

Software Design Document (SDD)

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(Employees Attendance Tracker System)

Software Design Document

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1. INTRODUCTION

1. Purpose

This software design documents describes the architecture and design of the online attendance system. This SDD shows how the software system will be structured to satisfy the requirements.it is the primary reference for programmer and therefore it contains all the information required by a programmer to write code. SDD translate the customer requirements as described in the SRS documents into representation of software components, interfaces and data necessary for implementation phase.

2. Scope

The purpose of the online attendance system is to ease managing and tracking employee attendance. The system aims to provide an online attendance tracking solution that captures real-time data for accurate employee attendance management. It allows employees to record their attendance by check in and check out through the unique company ID, identity information and appropriate verification method (face print - finger print - voice), which will be accepted only if the employee is in the same company location, the dashboard will depict the employees' attendance including check-in/check-out times, leaves, and absences. In addition, the system includes leave management features that enable the employee to request an emergency leave through the system to the manager, which has the validity to accept or reject the excuse after reviewing. Employees also have the ability to send an excuse for being absent from work that will be reviewed and checked by the manager. Using the employees' attendance data, the system has the ability to calculate their overtime. The custom work schedule can be established by the manager that contains a calendar for workdays and holiday days (time and date). So that the system accurately calculates and records work hours on workdays and rest days. New employees of the company can register their data in the system and then have it reviewed and accepted by the manager. Attendance and employee information is securely stored in the cloud. This document describes the implementation details of the online attendance system.

3. Reference

1. <https://docplayer.net/8184133-Software-design-document-sdd-template.html>
2. <https://selleo.com/blog/6-steps-of-uxui-design-process>
3. <https://www.uxdesigninstitute.com/blog/guide-to-the-ui-design-process/>
4. <https://www.visual-paradigm.com/guide/data-flow-diagram/what-is-data-flow-diagram/>
5. [https://docplayer.net/8184133-Software₄-design-document-sdd-template.html](https://docplayer.net/8184133-Software_4-design-document-sdd-template.html)

4. Structure

1-Introduction: in this section we will produce the overall description of this Document

2-System Overview: This section produces General View about our System design

3-System Architecture and Components Design: in this section we define the high-level structure and organization of the system also design the individual components or modules of the system.

4-Data Design: This section details the system data architecture, database description, data structure and data flow diagram

5-Design Details: This section provides the information needed for a system development team to actually build and integrate the hardware components, code and integrate the software modules, and interconnect the hardware and software segments into a functional product

6-Human Interface Design: This section provides the detailed design of the system and subsystem

2. SYSTEM OVERVIEW

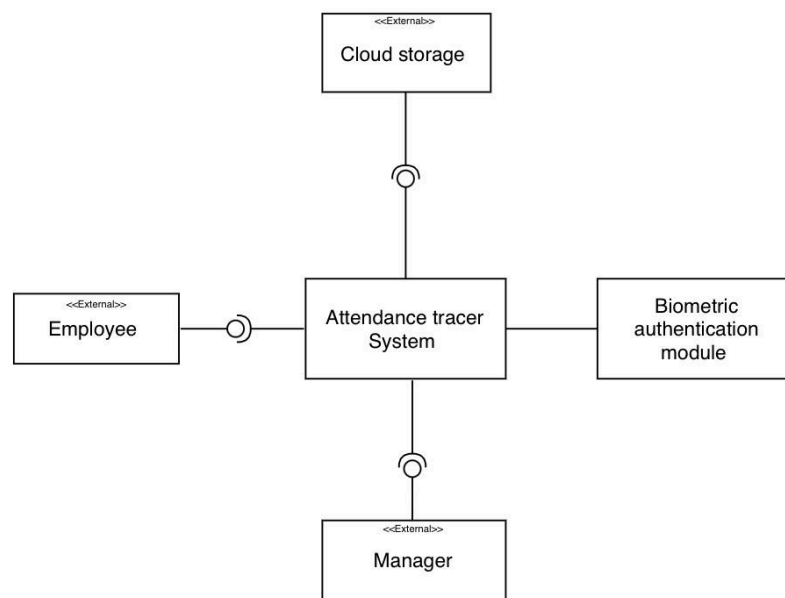
Employees Attendance Tracker System is online attendance system. Employees attendance tracker system basically has two modules for proper functioning. Manager module has rights for managing employee attendance, adding new employee, calculating overtime and give approval for absent and excuse for employee and on the opposite side there is an employee module which has rights of making daily attendance when reach to work and when exit from the work, send excuse and send absent report. The system designed in a way that only employee in this company should be allowed to access the system by company ID and then choose the way that can be attend either by (voice - fingerprint - or face print), and the attendance information will be saved on cloud. The employee information should be modified only by manager and no one else. The user interface should be consistent so, the employee can use it easy and in speed. The system should be visually, clear.

3. SYSTEM ARCHITECTURE AND COMPONENT DESIGN

3.1 Architecture Description

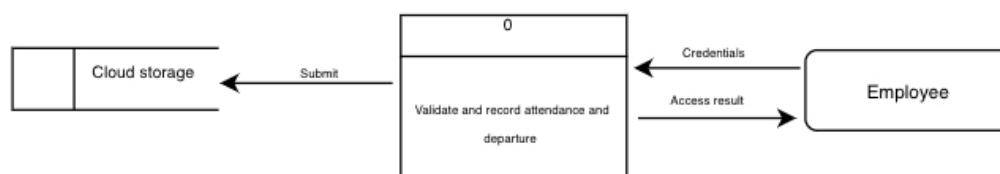
In this section we discussed the system architecture model that illustrating the major components of the Attendance Tracer System. The system involves employees and manager who utilise and interact with the system for attendance tracking purposes. The architecture includes a cloud storage component responsible for storing employee data securely.

Additionally, a biometric authentication module is implemented to verify user identity using various biometric modalities such as face print, fingerprint, and voice.

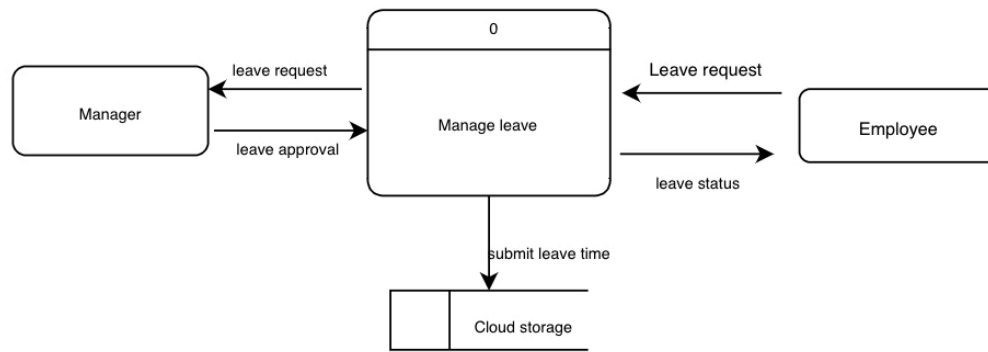


3.2 Component Decomposition Description

This section provides an in-depth analysis of the system's architecture and its decomposition into individual components. This section aims to explain the organization and interaction of various components, highlighting their functionalities and relationships. By breaking down the system into its constituent parts, the Decomposition Description elucidates how each component contributes to the overall functionality and performance of the system. Additionally, it elucidates the interfaces, dependencies, and interactions between components, enabling a comprehensive understanding of the system's design and structure. In the following we will provide a detailed overview of each component, and how they collaborate to achieve the system's objectives.



The "record attendance and departure" process captures and records employee attendance data, including check-in and check-out times. Store these data into the cloud storage after validate credentials of the employee.

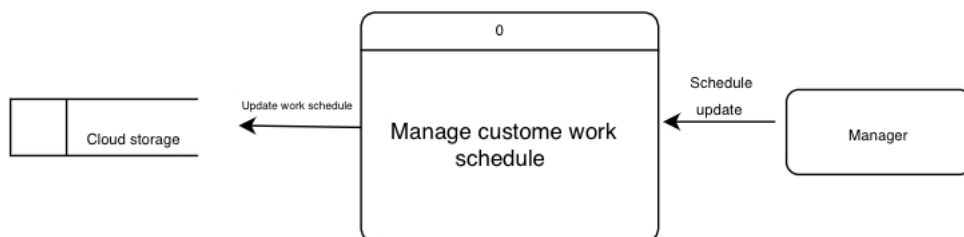


The "Manage Leave" process handles the management of leave requests from employees, including submission to managers for approval, returning the approval status to employees, and storing the leave time in the cloud.

Employee are external entities who initiate leave requests. He provides inputs such as their , leave details, and reasons for leave.

Manager is responsible for approving or rejecting leave requests submitted by employee. He receive leave requests, review them, and provide the approval status.

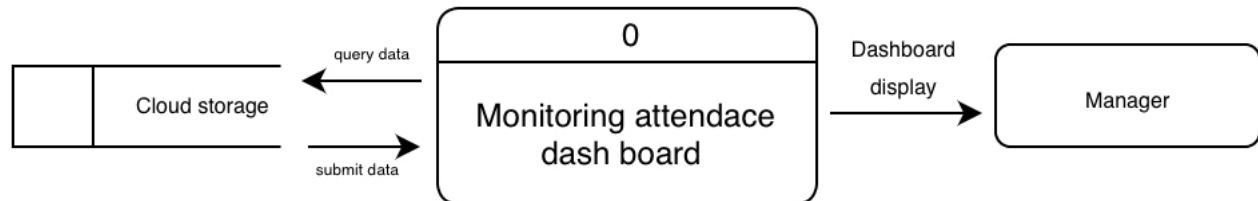
Cloud Storage is an external entity that stores and manages leave time information. It receives the leave time data from the "Manage Leave" process and stores it securely for future reference.



