

ATTENDANCE MANAGEMENT SYSTEM

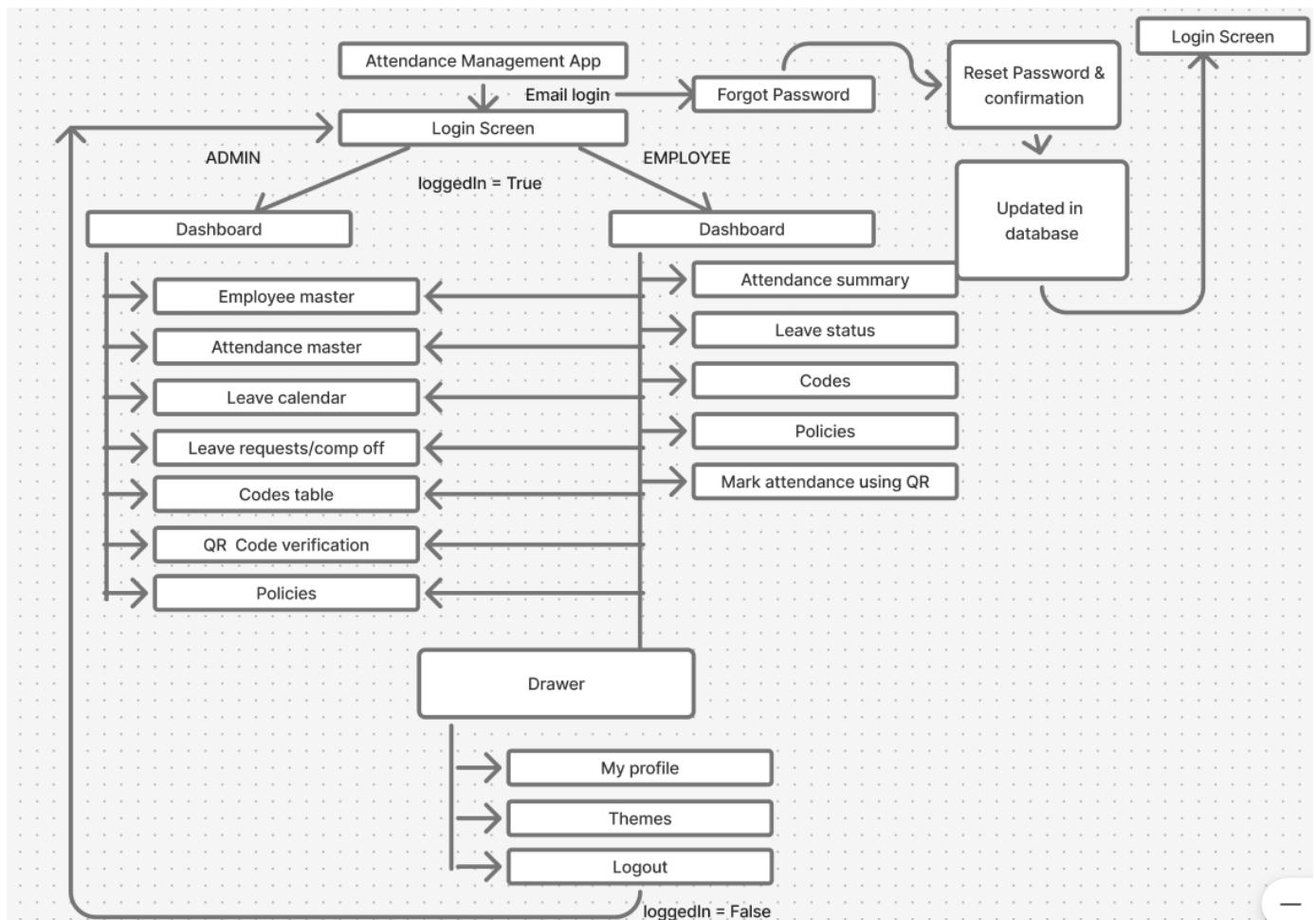
DOCUMENTATION

NAME: V SANJANA

ABSTRACT

AttendEase is a cross-platform attendance management solution developed using Flutter and Firebase aimed at automating employee attendance tracking in modern organizations. It supports both admin and employee roles, each with dedicated dashboards and functionality. The system offers QR code-based check-in/check-out, policy management, leave tracking and a real-time attendance calendar. AttendEase bridges traditional HR tasks with digital efficiency.

FLOW DIAGRAM - An overview



KEY FEATURES

Authentication:

- Secure email login/logout with Firebase Auth.
- Password reset and confirmation flow.

Role-Based Access:

- Differentiated dashboards for **Admin** and **Employee**.
- Role logic driven by SharedPreferences and Firestore roles.

QR Code-Based Attendance:

- Admins generate daily QR codes tied to office location and type (check-in/check-out).
- Employees scan QR codes using in-app camera to mark attendance.
- Security ensured through unique 25-character HEX keys validated from Firestore.

Attendance Management:

- Admin view with detailed daily attendance, edit options, hours worked, and PDF generation.
- Employee view with current day attendance and check-in/out options.

Leave & Comp Off Management:

- Employees apply for leave/comp off.
- Admins approve/reject with mandatory reasons.
- Leave types pulled dynamically from codes_master.

Company Policy Management:

- Admins can add/edit/delete policies.
- Employees can only view policies with toggleable detail view.

Codes Table:

- Dynamic management of office locations, leave types, statuses, etc.

Leave Calendar:

- Highlights public holidays, weekends, attendance status (present/absent).
- Displays employee names for absentees, and holiday details on tap.

Theming & Profile:

- Light/dark/system theme toggle using Provider.
- Profile screen with user details fetched from Firestore.

