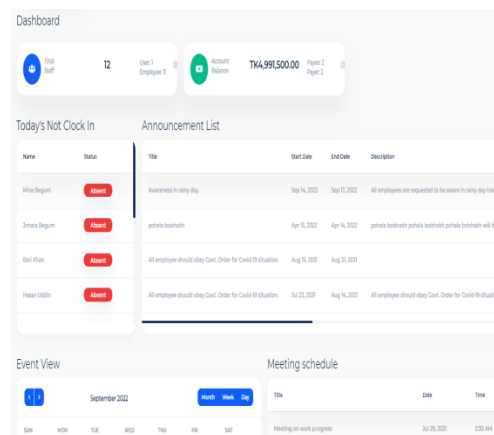


Figure 4.4: Dashboard

### 4.3.2 Manage Users

Using this section, we can manage users.

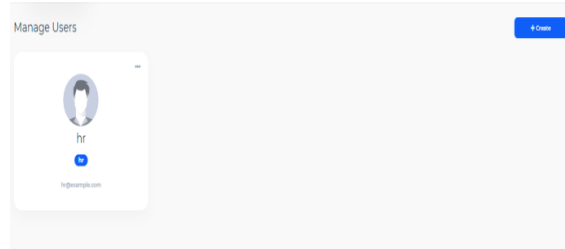


Figure 4.5: Manage user

### 4.3.3 Employee profile

Using this section, we can see all employees' profiles all together, including image, name, and employee id. They also have a search option to search according to branch, department, and designation.

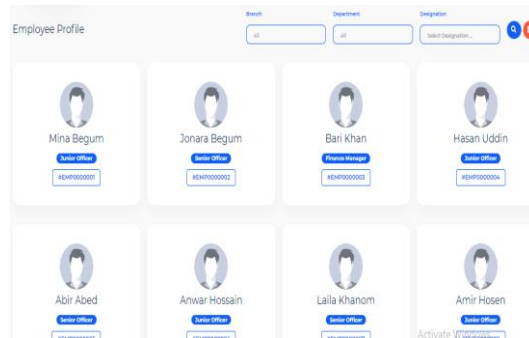
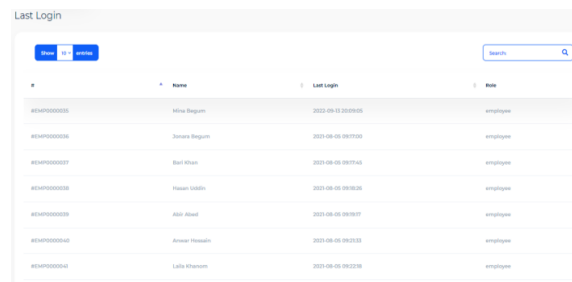


Figure 4.6: Employee profile

### 4.3.4 Last Login

Using this section, we can monitor employees who logged in last.



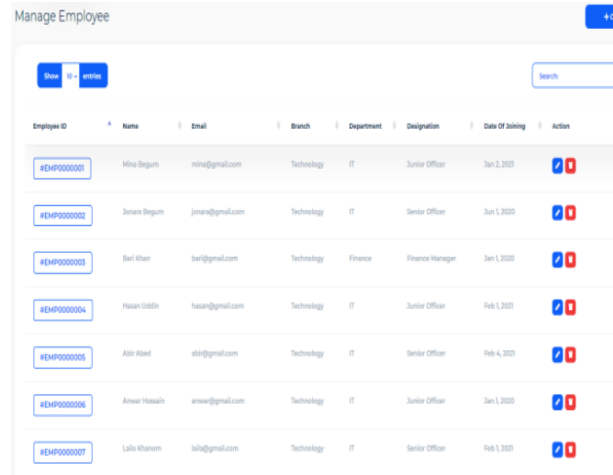
#	Name	Last Login	Role
#EAM00000001	Mina Begum	2023-08-08 09:09:00	employee
#EAM00000004	Jonara Begum	2023-08-08 09:07:00	employee
#EAM00000017	Bari Khan	2023-08-08 09:07:45	employee
#EAM00000018	Hasan Uddin	2023-08-08 09:08:26	employee
#EAM00000019	Abir Abed	2023-08-08 09:08:07	employee
#EAM00000040	Anwar Hossain	2023-08-08 09:02:33	employee
#EAM00000044	Laila Khanom	2023-08-08 09:02:38	employee

Figure 4.7: Last login



### 4.3.5 Manage employee

Using this section, we can manage all employee information. We can edit and delete individual information, search for and create new employees. When we create an employee, the password we have to give must be in alpha numeric format and at least 8 characters. By clicking the employee's id, we can also edit and delete individual employee information.

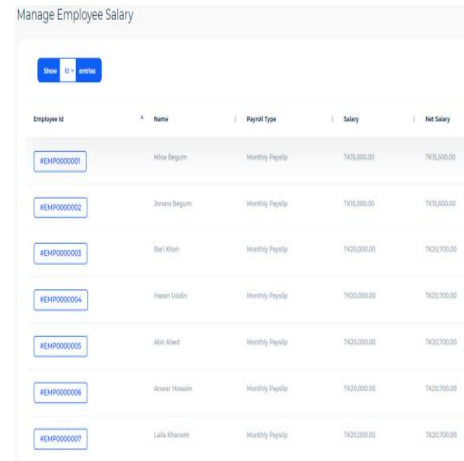


Employee ID	Name	Email	Branch	Department	Designation	Date Of Joining	Action
#EMP0000001	Mina Begum	mina@gmail.com	Technology	IT	Junior Officer	Jan 1, 2020	<a href="#">Edit</a> <a href="#">Delete</a>
#EMP0000002	Zareen Begum	zareen@gmail.com	Technology	IT	Senior Officer	Jan 1, 2020	<a href="#">Edit</a> <a href="#">Delete</a>
#EMP0000003	Barl Khan	barl@gmail.com	Technology	Finance	Finance Manager	Jan 1, 2020	<a href="#">Edit</a> <a href="#">Delete</a>
#EMP0000004	Hasan Usdin	hasan@gmail.com	Technology	IT	Junior Officer	Feb 1, 2020	<a href="#">Edit</a> <a href="#">Delete</a>
#EMP0000005	Abul Ahsan	abul@gmail.com	Technology	IT	Senior Officer	Feb 4, 2020	<a href="#">Edit</a> <a href="#">Delete</a>
#EMP0000006	Anwar Hussain	anwar@gmail.com	Technology	IT	Junior Officer	Jan 1, 2020	<a href="#">Edit</a> <a href="#">Delete</a>
#EMP0000007	Laila khatun	laila@gmail.com	Technology	IT	Senior Officer	Feb 1, 2020	<a href="#">Edit</a> <a href="#">Delete</a>

Figure 4.8: Manage employee

### 4.3.6 Manage Employee Salary

Using this section, we can create employees' salary information, manage employee salary, set employee salary, edit employee salary, and edit employee allowance. By clicking on an employee's id, we can add and edit an individual employee's salary related information.



Employee ID	Name	Payroll Type	Salary	Net Salary
#EMP0000001	Mina Begum	Monthly Payroll	TK15,000.00	TK13,500.00
#EMP0000002	Zareen Begum	Monthly Payroll	TK15,000.00	TK13,500.00
#EMP0000003	Barl Khan	Monthly Payroll	TK20,000.00	TK17,750.00
#EMP0000004	Hasan Usdin	Monthly Payroll	TK20,000.00	TK17,750.00
#EMP0000005	Abul Ahsan	Monthly Payroll	TK20,000.00	TK17,750.00
#EMP0000006	Anwar Hussain	Monthly Payroll	TK20,000.00	TK17,750.00
#EMP0000007	Laila khatun	Monthly Payroll	TK20,000.00	TK17,750.00

Figure 4.9: Set employee salary

### 4.3.7 Payslip

Using this section, we can generate payslips for employees, pay in bulk, edit individual payment information, download payslips, etc.