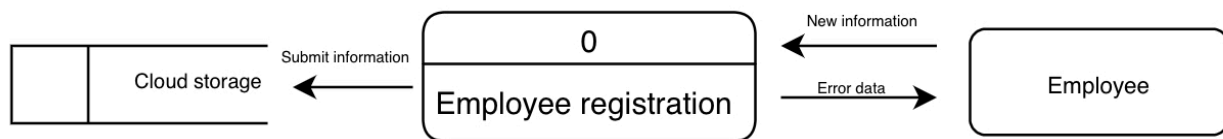
The "Manage Custom Work Schedule" process allows managers to modify the custom work schedule by adding or removing specific workdays and marking certain days as holidays. Managers provide inputs through the "Schedule Updates" data flow, specifying the changes to be made.

The schedule updates data flow represents the updates made by managers to the custom work schedule. It includes information such as the updated workdays, added holidays, and any other relevant changes.

Update work schedule data flow represents the updated custom work schedule. It includes the modified workdays, marked holidays, and any other changes made by the managers. The updated work schedule is stored in the Work Schedule Database.



Monitoring attendance dashboard” process checks availability of attendance information in the cloud then retrieves information such as attendance, departure time leave and absent record and the necessary information for generating attendance dashboard. Then display real time dashboard to the manager.



The process “employee registration” checks the validity and completeness of the new employee information provided by the user. It verifies whether all required inputs, such as face print, voice, fingerprint, name, password, and national ID, are correctly entered. If information are valid and complete the process saves employee’s information in the cloud, but in case of uncomplicated or duplicated data the process sends error to the employee.

3.3 Detail Component Description

3.3.1 System Description

The Online Attendance System is a comprehensive solution designed to facilitate the management and tracking of employee attendance. It provides an online platform that captures real-time data for accurate attendance management. The system allows employees to record their attendance through check-in and check-out procedures using their unique company ID and appropriate verification methods such as face print, fingerprint, or voice. The system ensures that attendance can only be recorded if the employee is physically present at the company location.

3.3.2 System Interfaces

Employee interface: The system interacts with employees and managers through a user-

friendly interface that enables attendance recording, leave requests, excuse submissions, and access to attendance data.

Manager Interface: The system provides a dedicated interface for managers to review and approve leave requests, excuse submissions, and employee registrations. Managers can also set up custom work schedules and view attendance reports.

3.3.3 System Dependencies:

Cloud Storage: The system relies on secure cloud storage to store and manage attendance data, employee information, custom work schedules, and other relevant data.

3.3.4 System Functionality

- **Attendance Recording:** The system allows employees to record their attendance by checking in and checking out using their company ID and verification methods (face print, fingerprint, or voice). The system verifies the employee's presence at the company location before accepting the attendance record.
- **Dashboard:** The system provides a comprehensive dashboard that displays employees' attendance details, including check-in/check-out times, leaves, and absences. The dashboard provides real-time updates and enables managers to monitor attendance records effectively.
- **Leave Management:** Employees can request emergency leaves through the system, which are forwarded to the manager for review. The manager has the authority to accept or reject the leave request after considering the circumstances. The system maintains a record of approved leaves.
- **Excuse Submission:** Employees can submit excuses for being absent from work, which are reviewed and checked by the manager. The system facilitates the communication and review process between employees and managers regarding absences.
- **Overtime Calculation:** Using the attendance data, the system has the capability to calculate employee overtime accurately based on predefined work schedules. This calculation takes into account both workdays and rest days, as specified by the manager.
- **Custom Work Schedule:** Managers can establish custom work schedules, specifying workdays and holiday days (time and date). The system accurately calculates and records work hours based on these schedules, ensuring accurate attendance tracking.
- **Employee Registration:** New employees can register their data in the system, including personal information and verification details (face print, fingerprint, or voice). The manager reviews and accepts the registration, allowing the employee to access the system and record attendance.

3.3.5 System Data Structure

Employee Information: This data structure includes the employee's information such name, password, e-mail, company ID, and verification method data(fingerprint-faceprint-voice).

Attendance Records: This data structure includes the attendance and departure times, leaves, absences, and overtime calculation.

Custom Work Schedule: data structure defines the custom work schedule specified by the manager, includes workdays, rest days.

3.3.6 System Algorithm and Logic

Overtime Calculation: System utilities algorithms to compute the employees' overtime based on predefined work schedule specified by the manager, by take in consideration work days and rest days.

Attendance Verification: The system utilities algorithms to verify the attendance of the employee with company ID and the verification methods(faceprint - fingerprint - voice).

3.3.7 System Error Handling

The system employing error handling mechanism to specify issues such as: mismatch the employee physical location with the company location during attendance recording, error in excuse submission, or mismatching credential information. The suitable error message leads them to solve the issues.

3.3.8 System Performance Consideration

In order to handle a large amount of attendance data and user interactions efficiently, the system is designed to handle a large volume of data. The optimization of performance can be achieved by using data indexing, caching mechanisms, and load balancing techniques in order to ensure smooth operation even during peak periods.

3.3.9 Security Considerations

The system takes in consideration the confidentiality and integrity of the employees' information. This includes protect data in the cloud from unauthorised access, or from damaged and modified, or breaches. By using different techniques such as encryption and access policies.

3.3.10 System Scalability

The system is designed to handle the increasing number of employees and companies. It can accommodate more by adding additional servers and increasing the cloud capacity without affecting the efficiency of performance.

3.3.11 Compliance

the system adherence to laws and regulations governing the domain of activity and ensuring

that information systems align with these requirements.

3.3.12 Analytics and Reporting

Insights can be driven from attendance data due to the system's ability to provide reporting and analytics capabilities. The manager may then make decisions based on the data available and enactments accordingly.

3.3.13 System Maintenance and Support

The system was designed based on the ability to modify it in the future, fix errors, add new features, and accept updates to the system, in addition to improving performance and the system's ability to maintain a good level of performance in all circumstances.

3.3.14 System Modules

- User Authentication Module
 - Purpose: Check user's identity based on their login credentials.
 - Interfaces: validate username and password against stored user data.
 - Functionality: provide access to authorised user and deny unauthorised one.

- Company ID verification module:
 - Purpose: verifies the entered ID with the company ID.
 - Interfaces: Accept company ID for validation.
 - Functionality: Check validity of company ID and its related to active employee.

- Location verification module
 - Purpose: Verifies user location for attendance recording.
 - Interfaces: using location mechanisms such as GPS.
 - Functionality: compare employee location with the actual company location to acceptance attendance.

- Real time attendance data capturing module
 - Purpose: record real time data for attendance and departure for accurate tracking.
 - Functionality: updates the attendance records for the employee.

- Leave request module
 - Purpose: allow employee to send a request.
 - Functionality: capture leave details of the request and save them for manager to review.

- Excuse submission module
 - Purpose: enable employee to send excuse for being absent.
 - Functionality: capture excuse details to be reviewed by the manager.

- Manager review and verification module
 - Purpose: enable manager to review and verify the leaves and excuses of employees.
 - Functionality: provides the submitted excuses and leaves for the manager to evaluated and validate.

- Employee data storage and retrieval module
 - Purpose: stores and retrieves employees data from the system to the cloud.
 - Functionality: provides secure and organised storage for easy and accurate retrieve data when needed.

- Data encryption module:
 - Purpose : Secure store and transmission of data.
 - Functionality: apply encryption algorithm to make data meaningless without authorised access.

- Access and permission module
 - Purpose: control the access for manager and employees in the system.
 - Functionality: rely on different level of access for each user and limit their accessibility and permissions based on their roles.

3.4 Design Rationale

The appropriate architecture for the system was selected based on certain criteria that ensures the system's needs and achieves its goals. The following design rationale outlines the key factors influencing the decision:

Security and Data Integrity

Cloud is characterises by providing security services for the system by encrypting data, and biometric authentication is also a strong addition that helps protect the system by ensuring that the system can only be accessed by authorized persons.

Flexibility and Accessibility:

Cloud storage facilitates universal accessibility and enabling users to interact with the system from different locations.

Biometric Authentication:

Biometric methods offer a high level of accuracy and reduce the risk of unauthorized access, after that it enhance overall system security.

After research and studies, there were many auxiliary tools, so alternatives were adopted for reasons of compatibility with the quality of the system, which will be discussed in Trade-offs and Considered Alternatives:

Biometric and Non-Biometric Authentication:

The chosen biometric authentication offers a more robust and reliable means of identity verification. Non-biometric methods were deemed less secure and more susceptible to unauthorized access.

Alternative Biometric Modalities:

Various biometric modalities were considered. However, the chosen modalities (face print, fingerprint, and voice) were selected for their balance between accuracy, and user acceptance.

Cloud-based Storage and On premises Database :

The preference for storing data in the cloud for our system is for several reasons, including that it is low-cost and the user can access it anywhere and on any device, and it is distinguished by its flexibility. provides the necessary scalability and accessibility where the On-premise storage was evaluated for data control but was dismissed due to limitations in scalability and potential infrastructure costs.

The considered alternatives were systematically evaluated, and the chosen architecture aligns with the system's overarching goals and requirements.

4. DATA DESIGN

The base that facilitates the systematic flow, storage, and organization of data necessary for the effective administration of employee attendance is the Data Design component. This section delves into the intricate details of the system's data architecture, encompassing the Database Description, Data Structure, and the intricacies captured in the Data Flow Diagram (DFD).

