

# Cadeau: Smart Gifting Platform

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Graduation Project I

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# Disclaimer

This report was written by students Noor Sayeh and Ro'a Abo Libdeh at the Engineering Department, Faculty of Engineering, An-Najah National University.

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# Abstract

In today’s digital economy, the demand for personalized and emotionally engaging e-commerce experiences has never been higher. Cadeau is a next-generation online gift shopping platform that bridges the gap between traditional gifting and modern, intelligent user experiences. The platform aims to revolutionize the way people select, customize, and purchase gifts by providing a dynamic, interactive, and AI-powered environment that caters to the emotional and practical needs of customers.

At the heart of Cadeau lies a personalized virtual assistant that interacts with users, offers tailored recommendations, and guides them through smart search experiences based on preferences and occasions. This avatar transforms the user journey from a simple transaction into a meaningful, guided experience. In addition, Cadeau supports full product customization with real-time 3D previews, allowing users to visualize changes before committing to a purchase. Customers are empowered to create truly unique and expressive gifts.

For those who enjoy spontaneity, the platform also includes a gamified “surprise shopping mode,” where users can receive mystery boxes or randomized gifts that align with their stated preferences—adding a fun, interactive twist to traditional shopping. The experience is further enhanced by a point-based rewards system that encourages continued engagement and loyalty.

Beyond the customer experience, Cadeau offers robust features for business users and administrators. Business owners can manage inventory, upload products, respond to orders, and engage with customers via a dedicated dashboard. Meanwhile, the admin panel includes tools for overseeing platform users, managing content, and ensuring system-wide efficiency.

Built using modern technologies such as Flutter, Node.js, MongoDB, and integrated AI systems, Cadeau is not just a gift shop—it’s a comprehensive digital ecosystem designed to elevate the act of gifting. By combining intuitive design, emotional intelligence, and personalization, the Cadeau project delivers a uniquely powerful and heart-centered approach to e-commerce in the 21st century.

# Introduction

In the rapidly evolving digital landscape, personalization and interactive shopping experiences are reshaping consumer expectations. Cadeau is an innovative gift shopping platform designed to merge emotion with technology, offering a delightful, immersive, and highly customizable journey for customers. Moving beyond static product listings, Cadeau introduces dynamic features such as a smart virtual avatar, real-time 3D previews, and gamified surprise modes to create a memorable and engaging e-commerce experience. With a user-friendly interface and features tailored to different user roles—admin, business owners, and customers—Cadeau elevates the act of gifting into a personalized and rewarding digital experience.

## 1.1 Problem statement

Selecting the perfect gift for someone can often be an overwhelming and uncertain experience. Many individuals struggle to decide what to buy, especially when aiming to choose something thoughtful, personalized, and meaningful. Traditional e-commerce platforms tend to offer a generic and transactional experience that lacks emotional resonance. They often fail to provide personalized suggestions, interactive features, or guided assistance—leaving users to browse endlessly without clarity or confidence.

From the business perspective, small vendors face challenges in standing out amidst a saturated market. Their products are frequently underrepresented, and they lack advanced tools to creatively showcase their offerings or connect meaningfully with customers. Moreover, the absence of modern capabilities such as real-time customization previews, gamified discovery tools, and AI-powered recommendations diminishes both customer satisfaction and competitive advantage.

These limitations highlight the urgent need for a smart, emotionally-aware gifting platform. Cadeau addresses this gap by combining personalization, interactivity, and intelligent features to transform gift-giving into an engaging, guided, and memorable experience

for both customers and businesses.

## 1.2 Objectives

The Cadeau project aims to revolutionize the online gift shopping experience through a feature-rich and intelligent platform that caters to diverse users:

1. **Empower Admin:** Equip administrators with tools to manage users, products, categories, notifications, and platform settings with full control.
2. **Support Businesses:** Enable store owners to add, update, and manage products, receive orders, and analyze user behavior.
3. **Enhance Customer Experience:** Allow users to browse curated gift collections, view 3D product previews, and engage in personalized discovery.
4. **Implement AI Assistance:** Integrate a smart assistant avatar to provide recommendations, category guidance, and contextual suggestions.
5. **Gamify Gifting:** Introduce a surprise shopping mode for mystery box experiences, enhancing fun and anticipation.
6. **Reward Loyalty:** Offer a points-based rewards system to incentivize frequent shopping and user retention.
7. **Support Customization:** Provide users with an interactive 3D design studio to craft their own cups and gift boxes—choosing shapes, colors, and custom messages—and previewing the final product in real time before placing an order.

## 1.3 Significance

Cadeau reimagines the art of gift-giving in a digital age by focusing on creativity, interactivity, and human connection. Through features like personalized product previews, AI-driven recommendations, and surprise gifting modes, it transforms shopping from a transactional task into an emotional experience. The platform not only empowers customers to express themselves through customized gifts but also provides business owners with a fair and competitive space to showcase their offerings. Cadeau bridges the gap between functionality and feeling, making each purchase an opportunity to spark joy, connection, and unforgettable memories.

# Constraints and Earlier Coursework

## 2.1 Constraints and Limitations

1. **Time Constraints:** The limited project timeline was the most significant constraint, influencing the prioritization of features, backend integration, and testing cycles.
2. **3D Customization Platform:** While Flutter powers the core mobile app for its cross-platform reach, it cannot perform live 3D modeling. To deliver the interactive cup and gift-box designer, we integrated a React + Three.js web module. This hybrid approach increases development complexity and requires careful synchronization.
3. **Integration Overhead:** Orchestrating state and data flow between the Flutter front end, the React 3D module, and our Node.js backend adds non-trivial overhead. Future feature updates must account for cross-framework compatibility and versioning.
4. **Customization Scope:** Giving users too many options would be overwhelming. We had to design and test iteratively.

## 2.2 Standards and Technologies

- **Development Environment:** Visual Studio Code for unified editing, debugging, and version control.
- **Mobile Framework:** Flutter (Dart) for Android and iOS apps, ensuring native-like performance.
- **3D Design Module:** React + Three.js to power real-time 3D previews of cups and gift boxes.

- **Backend:** Node.js with Express for RESTful API endpoints, enabling scalable business logic and data orchestration.
- **Database:** MongoDB for flexible document storage of users, products, orders, and customization metadata.
- **Testing Tools:**
  - Android Studio emulator for mobile testing
  - Postman for API contract validation
  - Flutter test frameworks for unit and integration tests
- **Security and Architecture:**
  - HTTPS + OAuth 2.0 for secure authentication flows
  - MVC design pattern for code modularity and maintainability
  - RESTful conventions for consistent client-server interactions

## 2.3 Earlier Coursework

- **Critical Thinking and Research Methods:** Developed strong documentation skills and structured problem-solving approaches essential for project planning and report writing.
- **Software Engineering and Design Patterns:** Mastered the MVC architecture and software testing practices used in both our Flutter and React codebases.
- **Advanced Software Development:** Gained expertise in Node.js, Express, and RESTful API design—core to our backend implementation.
- **Distributed Systems and Databases:** Leveraged lessons on NoSQL design and scaling from our Distributed Operating Systems lab to structure the MongoDB schema and ensure performant queries.

# Literature Review

The gift industry has traditionally focused on standardized products with limited personalization, often relying on in-store browsing or basic e-commerce functionality. With the advent of advanced technologies and shifting consumer expectations, the demand for meaningful, customized gifting experiences has surged. This literature review explores key technological, methodological, and domain-specific advances that justify and inform the development of the Cadeau platform.

**Personalization in the Gift Industry** Personalization has become a defining feature of successful e-commerce platforms. Research shows that consumers are more engaged and loyal to services that cater to their personal tastes and needs [Bielozorov et al., 2019]. In the context of gift-giving, the emotional value is significantly enhanced when the gift reflects the recipient's preferences. Platforms like NotOnTheHighStreet and Etsy have pioneered this model, offering tailored products and inspiring Cadeau's features such as custom gift box assembly, sticker placement, and dynamic message generation.

**3D Visualization and User Interaction** Modern interfaces increasingly incorporate 3D technologies to boost user engagement and allow interactive customization. Studies on product visualization indicate that interactive 3D previews improve user confidence in their choices and reduce return rates [Kim et al., 2018]. Cadeau integrates Web-based 3D displays using frameworks like React Three Fiber to let users personalize gift boxes, stickers on cups, and decorative elements in real-time, adding emotional and visual depth to the experience.

**Artificial Intelligence and Recommendation Engines** Artificial Intelligence plays a pivotal role in driving personalized user experiences. Recommendation engines powered by collaborative filtering or deep learning have been effectively employed in domains like retail, media, and lifestyle platforms [Gomez-Uribe and Hunt, 2015]. In Cadeau, AI is used to recommend products, occasion-specific gift sets, and personalized greeting cards. Techniques from natural language processing, such as transformer models (e.g., BERT [Devlin et al., 2019]), are leveraged to generate meaningful and context-aware messages.

Scalable Software Architecture and Development Practices To support dynamic user interactions and real-time updates, robust architectural patterns are essential. The Model-View-Controller (MVC) pattern has long been advocated for modular and maintainable codebases [Kransner Pope, 1988], and it has been adopted in the backend structure of Cadeau. Moreover, RESTful APIs [Fielding, 2000] enable seamless communication between the mobile frontend and server components, ensuring a responsive and smooth user experience.

NoSQL Databases and Flexible Data Handling With diverse data such as product specifications, user customizations, orders, and message templates, traditional relational databases often fall short. NoSQL databases like MongoDB provide the flexibility and scalability required in such environments [Cattell, 2011]. Cadeau relies on MongoDB to store user profiles, product metadata, 3D configuration files, and sticker information efficiently.

Gaps in Existing Platforms While many e-commerce platforms exist for gift shopping, few combine interactivity, personalization, and intelligent recommendations. Platforms like Amazon and local gift shops often offer static product listings with limited customization options. Research indicates a gap in offering real-time customization, emotional engagement through design, and AI-generated assistance [Li and Lei, 2015]. Cadeau addresses these shortcomings by offering a highly personalized, visually interactive, and AI-enhanced gifting platform.

# Methodology

This chapter outlines the tools, technologies, and development methods used to bring the **Cadeau** platform to life.

## 4.1 Tools and Technologies

### 4.1.1 Frontend Development

**Flutter** was used to build the mobile application for both Android and iOS. Key features include:

- Dynamic UIs for product browsing, customization, and ordering.
- Integration with REST APIs and real-time chats.
- Reusable widgets for user, owner, and admin roles.

For the 3D customization experience, a **WebView** embedded in **Flutter** loads a **React Three Fiber** app using **Three.js**. Users can:

- Interact with gift boxes and cups in real time.
- Select colors and add stickers for cups, and also customize the color of gift boxes.
- Customize quantity and view the design in 3D.

### 4.1.2 Backend Development

The backend was built using **Node.js** and **Express**, supporting:

- RESTful APIs for authentication, product handling, and order management.

- Role-based access control for users, owners, and admin.
- Notification generation and chat initialization.

### 4.1.3 Database Design

**MongoDB** was used to store users data, product information, order history, messages, and notifications.

- Collections: categories, users, messages, notifications, orders, discountpoints, favorites, fcmtokens, products, reviews.
- Indexed fields for fast filtering and analytics.