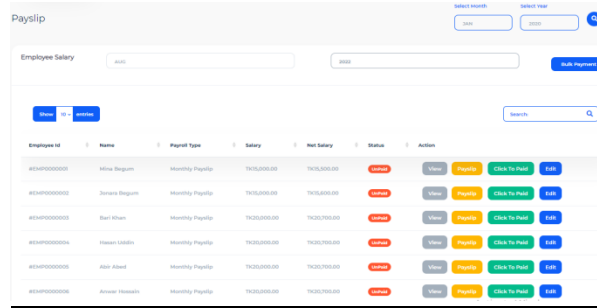


Figure 4.10: Manage playslip

### 4.3.8 Timesheet

Using this section, we can create, edit, and manage timesheets for employees. A timesheet is a spreadsheet for recording how much time an employee spends working on different tasks to calculate the total time worked on individual tasks.

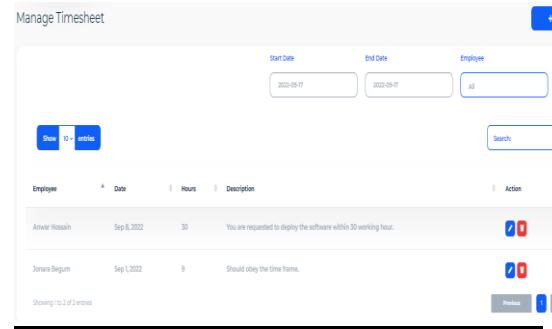


Figure 4.11: Manage timesheet

### 4.3.9 Manage leave

Using this section, we can manage leave, create new leaves, leave approval, leave action, and edit an individual employee's leave.

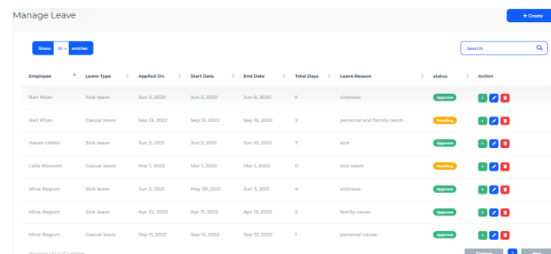


Figure 4.12: Manage leave

### 4.3.10 Marked attendance

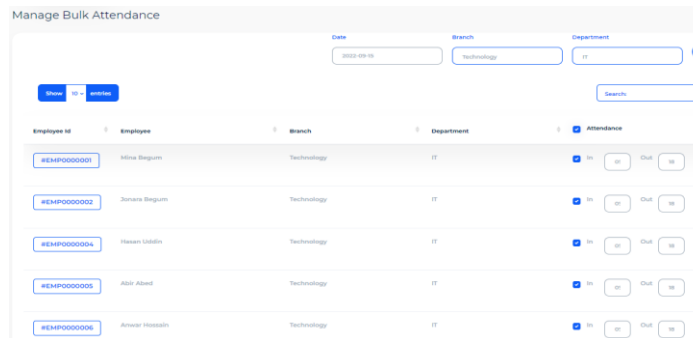
Using this section, we can see an employee's attendance list according to month and year. From here we can also see employees clock in, clock out, late, early leaving, overtime and edit individual attendance.

Employee	Date	Status	Clock In	Clock Out	Late	Early Leaving	Overtime	Action
Abir Abad	Sep 3, 2022	Present	9:00 AM	6:00 PM	00:00:00	00:00:00	00:00:00	<a href="#">🔍</a> <a href="#">✎</a>
Abir Abad	Sep 3, 2022	Present	9:00 AM	6:00 PM	00:00:00	00:00:00	00:00:00	<a href="#">🔍</a> <a href="#">✎</a>
Abir Abad	Sep 4, 2022	Present	9:00 AM	6:00 PM	00:00:00	00:00:00	00:00:00	<a href="#">🔍</a> <a href="#">✎</a>
Abir Abad	Sep 5, 2022	Present	9:00 AM	6:00 PM	00:00:00	00:00:00	00:00:00	<a href="#">🔍</a> <a href="#">✎</a>
Abir Abad	Sep 6, 2022	Present	9:00 AM	6:00 PM	00:00:00	00:00:00	00:00:00	<a href="#">🔍</a> <a href="#">✎</a>
Abir Abad	Sep 7, 2022	Present	9:00 AM	6:00 PM	00:00:00	00:00:00	00:00:00	<a href="#">🔍</a> <a href="#">✎</a>
Abir Abad	Sep 8, 2022	Present	9:00 AM	6:00 PM	00:00:00	00:00:00	00:00:00	<a href="#">🔍</a> <a href="#">✎</a>

Figure 4.13: Manage attendance

### 4.3.11 Bulk Attendance

Using this section, we can give all employees' attendance according to date with one click.

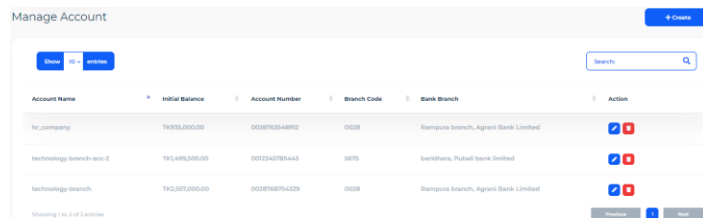


Employee ID	Employee	Branch	Department	Attendance
#EMP00000001	Mina Begum	Technology	IT	<input checked="" type="checkbox"/> In <input type="checkbox"/> Out <input type="checkbox"/> Se
#EMP00000002	Zinara Begum	Technology	IT	<input checked="" type="checkbox"/> In <input type="checkbox"/> Out <input type="checkbox"/> Se
#EMP00000003	Hanan Siddiqi	Technology	IT	<input checked="" type="checkbox"/> In <input type="checkbox"/> Out <input type="checkbox"/> Se
#EMP00000005	Abir Abad	Technology	IT	<input checked="" type="checkbox"/> In <input type="checkbox"/> Out <input type="checkbox"/> Se
#EMP00000006	Anwar Hossain	Technology	IT	<input checked="" type="checkbox"/> In <input type="checkbox"/> Out <input type="checkbox"/> Se

Figure 4.14: Manage bulk attendance

### 4.3.12 Account List

Using this section, we can create, edit, and delete a company's bank account information.



Account Name	Initial Balance	Account Number	Branch Code	Bank Branch	Action
Tc_company	TKL000000.00	0029702649102	0028	Rampura Branch, Agrani Bank Limited	<a href="#">🔍</a> <a href="#">✎</a>
Technology Branch acc-2	TKL4983000.00	002340785443	5875	Isardhara, Pubali Bank Limited	<a href="#">🔍</a> <a href="#">✎</a>
Technology-branch	TKL3070000.00	002970764329	0028	Rampura Branch, Agrani Bank Limited	<a href="#">🔍</a> <a href="#">✎</a>

Figure 4.15: Manage account list

### 4.3.13 Account Balances

Using this section, we can manage the company's account balances.

Account Name	Initial Balance
hr_company	T\$185,000.00
technology branch-acc-2	T\$1,495,500.00
technology branch	T\$2,302,000.00
<b>Total</b>	<b>T\$4,982,500.00</b>

Figure 4.16: Manage account balance

### 4.3.14 Manage Payee

Using this section, we can create, manage, and edit a payee's information.

Payee Name	Contact Number	Action
Wah Hossain	01564227887	[Edit] [Delete]
Roni Hasan	01564227945	[Edit] [Delete]

Figure 4.17: Manage payee

### 4.3.15 Payer

Using this section, we can create, manage, and edit a payer's information.

Payer Name	Contact Number	Action
Sekandar Ali	01565827903	[Edit] [Delete]
Shaleh Subhana	01786432109	[Edit] [Delete]

Figure 4.18: Manage payer

### 4.3.16 Deposit

Using this section, we can create, manage, and edit deposits' information.

