



**Faculty of Engineering & Information Technology**  
**Computer Engineering Department**  
**Graduation Project – I (10636581)**

## **CloudMerchant**

### **Submitted By:**

Muath Saed  
Hamza Nayef

### **Supervisors:**

Dr. Hanal Abuzant  
Dr. Amjad AbuHassan

**July 2024**

**Presented in partial fulfilment of the requirements  
for Bachelor degree in Computer Engineering**

## **Dedication**

Firstly, Thank God for everything we have done in this project, we would dedicate this work to our parents. Whom gave us all things to reach this stage in our life, which with their supports we can stand here today, we will never finish to thank our parents for all the opportunities that they have offer, for all the teachings that they have told us and for every advice that come out of their mouth. We hope that we can make you proud as we proud of you.

To our brothers, teachers, doctors special our supervisors and our colleges we dedicate this research.

## **Acknowledgement**

We would like to express our deepest gratitude to our supervisors, Dr. Hanal Abuzant and Dr. Amjad AbuHassan, for their invaluable guidance, support, and mentorship throughout the duration of this project. Their insights and feedback have been instrumental in shaping the direction and quality of this work.

We would also like to thank to all members of the teaching staff at the Department of Computer Engineering for their support, which has greatly contributed to the successful completion of this project.

We are indebted to our families and friends for their unwavering encouragement and understanding during this journey.

## **Disclaimer Statement**

This project was done by Muath Saed and Hamza Nayef at the Computer Engineering Department, Faculty of Engineering, An-Najah National University. It has not been altered or corrected, other than editorial corrections. As a result of the assessment, it may contain language as well as content errors. The views expressed in it together with any outcomes and recommendations are solely those of the students. An-Najah National University accepts no responsibility or liability for the consequences of this report when being used for a purpose other than the purpose for which it was commissioned.

## Abstract

---

The CloudMerchant is an innovative e-commerce platform designed to revolutionize the online shopping experience by seamlessly integrating local merchants into a vast digital ecosystem. This platform aims to enhance online shopping while fostering collaboration with local businesses, thus promoting community growth and economic sustainability. Through a user-friendly mobile app, customers can explore an extensive range of products from both global brands and neighborhood merchants, creating a customized shopping journey tailored to individual preferences. The project now includes the following enhanced key elements: user registration and authentication, user roles, shopping cart, payment methods, delivery and shipment tracking, user profile, chat, and notifications. CloudMerchant prioritizes inclusivity and diversity by providing a platform where local merchants can showcase their unique offerings alongside established retailers, thereby enriching the marketplace with a vibrant tapestry of goods. By empowering local businesses to reach a wider audience and connecting shoppers with authentic, community-driven products, CloudMerchant redefines the boundaries of traditional e-commerce, forging stronger connections between consumers and their local communities.

## Table of Contents

---

Dedication .....	I
Acknowledgement .....	II
Disclaimer Statement .....	III
Abstract .....	IV
Table of Figures.....	VI
Chapter One: Introduction.....	1
1.1 Motivation .....	1
1.2 Objectives.....	1
1.3 Scope of the Work .....	1
1.4 Organization of the Report.....	1
Chapter Two: Constraints, Standards and Earlier Coursework.....	2
2.1 Constraints Limitations.....	2
2.2 Standards .....	2
2.3 Earlier Coursework .....	2
Chapter Three: Literature Review .....	2
Chapter Four: Methodology .....	3
4.1 Tools, Methods and Programming Language .....	3
4.2 System Features Implementation (Mobile Application) .....	5
4.3 System Features Implementation (Web) .....	28
Chapter Five: Results and Discussion.....	32
Chapter Six: Conclusion.....	32
6.1 Summary .....	32
6.2 Future Work.....	32
References .....	33

## Table of Figures

---

Figure 1: Sign in Screen.....	5
Figure 2: Sign Up Screen (Buyer) .....	6
Figure 3: Sign Up Screen (Seller).....	7
Figure 4: Sign Up Screen (Driver) .....	8
Figure 5: Email Verification.....	9
Figure 6: Email verification success message .....	9
Figure 7: Reset Password Screen .....	10
Figure 8: Reset Password Mail .....	10
Figure 9: Reset Password Page .....	11
Figure 10: Reset password success message .....	11
Figure 11: Home Screen (Buyer) .....	12
Figure 12: Profile Screen.....	13
Figure 13: Product Details Screen.....	14
Figure 14: Shopping Cart Screen .....	15
Figure 15: Checkout Screen with Stripe Payment .....	16
Figure 16: Successful Payment Message.....	17
Figure 17: Order History Screen with an Order Details.....	18
Figure 18: Add New Product Screen .....	19
Figure 19: Edit Product .....	20
Figure 20: Pending Orders Screen.....	21
Figure 21: Real-time driver's location in Firebase .....	22
Figure 22: Out to Delivery Status Notification .....	23
Figure 23: Driver Tracking.....	24
Figure 24: Delivered Status Notification.....	25
Figure 25: Messages on the Seller's Phone .....	26
Figure 26: A Notification and Messages on the Customer's Phone.....	27
Figure 27: Sign In Page .....	28
Figure 28: Admin Dashboard Page.....	29
Figure 29: Approval Requests Page .....	30
Figure 30: User Management Page.....	30
Figure 31: Products Page .....	31
Figure 32: Order Management Page .....	31

# Chapter One: Introduction

---

## 1.1 Motivation

The motivation behind CloudMerchant stems from the need to bridge the gap between global e-commerce platforms and local merchants. In a world where online shopping is dominated by large corporations, many small businesses struggle to gain visibility and compete. CloudMerchant aims to level the playing field by integrating local merchants into a robust digital platform, promoting economic growth within communities, and providing consumers with a diverse range of products.

## 1.2 Objectives

The primary objectives of this project include:

- Integrate local merchants into a comprehensive e-commerce platform.
- Provide a user-friendly interface for both web and mobile applications.
- Enhance the online shopping experience with personalized features.
- Promote community growth and economic sustainability.

## 1.3 Scope of the Work

The scope of the project includes the development of a mobile platform that incorporates user registration, user roles, shopping cart functionality, multiple payment methods, delivery options with real-time tracking, user profiles, chat functionality, and notification systems. The project also focuses on the inclusion of local merchants and the promotion of their products alongside global brands.

## 1.4 Organization of the Report

This report is organized into several sections, starting with the introduction and motivation behind the project. It then covers the constraints, standards, and earlier coursework that influenced the project. The literature review provides context and background information. The methodology section details the tools, methods, and programming languages used, as well as the implementation of system features for both the mobile application and the website. The results and discussion section evaluates the outcomes of the project, and the conclusion summarizes the work and outlines potential future developments.

## Chapter Two: Constraints, Standards and Earlier Coursework

---

### 2.1 Constraints Limitations

- **Technical Constraints:** Limited by the availability and compatibility of development tools and technologies.
- **Budget Constraints:** Funding limitations affecting the scope of features and functionalities.
- **Time Constraints:** Deadlines impacting the depth of development and testing phases.

### 2.2 Standards

- **Web Standards:** Compliance with W3C standards for web development.
- **Security Standards:** Adherence to industry best practices for data security and user privacy.

### 2.3 Earlier Coursework

- **Web Development:** Previous courses on web development provided foundational knowledge for building the CloudMerchant platform.
- **Database Management:** Coursework in database management helped in designing and implementing the database structure for the project.
- **Web Standards:** Compliance with W3C standards for web development.
- **Mobile Application Development:** Previous experience in mobile app development was crucial for creating the CloudMerchant mobile application.

## Chapter Three: Literature Review

---

The literature review encompasses a study of existing e-commerce platforms, their integration with local merchants, and the impact on community growth. It includes an analysis of user experience design, payment systems, delivery tracking technologies, and real-time communication tools. The review also covers the importance of inclusivity and diversity in digital marketplaces, highlighting the benefits of promoting local businesses within a global e-commerce framework.

## Chapter Four: Methodology

---

### 4.1 Tools, Methods and Programming Language

#### 4.1.1 Programming Language

- **Frontend:** JavaScript, React Native for mobile applications, and React for the web interface.
- **Backend:** Node.js and Express.js for server-side development.
- **Database:** MongoDB for data storage and retrieval.

#### 4.1.2 Tools

- **Development Tools:** Visual Studio Code as the primary code editor for development.
- **Backend and Infrastructure:**
  - **Google Cloud:** Hosting environment for the backend server.
  - **Firebase:** Powers the push notification system and enables real-time data synchronization and location tracking.
  - **Stripe:** Secure platform for processing online payments.
  - **Cloudinary:** Service for image upload, storage, optimization, and delivery.
  - **Stripe:** Secure platform for processing online payments.
- **Collaboration and Testing:**
  - **Google Cloud:** For comprehensive API testing throughout the development lifecycle.

#### 4.1.3 Database

- **MongoDB:** A NoSQL database chosen for its flexibility and scalability, suitable for handling diverse product listings and user information.

## 4.1.4 Database Collections

### 4.1.4.1 AuthVerificationTokens

The **AuthVerificationTokens** collection stores tokens used for user authentication verification. This collection is crucial for ensuring secure user registration and login processes.

### 4.1.4.2 Carts

The **Carts** collection holds information about the items that users have added to their shopping carts. This collection is essential for managing the shopping cart functionality of the platform.

### 4.1.4.3 PasswordResetTokens

The **PasswordResetTokens** collection manages tokens used for password reset functionality. This collection ensures secure and efficient password recovery for users.

### 4.1.4.4 AuthVerificationTokens

The **AuthVerificationTokens** collection stores tokens used for user authentication verification. This collection is crucial for ensuring secure user registration and login processes.

### 4.1.4.5 Products

The **Products** collection stores detailed information about the products available on the platform. This collection is essential for product management and inventory control.

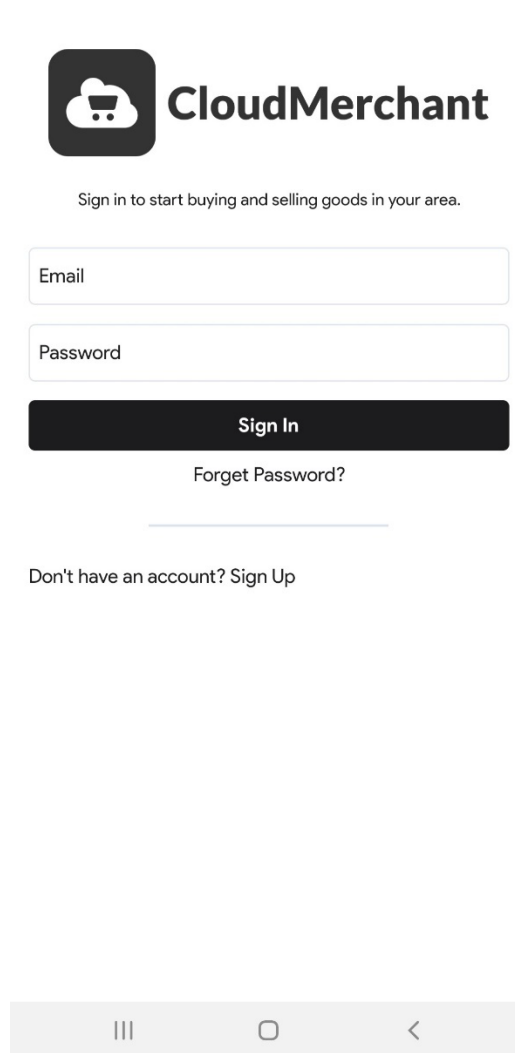
### 4.1.4.6 Users

The **Users** collection contains comprehensive information about the users registered on the platform. This collection is fundamental for user management and role-based access control.

## 4.2 System Features Implementation (Mobile Application)

### 4.2.1 User Authentication

Implemented using JSON Web Tokens (JWT) for secure and seamless user management. This ensures that user sessions are securely maintained, and authentication is efficiently handled.



The screenshot displays the sign-in interface for the CloudMerchant mobile application. At the top left is the CloudMerchant logo, which consists of a dark square icon containing a white cloud with a shopping cart inside, followed by the text "CloudMerchant" in a bold, sans-serif font. Below the logo is the instruction "Sign in to start buying and selling goods in your area." The form contains two input fields: "Email" and "Password", both with rounded rectangular borders. A prominent black button with the text "Sign In" in white is positioned below the password field. Underneath the button is a link for "Forget Password?". A horizontal line separates the sign-in section from the sign-up section, which includes the text "Don't have an account? Sign Up". At the bottom of the screen, a light gray navigation bar contains three icons: a hamburger menu icon (three vertical lines), a home icon (a circle), and a back icon (a left-pointing chevron).

