Criterion B: Design

Figure 1. Structure Diagram of Solution
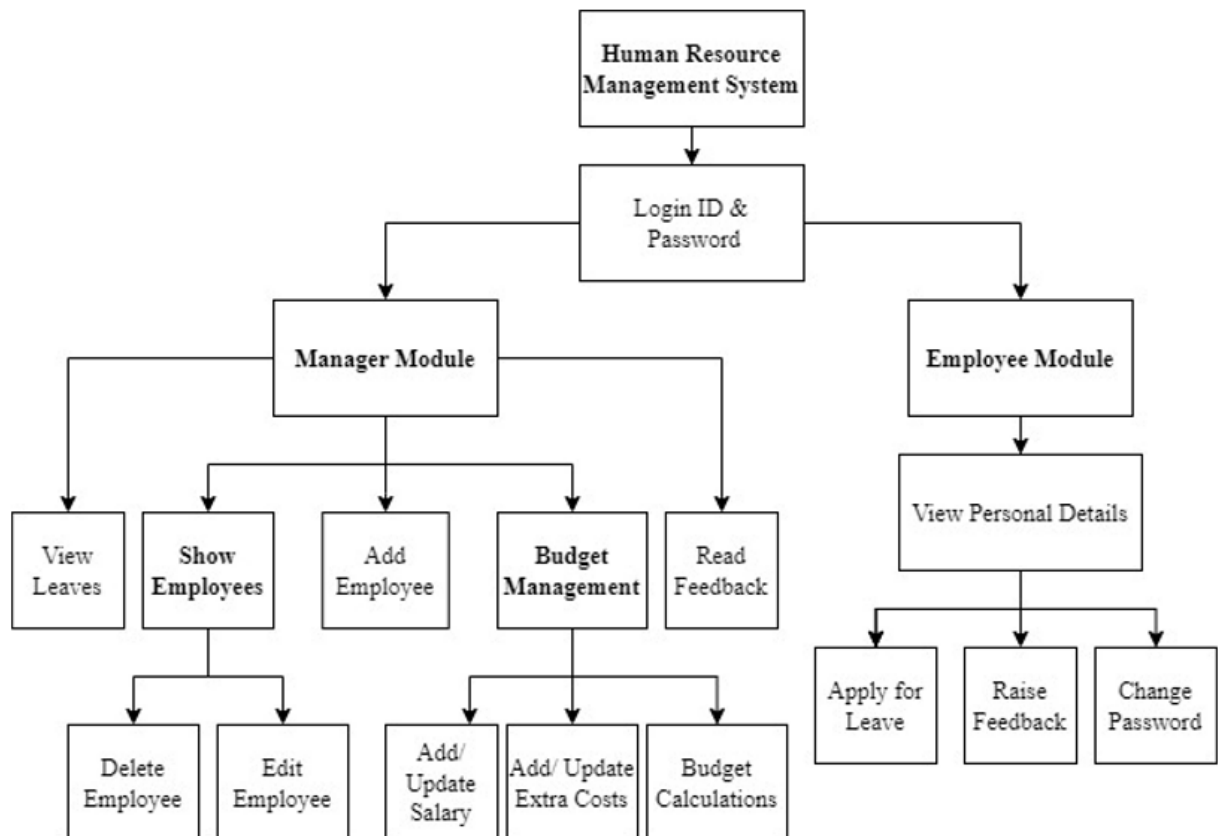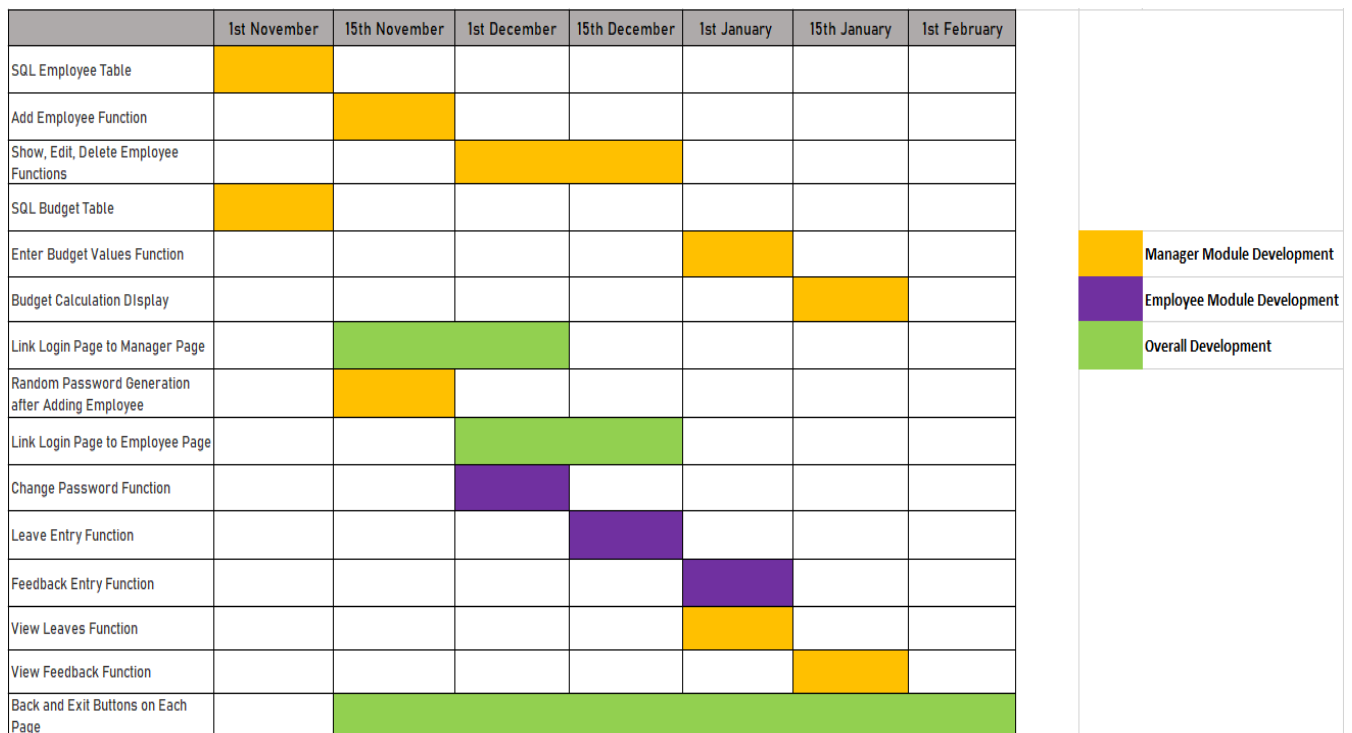
Figure 2. Gantt Chart for Development (Login Module, Manager Module, Employee Module)