MAJOR SCREENS

Login Screen

- Email authentication
- Forgot password → Reset and confirmation

Admin Dashboard

- Employee Master
- Attendance Master
- Leave Calendar
- Leave Requests / Comp Off
- Codes Table
- QR Code Verification
- Policy Management

Employee Dashboard

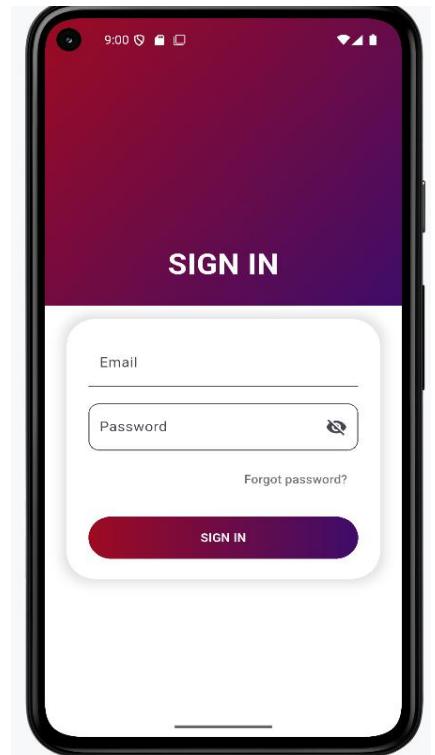
- Attendance Summary
- Leave Status
- Codes Viewer
- Company Policies
- QR Attendance (Check-In/Out)

Drawer (Common)

- My Profile
- Theme Toggle
- Logout

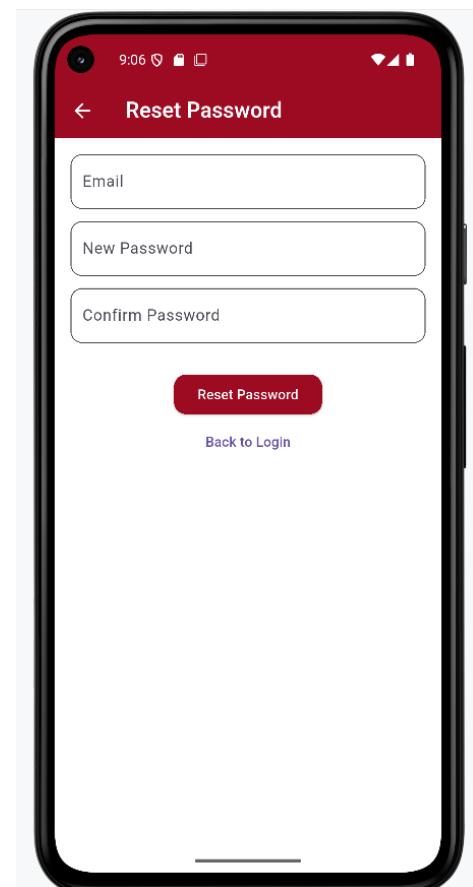
LOGIN SCREEN

Purpose
Provides a secure login interface for users to authenticate into the attendance app.
Features
<ul style="list-style-type: none">Input fields for email and password.Password field uses obscure Text for privacy."Forgot password?" link that navigates to password reset.Validates the credentials.UI includes a top gradient header and modern card layout for login.



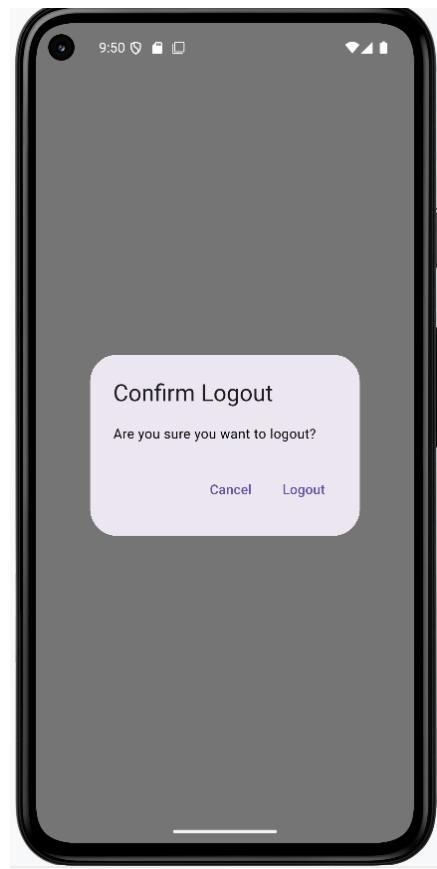
FORGOT PASSWORD

Purpose
Allows users to reset their password if forgotten.
Features
<ul style="list-style-type: none">Input fields for email, password and password confirmationConfirm password must matchThe newly entered user's password is updated in the user collection.Shows error messages if user not found or if update fails.Success message is displayed and navigates back to login screen.Login again with new password to enter the application.



LOGOUT SCREEN

Purpose
Prompts user to confirm logout and handles cleanup on logout.
Features
<ul style="list-style-type: none">• Dialog box is triggered after clicking Logout in the drawer.• Marks user as logged out in Firestore database (isLoggedIn: false) – This ensures that if the phone is restarted, the current user will be logged in already.• Navigates back to the Login Screen• If the user cancels, it pops back to the previous screen.



ADMIN DASHBOARD

Purpose
To serve as the main dashboard for the admin, showing: <ul style="list-style-type: none">• Calendar view with holiday and attendance highlights• Weather info• Quick navigation to all key admin modules like employee master, attendance, codes, policies, QR generation etc.
Features

Interactive Calendar

Integrated TableCalendar to display:

- Holidays from leave_calendar Firestore collection (shown with black dot)
 - Weekends (highlighted with red dot and name)
- Attendance status:
- Red background** if some are absent
 - Names of absent employees shown under date
- Tap any day to see holiday details in a dialog.

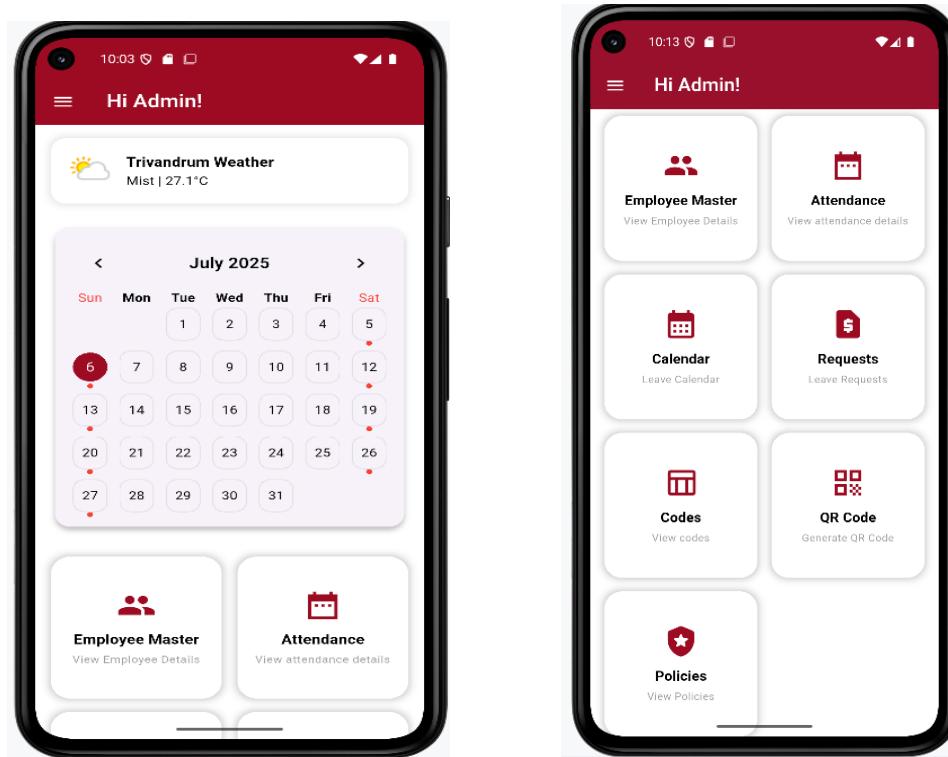
Weather Widget

- Fetches current weather and temperature for **Trivandrum** using WeatherAPI.
- Displays weather icon, condition and temperature.