Account	Payer	Amount	Category	Rate	Payment	Date	Action
Technology Research	Shahin Subhana	TK.500,000.00	Income Per Software	5	Direct Cash	Apr 18, 2022	✓ ✖
Technology Research	Shahin Subhana	TK.500,000.00	Income Per Software	5	Direct Cash	May 10, 2022	✓ ✖
Technology Research	Shahin Subhana	TK.500,000.00	Income Per Software	5	Direct Cash	Jun 05, 2022	✓ ✖
Technology Research	Shahin Subhana	TK.500,000.00	Income Per Software	5	Direct Cash	Jul 05, 2022	✓ ✖
Technology Research	Shahin Subhana	TK.500,000.00	Income Per Software	5	Direct Cash	Aug 10, 2022	✓ ✖

Figure 4.19: Manage deposit

### 4.3.17 Expense

Using this section, we can create, manage, and edit expense information.

Account	Payer	Amount	Category	Rate	Payment	Date	Action
HR Company	Shahin Subhana	TK.500,000.00	IT Equipment Buy	5	Direct Cash	Apr 18, 2022	✓ ✖
HR Company	Shahin Subhana	TK.500,000.00	Hardware Buy Expense	5	Direct Cash	Jul 16, 2022	✓ ✖
HR Company	Shahin Subhana	TK.500,000.00	IT Equipment Buy	5	Direct Cash	Aug 5, 2022	✓ ✖
Technology Research	Shahin Subhana	TK.500,000.00	Hardware Buy Expense	5	Direct Cash	Apr 10, 2022	✓ ✖
Technology Research	Shahin Subhana	TK.500,000.00	IT Equipment Buy	5	Direct Cash	May 10, 2022	✓ ✖
Technology Research	Shahin Subhana	TK.500,000.00	IT Equipment Buy	5	Direct Cash	Jun 05, 2022	✓ ✖

Figure 4.20: Manage expenses

### 4.3.18 Training

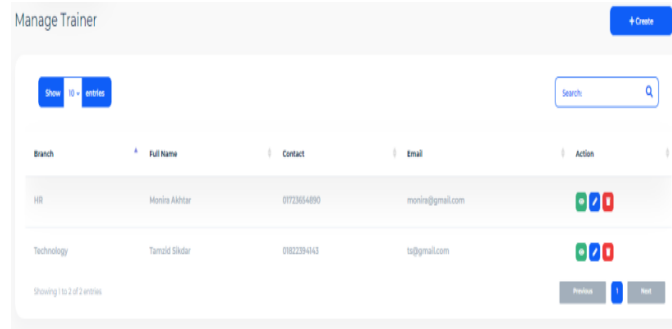
Using this section, we can create, manage, view details, edit, and delete training information. Here, the Jaccard Similarity algorithm is used to select the eligibility of a trainee for specific training criteria according to qualification and interest. Jaccard Similarity is a common proximity measurement used to compute the similarity between two objects, such as two text documents. Jaccard similarity can be used to find the similarity between two asymmetric binary vectors or to find the similarity between two sets.

Branch	Training Type	Condition for Eligibility	Eligible Candidate	Trainer	Training Duration	Cost	Action
HR	Procurement Training Pending	ABC of procurement	Mina Begum	Momira	Mar 2, 2022 to Mar 2, 2022	TK. 1,500.00	✓ ✖
Technology	E file Training Completed	ABC of e-filing	Bari Khan	Tanzid	Jun 3, 2021 to Jun 3, 2021	TK. 500.00	✓ ✖

Figure 4.21: Manage training

### 4.3.19 Trainer

Using this section, we can create, manage, view details, edit, and delete trainer information.

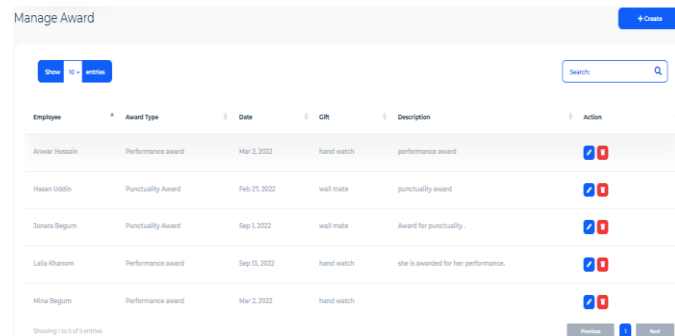


Branch	Full Name	Contact	Email	Action
HR	Monia Akhtar	01723654890	monia@gmail.com	<a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>
Technology	Tanzid Sidor	0182284443	ts@gmail.com	<a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>

Figure 4.22: Manage trainer

### 4.3.20 Award

Using this section, we can create, manage, and edit award information.

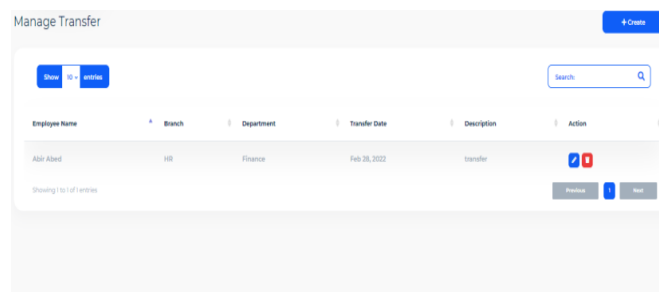


Employee	Award Type	Date	GR	Description	Action
Anwar Hossain	Performance award	Mar 2, 2022	hand watch	performance award	<a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>
Hasan Uddin	Punctuality Award	Feb 27, 2022	wall mate	punctuality award	<a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>
Jomna Begum	Punctuality Award	Sep 1, 2022	wall mate	Award for punctuality.	<a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>
Laila Khanom	Performance award	Sep 15, 2022	hand watch	she is awarded for her performance.	<a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>
Mina Begum	Performance award	Mar 2, 2022	hand watch		<a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>

Figure 4.23: Award management

### 4.3.21 Transfer

Using this section, we can create, manage, and edit transfer information.

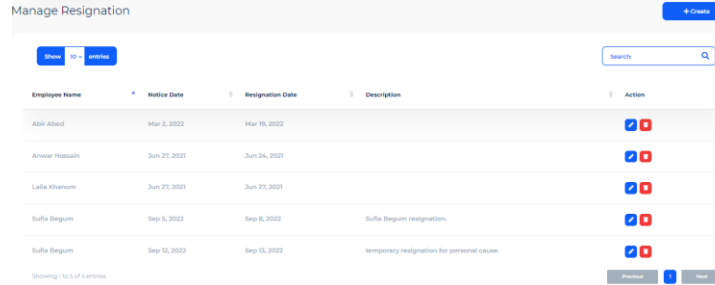


Employee Name	Branch	Department	Transfer Date	Description	Action
Abul Ahsan	HR	Finance	Feb 26, 2022	transfer	<a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>

Figure 4.24: Transfer management

### 4.3.22 Resignation

Using this section, we can create, manage, and edit resignation information for employees.



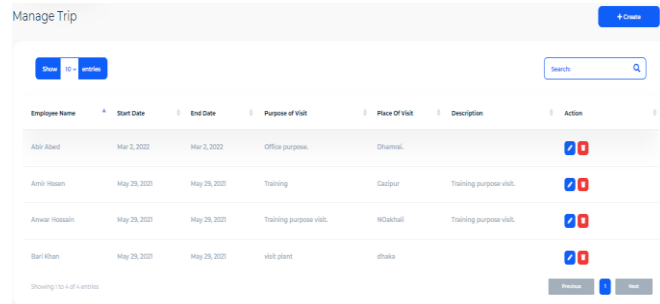
The screenshot shows the 'Manage Resignation' interface. It features a table with columns for Employee Name, Notice Date, Resignation Date, Description, and Action. There are buttons for 'Show', 'Add', and 'Refresh' at the top left, and a search bar at the top right. The table contains five entries for employees: Abul Ahsan, Anwar Hossain, Laila Khanom, Sufia Begum, and Sufia Begum. Each entry has a 'Show' and 'Edit' icon in the Action column.

