



**An-Najah National University**

Faculty of Engineering & Information Technology

Computer Engineering Department

Presented in partial fulfillment of the requirements for

Bachelor degree in Computer Engineering

2025

**Graduation Project 1 - Software**



**PalHands**

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## **Acknowledgment**

First and foremost, we thank God Almighty for granting us the strength, patience, and guidance to successfully complete this project. Without His blessings, this achievement would not have been possible.

We would like to extend our heartfelt gratitude to our families, who have been our main source of support throughout this journey. Their constant encouragement, belief in us, and endless patience provided the foundation upon which we were able to complete this work.

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## **disclaimer**

This report was written by Jana Sami Barakeh and Lemara Fuad Ali in fulfillment of the requirements for a Bachelor's degree in Computer Engineering. It has not been altered or corrected, other than editorial corrections, as a result of assessment and it may contain language as well as content errors. The views expressed in it together with any outcomes and recommendations are solely those of us. An-Najah National University accepts no responsibility or liability for the consequences of this report being used for a purpose other than the purpose for which it was commissioned.

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## Abstract

This project presents a mobile and web application designed to facilitate the process of offering and requesting services. Service providers can showcase the services they offer, while users can search for the desired service and select a suitable provider based on ratings and reviews from previous clients. The platform integrates an interactive map powered by GPS, enabling users to easily identify and choose the nearest provider.

The system also allows users to view the provider's availability schedule, book an appointment at a suitable time, and await confirmation. Notifications are sent to providers when a booking request is made, allowing them to review the requester's details as well as feedback and ratings from other providers who previously worked with that user. Once a booking is either accepted or rejected, the user is promptly notified.

Cancellations are supported under specific conditions: a request can be withdrawn freely if made at least two days prior to the appointment, whereas cancellations within two days require approval from the other party. After completing a service, both users and providers can submit reports or complaints about each other, ensuring accountability. Additionally, the platform supports suggestions for new services, which are reviewed by the administrator before approval to prevent misuse.

For security and reliability, administrators have the authority to suspend or remove any user or provider account, along with all associated bookings, while notifying the relevant parties. Direct communication between providers and users is supported, as well as access to frequently asked questions and AI-powered assistance to guide users through the platform.

Furthermore, providers can specify availability for emergency services, such as late-night or weekend requests, which can be booked at least two hours in advance. Overall, this system enhances service accessibility, reliability, and efficiency by connecting users with trusted providers in a secure and user-friendly environment.

In conclusion, PalHands offers an integrated, easy-to-use platform with a wide range of features, distinguishing it from other apps in this domain.

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## **Chapter 1:**

### **Introduction**

#### **1.1 Statement of the problem:**

With the continuation of war and difficult economic conditions, formal job opportunities have become scarce, leaving individuals in urgent need of alternative income sources to sustain their livelihoods. At the same time, society faces challenges in accessing providers of simple, everyday services, either due to the absence of dedicated platforms to showcase them or the difficulty of identifying people capable of offering such services.

For example, as the number of working women has increased, so has their need for supportive services such as childcare, household assistance, and other tasks that are often difficult to find within the community in an organized way.

In addition, many homemakers and university students possess skills or abilities that could serve as a source of supplementary income, yet they lack an effective medium to present these skills and connect with those in need of them.

This website was created to address these issues by acting as a bridge between service providers and those seeking services. It offers an organized platform that:

- Enables individuals to advertise their skills and simple services.
- Helps people in need of these services to easily find providers.
- Creates alternative income opportunities that support individuals under challenging economic conditions.

#### **1.2 Objectives:**

The primary objective of this project is to develop a mobile and web application that bridges the gap between individuals offering services and those in need of them, while ensuring reliability, accessibility, and security.

The specific objectives are to:

1. Provide a unified platform where service providers can showcase their skills and services, and users can easily search, compare, and select providers based on ratings, reviews, and proximity.

2. Facilitate communication and scheduling by integrating booking features, availability calendars, notifications, and cancellation policies that ensure smooth interaction between users and providers.
3. Enable direct communication through a built-in chat system between service providers and clients, allowing them to discuss service details, clarify requirements, and coordinate appointments efficiently.
4. Enhance trust and accountability through a transparent feedback and reporting system, where both users and providers can rate each other and submit complaints if necessary.
5. Ensure safety and reliability by giving administrators control over monitoring activities, approving suggested services, and suspending or removing accounts that violate policies.
6. Improve accessibility by using GPS-powered maps to connect users with nearby providers and supporting emergency service requests with flexible scheduling.
7. Support economic resilience by enabling homemakers, students, and individuals affected by limited job opportunities to earn additional income through offering services.
8. Increase usability and support with built-in FAQs and AI-powered assistance to guide users through the platform.

## **1.3 Scope of the work**

### **1.3.1 What does it do**

This project focuses on the design and development of a mobile and web application, PalHands, that connects service providers with clients seeking everyday services. The main scope of the work includes:

1. Platform Development: Designing and implementing a functional mobile and web platform where providers can list their services and users can search, filter, and select suitable providers.
2. Service Management: Enabling providers to manage their service offerings, availability schedules, emergency services, and bookings.
3. User Interaction: Implementing a chat system for direct communication between providers and clients, as well as notifications for booking requests, confirmations, and

cancellations.

4. **Accountability & Feedback:** Including features for ratings, reviews, complaints, and administrative controls to ensure reliability and trustworthiness of services.
5. **Accessibility & Navigation:** Integrating GPS-powered maps to allow users to locate nearby providers easily.
6. **Support & Assistance:** Providing AI-powered guidance and FAQs to help users navigate the platform.

### 1.3.2 Boundaries of the Work

The project does not cover:

- Physical provision of the services themselves (the app only facilitates the connection between providers and clients).
- Advanced security systems beyond user/admin monitoring and account management.
- Detailed business or legal contracts between users and service providers.
- Offline marketing, promotion, or external recruitment of service providers.<sup>3</sup>

This scope ensures that the project focuses on delivering a fully functional, user-friendly, and secure platform for managing and accessing everyday services, without extending into external or unrelated technical, financial, or legal areas.

## 1.4 Significance

**PalHands** platform holds significant social and economic importance by addressing real-world demands for accessible, reliable, and flexible services. With increasing numbers of working individuals and students seeking supplemental income, and families needing convenient access to household and personal services, there is a clear market need for a centralized digital platform.

By providing a secure and user-friendly system for service listings, bookings, and communication, the platform meets these growing demands while ensuring trust and accountability through feedback and rating mechanisms. Furthermore, features like GPS-based provider location, emergency service scheduling, and real-time notifications enhance user experience and efficiency.

The project contributes to **economic empowerment** by enabling individuals to generate additional income and supports **community cohesion** by connecting service seekers with

local providers. In essence, **PalHands** addresses a critical gap in the informal services market, offering a scalable, technologically advanced solution that meets both social and economic needs.

## 1.5 Organization of the report:

The report has the following organization:

- **Chapter 1:** An introduction and overview of the project objectives and importance.
  - **Chapter 2:** Constraints and Earlier course work.
  - **Chapter 3:** Literature Review.
  - **Chapter 4:** Methodology including programming languages, implementation and tools.
  - **Chapter 5:** Results and Discussion.
  - **Chapter 6:** Conclusion and Futurework.
- 

## Chapter 2

### 2.1 Constraint:

During the development of our application, we encountered several challenges, but we were able to continue making progress despite these obstacles.

One of the main difficulties was **time constraints**. The project duration of two months was not sufficient to fully refine the idea, master the necessary concepts, and learn a new programming language that none of us had prior experience with. This challenge was compounded by the need to balance the project with other academic obligations, including coursework, assignments, and exams.

Despite these challenges, we managed to overcome them through effective time management, teamwork, and dedicated effort, which allowed us to successfully complete the project.

### 2.2 Standard/codes:

- **Architecture:** MVC with services and middleware; environment-based configuration.
- **API & Security:** RESTful endpoints, JWT authentication, role-based access, input validation, and OWASP Top 10 compliance.
- **Database:** MongoDB/Mongoose with schema-first modeling, indexes, referential integrity, and timestamps.
- **Backend Practices:** Modular code, proper error handling, and logging for diagnostics.
- **Frontend (Flutter):** Material Design, Provider state management, null safety, services layer for API calls, and internationalization readiness.
- **Notifications & Validation:** Typed notifications, real-time unread counts, and route-level request validation.

-

## 2.3 Earlier coursework:

During our studies in Computer Engineering, we acquired a wide range of skills that were essential in completing this project. **Problem-solving skills** were strengthened through learning and applying algorithms, which helped us approach challenges with structured and logical thinking. Additionally, we gained practical experience in **working with databases** and **developing web interfaces** through courses focused on web development and database management.

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## Chapter 3 Literature review:

In developing PalHands, we reviewed and analyzed several existing platforms and academic studies to ensure our solution aligns with industry standards and addresses real user needs.

1. **Service Marketplace Platforms:** Platforms like TaskRabbit, UrbanClap (now Urban Company), and Care.com provide on-demand services, but they are either region-specific or focus on limited categories. Our work builds on the concept of connecting service providers with clients while targeting informal, everyday services such as childcare, household assistance, and small-scale tasks that are often underserved.
2. **Academic Studies:** Research on digital platforms for service delivery highlights the importance of trust, accountability, and usability. Studies show that feedback systems, real-time communication, and location-based services significantly improve user engagement and satisfaction (Smith et al., 2020; Johnson & Lee, 2019).
3. **Technical Implementations:** Existing works on mobile/web applications suggest that Node.js + MongoDB + Flutter is effective for rapidly deploying scalable, cross-platform solutions with flexible data structures (Kumar et al., 2021). This informed our choice of stack and guided best practices in API design, authentication, and database modeling.
4. **Results from Similar Systems:** Previous platforms demonstrate that users highly value features like booking management, availability scheduling, ratings/reviews, and direct messaging. Our platform integrates these functionalities to ensure high usability, reliability, and trust for both providers and users.

In summary, the review of relevant work helped us validate the project idea, choose an effective technical stack, and incorporate features proven to enhance user satisfaction, ensuring that PalHands addresses both practical and social needs effectively.

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## Chapter 4

### Methodology

#### 4.1 Development tools and technologies:

##### 4.1.1 Tools:

- **Visual Studio code:** We used it as our primary IDE for both front-end (Flutter) and back-end (Node.js) development due to its versatility and ease of use.
- **Android Studio:** It is used as an emulator to simulate and test the mobile application and how it works in reality.
- **Postman:** Utilized for testing APIs to ensure the reliability of our application by serving different HTTP requests and responses
- **GitHub:** Used for uploading code, version control, and team collaboration, allowing us to manage updates and communicate effectively throughout the project.

##### 4.1.2 Programming Languages and Frameworks:

###### Fronted Development:

- **Flutter:** We used Flutter to develop the front-end of our project for both mobile and web platforms. Flutter was chosen because it can create high-performance, multi-platform applications without depending on traditional web display methods. It uses its own rendering engine to provide consistent interfaces across platforms. Additionally, Flutter makes it easy to adapt the project to fit different screen sizes, like mobile and web with the same code, ensuring a smooth user experience.
- **Dart:** Flutter relies on Dart, a programming language developed by Google. Dart is powerful and suitable for mobile and web app development due to its object-oriented structure and support for asynchronous programming, which helps in creating responsive and efficient applications.

