FUNCTIONAL SPECIFICATION DOCUMENT

Caffe-In: QR-Code Based Attendance Monitoring System for evrydycoffee

DOCUMENT VERSION 1.5

01/29/2025

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01/10/2025	1.1	Added the diagrams	Harvey Dalanon
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01/29/2025	1.5	Adding Open Issues	Mark Aliño

APPROVALS

Approval Date	Approved Version	Approver Role	Approver
12/19/2024	1.0	Project Manager	Mark Aliño
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01/27/2025	1.4	Project Manager	Mark Aliño
01/29/2025	1.5	Project Manager	Mark Aliño

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1. Introduction

In this busy modern workplace scenario, accurate and reliable attendance recording is a primary factor in ensuring operational success. evrydycoffee in Santa Rosa, Laguna has noticed major drawbacks in the attendance management system currently in use, with manual timekeeping and punch cards that tend to be ineffective due to inefficiency, errors, and delay in processing. Having established the urge to innovate, the company proposes that the innovation needed be implementing Caffe-In: QR-Code Based Attendance Monitoring System, one that introduces attendance tracking, yet modern in concept, being simple, safe, and very effective for both evrydycoffee employees and its administrators in carrying out activities concerning the recordation of workers' hours spent working. Administrators will create unique QR codes for each employee, and each employee would check in and out using a designated scanner. The analytics and reporting feature allows administrators to arrive at actionable insights to improve workforce management. According to studies, QR code-based systems improve accuracy and minimize the administrative workload (Pati et al., 2023). Additionally, the system design applies role-based access control (RBAC) in ensuring that only authorized personnel gain access to sensitive information, hence protecting data security. The use of RBAC has been demonstrated in multi-user systems to maintain safe data handling as outlined in the Survey on RBAC Frameworks, 2023.

1.1 Purpose of the document

The Functional Specification Document is a document that provides detailed information on *how* the system solution will function and the requested behavior. This document is created

based on the high-level requirements identified in the Business Requirements Document and provides traceability on the functional specifications back to the business requirements. Included in this document will be the detailed functional requirements including use cases, system inputs and outputs, process flows, diagrams, and mock ups.

The Functional Specification Document will serve as a thorough manual for the system solution's intended performance and functional characteristics. By outlining the precise features of the suggested system, it will provide a link between the technological implementation and the high-level business needs. This document gives stakeholders a shared knowledge of the system's operation while guaranteeing traceability from business needs to functional specifications. It includes use cases that include detailed explanations of how a user interacts with the system, system inputs and outputs that describe the data that needs to be processed and generated, process flows that visually represent the operations and workflows, diagrams like the system architecture and data flow illustrations, and mock-ups that offer initial designs of the system's interface and component parts. This detailed presentation serves as a roadmap for the system's development and validation stages, guarantees stakeholder alignment, and clarifies expectations. The creation of evrydycoffee's QR Code-Based Attendance Monitoring System is the main emphasis of the paper, which guarantees the methodical creation of an effective and user-friendly solution.

1.2 Project Scope

The Caffe-In system deals only with attendance management within the operational framework of EvrydyCoffee in Santa Rosa, Laguna. In order to meet the demand for a more effective, precise, and user-friendly attendance management system, the project intends to build and implement a QR Code-Based Attendance Monitoring System for the coffee business “evrydycoffee”. The system's elimination of manual procedures, reduction of mistakes, and

enhancement of overall operational efficiency would streamline the employee time tracking process.

Each employee who submits his credentials will receive a unique QR code generated by the solution's admin interface. In this system, the employees will use these QR codes as their primary login and logout method when they start and end their shift. A scanning interface that uses the employee's QR code to authenticate him in real time will be shown on the storefront. For administrative evaluation and reporting, all attendance information will be gathered, documented, and safely stored.

The system design, development, and deployment phases of this project will include the creation of a user interface, database integration, QR code generation, and real-time scanning features. To ensure dependability and user-friendliness for all parties involved, it will undergo testing and validation. The scope will be restricted to evrydycoffee workers' attendance management, guaranteeing that the solution is customized to meet particular company requirements.

1.3 Scope of the document

The design, operation, and behavior of the evrydycoffee QR Code-Based Attendance Monitoring System are thoroughly described in this Functional Specification Document. In order to fulfill the project scope, this paper outlines the functional requirements and specifications needed to create a system that would automatically print out a unique QR code for each employee, enabling them to scan in and out on the coffee shop grounds.

This page outlines the main features of the system, such as the database integration for safely storing attendance records, the scanning module for recording attendance, and the admin interface for creating QR codes. In order to guarantee alignment with the high-level business requirements, it also describes the system's inputs, outputs, and process flows.

With the guarantee that this system precisely satisfies evrydycoffee's criteria and facilitates efficient and error-free attendance management, this FSD outlines such functional features and provides a framework to the development team, stakeholders, and other interested parties.

1.4 Related documents

Component	Name (with link to the document)	Description
Project Planning	Project Roadmap (Project Road Map: Caffe-In: QR-Code Based Attendance Monitoring System - QR Code-Based Attendance Monitoring System - Confluence)	Outlines the overall timeline, key phases and high-level goals of the project.
Project Tracking	Project Milestone (Project Milestone - Caffe-In: QR-Code Based Attendance Monitoring System - QR Code-Based Attendance Monitoring System - Confluence)	Defines important checkpoints in the project such as sprint completions and feature deliveries.
Project Approval	Client Approval Letter (https://drive.google.com/file/d/1Yy88vrFlOEas7EbmU_-efpfPqgVwiDax/view?usp=sharing)	A formal document indicating the approval of the client to the project scope, functionalities, and deliverables.
UI/UX Design	Figma Design Mockups (QR Based Attendance – Figma)	Visual representation of the system's UI/UX including page layouts and user flows.

Specification		
Project Management Tool	Caffe-In Jira Task List (Caffe-In - Backlog - Jira)	Detailed list of tasks, stories, and issues tracked for the project, including user stories and bugs.

1.5 Terms/Acronyms and Definitions

Term/Acronym	Definition	Description
QR Code	Quick Response Code	A two-dimensional barcode that encodes information such as employee ID that is used for attendance tracking.
DTR	Daily Time Record	A log of employee check-ins and check-outs for attendance monitoring.
RBAC	Role-Based Access Control	A security model that grants user permissions based on assigned roles such as Admin and Employee.
Timekeeping	Employee Work Hour Tracking	The process of recording employee work hours including clock-in, clock-out and break periods.
Database Schema	Structured Database Design	The blueprint that defines how data logs are organized

		and stored in the system for example employee records and attendance.
API	Application Programming Interface	A set of rules that allows different system components to communicate with each other for example front-end and back-end .
Report Generation	Automated Attendance Reports	The process of compiling attendance data into downloadable reports for analysis and record-keeping such as PDF and Excel.
Attendance Analytics	Data Analysis for Attendance Insights	The process of evaluating employee attendance patterns, identifying trends, detecting absenteeism and providing insights for better workforce management.
Employee ID	Unique Identifier for Employees	A unique number or code assigned to each employee used for identification in the system.

1.6 Risks and Assumptions

Assumption	Risk	Mitigation
Stable Internet Connection – The system assumes that users will have a stable internet connection for real-time attendance logging and QR scanning.	**Power or Internet Outages** – Employees may not be able to log attendance if the system relies on real-time internet access.	Develop an offline mode that syncs data when connectivity is restored.
Compatible Hardware – The system assumes that employees and administrators have access to devices (e.g., smartphones, tablets, or barcode scanners) capable of scanning QR codes.	**Device Compatibility Issues** – Some older devices may not support QR code scanning properly.	Optimize the system for multiple device types and provide fallback options.
Browser Compatibility – The web application is expected to function properly on modern browsers (Chrome, Firefox, Edge) but may not support outdated versions.	**Limited Browser Support** – Users with outdated browsers may experience performance issues.	Ensure compatibility testing and recommend supported browsers to users.
Consistent Employee Compliance – Users (employees) are expected to scan QR codes correctly to	**QR Code Spoofing** – Employees might attempt to manipulate or share QR codes to falsify attendance records.	Implement unique session-based QR codes.

record their attendance accurately.		
Secure Access – The system assumes that only authorized personnel (admins) will manage user accounts and attendance records.	**Data Security & Privacy Concerns** – Unauthorized access or data breaches could compromise attendance records.	Encrypt sensitive data and enforce strict access controls (RBAC).
Operating Environment – The application will be deployed on a web server with PHP, MySQL, and JavaScript support.	**System Downtime** – Server failures or database issues could prevent employees from logging attendance.	Implement scheduled backups and failover mechanisms.
Data Retention Policy – Attendance data will be stored in the system for a predefined period as per company policy.	**Legal & Compliance Risks** – The system must comply with labor laws and data protection regulations regarding employee attendance tracking.	Regularly review policies and ensure compliance with relevant laws.
Third-Party Libraries – The system will use third-party libraries for QR code generation and scanning, assuming their continued availability and support.	**API Deprecation** – If a third-party library (e.g., QR code generator) becomes deprecated or discontinued, it may affect functionality.	Regularly update dependencies and have alternative solutions in place.
QR Code System for Attendance – The system assumes that employees will scan unique QR codes to log their attendance.	**QR Code Integrity Issues** – If QR codes are shared or manipulated, attendance records may be inaccurate.	Consider adding session-based QR codes or requiring periodic re-authentication.

Accurate System Time – The system assumes that the server time is correctly set for accurate attendance records.	**Incorrect Time Stamping –** System time discrepancies can lead to incorrect attendance records.	Sync system time with a reliable source and allow admins to adjust timestamps if needed.
Scalability Planning – The system is designed to handle a predefined number of users efficiently.	**Scalability Issues** – If the number of users grows significantly, the system may experience slowdowns or crashes.	Optimize database queries and ensure proper load balancing.
Local Printing and Report Generation – Users will generate reports and print attendance records using locally installed software.	**Printer and Report Export Issues** – Since the system is offline, printing or exporting reports depends on the local machine's drivers and software.	Ensure proper printer setup and PDF/Excel export functionality.

2. System/ Solution Overview

The Caffe-In: QR-Code Based Attendance Monitoring System is an online solution for tracking attendance that automates employee timekeeping through the use of QR code technology. The system replaces manual procedures, which lowers errors, lessens administrative burden, and guarantees real-time, accurate attendance records.

Employees can use their devices to scan a QR code to record their time in and out, and an internet database securely stores the attendance data. Since the system is web-based, administrators and staff can access it remotely as long as they have an internet connection. Via an extensive analytics dashboard, administrators may oversee user accounts, produce reports that can be downloaded, and examine attendance patterns.

Automated reporting, secure QR-based verification, real-time monitoring, and paperless attendance tracking are some of the main advantages. By improving accessibility, accuracy, and efficiency, the technology makes it simpler for businesses to monitor and control staff attendance. Future developments could incorporate improved security features, biometric authentication, and payroll system integration.