Employee Name	Notice Date	Resignation Date	Description	Action
Abul Ahsan	Mar 2, 2022	Mar 10, 2022		Show Edit
Anwar Hossain	Jun 27, 2021	Jun 24, 2021		Show Edit
Laila Khanom	Jun 27, 2021	Jun 27, 2021		Show Edit
Sufia Begum	Sep 6, 2022	Sep 6, 2022	Sufia Begum resignation.	Show Edit
Sufia Begum	Sep 10, 2022	Sep 10, 2022	temporary resignation for personal cause.	Show Edit

Figure 4.25: Resignation management

### 4.3.23 Trip

Using this section, we can create, manage, and edit trip information.



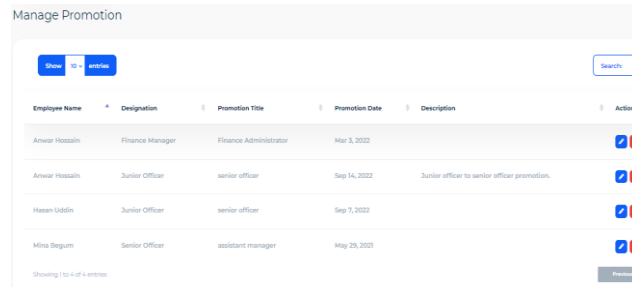
The screenshot shows the 'Manage Trip' interface. It features a table with columns for Employee Name, Start Date, End Date, Purpose of Visit, Place of Visit, Description, and Action. There are buttons for 'Show', 'Add', and 'Refresh' at the top left, and a search bar at the top right. The table contains four entries for employees: Abul Ahsan, Amir Hossain, Anwar Hossain, and Saif Khan. Each entry has a 'Show' and 'Edit' icon in the Action column.

Employee Name	Start Date	End Date	Purpose of Visit	Place of Visit	Description	Action
Abul Ahsan	Mar 2, 2022	Mar 2, 2022	Office purpose.	Dharmal.		Show Edit
Amir Hossain	May 28, 2021	May 29, 2021	Training	Cadipur	Training purpose visit.	Show Edit
Anwar Hossain	May 28, 2021	May 29, 2021	Training purpose visit.	Wobahall	Training purpose visit.	Show Edit
Saif Khan	May 28, 2021	May 29, 2021	visit plant	dhaka		Show Edit

Figure 4.26: Manage trip

### 4.3.24 Promotion

Using this section, we can create, manage, and edit promotion information.



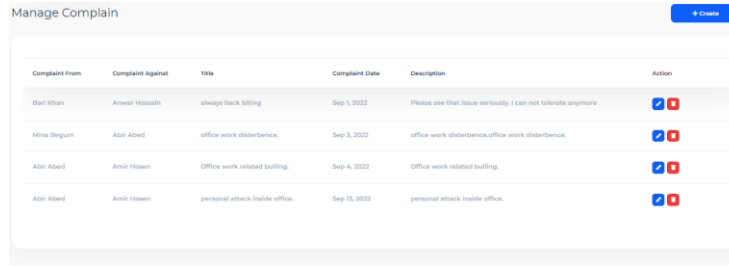
The screenshot shows the 'Manage Promotion' interface. It features a table with columns for Employee Name, Designation, Promotion Title, Promotion Date, Description, and Action. There are buttons for 'Show', 'Add', and 'Refresh' at the top left, and a search bar at the top right. The table contains four entries for employees: Anwar Hossain, Anwar Hossain, Hosen Uddin, and Mina Begum. Each entry has a 'Show' and 'Edit' icon in the Action column.

Employee Name	Designation	Promotion Title	Promotion Date	Description	Action
Anwar Hossain	Finance Manager	Finance Administrator	Mar 3, 2022		Show Edit
Anwar Hossain	Junior Officer	senior officer	Sep 14, 2022	Junior officer to senior officer promotion.	Show Edit
Hosen Uddin	Junior Officer	senior officer	Sep 7, 2022		Show Edit
Mina Begum	Senior Officer	assistant manager	May 29, 2021		Show Edit

Figure 4.27: Manage promotion

### 4.3.25 Complains

Using this section, we can create, manage, and edit complains information.



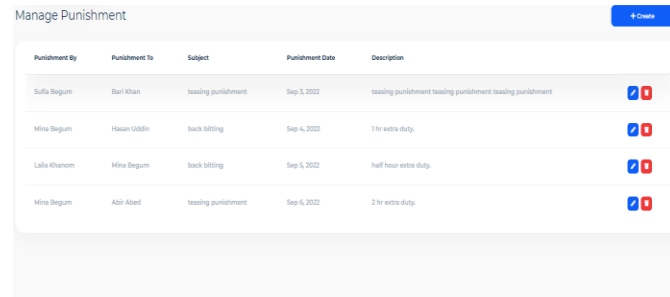
The screenshot shows the 'Manage Complain' interface. It features a table with columns: Complain From, Complain Against, Title, Complain Date, Description, and Action. There are four rows of complaint data, each with edit and delete icons in the Action column.

Complain From	Complain Against	Title	Complain Date	Description	Action
Baif Khan	Anwar Hossain	always back biting	Sep 3, 2022	Please see that I am seriously, I can not tolerate anymore	<a href="#">Edit</a> <a href="#">Delete</a>
Mina Begum	Abir Abed	office work disturbance.	Sep 3, 2022	office work disturbance.office work disturbance.	<a href="#">Edit</a> <a href="#">Delete</a>
Abir Abed	Amir Hossain	Office work related bullying.	Sep 4, 2022	Office work related bullying.	<a href="#">Edit</a> <a href="#">Delete</a>
Abir Abed	Amir Hossain	personal attack inside office.	Sep 15, 2022	personal attack inside office.	<a href="#">Edit</a> <a href="#">Delete</a>

Figure 4.28: Manage complains

### 4.3.26 Punishment

Using this section, we can create, manage, and edit punishment information.



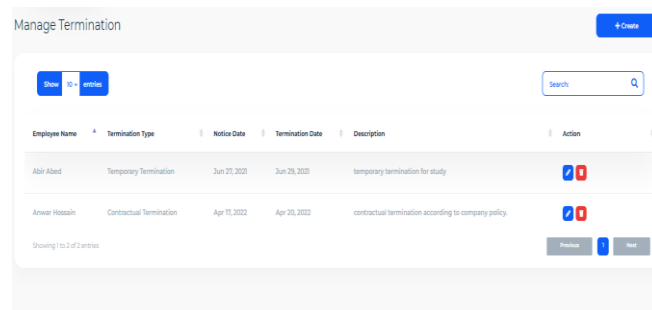
The screenshot shows the 'Manage Punishment' interface. It features a table with columns: Punishment By, Punishment To, Subject, Punishment Date, and Description. There are four rows of punishment data, each with edit and delete icons in the Action column.

Punishment By	Punishment To	Subject	Punishment Date	Description	Action
Suifa Begum	Baif Khan	teasing punishment	Sep 3, 2022	teasing punishment teasing punishment teasing punishment	<a href="#">Edit</a> <a href="#">Delete</a>
Mina Begum	Hassan Uddin	back biting	Sep 4, 2022	1 hr extra duty.	<a href="#">Edit</a> <a href="#">Delete</a>
Laila Khanom	Mina Begum	back biting	Sep 5, 2022	half hour extra duty.	<a href="#">Edit</a> <a href="#">Delete</a>
Mina Begum	Abir Abed	teasing punishment	Sep 6, 2022	2 hr extra duty.	<a href="#">Edit</a> <a href="#">Delete</a>

Figure 4.29: Manage punishment

### 4.3.27 Termination

Using this section, we can create, manage, and edit termination information.



The screenshot shows the 'Manage Termination' interface. It features a table with columns: Employee Name, Termination Type, Notice Date, Termination Date, and Description. There are two rows of termination data, each with edit and delete icons in the Action column. The interface also includes a search bar and pagination controls.

Employee Name	Termination Type	Notice Date	Termination Date	Description	Action
Abir Abed	Temporary Termination	Jun 27, 2021	Jun 29, 2021	temporary termination for study	<a href="#">Edit</a> <a href="#">Delete</a>
Anwar Hossain	Contractual Termination	Apr 10, 2022	Apr 20, 2022	contractual termination according to company policy.	<a href="#">Edit</a> <a href="#">Delete</a>

Figure 4.30: Manage termination



### 4.3.28 Announcement

Using this section, we can create, manage, and edit announcement information.