Admin Menu Grid (7 Modules)

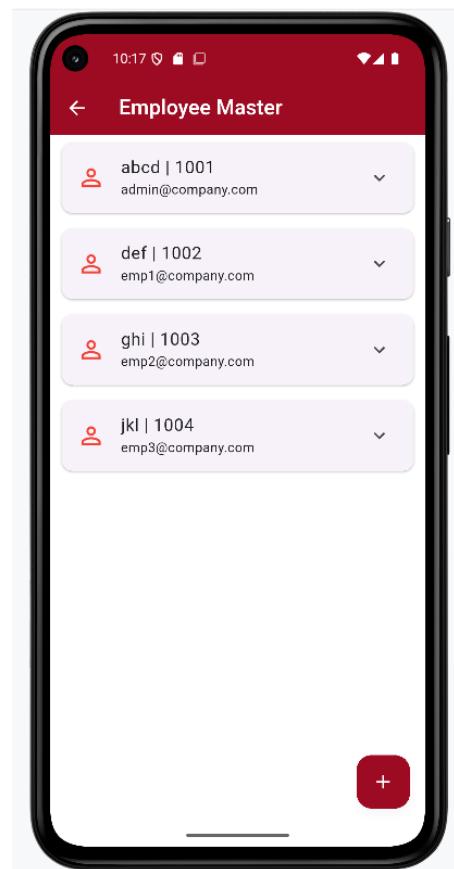
Each tile includes icon, title, and subtitle:

Label	Action / Navigates to
Employee Master	EmployeeMasterScreen – View/edit employees
Attendance	AdminAttendanceScreen – View attendance data
Calendar	LeaveCalendarScreen – See leave calendar
Requests	LeaveMasterScreen – Manage leave requests
Codes	CodesMasterScreen – View/edit code tables
QR Code	QRCodeGeneratorScreen – Generate QR codes
Policies	PolicyScreen – View / edit leave/policy information



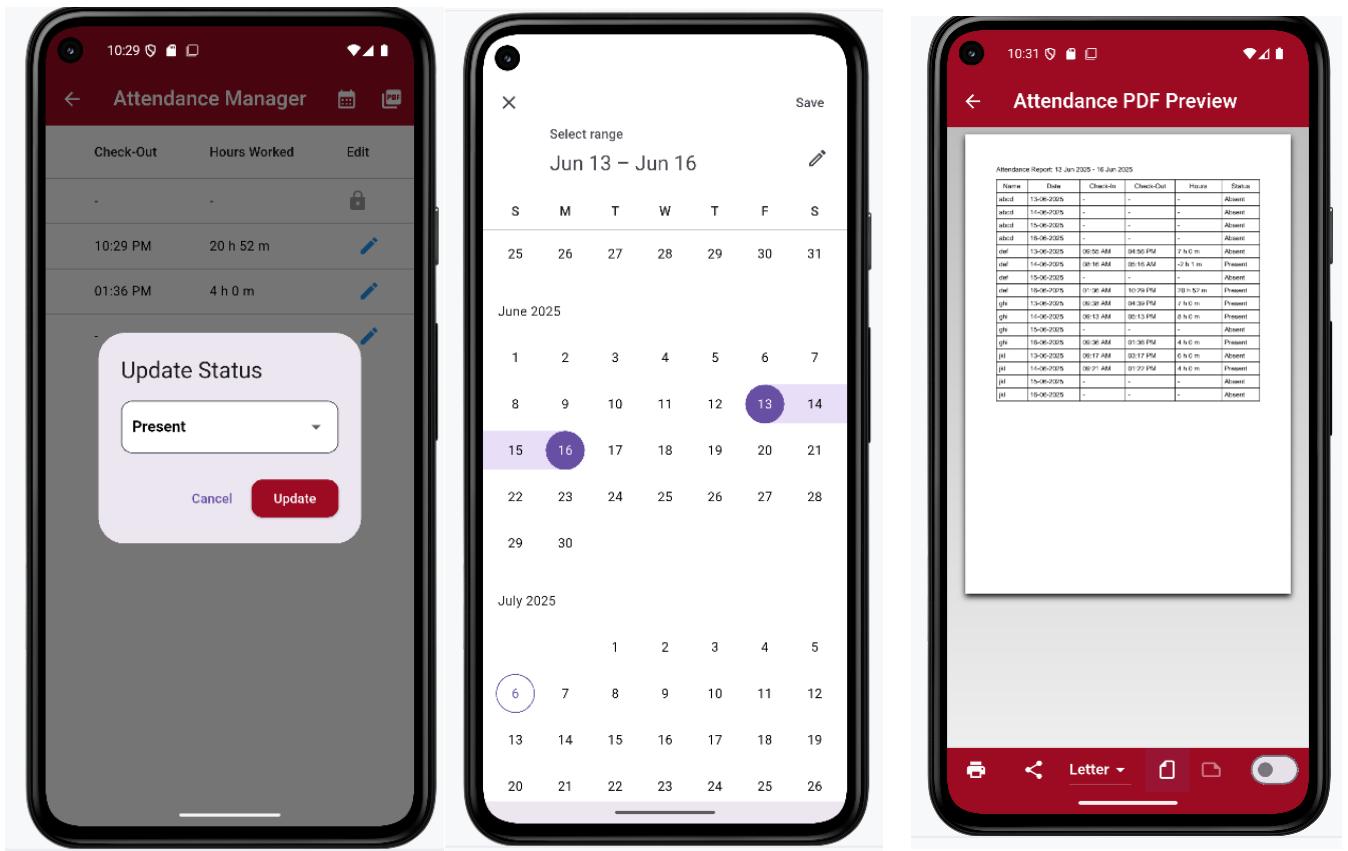
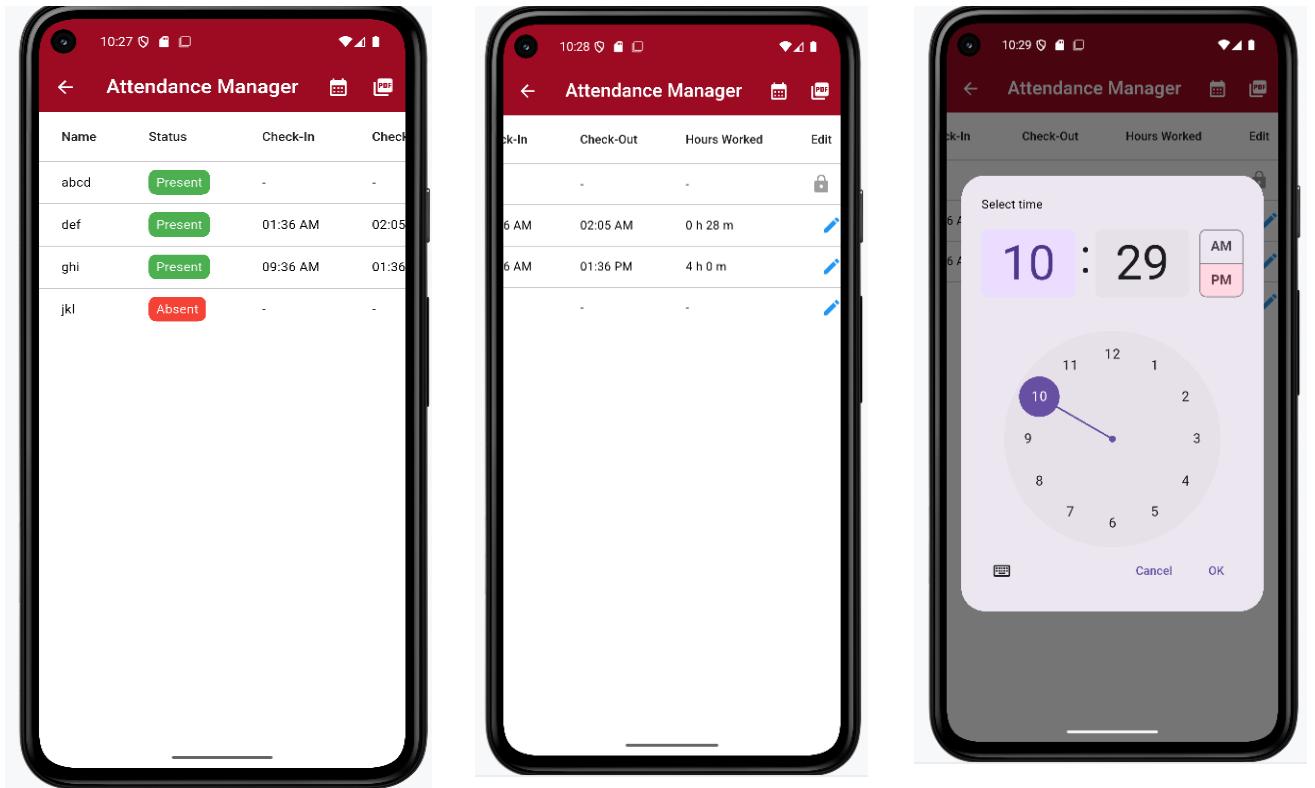
EMPLOYEE MASTER SCREEN