### 4.1.4 Development Tools

- **Visual Studio Code:** Main development environment with support for linting, formatting, and extensions.
- **Postman:** Used for API testing and validation.
- **Android Studio:** For device emulation and debugging.

### 4.1.5 Version Control

Version control was handled using **Git** and **GitHub**:

- Feature-based branching.
- Pull requests with peer review.
- Collaboration and issue tracking.

## 4.2 Mobile Application

### 4.2.1 Start Page

The start page is the first screen users encounter when opening the Cadeau app. It features a welcoming message and a primary action button labeled **”Start Shopping”**, which redirects users to sign in or register. The page reflects Cadeau’s branding, with a clean UI and a gift box icon to emphasize the platform’s purpose: making gift-giving joyful and interactive.

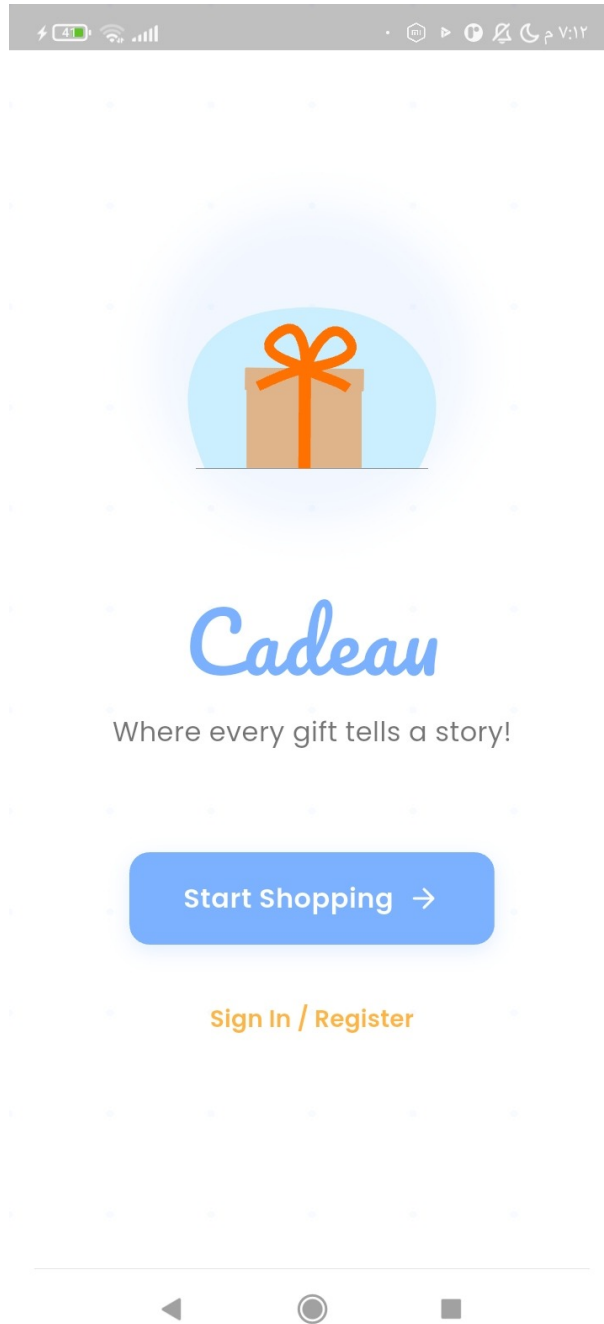


Figure 4.1: Start Page of Cadeau Application

## 4.2.2 Login Page

The login page allows registered users to access their accounts. It includes fields for email and password, and a "Sign In" button. There's also a navigation option to switch to the Sign-Up page. Proper input validation and password visibility toggle improve user experience and security.

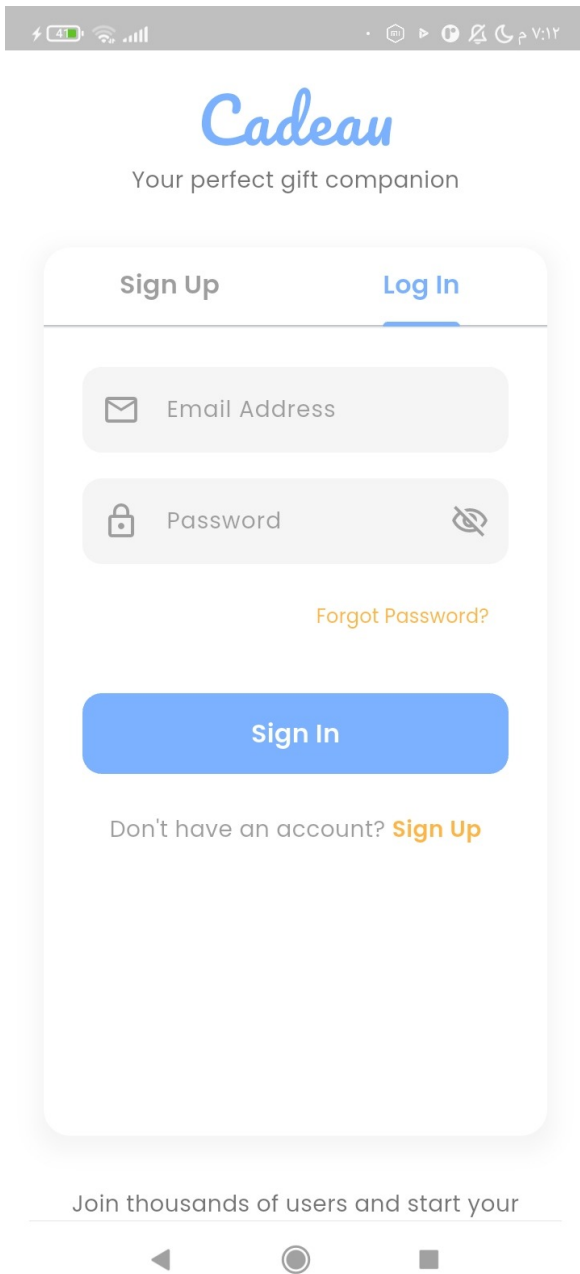


Figure 4.2: Login Page – Empty Fields

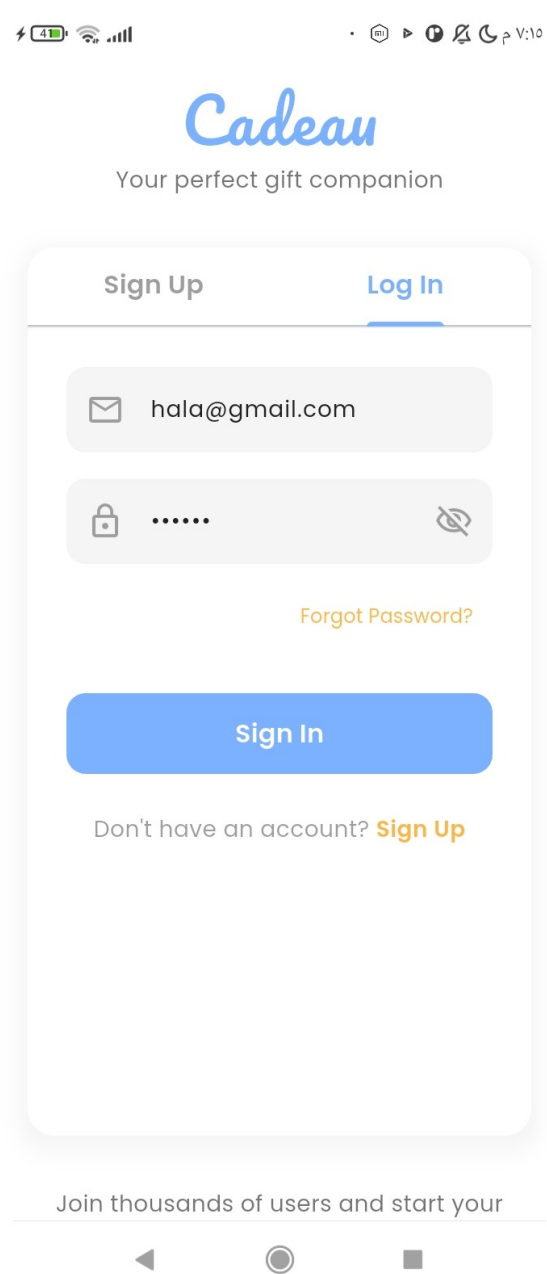


Figure 4.3: Login Page – With User Input

### 4.2.3 Registration Page

The registration page enables new users to create an account by entering their name, email, and password, and selecting their role (e.g., customer). Once the form is filled, users can click "Create Account" to proceed. This page includes essential user experience elements like password visibility toggles and role selection dropdown to ensure accurate and secure account creation.