4.1 Database Description

The database of the Employee Tracker attendance system is made to make managing and tracking employee attendance easier. It offers a reliable solution for precise attendance management. The database includes a number of features that improve the efficacy and efficiency of procedures linked to attendance. It is used to facilitate the recording and analysis of employee attendance data in real-time, offering a comprehensive solution to meet the attendance tracking needs of the organization:

1-Real Time Attendance Tracking

Through check-in and check-out procedures, employees can easily record their attendance by utilizing unique identifiers such as company IDs and identity information. Also, by verification methods, including face print, fingerprint, and voice recognition, ensure secure attendance records.

2-Location-Based Verification

In order to improve data accuracy and dependability, attendance records are only accepted when employees are present at the same location of the business.

3- Leave Management

Employees can request emergency leaves through the system and manager have the authority to review and approve or reject leave requests.

4- Excuse Submission

Employees can submit excuses for absences, which are subject to review by manager.

5- Overtime Calculation

The system calculates employee overtime by using attendance data, which makes precise compensation management possible.

6- Custom Work Schedules

Manager can establish custom work schedules, defining workdays, holidays, and associated timeframes, allowing precise calculation of work hours.

7- New Employee Registration

The system accommodates the registration of new employees, with data review and approval processes conducted by managers.

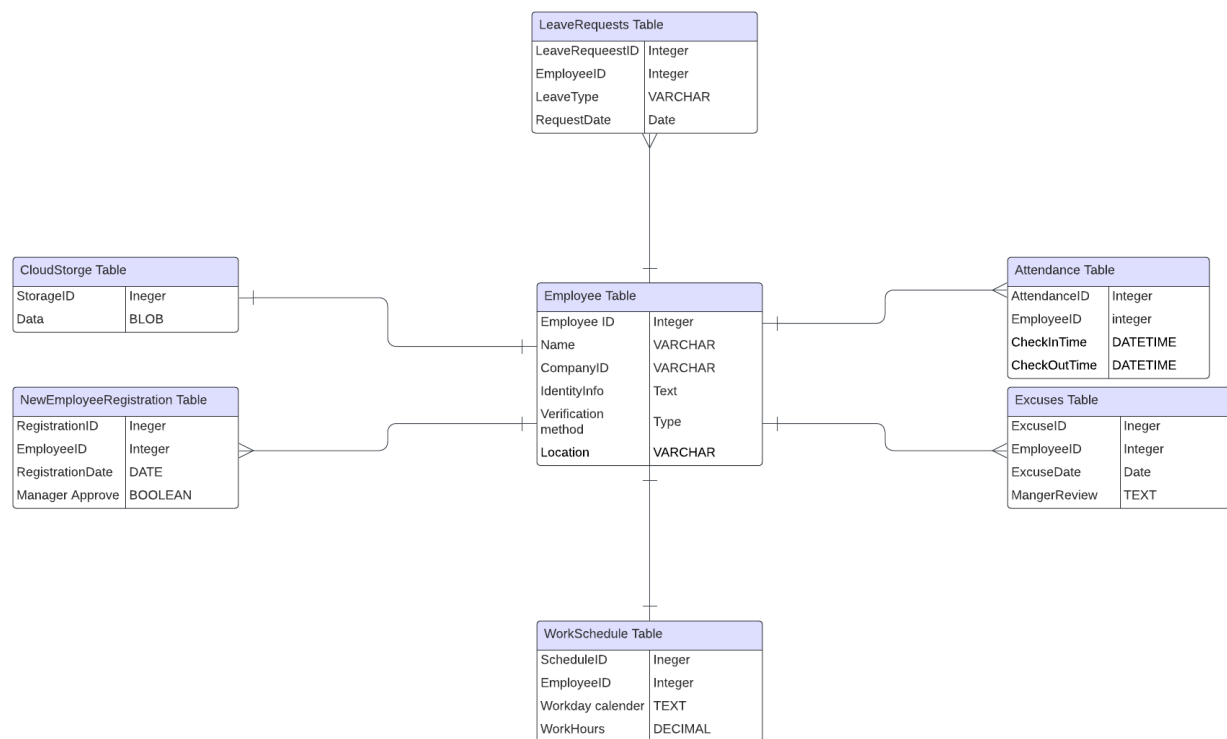
8- Cloud storage

The cloud repository consists of different tables for different entities in our system. The main ones are 'Employees', 'attendance records', 'Departure records', 'Verification methods', 'Leaves', 'Excuses', 'Work schedule', in addition to the attributes and relationships between these entities to ensure consistent management of data. In order to provide security we rely on role based access control so each user 'employee' or 'manager' has a permission accesses to the data based on his role. For security aspects, we apply different encryption techniques to hide personal information from unauthorised access. Also, we employ a frequent data backups to prevent losses of data and recovery

mechanisms to restore these data in case of loss of them in an unexpected manner. Due to data increasing each day we ensure that scalability accommodates more employees' data. For integration and interaction our storage interact with system modules, like the attendance tracking module, identity check module and work schedule module by APIs to facilitates accurate transmission of these data.

4.2 Data Structure

The Employee Tracker attendance system's database structure's essential elements and relationships are presented in the Entity-Relationship Diagram (ERD). This graphic representation provides a thorough manual for understanding the arrangement and relationships between data within the system.

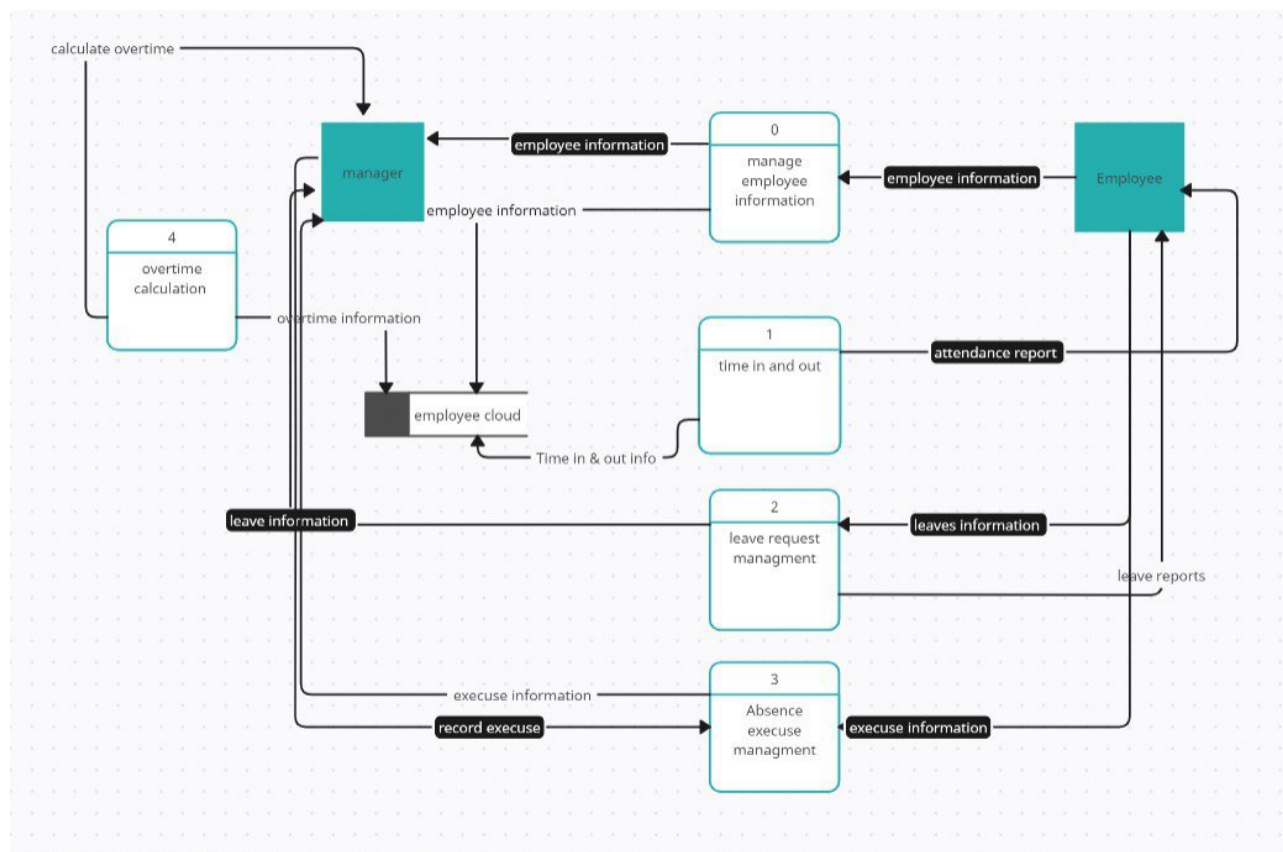
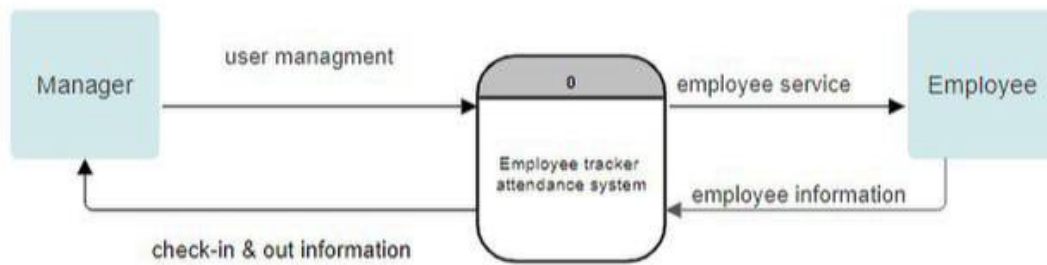


4.3 Data-flow Diagram (DFD)

The Data Flow Diagram serves as a visual narrative, illustrating the dynamic journey of data within the Employee Tracker attendance system. It clearly presents how information

flows from the point of entry employee attendance recording through unique identifiers and verification methods to its processing, storage, and eventual presentation on the system dashboard.