###### Backend:

- **Node.js:** Provides the runtime for event-driven, non-blocking operations, suitable for handling multiple requests efficiently.  
**Express.js:** Handles the HTTP layer, routing requests to appropriate controllers.  
**Middleware:** Plays a central role in keeping controllers clean and organized.
  - **Authentication and Roles:** Middleware manages user authentication, admin access, and logging of administrative actions.
  - **Validation:** Input validation is performed using libraries to ensure data integrity before reaching controllers.

- **Core Middleware:** Standard Express middleware like JSON parsing and CORS handling is applied globally.
- **Controllers:** Process incoming requests, interact with models, and delegate complex operations to services when necessary.
- **Services:** Contain reusable business logic that crosses multiple controllers, such as sending notifications to users, providers, or admins.  
If needed, the controller calls a service layer to perform reusable business logic before responding.

#### **RESTful API:**

- We used a RESTful API to enable communication between the frontend and backend of our project. REST (Representational State Transfer) is a popular architectural style for building APIs because it is simple, efficient, and widely supported.

#### **4.1.3 Database**

We chose MongoDB because it is a NoSQL, document-oriented database that provides flexibility in handling unstructured and semi-structured data, which is common in our application. For example, user profiles, service listings, and provider availability can have varying fields and nested structures that fit naturally into JSON-like documents.

Additionally, MongoDB scales easily for large numbers of users and service records, supports fast read/write operations, and integrates smoothly with Node.js via Mongoose, which simplifies data modeling and validation. Its flexibility and performance make it ideal for a dynamic platform like PalHands, where the data structures may evolve as we add new features.

## 4.2 Palhands application



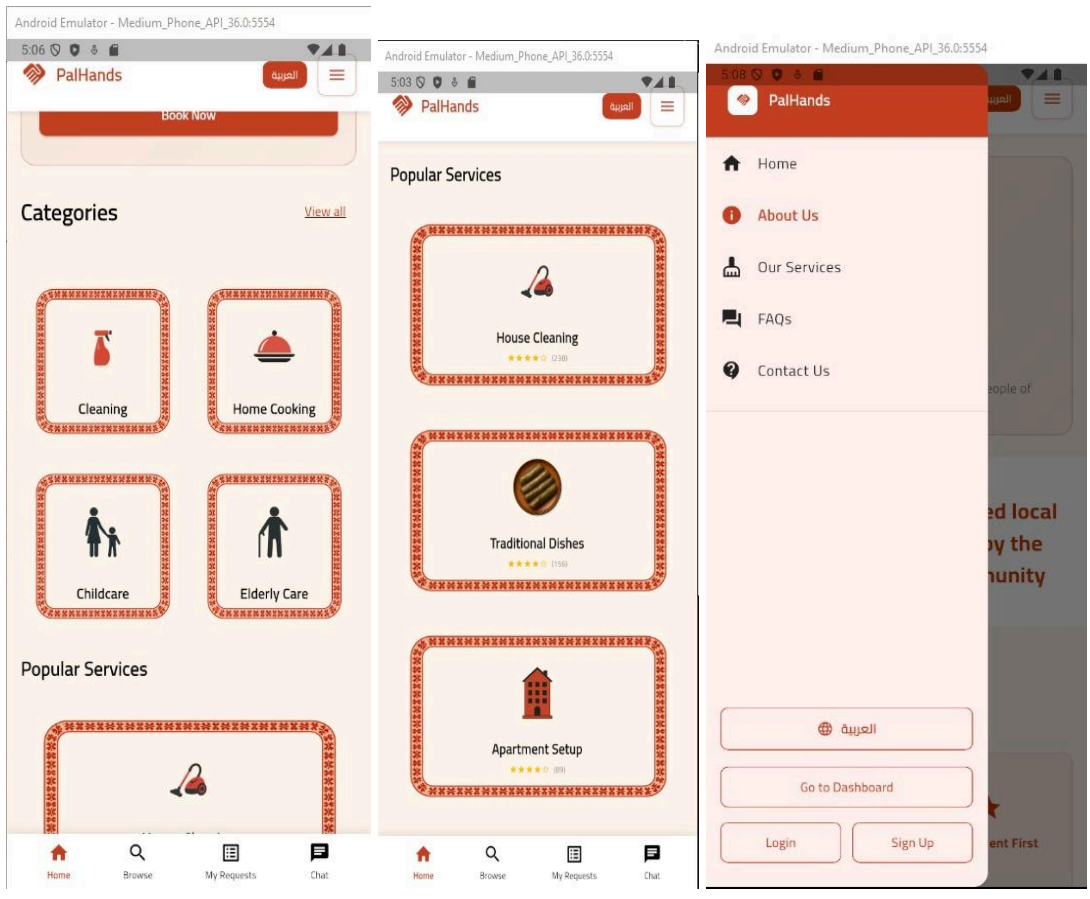


Figure 4.2: Home tab

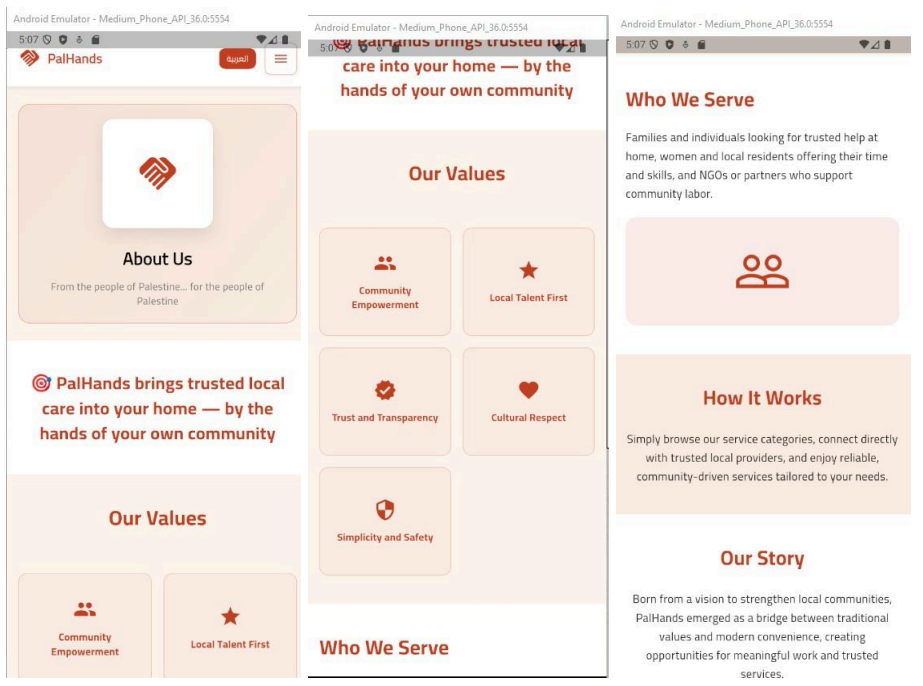


Figure 4.3: about us tab

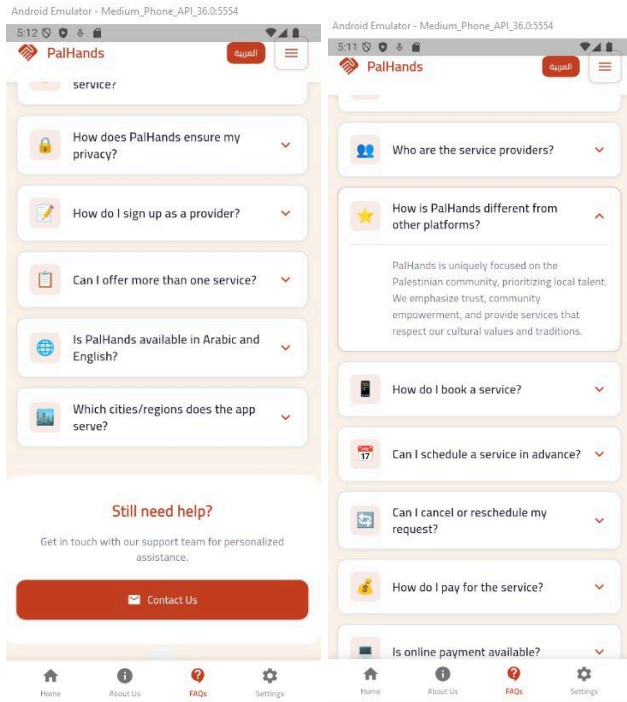
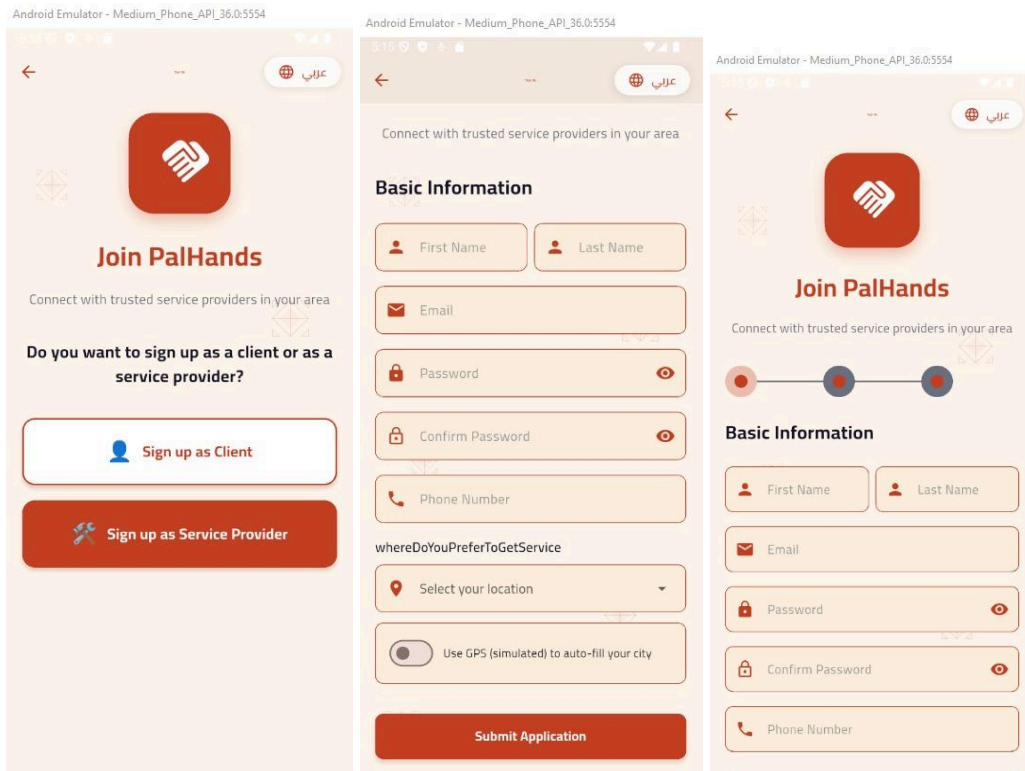