Figure 1: Sign in Screen

## 4.2.2 Buyer Sign Up

The buyer sign-up process involves collecting basic information such as name, email, password, address and location on the map. The sign-up form is designed to be user-friendly, with validation checks to ensure data integrity.

**CloudMerchant**

Sign up to start buying and selling goods in your area.

Name

Email

Password

Role

Buyer     Seller     Driver

Address

City

**Pick Location from Map**

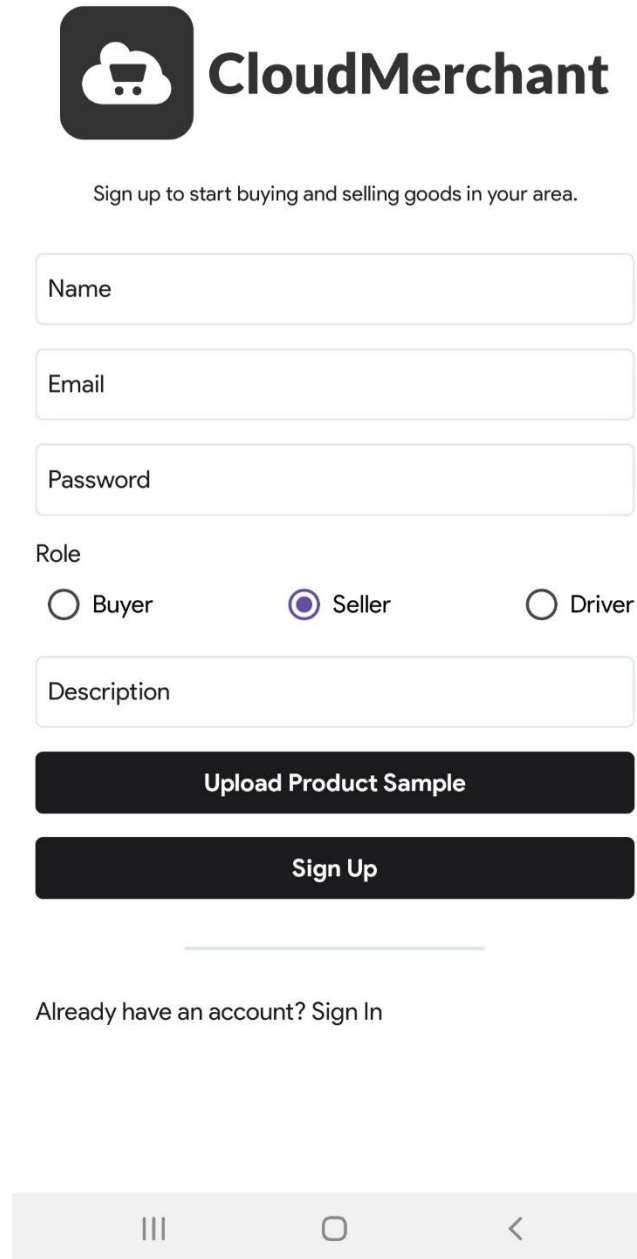
**Sign Up**

Already have an account? [Sign In](#)

Figure 2: Sign Up Screen (Buyer)

### 4.2.3 Seller Sign Up

Seller sign-up includes additional fields such as a brief description of the products offered. Sellers are also required to upload a sample image of the products for authenticity. This information is verified before the account is activated.



The image shows a mobile application sign-up screen for CloudMerchant. At the top left is the CloudMerchant logo, which consists of a dark rounded square containing a white cloud with a shopping cart icon, followed by the text "CloudMerchant" in a bold, sans-serif font. Below the logo is the text "Sign up to start buying and selling goods in your area." The form contains several input fields: "Name", "Email", and "Password", each in a white rounded rectangle with a light gray border. Below these is a "Role" section with three radio buttons: "Buyer", "Seller" (which is selected), and "Driver". Below the role selection is a "Description" text area. Two prominent black buttons with white text are stacked vertically: "Upload Product Sample" and "Sign Up". At the bottom of the screen, there is a light gray navigation bar with three icons: a hamburger menu icon (three vertical lines), a home icon (a circle), and a back arrow icon.

Figure 3: Sign Up Screen (Seller)

#### 4.2.4 Driver Sign Up

Driver sign-up involves collecting information such as name, email, password, and an image of the driver's license. This information is verified before the account is activated.



Sign up to start buying and selling goods in your area.

Role

 Buyer Seller Driver

Already have an account? [Sign In](#)



Figure 4: Sign Up Screen (Driver)

## 4.2.5 Account Verification

Account verification is done through email, where a verification link is sent to the user. Upon clicking the link, the account is verified and activated.

### Account Verification

From: CloudMerchant <s12011352@stu.najah.edu>  
To: <muath@gmail.com>

[Show Headers](#)

HTML

HTML Source

Text

Raw

Spam Analysis

HTML Check 2

Tech Info



### Email Verification

Dear Muath Saed,

Thank you for registering. Please verify your email address by clicking the link below:

[Verify Email](#)

If you did not request this, please ignore this email.

Best regards,  
CloudMerchant

Figure 5: Email Verification

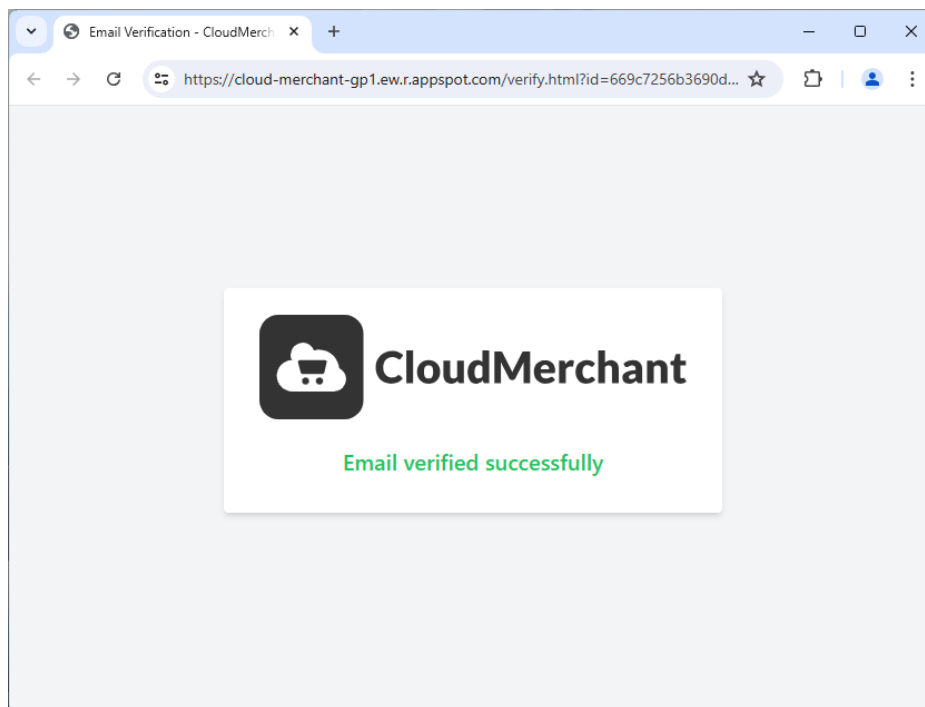
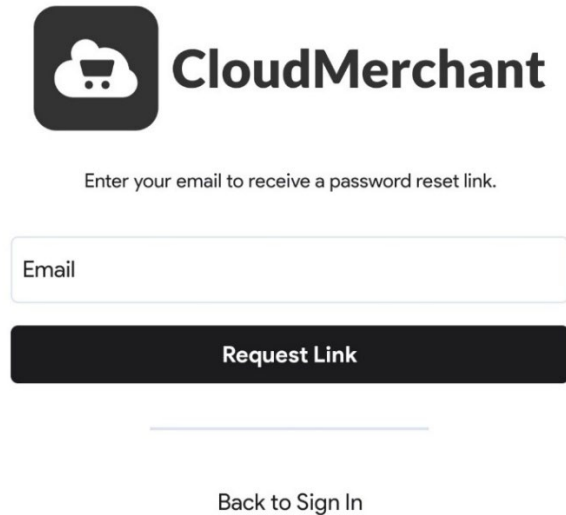


Figure 6: Email verification success message

## 4.2.6 Reset Password

The reset password feature allows users to reset their passwords via a secure link sent to their registered email address. This ensures that users can recover their accounts in case they forget their passwords.



The screenshot shows the CloudMerchant logo at the top left, consisting of a dark square with a white cloud and a shopping cart icon, followed by the text "CloudMerchant". Below the logo is the instruction "Enter your email to receive a password reset link." A text input field with the placeholder "Email" is positioned below the instruction. Underneath the input field is a dark button labeled "Request Link". At the bottom of the form, there is a link labeled "Back to Sign In" with a horizontal line above it.