2.1 Context Diagram/ Interface Diagram/ Data Flow Diagram, Application Screen Flow, Sitemap, Process Flow

Figure 1. Context Flow Diagram Proposed

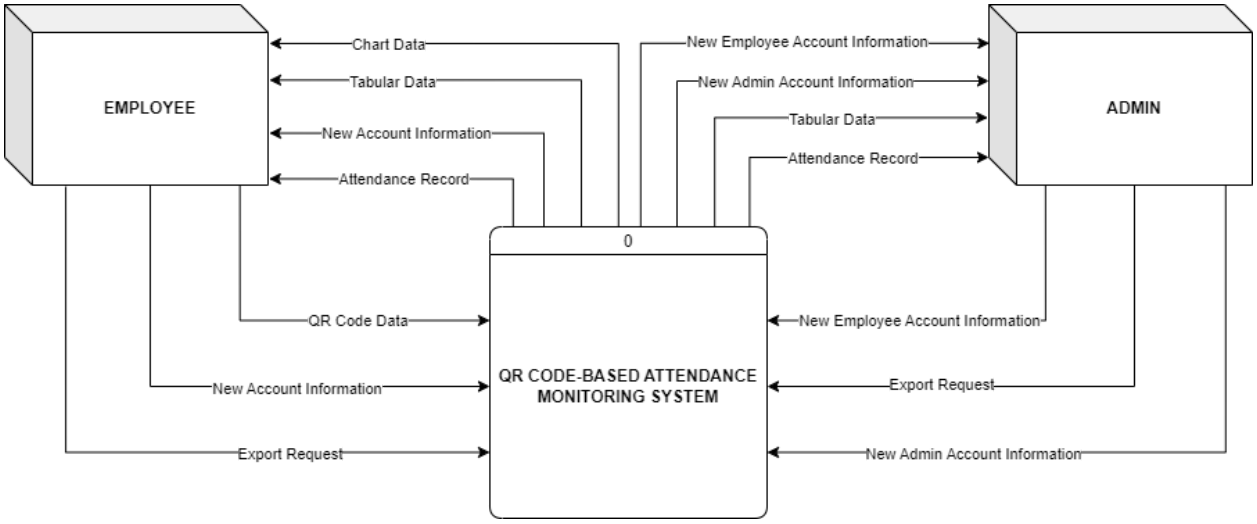


Figure 2. Data Flow Diagram Proposed - Daily Time Record Level 0

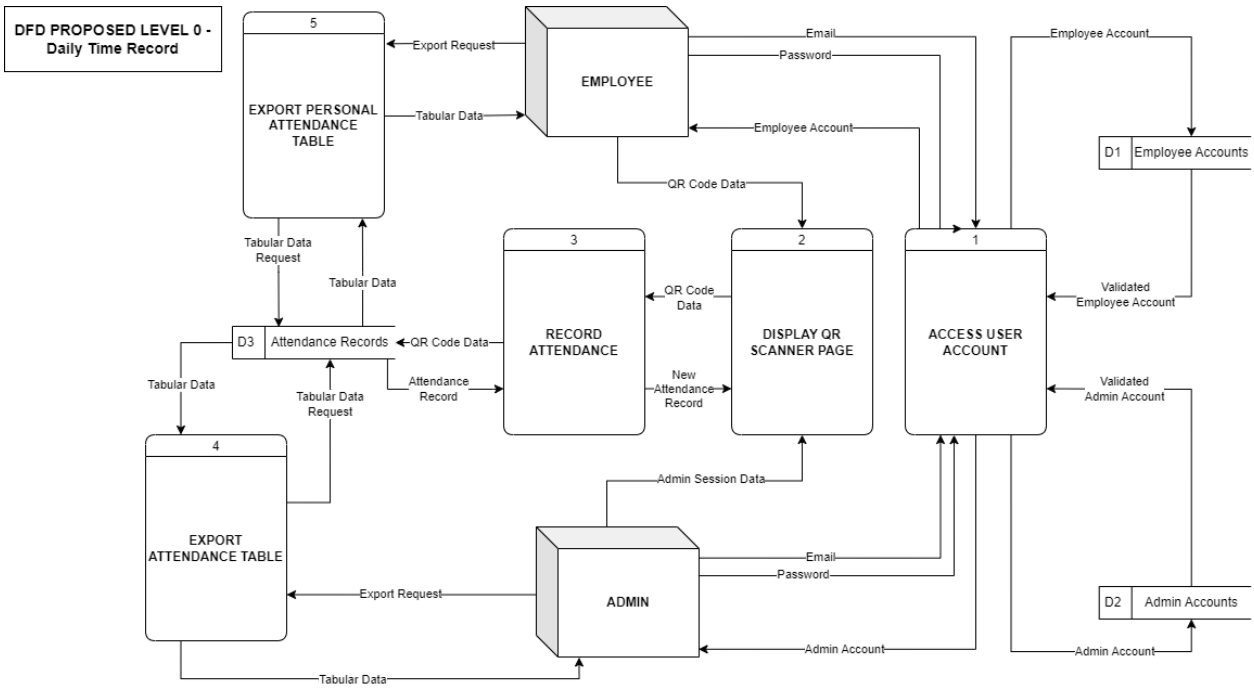


Figure 3. Data Flow Diagram Proposed - Employee Analytics Level 0

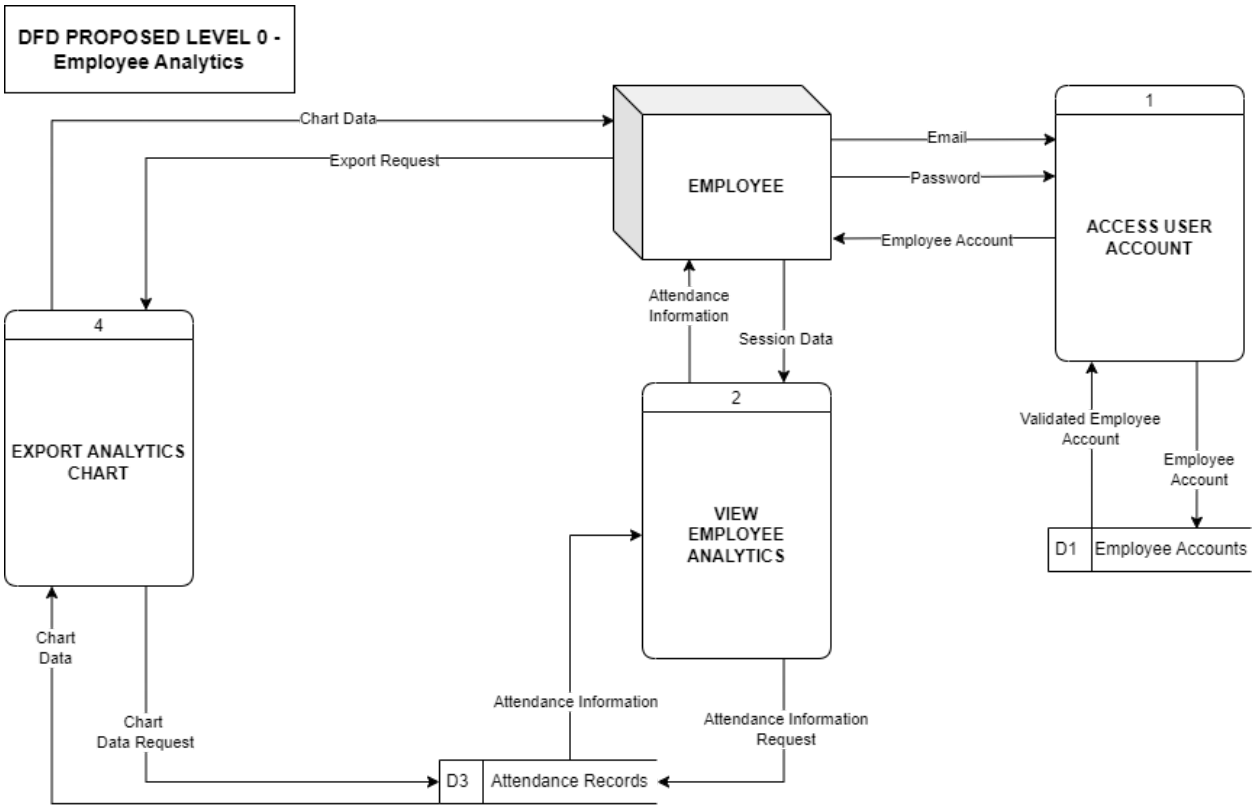


Figure 4. Data Flow Diagram Proposed - User Account Management Level 0

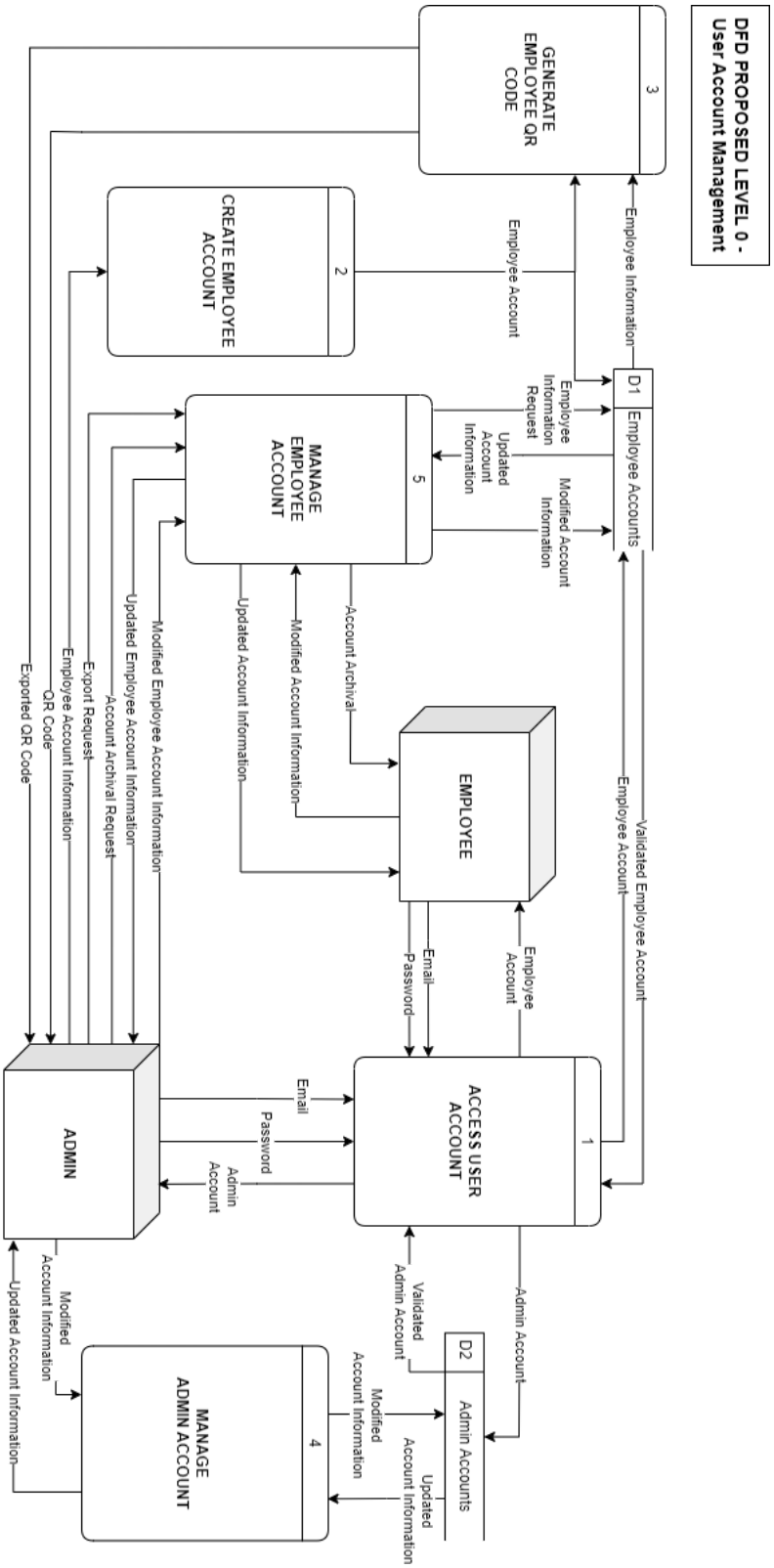


Figure 5. Data Flow Diagram Proposed - User Account Management Level 1

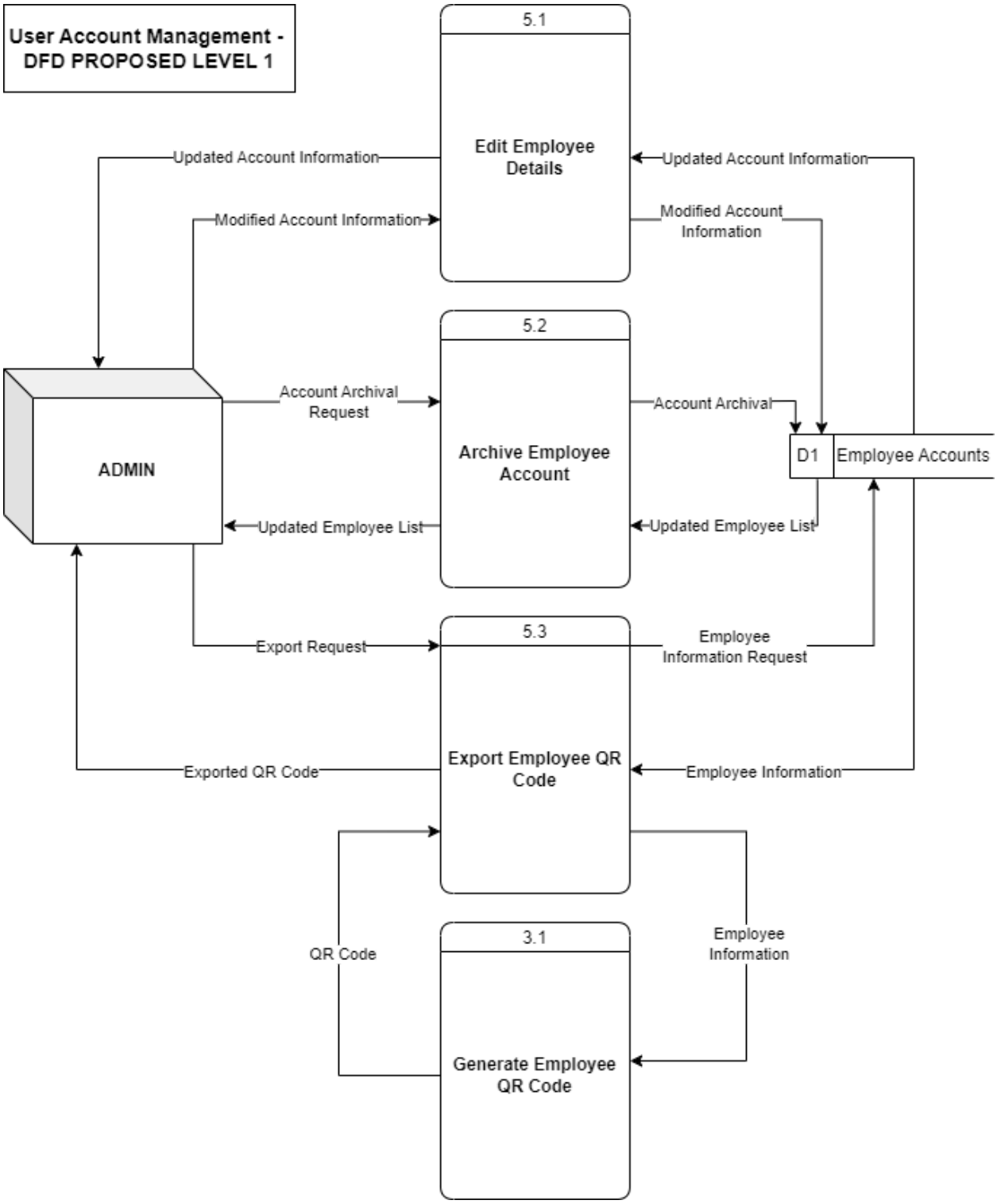
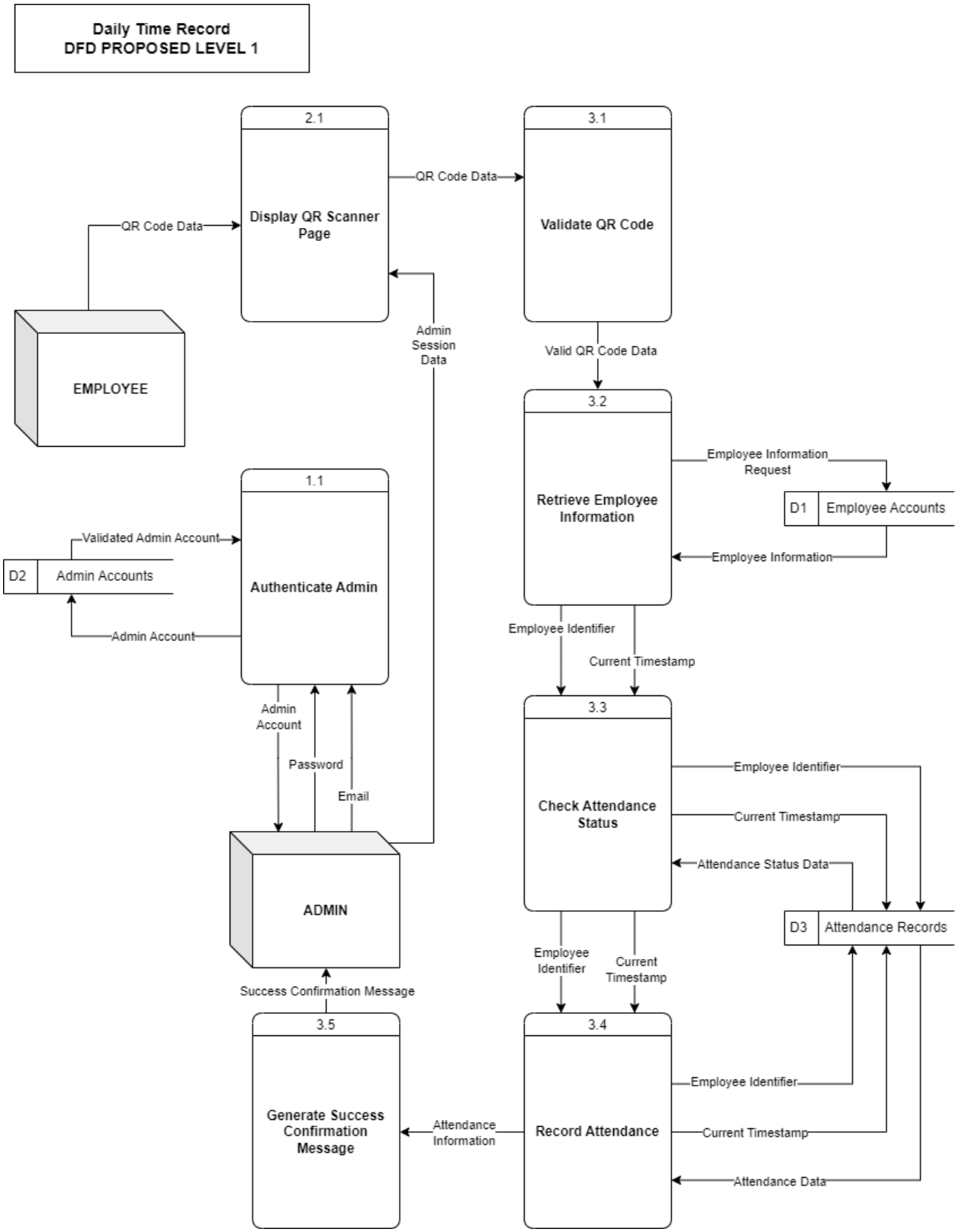


Figure 6. Data Flow Diagram Proposed - Daily Time Record Level 1



p

Figure 7. Database Schema

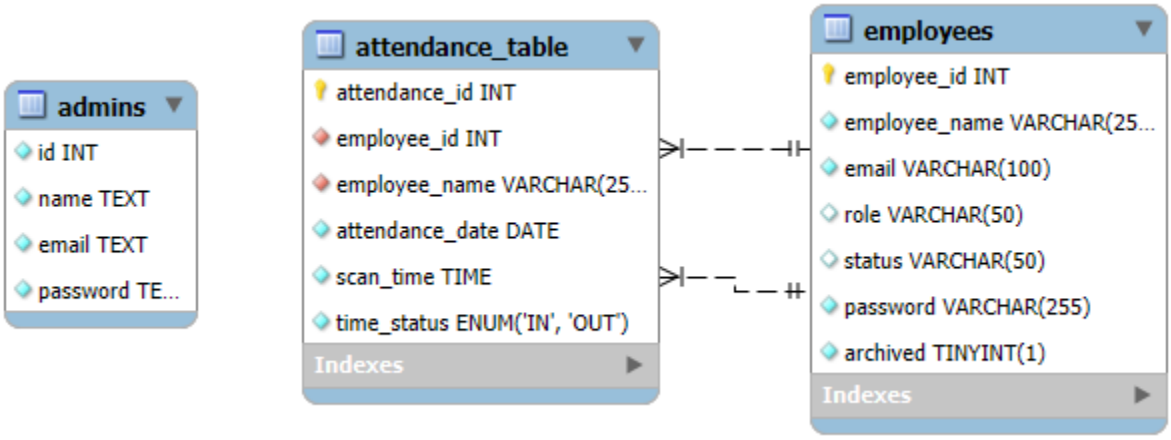


Figure 8. System Flow Diagram Proposed. Login (Admin)

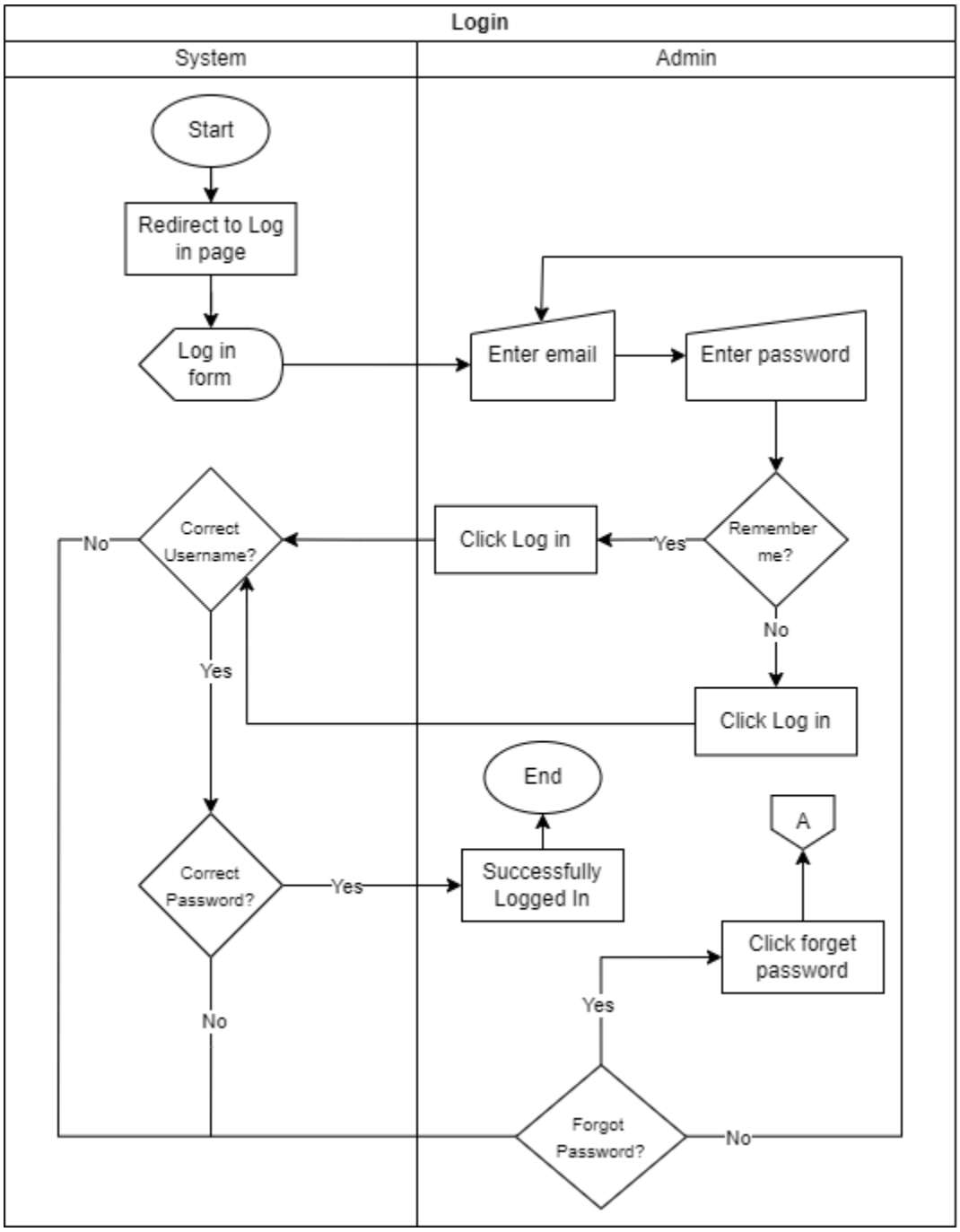


Figure 9. System Flow Diagram Proposed. Login (Employee)

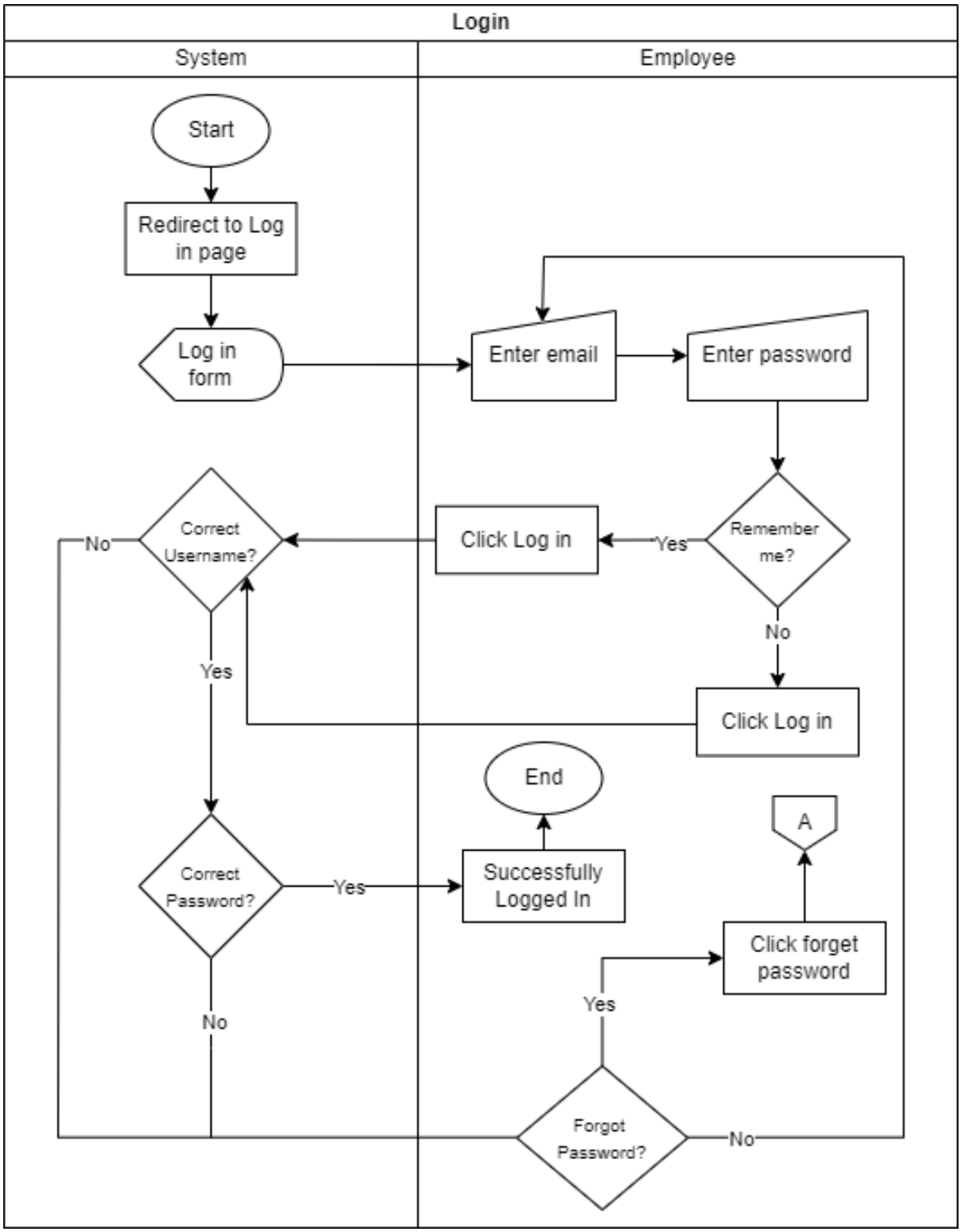


Figure 10. System Flow Diagram Proposed. Forgot Password (Admin)

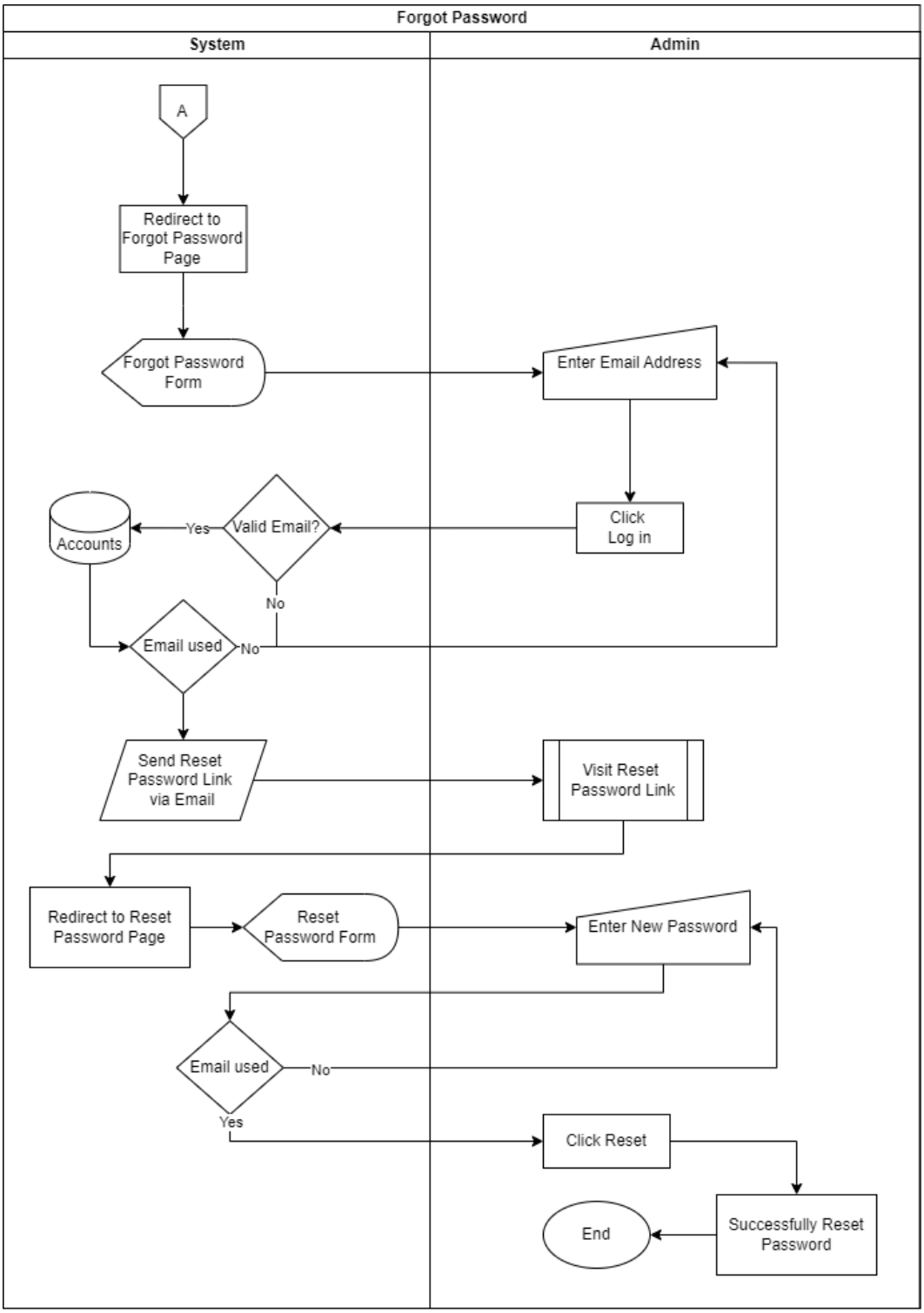


Figure 11. System Flow Diagram Proposed. Forgot Password (Employee)