	1st November	15th November	1st December	15th December	1st January	15th January	1st February
SQL Employee Table	■ (orange)						
Add Employee Function		■ (orange)					
Show, Edit, Delete Employee Functions			■ (orange)	■ (orange)			
SQL Budget Table	■ (orange)						
Enter Budget Values Function					■ (orange)		
Budget Calculation Display						■ (orange)	
Link Login Page to Manager Page		■ (green)	■ (green)				
Random Password Generation after Adding Employee		■ (orange)					
Link Login Page to Employee Page			■ (green)	■ (green)			
Change Password Function			■ (purple)				
Leave Entry Function				■ (purple)			
Feedback Entry Function					■ (purple)		
View Leaves Function					■ (orange)		
View Feedback Function						■ (orange)	
Back and Exit Buttons on Each Page		■ (green)	■ (green)	■ (green)	■ (green)	■ (green)	■ (green)

Legend:
- Manager Module Development (orange)
- Employee Module Development (purple)
- Overall Development (green)

Design Details and Interfaces:

The design templates were created using PowerPoint.

Figure 3. Login Page for Manager and Employees

Based on the username and password, either the manager or employee module is entered.

1. Manager Module:

When the manager logs in, they have access to 5 functionality buttons:

- Add Employee, Show Employees, Budget Management, Read Feedback, View Leaves

Figure 4. "Add Employee" Interface

The arrows represent drop-down menus:

Once an employee is added, a pop-up screen displays their unique username and password (randomly generated) which the manager can share with them.