Data Flow Diagram - Employee tracker attendance system

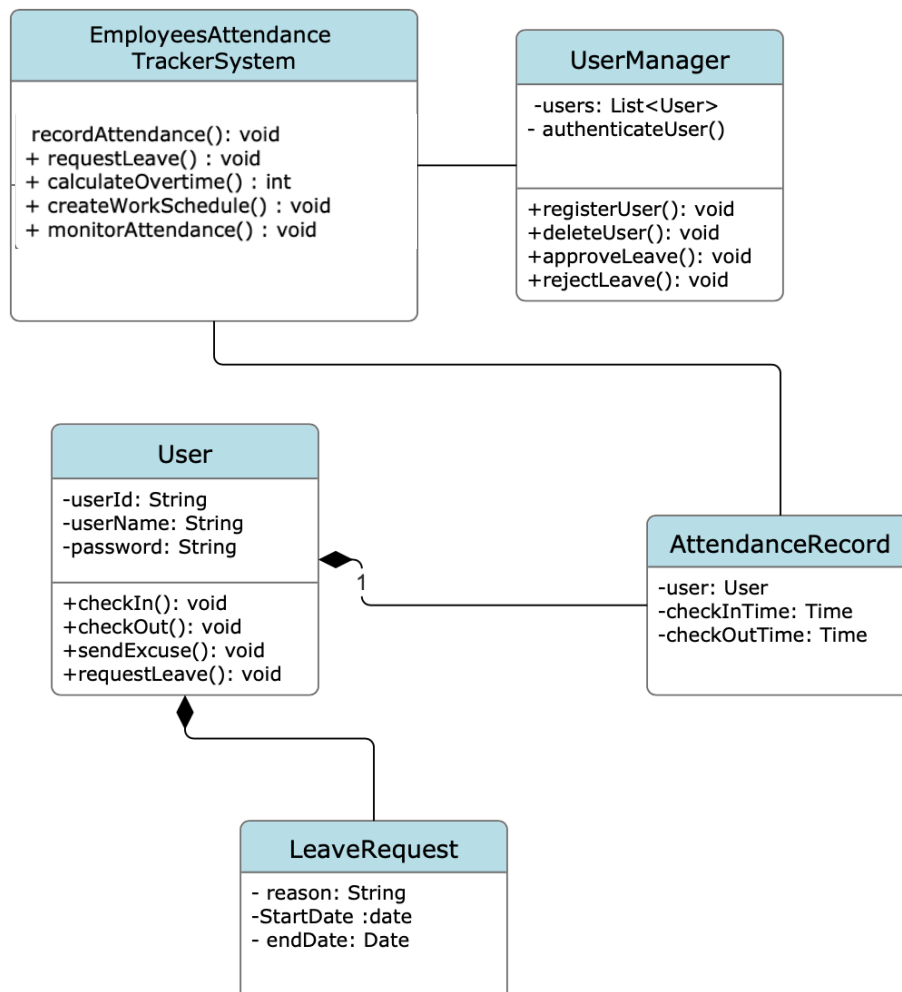


5. DESIGN DETAILS

In this section, we take a closer look at what each component does in a more systematic way, and how intricate aspects and specifications involved in the process of designing a software system. These details include various diagrams and representations that capture different dimensions of the system, allowing designers and developers to plan, communicate, and implement the software effectively. The primary design details include Activity Diagrams, Sequence Diagrams, State Diagrams, and Class Diagrams.

5.1 Class Diagrams:

The Class diagrams provide a static view of the system by depicting the classes, their attributes, methods, and relationships. They are fundamental in object-oriented design in our System “EmployeesAttendance TrackerSystem” the class diagram contain :



1. EmployeesAttendance TrackerSystem:

This is the main class representing the system for employee attendance tracking.

- It has several methods:
- recordAttendance(): Records the attendance of an employee.
- requestLeave(): Allows an employee to request leave.
- calculateOvertime(): Calculates overtime for an employee.
- createWorkSchedule(): Creates a work schedule.
- monitorAttendance(): Monitors the attendance of employees.

2. User:

Represents a user in the system. This class is related to EmployeesAttendance TrackerSystem.

Attributes:

- userId: String
- userName: String
- password: String
- Methods:
 - +checkIn(): void: Allows a user to check in.
 - +checkOut(): void: Allows a user to check out.
 - +sendExcuse(): void: Sends an excuse.
 - +requestLeave(): void: Requests leave.

3. UserManager:

Manages users in the system. Related to User.

Attributes:

- users: List<User>: Represents a list of users managed by the user manager.
- Methods:
 - +registerUser(): void: Registers a new user.
 - +deleteUser(): void: Deletes a user.
 - +approveLeave(): void: Approves leave requests.
 - +rejectLeave(): void: Rejects leave requests.

4. AttendanceRecord:

Represents the attendance record of a user. Related to User.

- Attributes:
 - user: User: Represents the user associated with the attendance record.
 - checkInTime: Time: Represents the check-in time.
 - checkOutTime: Time: Represents the check-out time.

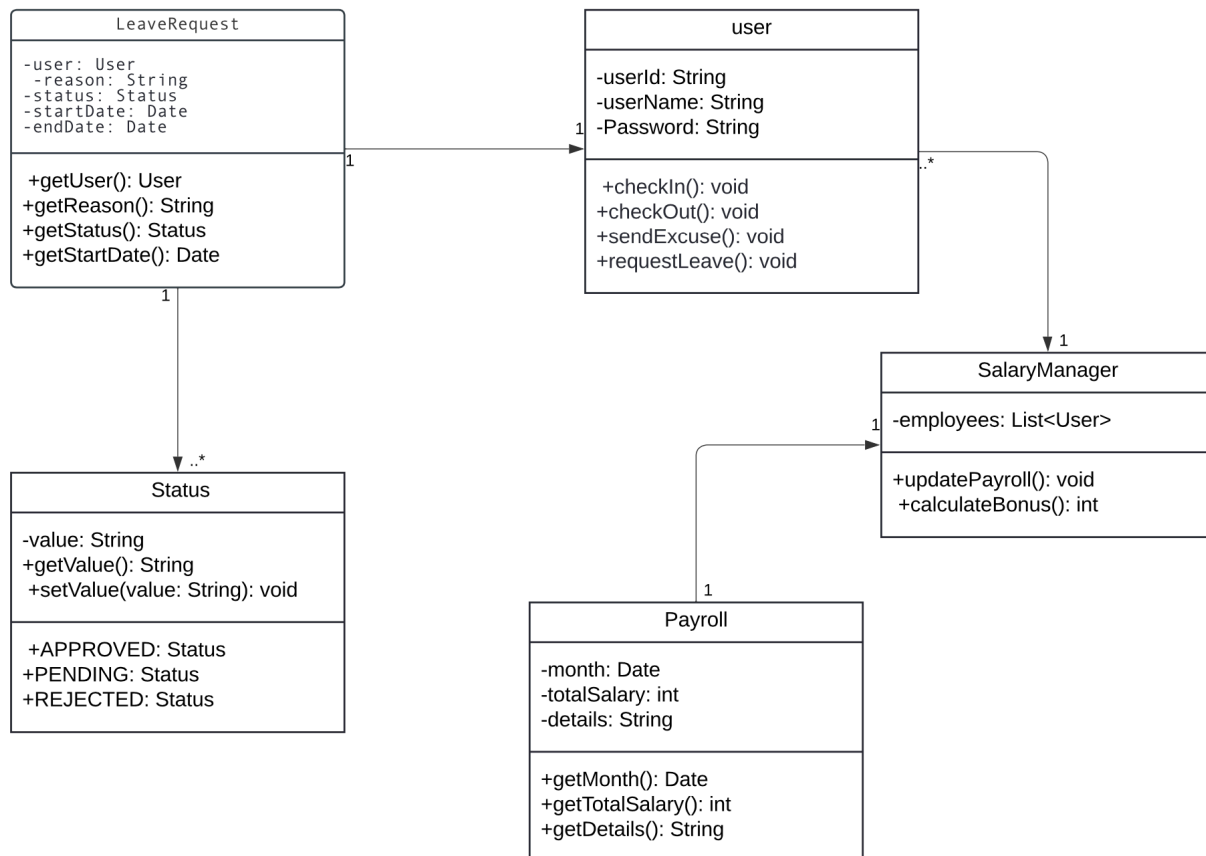
5. LeaveRequest:

Represents a leave request. Related to User.

- Attributes:

- user: User: Represents the user associated with the leave request.
- reason: String: Represents the reason for leave.
- checkOutTime: Time: Represents the requested check-out time.

This class diagram is involves request Leave classes :



1.LeaveRequest Class:

- Attributes:
 - user: User Represents the user associated with the leave request.
 - reason: String: Describes the reason for the leave.
 - status: Status: Indicates the status of the leave request (APPROVED, PENDING, REJECTED).
 - startDate: Date: Represents the start date of the leave.
 - endDate: Date: Represents the end date of the leave.
- Methods:
 - `+getUser(): User``: Retrieves the associated user.

+getReason(): String`: Retrieves the reason for the leave.
 +getStatus(): Status`: Retrieves the status of the leave request.
 +getStartDate(): Date`: Retrieves the start date of the leave.
 +getEndDate(): Date`: Retrieves the end date of the leave.