Figure 7: Reset Password Screen

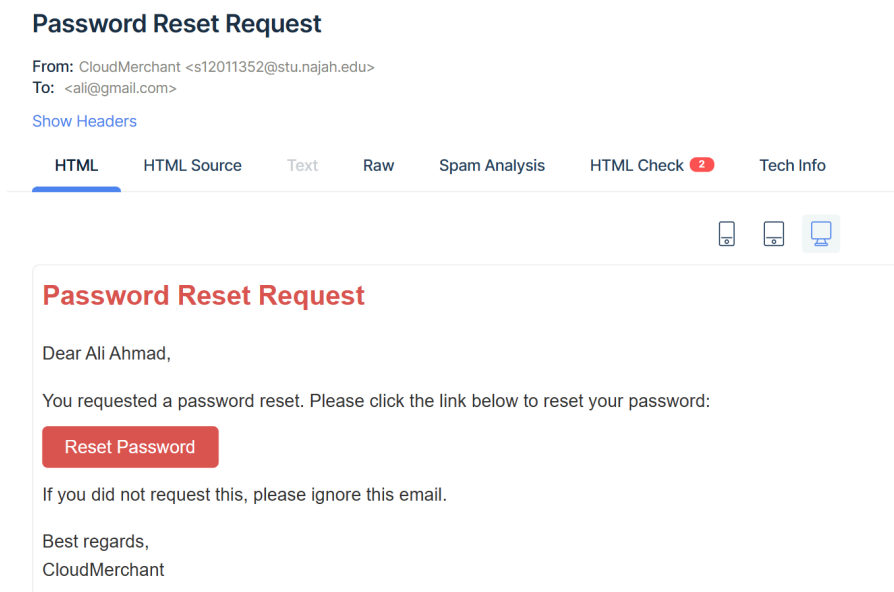


Figure 8: Reset Password Mail

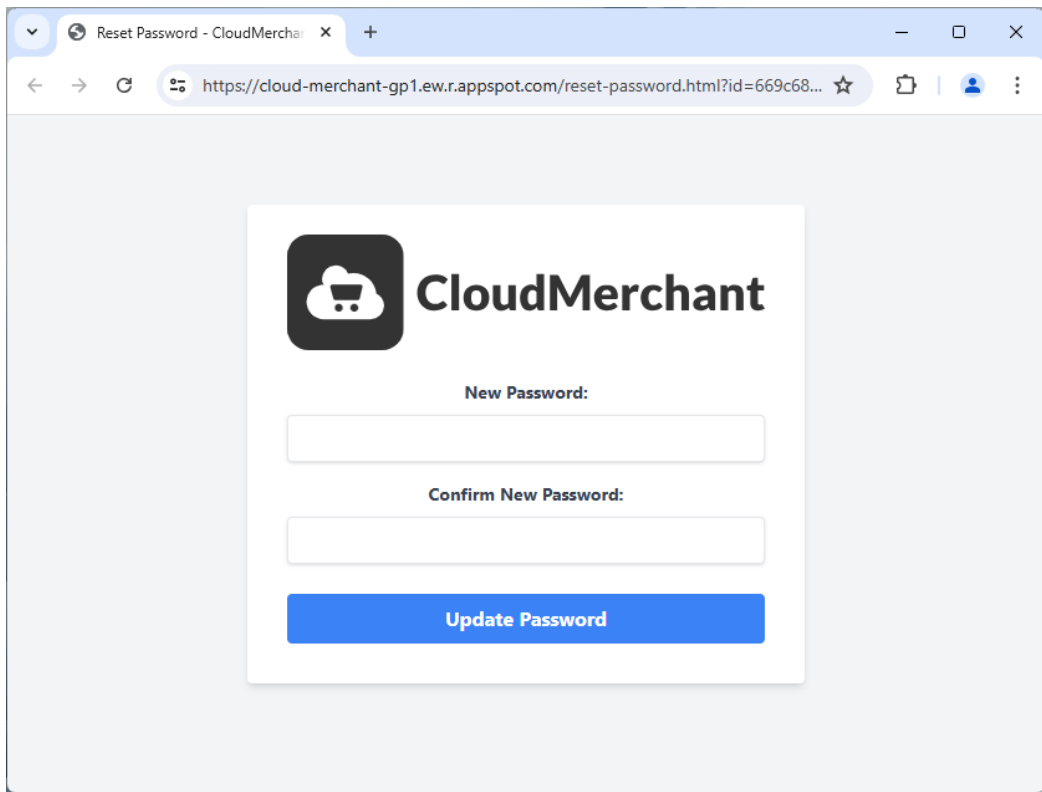


Figure 9: Reset Password Page

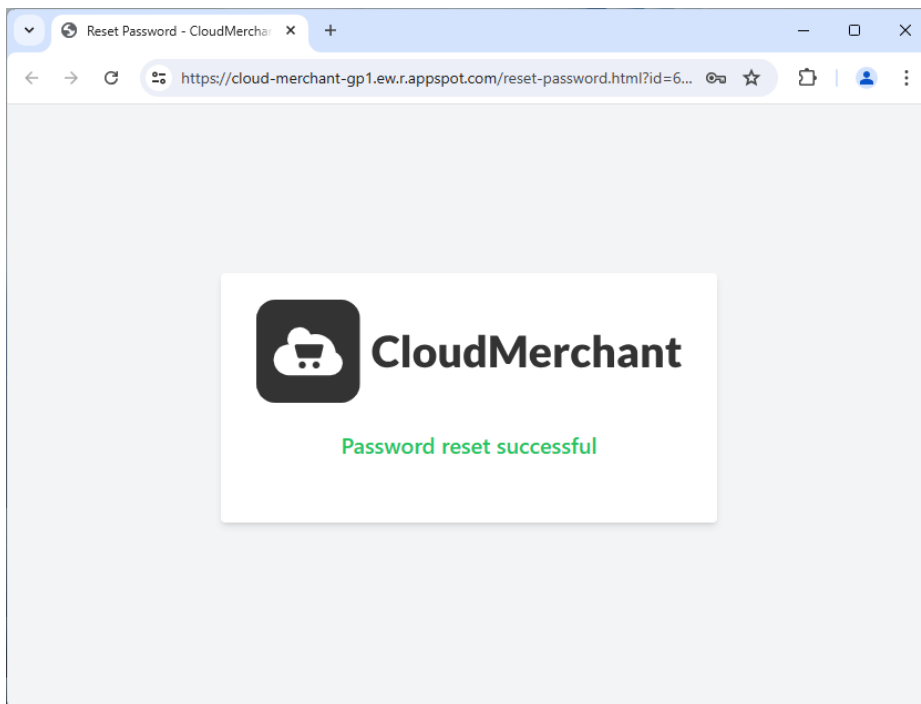


Figure 10: Reset password success message

## 4.2.7 Home Screen (Buyer)

The home screen for buyers displays featured products. It also includes categories for quick access to different product types.

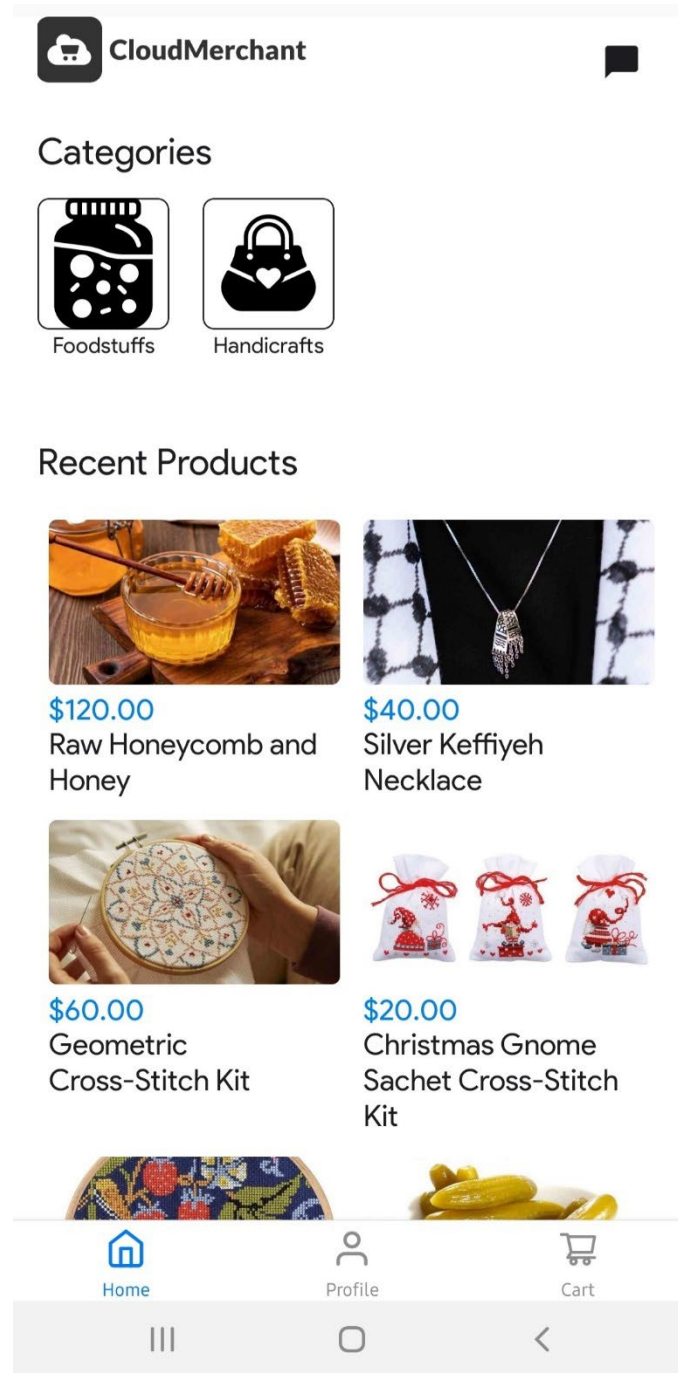


Figure 11: Home Screen (Buyer)

#### 4.2.8 Profile Screen (Buyer)

The buyer's profile screen allows users to view messages, view and update their personal information, manage their addresses, and view their order history. It serves as a central hub for managing the buyer's account.

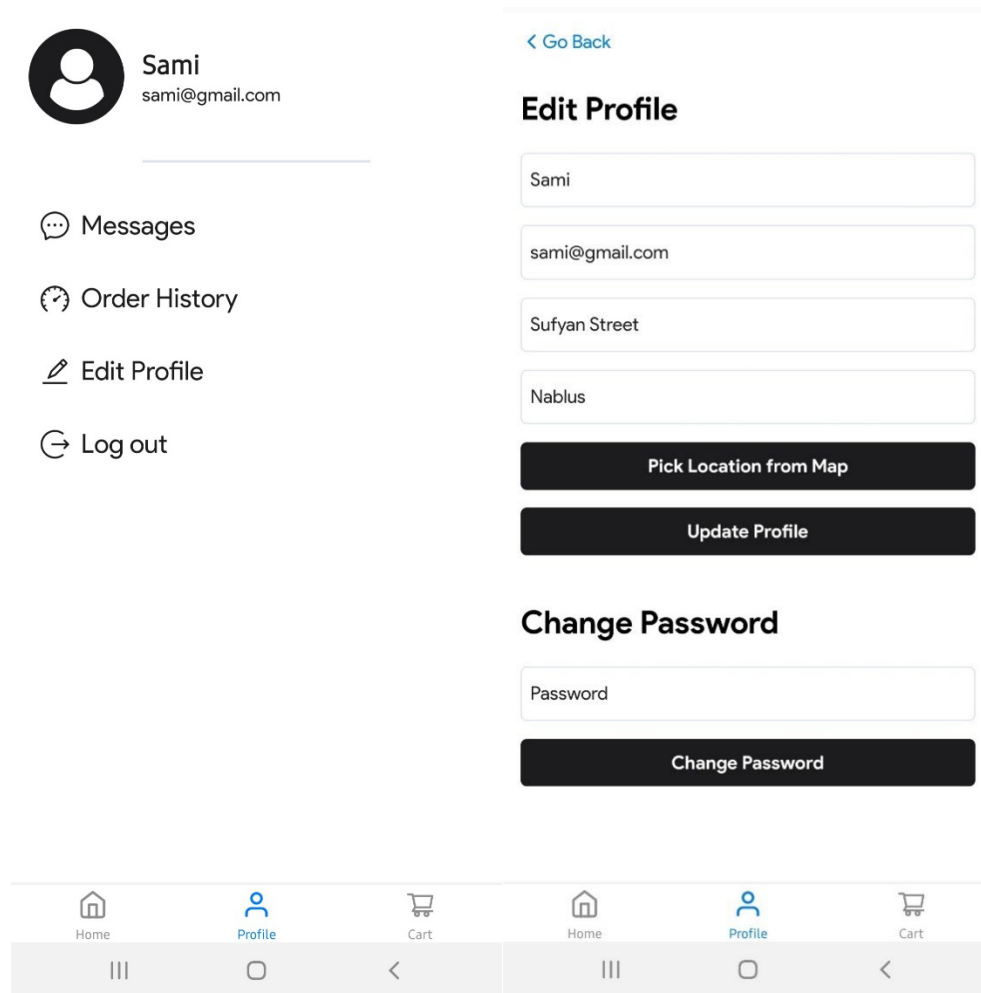


Figure 12: Profile Screen

#### 4.2.9 Select a Product and Add to Cart (Buyer)

Buyers can select products from the listings, view detailed descriptions, and add desired items to their shopping cart. The process is intuitive and allows for easy modifications to the cart.

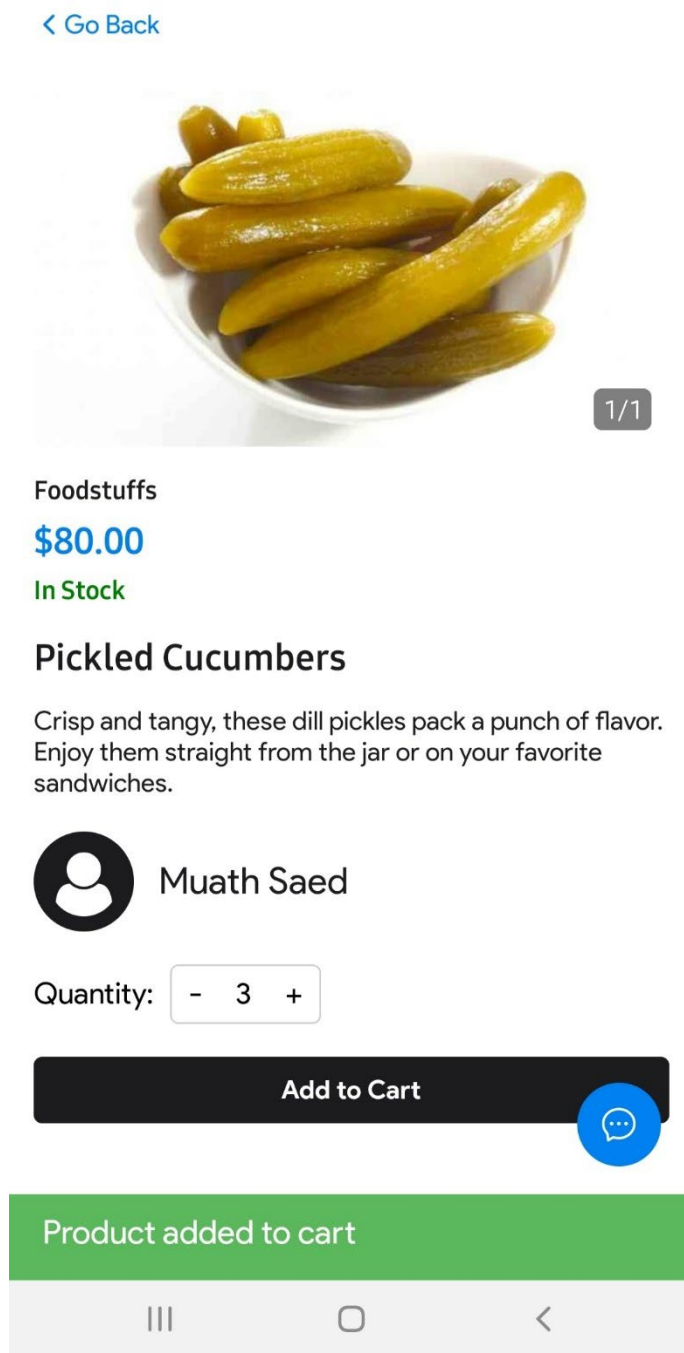


Figure 13: Product Details Screen

#### 4.2.10 Shopping Cart (Buyer)

The shopping cart feature enables buyers to review their selected items, adjust quantities, remove items, and proceed to checkout. The cart provides a summary of the total cost.