Figure 4.4: FAQs

## 4.2.1 Provider



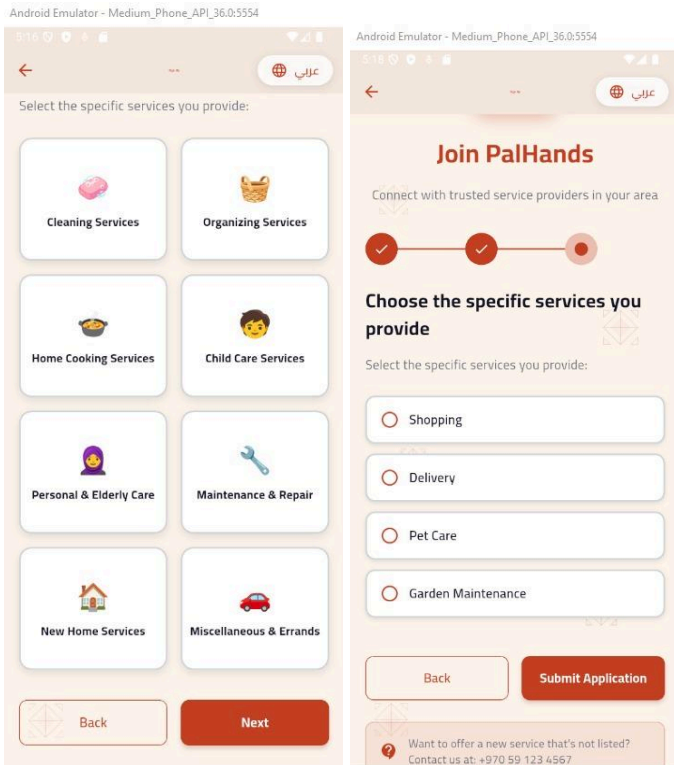
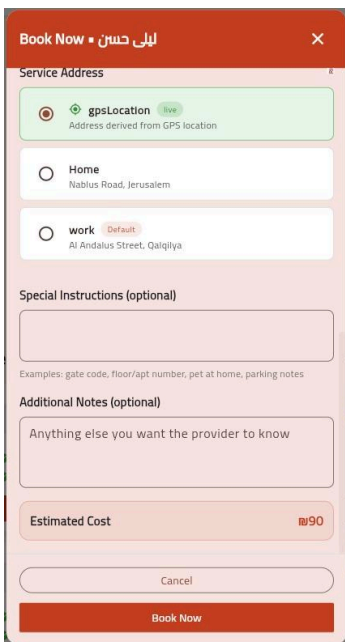


Figure 4.5: sign up as provider

GPS is enabled dynamically for the provider, he can choose the category he interested in and the service he wants to provide.



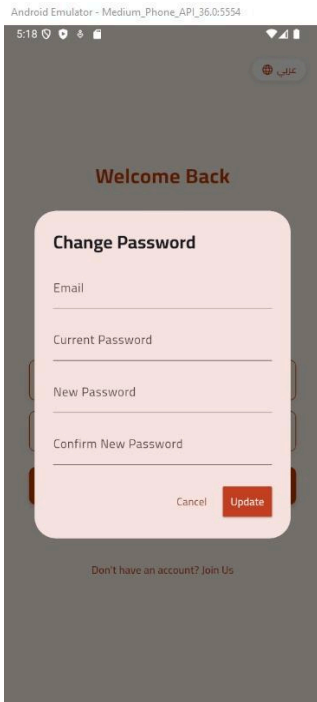


Figure 4.6: change password

Figure 4.7 :provider dashboard

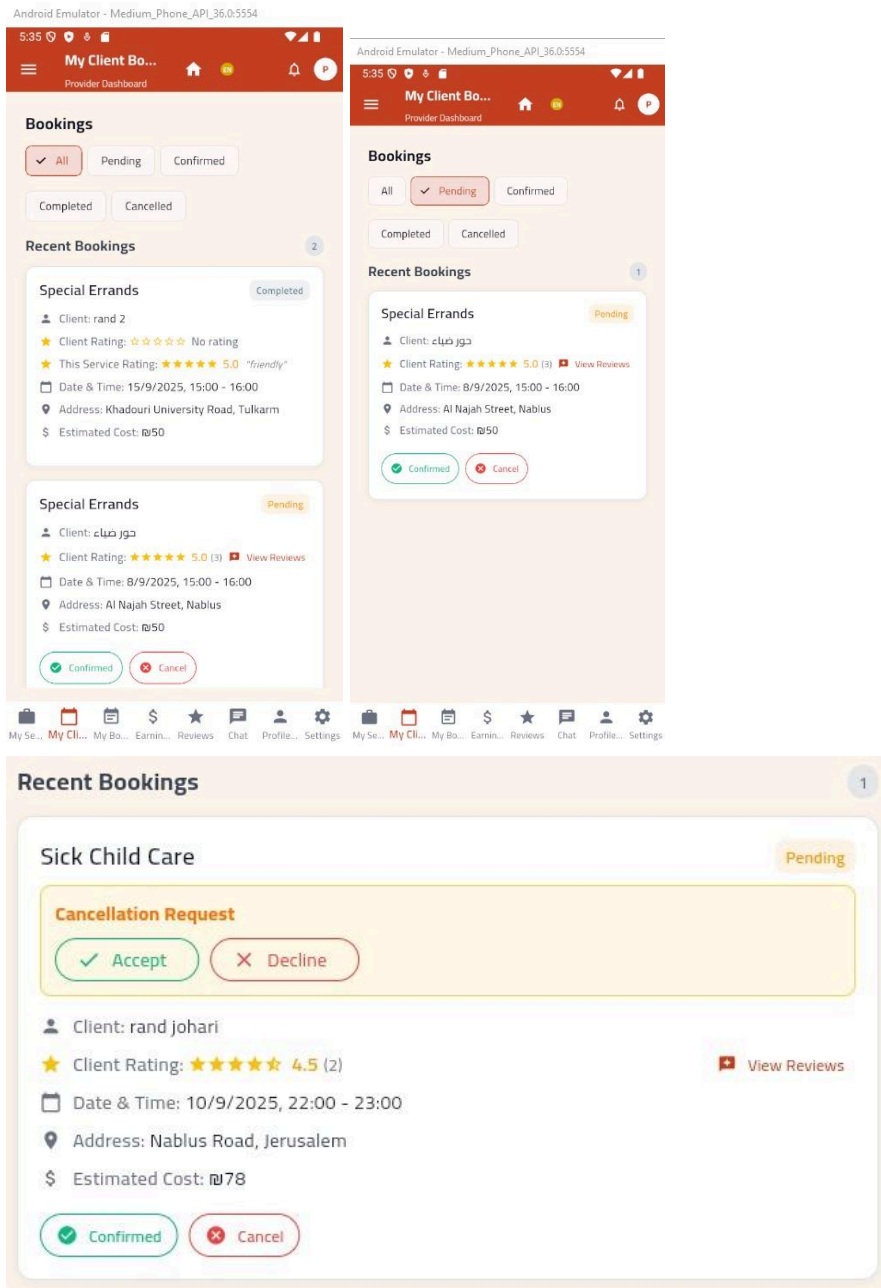
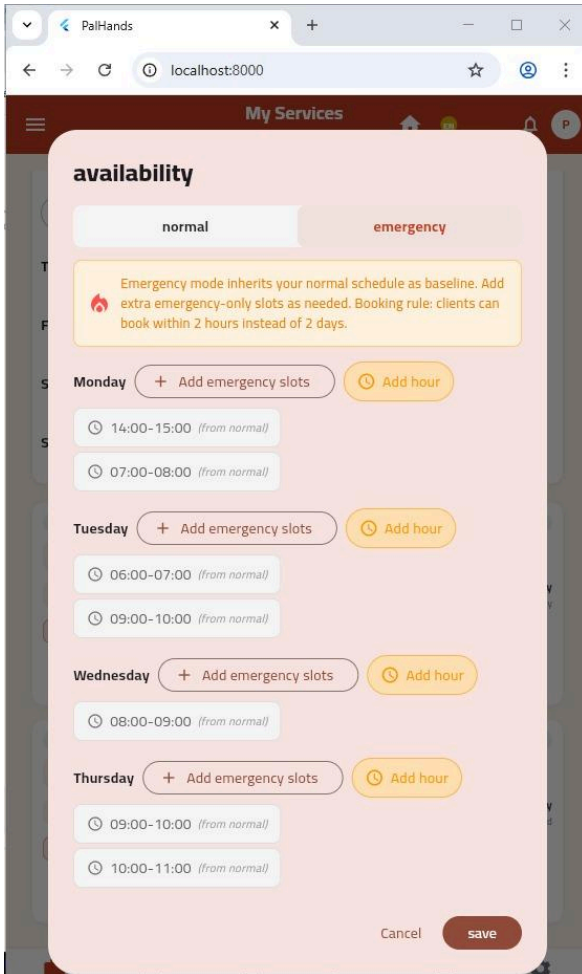
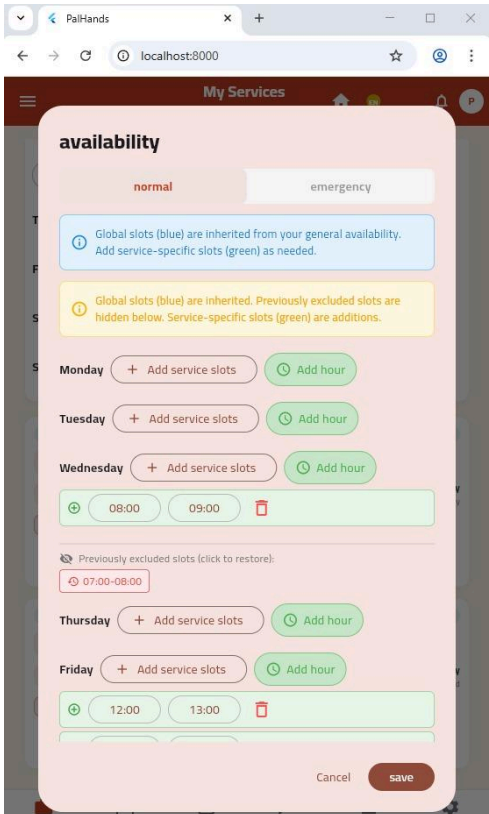
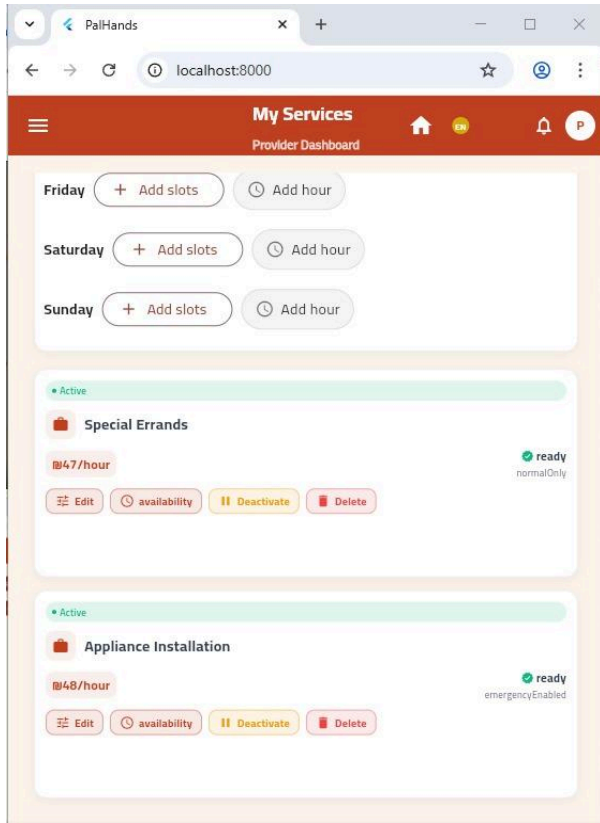
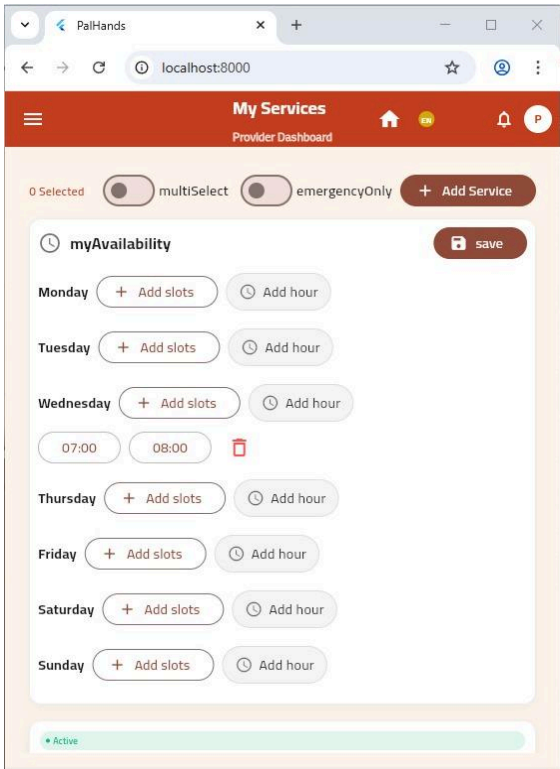


