



EAST WEST UNIVERSITY

Project Report

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Project Title: Mess Management App

Submitted by

Sheikh sazzaduzzaman

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Department of Computer Science and Engineering

Submitted to

Dr. Md Mostofa Kamal Rasel

Associate Professor

Department of Computer Science and Engineering

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1. Introduction:

The Mess Management App allows a vast variety of features related to planning meals per day, joint costs, and monthly payments in one Android-based app. The application has been created with help of Android Studio and it is based on Activities, Intents, Layouts, and local databases that help to provide a user with an interactive and smooth user experience. The various screens are easily navigated through to allow users to record meals, manage the expenses, view balances, and monthly check-ups.

The application has a role-based access control system so that the Admin users can manage the members, determine the price of their meals and control their expenses, whereas the Member ones can add the meals, check the status of their balance and pay. SQLite and firebase hybrid data storage are used to provide offline and cloud-synchronization. Background tasks like data synchronization and computations are managed effectively to ensure that user experience is not compromised. The system enhances transparency, minimizes manual errors, and prevents conflict among members of the mess as the financial data is presented in a clear and accurate manner.

1.1 Background:

In common living situations like bachelor messes or hostels, common budgeting like day to day meals is usually done manually. The error in calculations, absence of records and lack of understanding among the members are caused by this traditional approach. Since the use of a smartphone has become the regular case, it is necessary to have a digital solution that will be able to automate the process of tracking meals and expenses, as well as monthly settlement.

The Mess Management App would be able to solve these problems and provide a centralized Android-based application in which every member would be able to engage in an open way. SQLite allows operating it offline to perform daily business, whereas Firebase provides cloud storage and device synchronization. The application will make mess management easier and bring fairness and responsibility among its users through the combination of user-friendly interface, data storage organization, and automatic calculations.

1.2 Challenges faced in development:

1. **Layout Design:** The design of a clean and easy to use interface was not easy as several features needed to be shown to the user without overwhelming them. To ensure consistency of all the screens and still make them usable demanded proper planning.
2. **Role-Based Access Control:** Admin and Member functionalities had to be implemented distinctly, and a robust permission handling was needed to ensure that only the authorized access control and prevent unauthorized information access to retain the integrity of the data.
3. **Database Synchronization:** It was complicated to maintain the data flow between SQLite (local) and Firebase (remote). It was necessary to make sure that offline information could be later synchronized and did not have to be duplicated or lost.
4. **Accuracy in the calculation:** Calculation of meal rate and due was necessary keeping in mind the various types of meals, costs, payment details on each member.
5. **Data Validation & Error Handling:** Data validation, bad entries and error recovery in unusual cases like data missing or network problems were the key problems in the development.
6. **UI Consistency:** It was a challenging process to ensure consistency in colors, button styles, and typography throughout the application and have several features in it.