Purpose
To allow the admin to view, add, edit and delete employee records.
Features
<ul style="list-style-type: none">• Displays employee data using an expandable ExpansionTile for each employee.• Fetches real-time data.• Allows admin to:<ul style="list-style-type: none">◦ Add a new employee via a dialog.◦ Edit employee details (name, phone, designation, role, etc.).◦ Delete employee records (non-admin only).• New employee is created with a default password.• Role dropdown restricts values to either admin or employee.• Floating action button to trigger the Add Employee dialog.



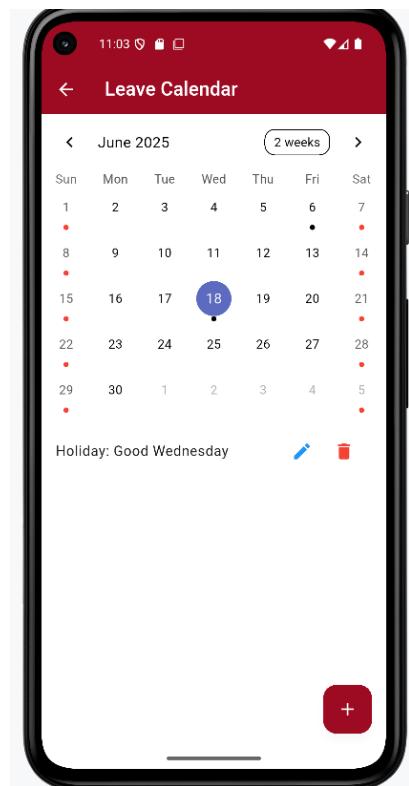
ATTENDANCE MASTER

Purpose
<ul style="list-style-type: none">• To allow the admin to view and manage attendance records of all employees for a specific date.• To generate a PDF attendance report for a selected date range.
Features
<ul style="list-style-type: none">• Automatically fetches attendance for the current date on screen load.• Allows date selection via a date picker to view past/future attendance.• Displays: Name, Status (color-coded), Check-In time (editable), Check-Out time (editable), Total hours worked. <p>Admin can edit:</p> <ul style="list-style-type: none">• Attendance status (Present, Absent, Half Day)• Check-in and check-out times via time pickers◦ Validates that check-out time is after check-in time.◦ Automatically calculates hours worked from check-in and check-out.◦ Generates a PDF report using printing and pdf packages:• Allows user to select a date range• Fetches attendance for all users over the selected period and Displays the pdf.