Figure 4.8: booking request

he can manage his service and his available times, add new service for his card or request a new service from the admin to added to the system (he cannot add a new service for the system by himself to avoid misusing)



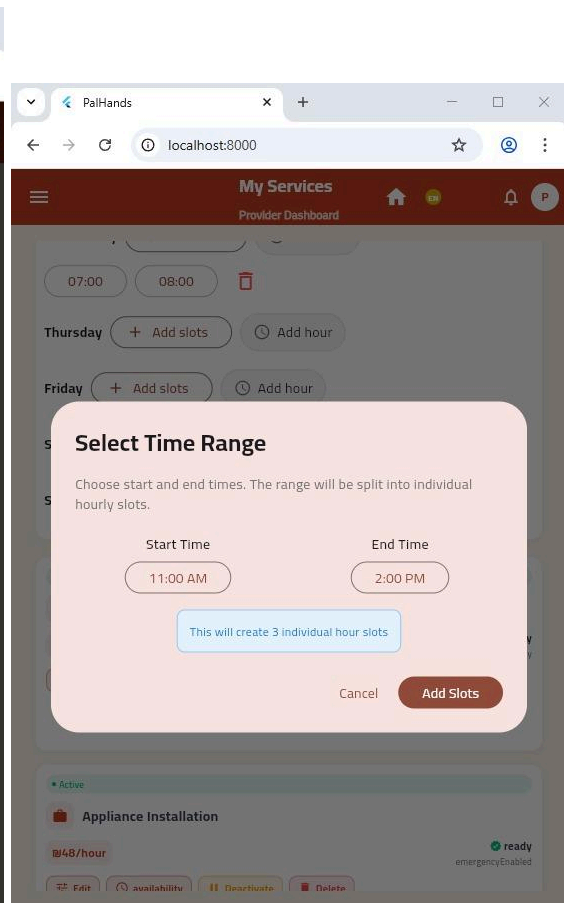
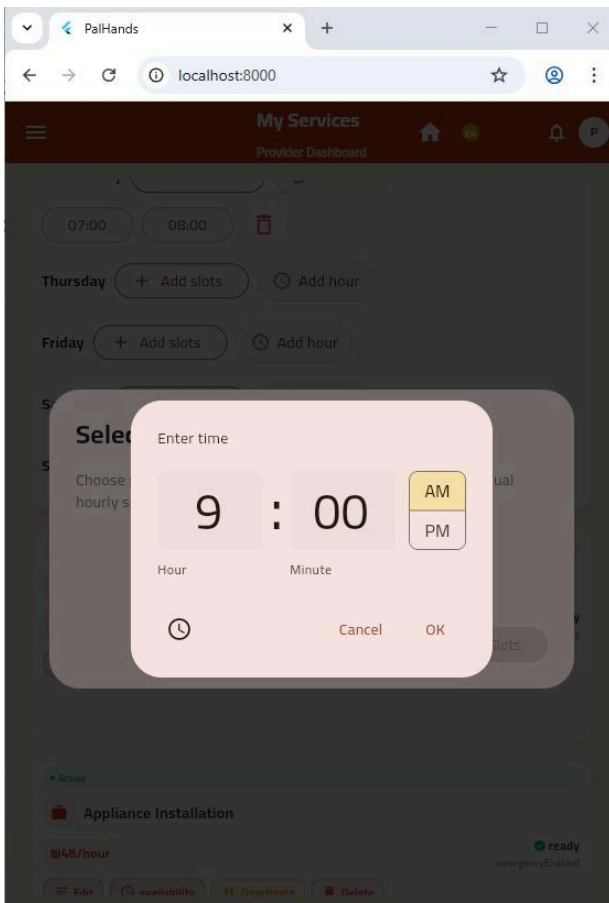
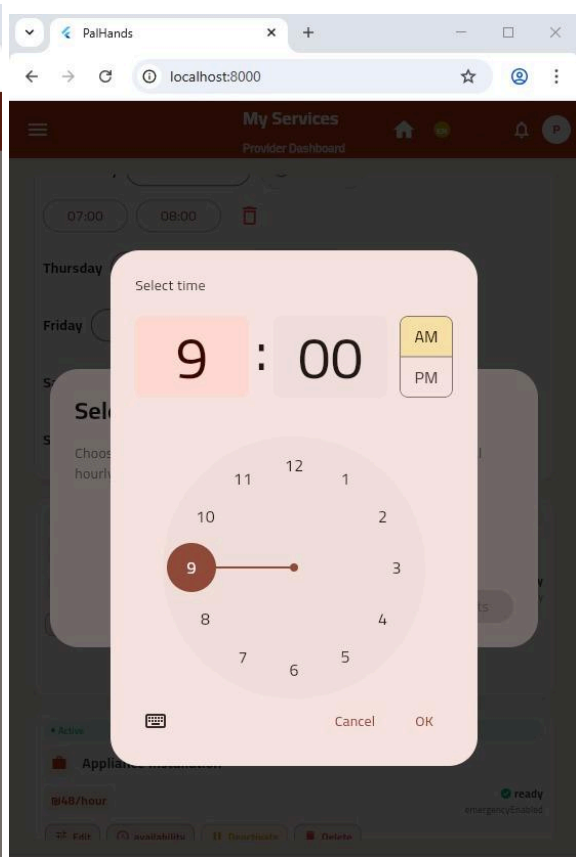
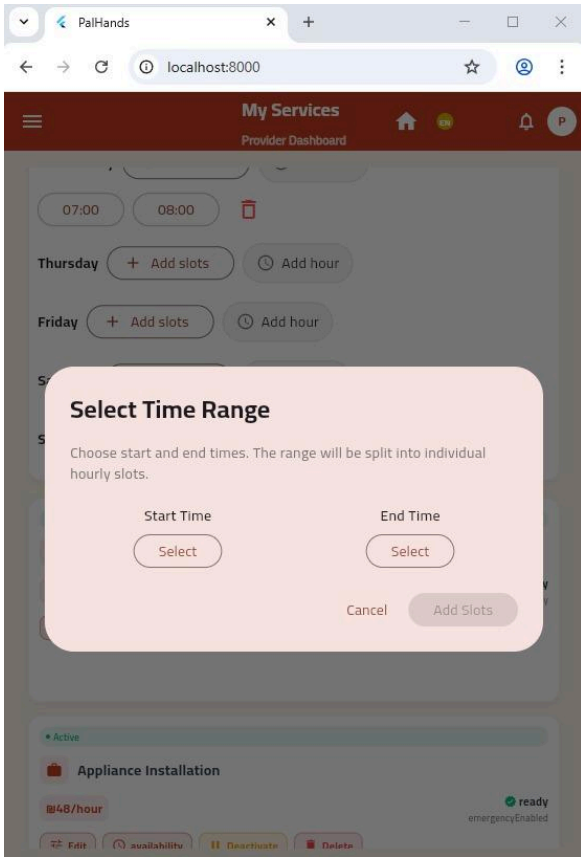


Figure 4.9: add available times

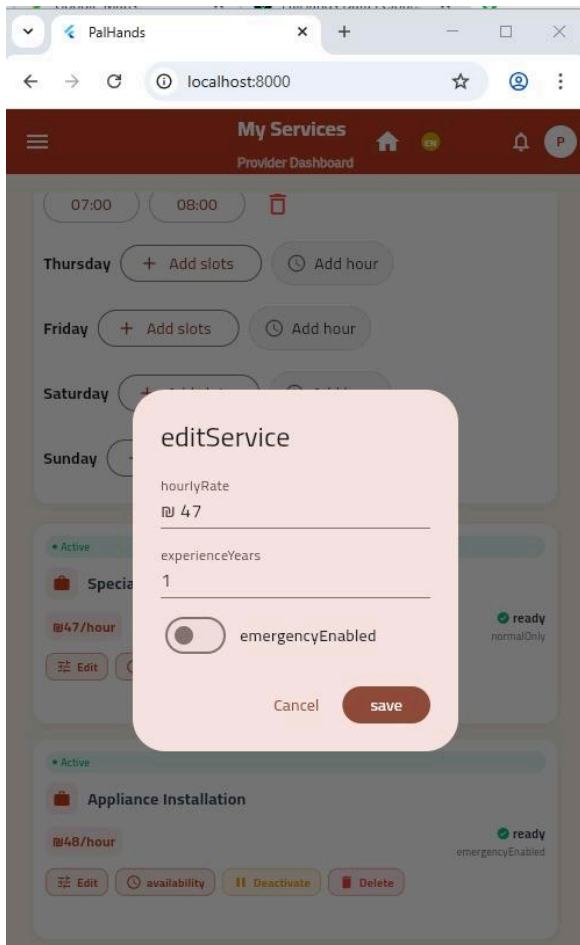


Figure 4.10: edit service

provider can see all requested classifying as completed, confirmed, pending, cancelled. He can see each client's reviews from the previous providers who treated with. He also can rate the client after completing the service.

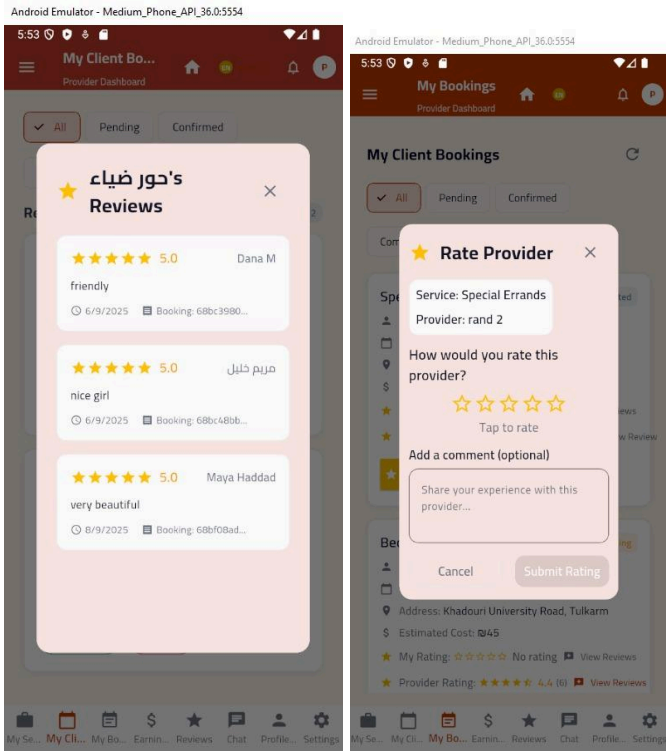


Figure 4.11: rating and reviews

when he has a new book he get a notification, also when he confirmed it or cancel, the client will get a notification.