2. Methodology :

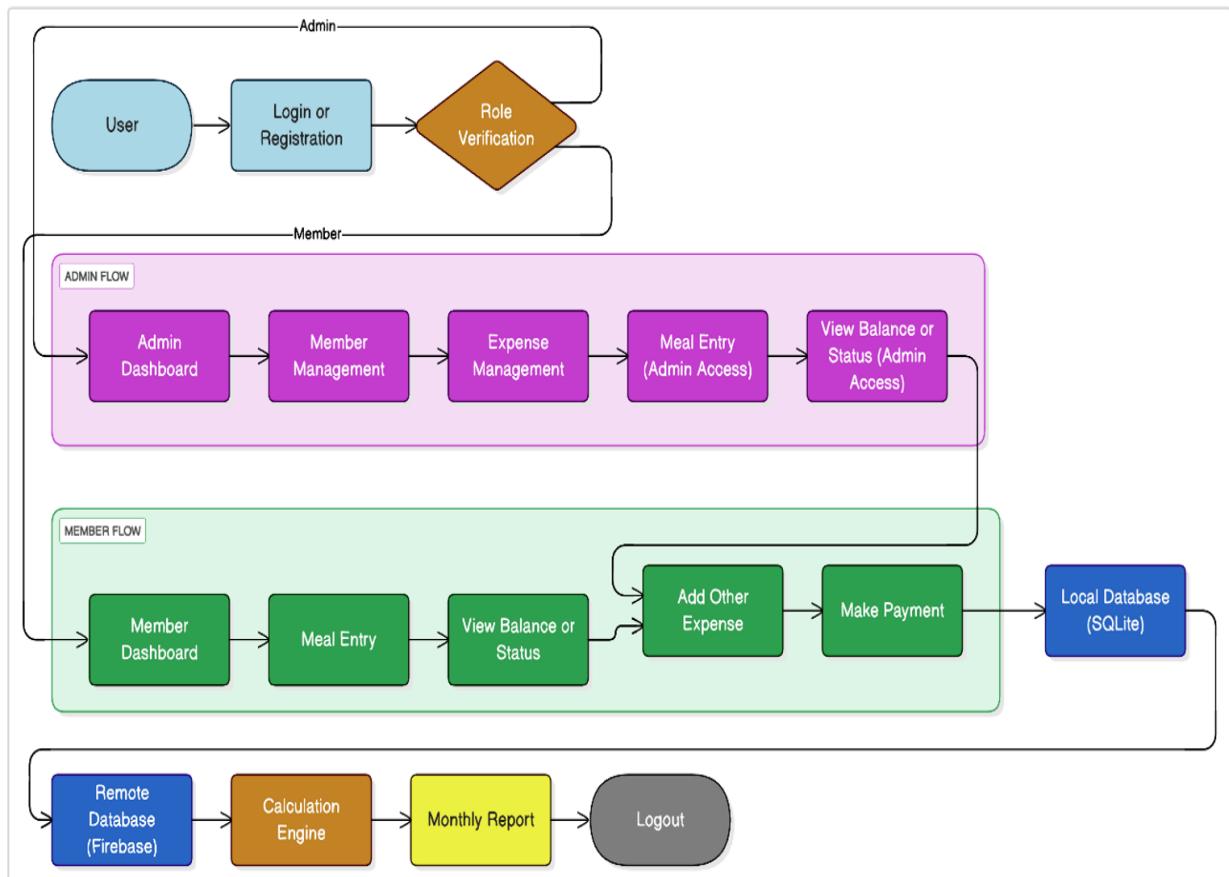


Figure 1: Data Flow Diagram

The system follows a structured workflow starting from user authentication to final report generation. After login or registration, the system verifies the user role (Admin or Member) and directs the user to the appropriate dashboard. Both roles can perform allowed actions such as meal entry, expense entry, and payment recording. All data is first stored in SQLite for offline access and then synchronized to Firebase. The calculation engine processes meal rates and dues, which are later used to generate monthly summaries and settlement reports.

3. Benefits / Usability:

The Mess Management App provides a number of advantages to mess members and administrators, which allows them to handle their daily management more effectively:

1. **Automated Meal Tracking:** The users will be able to log meals on a daily basis and less reliance on manual logging.
2. **Clear Cost Control:** The cost of all shared expenses is transparent, and this promotes justice amongst the members.
3. **Status of Real Time Balance:** Members are able to see paid and due at any point in time.
4. **Offline Access:** SQLite enables the user to retrieve and store data in absence of the internet.
5. **Cloud Synchronization:** Firebase provides secure backups of data and is multi-device compatible.
6. **Easy to Use Interface:** The app is easy to navigate as it has simple layouts and is user friendly to all users.

4. Implementation Details :

Mess Management App is designed using the latest methods of development on Android in order to be reliable and performance-oriented:

1. **Activities, Intents & Layouts:** Will be utilized in order to move around between login, dashboard, expense, and report screens.
2. **Local/Remote Databases:** SQLite is more stable with offline data, and Firebase is more stable with online data, which is synchronized and saved in a safe place.
3. **Calculation Engine:** It automatically computes a meal cost, total expense and dues per person.
4. **Secure Authentication:** The user credentials and role data are stored in a secure manner to avoid unauthorized access.
5. **UI Consistency:** The theme of consistency is applied to the entire application because it makes it easier to use.

The combination of these elements will result in a powerful and scalable system that can serve the purpose of real-life mess management.

4.1 Key Features:

➤ Sign Up and Login Pages

Sign Up Page: New users can register by entering personal information and selecting their role.



The sign-up page features a blue header bar with the text "Sign-Up to Continue" and a back arrow icon. Below the header are several input fields and labels:

- FULL NAME**: A text input field labeled "Full Name".
- CONTACT NUMBER**: A text input field labeled "Contact Number".
- HOME ADDRESS**: A text input field labeled "Home Address".
- PARENTS' CONTACT NUMBER**: A text input field labeled "Parents' Contact".
- USERNAME / EMAIL**: A text input field labeled "Email / Username".
- PASSWORD**: A text input field labeled "Password (use letters and numbers)".
- CONFIRM PASSWORD**: A text input field labeled "Confirm Password".
- REGISTER AS**: A section with two radio buttons: one selected for "Member" and one for "Admin".