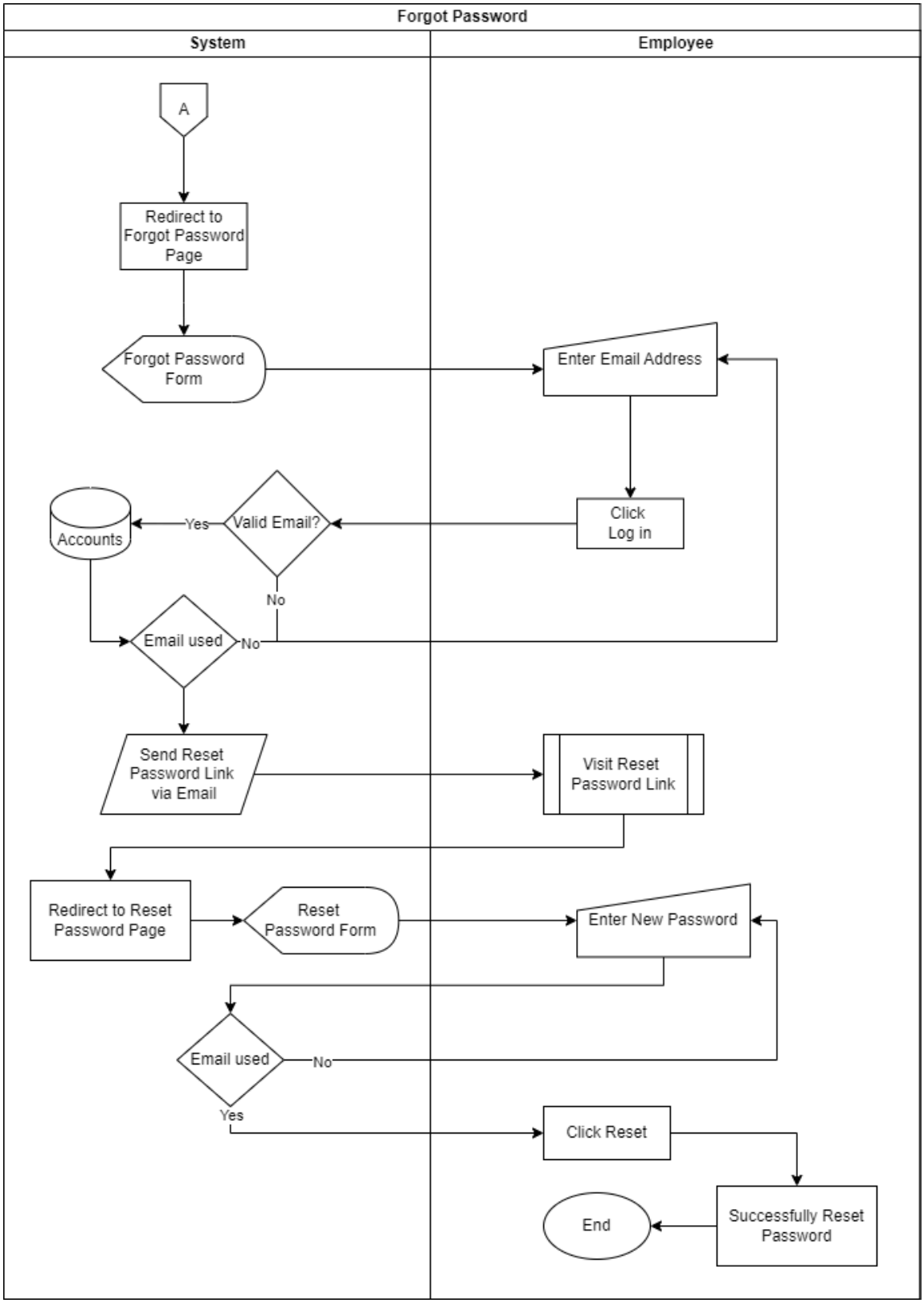


Figure 12. System Flow Diagram Proposed. Export Personal Attendance Table

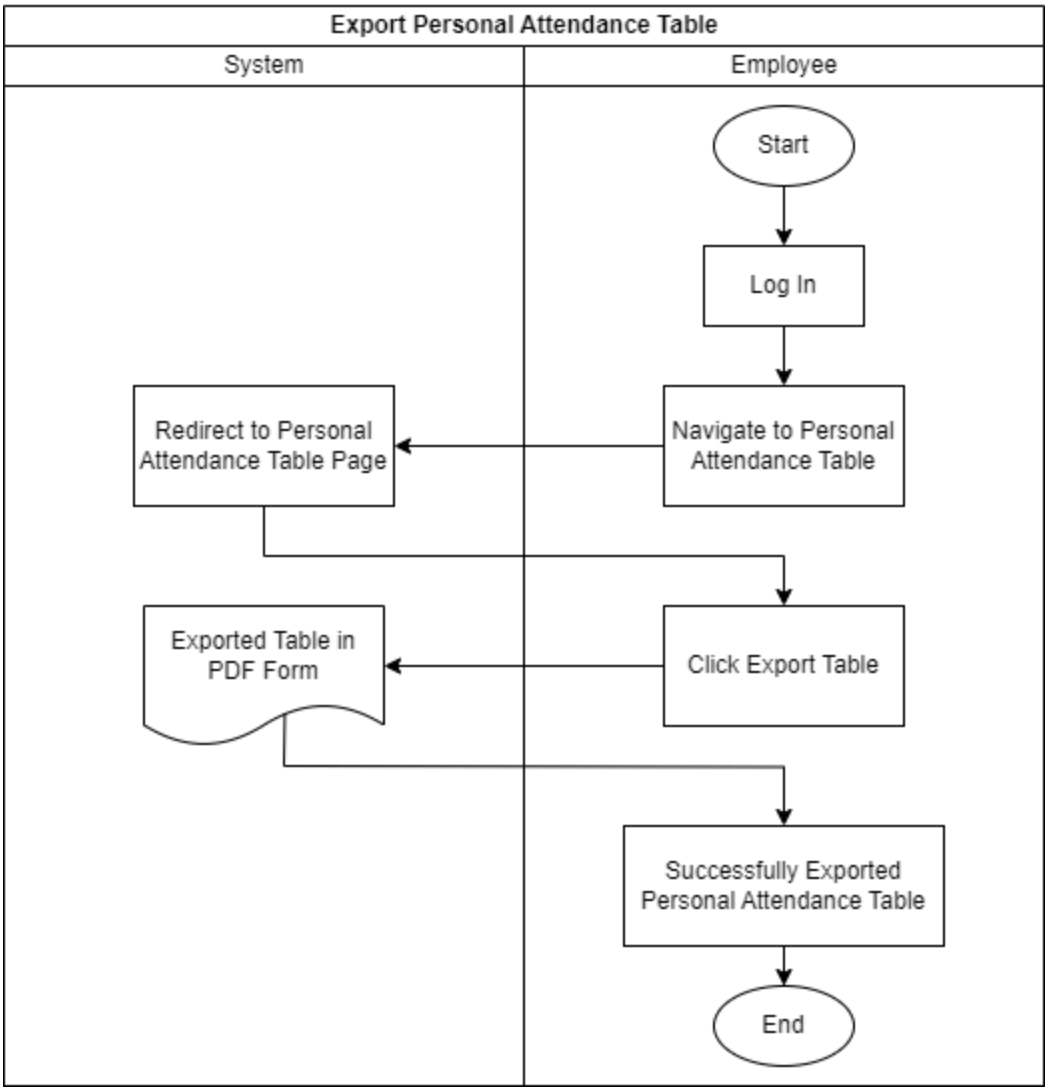

Export Personal Attendance Table
System
Employee
Start
Log In
Navigate to Personal Attendance Table
Redirect to Personal Attendance Table Page
Click Export Table
Exported Table in PDF Form
Successfully Exported Personal Attendance Table
End

FIgure 13. System Flow Diagram Proposed. Export Heat Map

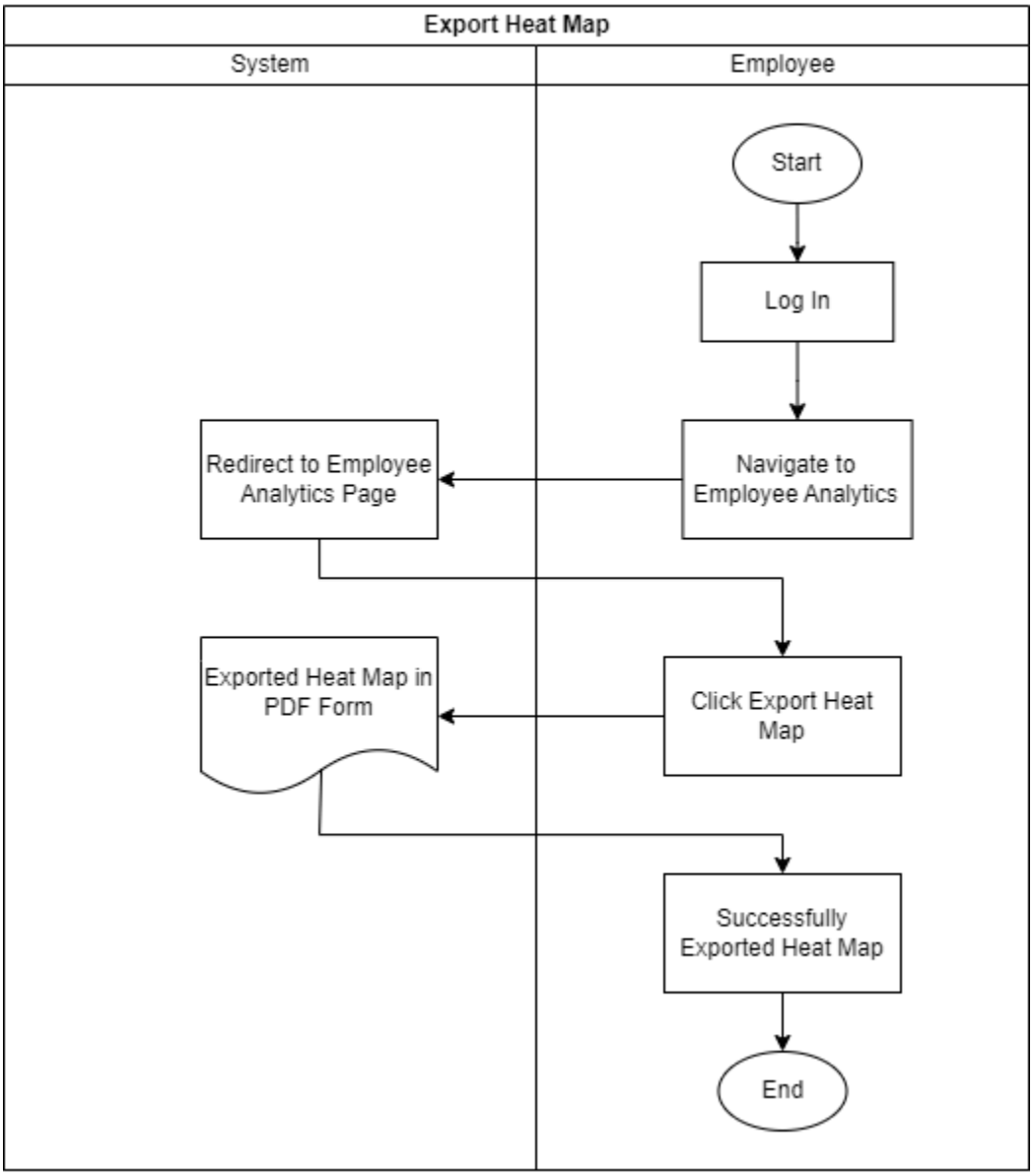


FIgure 14. System Flow Diagram Proposed. Export On-Time / Late Doughnut Chart

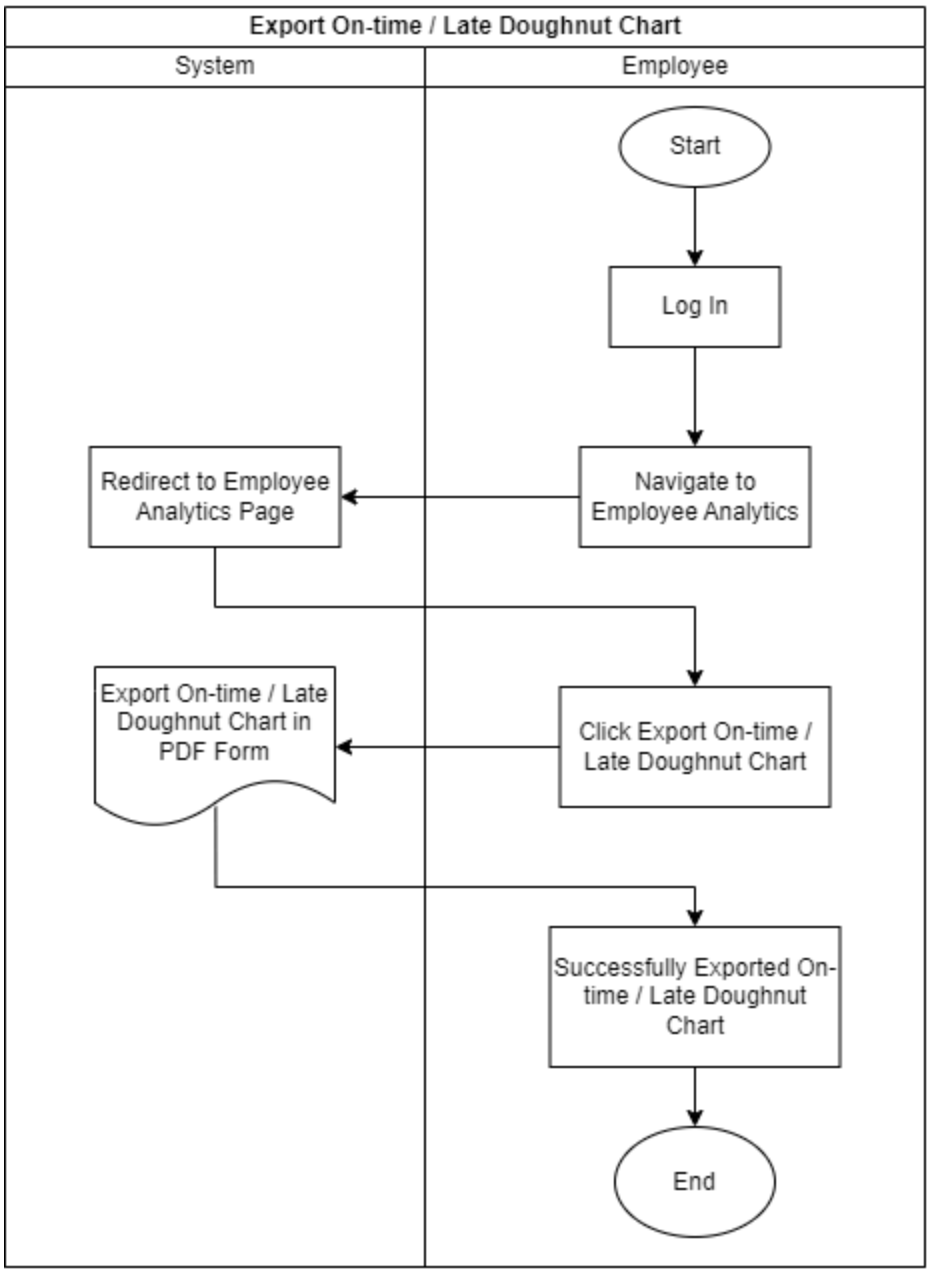


Figure 15. System Flow Diagram Proposed. Edit Employee Account

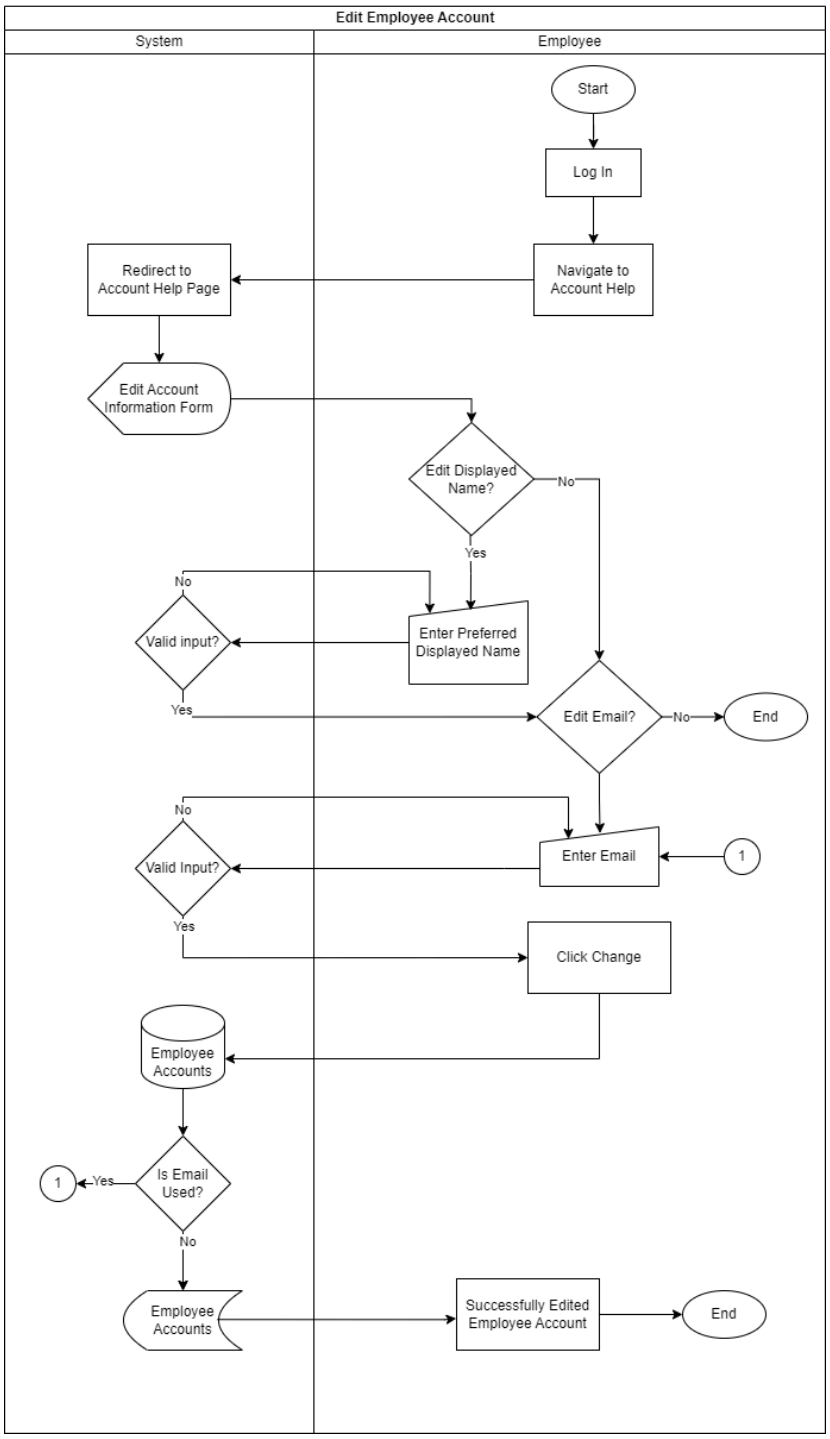


Figure 16. System Flow Diagram Proposed. Change Password (Admin)