### Shopping Cart

Pickled Cucumbers	\$80.00	-	3	+	Remove
Silver Keffiyeh Necklace	\$40.00	-	1	+	Remove

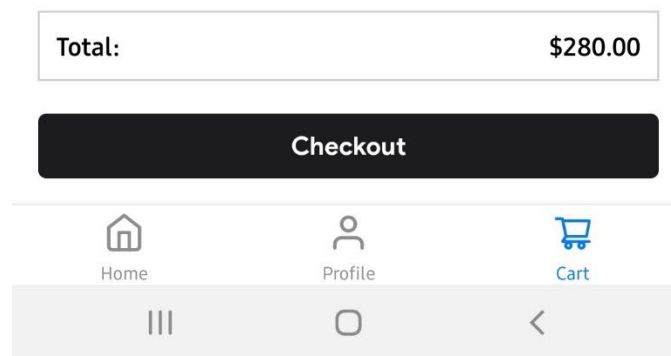


Figure 14: Shopping Cart Screen

#### 4.2.11 Checkout (Buyer)

During checkout, buyers can choose their preferred payment method, and review their order before placing it. The checkout process is streamlined for efficiency and ease of use.

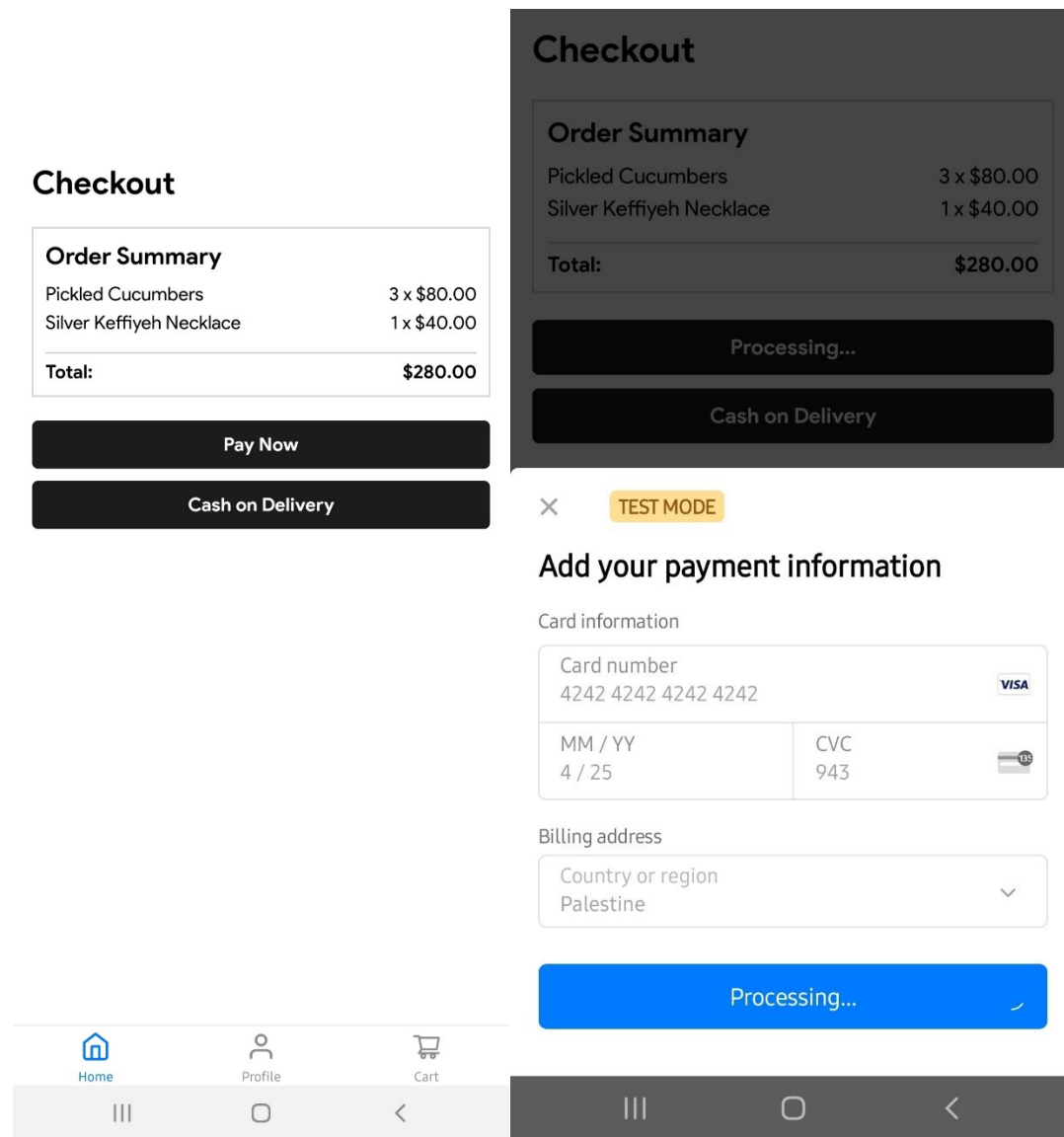


Figure 15: Checkout Screen with Stripe Payment

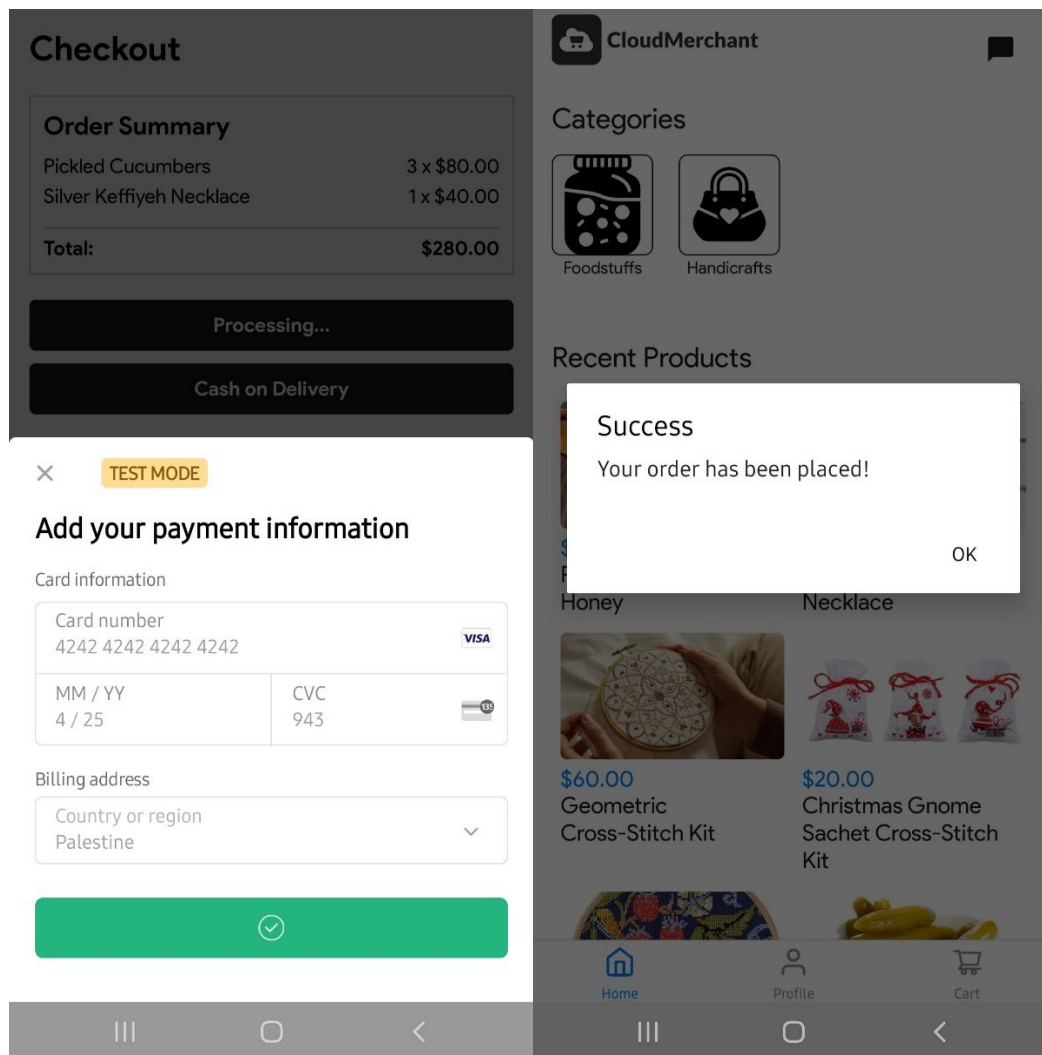


Figure 16: Successful Payment Message

## 4.2.12 Order History (Buyer)

Buyers can view and manage their past orders, including tracking shipments in real-time. The order history screen provides details on each order, including status updates and delivery information.

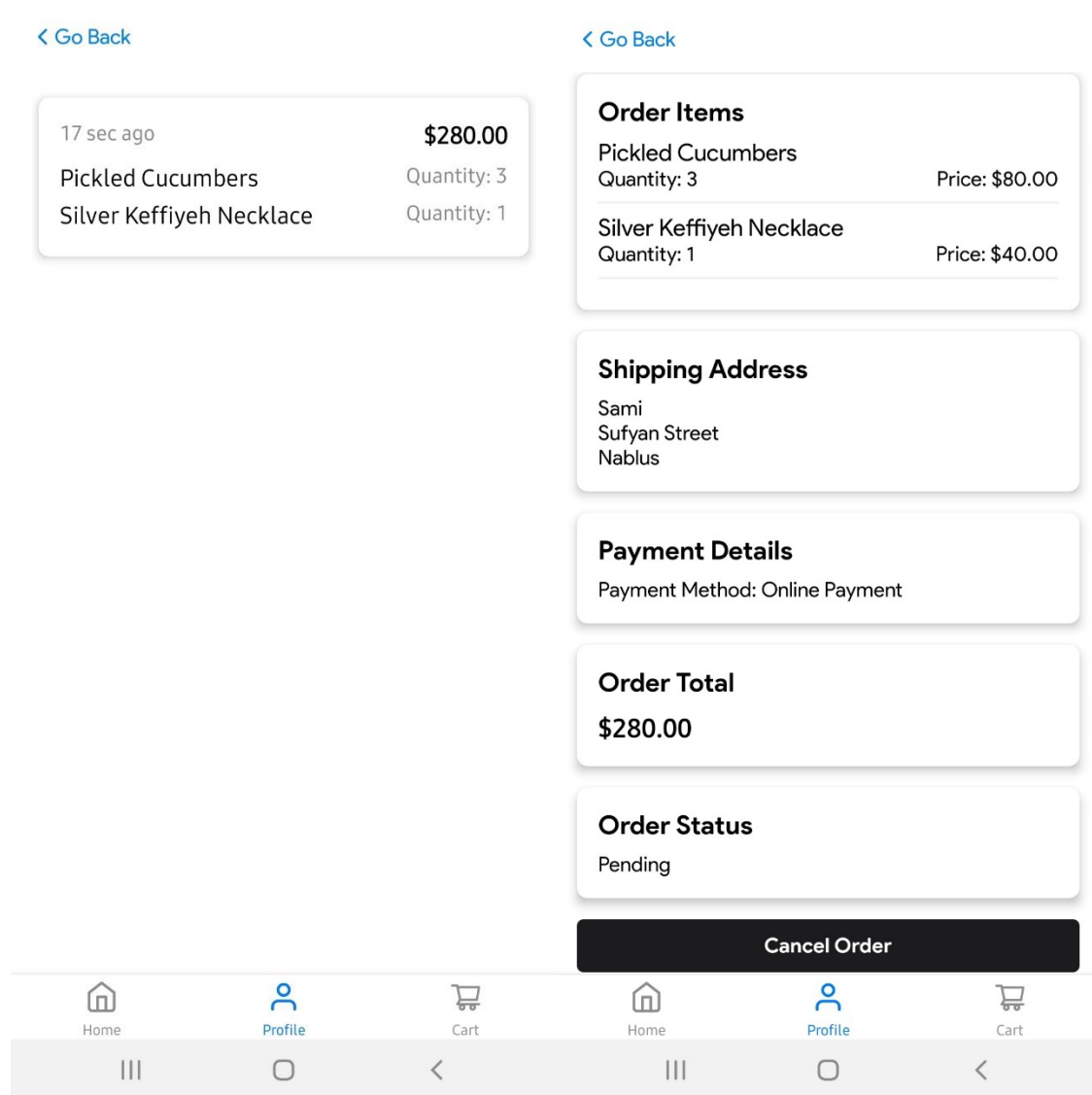
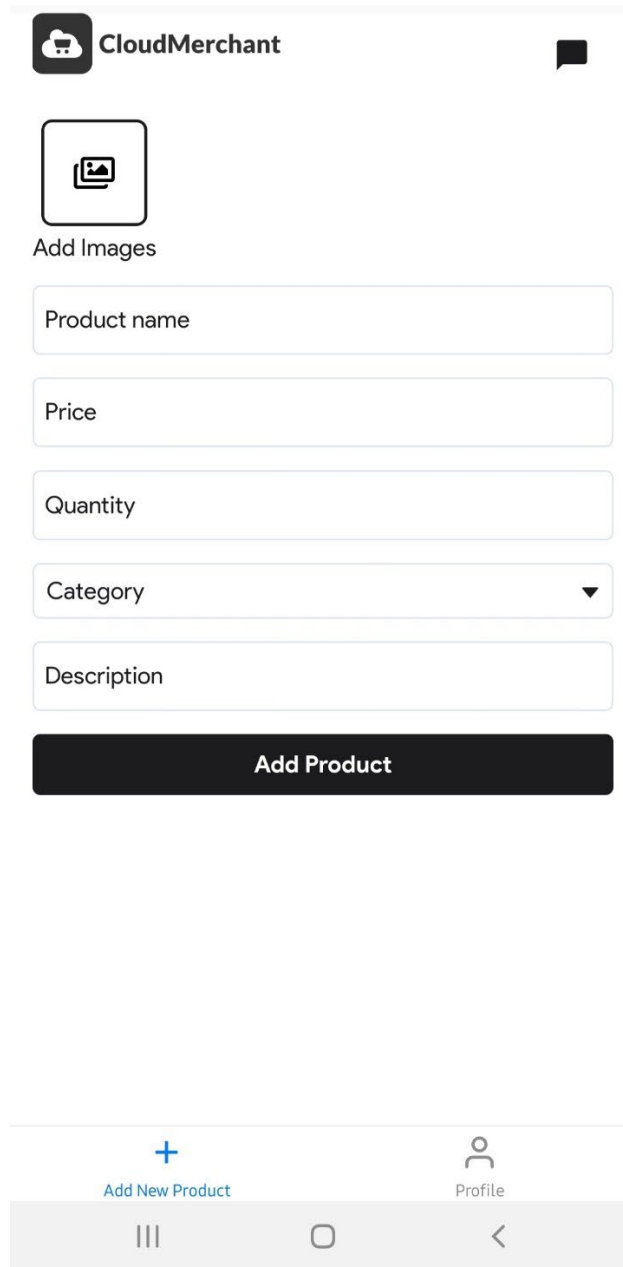