A large green "Sign-Up" button is located at the bottom of the form.

Figure 2: Sign-Up Page

Login Page: Registered users authenticate securely to access their dashboard.

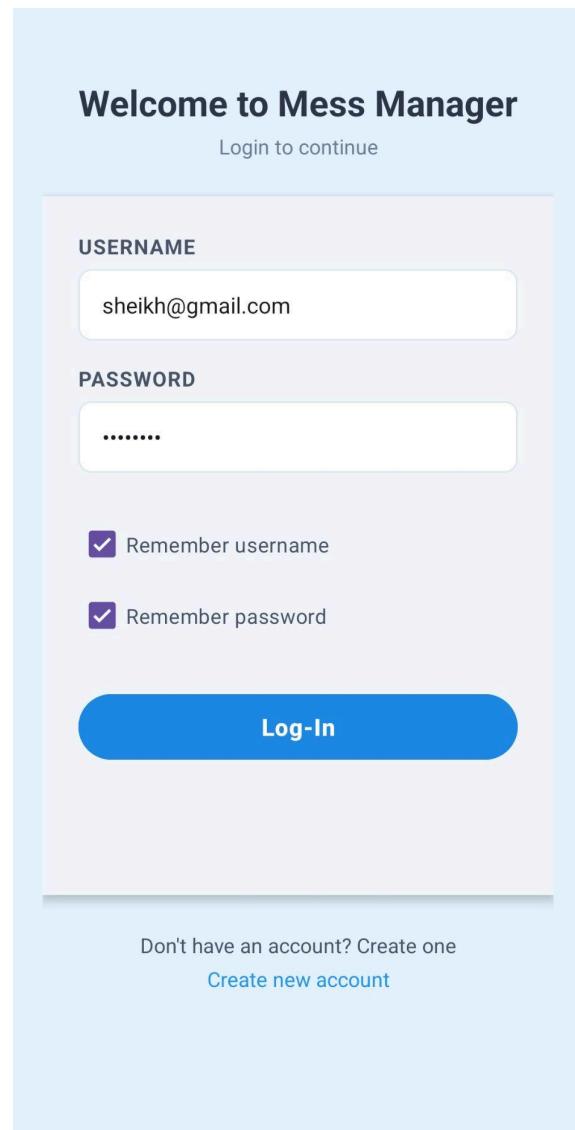


Figure 3: Login Page

➤ Admin Dashboard

Dashboard (Admin)

23 Dec 2025

Total Meals
36

Total Expense
5200 ₩

Paid (This Month)
5200 ₩

Balance Status
Balanced

Meal Price
Breakfast = 50
Lunch = 150
Dinner = 150

Breakfast Add Cancel

Lunch Add Cancel

Dinner Add Cancel

PAY NOW

Dashboard Expenses Members Profile

Figure 4: Admin Dashboard

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➤ Meal Entry System

- Record breakfast, lunch, and dinner.
- Meal price is controlled by Admin.
- Prevents duplicate or invalid entries.