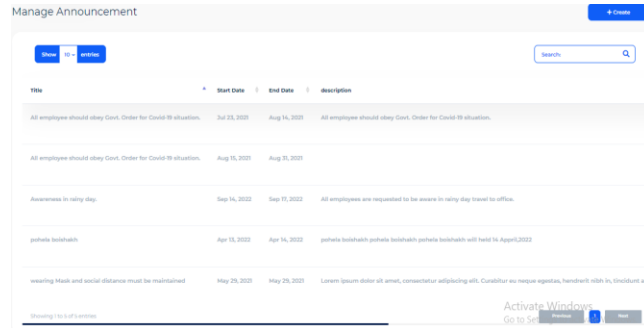


Figure 4.31: Manage announcement

### 4.3.29 Holiday

Using this section, we can create, manage, and edit holiday information.

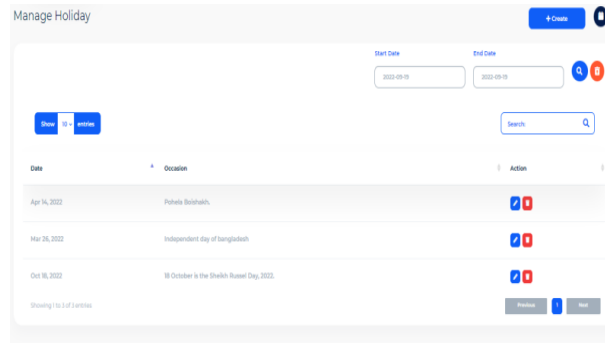


Figure 4.32: Manage Holiday

### 4.3.30 Event

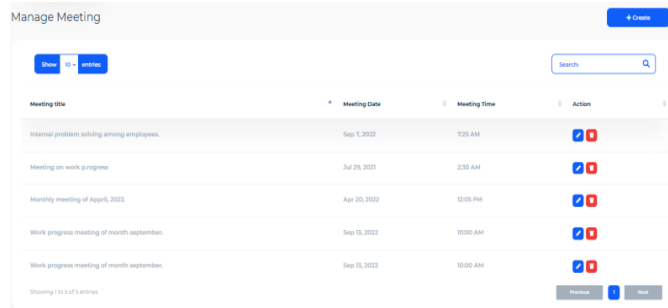
Using this section, we can create and edit event information.



Figure 4.33: Manage event

### 4.3.31: Meeting

Using this section, we can create, manage, and edit meeting information.



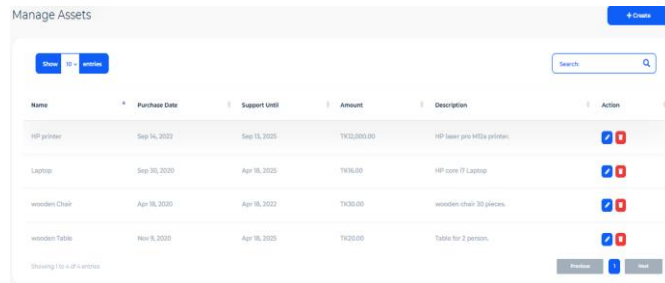
The screenshot shows the 'Manage Meeting' interface. It features a search bar at the top right and a table with columns for Meeting Title, Meeting Date, Meeting Time, and Action. The table contains five entries, each with a blue checkmark and a red minus sign in the Action column.

Meeting Title	Meeting Date	Meeting Time	Action
Internal problem solving among employees.	Sep 7, 2022	7:25 AM	[Checkmark] [Minus]
Meeting on work progress	Jul 26, 2021	2:30 AM	[Checkmark] [Minus]
Monthly meeting of April, 2022.	Apr 26, 2022	3:05 PM	[Checkmark] [Minus]
Work progress meeting of month september.	Sep 15, 2022	10:00 AM	[Checkmark] [Minus]
Work progress meeting of month september.	Sep 15, 2022	10:00 AM	[Checkmark] [Minus]

Figure 4.34: Manage meeting

### 4.3.32: Assets

Using this section, we can create, manage, and edit assets information.



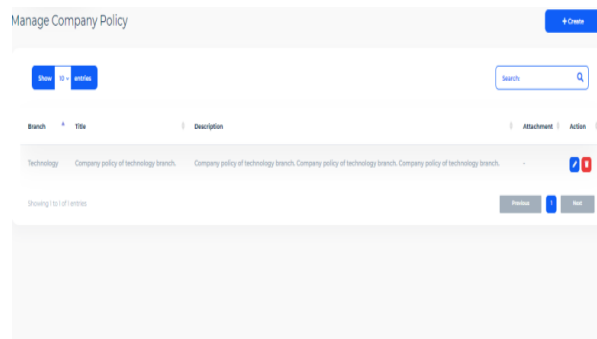
The screenshot shows the 'Manage Assets' interface. It features a search bar at the top right and a table with columns for Name, Purchase Date, Support Unit, Amount, Description, and Action. The table contains four entries, each with a blue checkmark and a red minus sign in the Action column.

Name	Purchase Date	Support Unit	Amount	Description	Action
HP printer	Sep 14, 2022	Sep 15, 2022	1432,000.00	HP laser pro M712n printer.	[Checkmark] [Minus]
Laptop	Sep 30, 2020	Apr 16, 2022	1136.00	HP core i7 Laptop	[Checkmark] [Minus]
wooden Chair	Apr 16, 2022	Apr 16, 2022	1430.00	wooden chair 30 pieces.	[Checkmark] [Minus]
wooden Table	Nov 8, 2020	Apr 16, 2022	1425.00	Table for 2 person.	[Checkmark] [Minus]

Figure 4.35: Manage asset

### 4.3.33: Company policy

Using this section, we can create, manage, and edit company policy information.



The screenshot shows the 'Manage Company Policy' interface. It features a search bar at the top right and a table with columns for Branch, Title, Description, Attachment, and Action. The table contains one entry with a blue checkmark and a red minus sign in the Action column.

Branch	Title	Description	Attachment	Action
Technology	Company policy of technology branch.	Company policy of technology branch. Company policy of technology branch. Company policy of technology branch.	-	[Checkmark] [Minus]

Figure 4.36: Manage company policy

## Report section

### 4.3.34: Income vs. expense

Using this section, we can compare the income and expenses of the company by month and all together.

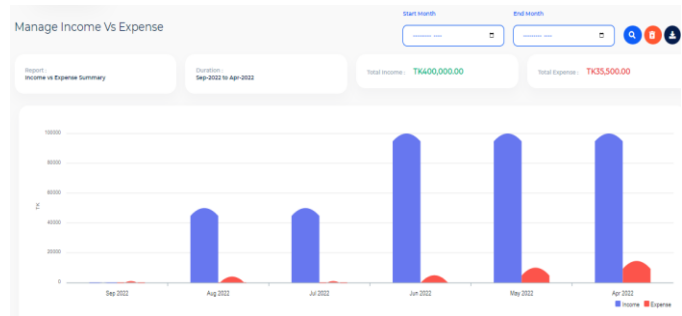


Figure 4.37: Income vs expense

### 4.3.35: Monthly attendance

Using this section, we can monitor the monthly attendance of employees, overtime, early leave, and late time. We can also download an attendance report form here.

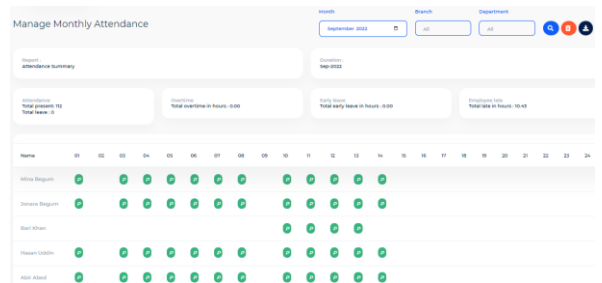


Figure 4.38: Monthly attendance report

### 4.3.36: Leave

Using this section, we can see the leave report of an employee and also see the employees' approved leaves, rejected leaves, pending leaves, and total left leaves.