Figure 17: Order History Screen with an Order Details

#### 4.2.13 Add New Product Screen (Seller)

Sellers can add new products by providing product details such as name, description, price, and images. The interface is designed to be straightforward, allowing for quick and easy product listings.



CloudMerchant

Add Images

Product name

Price

Quantity

Category

Description

Add Product

Add New Product

Profile

Figure 18: Add New Product Screen

#### 4.2.14 Edit Product (Seller)

Sellers can edit existing product listings to update information such as price, description, and availability. This feature ensures that product information is always accurate and up-to-date.

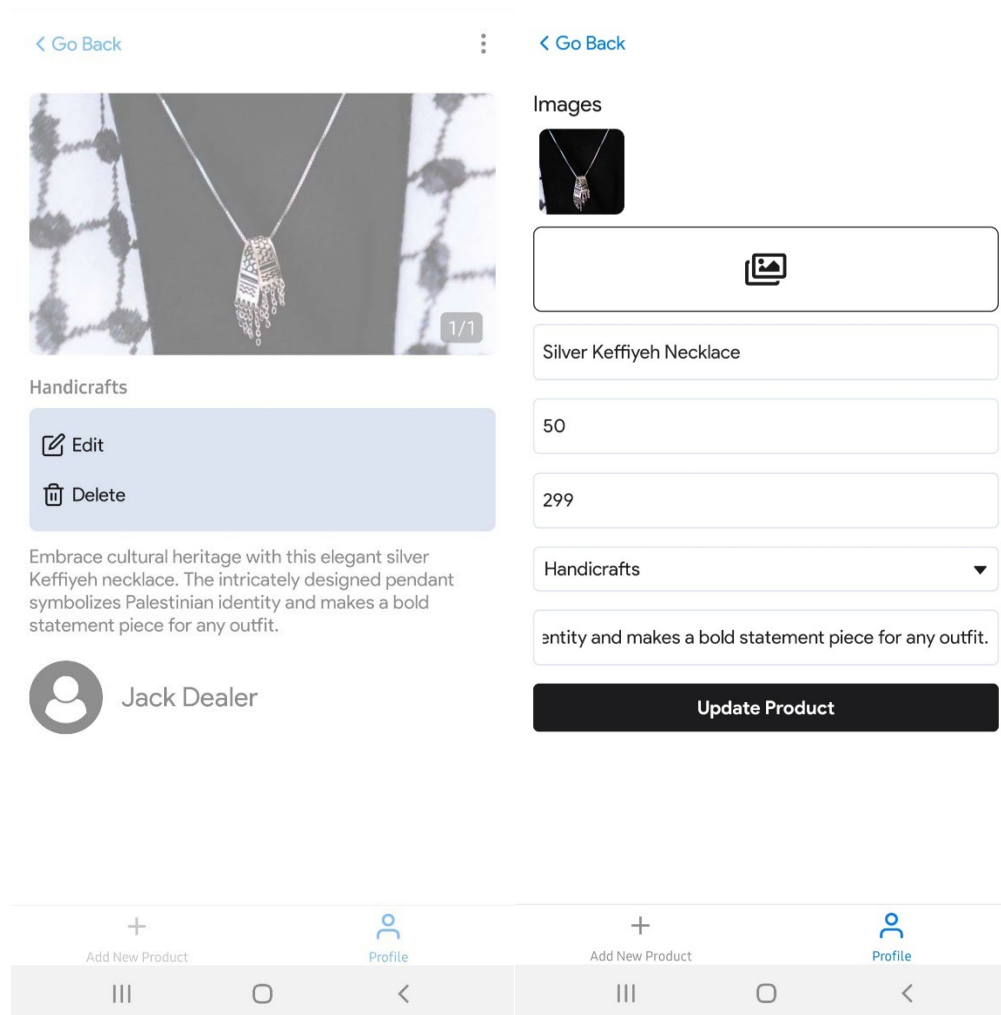


Figure 19: Edit Product

#### 4.2.15 View Pending Orders (Driver)

Drivers can view pending orders assigned to them, including pickup and delivery details. The interface provides real-time updates on order status, ensuring efficient delivery management.



Figure 20: Pending Orders Screen

### 4.2.15.1 Real-Time Tracking

Real-time tracking is a crucial feature for both drivers and customers within the CloudMerchant platform. This functionality leverages GPS and other tracking technologies to provide accurate and timely updates on the location of delivery drivers.

- **Implementation:**
  - **GPS Integration:** The mobile application integrates with the device's GPS to continuously track the driver's location.
  - **Location Updates:** The driver's location is updated at regular intervals and sent to the server, which then updates the customer's view.
  - **Firestore Integration:** Firestore is used to store and synchronize the real-time coordinates of the drivers. This ensures that the location data is updated instantly across all devices.
  - **Map Display:** Customers can view the real-time location of their orders on a map interface within the app, providing transparency and reducing anxiety about delivery times.
  - **Status Updates:** Both drivers and customers receive real-time notifications about the status of the delivery, such as "Out for Delivery," and "Delivered."

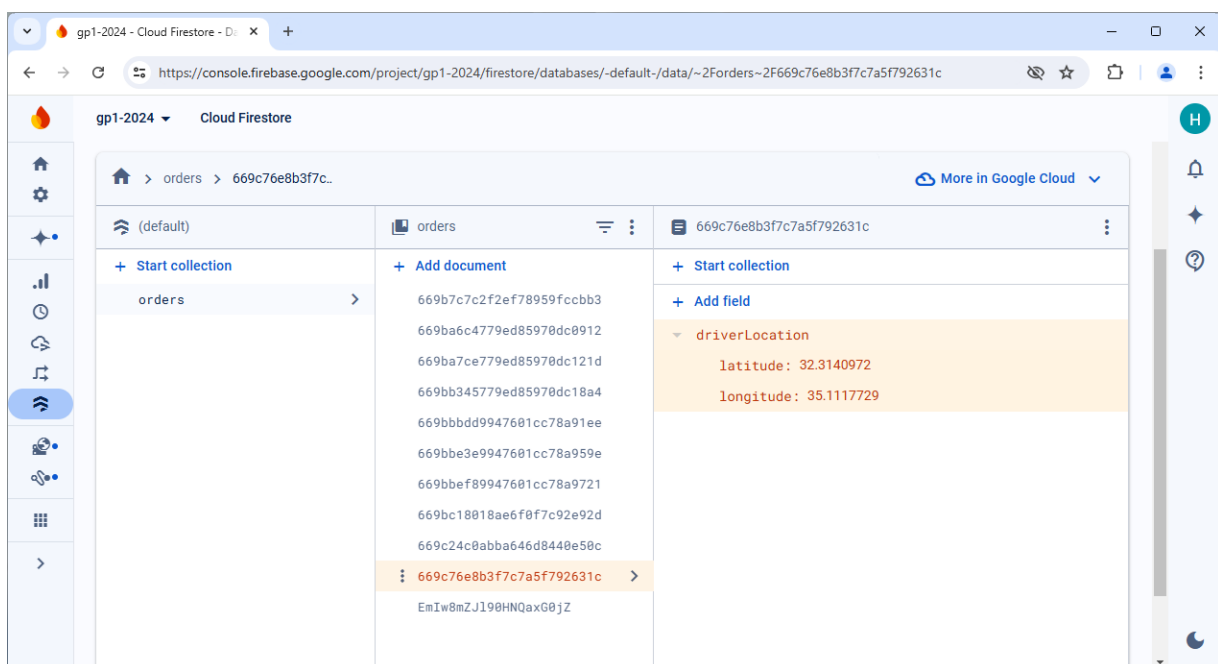


Figure 21: Real-time driver's location in Firestore

When the status changed to "Out to Delivery", the customer will receive a push notification.