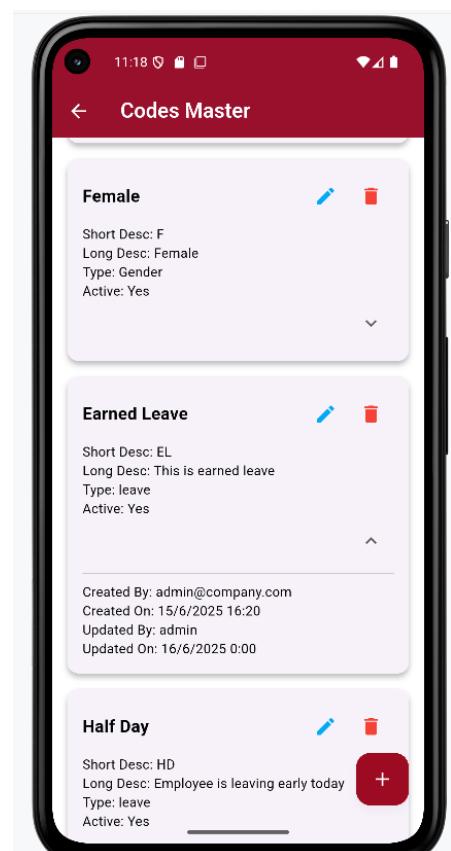
LEAVE CALANDER

Purpose
To manage and visually display holidays and weekends on a calendar interface for employees and admins.
Features
<ul style="list-style-type: none">Calendar UI using table_calendar.Fetches holidays from Firestore leave_calendar collection.Highlights:<ul style="list-style-type: none">Weekends (Saturday and Sunday) in red.Holidays with black dots.Shows list of holidays for a selected day.Admin-only capabilities:<ul style="list-style-type: none">Add new holidays.Edit existing holidays.Delete holidays.



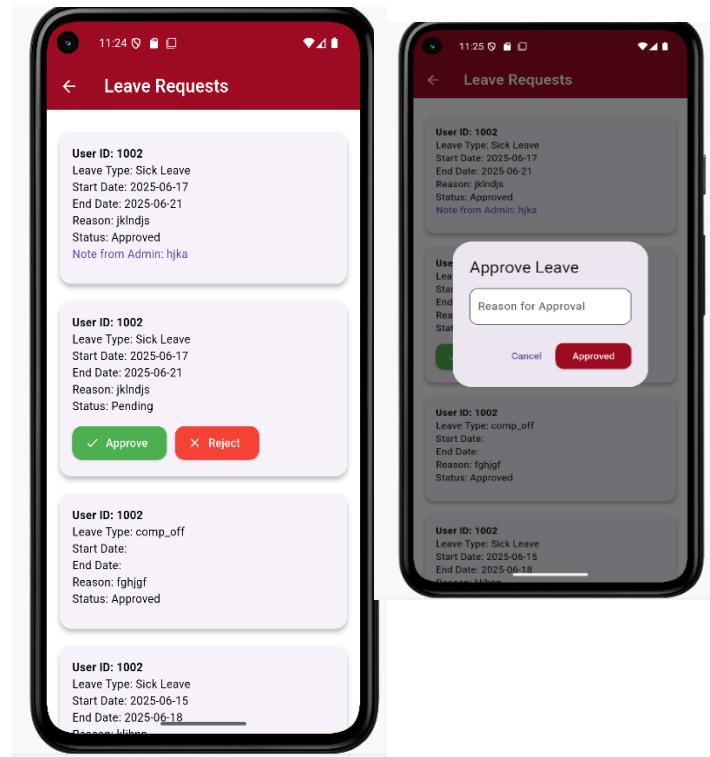
CODES MASTER

Purpose
To manage reference data (codes) used across the app, such as leave types, office locations, statuses etc.
Features
<ul style="list-style-type: none">Loads codes from codes_master collection.Displays:<ul style="list-style-type: none">Name, short and long descriptions.Type and active status.Toggle to view metadata:<ul style="list-style-type: none">Created By, Created On.Updated By, Updated On.Admin-only capabilities:<ul style="list-style-type: none">Add new code entries.Edit existing code entries.Delete code entries.Floating action button restricted to admins via role check (userRole from SharedPreferences).



LEAVE MASTER SCREEN

Purpose
To allow admins to view, approve, or reject employee leave applications with reasoning, supporting different leave types.
Features
<ul style="list-style-type: none">Fetches leave requests from the leaves collection.Supports: Regular leaves (Start Date, End Date). Comp Off leaves (Date of Working, Date of Leave).Shows reason for leave and current status.Displays admin note if present.Admin must approve or Reject leave with a reason for decision.



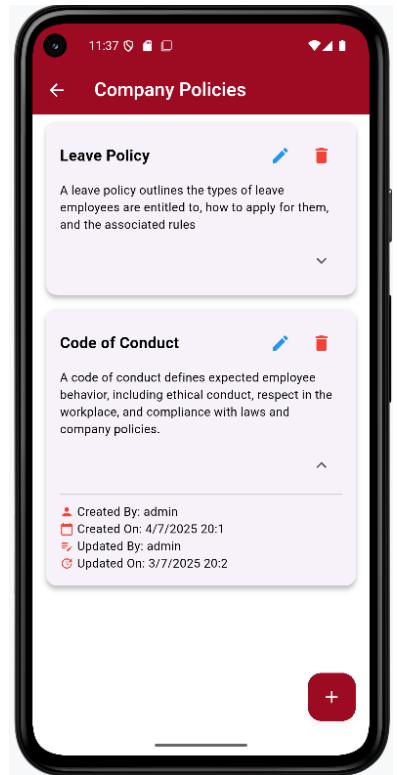
QR CODE VERIFICATION

Purpose
To allow admins to generate secure, unique QR codes for Check-In or Check-Out purposes, linked to specific office locations and saved in Firestore for employee attendance tracking.
Features
<ul style="list-style-type: none">Fetches office locations from codes_masterQR type: Check-In or Check-OutAutomatically generates a 25-character secure HEX key.Saves QR data to FirestoreThis helps in tracking employees attendance and location.