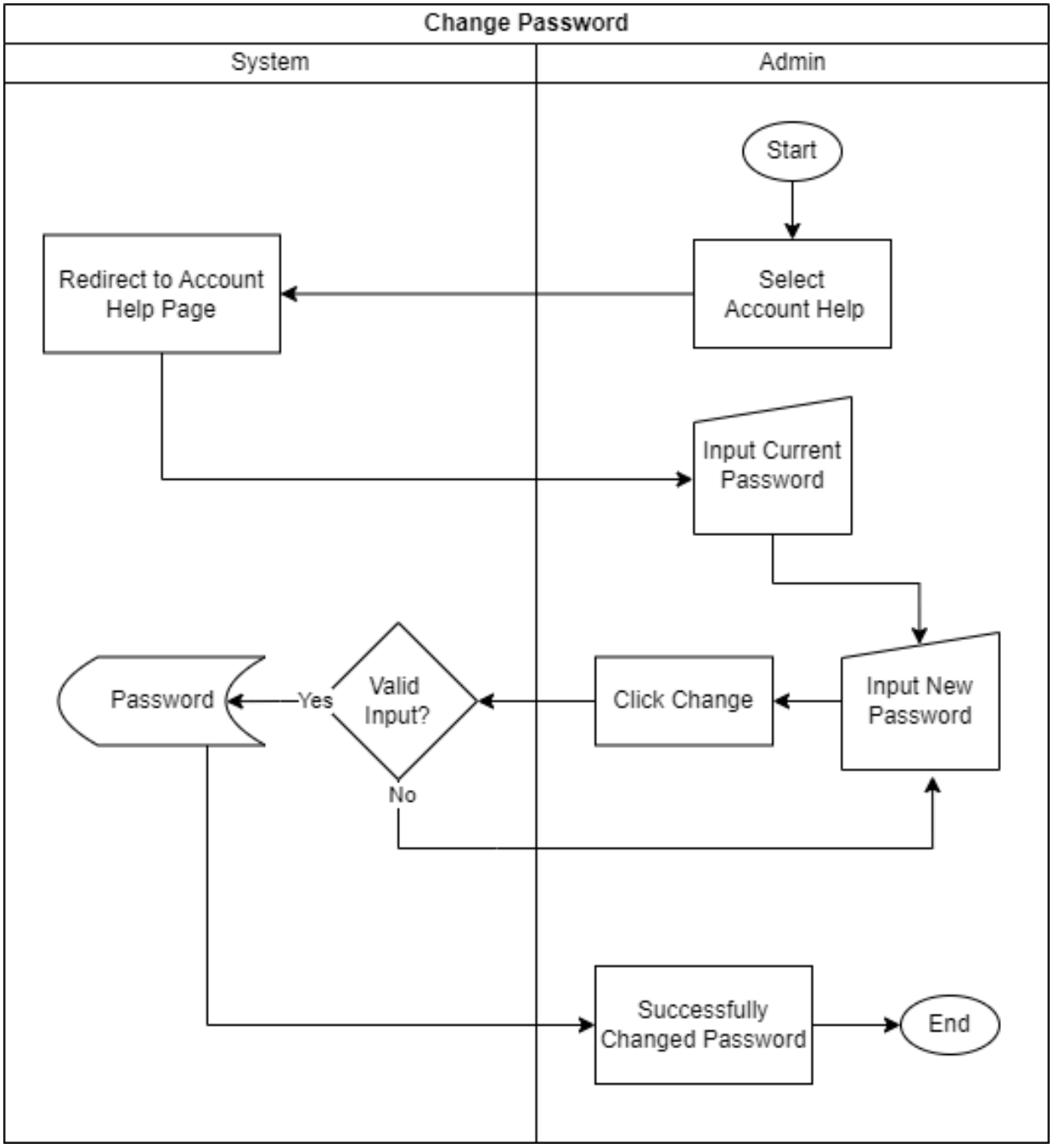


Figure 17. System Flow Diagram Proposed. Change Password (Employee)

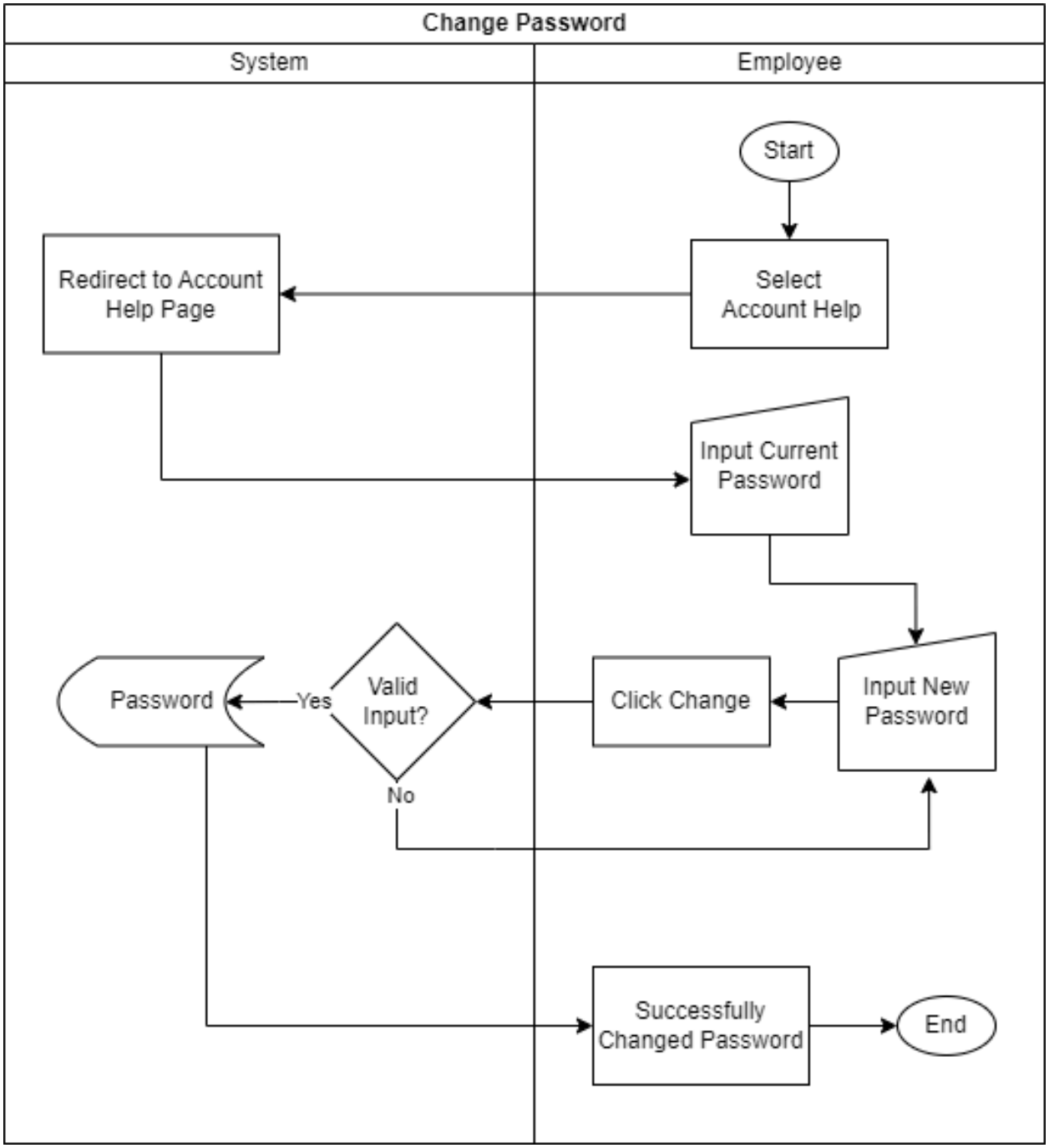


Figure 18. System Flow Diagram Proposed. Export Admin Table

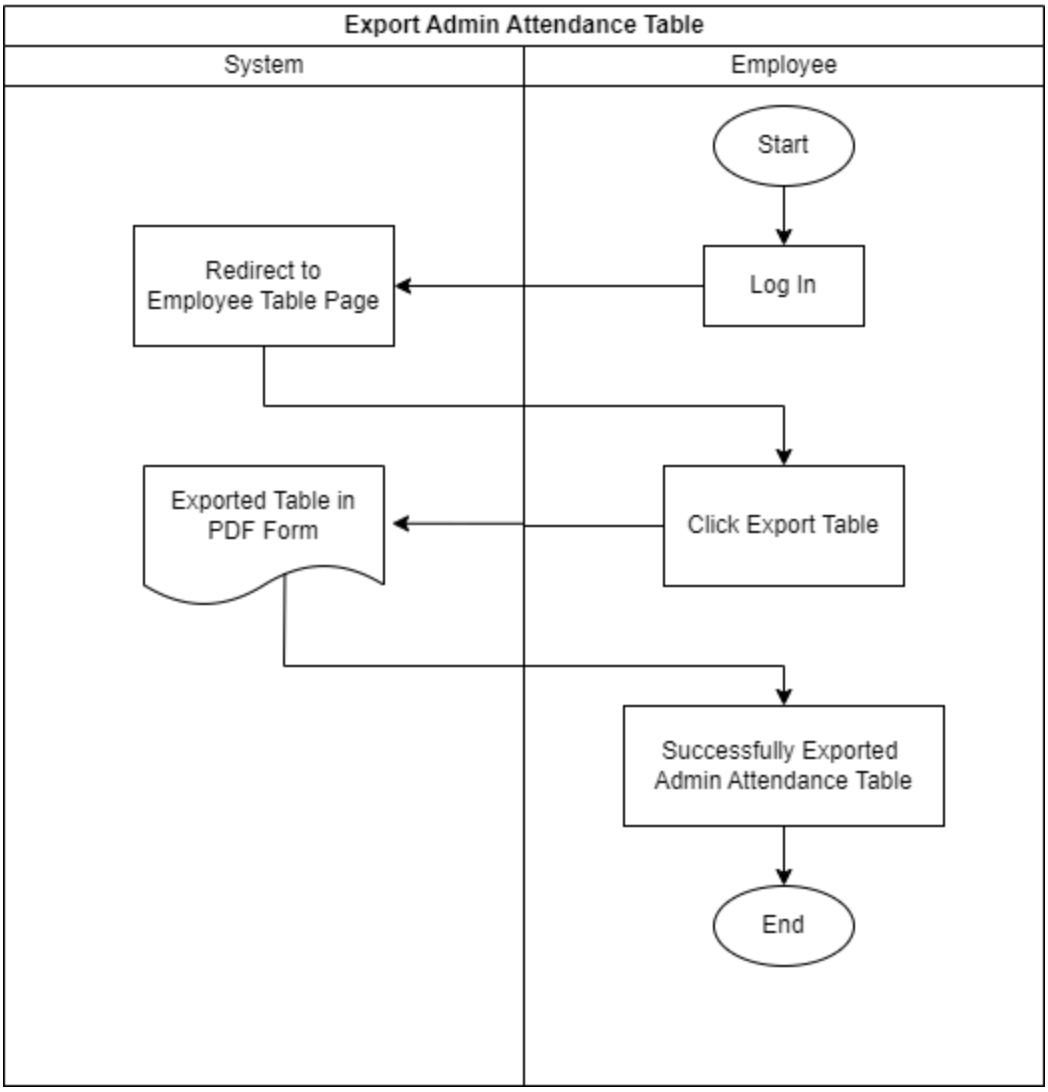


Figure 19. System Flow Diagram Proposed. QR Scanning or Recording of Attendance

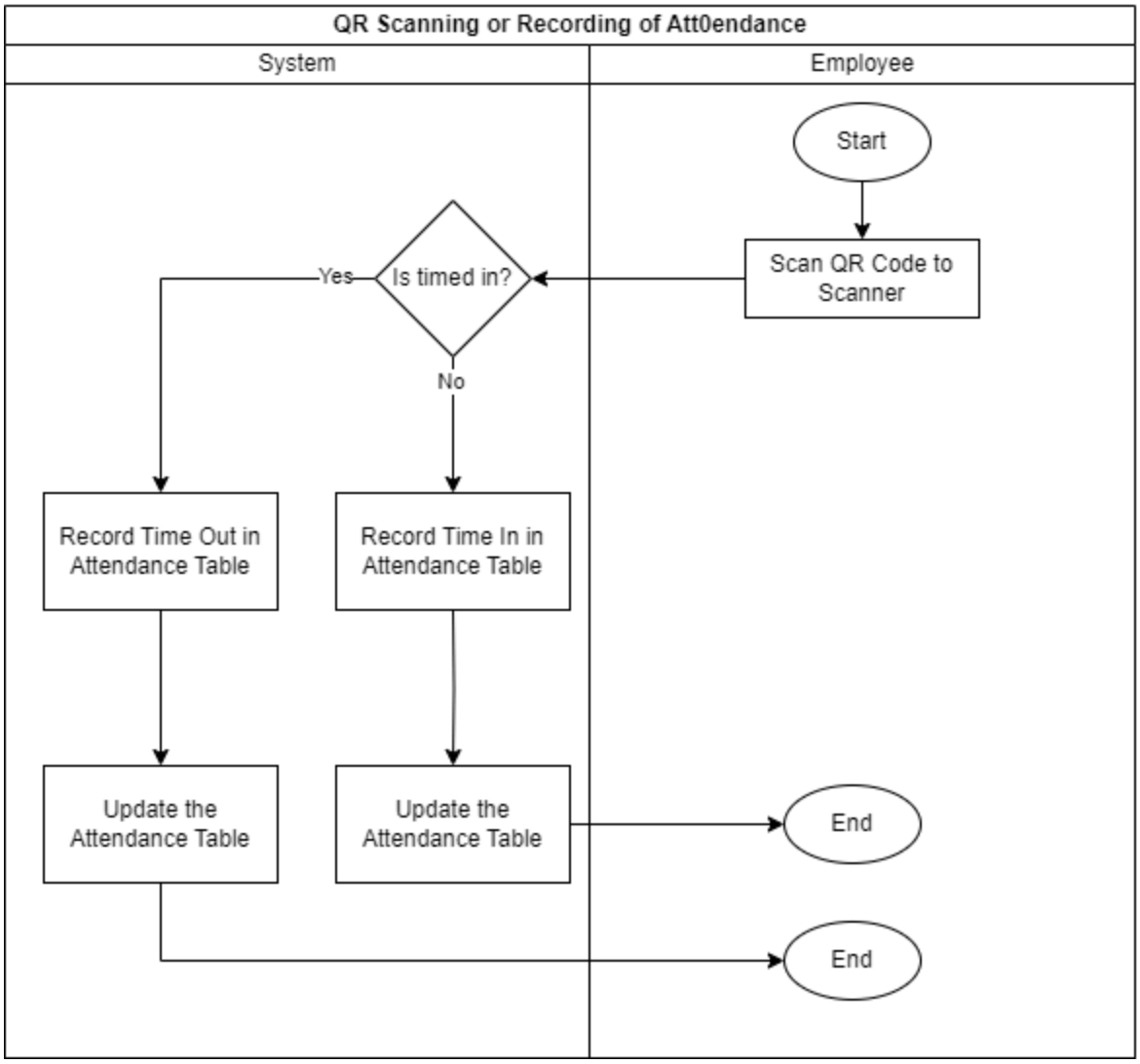


Figure 20. System Flow Diagram Proposed. Add Employee

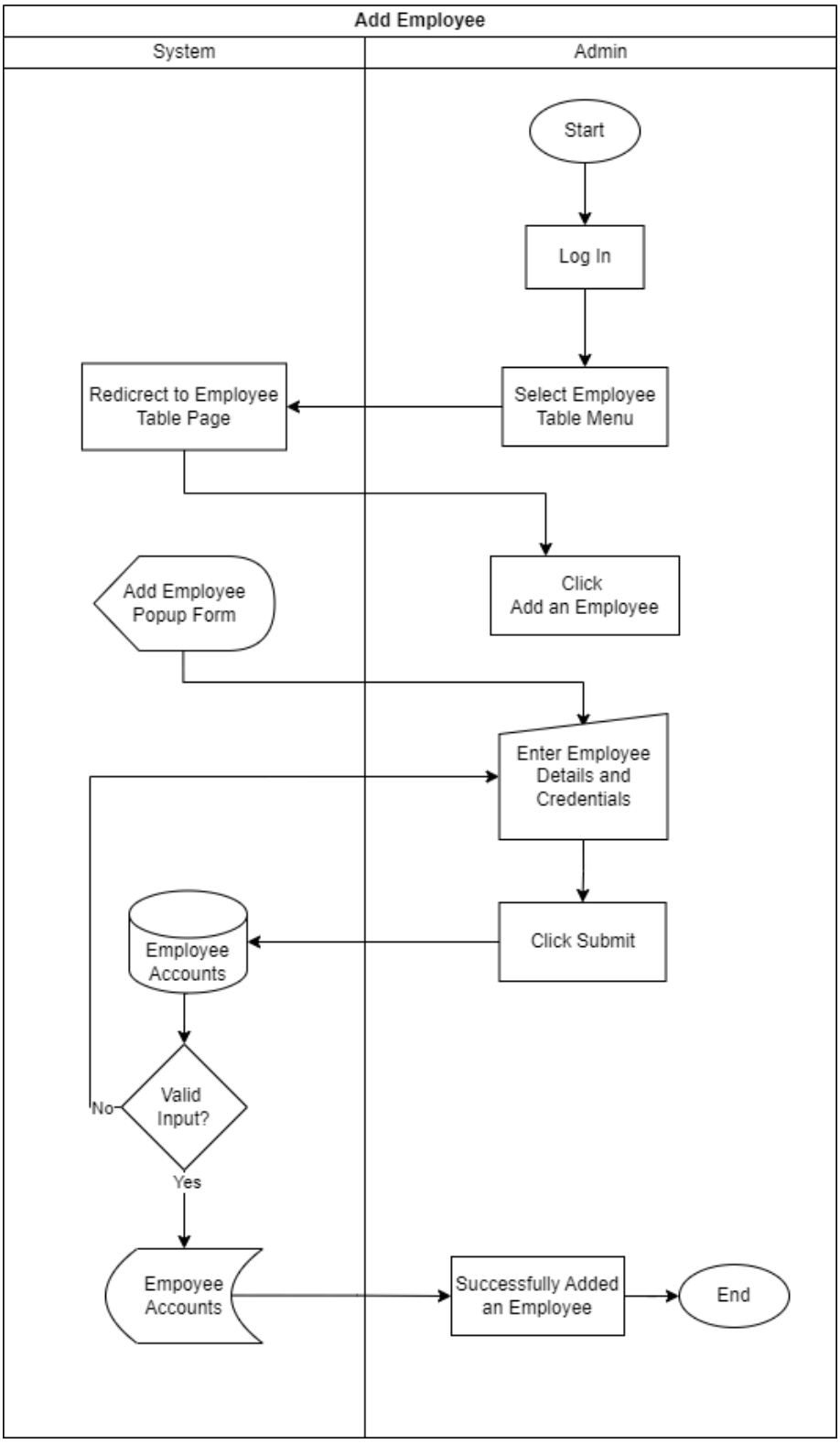
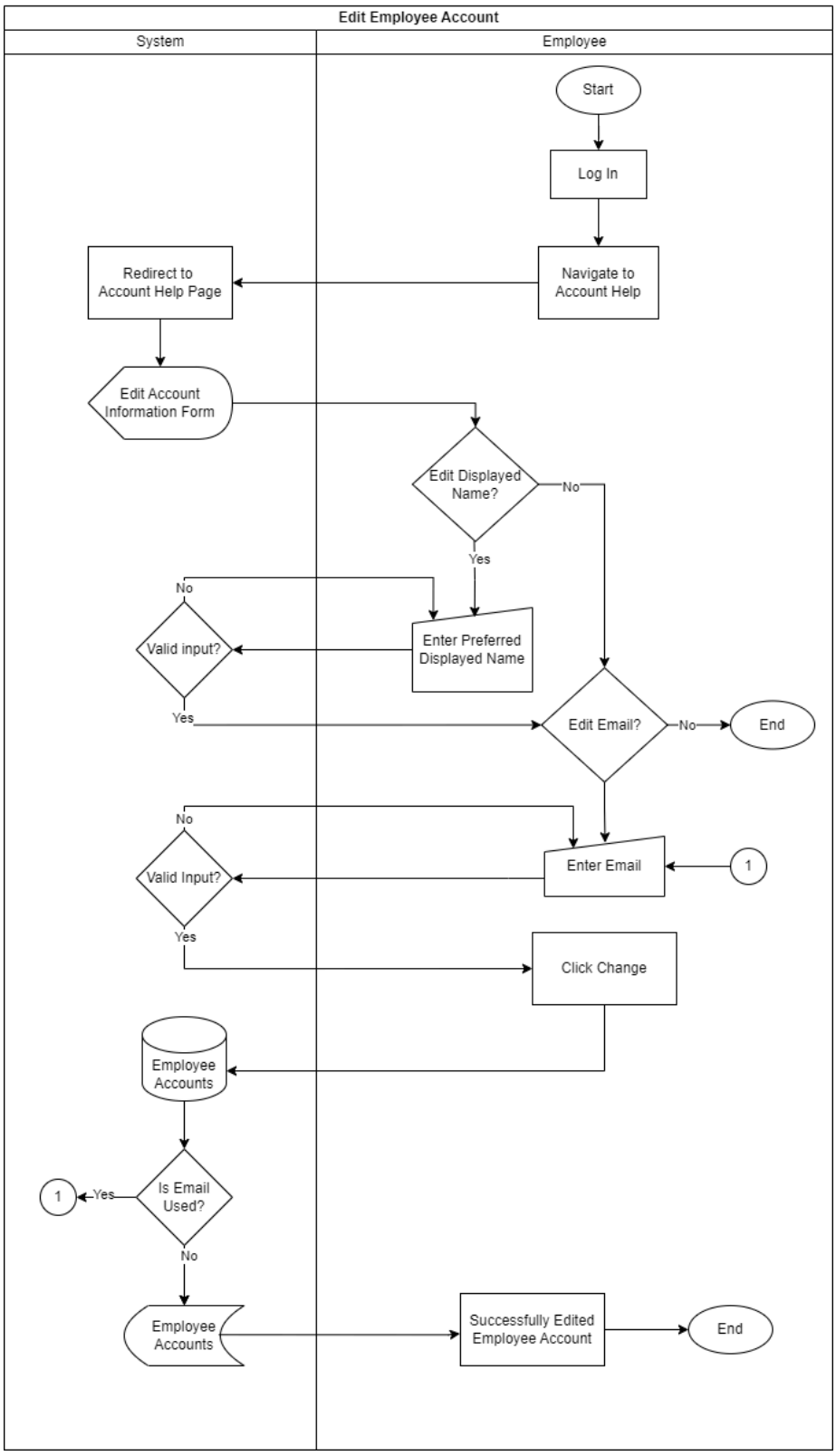


Figure 21. System Flow Diagram Proposed. Edit Employee Details


Edit Employee Account
System
Employee
Start
Log In
Navigate to Account Help
Redirect to Account Help Page
Edit Account Information Form
Edit Displayed Name?
No
Yes
No
Valid input?
Enter Preferred Displayed Name
Yes
Edit Email?
No
End
No
Valid Input?
Enter Email
1
Yes
Click Change
Employee Accounts
1
Yes
Is Email Used?
No
Employee Accounts
Successfully Edited Employee Account
End

2.2 System Actors

2.2.1 User Roles and Responsibilities / Authority Requirements

User/Role	Example	Frequency of Use	Security/Access, Features Used	Additional Notes
Administrator	Owner of the Shop	Frequent	Full access which includes Manage users, configure system settings view and export attendance reports, audit logs and employee attendance tracking.	Responsible for overseeing the system, ensuring data accuracy and handling employee records.
Employee	Staff	Frequent	Can scan QR codes for time-in/time-out, view personal attendance records.	Must comply with attendance policies and ensure accurate scanning.