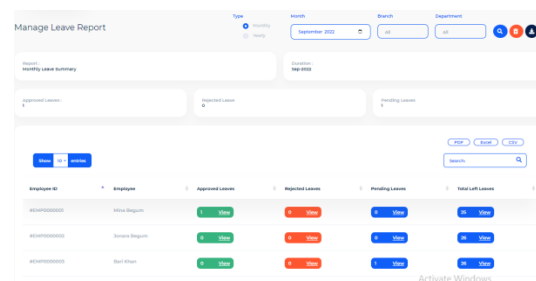


Figure 4.39: Leave report

### 4.3.37: Account statement

Using this section, we can manage the monthly summary of account statements.

Account	Date	Amount
Verhagegala Branch	Apr 30, 2022	19,900,000.00
Verhagegala Branch	May 31, 2022	19,900,000.00
Verhagegala Branch	Jun 30, 2022	19,900,000.00

Figure 4.40: Account statement

### 4.3.38: Payroll

Using this section, we can see a monthly or yearly summary report of payroll. We can also download the report.

Employee ID	Employee	Salary	Net Salary	Month	Status
No data available in table					

Figure 4.41: Payroll report

### 4.3.39: Manage Timesheet

Using this section, we can see timesheet report of individual employee. Such as-total working employees, hours and download report.

Employee ID	Employee	Date	Hours	Description
#E4F0000000000000	Service Request	Sep 1, 2022	0	Physical delay this time frame.
#E4F0000000000000	Annual Holiday	Sep 6, 2022	30	You are requested to display the software within 30 Seconds/Settings to activate Windows.

Figure 4.42: Manage timesheet report

### 4.3.40: Complaint

Using this section, we can see and download complaints reports of employees' consciousness.

Complaint From	Complaint Against	Title	Complaint Date	Description
Abeer Akbar	Abeer Akbar	Office work related building	2022-09-04	Office work related building
Abeer Akbar	Abeer Akbar	personal attack inside office	2022-09-05	personal attack inside office
Abeer Akbar	Abeer Akbar	Always back sitting	2022-09-05	Please see that issue seriously, I can not tolerate anymore
Abeer Akbar	Abeer Akbar	office work disturbance	2022-09-05	office work disturbance office work disturbance

Figure 4.43: Manage complain report

### 4.3.41: Punishment

Using this section, we can see and download punishment reports of employees to identify punished employees for company awareness.

Punishment By	Punishment To	Subject	Punishment Date	Description
Laila Akbar	Abeer Akbar	back sitting	Step 1, 2022	Half hour extra duty
Abeer Akbar	Abeer Akbar	back sitting	Step 1, 2022	1 hour extra duty
Abeer Akbar	Abeer Akbar	back sitting	Step 1, 2022	2 hr extra duty
Abeer Akbar	Abeer Akbar	back sitting	Step 1, 2022	back sitting back sitting back sitting

Figure 4.44: Punishment report

### 4.3.42: Job status

Using this section, we can see job status reports of employees, including approximate retirement date, whether they are still employed, terminated, or resigned. According to the retirement date, the company can make a decision for a long-term work assignment.

Employee ID	Name	Email	Branch	Department	Designation	Job Status	Date
#EMP0000001	Abeer Akbar	abeer@gmail.com	Technology	IT	Junior Officer	waiting/Agree. (Ret. date)	Jun 25, 2022
#EMP0000002	Abeer Akbar	abeer@gmail.com	Technology	IT	Senior Officer	waiting/Agree. (Ret. date)	Jun 1, 2022
#EMP0000003	Abeer Akbar	abeer@gmail.com	Technology	Finance	Finance Manager	waiting/Agree. (Ret. date)	Feb 1, 2022
#EMP0000004	Abeer Akbar	abeer@gmail.com	Technology	IT	Junior Officer	waiting/Agree. (Ret. date)	Jun 1, 2022
#EMP0000007	Abeer Akbar	abeer@gmail.com	Technology	IT	Senior Officer	waiting/Agree. (Ret. date)	Jul 15, 2022

Figure 4.45: Job status report

## Constant

### 4.3.43: Branch

Using this section, we can create, manage, and edit branch information.

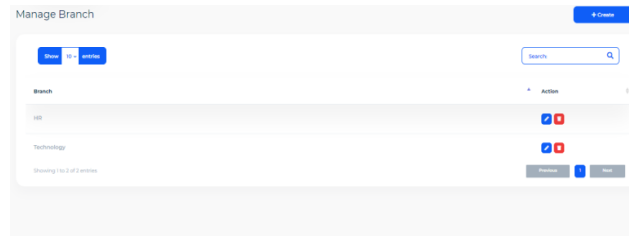


Figure 4.46: Branch management

### 4.3.44: Department

Using this section, we can create, manage, and edit department information.

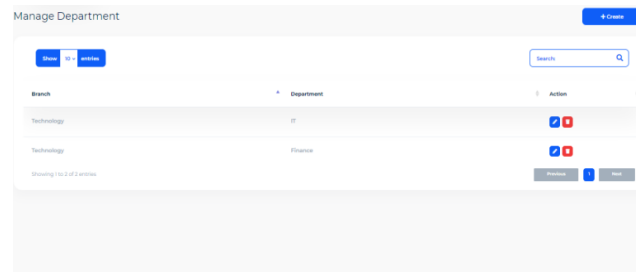


Figure 4.47: Manage department

### 4.3.45: Designation

Using this section, we can create, manage, and edit designations information.

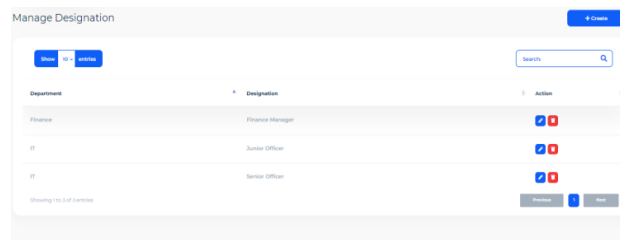


Figure 4.48: Manage designation

### 4.3.46: Award Type

Using this section, we can create, manage, and edit award types.



Figure 4.49: Manage award type

### 4.3.47: Payslip type

Using this section, we can create, manage, and edit payslip types.

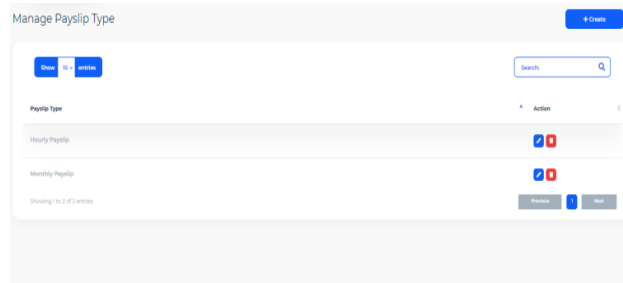


Figure 4.50: Manage payslip type

### 4.3.48: Allowance option

Using this section, we can create, manage, and edit allowance options.

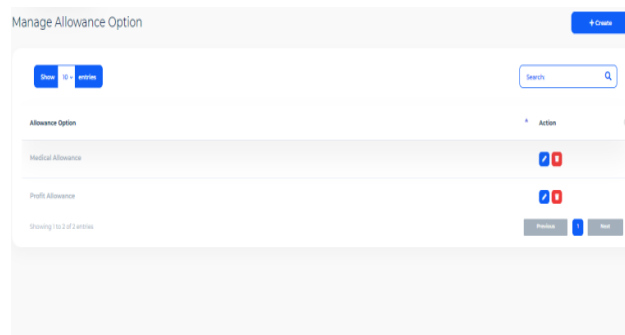


Figure 4.51: Manage allowance option

### 4.3.49: Loan option

Using this section, we can create, manage, and edit loan options.