Figure 5. Randomly Generated Login Credentials

Table 1. Employee Table in the SQL Database

Column Name	Field	Validation Method
employee_id	Integer	Primary Key: AutoIncrement, Presence Check
name	Character (100)	Presence Check, Length Check, Type Check: isalpha()
email	Character (100)	Presence Check, Length Check
phone	Integer	Presence Check, Type Check: isdigit()
sex	Character (100)	N/A
dob	Date	Format Check
doj	Date	Format Check

Figure 6. Add Employees Flowchart

```
                          ╭─────────╮
                          │  Start  │
                          ╰────┬────╯
                               │
                               ▼
                    ╱────────────────────╲
                    │  input name, email, │
        ┌──────────▶│   phone, dob, doj,  │
        │           │       gender        │
        │            ╲────────┬──────────╱
        │      No             │
        │    ┌──────┐         ▼
        │    │    ◀─╲  ╱──────────────╲
        │    └──────▶╲ │  Is enter    │
        │            ╱ │  clicked?    │
        │              ╲──────┬───────╱
        │                     │ Yes
        │                     ▼
        │             ╱──────────────╲
  ╱──────────╲        │  Are all     │
  │ output    │  No   │  fields      │
  │ "fill     │◀──┬── │  filled?     │
  │ all       │   │   ╲──────┬───────╱
  │ fields"   │ ┌─┴──────┐   │ Yes
  ╲──────────╱ │ Clear all│   ▼
               │ fields   │ ┌──────────────┐
               └──────────┘ │ Store in     │
   ┌─────────┐              │ database     │
   │ people  │◀─────────────┤              │
   │         │              └──────┬───────┘
   └─────────┘                     │
                                   ▼
                    ┌─────────────────────────────┐
                    │ username = remove all spaces │
                    │          from name           │
                    │ password = randomly generated│