2.3 Dependencies and Change Impacts

2.3.1 System Dependencies

- **Web Server** – The system requires a web server such as Apache to host the application like XAMPP.

- **Database Management System** – Uses MySQL to store employee records, attendance logs, and reports.
- **Programming Languages & Frameworks** – Developed using PHP for back-end, JavaScript for front-end, HTML, CSS for UI design.
- **QR Code Libraries** – Utilizes third-party libraries for QR code generation and scanning for example JavaScript-based QR scanners or PHP QR Code libraries.
- **Web Browsers** – The system requires a modern browser for proper functionality such as Chrome, Firefox and Edge.
- **Device Compatibility** – Employees and admins need smartphones, tablets or webcams capable of scanning QR codes.
- **Report Generation Tools** – Supports exporting reports in PDF/Excel, requiring appropriate libraries for example PDF and Excel.

2.3.2 System Changes Impacts

- **Manual Attendance Systems** – sThe existing paper-based or manual digital attendance system will be replaced by the QR code-based tracking, requiring a transition to the new process for logging attendance.
- **Employee Management Systems** – The system will integrate with existing employee management systems to import and update employee data for attendance tracking like names, departments and roles.
- **Time Clocking Systems** – If there are any existing electronic time clocking systems, they may be replaced or integrated with the QR-based attendance system to streamline employee check-ins and check-outs.
- **Reporting and Analytics Tools** – Existing tools for generating attendance reports will need to adapt to the new data of the system format to ensure accurate and comprehensive attendance tracking and reporting.

- **Data Backup Systems** – The system's attendance data will need to be incorporated into the organization's existing backup solutions to ensure proper storage and protection of records.

3. Functional Specifications

The functional specifications for the Caffe-In: QR-Code Based Attendance Monitoring System are described in this section. The features offered to end users are mapped to the system's functional requirements, use cases, and business requirements in these specifications. A summary of the features is provided below, arranged according to the modules, user roles, and interfaces.

Module	Functionality	Linked Use Case
User Management	● **User Registration** (Admin - QR Generation Page) ● **User Authentication** (Admin - Login Page)	UC-A-04 and UC-A-01
QR Module	● **QR Scanner** (Employee - QR Scanning Page) ● **QR Generation** (Admin - QR Generation Page)	UC-E-06, UC-E-07 and UC-A-04
Attendance Management	● **Daily Time Record Table for Time In / Time Out** (Admin - QR Generation Page, Employee - QR Scanning Page) ● **Employee Attendance Analytics** (Employee - Analytics Page)	UC-A-04, UC-E-06, UC-E-07 UC-E-04 and UC-A-03

	• **Report Generation** (Admin -Export PDF)	
Admin-side Module	• **Employee Table** (Admin - QR Generation Page) • **Employee Account Configuration** (Admin - QR Generation Page)	UC-A-04

3.1 Caffe-In: QR-Code Based Attendance Monitoring System For Evrydycoffee

3.1.1 Purpose/ Description

The main features of the Caffe-In: QR-Code Based Attendance Monitoring System are described in the Functional Specifications, along with how they satisfy the company's attendance tracking requirements. This section describes the system's features, such as reporting, attendance management, QR scanning, and user registration.

These specifications are meant to make sure the system works as planned and gives administrators and staff accurate and effective attendance tracking. The development process is guided by these specifications, which guarantee that the system satisfies its goals and is prepared for testing and deployment.

3.1.2 Use case

Use Case Table for Log In

UC-E-01	Log In
Primary Actor(s)	Employee
Stakeholders and Interest	The employee wants to log in to their account.
Trigger	The employee navigates to the website and clicks on the Log in menu
Pre-conditions	The employee has an existing account.
Post-conditions	The employee successfully logged in.
Main Success Scenario	1. The website redirects to the Log in page. 2. The employee provides account credentials. 3. The employee finishes by clicking on the Log in button.
Extensions	2.1 If the employee forgets their password, there is an option to reset it. 3.1 If the employee enters the wrong credentials, they will be prompted to try again.
Priority	High
Special Requirements	No special requirements apply for this use case.
Open Questions	None

Use Case Table for Change Password

UC-E-02	Change Password
Primary Actor(s)	Employee

Stakeholders and Interest	The employee wants to change their account's password.
Trigger	The employee navigates to their profile icon and clicks on the Account Help.
Pre-conditions	The employee must be logged in.
Post-conditions	The employee successfully changed the password of their account.
Main Success Scenario	1. The website redirects to the Account Help Page. 2. The employee enters their current password. 3. The employee enters their new password. 4. The employee finishes by clicking the Change button.
Extensions	2.1 If the employee enters an invalid current password, they will be prompted to try again. 3.1 If the employee enters an invalid new password, they will be prompted to try again.
Priority	Medium
Special Requirements	No special requirements apply for this use case.
Open Questions	None

Use Case Table for Exporting Personal Table

UC-E-03	Export Personal Table
Primary Actor(s)	Employee
Stakeholders and Interest	The employee wants to export their personal table.
Trigger	The employee navigates to their Attendance Table page.
Pre-conditions	The employee must be logged in.
Post-conditions	The employee successfully exported their personal Attendance Table.
Main Success Scenario	1. The website redirects to the Attendance Table Page. 2. The employee finishes by clicking on the Export Table to PDF.
Extensions	None
Priority	Medium
Special Requirements	No special requirements apply for this use case.
Open Questions	None

Use Case Table for Exporting Desired Chart

UC-E-04	Export Desired Chart
Primary Actor(s)	Employee
Stakeholders and Interest	The employee wants to export their desired chart.
Trigger	The employee navigates to their Employee Analytics page.
Pre-conditions	The employee must be logged in.
Post-conditions	The employee successfully exported their desired chart.
Main Success Scenario	1. The website redirects to the Employee Analytics page. 2. The employee finishes by clicking on the Export button for their desired chart.
Extensions	None
Priority	Medium
Special Requirements	No special requirements apply for this use case.
Open Questions	None

Use Case Table for Edit Account

UC-E-05	Edit Account
Primary Actor(s)	Employee
Stakeholders and Interest	The employee wants to edit their account information..
Trigger	The employee navigates to the website and clicks account help.
Pre-conditions	The employee has an existing account and hasn’t timed-in

Post-conditions	The employee successfully edited their account information.
Main Success Scenario	1. The website redirects to the account settings page. 2. The employee changes the account details they want to edit. 3. The employee finishes by clicking on the change button.
Extensions	2.1 If the user input is invalid, they will be prompted to try again.
Priority	High
Special Requirements	No special requirements apply for this use case.
Open Questions	None

Use Case Table for Time in

UC-E-06	**Time In**
Primary Actor(s)	Employee
Stakeholders and Interest	The employee wants to record their time-in attendance.
Trigger	The employee navigates to the website and clicks on the attendance page navigation.
Pre-conditions	The employee has an existing account and hasn't timed-in.
Post-conditions	The employee successfully timed in.
Main Success Scenario	1. The website redirects to the attendance page. 2. The employee scans their QR code to the scanner. 3. The system records the time in.
Extensions	2.1 If the employee has already timed in, it will record as time-out.
Priority	High
Special Requirements	No special requirements apply for this use case.
Open Questions	None

Use Case Table for Time out

UC-E-07	Time Out
Primary Actor(s)	Employee
Stakeholders and Interest	The employee wants to record their time-out attendance.
Trigger	The employee navigates to the website and clicks on the attendance page navigation.
Pre-conditions	The employee has an existing account and hasn't timed-out.
Post-conditions	The employee successfully timed-out.
Main Success Scenario	1. The website redirects to the attendance page. 2. The employee scans their QR code to the scanner. 3. The system records the time-out.
Extensions	2.1 If the employee has already timed out, it will record as time-in.
Priority	High
Special Requirements	No special requirements apply for this use case.
Open Questions	None

Use Case Table for Log In

UC-A-01	Log In
Primary Actor(s)	Admin
Stakeholders and Interest	The admin wants to log in to their account.
Trigger	The admin navigates to the website and clicks on the Log in menu
Pre-conditions	The admin has an existing account.
Post-conditions	The admin successfully logged in.
Main Success Scenario	1. The website redirects to the Log in page. 2. The employee provides account credentials. 3. The employee finishes by clicking on the Log in button.
Extensions	2.1 If the admin forgets their password, there is an option to reset it. 3.1 If the admin enters the wrong credentials, they will be prompted to try again.
Priority	High
Special Requirements	No special requirements apply for this use case.

Open Questions	None

Use Case Table for Change Password

UC-A-02	**Change Password**
Primary Actor(s)	Admin
Stakeholders and Interest	The admin wants to change their account's password.
Trigger	The admin navigates to their profile icon and clicks on the Account Help.
Pre-conditions	The admin must be logged in.
Post-conditions	The admin successfully changed the password of their account.
Main Success Scenario	1. The website redirects to the Account Help Page. 2. The admin enters their current password. 3. The admin enters their new password. 4. The admin finishes by clicking the Change button.
Extensions	2.1 If the admin enters an invalid current password, they will be prompted to try again. 3.1 If the admin enters an invalid new password, they will be prompted to try again.
Priority	Medium
Special Requirements	No special requirements apply for this use case.
Open Questions	None

Use Case Table for Exporting Attendance Table

UC-A-03	**Export Attendance Table**
Primary Actor(s)	Admin

Stakeholders and Interest	The admin wants to export their personal table.
Trigger	The admin navigates to their Attendance Table page.
Pre-conditions	The admin must be logged in.
Post-conditions	The admin successfully exported their Attendance Table.
Main Success Scenario	1. The website redirects to the Attendance Table Page. 2. The admin finishes by clicking on the Export Table to PDF.
Extensions	None
Priority	Medium
Special Requirements	No special requirements apply for this use case.
Open Questions	None

Use Case Table for Add Employee

UC-A-04	**Add Employee**
Primary Actor(s)	Admin
Stakeholders and Interest	The admin wants to add an employee in the system.
Trigger	The admin navigates to the Employee Table page.
Pre-conditions	The admin must be logged in.
Post-conditions	The admin successfully added a new employee in the system.
Main Success Scenario	1. The website redirects to the Employee Table page. 2. The admin clicks on the Add an Employee button. 3. The admin fills out the name and email of the employee.

	4. The admin selects the role for the employee. 5. The admin selects the status of the employee. 6. The admin gives a temporary password for the employee's account. 7. The admin finishes by clicking the submit button.
Extensions	7.1 If the admin enters an invalid input, they will be prompted to try again.
Priority	Medium
Special Requirements	No special requirements apply for this use case.
Open Questions	None

Use Case Table for Edit Employee

UC-A-05	**Edit Employee**
Primary Actor(s)	Admin
Stakeholders and Interest	The admin wants to edit the information of the employee
Trigger	The admin navigates to the Employee Table page.
Pre-conditions	The admin must be logged in.
Post-conditions	The admin successfully edited the employee's information.
Main Success Scenario	1. The website redirects to the Employee Table page. 2. The admin clicks on the Add an Employee button. 3. The admin fills out the name and email of the employee.

	4. The admin selects the role for the employee. 5. The admin selects the status of the employee. 6. The admin finishes by clicking the submit button.
Extensions	6.1 If the employee enters an invalid input, they will be prompted to try again.
Priority	Medium
Special Requirements	No special requirements apply for this use case.
Open Questions	None