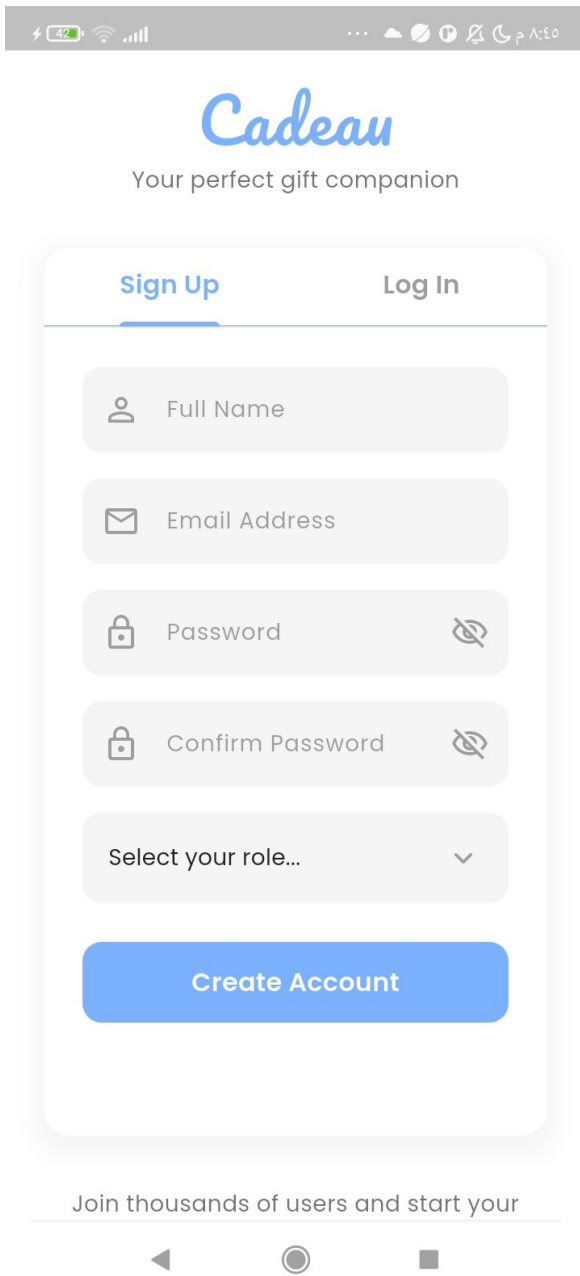


Figure 4.4: Registration Page – Empty Fields

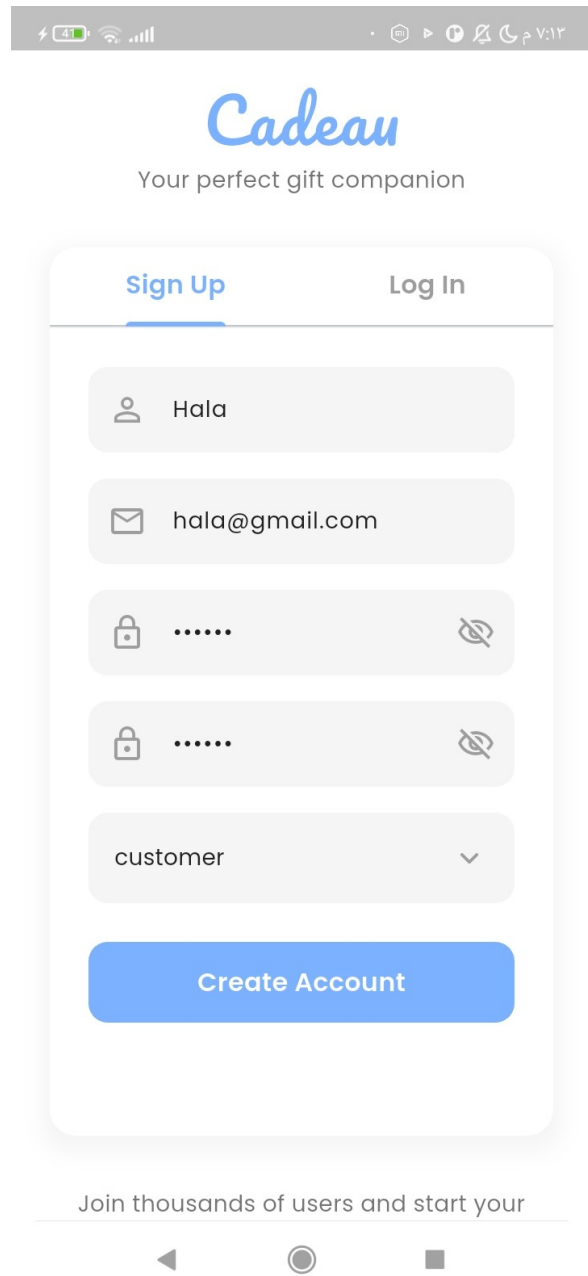


Figure 4.5: Registration Page – With User Input

#### 4.2.4 AI Avatar Selection

After completing the registration process, the user is prompted to choose an avatar. This avatar becomes the user's interactive companion throughout their gifting journey on Cadeau. The selected avatar is used to personalize the experience and serves as the visual identity for AI-powered conversations and recommendations within the platform.



Figure 4.6: Avatar Selection – Page 1



Figure 4.7: Avatar Selection – Page 2

## 4.2.5 User Home Page

After logging in, users are welcomed to the home page, which acts as the central hub of the Cadeau platform. It displays personalized gift suggestions, featured products, and categories such as occasions and recipient types. Users can easily navigate through trending items, use the search feature, and view promotional banners. This page is designed to offer a smooth and interactive experience that aligns with the user's preferences and gifting needs.

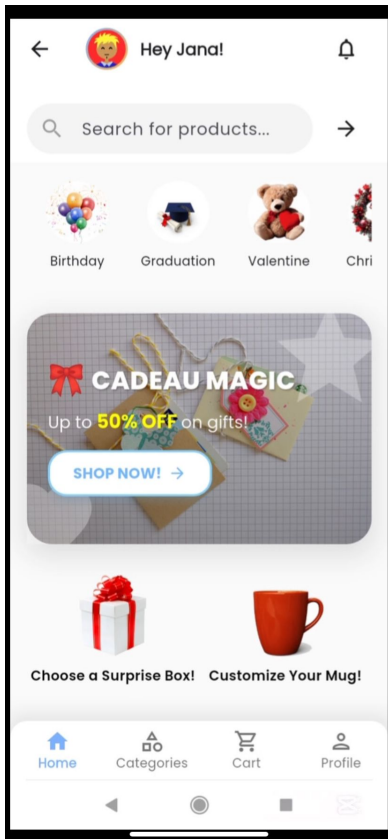


Figure 4.8: Main Interface

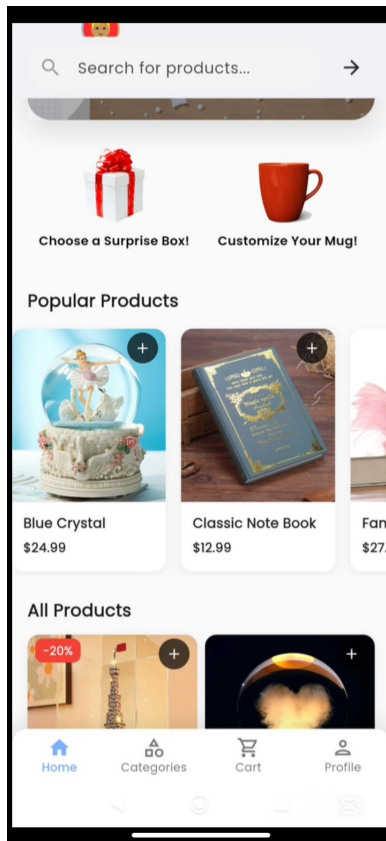


Figure 4.9: Popular Products

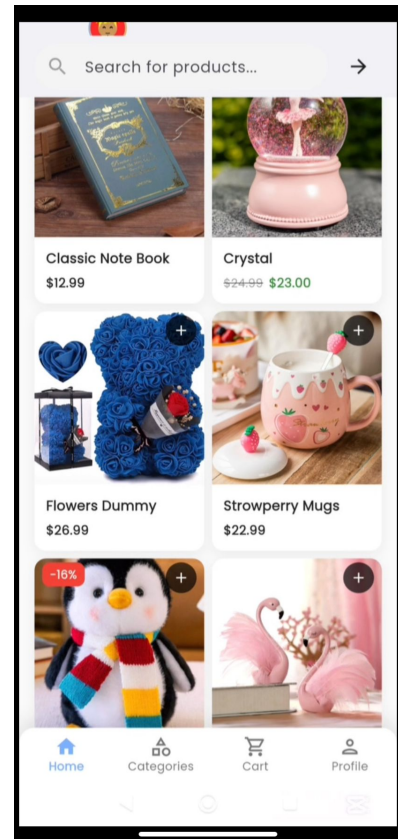


Figure 4.10: All Products

## 4.2.6 Navigation Bar

The navigation bar is located at the bottom of the user interface and provides quick access to key sections of the Cadeau app. It ensures a seamless and intuitive browsing experience by allowing users to switch between major functionalities with a single tap. The navigation bar includes:

- **Home** – Displays personalized gift suggestions and highlights featured products.
- **Categories** – Allows users to explore gifts by category.
- **Cart** – Shows selected items and lets users proceed to checkout.
- **Profile** – Provides access to user details, order history, and preferences.