                    └──────────────┬───────────────┘
                                   │
                                   ▼
                          ╱──────────────╲
                          │   output      │
                          │   username,   │
                          │   password    │
                          ╲──────┬───────╱
                                 │
                                 ▼
                          ╭─────────╮
                          │   End   │
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```
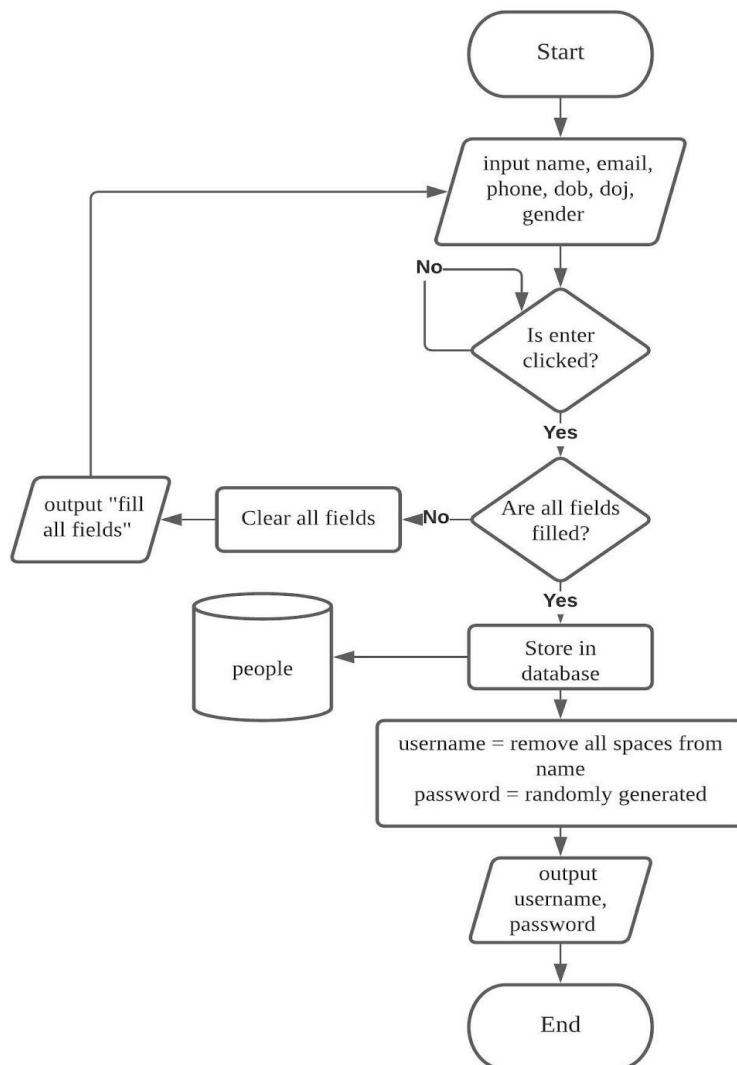
Table 2. "Show Employees" Functionality

Function	Comments
Show Employees Page: 1. Delete Employee 2. Edit Employee 3. Search	1. "Delete Employee" removes all records of the selected employee from the company database. 2. "Edit Employee" allows the admin to update details 3. "Search" allows the manager to filter through the employees by name

Figure 7. "Show Employees Interface"

The design will incorporate a back button on all pages:

Employee ID	Full Name	Email ID	Contact No.	Gender	Date of Birth	Date of Joining
32	Harry Potter	hpotter@cottonsoil.com	7987654321	Male	31/07/1980	15/01/2018
56	Ron Weasley	rweasley@cottonsoil.com	8987654321	Male	01/03/1980	12/11/2019
57	Hermione Granger	hgranger@cottonsoil.com	9987654321	Female	19/09/1979	07/02/2020
98	Luna Lovegood	llovegood@cottonsoil.com	6987654321	Female	13/02/1981	08/03/2021

Figure 8. "Budget Management" Interface

Table 3. "Budget Management" Functionality

Functions	Comments
Budget Management Page: 1. Total Budget 2. Add Salary 3. Add Extra Costs 4. Update Costs 5. Budget Calculations	1. "Total Budget" allows the manager to enter the total HR budget 2. "Add Salary" allows the manager to add the total salaries of each employee using employee ID 3. "Add Extra Costs" prompts the admin to enter the type of cost to document additional expenses 4. "Update Costs" allows the manager to make changes to the salary and extra costs previously entered 5. "Budget Calculations" allows the manager to see the breakdown of the HR budget