2. Status Class:

- Attributes:
 -value: String: Represents the value of the status (e.g., "APPROVED").
 - Methods:
 +getValue(): String: Retrieves the value of the status.
 +setValue(value: String): void: Sets the value of the status.
 - Constants:
 +APPROVED: Status: Represents the approved status.
 +PENDING: Status: Represents the pending status.
 +REJECTED: Status: Represents the rejected status.

3. SalaryManager Class:

- Attributes:
 -employees: List<User>: Represents a list of employees managed by the salary manager.
 - Methods:
 +updatePayroll(): void: Updates the payroll for the managed employees.
 +calculateBonus(): int: Calculates the bonus for the employees.

4. Payroll Class:

- Attributes:
 -month: Date: Represents the month for which the payroll is calculated.
 -totalSalary: int: Represents the total salary for the specified month.
 -details: String: Provides additional details about the payroll.
 - Methods:
 +getMonth(): Date`: Retrieves the month for the payroll.
 +getTotalSalary(): int`: Retrieves the total salary for the month.
 +getDetails(): String`: Retrieves additional details about the payroll.

Associations and Relationships:

This class diagram involves request create schedule :

1-EmployeesAttendance TrackerSystem:

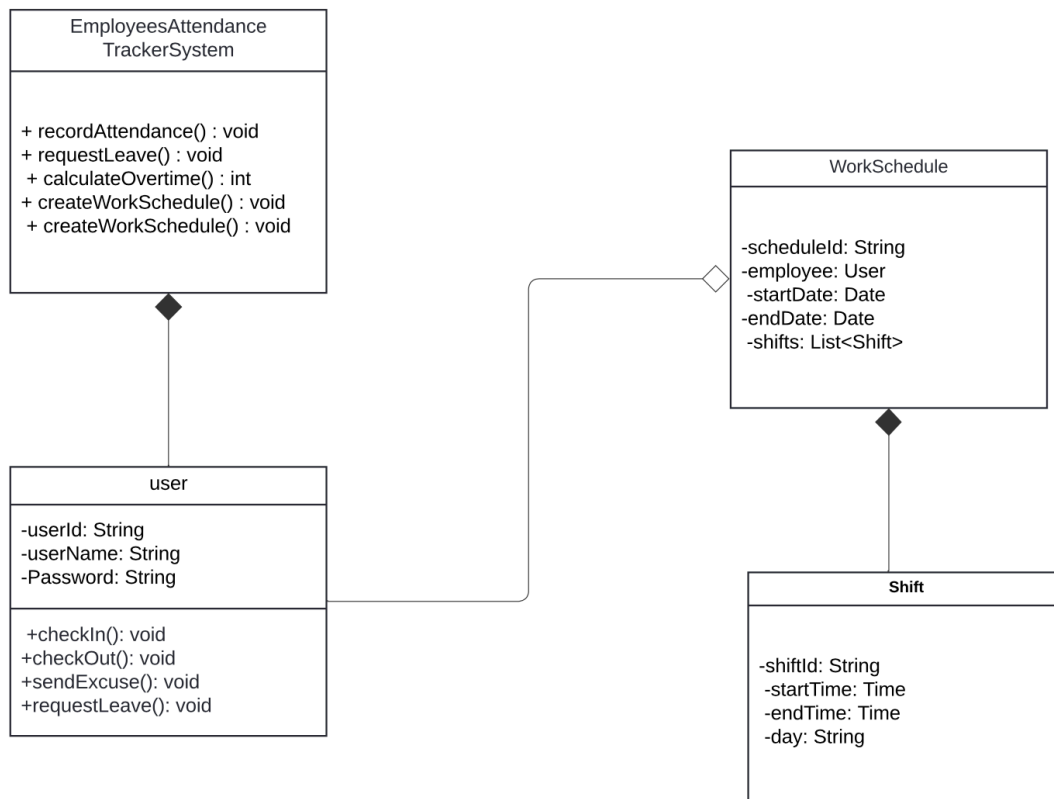
Represents a system for tracking employees' attendance.

Has methods like recordAttendance(), requestLeave(), calculateOvertime(), createWorkSchedule(), and monitorAttendance().

2-User:

Represents a user in the system.

Has attributes like userId, userName, password.



(create schedule Class digram)

Has methods like `checkIn()`, `checkOut()`, `sendExcuse()`, `requestLeave()`.

3-WorkSchedule:

Represents a custom work schedule for employees.

Has attributes like `scheduleId`, `employee` (associated with a `User`), `startDate`, `endDate`, and `shifts` (a list of `Shift` instances).

Represents a composition relationship with `Shift`.

4-Shift:

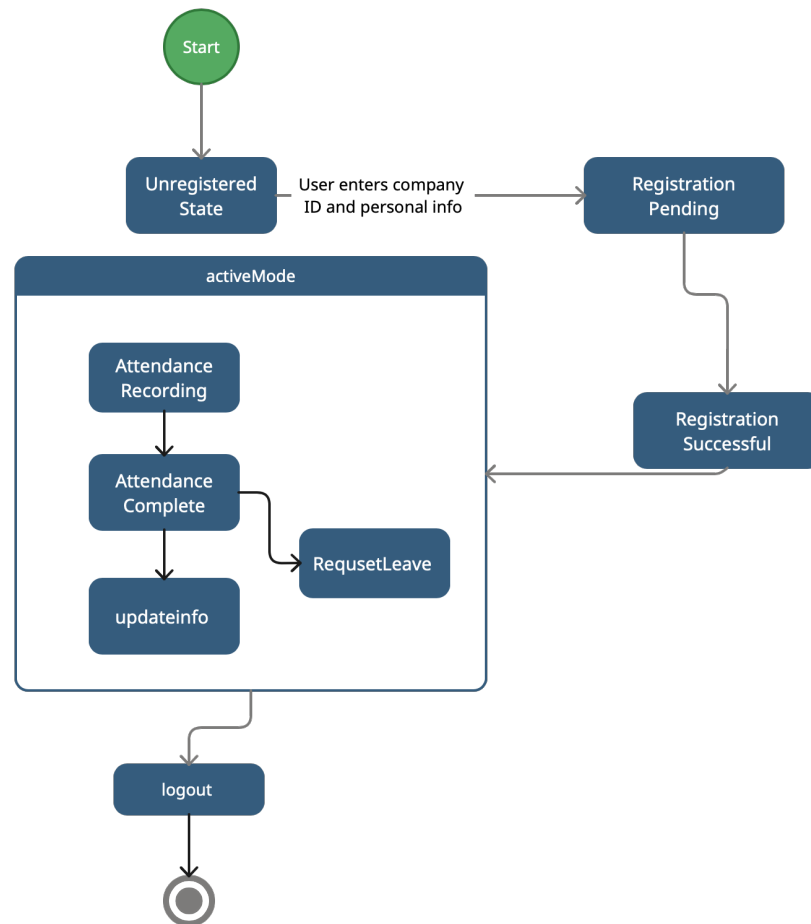
Represents a shift in a work schedule.

Has attributes like `shiftId`, `startTime`, `endTime`, and `day`.

5.2 State Diagrams :

State diagrams represent the various states that a system or an object can assume and the transitions between these states. They are crucial for modeling the dynamic behavior of a system.

The summary of State Diagrams :



Unregistered State:

Initial state where a user enters the company ID and personal information.

Transition: Moves to the "Registration Pending" state.

Registration Pending State:

Represents that the registration request is pending.

Transitions:

If registration is successful, moves to the "Registration Successful" state.

If registration fails, stays in the "Registration Pending" state.

Registration Successful State:

Represents that the registration was successful.

Transitions:

Moves to the "Active Mode" composite state.

active Mode Composite State:

A composite state that encapsulates the active modes: "Attendance Recording," "Complete Attendance," "Update Info," and "Request Leave."

Transitions:

If the user requests attendance recording, moves to the "Attendance Recording" state. And then move to the user completes attendance.

If the user chooses to update info, moves to the "Update Info" state.

If the user requests leave, moves to the "Request Leave" state.

Attendance Recording State:

Represents the process of recording attendance.

Transitions:

Moves back to the "Active Mode" composite state If user .

Complete Attendance State:

Represents the completion of the attendance recording process.

Transitions:

Moves back to the "Attendance Recording State" if Attendance was not registered successfully.

Update Info State:

Represents the state where the user updates their information.

Request Leave State:

Represents the state where the user requests leave.

Logout State:

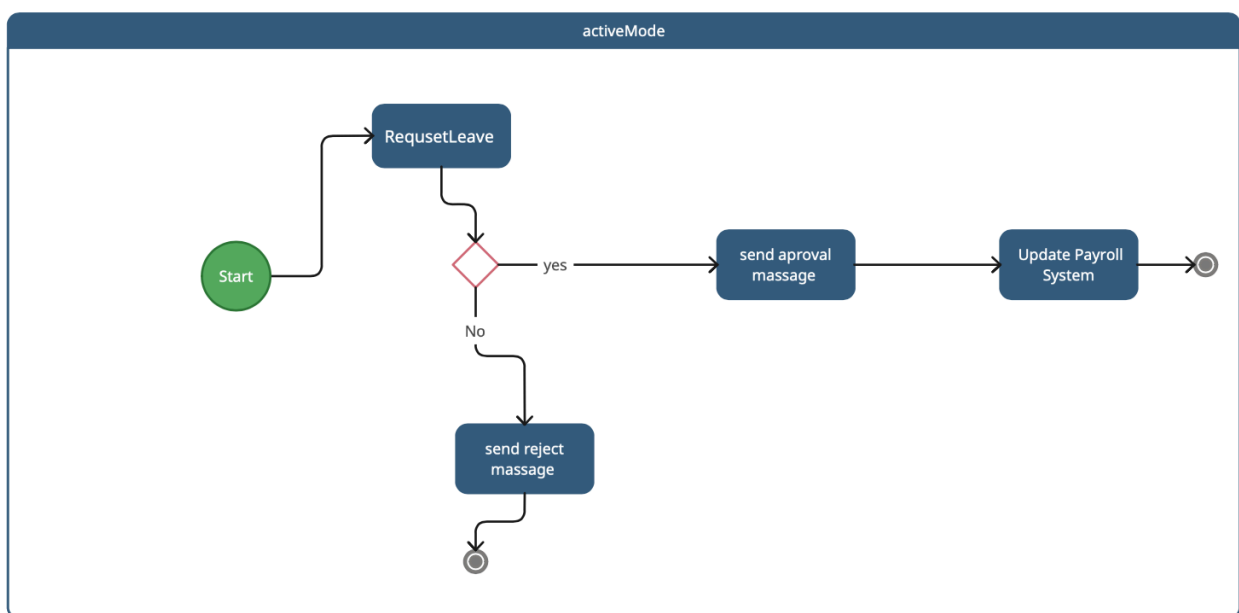
Represents the state where the user logs out.