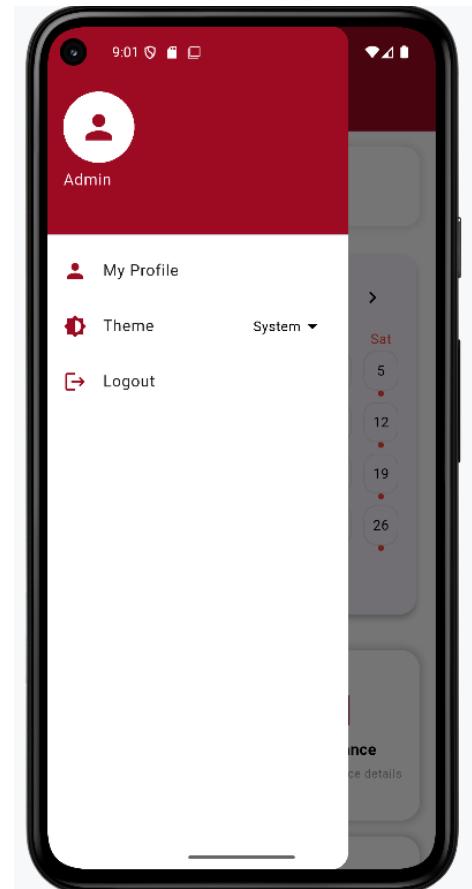
POLICIES SCREEN

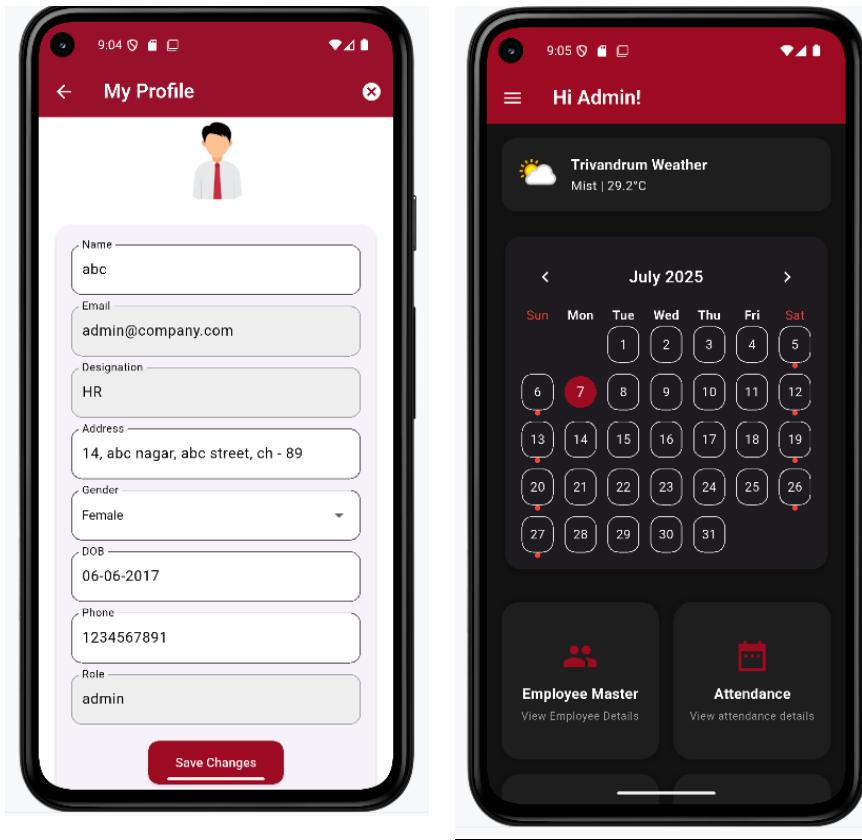
Purpose
To manage and display company policies dynamically with admin privileges to add, update, or delete entries.
Features
<ul style="list-style-type: none">• Fetches policies from policies collection in Firestore.• Displays:<ul style="list-style-type: none">◦ Policy name◦ Policy description◦ Expandable view for metadata• Admin-only capabilities:<ul style="list-style-type: none">◦ Add new policy via dialog◦ Edit existing policy◦ Delete policy



NAVIGATION DRAWER – (Same for employee side too)

Purpose
To make the navigation purpose easy and dynamic.
Features
<ul style="list-style-type: none">• Admin Profile Access<ul style="list-style-type: none">◦ Drawer contains a "My Profile" link which navigates to Profile Screen, where all the user details are available.◦ Admin will be able to edit certain fields if needed.• Dynamic Theme Switcher<ul style="list-style-type: none">◦ Choose from: System, Light, or Dark theme using Dropdown Button.◦ Integrated with Provider to persist theme state.• Secure Logout Option<ul style="list-style-type: none">◦ Drawer also provides a Logout option.◦ Navigates to Logout Screen, which handles log out and user status cleanup.





EMPLOYEE DASHBOARD

Purpose

To serve as the main dashboard for the employee, showing:

- Calendar view with holiday and attendance highlights of themselves.
- Weather info
- Quick navigation to all key admin modules like attendance marking, codes, policies, Leave application and viewing etc.

Features

Interactive Calendar

Integrated Table Calendar to display:

- Holidays from leave_calendar Firestore collection (shown with black dot)
 - Weekends (highlighted with red dot and name)
- Attendance status:
- Red background if some he/she was absent on that day.
- Tap any day to see holiday details in a dialog.