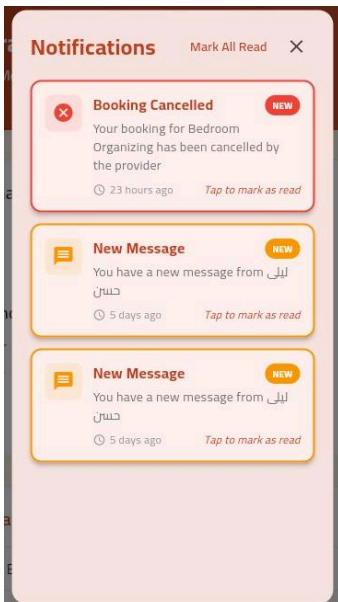


Figure 4.12: notifications

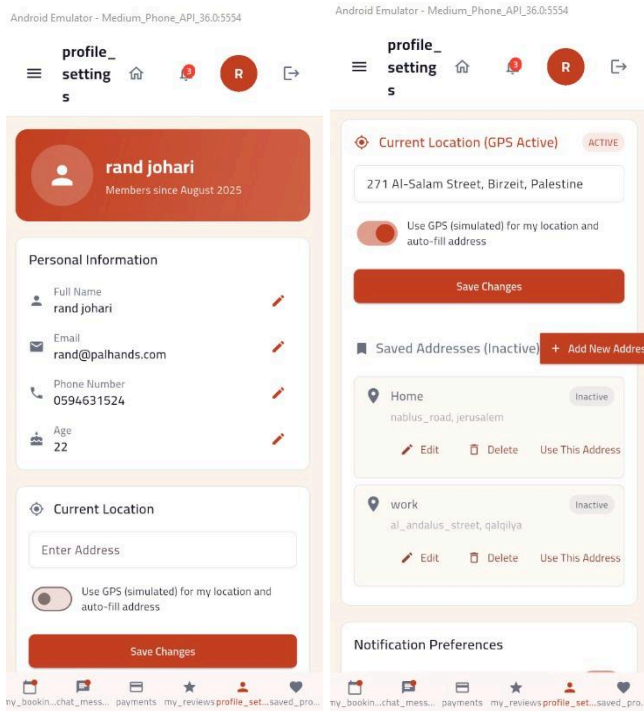


Figure 4.13: profile setting

A provider can also behave as a client and book a service.

## 4.2.2 Client

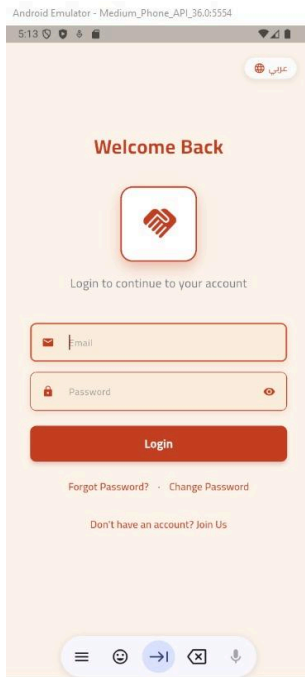


Figure 4.14: Client login

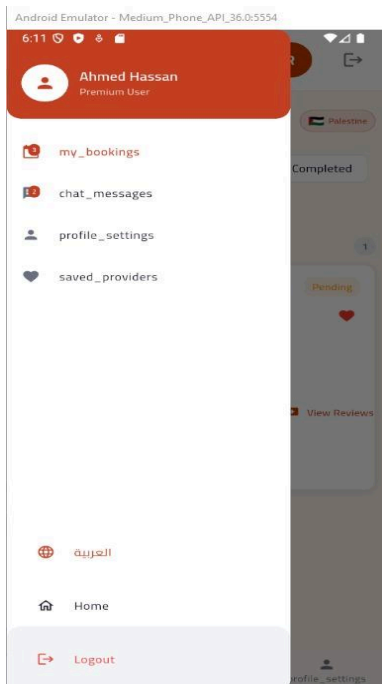
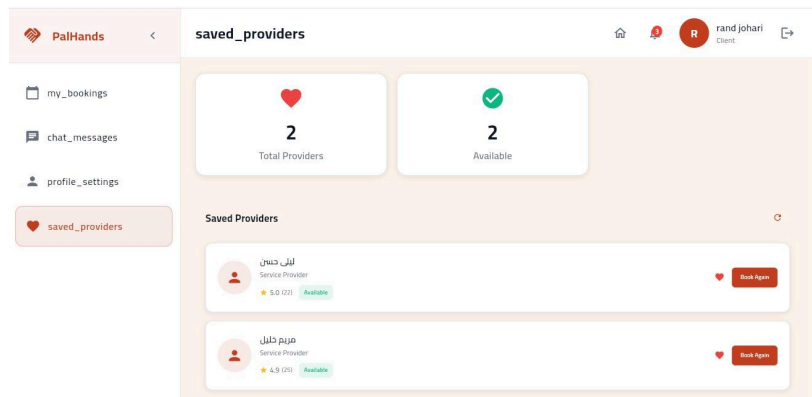
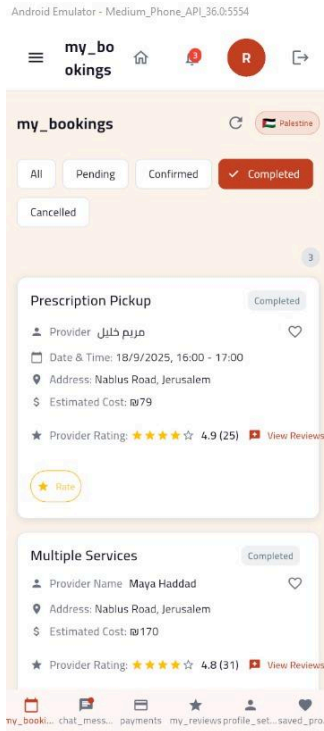


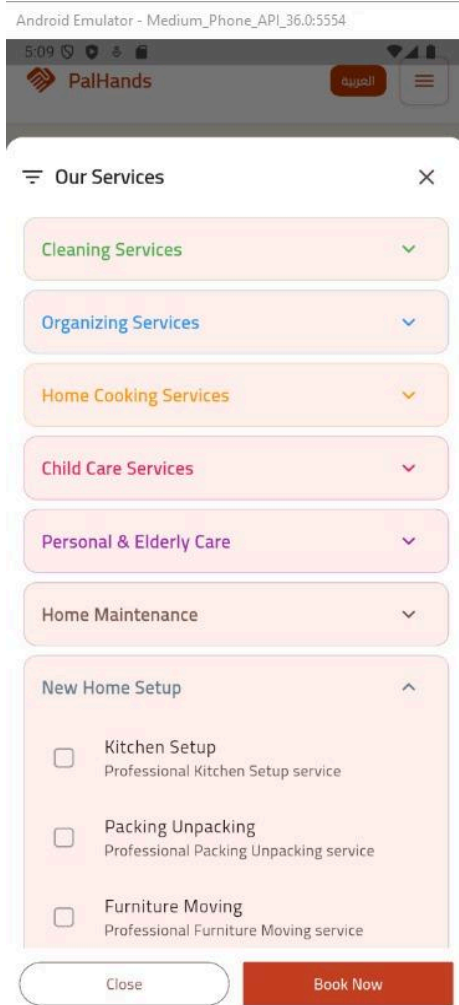
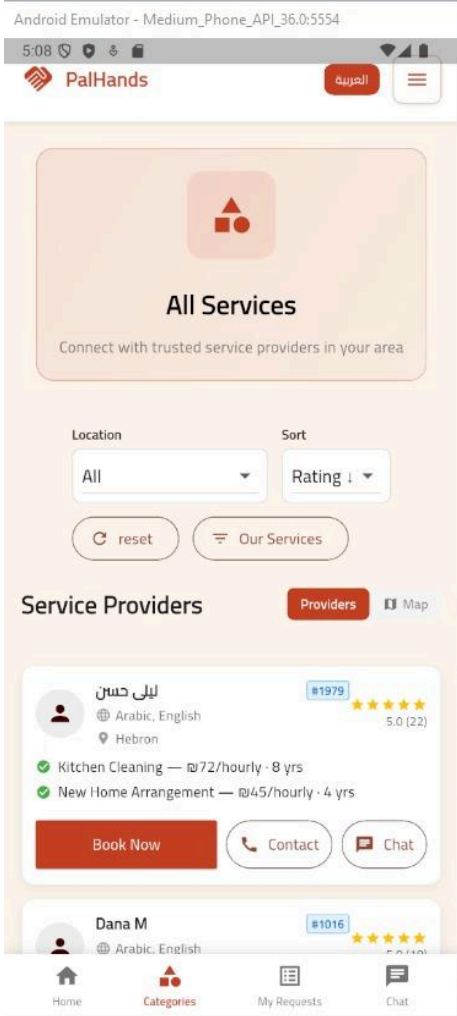
Figure 4.15: client dashboard

he can see his booking and their status, and rate the providers for the completed service. also see the previous reviews for the provider.