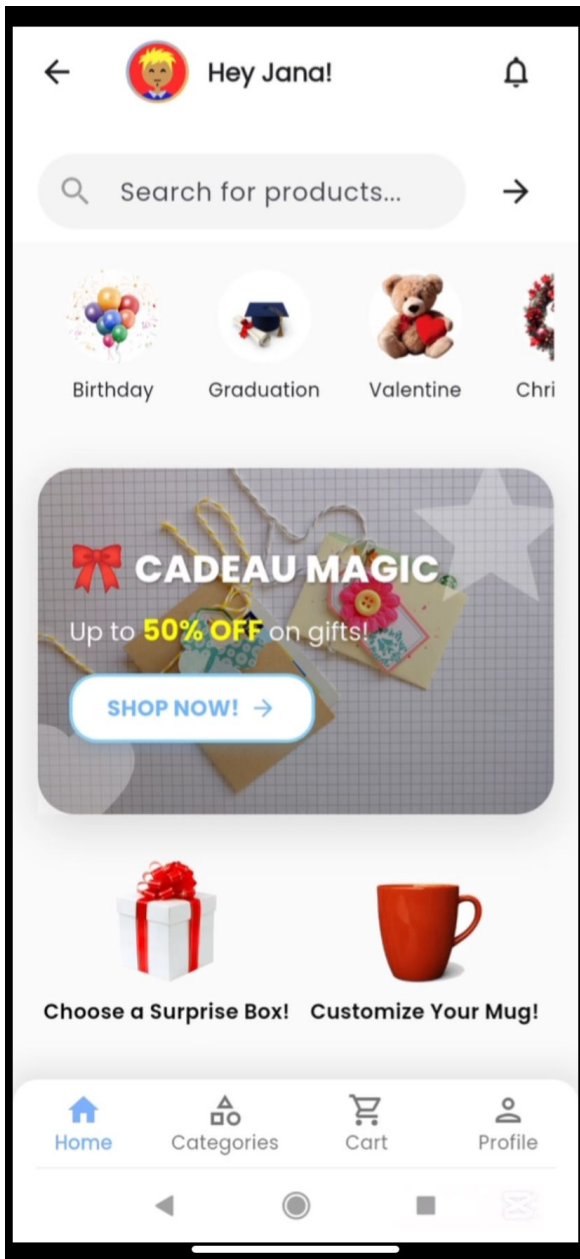


Figure 4.11: Navigation – Home

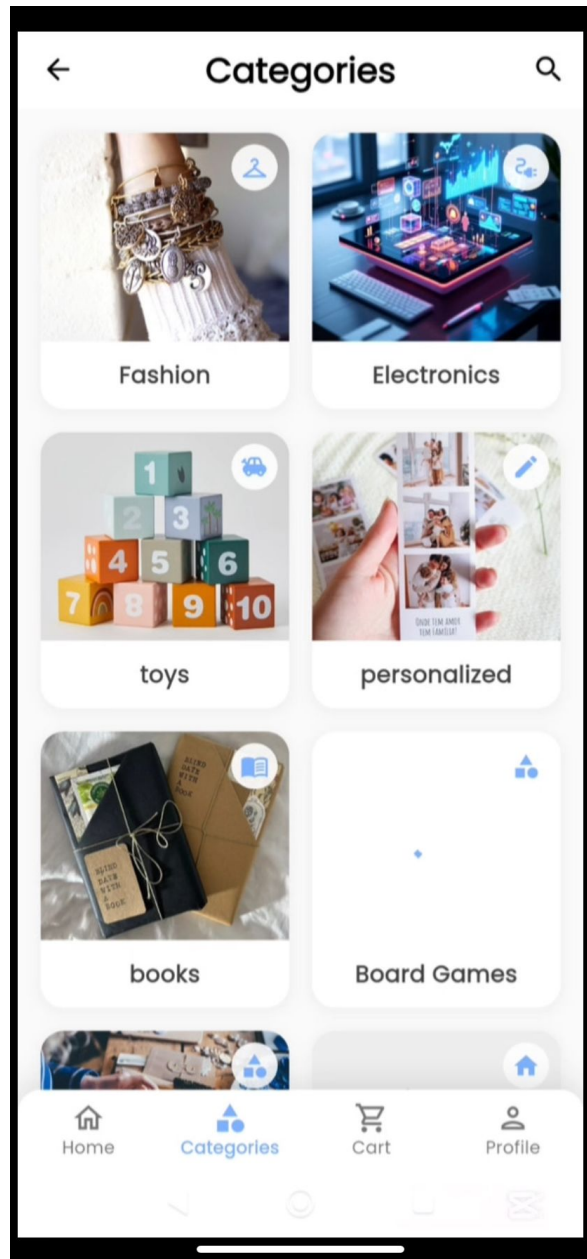


Figure 4.12: Navigation – Categories

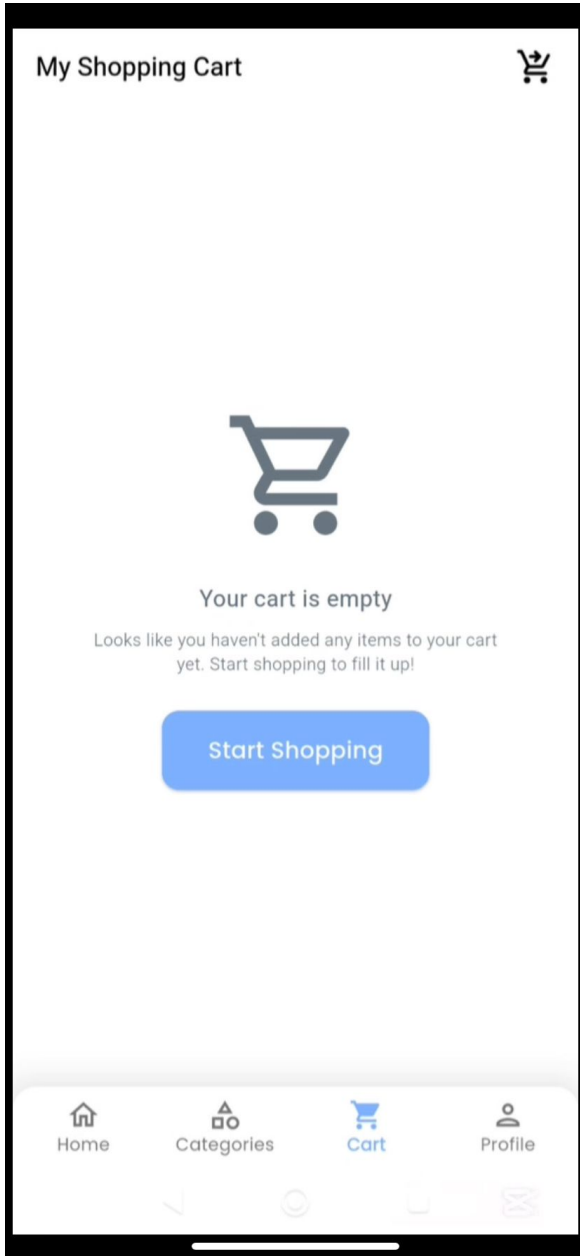


Figure 4.13: Navigation – Cart

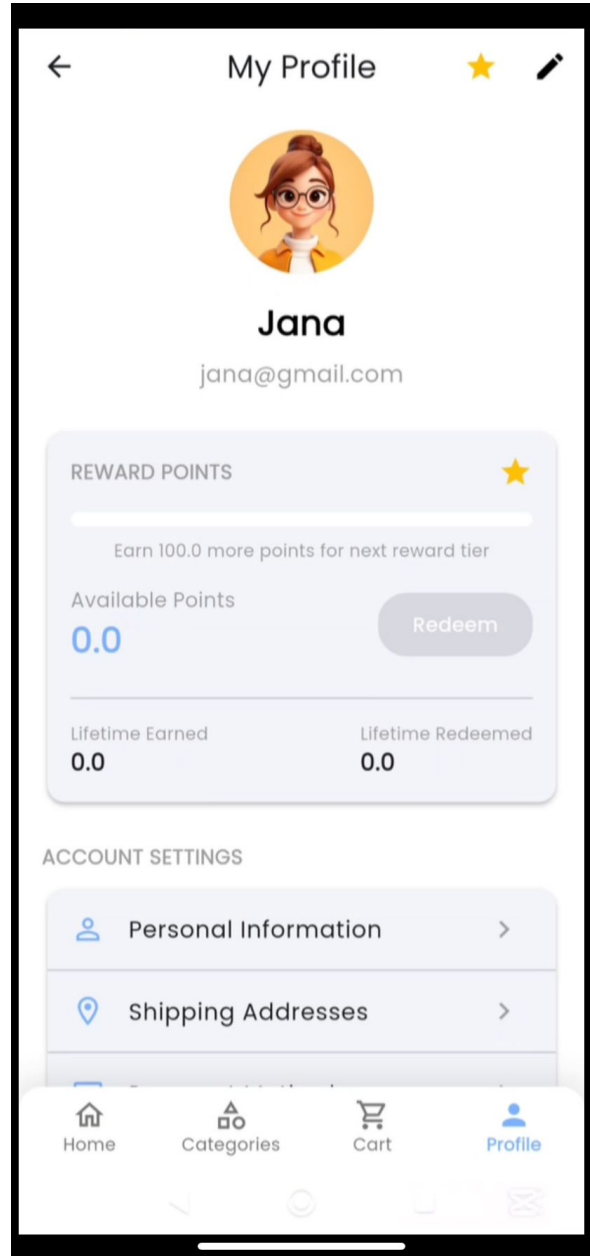


Figure 4.14: Navigation – Profile

### 4.2.7 Advanced Search

The advanced search feature empowers users to quickly find the perfect gift by filtering products based on various attributes. Instead of scrolling through the entire catalog, users can narrow down their search using parameters such as:

- **Keyword** – A specific word or phrase related to the desired product.
- **Category** – Filter by predefined groups such as electronics, fashion, jewelry, etc.
- **Occasion** – Tailor the search based on occasions like birthdays, anniversaries, or holidays.
- **Recipient Type** – Choose whether the gift is for a mother, friend, partner, child, etc.

This feature significantly enhances the user experience by delivering accurate and relevant product suggestions tailored to user needs.