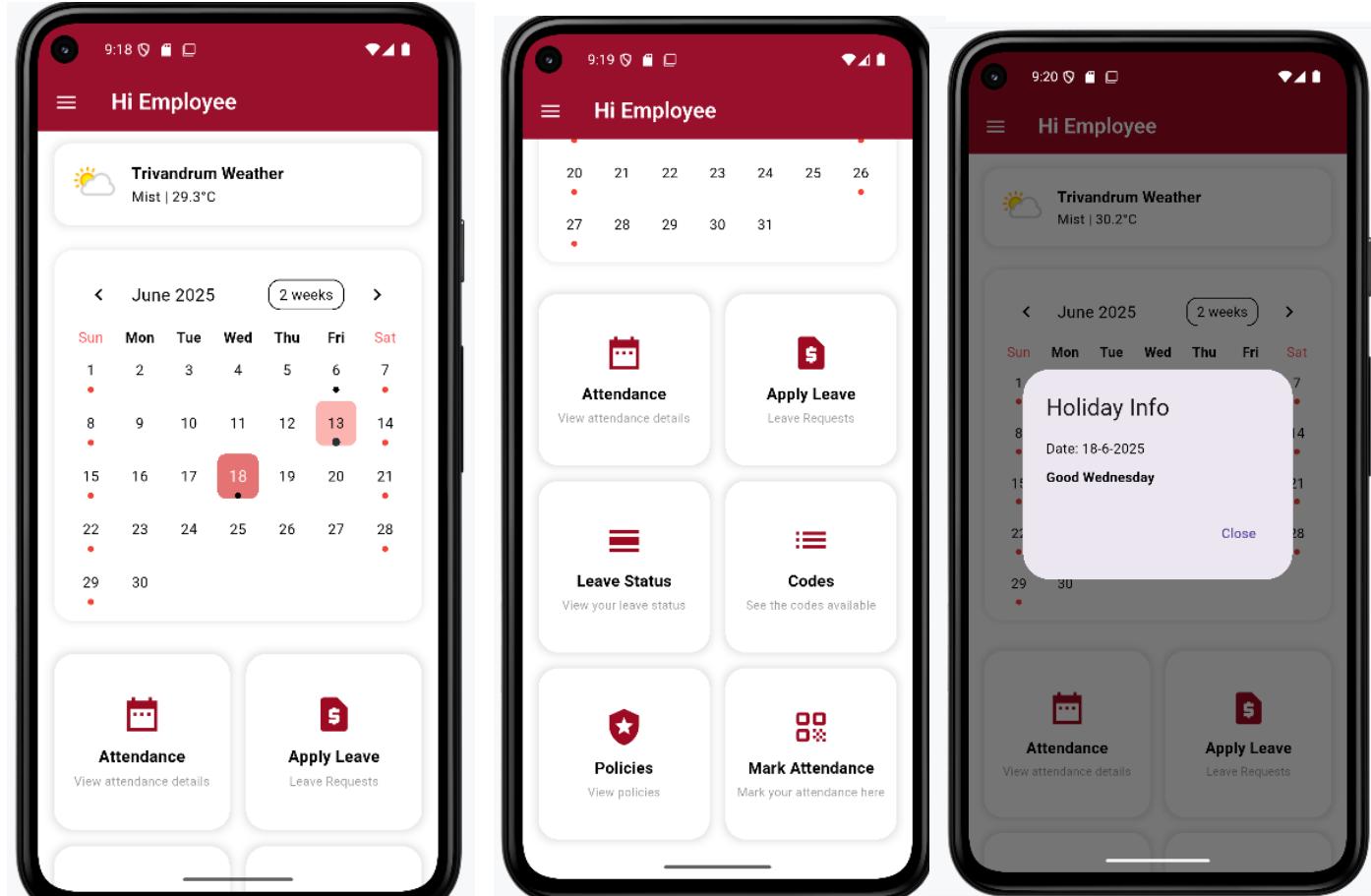
Weather Widget

- Fetches current weather and temperature for **Trivandrum** using WeatherAPI.
- Displays weather icon, condition and temperature.

Admin Menu Grid (7 Modules)

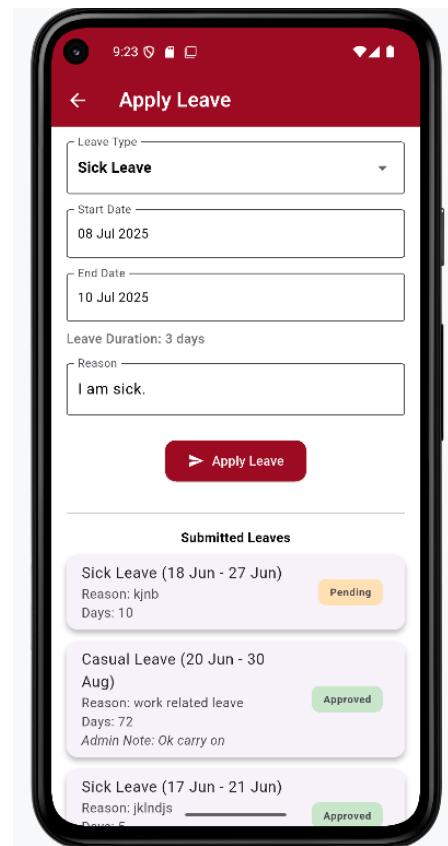
Each tile includes icon, title, and subtitle:

Label	Action / Navigates to
Attendance	Mark attendance using QR Code
Apply Leave	He/she can apply leave through this module
Leave Status	All the status of applied leaves will be available here with admin's note (pending, accepted, rejected)
Codes	View various codes in the code table which are active
Policies	View all policy information which are active



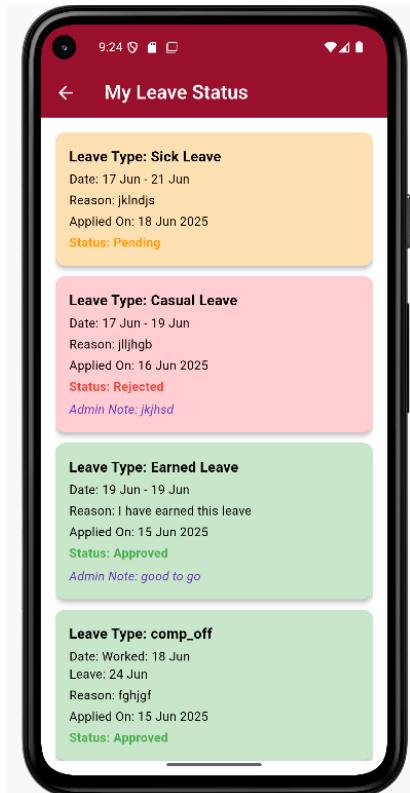
APPLY LEAVE

Purpose
It allows employees to apply leave on the basis of different types of leave types available.
Features
<ul style="list-style-type: none">Employee will be able to apply for different types of leaves. (sick leave, casual leave, earned leave, Comp off)Employee will also be able to apply for half a day.If the start and date is provided, the leave duration is calculated by itself.Reason for the leave must be provided.Status of the leave (pending, approved, rejected) is displayed below after submitting.



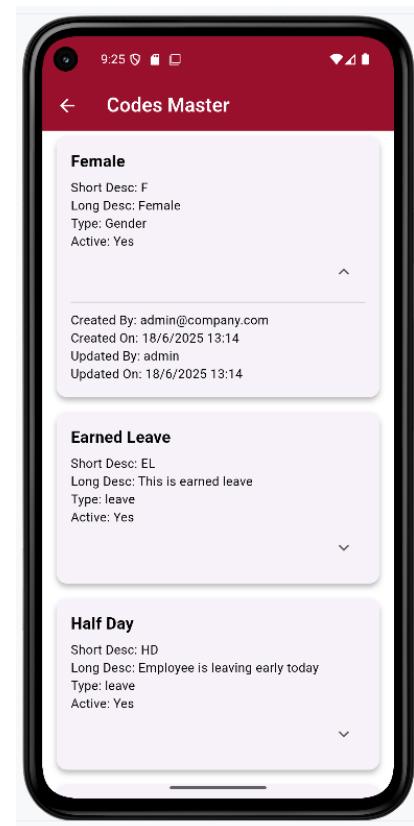
LEAVE STATUS

Purpose
It allows employees to view the admin's response for their leave application.
Features
<ul style="list-style-type: none">Employee can see the status of their leave application.Different colour codes like red for rejection, green for approval and yellow for pending is provided for enhanced user experience.The reason of approval/rejection provided by the admin can also be viewed .