he can favourite the provider and save it

Figure 4.16: client booking



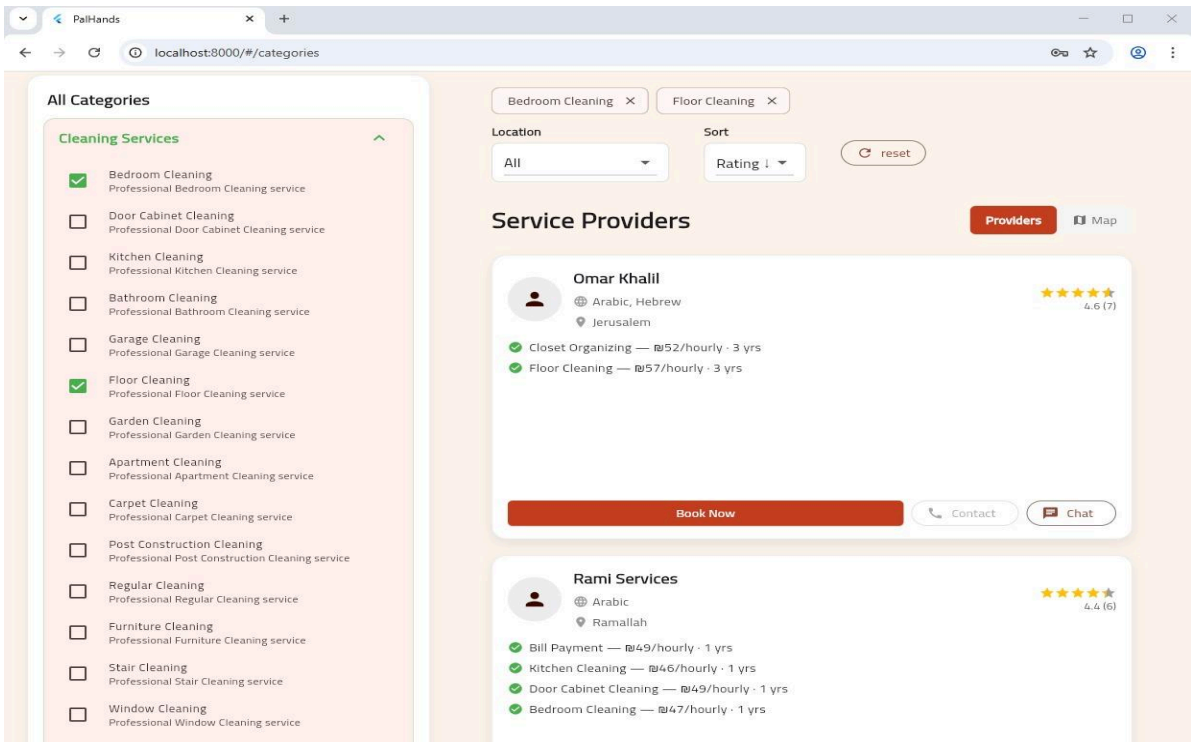
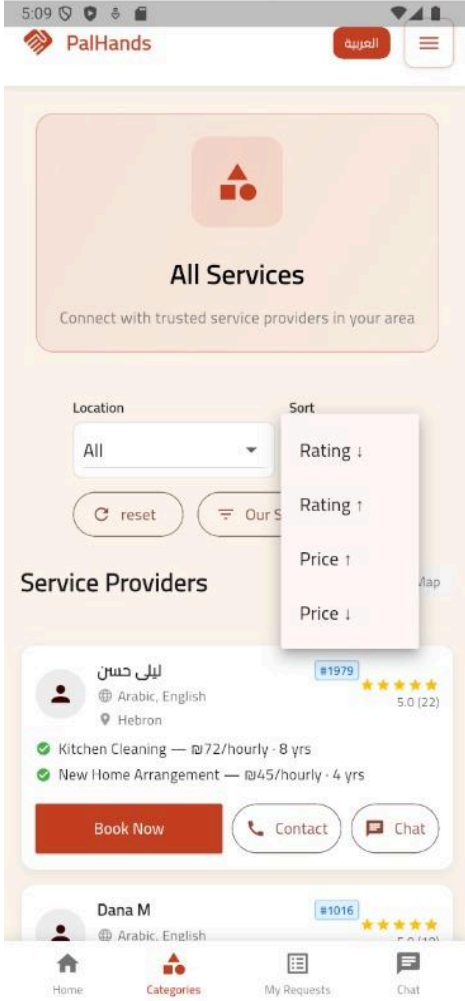
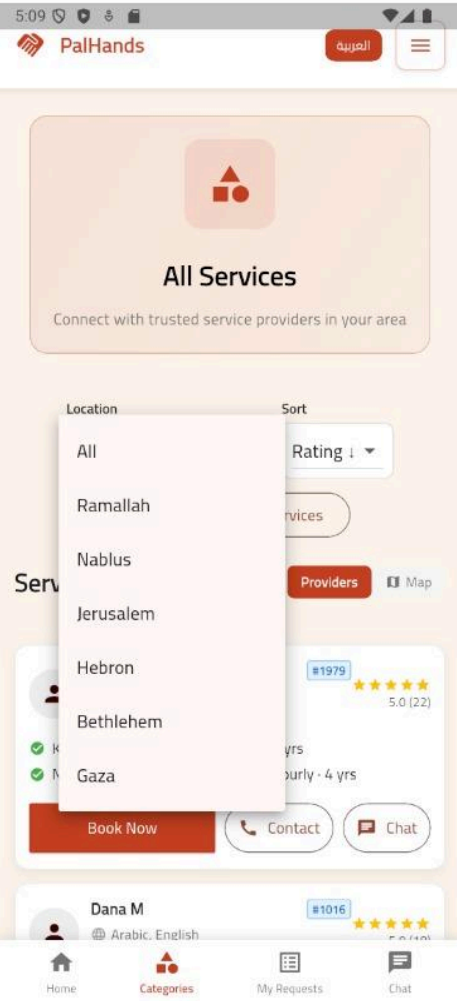


Figure 4.17: our service

he can check the needed service, the providers who present this service shown for him, he can open a map that shown the providers location, to book the nearest one .

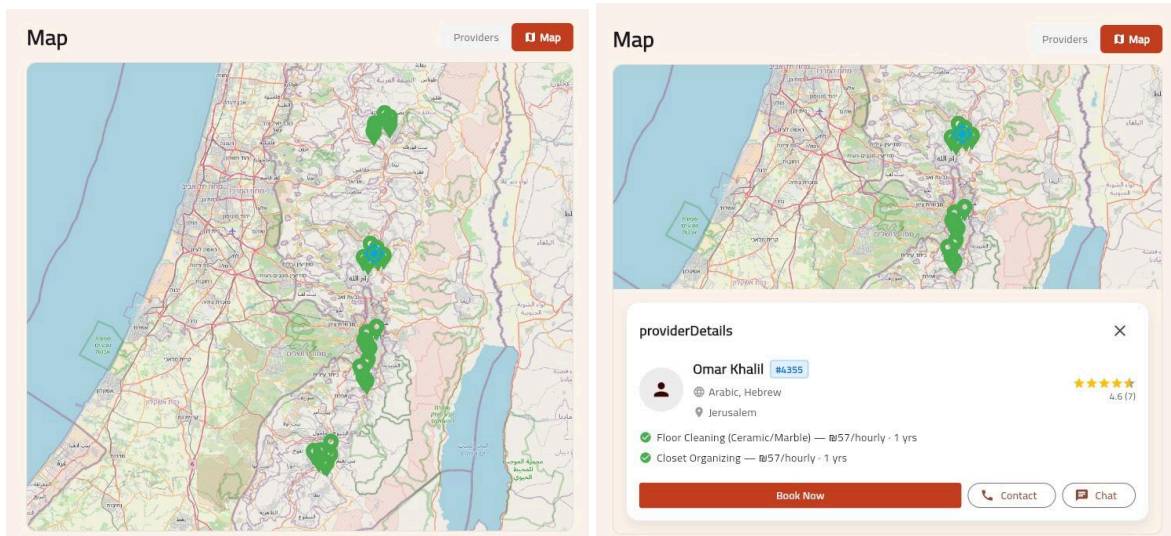


Figure 4.18: map

when he choose a provider, he can choose the service he need and see the available times of this provider, he also can check if this provider work in emergencies times( at late time or at the weekend).