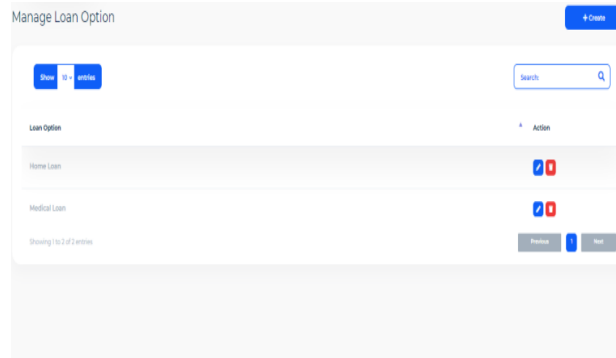


Figure 4.52: Manage loan option

### 4.3.50 Deduction Option

Using this section, we can create, manage, and edit deduction options.

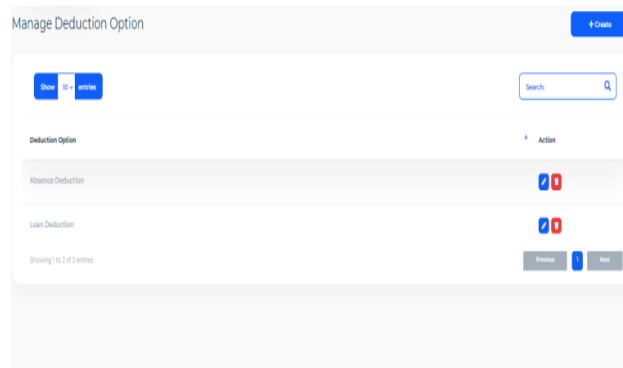


Figure 4.53: Manage deduction option

### 4.3.51: Expense Type

Using this section, we can create, manage, and edit Expense types.

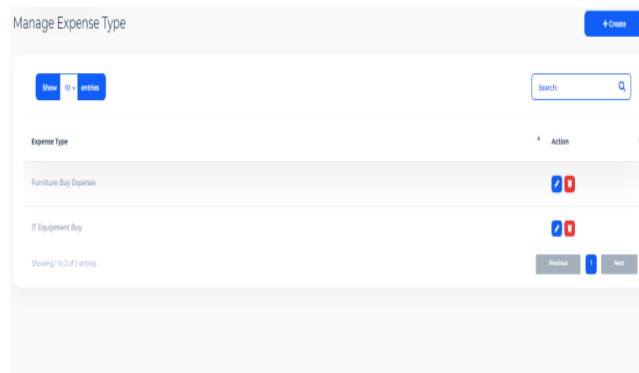


Figure 4.54: Manage expense type



### 4.3.52: Income type

Using this section, we can create, manage, and edit income types.

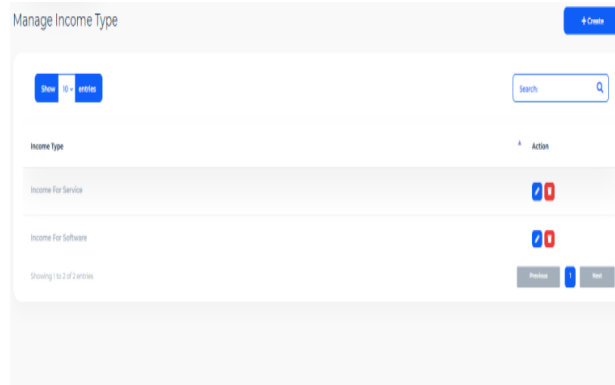


Figure 4.55: Manage income type

### 4.3.53: Payment type

Using this section, we can create, manage, and edit payment types.

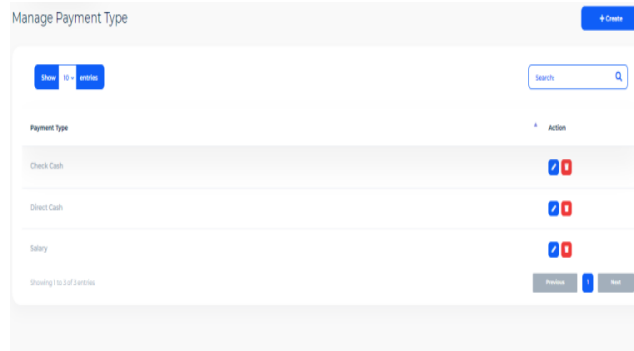


Figure 4.56: Manage payment type

### 4.3.54: Leave type

Using this section, we can create, manage, and edit leave types.

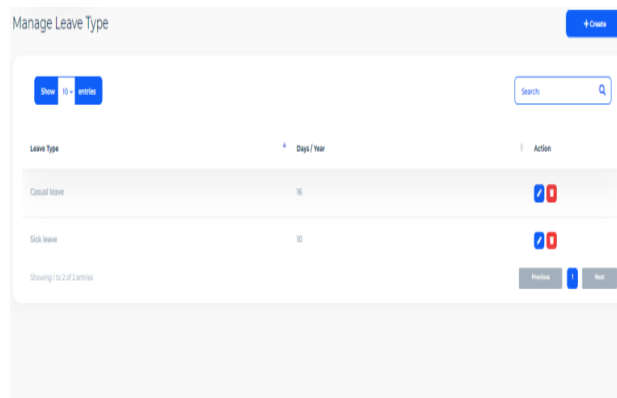


Figure 4.57: Manage leave type

### 4.3.55: Termination type

Using this section, we can create, manage, and edit termination types.

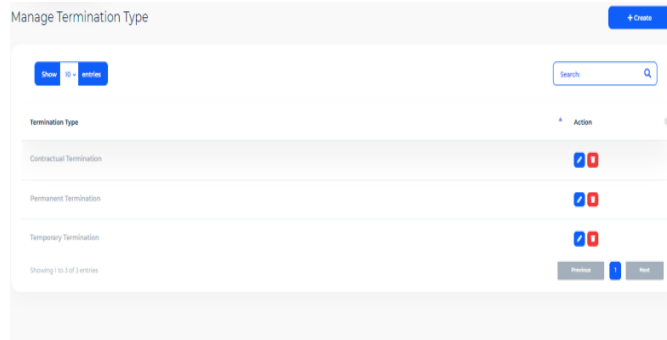


Figure 4.58: Manage termination type

### 4.3.56: Training Type

Using this section, we can create, manage, and edit training types.

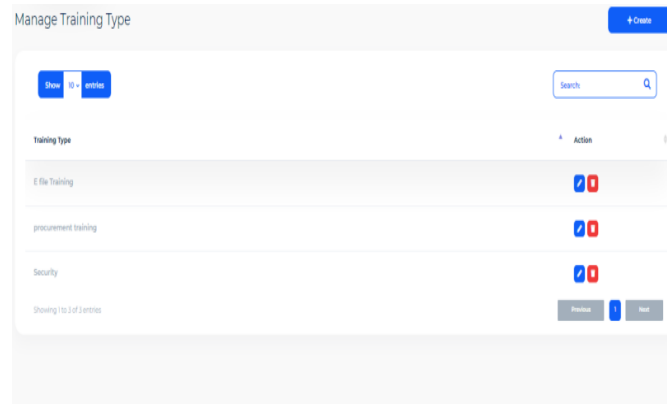


Figure 4.59: Manage training type

### 4.3.57: System settings

Company logo, company name, company address and zip code, currency, currency symbol, date format, time format, company start time, company end time, etc. can be set here.

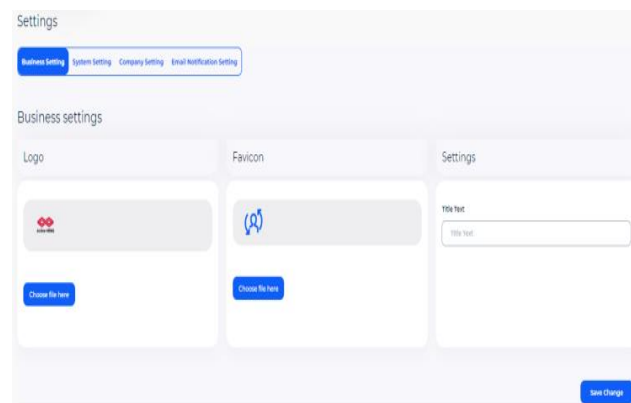


Figure 4.60: System settings

### 4.3.58: Employee Self Profile

Using this section, each employee can give self-attendance, see leave status, events, meetings, holidays, download payslips, etc.