Table 4. Budget Table in the SQL Database

Column Name	Field	Validation Method
employee_id	Integer	Foreign Key, Presence Check
salary	Integer	Presence Check
extra_cost	Integer	Presence Check
cost_type	Character (100)	N/A

Figure 9. Budget Calculations Flowchart
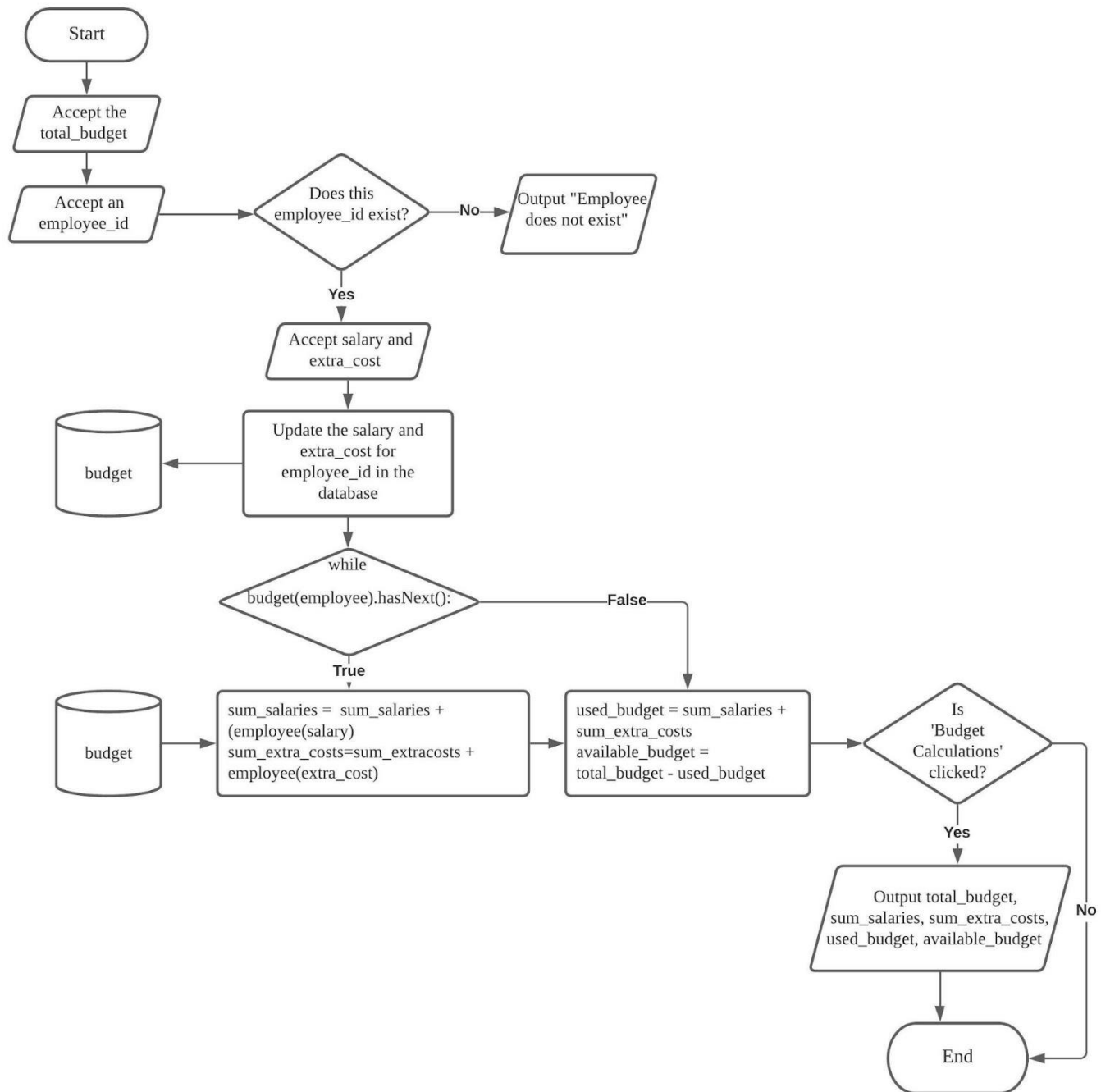
2. Employee Module:

As soon as an employee logs in, they can view the following options:

Figure 9. Employee Module Welcome Page
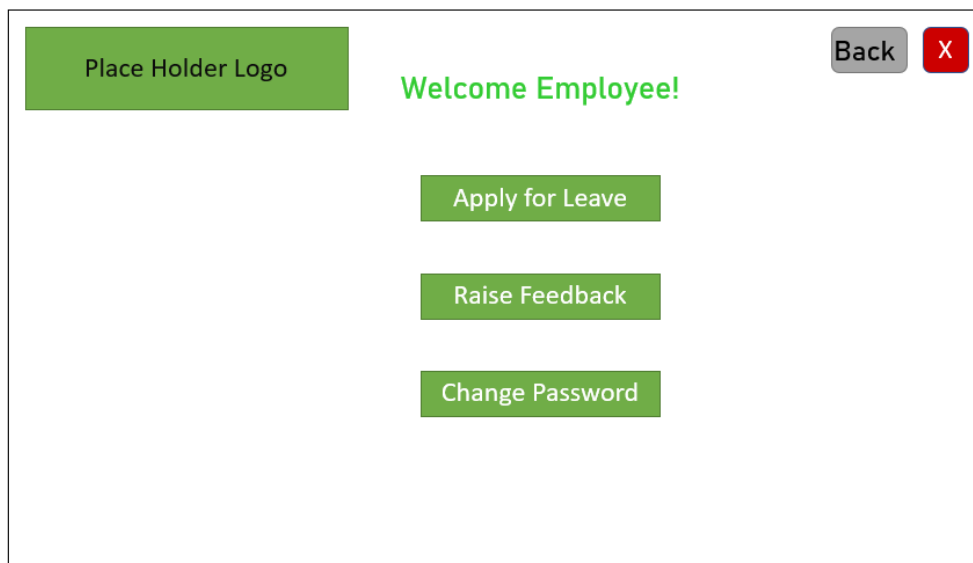
Table 5. Employee Module Functionalities

Function	Comments
1. Apply for Leave 2. Raise Feedback 3. Change Password	1. "Apply for Leave" opens a calendar interface where employees can click on the days they will be on leave. 2. "Raise Feedback" allows employees to give anonymous feedback. 3. "Change Password" allows the employee to update their password

Table 6. Leaves Table in the SQL Database

Column Name	Field	Validation Method
leaverId	Integer	Foreign Key
start	Date	Format Check, Presence Check
end	Date	Format Check, Presence Check
available	Integer	N/A
leaves	Integer	N/A

Figure 10. Leave Application Interface

Figure 11. Leave Application Flowchart
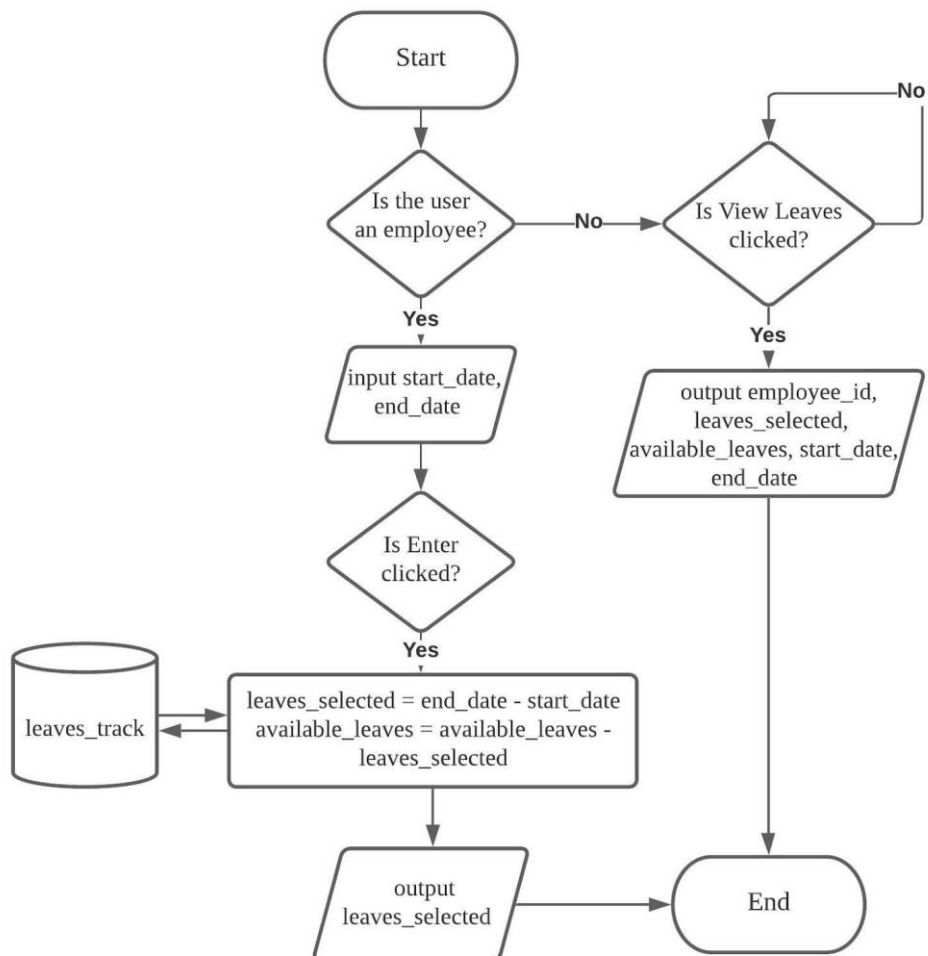
3. Handover to Client

The executable file and database tables will be installed on the client's computer. This will allow him to run the application. From there, the client can install the solution on each employee's PC (provided by the company) either through the company's network folder or manually as requested (Appendix: Feedback).

4. Action Test Plan

Table 7. Action Test Plan

#	Action to be Tested	Method of Testing
1	Login credentials are functional and enter the correct manager or employee interface	• Data testing by entering an incorrect username with the correct password and vice versa so that the login is unsuccessful for abnormal data. • Check with the valid credentials to see if the user enters the appropriate interface.