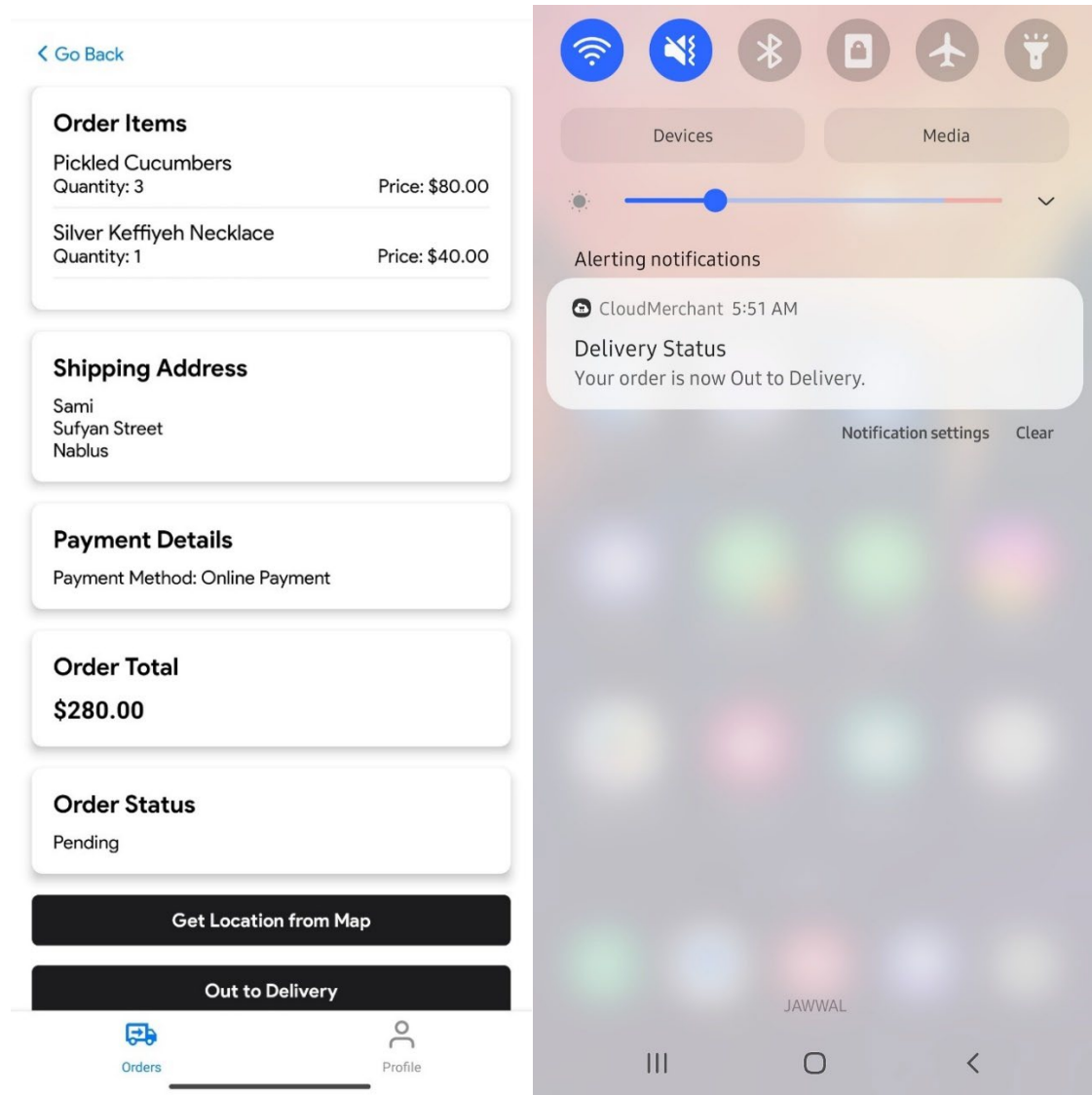


Figure 22: Out to Delivery Status Notification

Then "Track Order" button will be enabled and the customer can track the shipment. The blue marker indicating the driver's real-time location and the green marker indicating the destination.

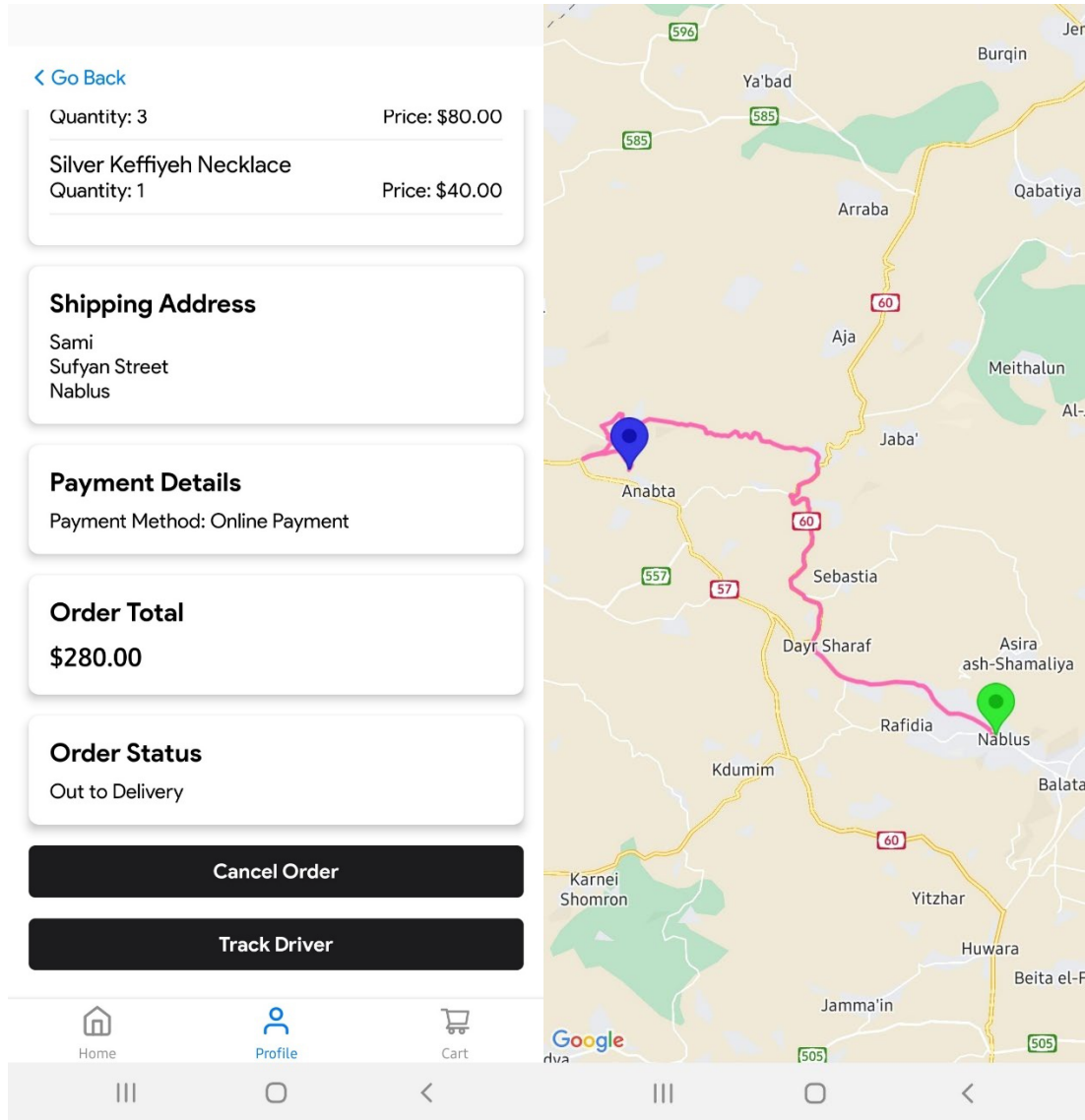


Figure 23: Driver Tracking

When the driver changes the status to "Delivered", the customer will receive a push notification.

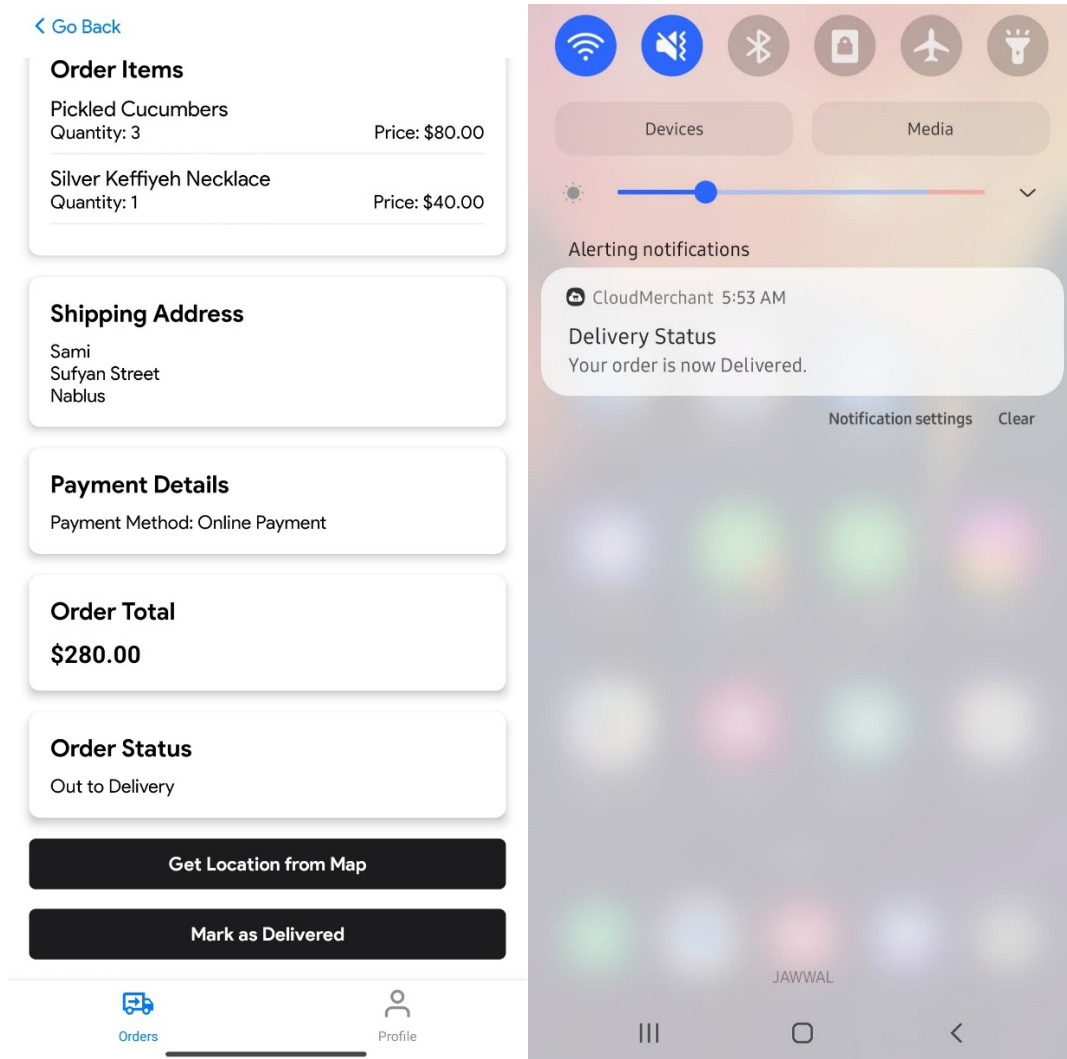


Figure 24: Delivered Status Notification

## 4.2.16 Chatting (Between Buyer and Seller)

Real-time chat functionality allows buyers and sellers to communicate directly. This feature facilitates coordination, answers queries, and enhances the overall shopping experience.