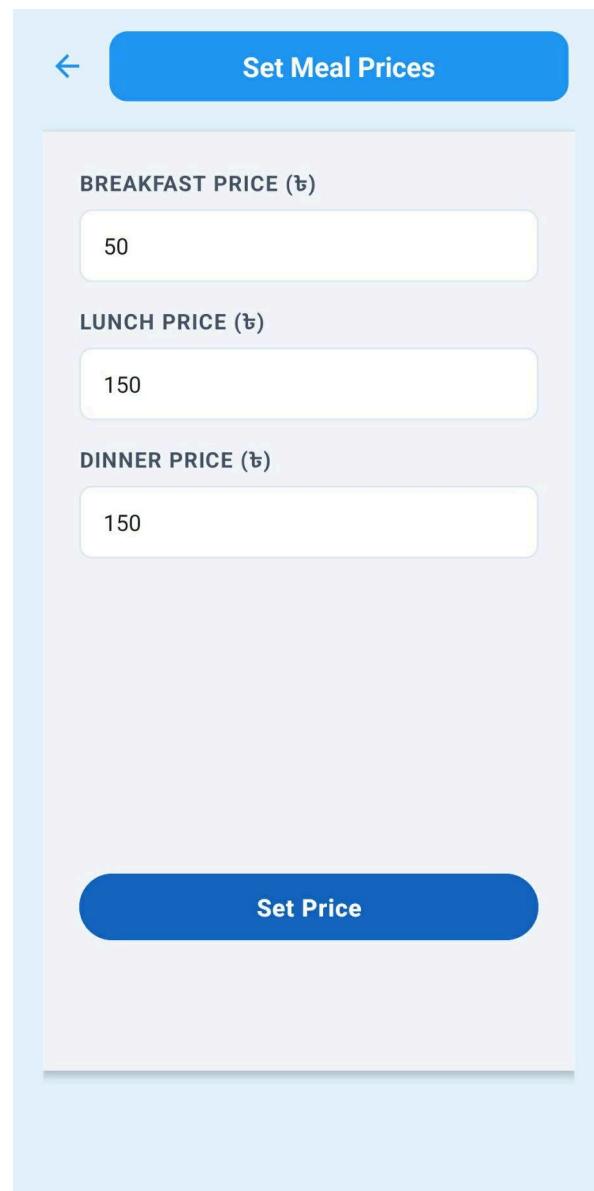


Figure 5: Set Meal Price Page

➤ Expense Management

- Add and manage shared expenses.
- Categorize expenses for better tracking.

Add New Expense

Expense Details

EXPENSE TITLE

Enter expense title

AMOUNT

0.00

DATE

2025-12-17

CATEGORY

Food

PAID BY

sheikh@gmail.com

SAVE EXPENSE

Figure 6: Add Expense Page

➤ Member Management (Admin)

- Approve members and add or remove members.
- Monitor individual meal and expense data.