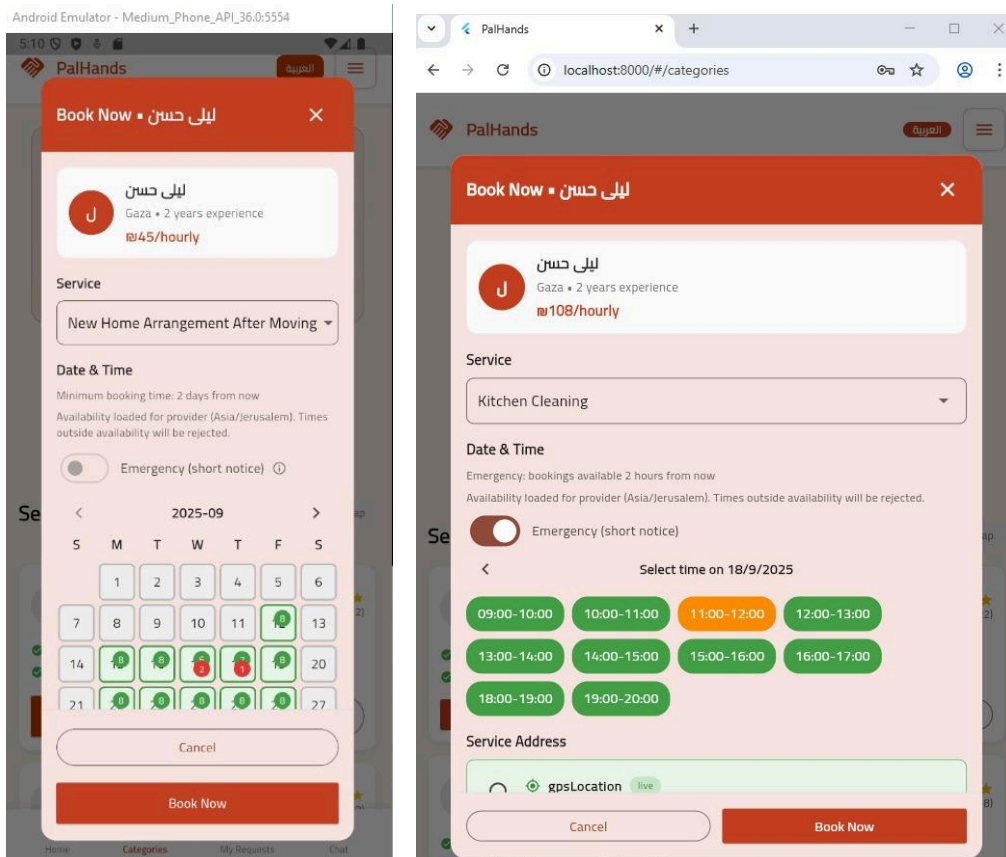


Figure 4.19: available times

also chat between them is available

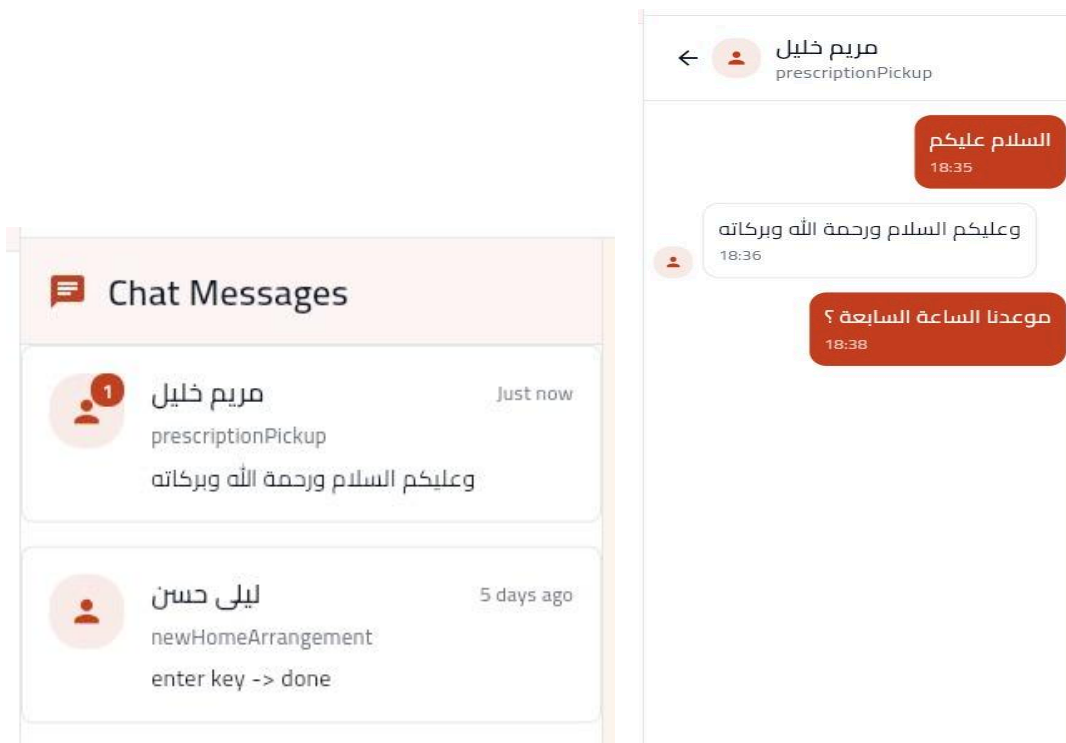


Figure 4.20: chat system

he can report a client , also client can do this, by the id

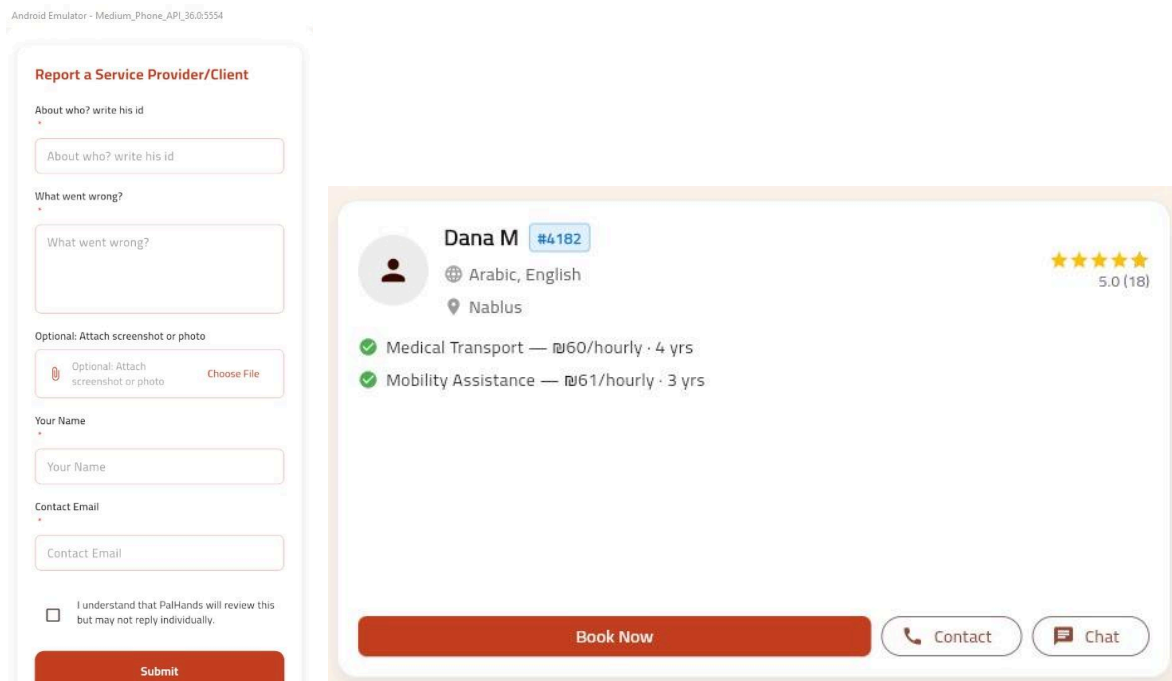


Figure 4.21: report a provider or client

### 4.2.3 Admin:

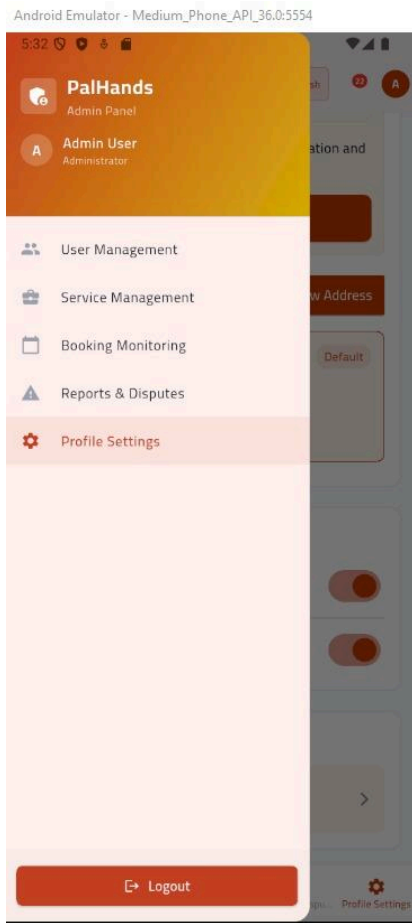


Figure 4.22: admin dashboard

he can add a category, service and delete them, inactive service

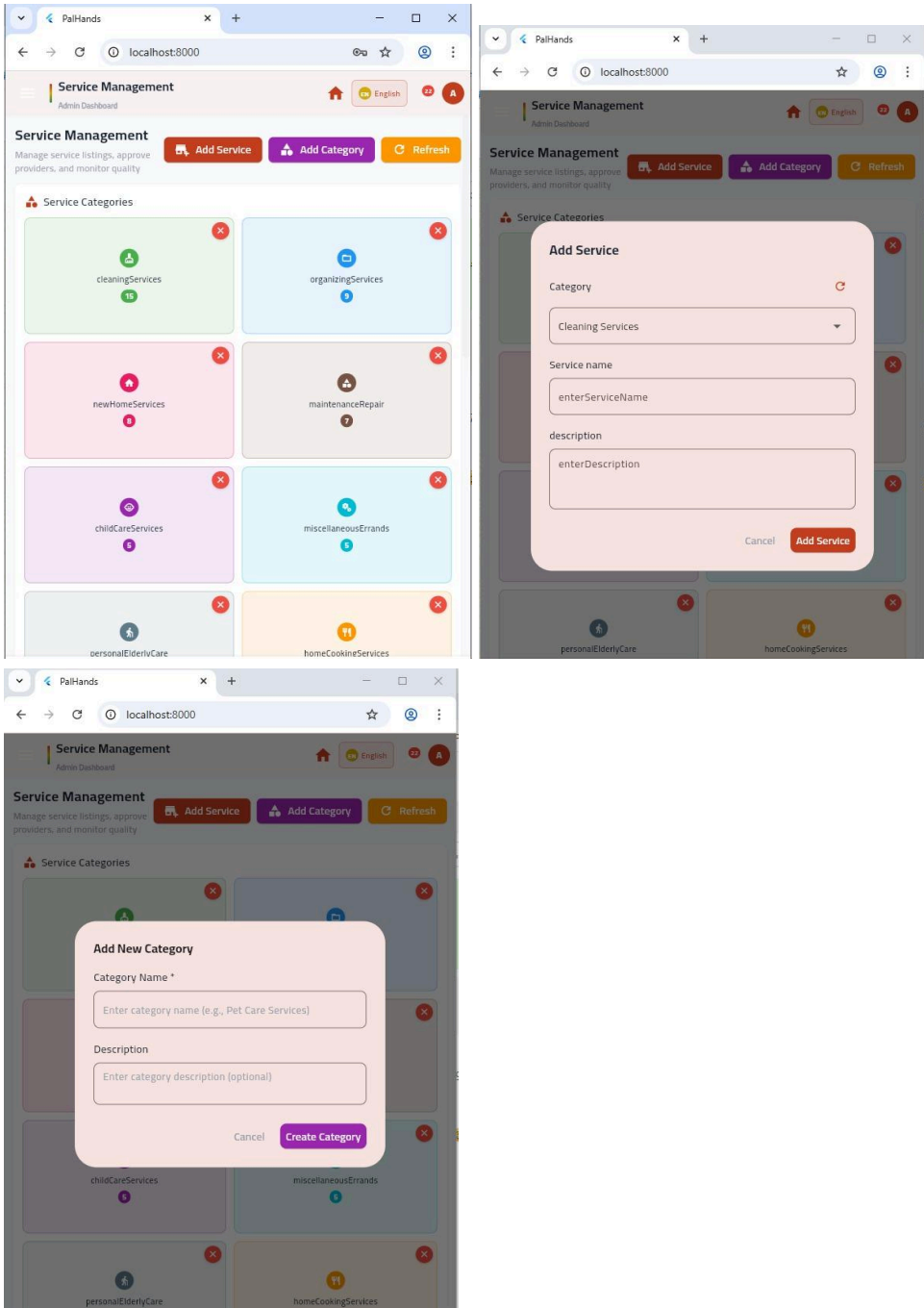


Figure 4.23: add category and service

Reports & Disputes Admin Dashboard

Admin Dashboard

Total Reports 98 Pending 97 Resolved 2 Under Review 1 Dismissed 9

Status: Active Reports Category: All Categories Refresh

Reporter	Category	Status	Date	Actions
Test Reporter test@example.com	User Issue	PENDING	08/09/2025	View Edit
bbb bb@b.com	Feature Suggestion	PENDING	08/09/2025	View Edit
Debug Tester debug@example.com	User Issue	PENDING	08/09/2025	View Edit
uuu uu@uod.com	Service Category Request	PENDING	08/09/2025	View Edit
Technical User tech@example.com	Technical Issue	PENDING	08/09/2025	View Edit

Pending 97 Resolved 2 Under Rev 1

**Edit Report Status**

Select new status:

Status: Pending Current

Cancel Update

Feature Suggestion PENDING 08/09/2025

**Edit Report Status**

Select new status:

Pending Current

Under Review Valid

Dismissed Valid

Resolved Valid

User Issue PENDING 08/09/2025

Reports & Disputes Admin Dashboard

**Report Details**

Reporter: Test Reporter  
Email: test@example.com  
Status: Pending  
Issue Type: Inappropriate Behavior  
Reported ID: Test User for Admin Notification Fix  
Reported User Role: CLIENT  
Description: This is a test report to verify that admin notifications are working after the authentication fix.  
Created: 08/09/2025  
Updated: 08/09/2025