Transitions:

Moves to the "End" state.

End State: Represents the end of the process.

State digram for Request Leave State:



Requesting Leave:

This is the initial state when an employee submits a leave request.

The system checks whether the employee has submitted all required information.

If yes, it transitions to the Approval Pending state.

If no, it transitions to the Rejection state.

Approval Pending:

In this state, the system awaits approval or rejection from a manager.

If the leave request is approved, it moves to the Update Payroll state.

If rejected, it moves to the Rejection state.

Update Payroll:

If the leave request is approved, the system updates the payroll using the `updatePayroll()` method.

This state reflects the processing of the leave request.

After completion, it moves to the Closed state.

Rejection:

If the leave request is rejected, the system notifies the employee by triggering the `sendRejection()` method.

After notifying, it moves to the Closed state.

Closed:

The leave request process is considered complete, and the system is in a closed state.

Transitions:

From Requesting Leave to Approval Pending upon submitting a leave request.

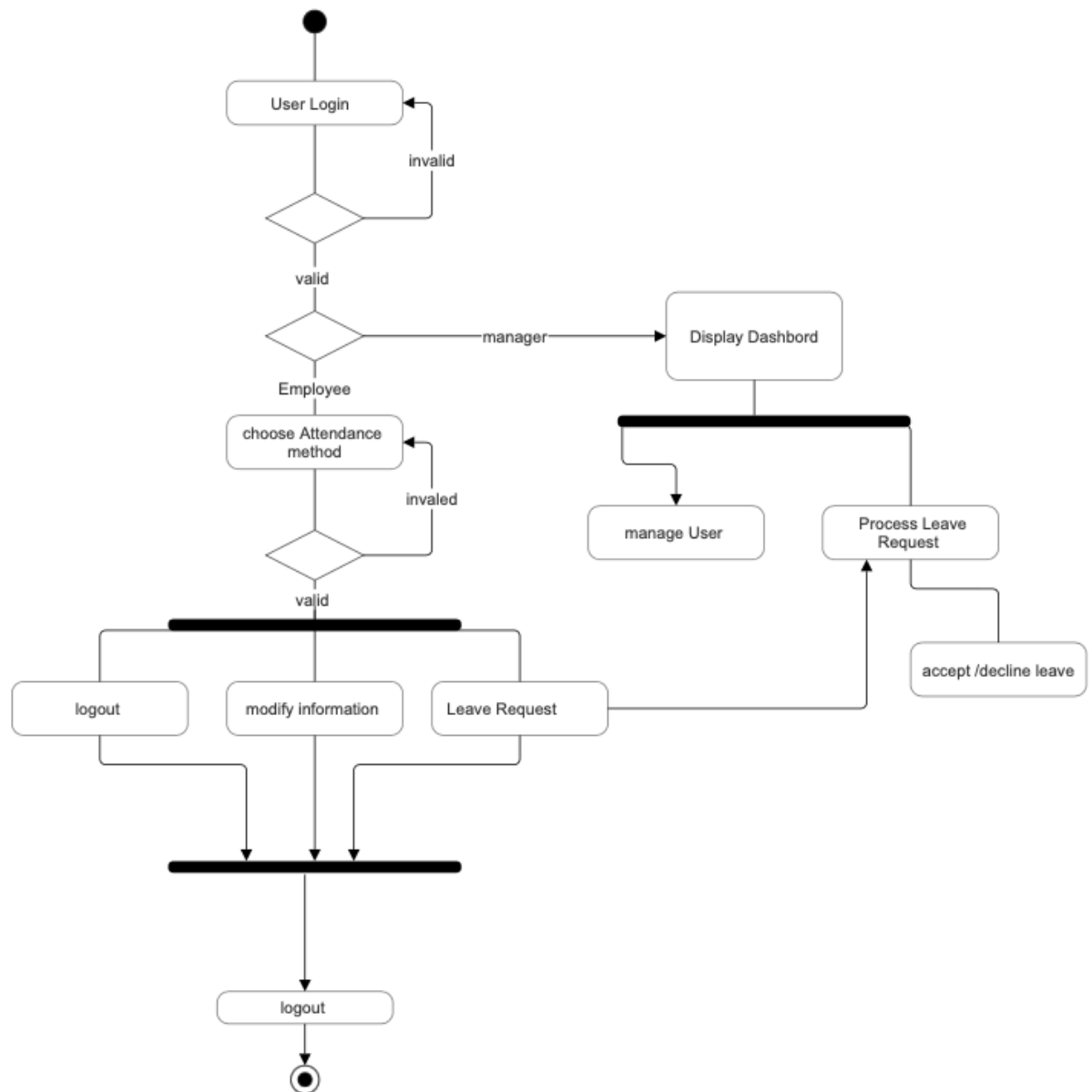
From Approval Pending to Update Payroll if the request is approved.

From Approval Pending to Rejection if the request is rejected.

From Update Payroll and Rejection to Closed after processing.

5.3 Activity Diagrams :

Activity diagrams are another type of UML diagram that illustrates the flow of activities and actions within a system or business process. They're particularly useful for modeling workflows and the sequence of steps in a process. Here's an explanation of the key components in the activity diagram you provided for the Employee Attendance Tracker System:

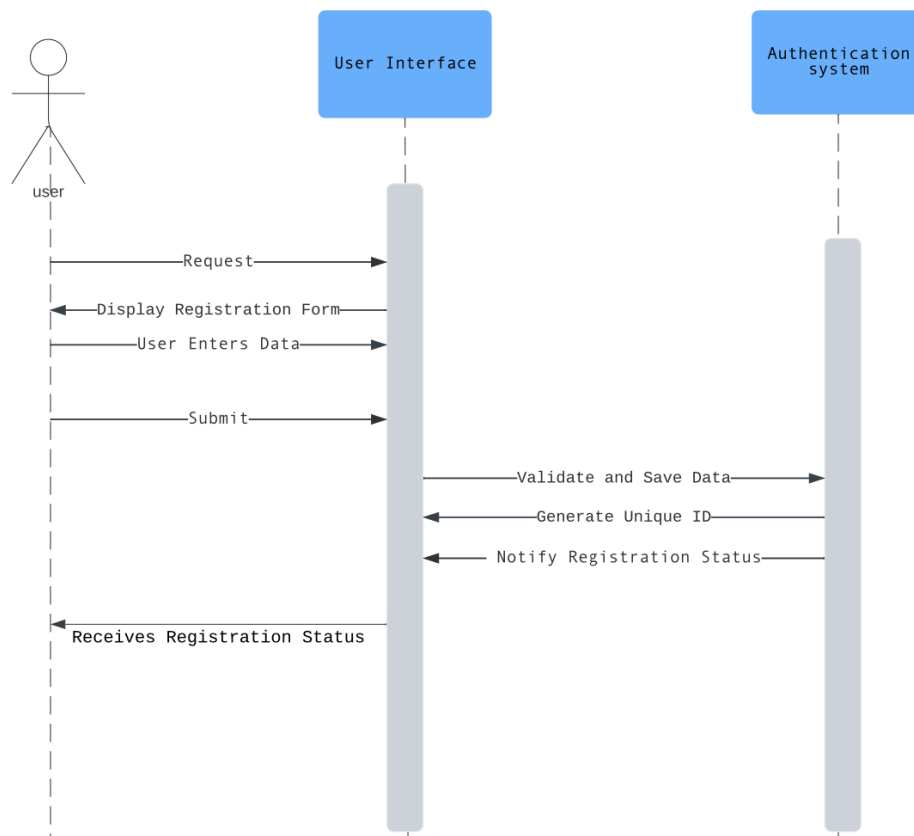


5.4 Sequence Diagrams :

Sequence diagrams illustrate the interactions and communication sequences between different components or objects in a system. They emphasize the chronological order of messages and the flow of control

The following sequence diagram provides a detailed overview of the processes involved in registration and capturing attendance, verifying user identity, within the Employee Attendance Tracker System. Each step is meticulously outlined, encompassing user interactions, system responses, and potential outcomes. The diagram aims to offer a comprehensive understanding of the system's functionality during attendance tracking and leave management.

The following sequence diagram involve registration process :



1. User Requests Registration:

- The process begins with the "User" initiating a request for registration by interacting with the "User Interface."

2. Display Registration Form:

- The "User Interface" responds by displaying the registration form, expecting the user to enter necessary details.

3. User Enters Data:

- The "User" enters relevant information into the registration form, such as personal details or any required data.