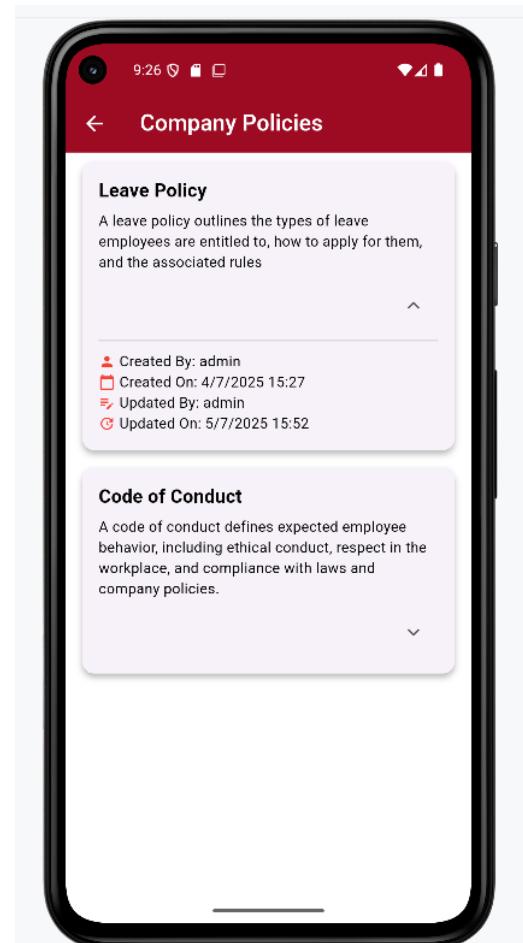
CODES MASTER

Purpose
To view varied reference data (codes) used across the app, such as leave types, office locations, statuses etc for easy reference for employee.
Features
<ul style="list-style-type: none">• Loads codes from codes_master collection.• Displays:<ul style="list-style-type: none">◦ Name, short and long descriptions.◦ Type and active status.• Toggle to view metadata:<ul style="list-style-type: none">◦ Created By, Created On.◦ Updated By, Updated On.



POLICIES SCREEN

Purpose
To display company policies to the employees.
Features
<ul style="list-style-type: none">• Fetches policies from policies collection in Firestore.• Displays:<ul style="list-style-type: none">◦ Policy name◦ Policy description◦ Expandable view for metadata



MARK ATTENDANCE USING BY SCANNING THE QR CODE

Purpose
To Scan QR Code to mark his/her attendance
Features
<ul style="list-style-type: none">• Employee scans QR code• Parse and validate data:<ul style="list-style-type: none">◦ Check if the scanned QR exists in Firestore.◦ Validate securityKey, date, and type (check-in/out).• If valid, mark attendance in the Firestore attendance collection



DATA FLOW OF THE PROJECT

attendance > 1002_13062025		More in Google Cloud
default	attendance	1002_13062025
+ Start collection	+ Add document	+ Start collection
attendance >	1002_13062025 >	+ Add field
codes_master	1002_14062025	checkInTime: 13 June 2025 at 09:55:41 UTC+5:30
leave_calendar	1002_16062025	checkOutTime: 13 June 2025 at 16:56:03 UTC+5:30
leaves	1002_18062025	createdBy: "self"
policies	1002_20062025	createdOn: 16 June 2025 at 12:56:53 UTC+5:30
qrCodes	1002_25062025	date: 13 June 2025 at 12:57:06 UTC+5:30
user	1003_13062025	name: "def"
	1003_14062025	status: "Absent"
	1003_16062025	updatedBy: "admin"
	1004_13062025	updatedOn: 16 June 2025 at 12:56:27 UTC+5:30
	1004_14062025	userId: 1002

Authentication Flow

- User logs in using email and password (Firebase Auth).
- On success, user role (admin or employee) is fetched from Firestore and stored locally using SharedPreferences.
- Role determines navigation to the AdminDashboard or EmployeeDashboard.

QR Code Generation (Admin)

- Admin selects:
 1. Office location (fetched from codes_master where type = 'officeLocation').
 2. QR type (check-in or check-out).
- System generates a 25-character hex securityKey.
- The QR data (with type, officId, securityKey, generatedBy, and date) is saved to qrCodes collection in Firestore.

QR Scan and Attendance Marking (Employee)

- Employee clicks "Check-In" or "Check-Out", which opens the QR scanner.
- QR code is scanned and decoded into JSON.
- The app verifies QR securityKey matches the one in Firestore for current date, type and office.

If valid:

- Attendance is written to attendance collection using document ID format: userId_ddMMyyyy.
- Fields include userId, checkInTime / checkOutTime, status, markedBy, updatedOn.

Policy Management

- Admins can add/edit/delete policies in the policies collection.
- Fields like policyName, policyDescription, createdBy, updatedBy are used.
- Employees can only view the policy list (CRUD can only be done by admin).

Codes Table

- Used to manage dropdown values like:
 - Leave types
 - Attendance statuses
 - Office locations
- All entries are stored in codes_master.
- Only admins can perform CRUD on this table.

Leave and Comp Off

- Employees apply for leave or comp off via leave application module (with dynamic leave types from codes_master).
- Requests are saved in leaves collection with fields like:
 - leaveType, startDate, endDate, reason, status, reasonFromAdmin.

- Admins review and approve/reject the requests, and must enter a reason (mandatory).
- Rejected/approved requests are shown to employees with colored status.

Leave Calendar & Attendance View

- Admin calendar view shows:
 - Public holidays (from leave_calendar) using red/black/yellow dots.
 - Absent employees under each day.
 - Status coloring (red = someone absent).
- Clicking on a holiday shows a dialog with holiday name, date and office.

Profile & Role Detection

- On login, employee details are fetched using email from employees collection.
- Profile screen displays name, email, ID and other details aesthetically.

Themes and Settings

- Theme (light/dark/system) is toggled using **Provider** and stored locally.
- Applied consistently across all screens.

FUTURE ENHANCEMENTS OF THE PROJECT

1. Automated Reminders

Pushing notifications to remind employees to check-in/out and give alerts for leave approvals or missing attendance.

2. Analytics Dashboard for admin

Preparing visual dashboards for monthly attendance trends, leave patterns and department-wise absenteeism to enhance admin's understanding of the data.

3. Chatbot Support

Integrate an in-app chatbot for quick FAQs and leave/attendance queries.

4. Email Notifications

Send emails for leave approvals/rejections, Policy updates and Attendance irregularities.

CONCLUSION

AttendEase serves as a comprehensive digital solution designed to revolutionize the way organizations manage attendance, leave requests, and HR records. With a focus on efficiency, accuracy and user experience, the platform leverages the power of Flutter and Firebase Firestore for real-time data management.

Through features like QR-based check-in/out, role-based access control, automated leave workflows, and an intuitive admin dashboard, AttendEase not only reduces manual errors but also fosters transparency and accountability across the organization.

The app ensures:

- Secure, contactless attendance using dynamic QR codes.
- Real-time updates for both employees and administrators.
- Centralized policy and code management to align with organizational standards.
- Responsive and modern UI/UX for enhanced usability across all devices.

With a scalable backend, modular architecture, and clearly defined user flows, AttendEase is future-ready—well-suited for integration automated alerts, chatbots analytics dashboards and much more.