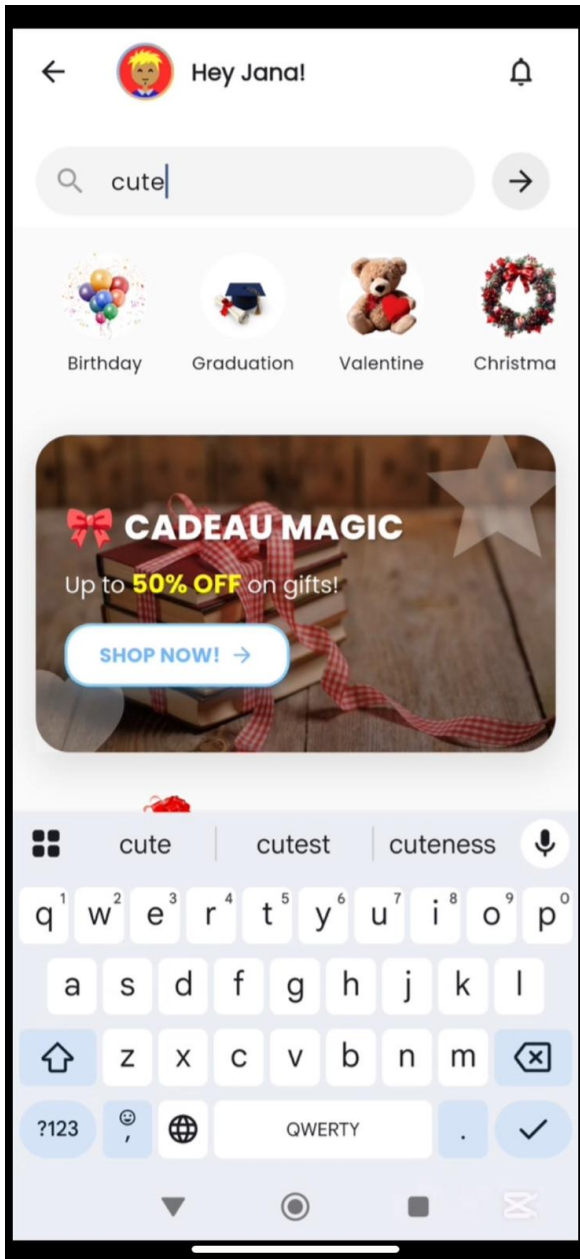


Figure 4.15: Search by Keyword

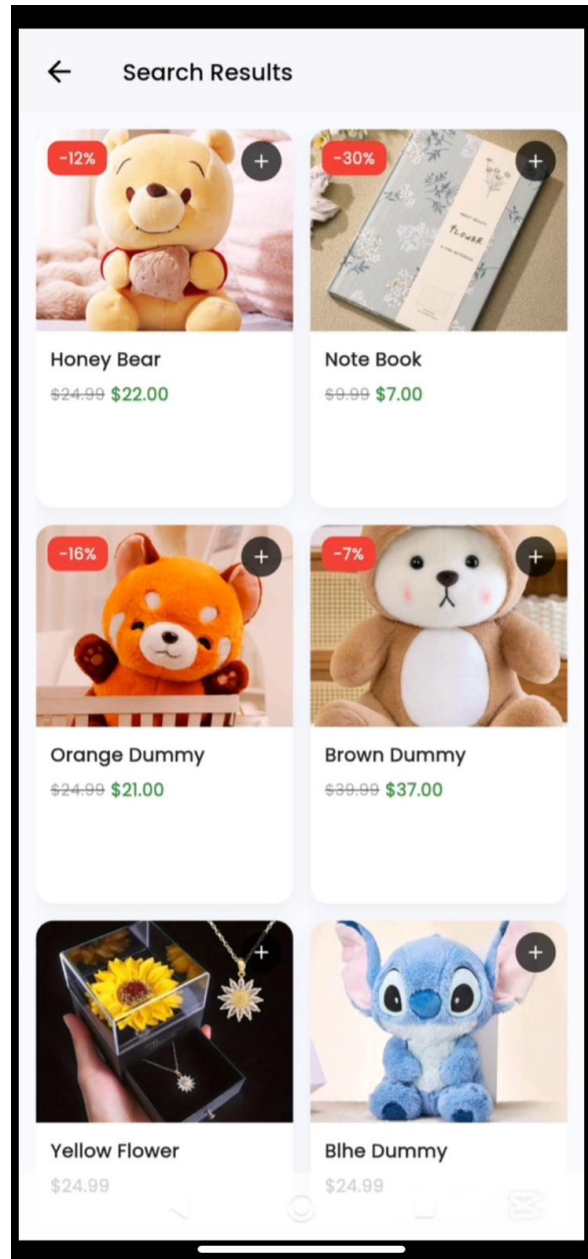


Figure 4.16: Search results

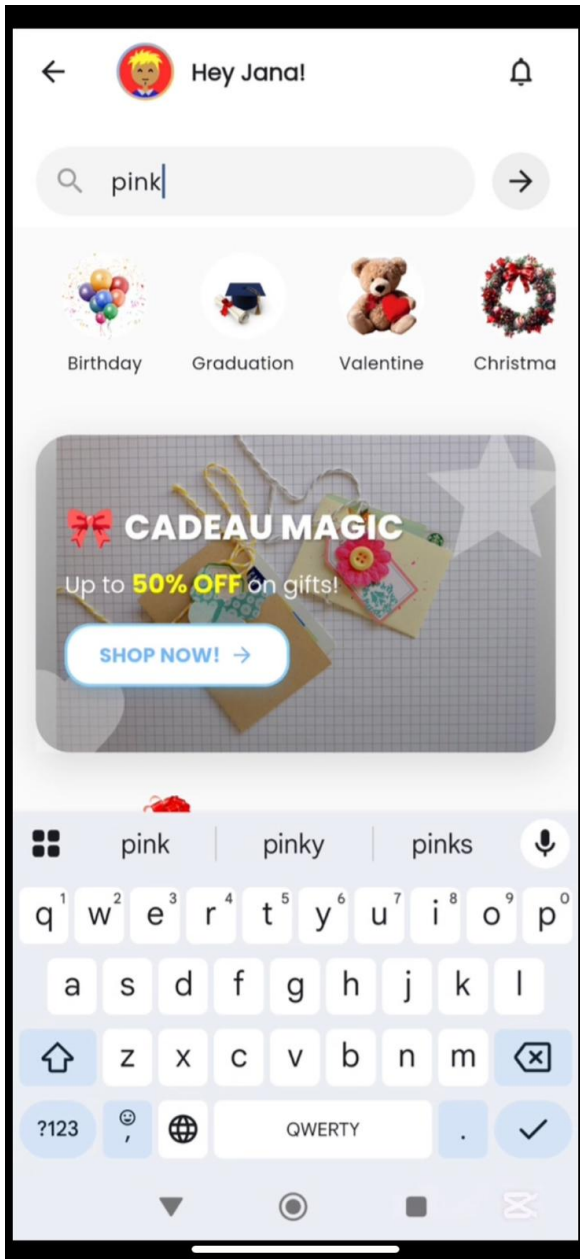


Figure 4.17: Search by color

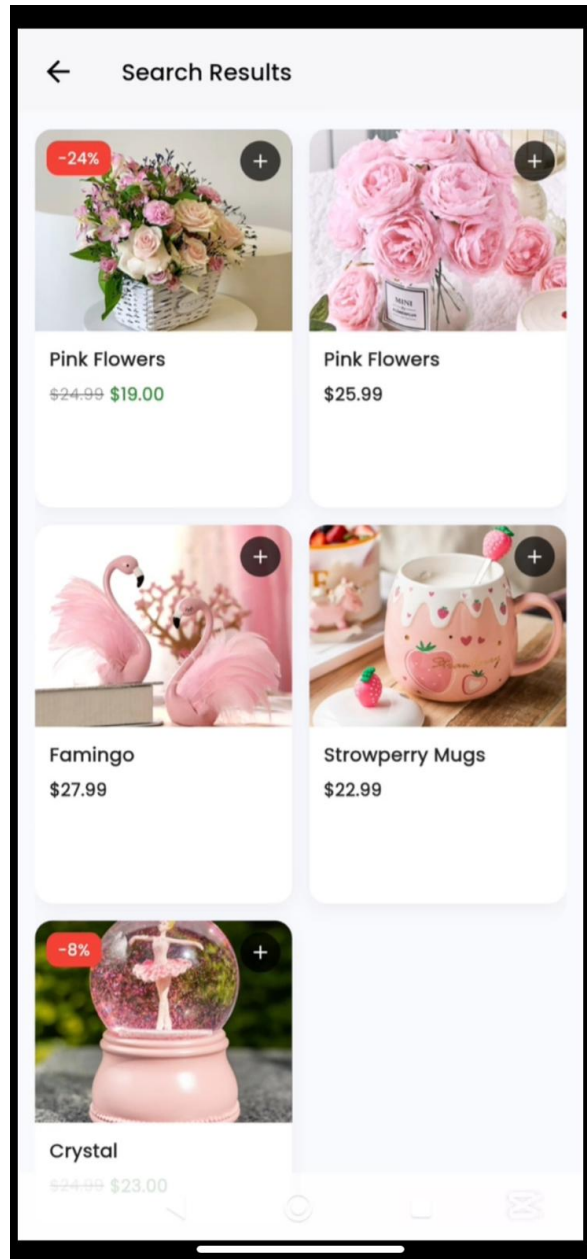


Figure 4.18: Search results

## 4.2.8 Filtering Products by Occasion

To help users quickly find suitable gifts, the Cadeau platform provides filtering options based on different occasions. Users can select an occasion such as birthdays, anniversaries, Christmas, or other special events. This filter narrows down the product list to items that are most relevant and popular for the chosen occasion, enhancing the user experience by making the gift selection process faster and more meaningful.

By leveraging occasion-based filtering, users can easily discover gifts tailored to specific celebrations, ensuring their choices are thoughtful and appropriate.

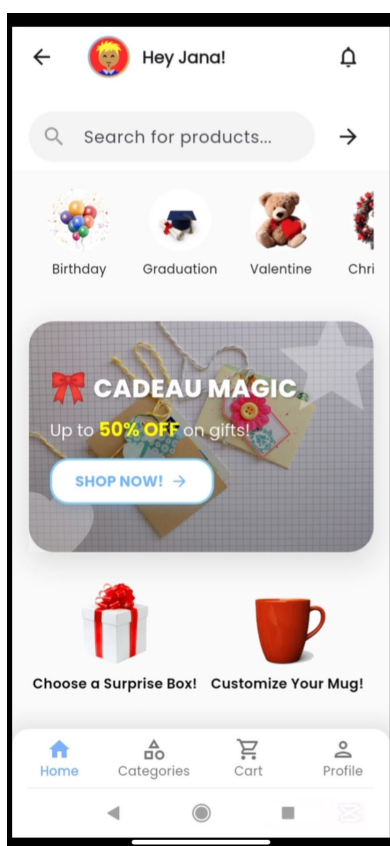


Figure 4.19: Select Occasion

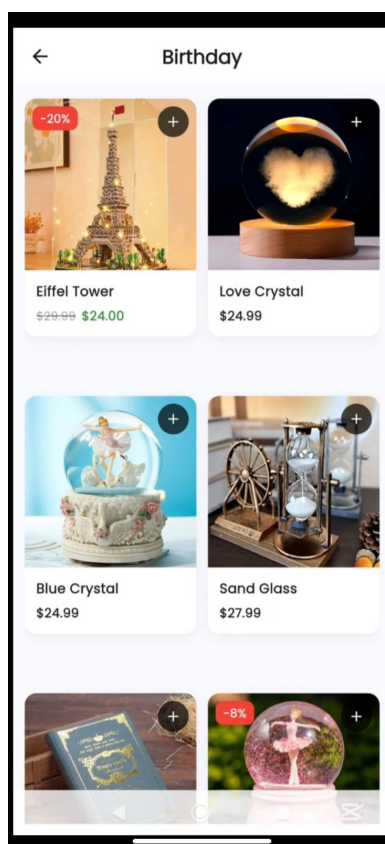


Figure 4.20: Filtered Product List

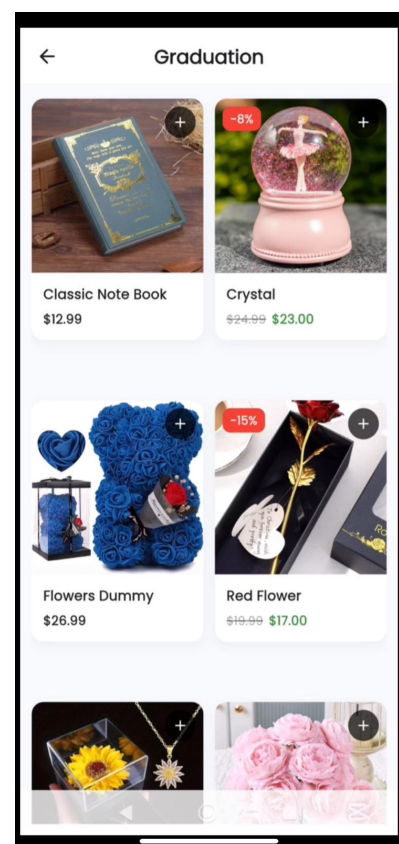


Figure 4.21: Filtered Product List

## 4.2.9 Discounted Products

The Cadeau platform highlights discounted products to help users find great gifts at affordable prices. These products are displayed in a dedicated section on the home page and are often promoted with banners or labels indicating the percentage of the discount.

Discounted items include limited-time offers, seasonal promotions, and clearance products across various categories. This feature encourages users to explore deals and increases the chances of finding valuable items within their budget. It also plays a key role in driving user engagement and boosting sales during peak gifting seasons.