4. Submit Data :

- The "User" submits the entered data through the "User Interface."

5. Validate and Save Data :

- The "User Interface" sends the entered data to the "Authentication System" for validation and storage.

6. Generate Unique ID :

- The "Authentication System" generates a unique identifier for the registered user.

- Note: This unique ID is crucial for distinguishing and identifying individual users in the system.

7. Notify Registration Status :

- The "Authentication System" processes the data, validates it, and notifies the "User Interface" of the registration status.

Note: in this step could involve actions like checking for duplicate records, ensuring data completeness, and saving the user's information in the database.

8. User Receives Registration Status:

- The "User Interface" receives the notification about the registration status and displays it to the user

The following sequence diagram involve attendance process:

1. User Requests Attendance :

- The process begins with the "User" initiating a request for attendance through the "User Interface."

2. Authenticate User :

- The "Authentication System" verifies the user's identity before proceeding with the attendance capture process.

3. Check Attendance Method:

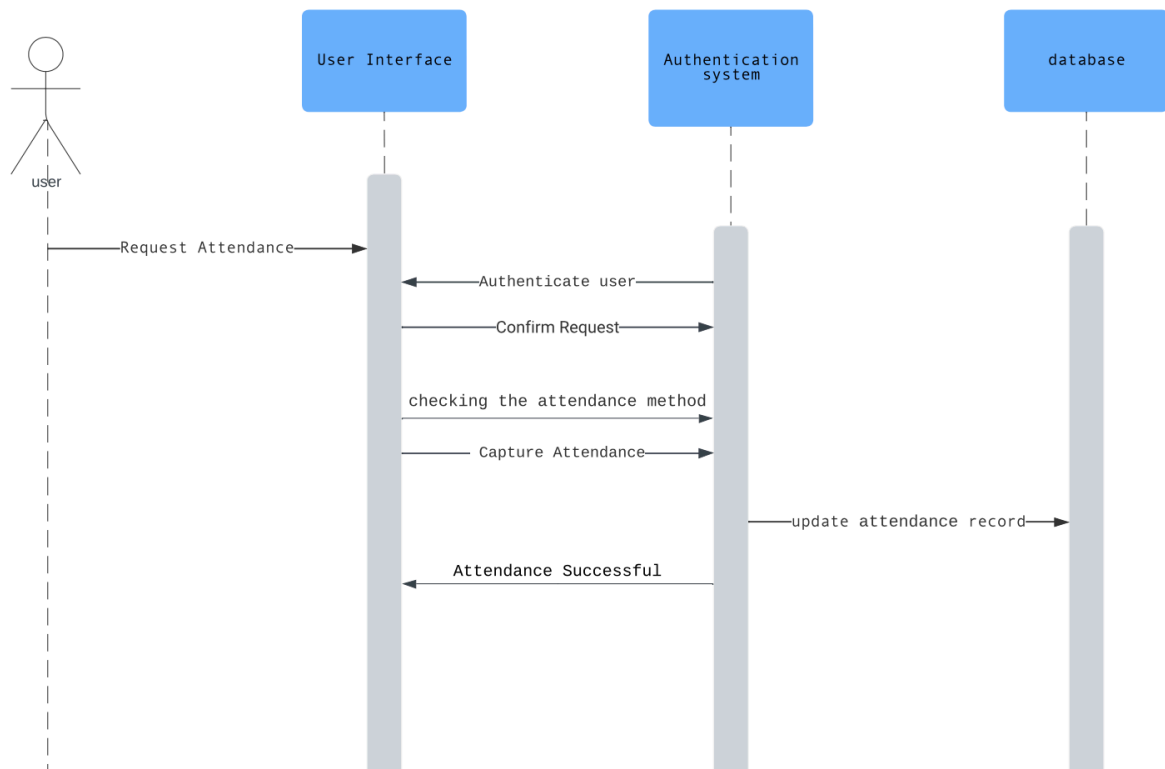
- The system checks the user's selected attendance method, which could be a photo, voice recognition, or fingerprint scanning.

4. Verify Attendance :

- The system initiates the verification process for the captured attendance data based on the selected method.

- For example, if the user chose a photo, the system verifies the captured photo against the stored data.

5. Update Database :



(sequence diagram attendance process)

The system updates the database with the user's attendance information, marking the attendance as recorded.

6. Attendance Successful :

- If the verification is successful, the system records the attendance, and the process proceeds to completion.

7. Notify Attendance Status :

- The "Authentication System" notifies the "User Interface" of the attendance status, indicating whether it was successful or not.

8. User Receives Attendance Status :

- The "User Interface" displays the attendance status to the user, providing feedback on the success or failure of the attendance capture.

The following sequence diagram involve calculate overtime process:

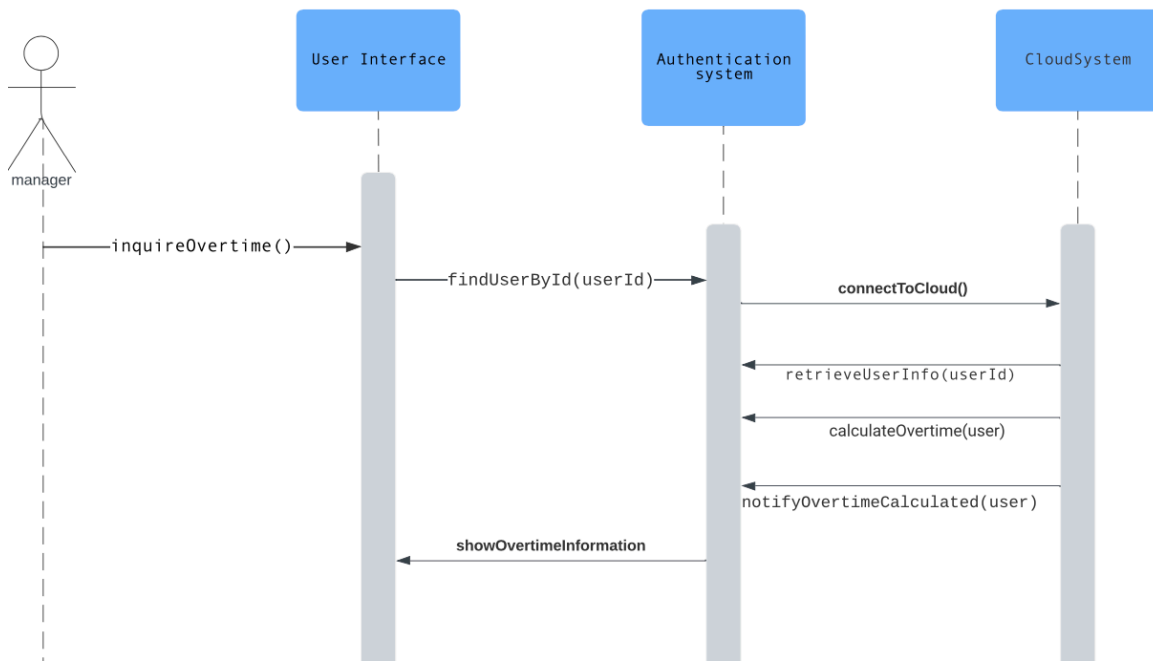
1-Manager Inquires Overtime:

The sequence starts with the "manager" making a request to inquire about overtime.

2-AuthenticationSystem: Find User by ID :

The request is sent to the "AuthenticationSystem" (formerly "EmployeesAttendance") to find the user based on their ID.

3-Connect to Cloud :



(sequence diagram calculate overtime process)

The "AuthenticationSystem" initiates a connection to the "CloudSystem" to access user-related information.

4-Retrieve User Information :

The "CloudSystem" retrieves the necessary user information based on the user ID provided by the "AuthenticationSystem."

5-CloudSystem: Calculate Overtime:

Once the user is identified, the "AuthenticationSystem" communicates with the "CloudSystem" (formerly "UserManager") to retrieve the necessary information for calculating overtime.

6-CloudSystem Notifies Overtime Calculated :

The "CloudSystem" calculates the overtime based on the retrieved information and notifies the "AuthenticationSystem" that the calculation is complete.

7-Show Overtime Information to Manager

The "AuthenticationSystem" then displays the calculated overtime information to the manager. This step involves presenting the details to the user interface or generating a report.

6. HUMAN INTERFACE DESIGN

6.1 Overview of the user interface

In this section, we will provide a comprehensive overview of the user interface for the "Attendance Tracer System." The user interface is designed with a user-centric approach, ensuring that users can interact with the system seamlessly and efficiently. This overview will highlight the key components and functionalities of the user interface, giving users a clear understanding of how they will engage with the system.

The user interface of the "Attendance Tracer System" is presented through a user-friendly web-based platform. This platform offers a visually appealing and intuitive interface that enhances the user experience. It employs a clean and organized layout to ensure easy navigation and accessibility for users.

Upon accessing the system, users are greeted with the login interface. This interface provides a simple web form where employees can enter their company ID. If the employee is accessing the system from the same location as the company, they can proceed to verify their identity. The login interface includes input fields for the username, password, and a "sign in" button. Additionally, it incorporates options for employees to choose their preferred method for identity verification, such as a fingerprint scanner, a camera for capturing face images, or a microphone for recording voice samples.

Once logged in, the attendance time and date sent to the cloud storage and employees can access various features and functionalities through the user interface. For instance, the interface includes a service to viewing his overtime hours and record departure, in addition to emergency leave request section where employees can submit requests for emergency leave directly to their managers. This section presents an input form where employees can enter details such as the reason for the emergency leave, and any additional attachment. Clear instructions guide employees through the submission process, ensuring that all necessary information is provided.