Close

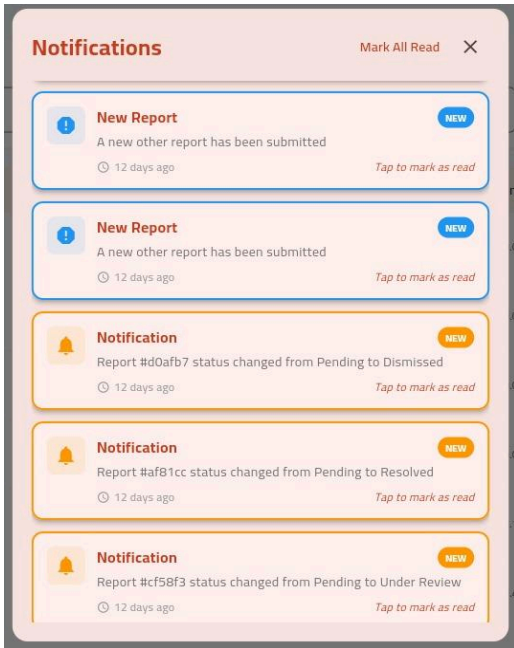
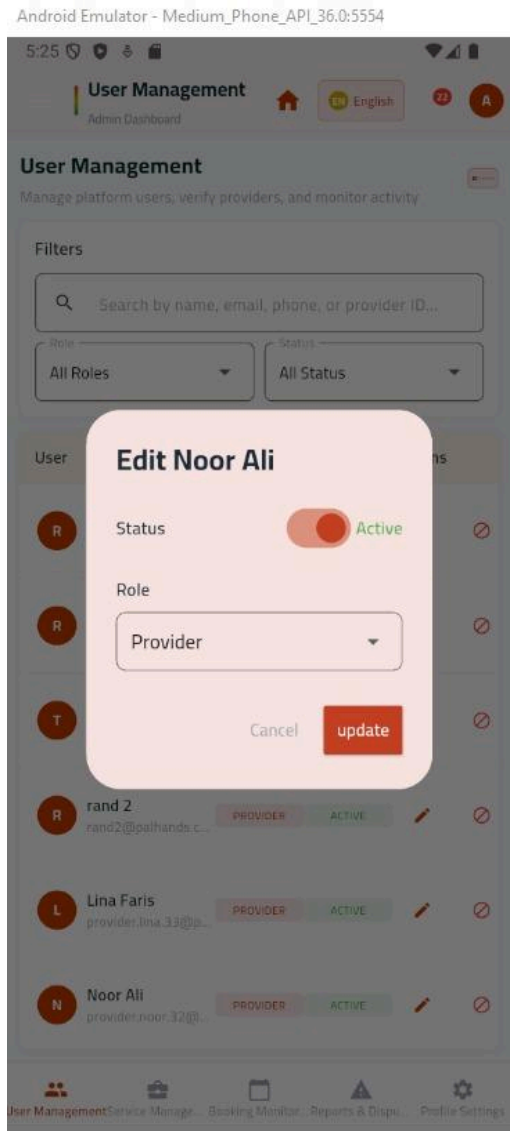
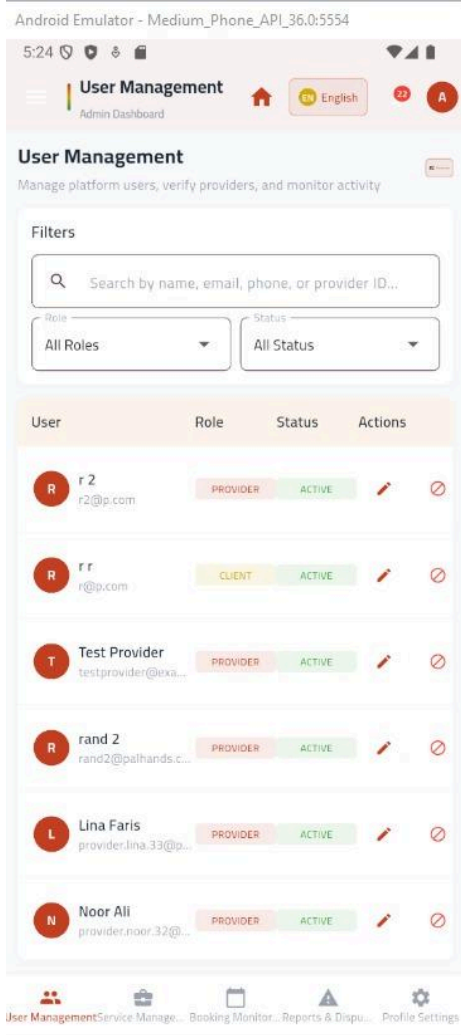


Figure 4.24: admin reports

he can manage the users and inactive a provider or client, all his booking should cancelled, and the other person should get a notification of that



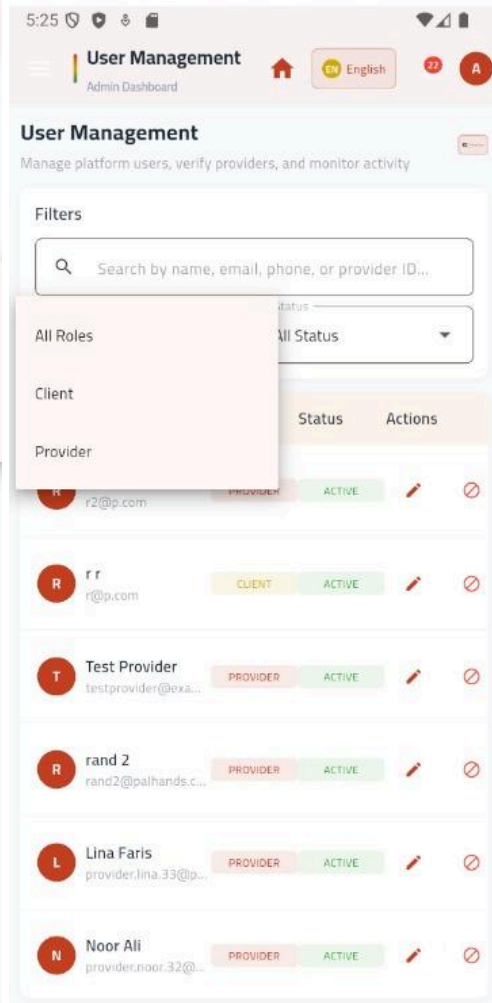
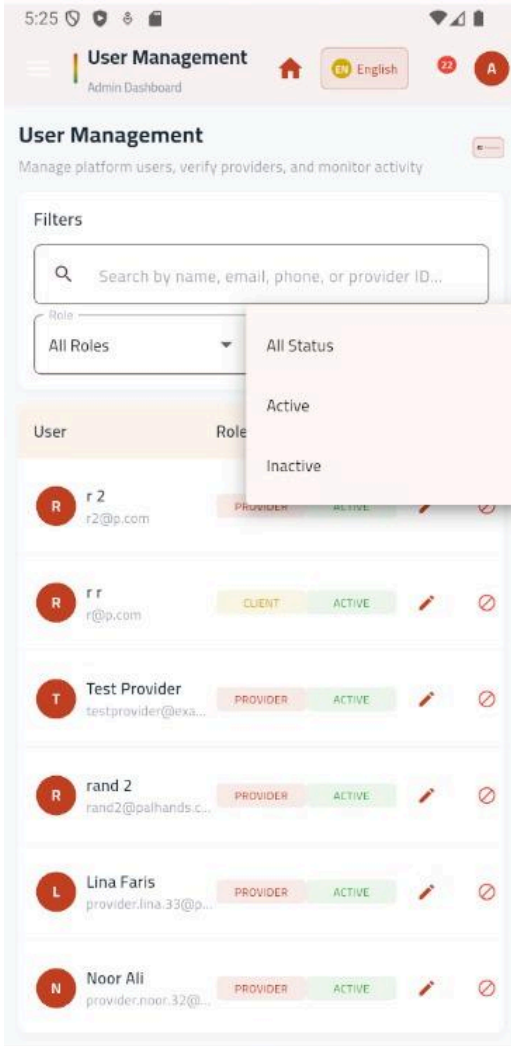
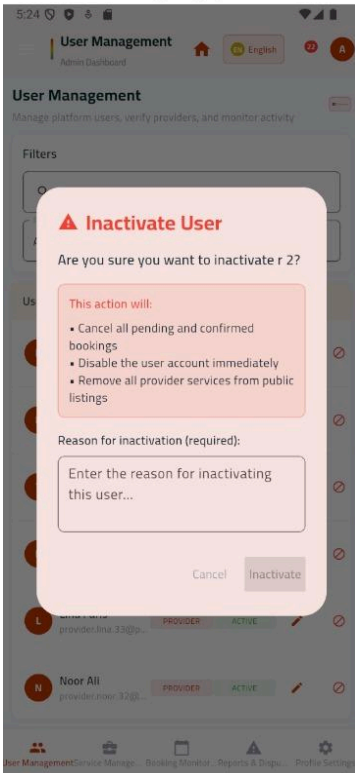







Figure4.25: user management



	<b>Lina Faris</b> provider.lina.33@palhands.com	PROVIDER	ACTIVE	★ 4.1	1/9/2025	 
	<b>Noor Ali</b> provider.noor.32@palhands.com	PROVIDER	ACTIVE	★ 4.4	1/9/2025	 

**User Inactivated successfully**

Cancelled Bookings: 1

Affected Users: 1

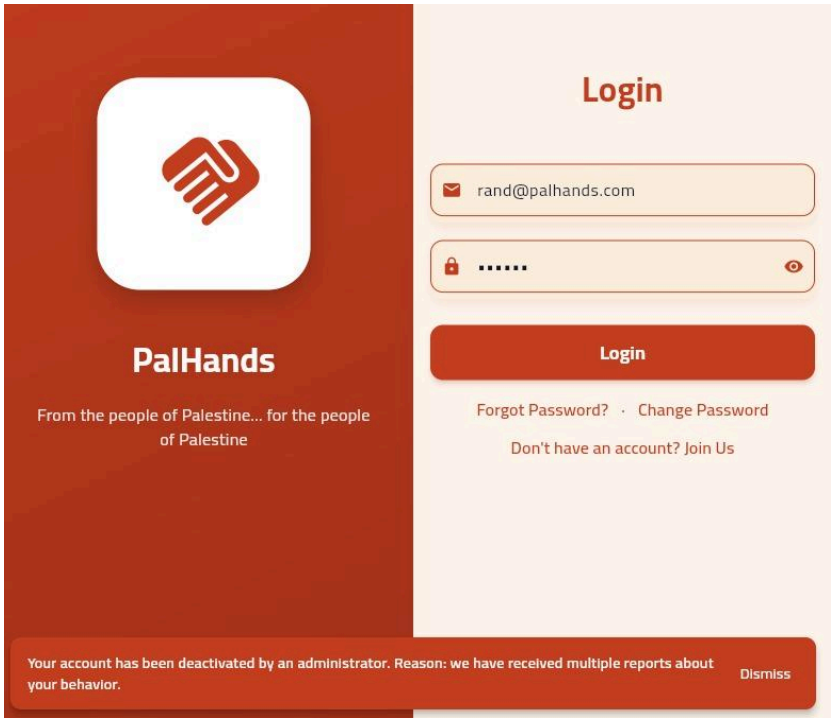


Figure 4.26: inactive user

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## chapter 5

### Results and Analysis

The PalHands project successfully developed a mobile application and a web platform aimed at connecting service providers with users in an easy and efficient way. The platform allows users to showcase their skills and a variety of services, such as childcare, household assistance, and other daily tasks, providing additional income opportunities for students, homemakers, and others seeking alternative sources of income.

Users can easily search for the services they need, view ratings and reviews of service providers, and book appointments directly through the app. The platform also supports GPS-based provider location, viewing availability schedules, and instant notifications when a booking is requested or confirmed.

On the service provider side, the platform offers a dedicated dashboard to manage services, set available times, track orders, and communicate with clients via a real-time chat system. Administrators can also manage the platform and control accounts to ensure security and reliability.

The use of Node.js and MongoDB for the backend contributed to fast and reliable performance, while providing flexible data management that can scale with increasing numbers of users and services.

Despite challenges such as data organization and synchronizing bookings between users and providers, the system proved to be effective and user-friendly, enabling users to access required services efficiently and reliably, while supporting service providers in generating additional income.

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## chapter 6

### 6.1 conclusion

**PalHands** project successfully addresses a critical gap in connecting service providers with individuals seeking everyday services. By developing a mobile and web application, we have created a secure, user-friendly, and efficient platform that enables providers to showcase their skills and users to easily find and book services such as childcare, household assistance, and other essential tasks.

Through the integration of features like real-time chat, GPS-based provider location, booking management, notifications, ratings, and reviews, the platform ensures transparency, accountability, and convenience for all users. Additionally, the administrative controls and validation layers enhance the reliability and security of the system.

This project not only contributes to **economic empowerment** for homemakers, students, and other individuals seeking alternative income sources, but also fosters **community support** by connecting those in need with trusted service providers.

In summary, **PalHands** represents a practical, innovative, and socially impactful solution that bridges the gap between informal service providers and users, improving accessibility, trust, and efficiency in everyday service transactions.

### 6.2 Future Work

- Fully integrating electronic payment gateways: Facilitating payment processes and tracking orders entirely within the app.
- Enable admins to monitor providers' activities and delete their non-permanent accounts for a long period to maintain the site's effectiveness.