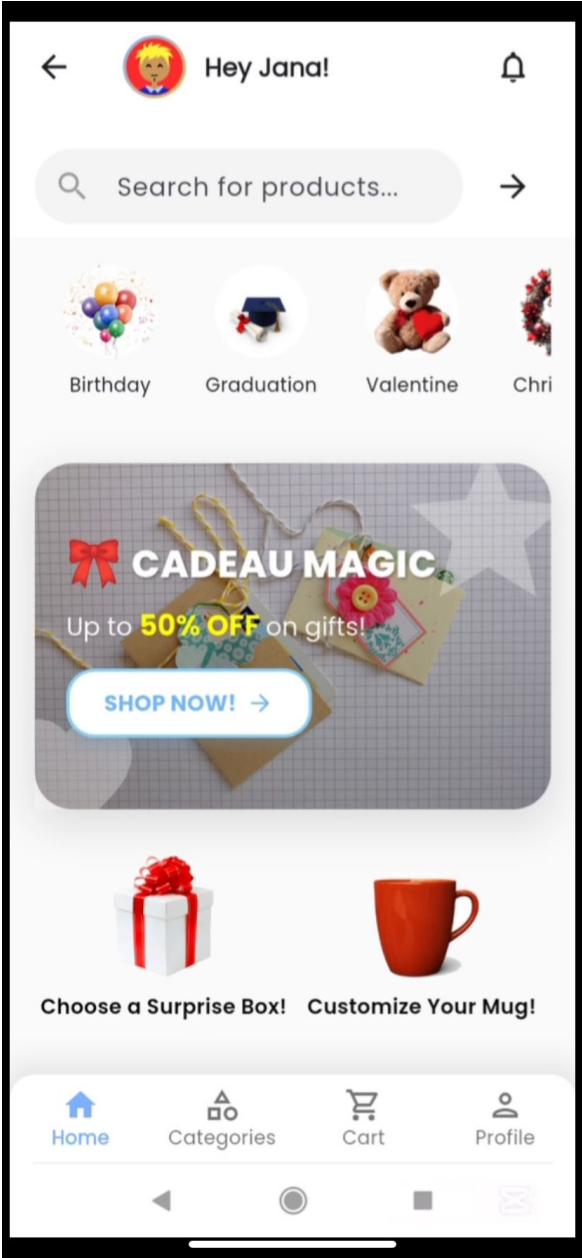


Figure 4.22: Discounted Products

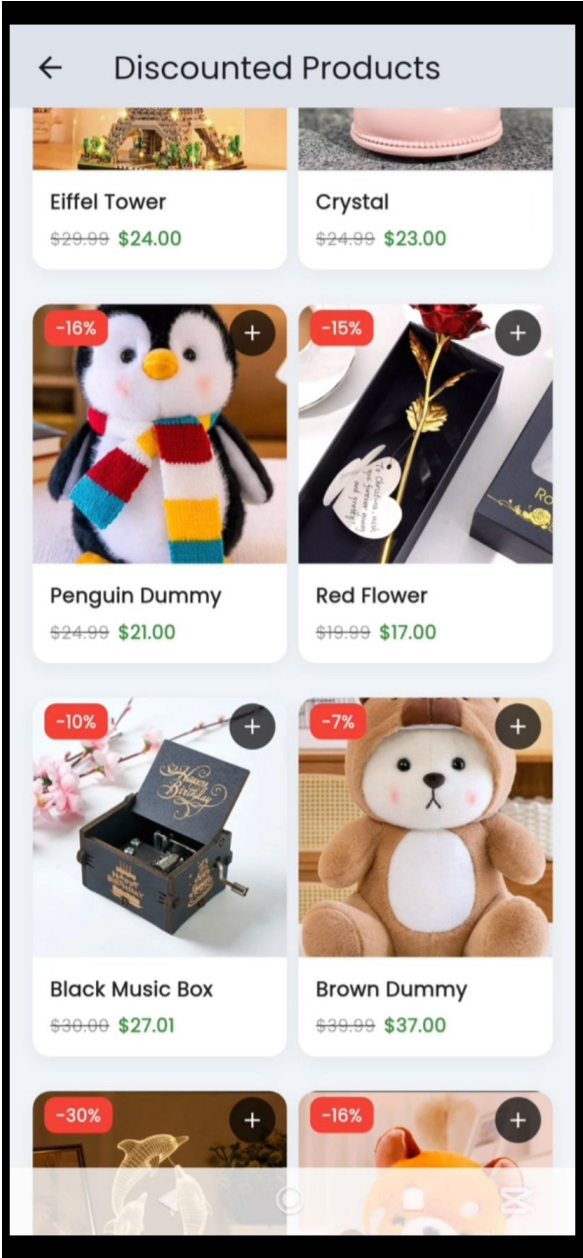


Figure 4.23: Discounted Products Section

### 4.2.10 Product Details

When a user taps on a product, they are taken to the Product Details page, which provides comprehensive information about the selected item. This page includes essential product specifications such as name, price, description, available quantity.

In addition to the core product information, this page also displays user-generated reviews and ratings. These reviews offer insights from previous buyers, helping new users make informed decisions. Each review typically includes the reviewer's name, rating (e.g., out of 5 stars), and a short comment about their experience with the product.

This feature fosters trust and transparency, encouraging users to share feedback and engage with the community.

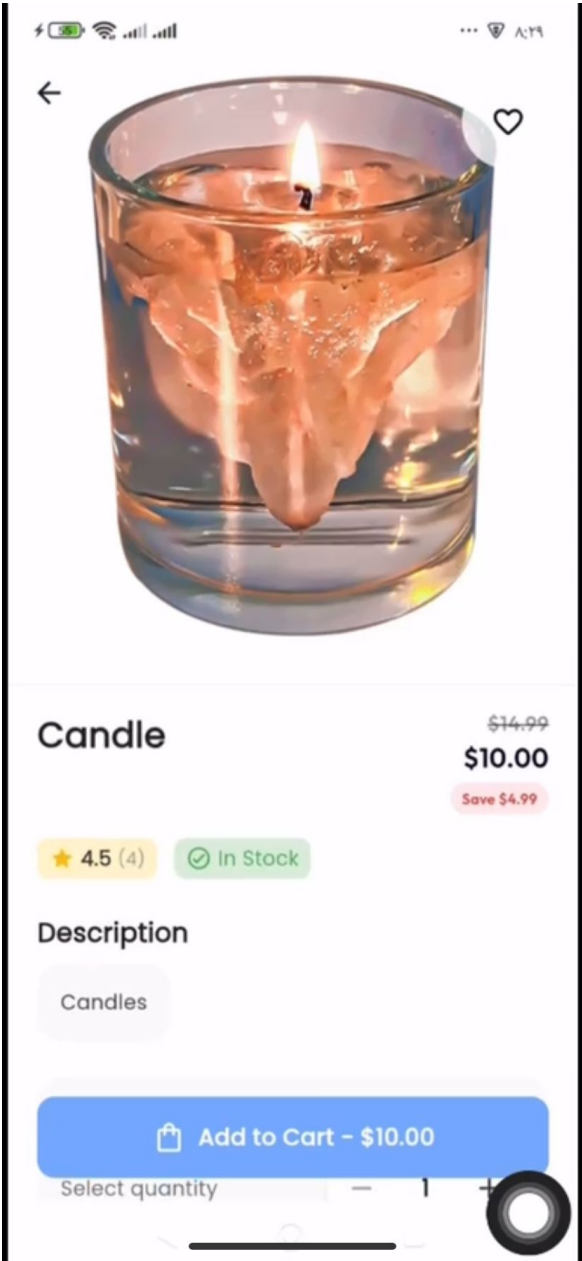


Figure 4.24: Product Details – Information and Price

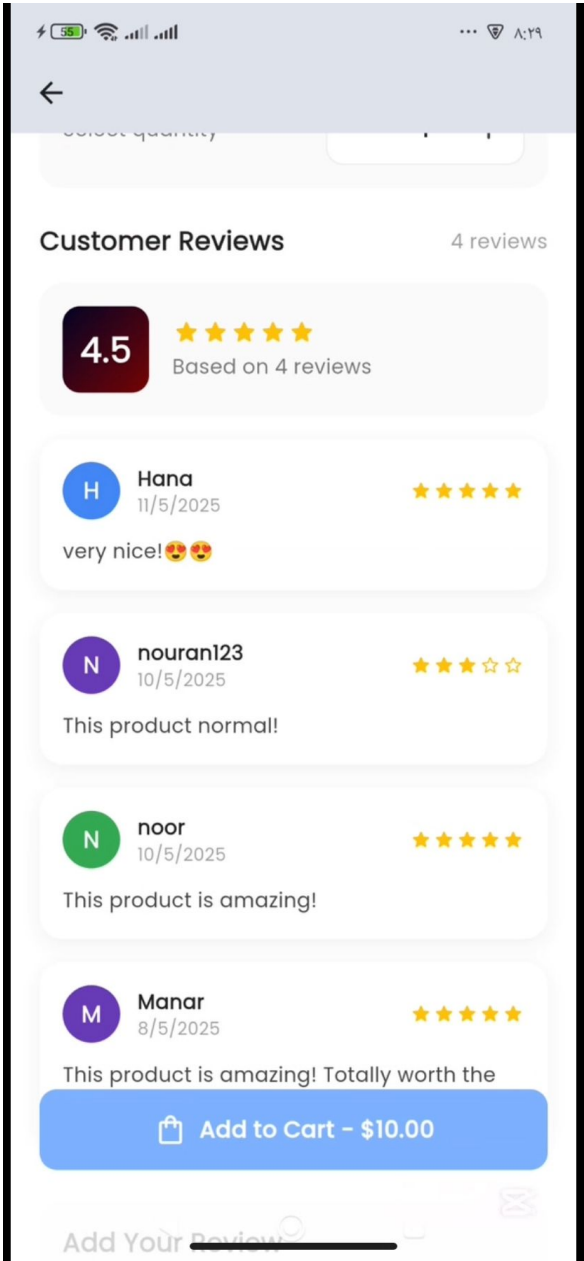


Figure 4.25: Product Details – User Reviews

## 4.2.11 Favorites and Cart Confirmation

When a user adds a product to their favorites list or shopping cart, the Cadeau avatar appears with a friendly and encouraging message. This interaction adds a touch of personality to the experience and builds a sense of connection between the user and the platform. The avatar celebrates the user's action and reinforces their decision with supportive feedback, making the process of browsing and saving items feel more engaging and enjoyable.

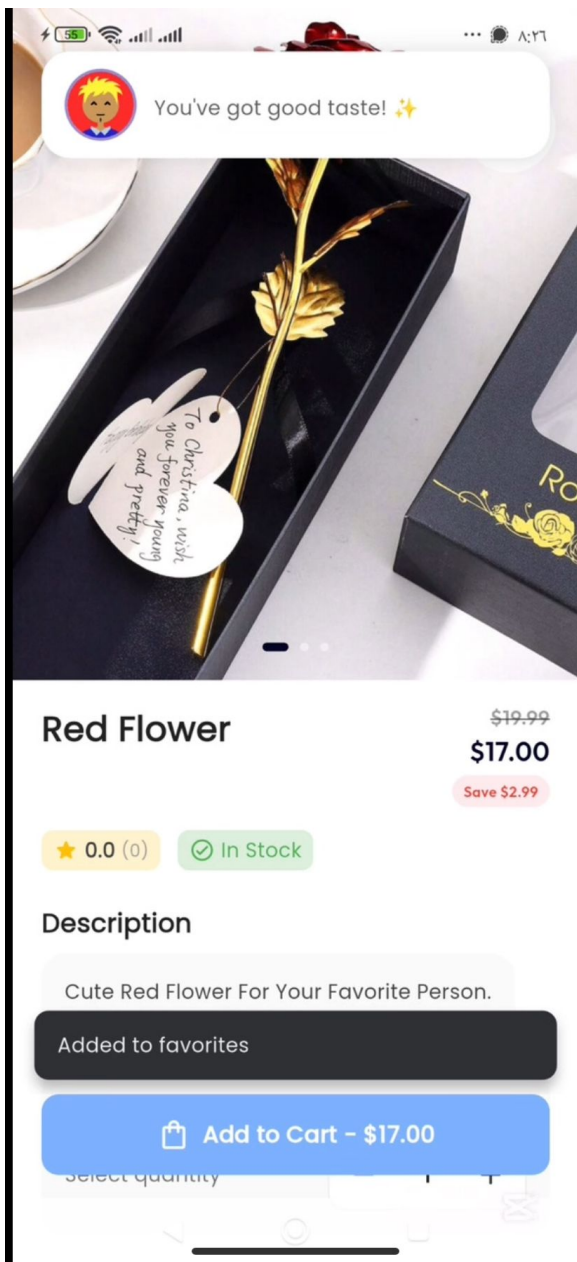


Figure 4.26: Avatar Response – Product Added to Favorites

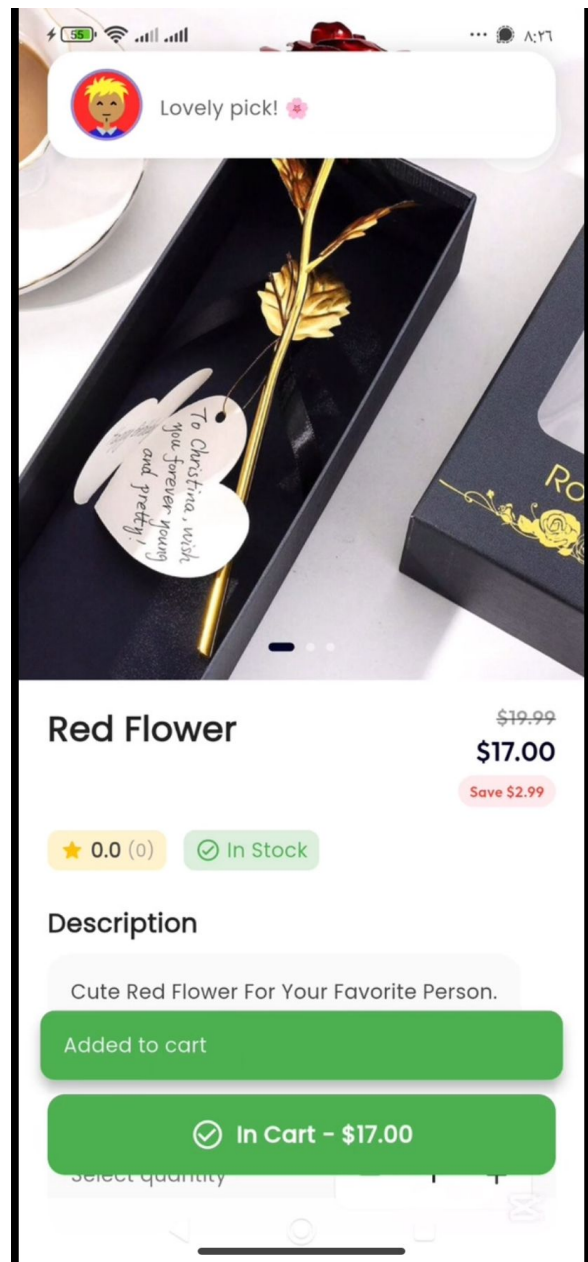


Figure 4.27: Avatar Response – Product Added to Cart

## 4.2.12 Comment and Review Process

The Cadeau platform allows users to leave comments and reviews after purchasing a product. This feature encourages feedback and fosters community trust. Users can rate the product, write a short comment about their experience, and submit it through a simple and intuitive interface.