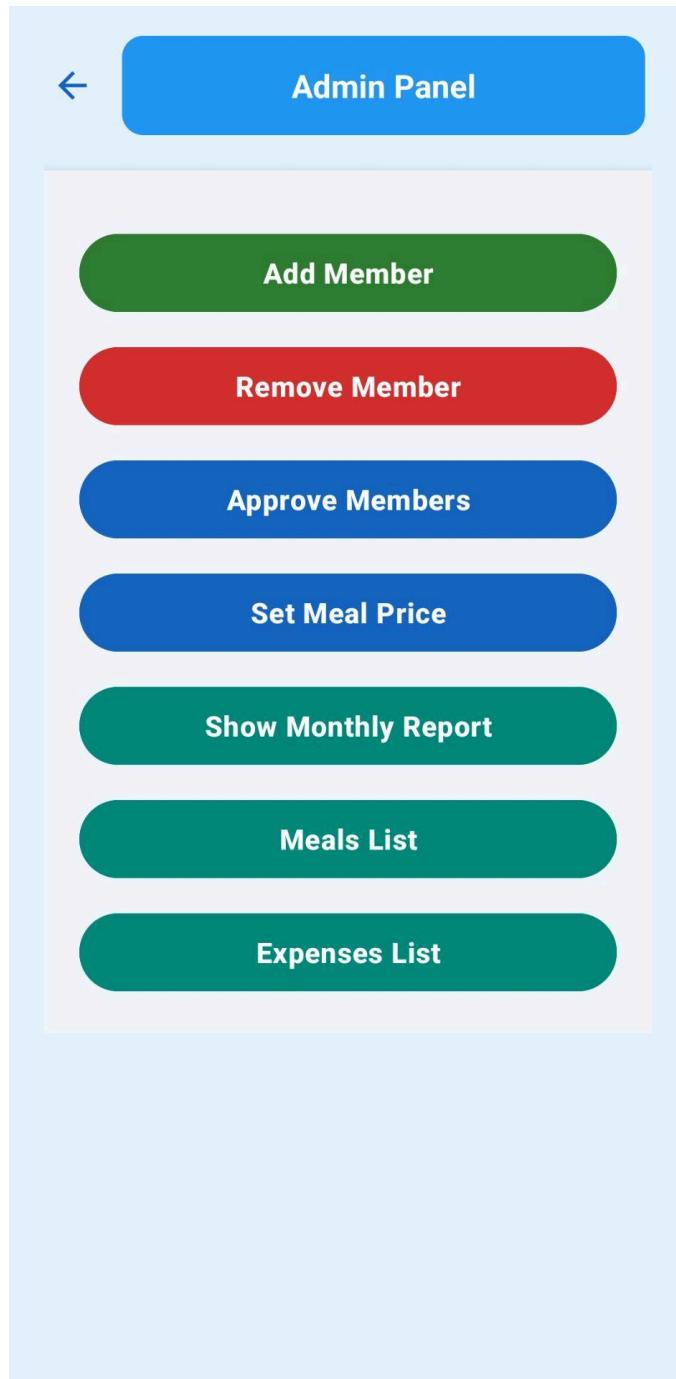


Figure 7: Admin Panel

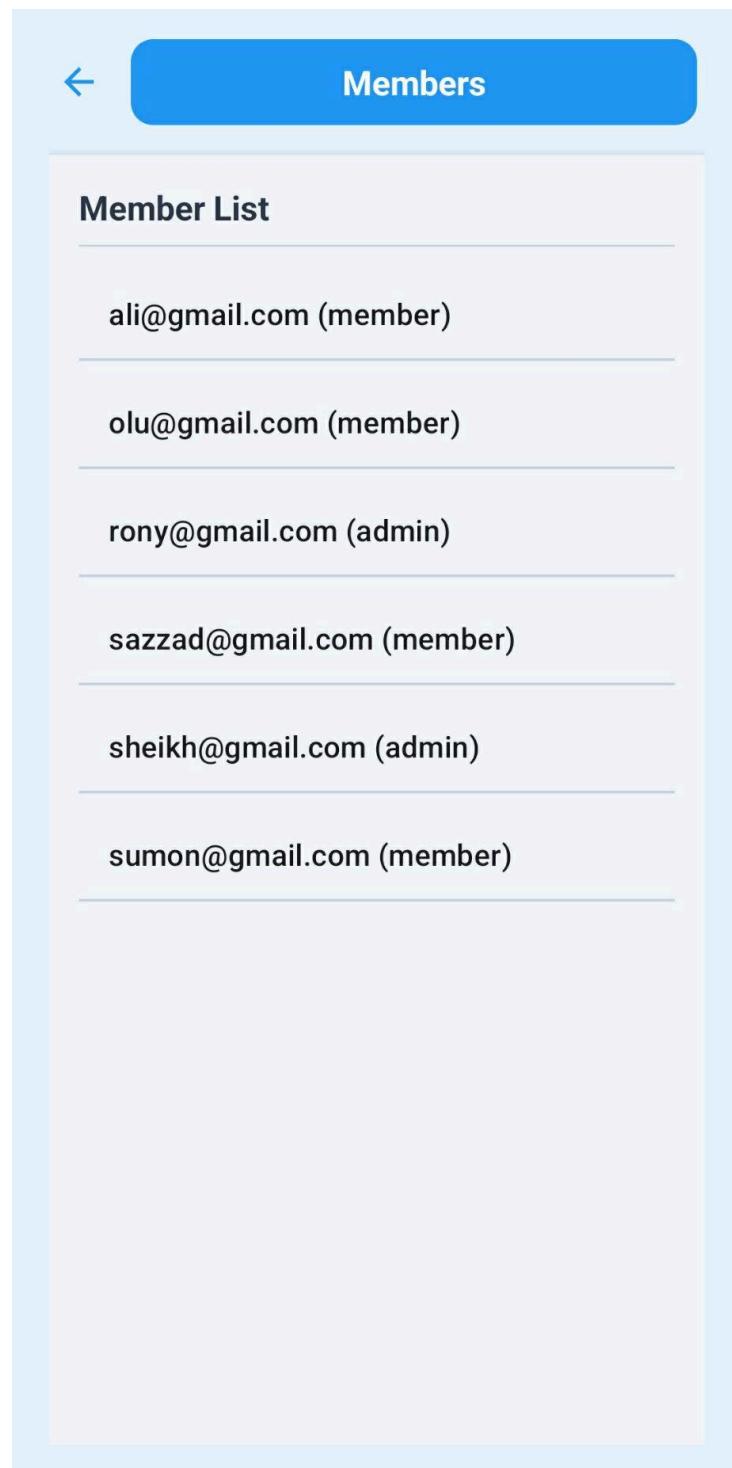


Figure 8: Member List



Figure 9: Member Details

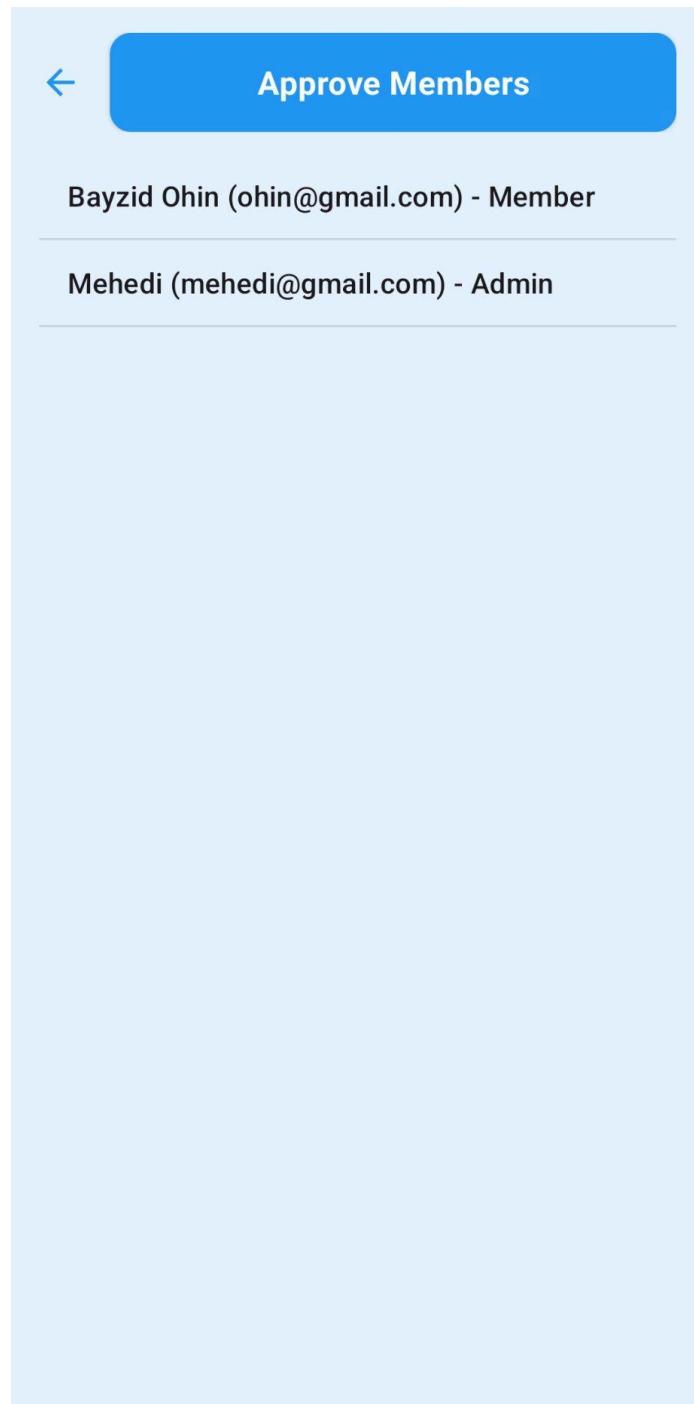


Figure 10: Approve Members

➤ Monthly Summary

- Displays total meals, expenses, paid amount, and dues.
- Clearly shows settlement status.

The screenshot displays the 'Monthly Summary' for December 2025. At the top, it shows 'Total meals (all members): 15', 'Total other expenses: 900 ₣', and meal prices: Breakfast 50 ₣, Lunch 150 ₣, Dinner 150 ₣. Below this, the summary is broken down by user:

User	Meals	Meal cost	Other expenses	Paid	Total cost	Status
ali@gmail.com	Breakfast 1 • Lunch 1 • Dinner 1	350 ₣	50 ₣	400 ₣	400 ₣	Settled
olu@gmail.com	Breakfast 1 • Lunch 1 • Dinner 1	350 ₣	50 ₣			

Figure 11: Monthly Summary

4.2 Profile Management & Cloud Synchronization

The application also has a profile management screen where the user may view profile details, add profile pictures and also administration functions where authorized users may access the administration controls. Cloud synchronization is also available in the profile section and gives the user an option to do a manual sync between the local data in the SQLite and the Firebase remote database. This will guarantee the backup of data, inter-device consistency, and safe storage. There is also a logout mechanism that is used to end user sessions safely.