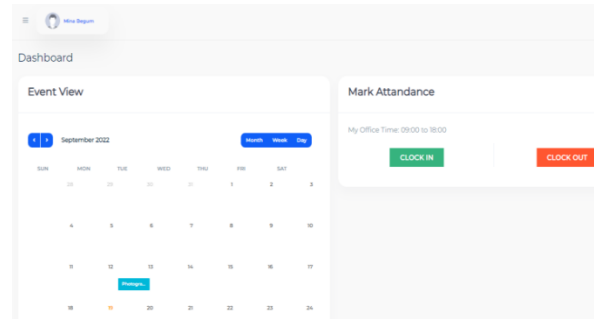


Figure 4.61: Employee self-profile

## CHAPTER 5

### TESTING

#### 5.1: Testing

Testing is characterized as a process of assessment that either the definitive system meets its specified fulfillments initially or not [13]. It is primarily a process that includes validation and verification processes to determine whether the developed system meets the user's requirements [14]. Testing means the process of analyzing the software item to detect the differences between existing or required conditions and evaluating the features of the software item. Before the software is released, it must be thoroughly tested using numerous test cases and modes to ensure that it is free of bugs. and use minimum space requirements as well as a minimum time to perform. The test cases were chosen ahead of time, with expected outcomes specified and actual outcomes recorded for comparison. The selection of test cases is done via the "White Box Testing" technique to check the internal programming logic and efficiency and via the "Black Box Testing" technique to check software requirement fulfillment to find the maximum number of errors with minimum effort and time. Despite the fact that test cases are cyclomatic complexity, conditional test design, the software code is not in its optional form, as are all other possible alternative parts in the software are not considered. At the integration level, the software will be subjected to third-party tests, which would further enhance the software's optimality and efficiency.

#### Test Characters

- A good test has a high probability of finding an error.
- A good test is not redundant.
- A good test should be "best of breed".
- A good test should be neither too simple nor too complex.

## **Black Box Testing**

A software testing technique that is essential for software testing. The testers performing black box testing have no knowledge of the internal design and have no access to the source code. Only the system architecture is known to the tester. This technique will be used to ensure that the system accepts all required inputs and produces the desired output [18].

The method of Black Box Testing is used by the software engineer to derive the required results from the test cases:

- Black Box Testing alludes to the testing that is conducted at the software interface.
- A Black Box Test examines some fundamental aspects of a system with little regard to the internal logic structure of the software.
- A limited number of important logical paths can be selected and exercised.
- An important data structure can be probed for validity.

The following categories were subjected to black box testing to identify errors:

- Incorrect or missing functions
- Graphics error.
- Errors in data in binary format
- The data in integer format contained an error.
- File error.
- Pointer error.
- Memory access error
- Variable error.
- Performance error.

## White Box Testing

White box testing is a software evaluation technique that looks at the software's internal structure, design, coding, and inner workings. Developers utilize this testing method to ensure that inputs and outputs flow smoothly across the program, boosting usability and security. The notion is known as "white box" since the code is visible to the tester during the examination [19].

Glass Box Testing is another name for White Box Testing. The software engineer can create the following test cases using white box testing methods:

- Guarantee that all independent paths within a module have been exercised at least once.
- Exercise all logical decisions on their true and false sides.
- Execute all loops at their boundaries and within their operational bounds.
- Exercise internal data structures to ensure validity.

The following issues were addressed during White Box Testing:

- The number of input parameters is equal to the number of arguments.
- Parameters and arguments are attributed to match.
- The number of arguments transmitted is called a module and is equal to the attributes of parameters.
- The unit system of argument transmitted is called the module equal unit system of the parameter.
- Several attributes and order of arguments to build in functions correctly.
- Any references to parameters are not associated with building in functions correctly.
- Only the input arguments were changed.

- A global variable definition is consistent across the module.
- Files attributes are correct.
- Format specifications match I/O specifications.
- Files are opened before use.
- Files are closed while work is going on.
- I/O errors are handled.
- Any textual errors in the output information.

## **5.2: Test Plan**

Testing is the process of examining a software item in order to determine the difference between the current and required permissions and to assess the software item's functionality. Different levels of testing begin once the test plan is completed and the test cases are fully defined.

### **Unit Testing**

Unit testing is performed to test the validity of the individual units. This is done in the coding phase with interactive testing. Thus, it constitutes a majority of the functionality tests for each logical unit.

### **Integrity Testing**

When all the development of all the units or modules is completed and integrated, the integrity test phase is started. In this phase, the interface between the modules is tested. This phase verifies whether the inter-module exchange of information and events is as per required system behavior.

Result: The test succeeded.

### **System Testing**

The system testing phase incorporates performance stress testing to meet the product criteria concerning the desired benchmarks. This is a necessary test for the highly data-intensive product.

Result: The entire system was put through its paces in terms of security, flexibility, error recovery, and efficiency. The test was successful.

### **Validation Testing**

To ensure that the requirements were met, tests were carried out. All functional needs were met through the development of plans and processes. The software was alpha-tested. There are two goals in preparing test plans. Firstly, a properly detailed test plan demonstrates that the program specifications are understood completely. Second, the test plan is utilized during program testing to demonstrate the program's correctness.



## CHAPTER 6

### PROJECT MAINTENANCE

#### 6.1: Project Maintenance

In the software development life cycle, maintenance is critical. A software project is delivered within estimated time only if all the phases of the software development process are completed within estimated and primarily set up time [15].

Project maintenance is the post-implementation support for the client-side from the developer's end. The development team is bound to give support and be present at once when the need arises.

- Only 20% of the maintenance is spent "fixing mistakes" and the remaining 80% is for adapting existing systems to change in their external environments, making enhancements requested by the users, and reengineering an application for future use.
- When maintenance is considered to encompass all those activities, it is relatively easy to see why it absorbs too much effort.
- Maintenance is of
- Corrective Maintenance
- Adaptive Maintenance
- Perfective Maintenance or Enhancement.
- Preventive maintenance or reengineering

We can suggest the maintenance metrics, i.e., Software Maturity Index (SMI), that indicate the stability of a software product (based on changes that occur for each release of the product).

## CHAPTER 7

# CONCLUSION

### 7.1: Project Summary

In conclusion, I would like to say that this Human Resource Management System has achieved its purpose. This project has been extremely labor-intensive to finish. During the development of the system, a conscious attempt was made to construct and develop a software package that would generate a proper HR management system using available tools, techniques, and resources. We have made sincere effort to make the HR system as user-friendly as possible [16].

These are the benefits of this project:

The HR department can easily create employees for the respective branch.

- It can significantly improve the company's HR performance.
- Salary management is more efficient than manual systems.
- Different types of report generation, especially leave, retirement time, etc., make the software more effective.
- Whatever that was done manually has been completely shifted to the computerized process, and this has enabled the company to carry out its operations more quickly.
- This has also given the users a wider spectrum of communication. since all previous manual work has been replaced by electronic work.
- Data processing is now more effective.
- Data may be accessed and obtained with only one click. The complexity and expense of data processing have both decreased.
- It is faster and more efficient data processing. It is less time-consuming.

- Operations are more transparent.
- Communication between the users is more efficient. In particular, the report section made the software more efficient.

## **7.2: Future Works**

- The future of HR will be met with a variety of challenges that will be solved according to the situation.
- I want to include artificial intelligence (AI) so that company authorities may operate more simply and efficiently.
- I also want to develop a mobile application for users' convenience.
- Part of this future is continuing diversification in the workforce, as well as the services rendered by the organization to meet the needs of the population and constituents.
- At the same time, this will come with an administration's responsibility to provide new management strategies.
- In response to user requests, I'll provide more features.
- Because there are always new requirements and that number keeps growing every day, no website has ever been declared complete forever.

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