Submitted reviews are displayed publicly on the Product Details page, helping future buyers evaluate the quality and suitability of items based on real user experiences. This process enhances transparency and builds a reliable shopping environment.

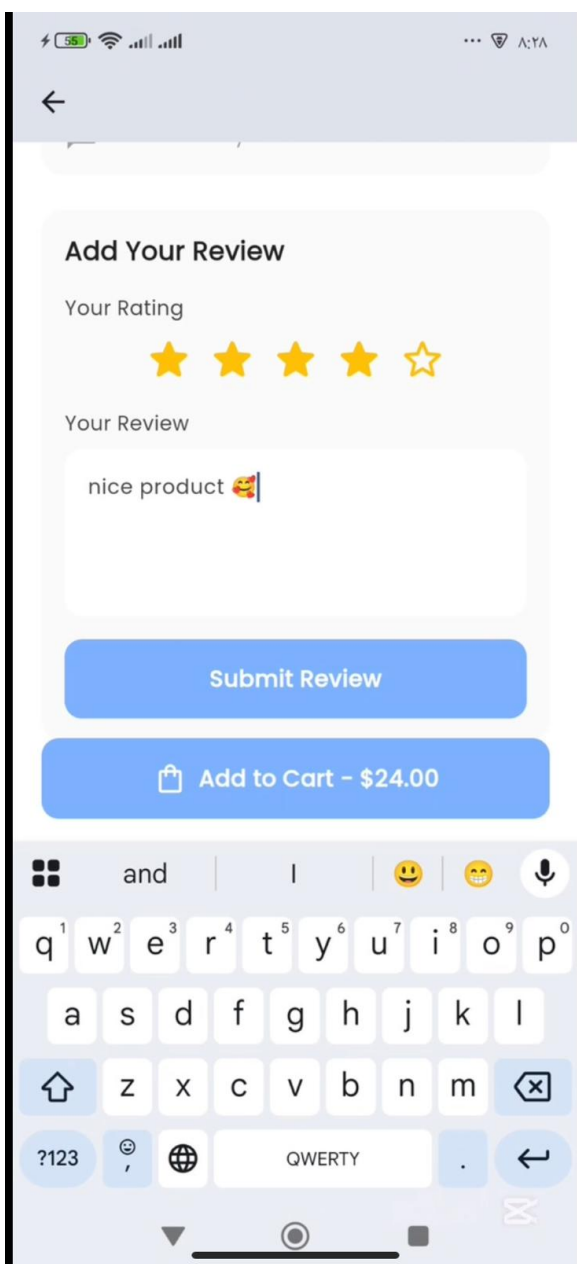


Figure 4.28: Write a Review

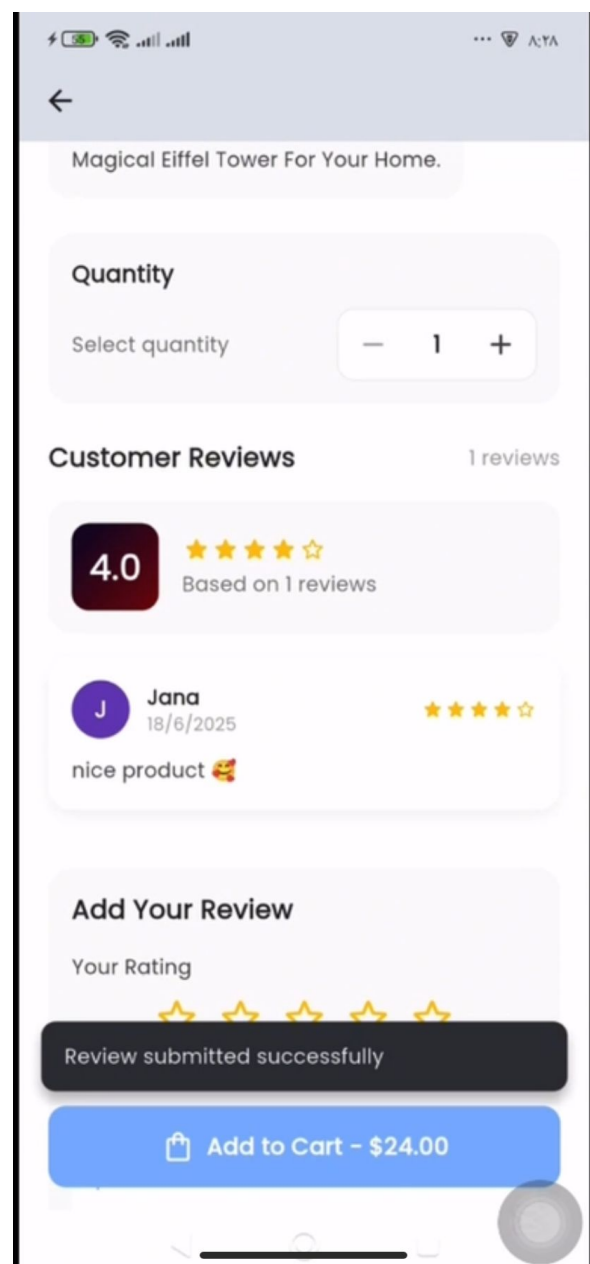


Figure 4.29: Submitting the Review

### 4.2.13 User Cart Page

The cart page displays all products that the user has selected for purchase. Each item is listed with key details such as product name, quantity, price. Users can update quantities or remove items before proceeding to checkout.

This page ensures clarity and control during the shopping process. It also helps users review their choices and make final decisions with confidence before completing the order.

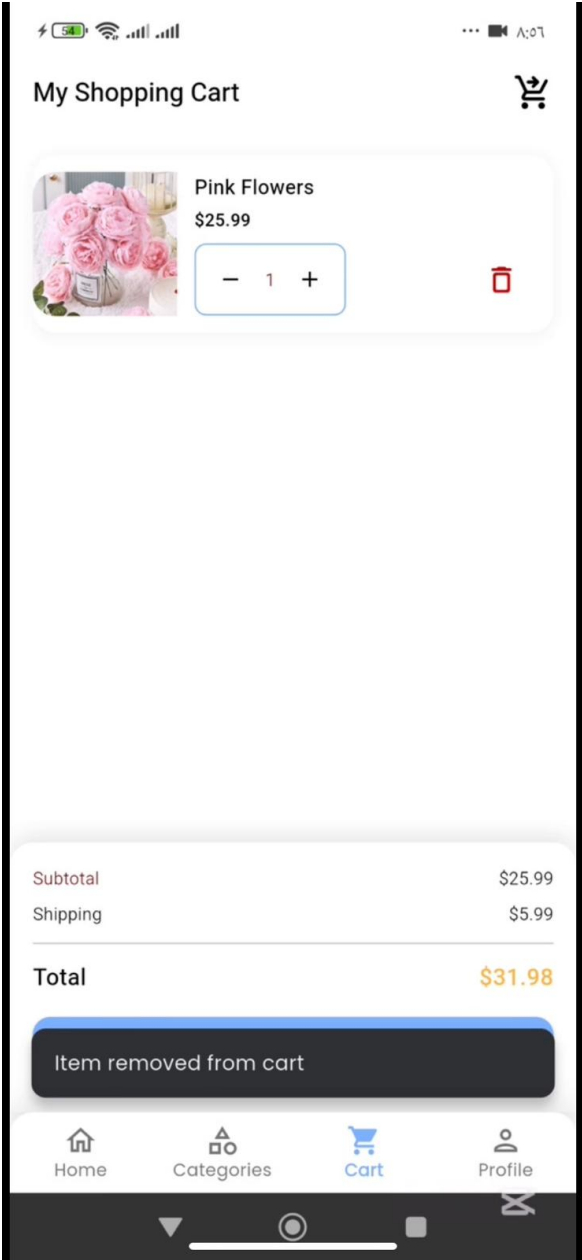


Figure 4.30: User Cart Page – Selected Items Overview

## 4.2.14 3D Gift Box Customization

The **Gift Box 3D Display** in the Cadeau platform enables users to create a visually personalized gift presentation by customizing the color and model of a virtual gift box. Just like the cup customization, this feature is built using **React Three Fiber** and embedded within the mobile app via a **WebView** for seamless interaction.

During the checkout process, users are given the opportunity to personalize their gift box—selecting the shape and adjusting its appearance before finalizing the order. This step enhances the emotional value of the gift and ensures that each package feels unique and thoughtfully prepared.

Inside the 3D customization interface, users can:

- **Choose from four distinct box models**, each with unique shapes and ribbon styles.
- **Adjust the colors** of the box base, lid<sup>1</sup>, handler<sup>2</sup>, and ribbon.
- Use a “**Match to Box**” shortcut to quickly apply the same color to the lid or handler (if applicable).
- **Save** the final configuration as part of the order.

This feature enhances the emotional value of the gift by allowing customers to creatively shape the packaging experience. It reflects Cadeau’s mission to deliver a truly interactive and personalized gifting journey.

---

<sup>1</sup>Lid customization is available only for box models that support separate lids, such as first one.

<sup>2</sup>handler customization is available only for box models that has handler, such as fourth one.