2	Employee addition and creation of login credentials is functional	• Ensure warning message is displayed if data is missing for sample employee • Check if generated login credentials are displayed
3	Deletion of an entry or modification of details are successful	• Functional testing by deleting the sample employee and checking whether entry is removed from the database • Ensure validation before deletion • Update all fields of an employee to assess whether each detail can be modified except employee ID • Deletion of employee should delete records in leave and budget pages

4	Data can be searched for from the employee table	• Type a portion of the name of an employee to check whether other employees are made invisible
5	Budget, salaries, and extra costs addition and updating is functional	• Enter a total budget. Using the employee ID, add a salary and extra cost. • Alpha testing by changing the values and checking whether the arithmetic changes are made in the database.
6	Salaries cannot be added twice for the same employee	• Try adding a different salary for the same employee to check whether an error message is displayed
7	Employees can select leaves from a calendar and enter them. The manager can view the leaves applied by the employee	• Select the start and end date on the calendar. Check whether the number of days selected matches the "Leaves Selected". • Login to the manager portal and see whether the added leave is visible
8	Employee login with randomly generated password and changed password is successful	• Login to a sample account and change the password. • Then, try to login using the new password and check whether the same portal appears
9	Employees can enter anonymous feedback for the company	• Submit feedback using the employee portal and check whether it is seen by the manager. • Ensure the employee's name is not visible