### 4.2.16.1 The Seller received a message from a customer

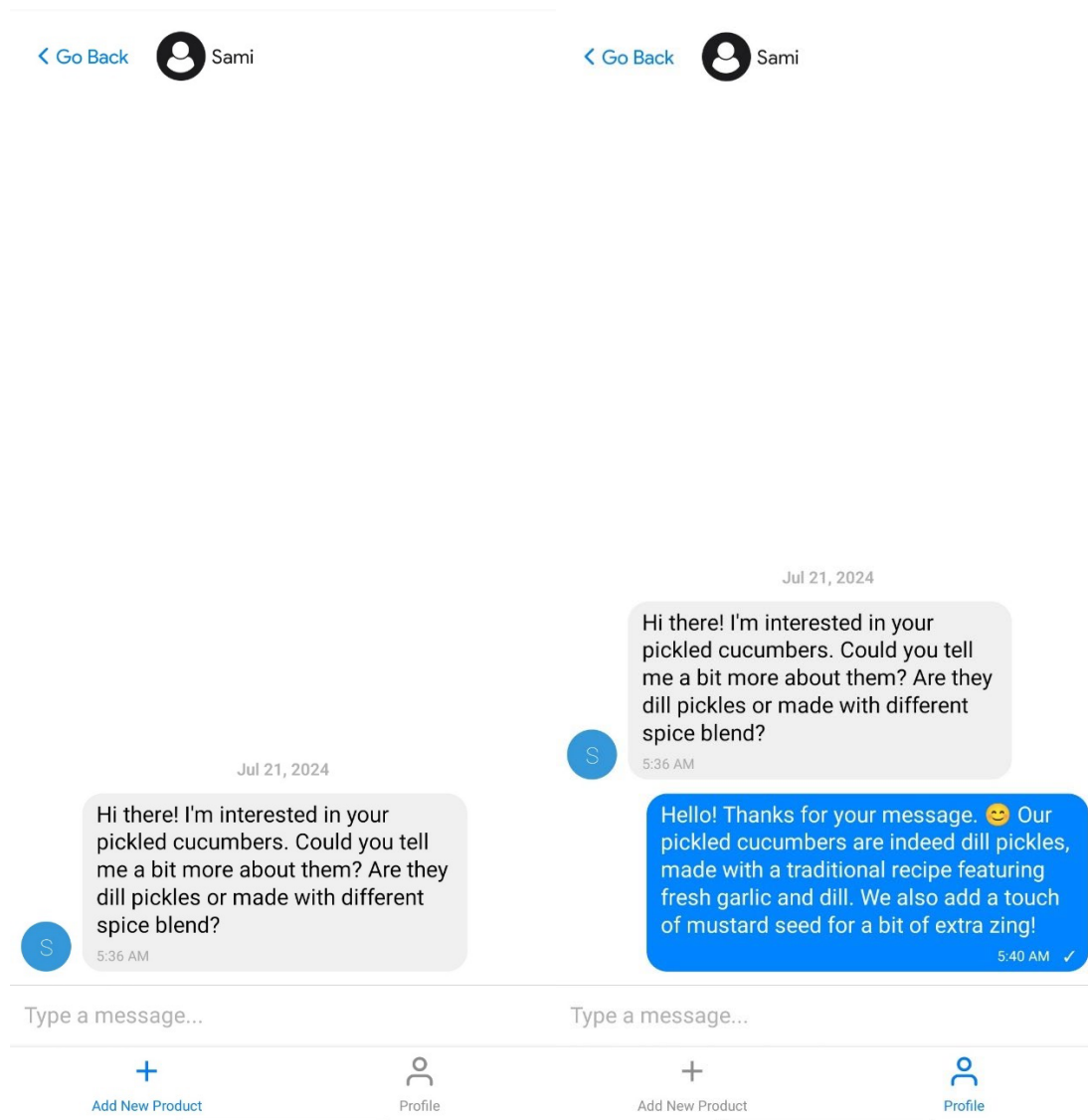


Figure 25: Messages on the Seller's Phone

#### 4.2.16.2 The customer received a response from the seller

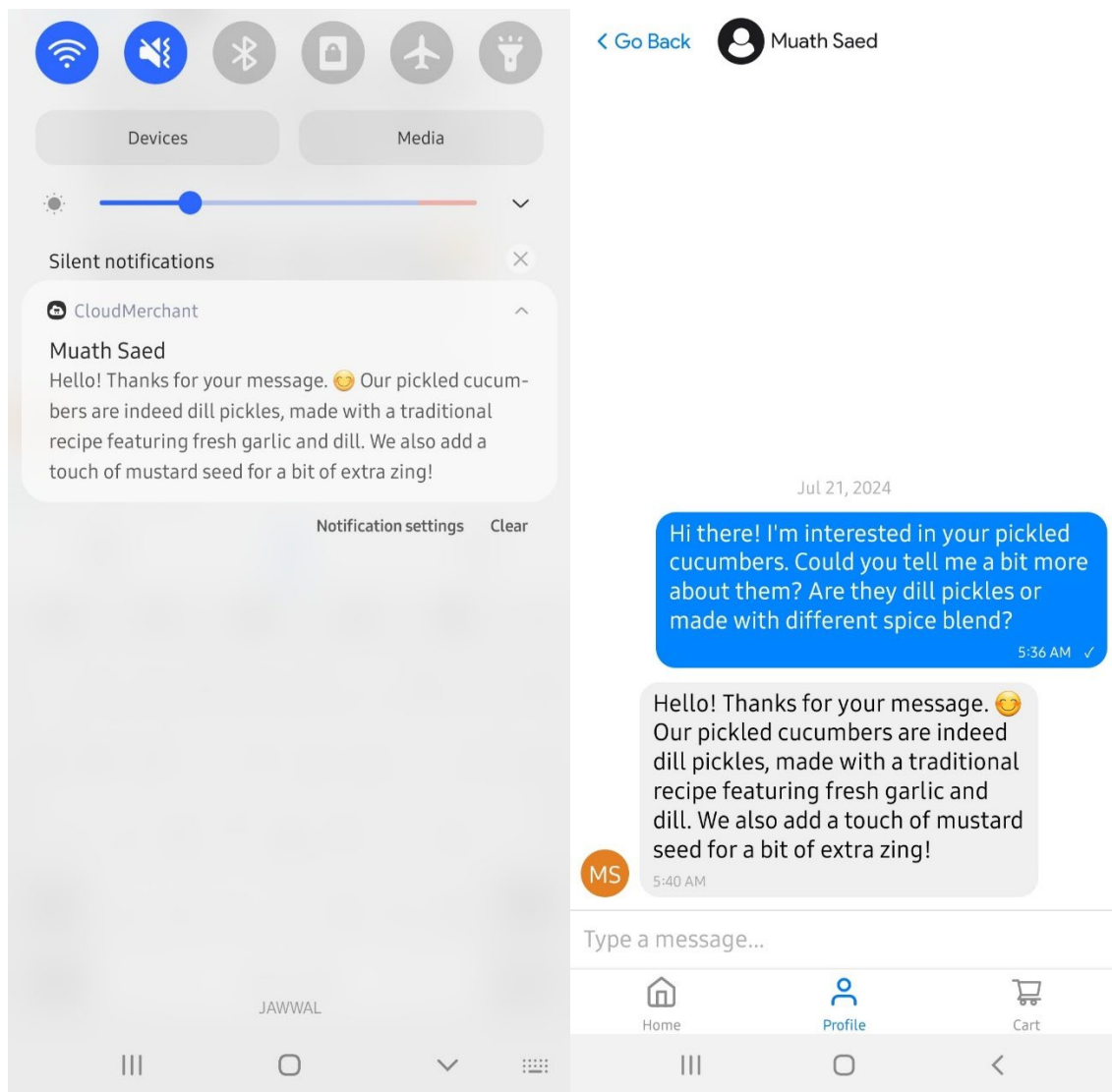


Figure 26: A Notification and Messages on the Customer's Phone

## 4.3 System Features Implementation (Web)

### 4.3.1 Sign In Screen

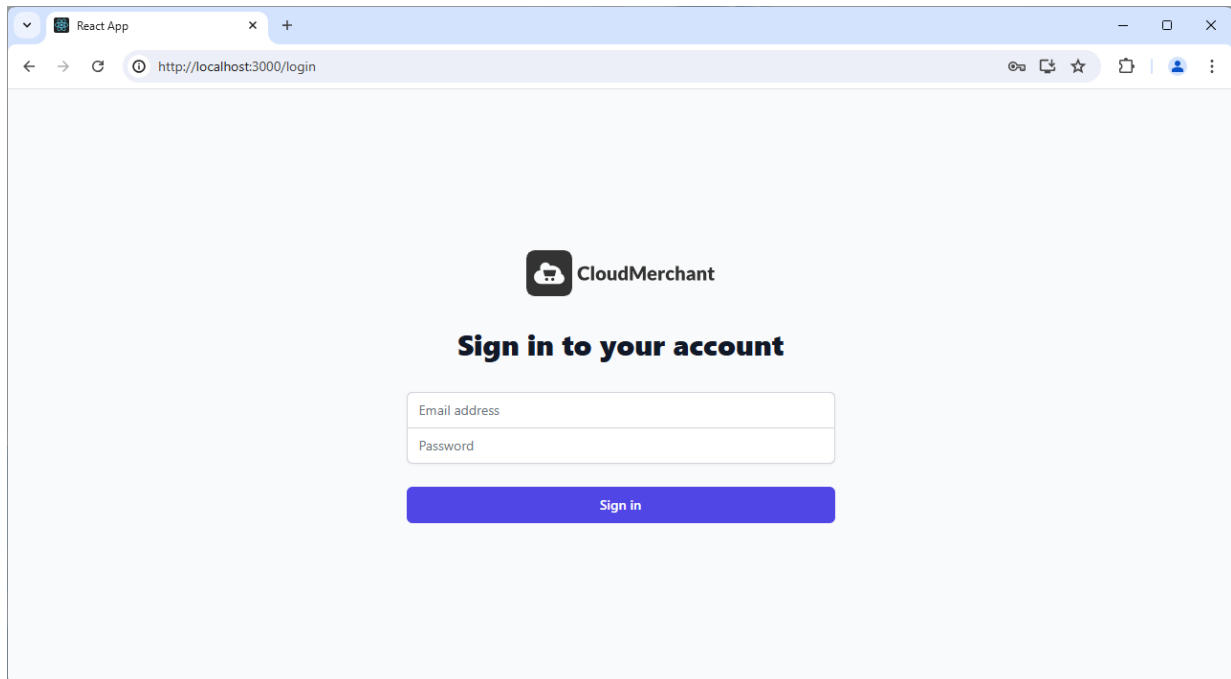


Figure 27: Sign In Page

### 4.3.2 Admin Dashboard

The admin dashboard provides a snapshot of key metrics and data points, including the total number of users, products, orders, and total revenue. This overview is designed to give administrators a quick and clear understanding of the platform's current status and performance.

- **Total Users:** Displays the total number of registered users on the platform.
- **Total Products:** Shows the total number of products available on the platform.
- **Total Orders:** Indicates the total number of orders placed through the platform.
- **Total Revenue:** Summarizes the total revenue generated from all orders.

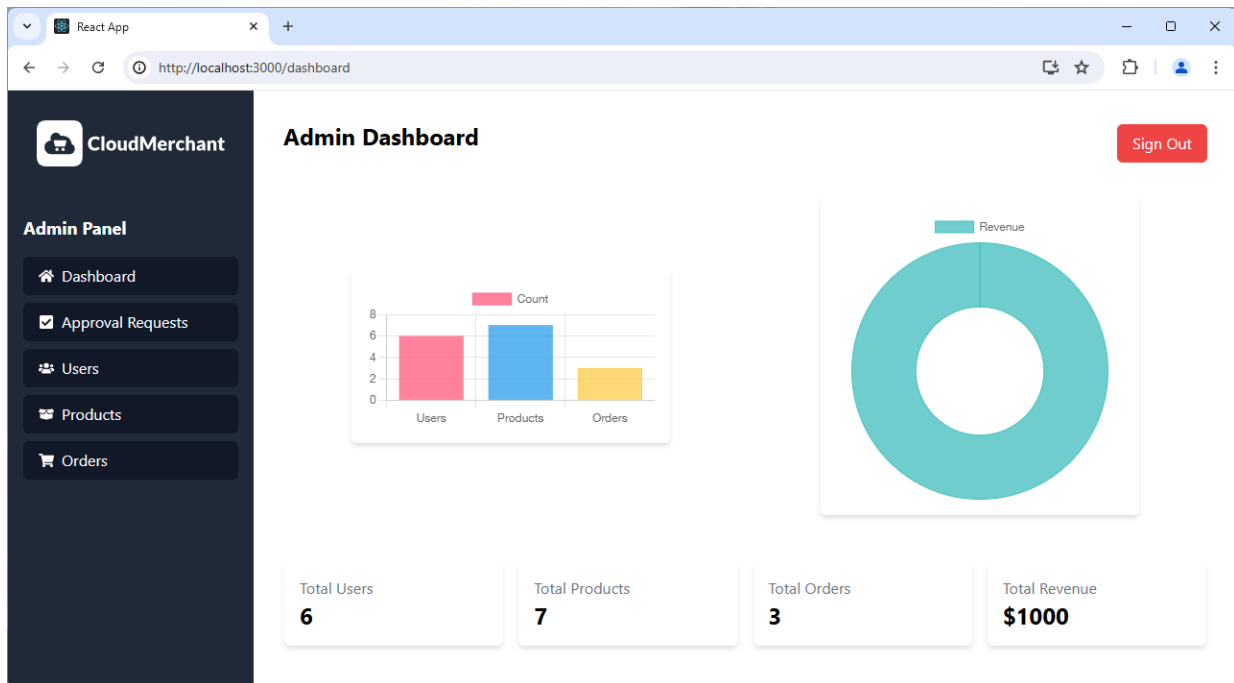


Figure 28: Admin Dashboard Page

### 4.3.3 Approval Requests

The approval requests section allows administrators to manage and approve new user registrations, particularly for sellers and drivers who need additional verification before gaining full access to the platform. This section includes the following features:

- **User Details:** Displays the name, email, role, description, and image of users who have requested approval.
- **Actions:** Provides options for administrators to approve or reject the registration requests.