3.1.3 Mock-up

Figure 22. Home Page

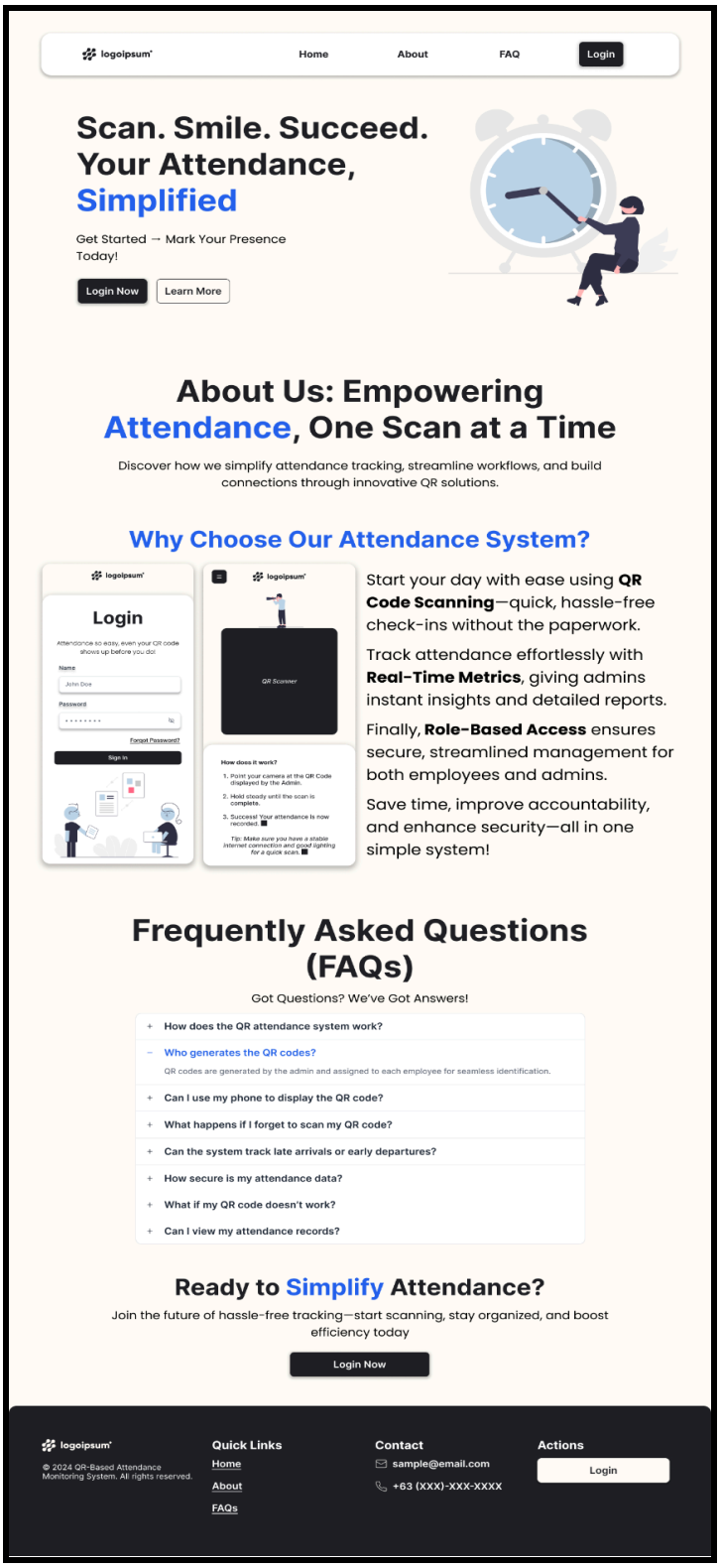


Figure 23. Admin Login Page

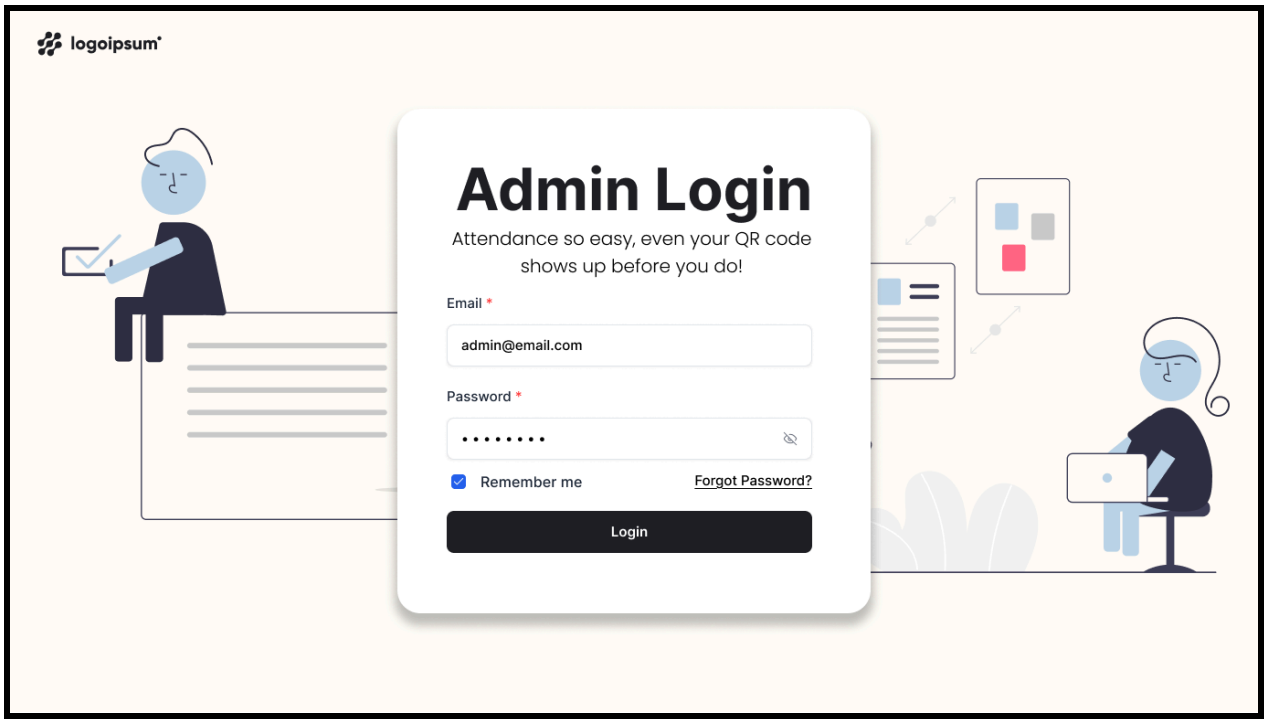


Figure 24. Admin Attendance QR Scanning Page

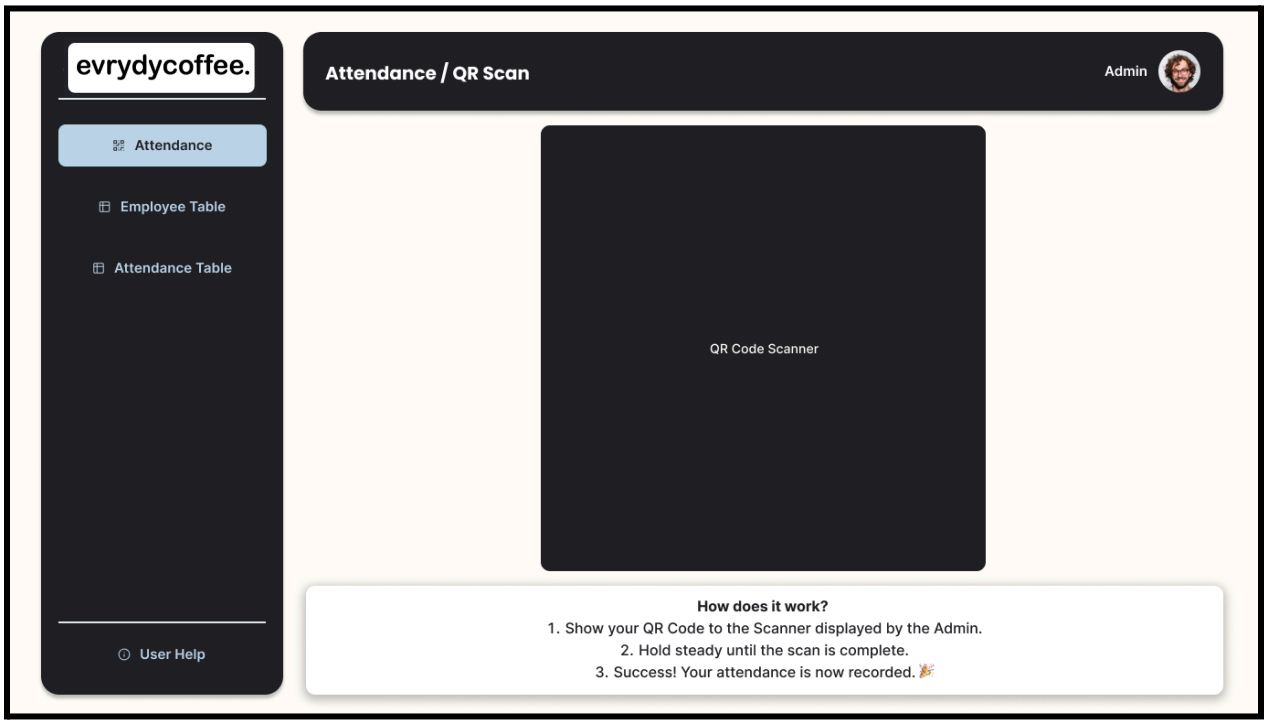


Figure 25. Employee Table Page

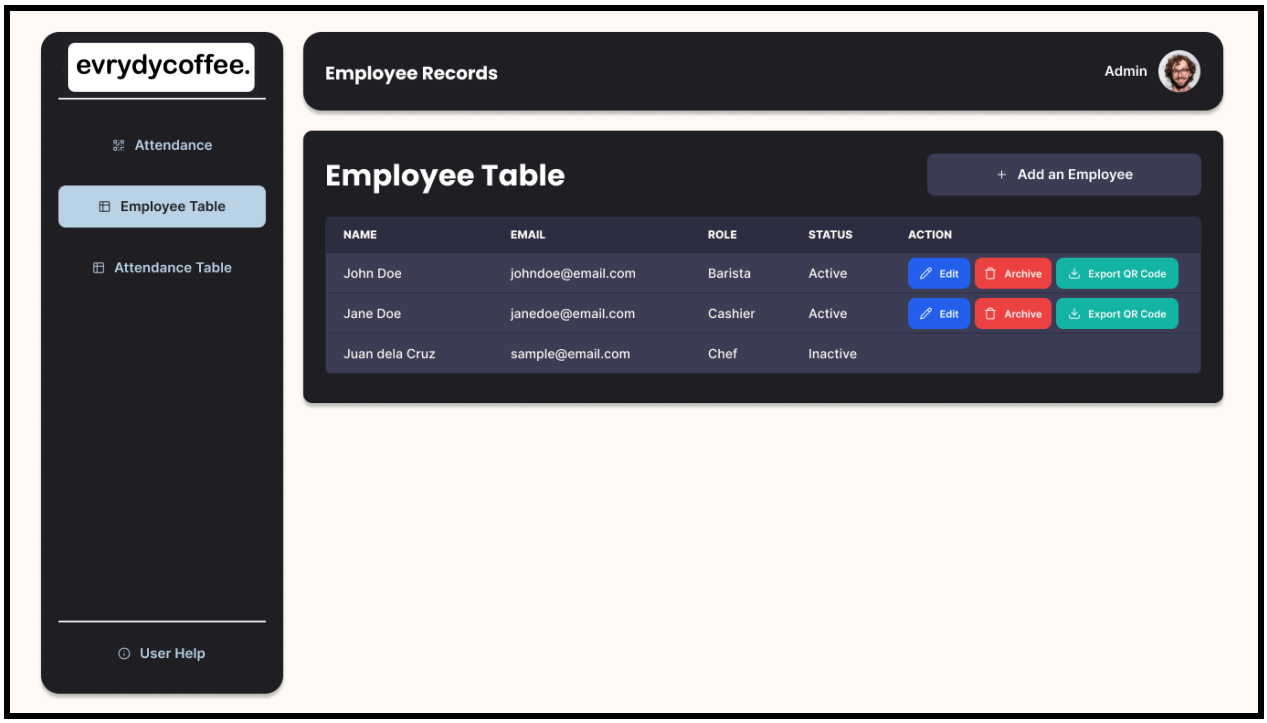


Figure 26. Admin Attendance Table Page

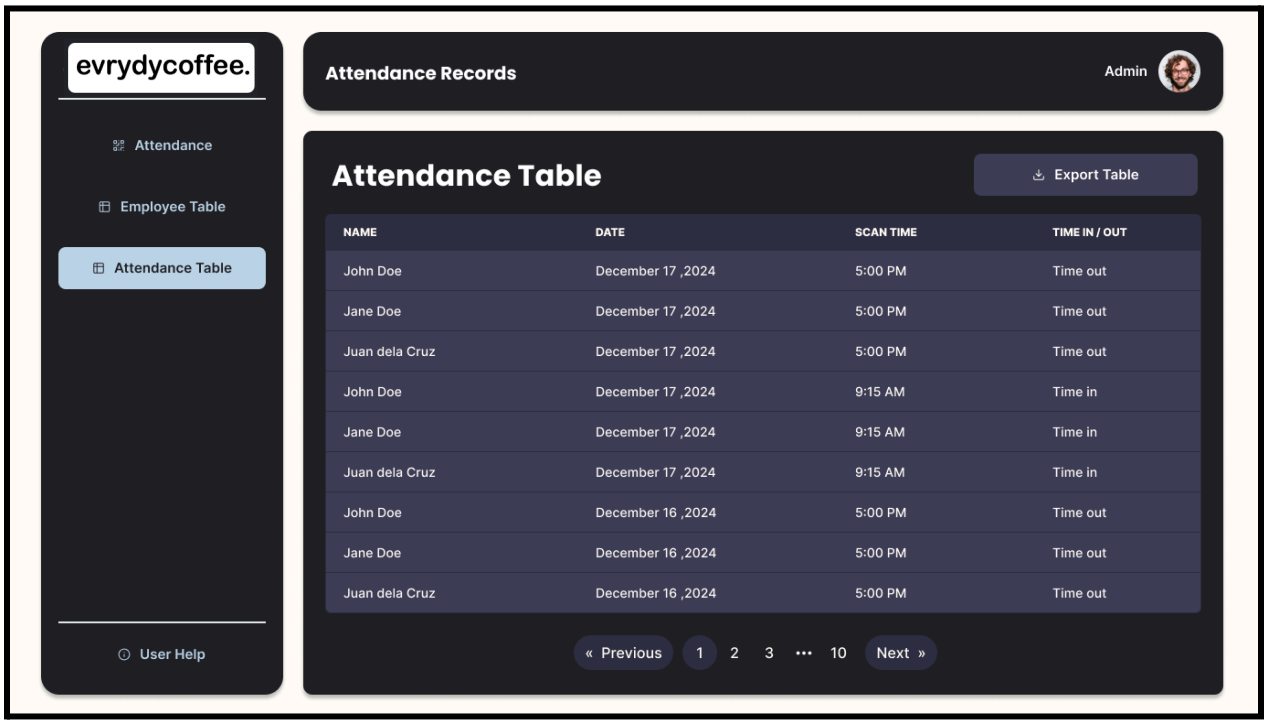


Figure 27. Admin Account Settings Page

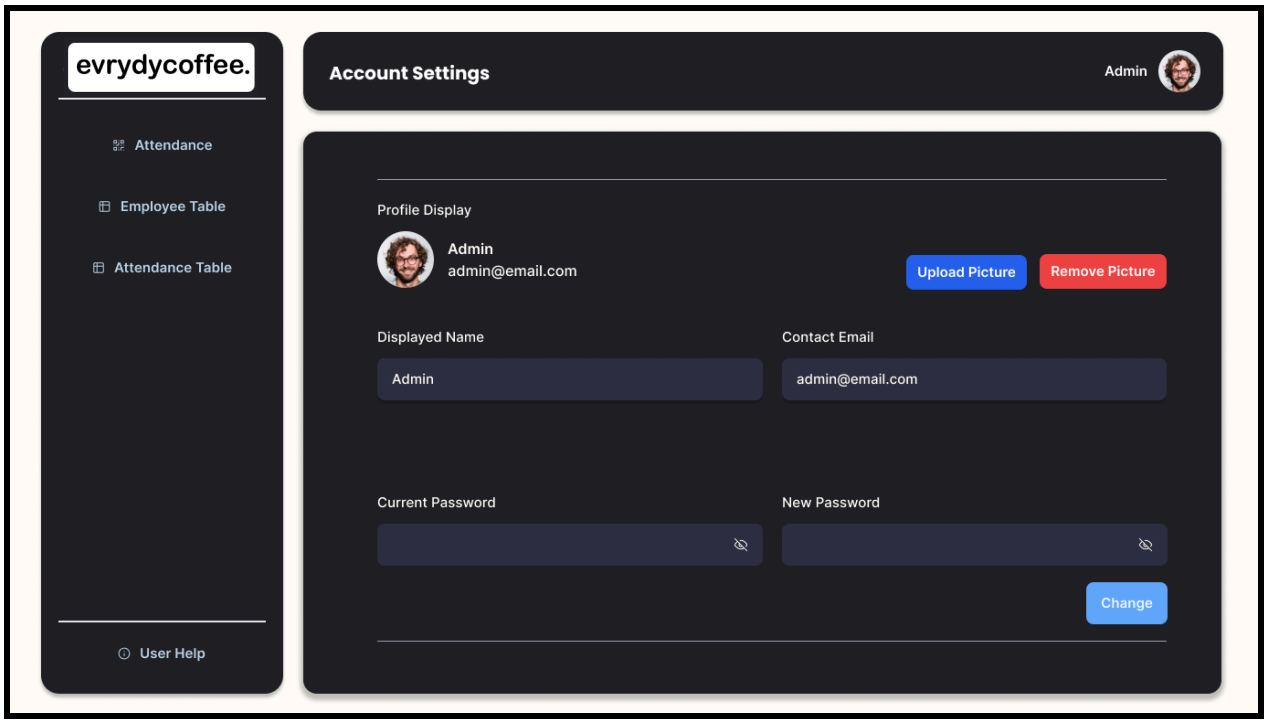


Figure 28. User/Employee Login Page

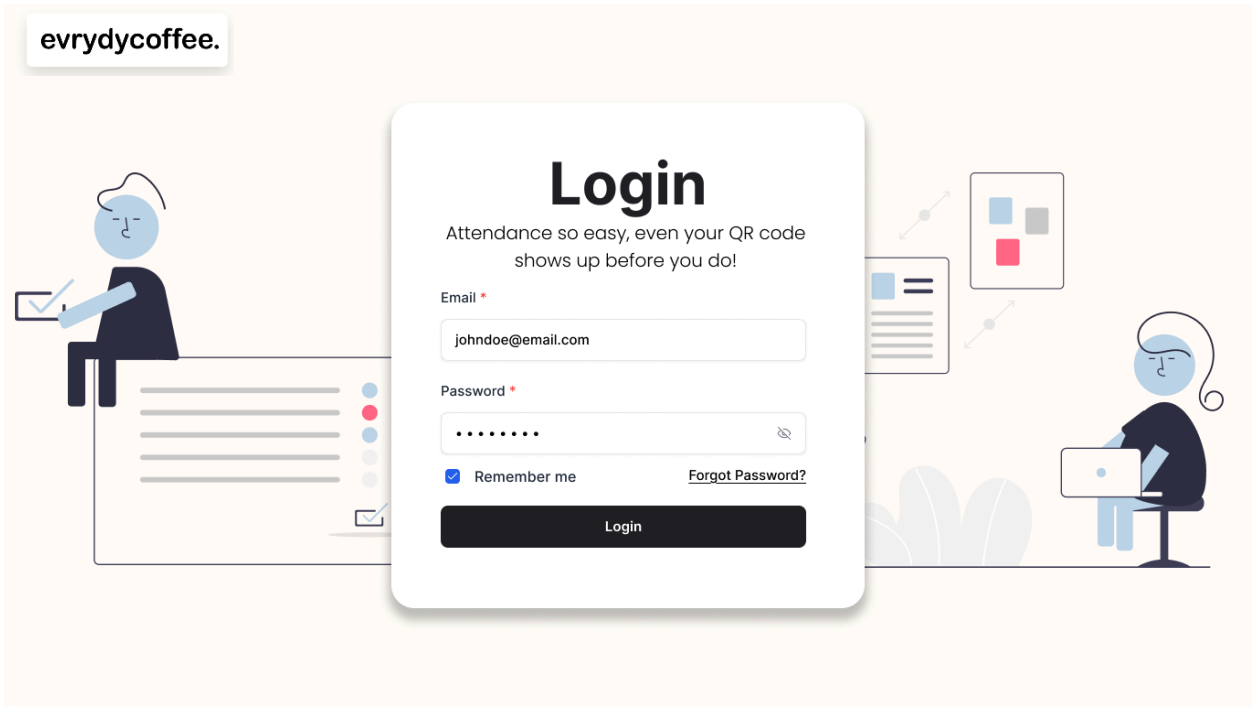


Figure 29. User Attendance Table Page

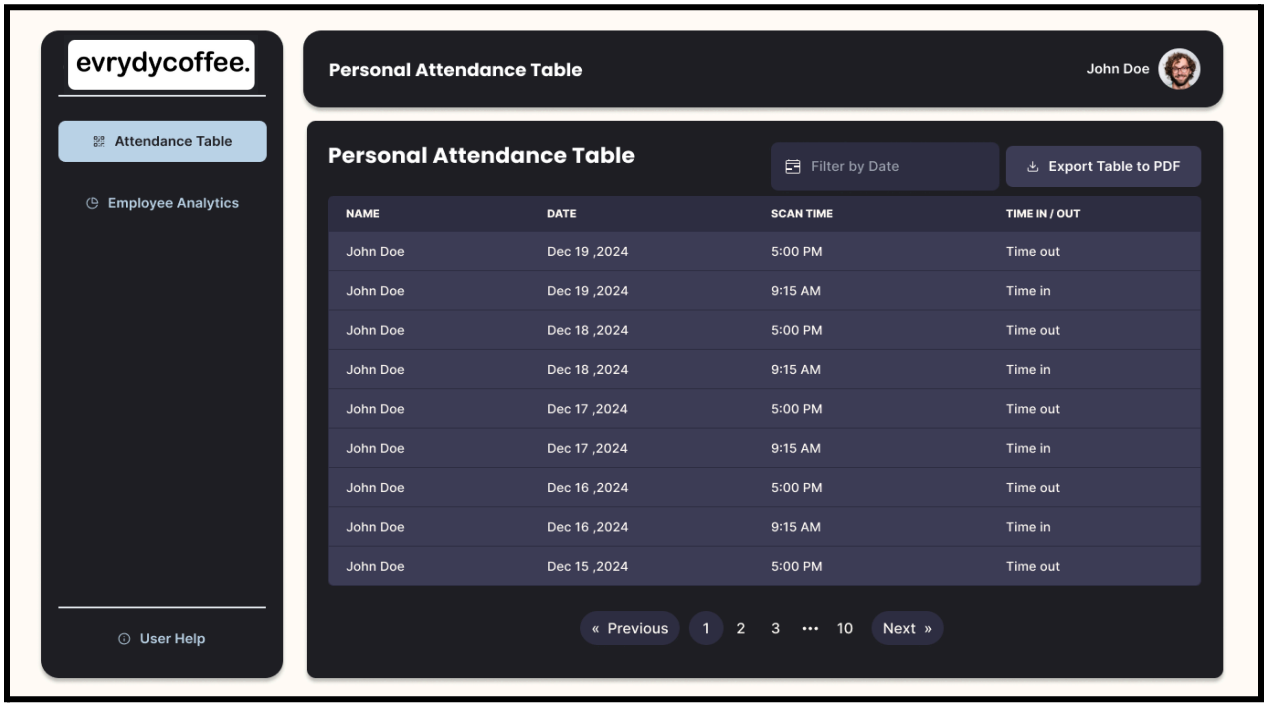


Figure 30. Employee Analytics Page

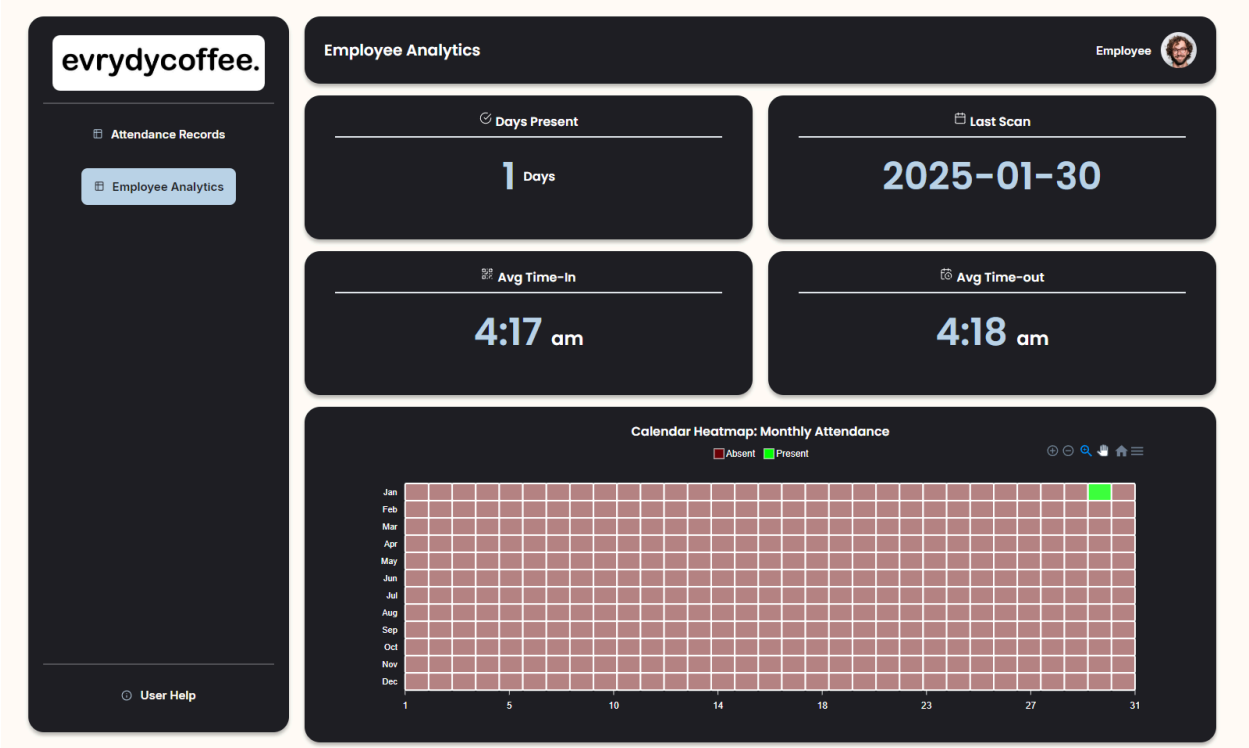


Figure 31. User Account Settings Page

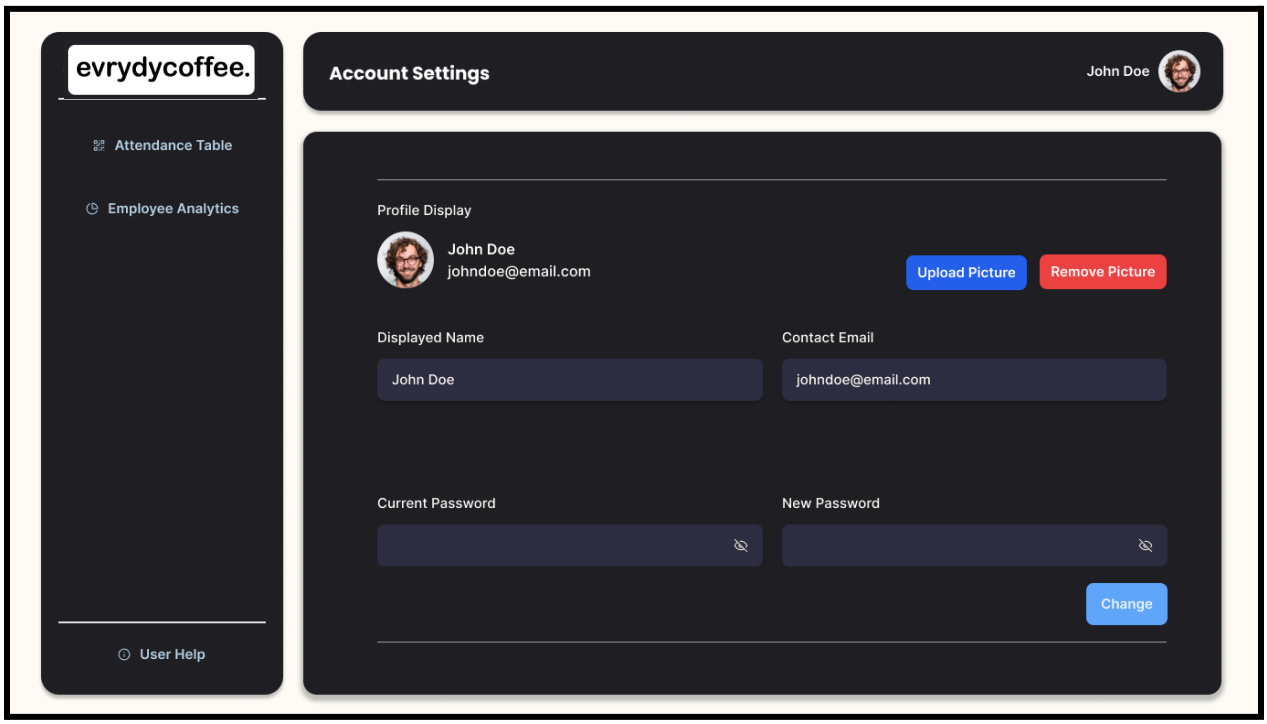


Figure 32. Forgot Password - Email for Password Reset Link Page

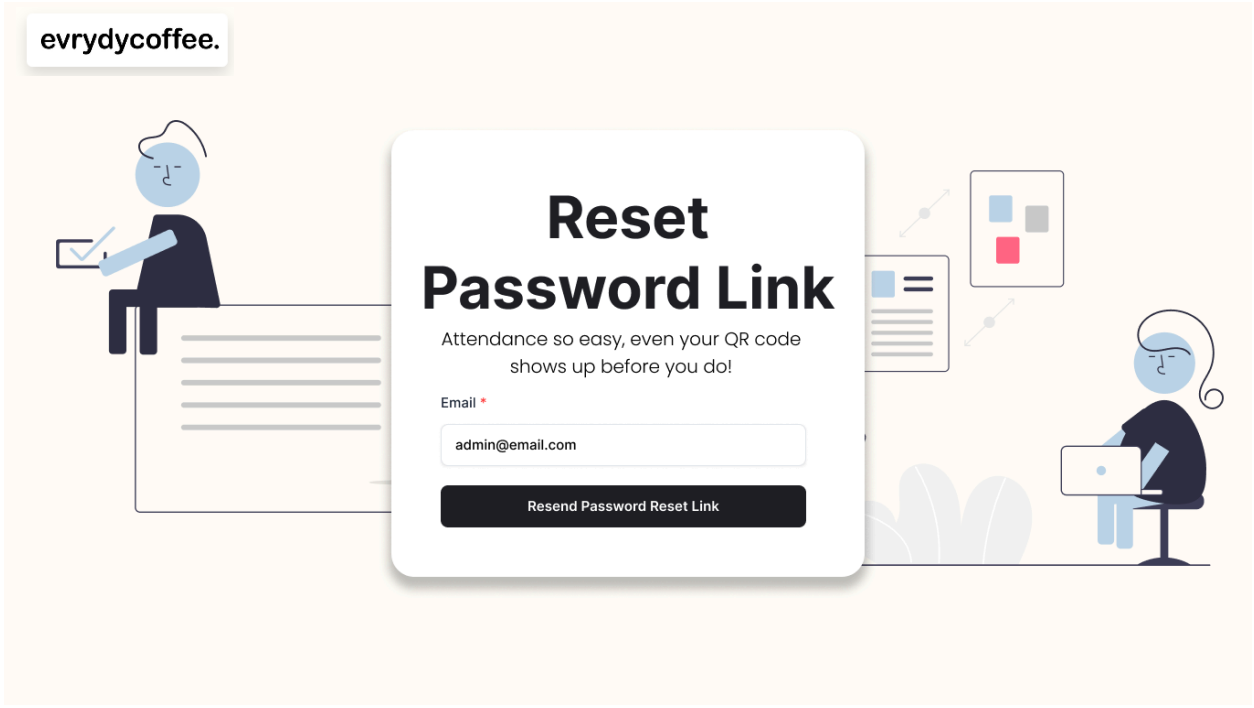
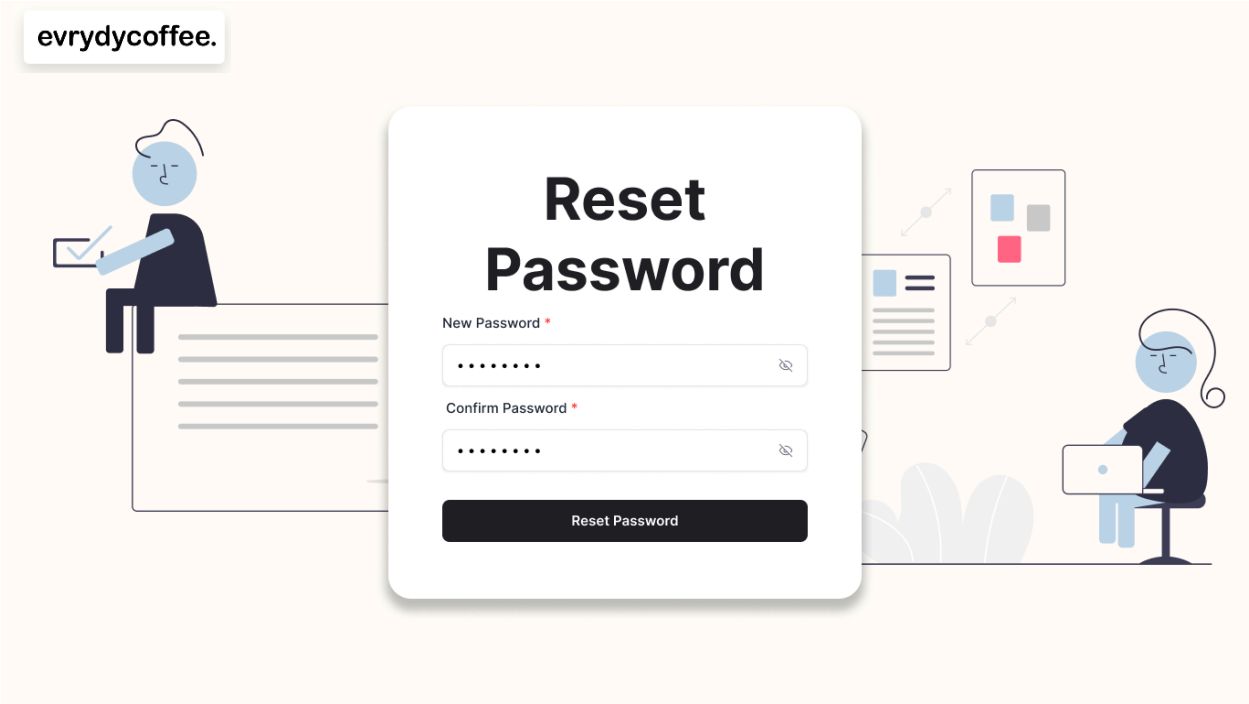


Figure 33. Forgot Password - Reset Password Page



3.1.4 Functional Requirements

Spec ID	Specification Description	Business Rules/ Data Dependency
LP-1	The Landing Page must include a responsive Navigation Menu with links to “Home”, “About”, “FAQs”, and “Login”.	The navigation links must be functional. The Navigation Menu must be responsive and adapt to different screen sizes. The page must be accessible to unauthenticated users only.
LP-2	The Landing Page must display an introductory section and a brief	This content should be static, and displayed to all visitors.

	overview of the platform's features.	
PA-1	The Personal Attendance Table Page must display a table with the authenticated user's attendance records.	The table must allow pagination, filtering by date, and display attendance records based on the user’s data from the attendance database.
PA-2	The Personal Attendance Table Page must include an Export to PDF button to export the table data.	The PDF export must contain all attendance records displayed in the table, including date, time, time-in/time-out.
AT-1	The Attendance Table (Admin) Page must display a table listing all employee attendance records.	The table must show employee name, date, time, and time-in/time-out. Admin must be able to filter by date and employee.
AT-2	The Attendance Table (Admin) Page must include an Export to PDF button for exporting the table as a PDF.	The PDF must contain all the attendance data displayed in the table for the selected date filter range.
AS-1	The Account Settings Page must allow users to update their email, password, and name.	Users must be able to change their email, password, and name with validation in place. Password changes must require re-authentication.
AS-2	The Account Settings Page must allow users to upload and remove their avatar image.	The avatar must be validated before upload (e.g., file type, size). Users can also remove their avatar image. The changes should be reflected in the user profile immediately.

AS-3	The Account Settings Page must have a save button for all changes.	Any changes made must be saved when the user clicks the save button
AL-1	The Admin Login Page must allow admins to log in using their email and password.	Admin login form must include validation for email format and password. On successful login, admins should be redirected to the QR Scanning Page.
AL-2	The Admin Login Page must include a "Remember Me" feature to allow admins to stay logged in.	The 'Remember Me' option must securely persist the admin's login session across visits using cookies.
AL-3	The Admin Login Page must allow admins to reset their password if forgotten.	A password reset link must be sent to the admin's registered email address. Admins must be able to securely reset their password using the link.
UL-1	The User Login Page must allow users to log in using their email and password	User login form must include validation for email format and password. On successful login, users should be redirected to the Personal Attendance Table page.
UL-2	The User Login Page must include a "Remember Me" feature to allow users to stay logged in.	The 'Remember Me' option must securely persist the user's login session across visits using cookies.
UL-3	The User Login Page must allow users to reset their password if forgotten.	A password reset link must be sent to the user's registered email address. Users must be able to securely reset their password using the link.

UA-1	The User Authentication Page must authenticate the admin and user separately based on role.	Different roles (admin and user) must be redirected to their respective dashboards upon login.
UA-2	Admin users must be able to access the QR Scanning page after successful authentication.	Admin users must be able to access all features available for admins, including managing employees, attendance records, and generating reports.
UA-3	Regular users must be able to access the Personal Attendance Table page after successful authentication.	Regular users must be able to view and manage their personal data, attendance records, and generating reports.
EA-1	The Employee Analytics Page must display analytics for individual employees, including: - Days Present - Last Scan - Average Time-In - Average Time-Out	Analytics must update dynamically when new attendance records are added or modified. Data for time-in/out and attendance must be fetched from the attendance database.
EA-2	The Employee Analytics Page must include a heatmap that visually represents employee attendance records.	The heatmap must display data of days present with valid time-in and time-out using the green color to represent the “Present” status.
EA-3	The Employee Analytics Page must include an Export to PDF button for heatmap	The PDF must include the Heatmap

ET-1	The Employee Table Page must display a list of all employees in the database with name, email, role, and status.	Data is pulled from the employee database.
ET-2	Administrators must be able to add employees through a modal requiring name, email, role, status, and password.	The modal must validate fields before submission. A QR code is generated upon adding a new employee.
ET-3	Administrators must be able to edit employee details through a modal.	Editable fields include name, email, role (dropdown), and status (dropdown). Changes are reflected immediately in the database.
ET-4	Administrators must be able to soft-delete employees through a Delete Confirmation modal.	Clicking "Delete" opens a modal with cancel and delete options. The employee record is marked as deactivated (soft delete).
QR-1	The QR Scanner Page must display a functional QR scanner integrated with an API.	The scanner must validate QR codes for attendance. Data from scanned codes is logged in the attendance database, with real-time feedback displayed to the user (success or failure).

3.1.5 Field level specifications

Form Elements:

Call-out	Field Label	UI Control	Mand?	Edit	Data Type	Value Set	Default Value	Data Example	Data Source
QRCBAMS - E1	Email	Textbox	Yes	Yes	Alpha-numeric	none	NA	johndoe@email.com	Employee Entry
QRCBAMS - E2	Password	Textbox	Yes	Yes	Alpha-numeric	none	NA	*********	Employee Entry
QRCBAMS - E3	Filter by Date	Datepicker	No	Yes	Date	none	Current date	January 27, 2025	Employee Entry
QRCBAMS - E4	Displayed Name	Textbox	No	Yes	Text	none	Current Displayed Name	John Doe	Employee Entry
QRCBAMS - E5	Contact Email	Textbox	No	Yes	Alpha-numeric	none	Current Contact Email	johndoe@email.com	Employee Entry
QRCBAMS - E6	Current Password	Textbox	No	Yes	Alpha-numeric	none	NA	*********	Employee Entry
QRCBAMS - E7	New Password	Textbox	No	Yes	Alpha-numeric	none	NA	*********	Employee Entry
QRCBAMS - A1	Email	Textbox	Yes	Yes	Alpha-numeric	none	NA	admin@email.com	Admin Entry
QRCBAMS - A2	Password	Textbox	Yes	Yes	Alpha-numeric	none	NA	*********	Admin Entry
QRCBAMS - A3	Name	Textbox	Yes	Yes	Text	none	NA	John Doe	Admin Entry
QRCBAMS - A4	Email	Textbox	Yes	Yes	Alpha-numeric	none	NA	johndoe@email.com	Admin Entry

QRCBAMS - A5	Role	Dropdown	Yes	Yes	Text	Barista, Chef, Cashier	Cashier	Cashier	Admin Entry
QRCBAMS - A6	Status	Dropdown	Yes	Yes	Text	Active, Inactive	Active	Active	Admin Entry
QRCBAMS - A7	Password	Textbox	Yes	Yes	Alpha-numeric	none	NA	*********	Admin Entry
QRCBAMS - A8	Name	Textbox	Yes	Yes	Text	none	NA	John Doe	Admin Entry
QRCBAMS - A9	Email	Textbox	Yes	Yes	Alpha-numeric	none	NA	johndoe@email.com	Admin Entry
QRCBAMS - A10	Role	Dropdown	Yes	Yes	Text	Barista, Chef, Cashier	Cashier	Cashier	Admin Entry
QRCBAMS - A11	Status	Dropdown	Yes	Yes	Text	Active, Inactive	Active	Active	Admin Entry
QRCBAMS - A12	Displayed Name	Textbox	No	Yes	Text	none	Current Displayed Name	Admin	Admin Entry
QRCBAMS - A13	Contact Email	Textbox	No	Yes	Alpha-numeric	none	Current Contact Email	admin@email.com	Admin Entry
QRCBAMS - A14	Current Password	Textbox	No	Yes	Alpha-numeric	none	NA	*********	Admin Entry

QRCBAMS - A15	New Password	Textbox	No	Yes	Alpha-numeric	none	NA	*********	Admin Entry
QRCBAMS - A16	Filter by Date	Datepicker	No	Yes	Date	none	Current date	January 27, 2025	Admin Entry