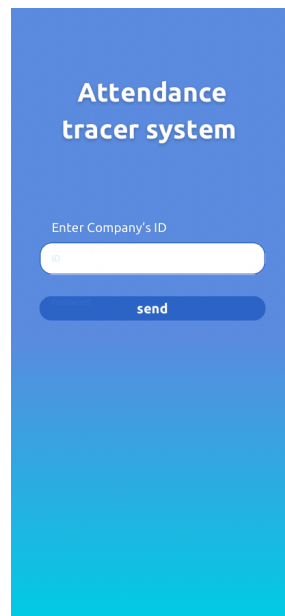
Another section of the user interface is dedicated to the submission of absence excuses. Here, employees can send excuses for their absences to their managers through the system. The interface includes an input form where employees can provide a description of the reason for their absence, attach supporting documentation or evidence if required, and provide any other relevant details.

For manager, the user interface offers a dedicated Manager Dashboard section. This section provides a comprehensive overview of employee attendance, allowing managers to monitor and analyze attendance data effectively. The Manager Dashboard presents attendance summaries, employee information, work schedules, timesheets, and overtime details. It includes features for reviewing and approving employee requests for emergency leave and managing excuses for absences. The dashboard interface is designed to streamline managers' tasks and provide easy access to relevant attendance-related information.

Overall, the user interface of the "Attendance Tracer System" aims to provide a user-friendly, intuitive, and visually appealing experience for all users. It enables employees to conveniently interact with the system, submit requests, and communicate with their managers. Simultaneously, it empowers managers with comprehensive tools and insights to effectively manage employee attendance.

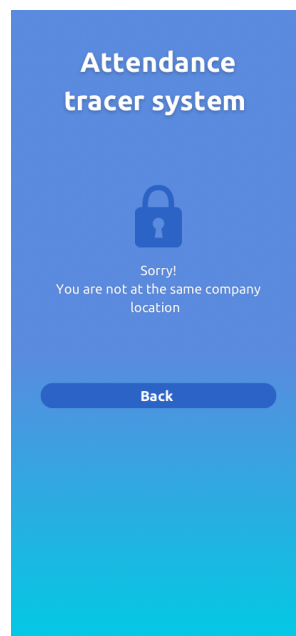
6.2 Detail Design of the User Interface

In this section, we will present an illustrative overview of the user interfaces that individuals will encounter while utilizing the "Attendance Tracer System." These interfaces have been specifically designed to ensure a user-friendly experience, allowing users to seamlessly interact with the system and effectively manage attendance-tracking tasks.



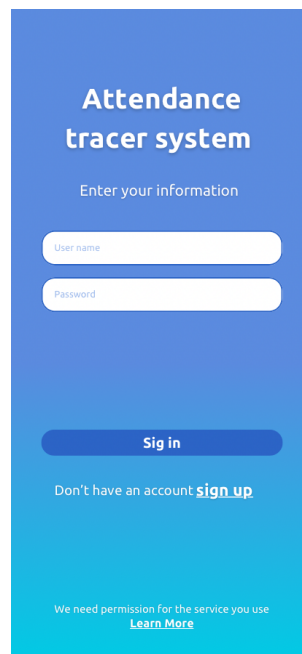
The image shows a mobile application interface for the "Attendance tracer system". The background is a blue gradient. At the top, the title "Attendance tracer system" is displayed in white. Below the title, there is a text input field with the placeholder "Enter Company's ID". Below the input field is a blue button with the text "send" in white.

The first interface is displayed to allow the employee enter the company ID to connect with company system and data.



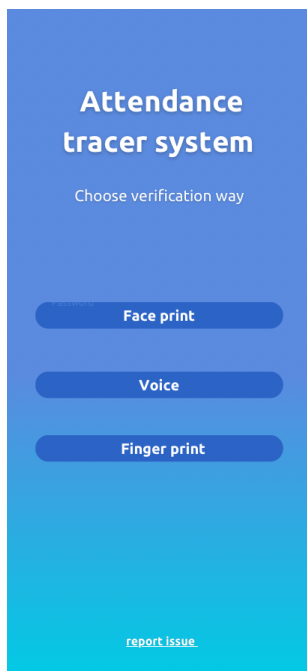
The image shows a mobile application interface for the "Attendance tracer system" displaying an error message. The background is a blue gradient. At the top, the title "Attendance tracer system" is displayed in white. Below the title, there is a blue icon of a padlock with a keyhole. Below the icon, the text "Sorry!" is displayed in white, followed by "You are not at the same company location" in a smaller white font. At the bottom, there is a blue button with the text "Back" in white.

After user entered the company's ID the system will check if the employee in the same physical company location or not if he is not, the. System displays the rejection interface.



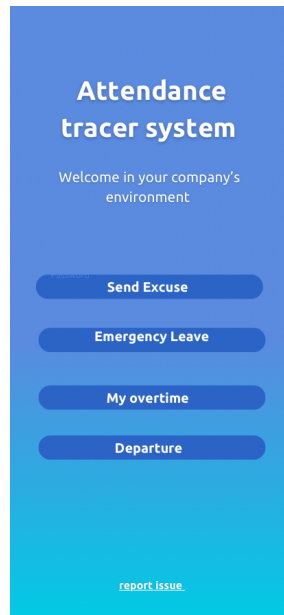
The image shows a mobile app interface for an 'Attendance tracer system'. The background is a blue gradient. At the top, the title 'Attendance tracer system' is displayed in white. Below the title, the text 'Enter your information' is shown. There are two white input fields: 'User name' and 'Password'. Below these fields is a blue 'Sig in' button. Under the button, there is a link 'Don't have an account sign up'. At the bottom, there is a small text 'We need permission for the service you use' with a link 'Learn More'.

If the employee's location match company's location then the above interface will be appear to complete authorisation. Requesting employee to enter user name and password.

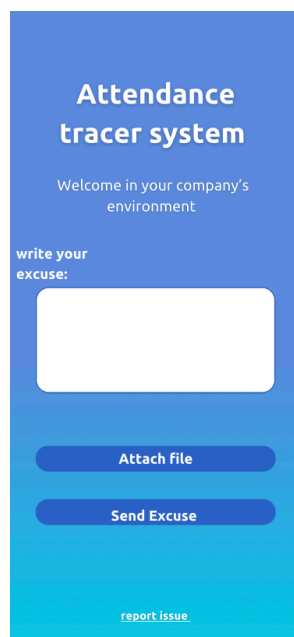


The image shows a mobile app interface for an 'Attendance tracer system'. The background is a blue gradient. At the top, the title 'Attendance tracer system' is displayed in white. Below the title, the text 'Choose verification way' is shown. There are three blue buttons: 'Face print', 'Voice', and 'Finger print'. At the bottom, there is a link 'report issue'.

After fill information the interface of choosing the satisfactory method for verification appeared with three options(Face print - voice - finger print). After valid verification the time and date of attendance will be stored in company's cloud storage.



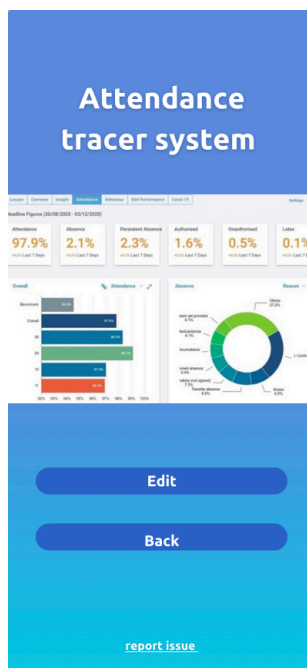
After successful log in the above services's interface displayed in which the user can send excuse for his manger about being absent, or request to leave from work because of emergency, or to see the overtime hours, if the working hours are over then employee can choose the 'Departure' option, so his departure information stored in cloud.



This interface to allow employee writing his excuse to be send to his manager. Also employee able to attach file for the excuse.

The screenshot shows a mobile application interface titled "Attendance tracer system". Below the title, it says "Welcome in your company's environment". The main section is titled "write your emergency reason:" and contains a text input field with the placeholder "Write here...". Below the input field are two buttons: "Attach file" and "Send request". At the bottom, there is a link labeled "report issue".

Also employee by facing the above interface can send a request for the manager about emergency reason for leave.



This illustrated interface is for the manager to monitor the attendance of the employees in the form of a real time dashboard that receives employees' information from company cloud.

The screenshot shows a mobile application interface for an 'Attendance tracer system'. The title 'Attendance tracer system' is at the top. Below it, the section 'Custom work schedule' is displayed. There are two input fields: 'Customize work dates:' and 'Customize holidays dates:', each followed by a calendar icon. At the bottom, there are two large blue buttons labeled 'Save' and 'Back'. A small link 'report issue' is at the very bottom.

Interface to enable the manager to create a custom work schedule that contains calendar for workdays and holiday days (time and date). So that the system accurately calculate and record work hours on workdays and rest days.

The screenshot shows a mobile application interface for an 'Attendance tracer system'. The title 'Attendance tracer system' is at the top. Below it, the section 'Register a new employee' is displayed. There are three input fields: 'Name', 'Password', and 'National ID'. Below these fields, the text 'Verification method:' is shown. There are three rows of verification options: 'Face print:', 'Voice:', and 'Finger print:', each with an 'Enter' button. At the bottom, there is a large blue button labeled 'Sign Up'. Below the 'Sign Up' button, there is a link 'Have an account? Log In' and a small text 'We need permission for the service you use' with a link 'Learn More'.

This interface for register a new employee if he is not already on the system, which is require the user information like name, password and national ID, in addition to his properties for verification like: face print, voice and face print.