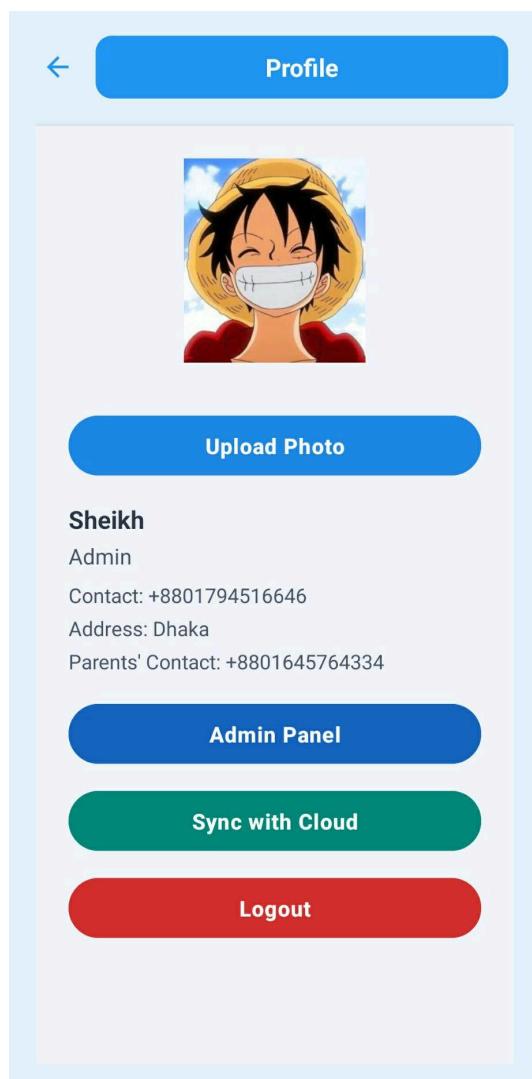


Figure 12: Profile & Cloud Sync

4.3 Notification System

The Mess Management App includes a notification system to keep users informed about important daily activities. Notifications are automatically triggered for events such as missing meal entries, newly added expenses, and payment confirmations. This feature helps users stay updated without opening the application frequently and improves overall usability. By providing timely reminders and alerts, the notification system ensures better participation and reduces the chances of missing critical updates.