Form Business Rules and Dependencies:

Field Label	Validation / Business Rules	Error Messages	Data Dependencies	Additional Info/ Notes
Email	Required. Must follow the valid format for email: examplemail.com Must be unique in the database	For incorrect email, display: “Please enter a valid email.” or “Email already exists.”	None	
Password	Required. Must follow the strong password validity: Minimum of 8 characters Should contain lowercase Should contain uppercase Should contain numbers Should contain special characters	For invalid password, display: “Password must contain: Minimum of 8 characters Should contain lowercase, Should contain uppercase, Should contain numbers, Should contain special characters ”	None	Password must be hashed in the database.
Filter by Date	Must be a valid date format (YYYY-MM-DD).	“Please enter a valid date.”	None	Used for filtering

				records within a date range.
Displayed Name	Must be at least 2 characters and max 255.	“Please enter a valid name.””	None	Required for changing the User Displayed Name.
Contact Email	Must follow the valid format for email: examplemail.com Must be unique in the database	For incorrect email, display: “Please enter a valid email.” or “Email already exists.”	None	Required for changing the Email.
Current Password	Required. Must match the user’s existing password.	“Incorrect current password.”	User’s stored password	Required for password change.
New Password	Required. Must follow the strong password validity: Minimum of 8 characters Should contain lowercase Should contain uppercase Should contain numbers Should contain special characters	For invalid password, display: “Password must contain: Minimum of 8 characters Should contain lowercase, Should contain uppercase, Should contain numbers, Should contain special characters ”	None	
Confirm Password	Required. Must match the New Password.	“Passwords do not match.”	New Password	Ensures users

				confirm their new password.
Role	Required. Must be one of predefined roles	“Please select a valid role.”	None	
Status	Required. Must be one of predefined statuses.	“Please select a valid status.”	None	

Buttons, Links and Icons:

% of work done: Total Number of Completed Tasks/Total Number of Tasks * 100

Button, Link, Icon Label	OnClick Event	Other Event	Visible	Enabled Vs Disabled	Navigate To	Validation	Dependencies
Log-In Button	Validates user credentials and redirects to the dashboard if successful or displays an error message if invalid.	onClick and onKeyPress (Enter key) It will trigger the login process.	Yes, visible only on the login page.	Disabled if username or password fields are empty. Enabled when both username and password fields are filled.	Admin Modules and User Modules.	Username and password fields must not be empty. Password must meet security criteria. Check if credentials match a valid	Username and password fields must be filled. "Show Password" toggle. "Remember Me" checkbox. "Forgot Password" link redirection if credentials fail.

						user in the database. Prevent multiple rapid login attempts.	
Export Table to PDF Button	Generates a PDF version of the displayed table and allows the user to download it.	N/A	Yes, visible only on the attendance and employee table page. .	Disabled if the table is empty. Enabled when the table contains data.	N/A	Table must contain at least one row of data. Ensure correct format for exporting	The table must have data before export. Filters or search inputs to ensure the correct dataset is exported. Table sorting to maintain order in the exported file.
Cancel Button	Clears or resets form fields and optionally closes the modal or dialog box.	onKeyPress (Escape key) It will trigger form reset or close the modal.	Yes, visible when add employee and edit employee form	Disabled if no changes have been made in the form. Enabled when the user modifies	N/A	Confirm if changes exist before resetting. Ensure form fields are properly cleared without	Active form fields should reset or discard changes. Confirmation modal optional before canceling.

			or modal is open.	any field in the form.		affecting other data.	
Submit Button	Validates form inputs, sends data to the backend, and displays a success or error message.	onKeyPress (Enter key) It triggers form submission.	Yes, visible when add employee and edit employee form or modal is open.	Disabled if required fields are empty or invalid. Enabled when all required fields are properly filled.	N/A	All required fields must be filled. Fields should follow validation rules. No duplicate or invalid entries in the database. Prevent multiple form submissions.	All required input fields being filled and validated.
Add Employee Button	Opens a modal or redirects to the Add Employee form. Prepares a blank form for entering	N/A	Yes, visible only on the Employee Table Page (Admin Side).	Enabled	N/A	Admin must be logged in and have permission to add employees. The employee form must	May rely on input fields in the form

	new employee details.					be filled out correctly	
Edit Button	Opens a modal or redirects to the Edit Employee form, pre-populated with the existing employee details. Allows the admin to update information.	N/A	Yes, visible only on the Employee Table Page (Admin Side).	Enabled	N/A	Employee data must exist and be valid	Depends on the employee being selected for editing. May rely on input fields
Archive Button	Archives the selected employee's data. Displays a confirmation dialog	N/A	Yes, visible only on the Employee Table Page	Enabled	N/A	Confirmation of the archive action is required	Depends on selecting an employee for archiving.

	before performing the archive action.		(Admin Side).				
Export QR Code Button	Generates and downloads the QR code for the selected employee or selected list of employees. Displays a preview of the QR code.	N/A	Yes, visible only on the Employee Table Page (Admin Side).	Enabled	N/A	At least one employee must be selected for QR code export.	Depends on employee selection for generating QR codes. May rely on the employee's information being complete and valid for QR code generation.
Export Heatmap to PDF Button	Captures the heatmap visualization and converts it into a downloada	N/A	Yes, visible only on the employee analytics page.	Disabled if the heatmap is not generated or empty.	N/A	Ensure a heatmap is generated before exporting. Validate that the exported file does not	A generated heatmap must be present. Selected filters or date range to define heatmap scope.

	ble PDF file.					exceed size limits.	Proper rendering of the heatmap before export.
Change Button	Enables input fields for editing and may display a confirmation modal.	N/A	Yes, visible only on the account settings page.	Enabled	N/A	Ensure only editable fields are activated.	Editable fields should be disabled until this button is clicked.
Upload Picture Button	Opens a file selection dialog, previews the image, and uploads it to the server.	onChange it will open a file selection dialog.	Yes, visible only on the account settings page.	Enabled	N/A	File must be an image. Prevent duplicate uploads.	A file input field for selecting the image.
Remove Picture Button	Removes the currently uploaded image, sets a default placeholder, and	N/A	Yes, visible only on the account settings page.	Enabled	N/A	Ensure the default placeholder image is set after removal.	An existing uploaded picture. Confirmation prompt before deleting the image.

	optionally deletes the file from the server.						
Attendance Page Button	Redirects the user to the Attendance (DTR) Table Page. Loads employee attendance records dynamicall y. Applies default date filters. Fetches data from the database and displays it in a table.	N/A	Yes visible by default for admin with attendan ce record access.	Enabled	Attendance Page	Admin must be logged in. Admin must have permission to view attendance records. Ensure attendance data exists before loading the page.	N/A

Attendance Table Button	Navigates to or displays the attendance records table.	onHover It will display a tooltip like “View Attendance Records.”	Yes, visible on both admin and user modules.	Enabled	Attendance Table Page	Validate that data is available for display.	Date filters or search inputs to refine results.
Employee Table Button	Navigates to or displays the employee records table.	onHover It will display a tooltip like “View Employee Records.”	Yes, visible on both admin and user modules.	Enabled	Employee Table Page	Ensure the table loads correctly without missing data.	Search or filter options to refine employee data.
Account Settings Button	Navigates to the account settings page where users can update profile details and passwords.	N/A	Yes, visible on both admin and user modules.	Enabled	Account Settings Page	Validate that session data exists before redirection.	User authentication button should be disabled if not logged in. Editable profile fields if applicable. "Change Password" option if available in settings.