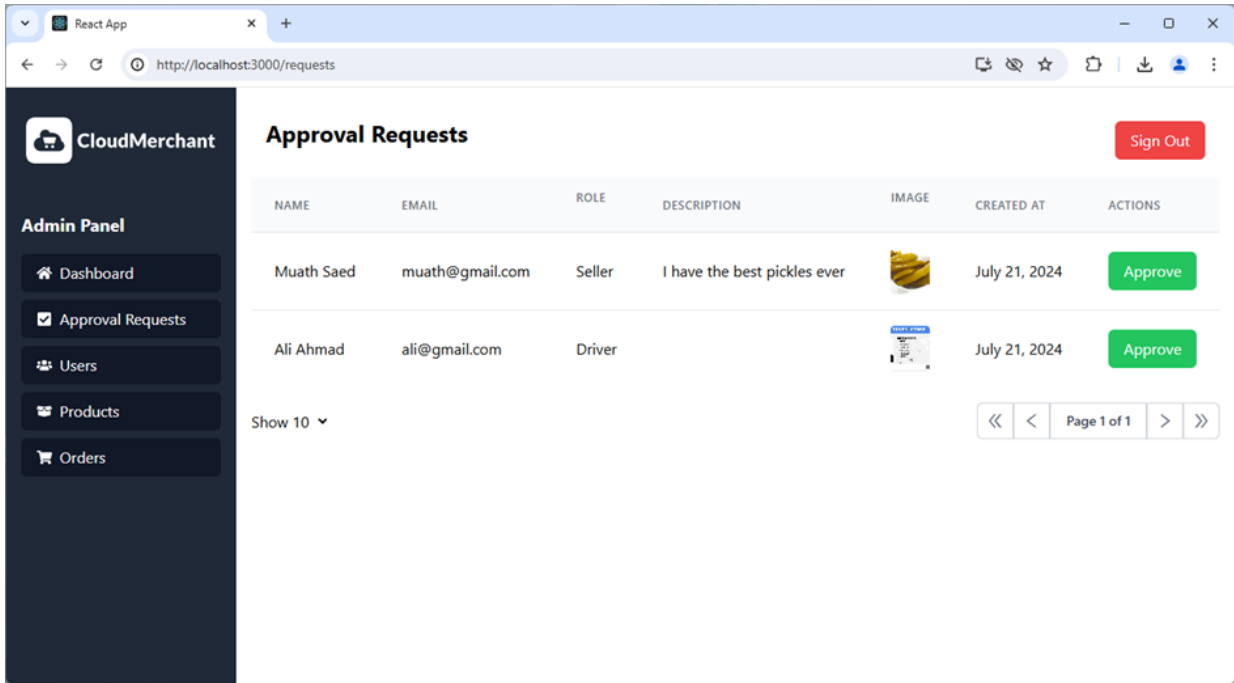


Figure 29: Approval Requests Page

#### 4.3.4 User Management

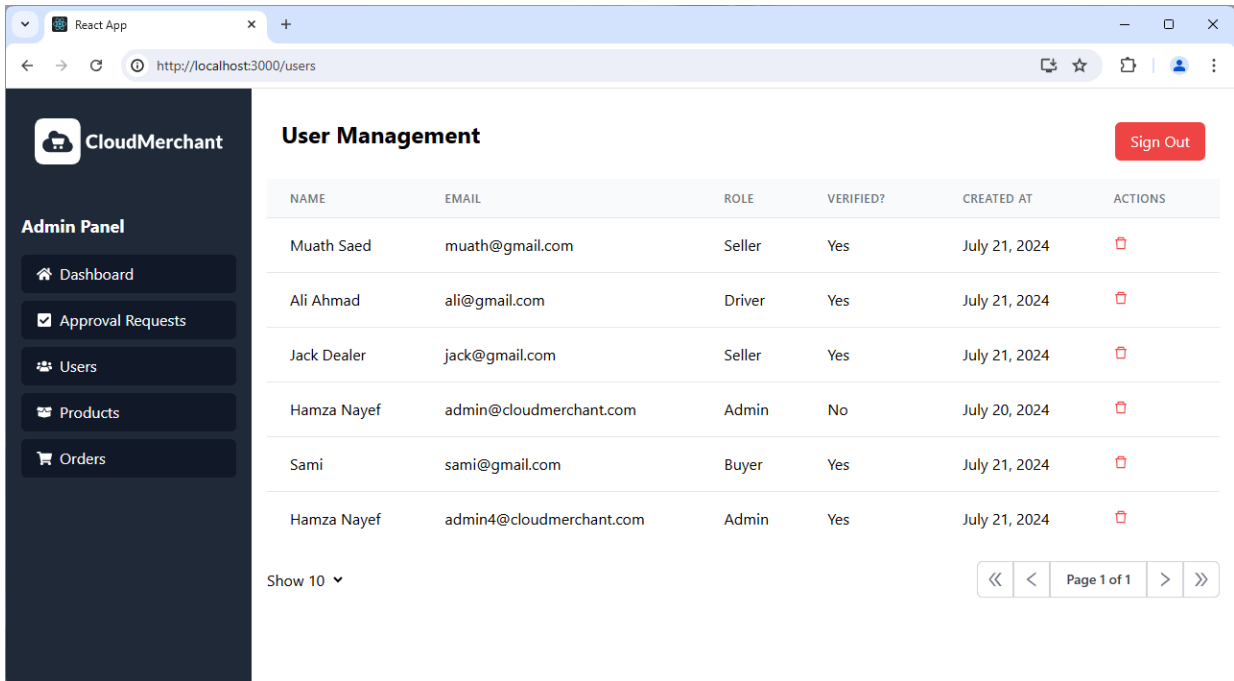


Figure 30: User Management Page

### 4.3.5 Products

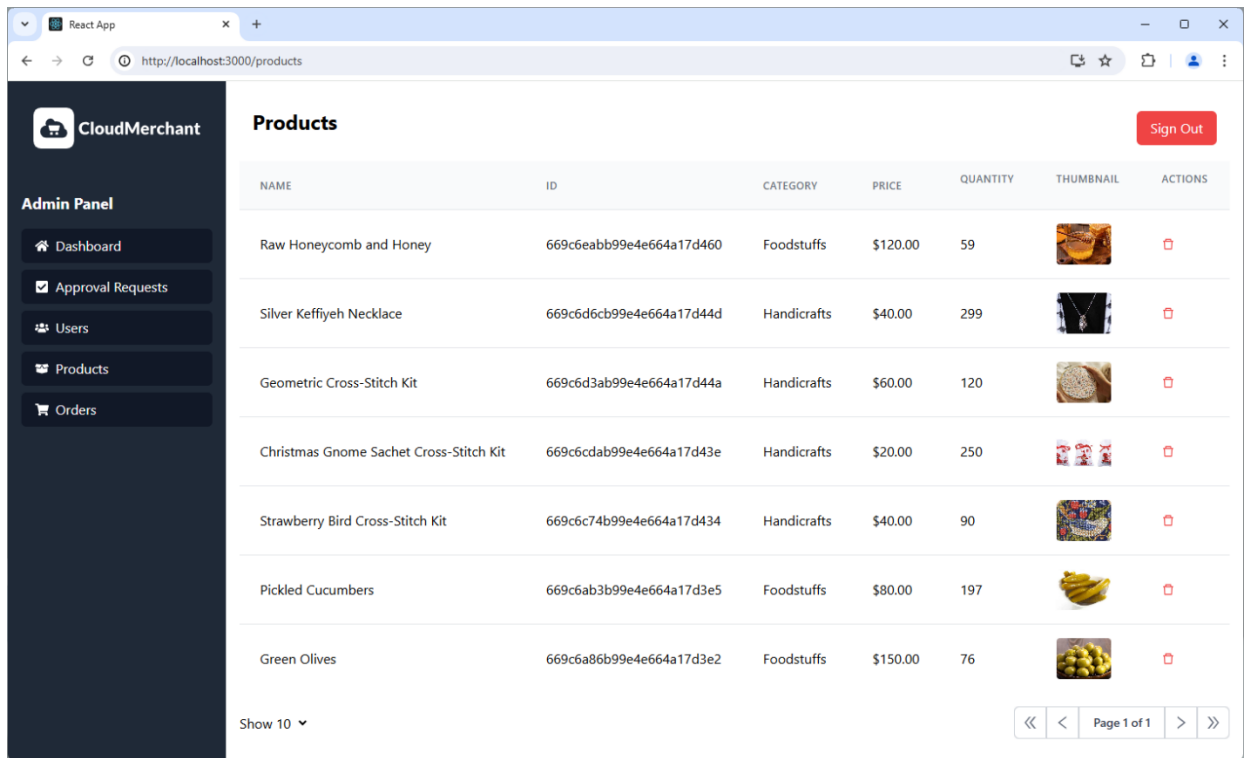


Figure 31: Products Page

### 4.3.6 Order Management

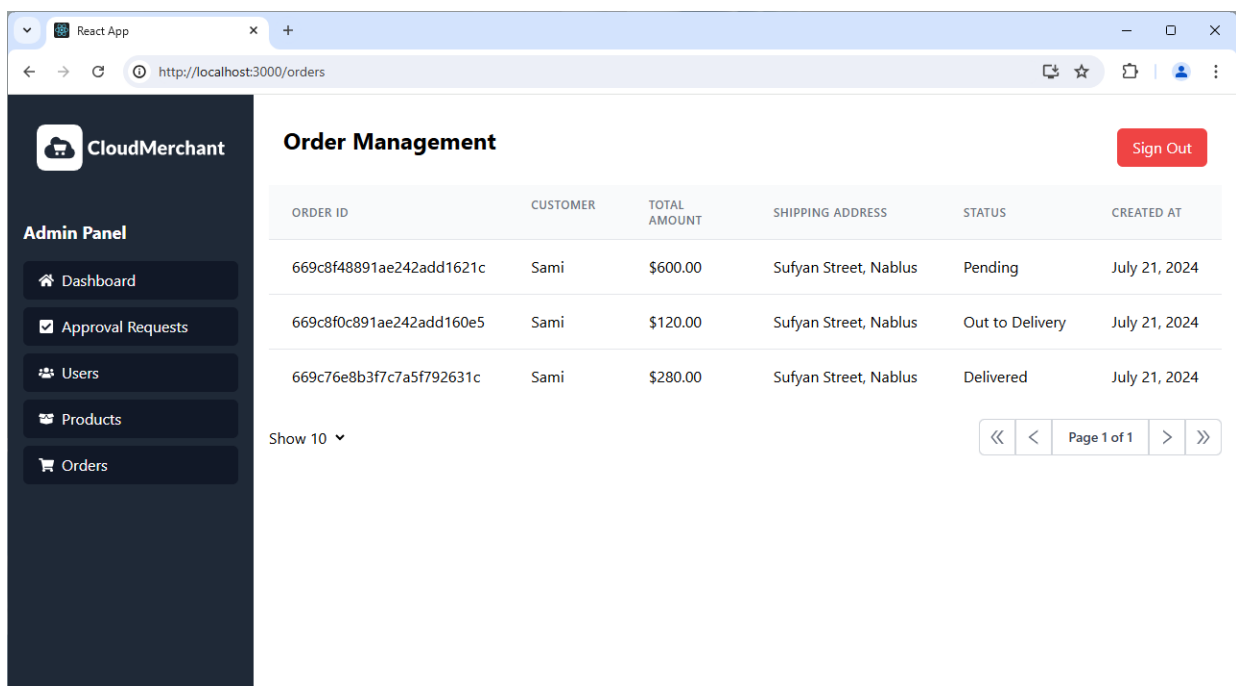


Figure 32: Order Management Page

## Chapter Five: Results and Discussion

---

The development of CloudMerchant has resulted in a robust and user-friendly platform that integrates local merchants into the e-commerce ecosystem. The platform has successfully enhanced the online shopping experience by providing a diverse range of products and fostering community growth. The real-time tracking and chat functionalities have improved customer satisfaction by ensuring transparency and facilitating communication. The inclusion of multiple payment methods has catered to different user preferences, and the admin dashboard has streamlined management processes.

## Chapter Six: Conclusion

---

### 6.1 Summary

CloudMerchant has achieved its objective of revolutionizing e-commerce by integrating local merchants into a digital platform. The project has provided a personalized and secure shopping experience, promoted economic sustainability, and strengthened connections between consumers and their local communities.

### 6.2 Future Work

Future developments could include expanding the range of supported payment methods, enhancing AI-driven product recommendations, and further optimizing the platform for performance and scalability. Additionally, incorporating more advanced analytics and reporting tools could provide valuable insights for merchants and administrators.

## References

---

1. *Firebase Documentation*. (n.d.). Retrieved May 2024, from Google: <https://firebase.google.com/docs>
2. *Introduction · React Native*. (n.d.). Retrieved May 2024, from React Native RSS: <https://reactnative.dev/docs/getting-started>
3. *MongoDB Documentation*. (n.d.). Retrieved May 2024, from MongoDB: <https://www.mongodb.com/docs/>
4. *Node.js V22.5.1 Documentation*. (n.d.). Retrieved May 2024, from Node.js: <https://nodejs.org/docs/latest-v20.x/api/index.html>
5. *Quick start*. (n.d.). Retrieved May 2024, from React: <https://react.dev/learn>
6. *The starting point for learning TypeScript*. (n.d.). Retrieved May 2024, from TypeScript: <https://www.typescriptlang.org/docs/>