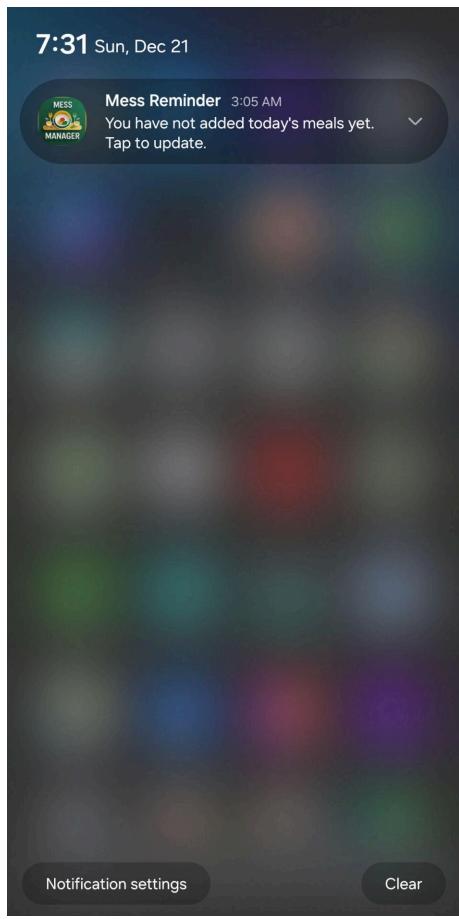


Figure 13: Meal Reminder Notification

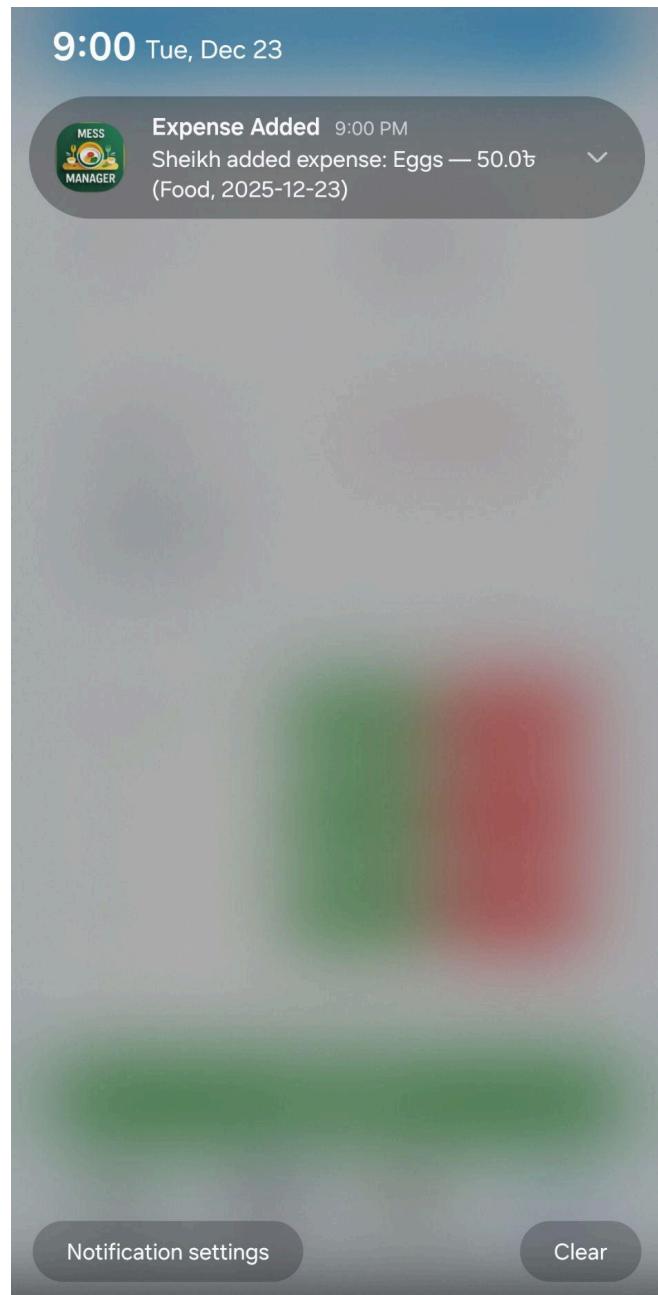


Figure 14: Expense Added Notification

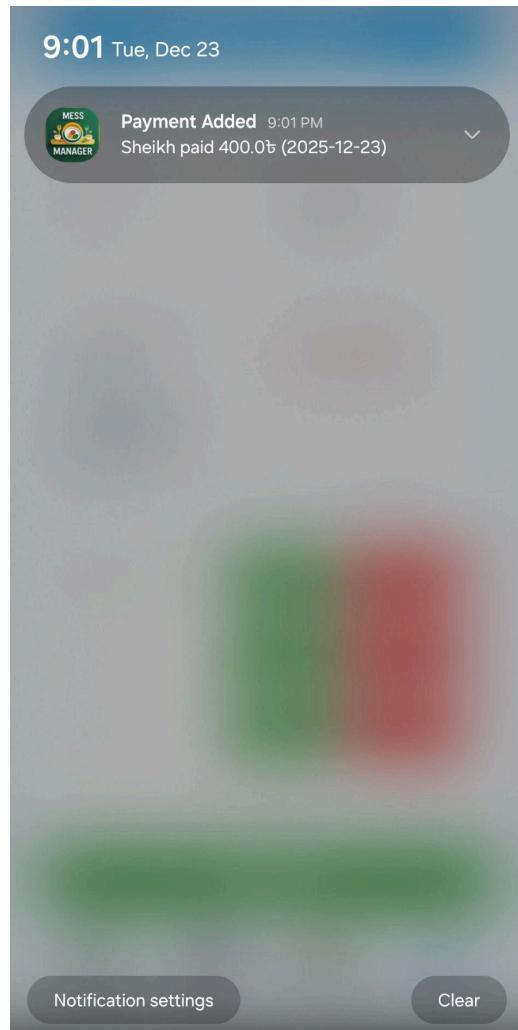


Figure 15: Payment Confirmation Notification

5. Business Model:

The Mess Management App follows a **Freemium business model**:

- **Free Version:** Meal tracking, expense entry, and monthly summary.
- **Premium Version:** Cloud sync, advanced reports, and analytics features.

This model allows basic usage at no cost while offering advanced features for long-term mess management needs.

6. Future Enhancements

1. Online Payment Gateway Integration
2. Advanced Analytics and Graphical Reports
3. PDF/Excel Report Export
4. Multi-language Support
5. iOS Platform Support

6.1 Vision for the Future:

It is the vision of the Mess Management App to be a digital solution to shared living environments fully and intelligently in the long-run. The coming versions will see the introduction of secure online payment gateways and elaborate analytics to lower the costs. The system will also be designed to serve various platforms, such as Internet-based and iOS access, so that more people can use them. The application aims to reduce conflicts, increase transparency, and ease the daily management of messes by ensuring it is always more automated, scaled, and easy to use.