Sign-out Button	Clears user session data and redirects to the login page.	N/A	Yes, visible on both admin and user modules.	Enabled		Ensure session data is cleared properly before redirecting. Prevent sign-out if no active session exists.	Active user session should be disabled if no session exists.

4. System Configurations

Database Setup

1. **Install xampp or Laragon**
2. **Set up VsCode or other IDEs**
3. **Configure PHP Connection**
4. **Set up database with MySQL**

Purpose/Intent - Set up the database schema, tables, and relationships required for the application.

Alternatives - Use SQLite for lightweight local testing if the MySQL database isn't available.

QR Code API Integration Configuration

1. **Select QR Code API: optionally you can use a separate API for scanner and generator**
2. **Obtain API key (if required)**
3. **Configure API end-point**
4. **Test API end-point with request**
5. **Display/Save QR Code**
6. **Error Handling**
7. **Secure API Key (if provided) to .env**
8. **Test QR Code Integration**

Purpose/Intent - Configure QR code generation for attendance tracking.

Alternatives - Use third-party libraries like BaconQRCode for Laravel or Google Charts API for simpler QR generation.

Dependencies - Dependencies include library installation, and appropriate routes for QR generation.

PDF Export Configuration

1. **Install jsPDF: npm install or through cdn**
2. **Import jsPDF: Import in JavaScript code with import { jsPDF } from "jspdf"**
3. **Initialize jsPDF: Create a jspdf instance**
4. **Add Content to PDF**
5. **Export Table Content**
6. **Add Report Title, and Date**
7. **Add Export Button**
8. **Test with Sample Data**

Purpose/Intent - Set up PDF generation tools for exporting reports, tables, and other content.

Alternatives - Use libraries like jspdf, DOMPDF, TCPDF, or external APIs for PDF generation.

Dependencies - Requires correct library installation, styling configuration, and testing for PDF layout consistency.

Heatmap Configuration

1. **Install ApexCharts: npm install or through cdn**
2. **Include ApexCharts: import in JavaScript code with import ApexCharts from "apexcharts"**
3. **Prepare Heatmap Data**
4. **Define Chart Options**
5. **Render Heatmap Chart**
6. **Add Export to PDF Button**
7. **Test and Debug**
8. **Style the Heatmap**

Purpose/Intent - Configure heatmap visualization for analytics.

Alternatives - Use libraries like Chart.js, ApexCharts, or D3.js for heatmap implementation.

Dependencies - Dependencies include access to attendance data and a functional JavaScript library for rendering heatmaps in the UI.

Back-End Configuration

1. **Set Up Project Structure**
2. **Configure Database Connection**
3. **Implement Routing**
4. **Setup Authentication**
5. **Create API Endpoints**
6. **Implement Error Handling**

Purpose/Intent - Set up back-end functionality like routing, database interaction, and server-side validation without frameworks.

Workaround - Create a single index.php file as a router to handle all requests temporarily.

Dependencies - Requires proper folder structure, secure handling of form data, and PDO/MySQLi for database interaction.

5. Other System Requirements/ Non-Functional Requirements

Requirement Type	Specification Description	Details
Performance	System Response Times	The system should respond to user requests within 2 seconds for most actions and within 5 seconds for heavy operations.
Scalability	Handling Increased Load	The system should be able to handle user load without performance degradation.
System Availability	System Uptime	The system must maintain 99.9% uptime, excluding scheduled maintenance.
Security	Data Encryption for sensitive user data and information	All sensitive data must be encrypted
Legal Compliance	GDPR Compliance	All data collection and processing must comply with GDPR, including user consent and data retention

Requirement Type	Specification Description	Details
		policies.
Mobile Compatibility	Mobile Accessibility	The system should be fully accessible and responsive on mobile devices (phones, tablets, etc.).
API Performance	API Latency and Throughput	APIs should return results within 1 second for typical queries and 5 seconds for complex operations.

6. Reporting Requirements

Personal Attendance Table Report

Scope - User's attendance records including the date, time, time-in/time-out status.

Format - Available in PDF format; data is presented in tabular form.

Data Elements - Report Title, Date Generated, Name of Employee, Date, Scan Time, Time-in/Time-out.

Extraction mechanism - The report is downloadable from the system upon request.

Accessibility Levels - The report will be accessible for the employee who requested the report. Access to the report will require employee authentication.

Frequency of report extractions - The report will be generated depending on the user's demand.

Attendance Table (Admin) Report

Scope - All Employee attendance records including the name, date, time, time-in/time-out status.

Format - Available in PDF format; data is presented in tabular form.

Data Elements - Report Title, Date Generated, Name, Date, Scan Time, Time-in/Time-out.

Extraction mechanism - The report is downloadable from the system upon request.

Accessibility Levels - The report will be accessible to the admin only. Access to the report will be restricted to the admins, and will require admin authentication.

Frequency of report extractions - The report will be generated depending on the user's demand.

Employee Calendar Heatmap Report

Scope - User's Employee Calendar Heatmap.

Format - Available in PDF format; file includes the visual of the employee calendar heatmap.

Data Elements - Report Title, Date Generated, Employee Calendar Heatmap.

Extraction mechanism - The report is downloadable from the system upon request.

Accessibility Levels - The report will be accessible for the employee who requested the report. Access to the report will require employee authentication.

Frequency of report extractions - The report will be generated depending on the user's demand.

7. Integration Requirements

QR Code API

Protocol - RESTful API or PHP package (e.g., Endroid/QrCode).

Purpose - Generating and Scanning QR Code for Employee Attendance

Apexcharts

Protocol - JavaScript-based data rendering via AJAX.

Purpose - Calendar Heatmap for Employee Analytics

jsPDF

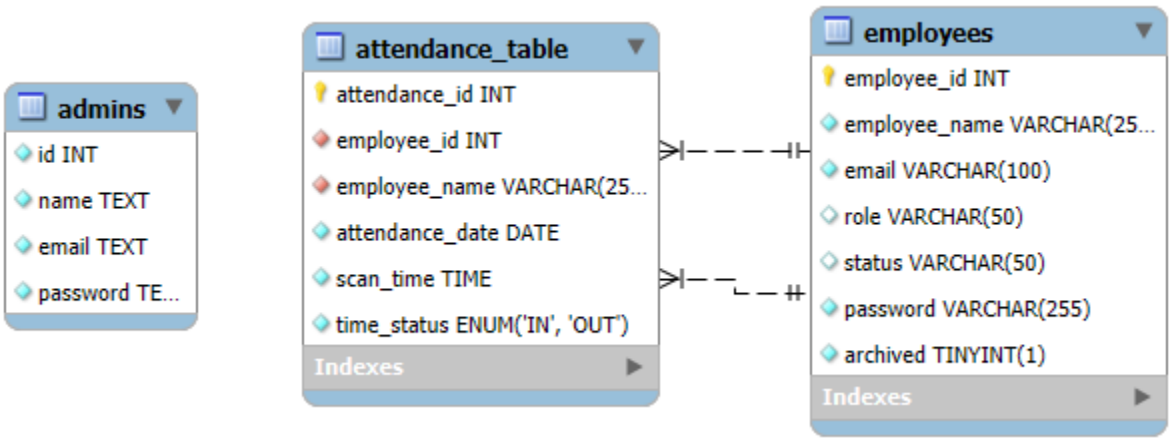
Protocol - Local JavaScript (jsPDF).

Purpose - Report generation of table or chart in PDF format.

MySQL Database

Purpose - Store Employee-related data such as attendance record,. and user accounts

Table Structure



System Architecture

Frontend - Structured with HTML, CSS and JavaScript

Backend - PHP for backend functions and database connection

Database - MySQL for storing user-related data and user accounts

APIs - QR Code API for QR Generation and Scanning, Apexcharts for Heatmap visual, jsPDF for report generation.

7.1 Exception Handling/ Error Reporting

Exception/ Error ID	Error	Cause	Solution Strategy
E-001	Database Connection Error	Loss of connection to the database due to network issues or database server failure.	Retry the connection up to 3 times. Check network connection and ensure the database server is up.
E-002	Invalid Input Data	User input does not meet validation criteria.	Return a detailed validation message to the user indicating the invalid input field and the expected format.
E-003	QR Code API Failure	QR Code API endpoint is down or returns an invalid response. Possible	Log the error with the API response. Retry the API request after a short delay.

		incorrect integration of API.	
E-004	Authentication Failure	User credentials are incorrect or expired session token.	Redirect the user to the login page with an error message.
E-005	Account does not exist	User account does not exist in the database	Redirect the user to the login page with an error message
E-006	Access Forbidden	User tried to access unauthorized page	Redirect the user to the login page with an error message.
E-007	Password Mismatch	User input for “New Password” and “Confirm Password” do not match	Redirect the user to the account settings with an error message.
E-007	Email Already Registered	User email already exists in the database.	Display an error message to use an unregistered email address.
E-008	Unable to Export to PDF	PDF API endpoint is down.	Retry the API request after a short delay.

8. Data Migration/ Conversion Requirements

In the framework of evrydycoffee's transition to a QR-Code Based Attendance Monitoring System (Caffe-In), which is equipped with automated attendance tracking capabilities, the data migration/conversion requirements would involve migrating and merging important employee attendance data from various sources into the Caffe-In platform to meet the requirements plan.

Objectives:

This system development project aims to create a comprehensive attendance management system tailored for food service organizations. The system will efficiently manage employee records, QR code authentication, attendance tracking processes, and report generation. The product will be a user-friendly web-based platform accessible to administrators and employees, ensuring smooth and transparent attendance monitoring processes.

Scope:

Implement and develop a QR-Code Based Attendance Monitoring System for evrydycoffee to enhance the attendance tracking process. The System addresses the existing attendance procedures at evrydycoffee, including employee registration, QR code generation, attendance logging, report tabulation, and analytics, creating a more integrated system for attendance data management.

Data Mapping:

A data mapping document defines how data from each source will be mapped to the corresponding fields in Caffe-In. This ensures that the data is accurately aligned and transferred between systems.

Data Extraction:

Relevant employee data is extracted from the identified sources, which may involve exporting data from existing spreadsheets, manual logbooks, or legacy systems.

8.1 Data Conversion Strategy

Approach for Extracting, Transforming, and Loading Data

- **Data Inventory:** Perform a thorough inventory of all the data in the current system, including employee records, attendance logs, and time tracking documents.
- **Data Mapping:** Analyze the data structures, formats, and relationships in the current system and map them to the equivalent data structures and formats in the new system. Create guidelines for data transformation, such as those for data erasure, normalization, and validation processes.
- **Data Extraction:** Using the proper techniques, such as exporting data files or connecting to databases, extract the data from the current system. Make sure that data extraction procedures maintain data consistency and data integrity.
- **Data Transformation:** Apply established guidelines and practices to transform the retrieved data into the required formats and organizational structures for the new system. This includes data normalization, cleansing, and validation to standardize formats, remove duplicates or inconsistencies, and ensure accuracy and completeness.
- **Data Loading:** Using the system's data structures as a guide, load the changed data into the new digital system. To ensure the accuracy and integrity of the data, perform data validation checks as the files are being loaded.

Conversion Schedule

- Create a conversion timetable that specifies the timeframes for every stage of the data conversion procedure.
- Take into account elements like data amount, transformation complexity, and resource availability.
- Set milestone dates for finishing each process, including data extraction, transformation, and loading, and give priority to important data.
- Set aside enough time for testing and validation to guarantee the precision and dependability of the transformed data.

Test Plan for Testing the Converted Data

- Test Data Integrity: Verify the converted data appropriately represents the original data by running data integrity checks. To find any discrepancies or data loss, compare sample records from the old system with their corresponding records in the new system.
- Test Data Completeness: Check to see if all necessary data has been correctly transferred to the new system. Verify that during the conversion process, no essential data components have been left out or overlooked.
- Test Data Relationships: Examine the new system to ensure that the connections between various data elements, such as employee records and related attendance records, are preserved correctly.
- Test Data Quality: To find and fix any data abnormalities, inconsistencies, or errors in the converted data, do data quality checks. This could entail executing scripts for data validation, doing data profiling, or completing data quality evaluations.
- Test System Functionality: Verify that the newly digitized system can use the converted data properly. To make sure they work as intended, test data retrieval, storage, and analysis functions and functionalities inside the system that depend on the transformed data.
- Test Performance: To make sure the new system satisfies performance requirements, such as reaction times, data retrieval speed, and system stability, evaluate its performance using the transformed data.
- User Acceptance Testing: Test the transformed data with end users to get feedback and confirm the new system satisfies their needs and expectations. During this testing step, address any problems or worries that have been found.

8.2 Data Conversion Preparation

Preparing for data conversion is a crucial step in ensuring a smooth transition from the existing manual or legacy attendance system to the new QR-based attendance monitoring system. This preparation involves planning and executing processes to address potential issues and facilitate an efficient conversion process.

Evaluate Needs

Understand the specific information conversion requirements of evrydycoffee's attendance processes. Analyze the current data environment, including the data's value, quality, format, structure, and requirements for migrating data from the source system to the new QR-based Attendance Monitoring System, including:

- Employee personal information
- Historical attendance records
- Time-in/time-out logs
- Role assignments
- Account credentials

Identify Root Cause(s) of Data Conversion Failure

Pinpoint potential reasons that could lead to unsuccessful data conversion:

- Data format incompatibility between legacy and new system
- Inconsistent time format recordings
- Missing or incomplete employee records
- Duplicate employee entries
- Invalid or corrupted attendance logs
- Incompatible role definitions

Assess the Impact of Data Conversion Failure

Evaluate how the failure of data conversion affects:

- Daily attendance tracking operations
- Employee time management
- Payroll processing
- Administrative reporting capabilities
- System accessibility for employees and administrators

Conduct Detailed Data Examination

Analyze the data involved in the conversion process:

- Validate completeness of employee records
- Verify accuracy of historical attendance data
- Check consistency of time logs
- Review role assignments and permissions
- Examine existing QR code associations (if any)

Backup Plan

Create a comprehensive backup strategy to protect all attendance-related data:

- Perform full database backup before conversion
- Create encrypted backups of:
    - Employee personal information
    - Historical attendance records
    - Account credentials
    - System configurations
- Store backups in secure, redundant locations
- Implement automated daily backup procedures
- Maintain backup logs and verification records

Restoration Procedure

- Implement a detailed restoration process:
- Verify backup integrity before restoration
- Test restoration in staging environment
- Document step-by-step restoration procedures
- Establish recovery time objectives
- Define data recovery validation steps
- Create rollback procedures for failed conversions

Communication With Stakeholders

Inform relevant stakeholders at evrydycoffee:

- Notify all employees about the system transition
- Provide training for QR code usage
- Communicate conversion timeline to management
- Establish support channels for transition period
- Document new procedures for attendance tracking

Assign Resources

Allocate necessary resources for successful conversion:

- Technical team for data migration
- QR code generation specialists
- System administrators
- Training personnel
- Support staff during transition
- Hardware and software resources

Verification and Validation

Set up comprehensive testing procedures:

- Create test cases for data validation
- Verify employee information accuracy
- Test QR code generation and scanning
- Validate attendance logging functionality
- Confirm reporting capabilities
- Check system access and permissions
- Perform end-to-end system testing

8.3 Data Conversion Specifications

Source	Source Data Element	Target	Target Data Element	Conversion Rules	Notes
Request List of Manual Attendance Records	Employee Name	Employee Database	employee_name	Runs a custom PHP script that will populate the last_name column with the data type of varchar and length of 100.	This can also be accomplished through the system Add Employee page.
Request List of Manual Attendance Records	Employee Email	Employee Database	email	Runs a custom PHP script that will populate the email column with the data type of varchar and length of 50.	This can also be accomplished through the system Add Employee page. Primary key for employee identification.
Request List of Manual Attendance Records	Employee Role	Employee Database	role	Runs a custom PHP script that will populate the role column with the data	This can also be accomplished through the system

				type of enum with values: Barista, Chef, Cashier.	Add Employee page.
Request List of Manual Attendance Records	Employee Status	Employee Database	status	Runs a custom PHP script that will populate the status column with the data type of enum with values: Active, Inactive.	This can also be accomplished through the system Add Employee page.
Legacy Attendance Logs	Time of Attendance	Attendance Database	scan_time	Runs a custom PHP script that will populate the time_in column with the data type of datetime.	Historical attendance data conversion. Requires time format standardization.
Legacy Attendance Logs	Date	Attendance Database	attendance_date	Runs a custom PHP script that will populate the date column with the data type of date.	Historical attendance data conversion.

Legacy Employee Records	Employee ID	Employee Database	employee_id	Runs a custom PHP script that will populate the employee_id column with the data type of varchar and length of 20.	This will be used for QR code generation.
Legacy System Credentials	Password	Employee Database	password	Runs a custom PHP script that will populate the password column with the data type of varchar and length of 255. Passwords must be hashed.	Temporary passwords will be generated for all converted accounts.

9. References

Dipmala Salunke, Upadhyay, A., Amol Sarwade, Vaibhav Marde, & Sachin Kandekar. (2013). A survey paper on Role Based Access Control. 2(3), 1340–1342. https://www.researchgate.net/publication/368755664_A_survey_paper_on_Role_Based_Access_Control

Pati, S., Bhanja, S., Majumder, A., Sahu, S., Banerjee, S., & Sen, G. (2023). A Novel QR Code Based Smart Attendance Tracking System. A Novel QR Code Based Smart Attendance Tracking System, 1–4. https://doi.org/10.1109/iementech60402.2023.10423485

10. Open Issues

Issue ID	Issue	Raised By	Raised On	Solution/ Decision	Resolved By	Resolved On	Status
QRCBAMS-ALP-017	Verify error message displayed for invalid login attempts.	Jamil	22/12/2024	Invalid login attempts should result in an error message being shown by the system.	Given	22/13/2024	PASSED
QRCBAMS-ALP-018	Verify passwords are stored securely (hashed) in the database	Jamil	22/12/2024	Ensure that user passwords are stored securely in the database using hashing.	Given	22/13/2024	PASSED
QRCBAMS-ALP-031	Verify email field accepts valid email formats (e.g., user@gmail.com)	Jamil	01/09/2025	Make sure that only legitimate email formats are accepted in the email field.	Given	01/10/2025	PASSED
QRCBAMS-AET-031	Verify accurate display of	Jamil	01/23/2025	Ensure that employee details are	Given	01/24/2025	PASSED

	employee information (name, email, role, status)			correctly displayed in the table.			
QRCBAMS-AET-041	Verify status values correctly display as "Active" or "Inactive"	Jamil	01/23/2025	Ensure employee statuses display only "Active" or "Inactive."	Given	01/24/2025	PASSED
QRC BAMS-ELP-006	Retained vallidation after page reload	Eurika	1/09/2025	The error validation is still displayed after the page has reloaded	Given	1/10/2025	PASSED
QRCBAMS-ELP-018	Invalid login credentials	Eurika	1/23/2025	It should not accept test datas such as ".c0m" and space	Given	1/24/2025	PASSED
QRCBAMS-ELP-020	Restriction to login page after user login	Eurika	1/27/2025	It should not go back to the login page after logging in	Given	1/28/2025	PASSED

QRCBAMS-ELP-028	Error validation	Eurika	1/27/2025	Error validations are not displaying when inputting new credentials.	Given	1/28/2025	PASSED
QRCBAMS-EATP-001	Filtering of table	Eurika	1/28/2025	Each column should have sorting function	Given	1/29/2025	PASSED
QRCBAMS-EATP-010	Column resize behavior	Eurika	1/28/2025	It should not resize freely	Given	1/29/2025	PASSED