Figure 4.31: 3D Gift Box Customization – Default model with initial color settings



Figure 4.32: Selecting rounded gift box model



Figure 4.33: Selecting square gift model

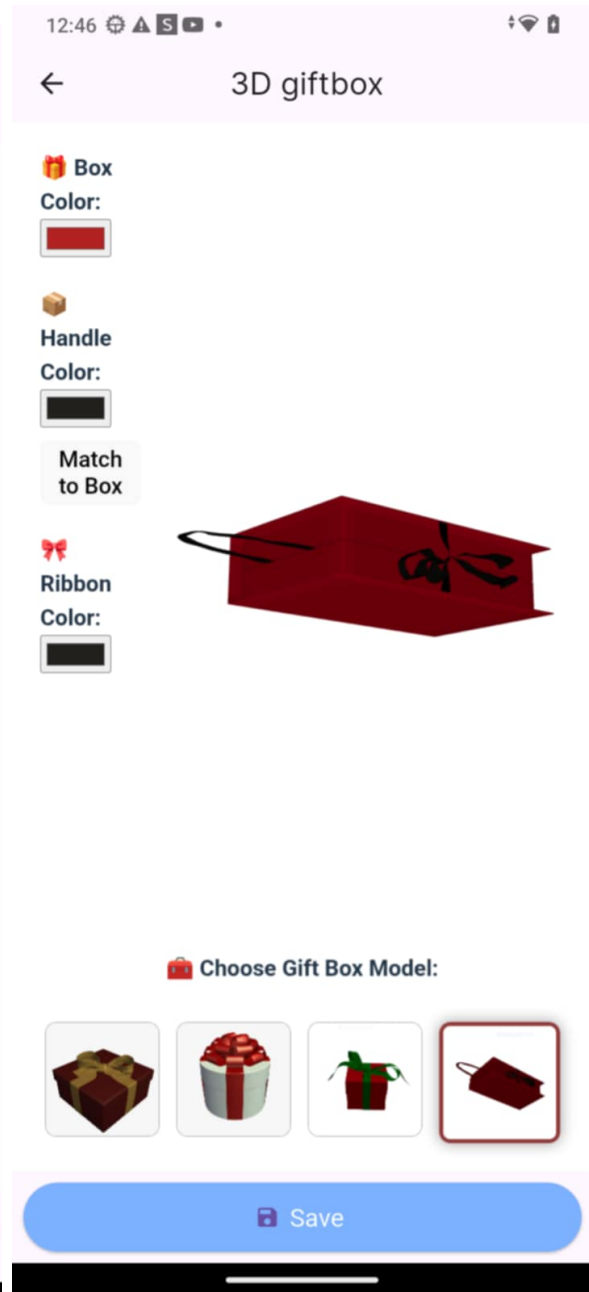


Figure 4.34: Selecting slim rectangular bag-style box model



Figure 4.35: Customizing box and lid colors



Figure 4.36: Customizing box and lid colors

#### 4.2.15 User Card Creation

Before completing the order, the Cadeau platform allows users to create a personalized greeting card to accompany the gift. This process requires the user to enter three main details:

- **Their name** – The sender of the gift.
- **The recipient's name** – The person who will receive the gift.

- **A personal message** – A short text to be displayed on the card.

After entering the information, the user can preview the card to see both its design and the content. This preview ensures that everything looks just right before saving the card and proceeding to the payment stage. The card adds a personal and emotional touch to the gift, making the experience even more special.

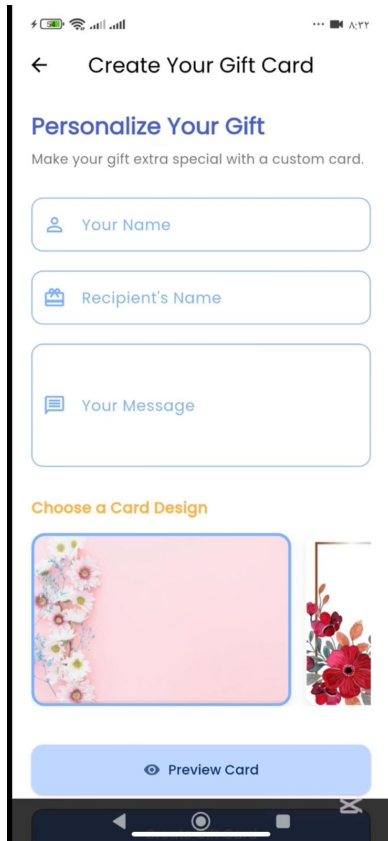


Figure 4.37: Card Input Form

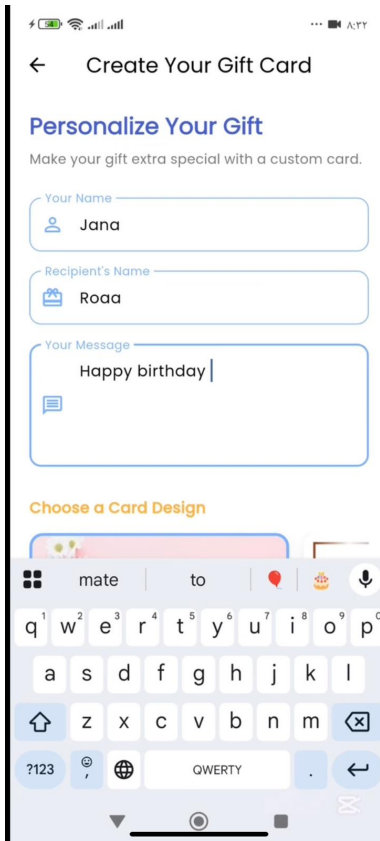


Figure 4.38: Card Input Form

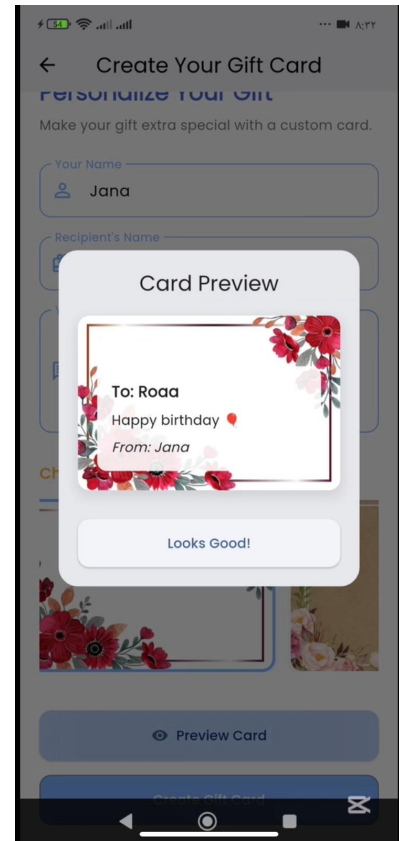


Figure 4.39: Card Preview – Design and Message

#### 4.2.16 Selecting Delivery Location

To enhance the delivery process, the Cadeau platform integrates with the external Geopify API, allowing users to select their precise delivery location directly from an interactive map. This feature improves address accuracy, reduces user effort, and ensures smoother order fulfillment.

The user can use the current GPS position. Once selected, the location is saved and linked to their order for delivery.

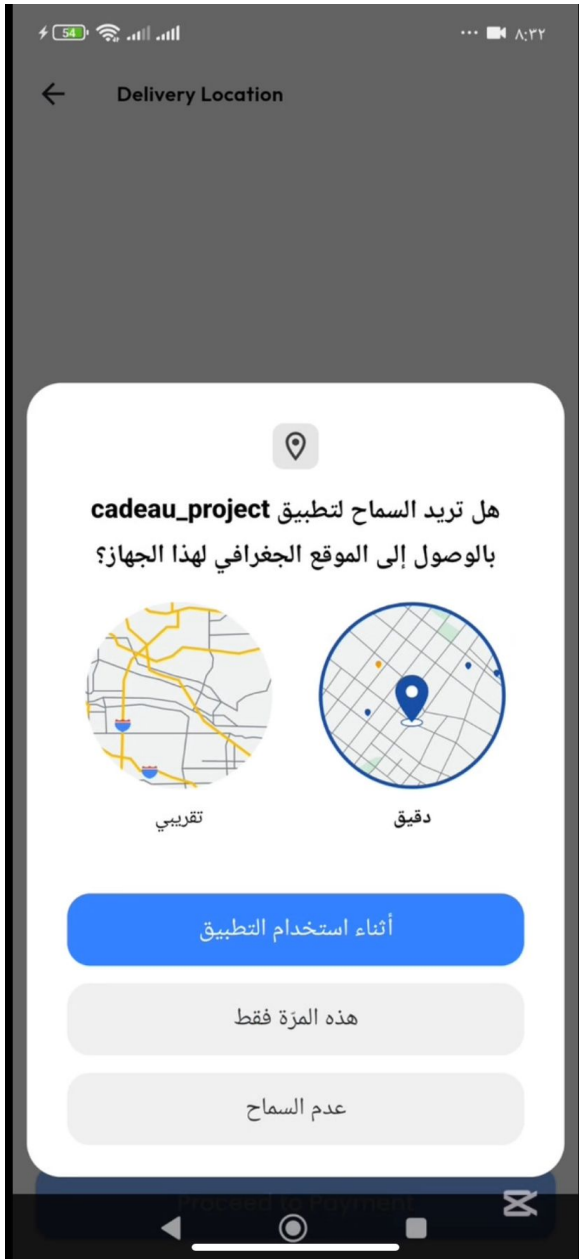


Figure 4.40: Allow location

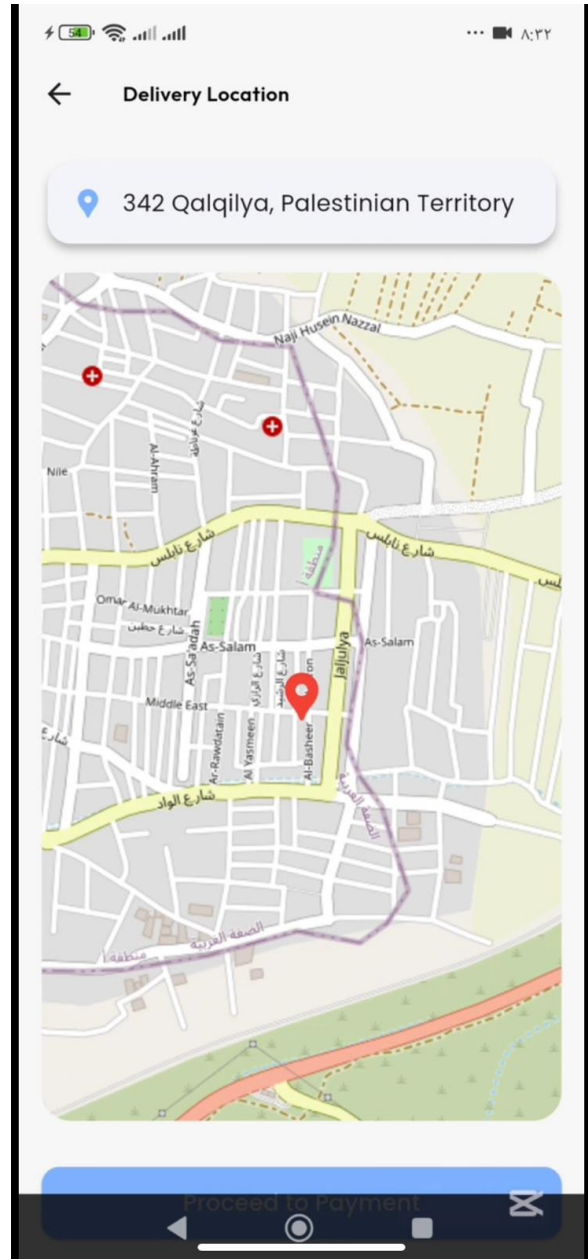


Figure 4.41: Selecting Pin on Map

#### 4.2.17 Secure Payments with Stripe API

To facilitate a smooth and secure payment experience, the Cadeau platform integrates with the external Stripe API. Stripe is a trusted and widely-used payment gateway that ensures secure handling of user payment information while supporting various payment methods, including credit cards.

During checkout, users are redirected to Stripe's secure payment interface. After successful payment, the transaction details are safely recorded and the user is directed back to the application to complete the shopping process.

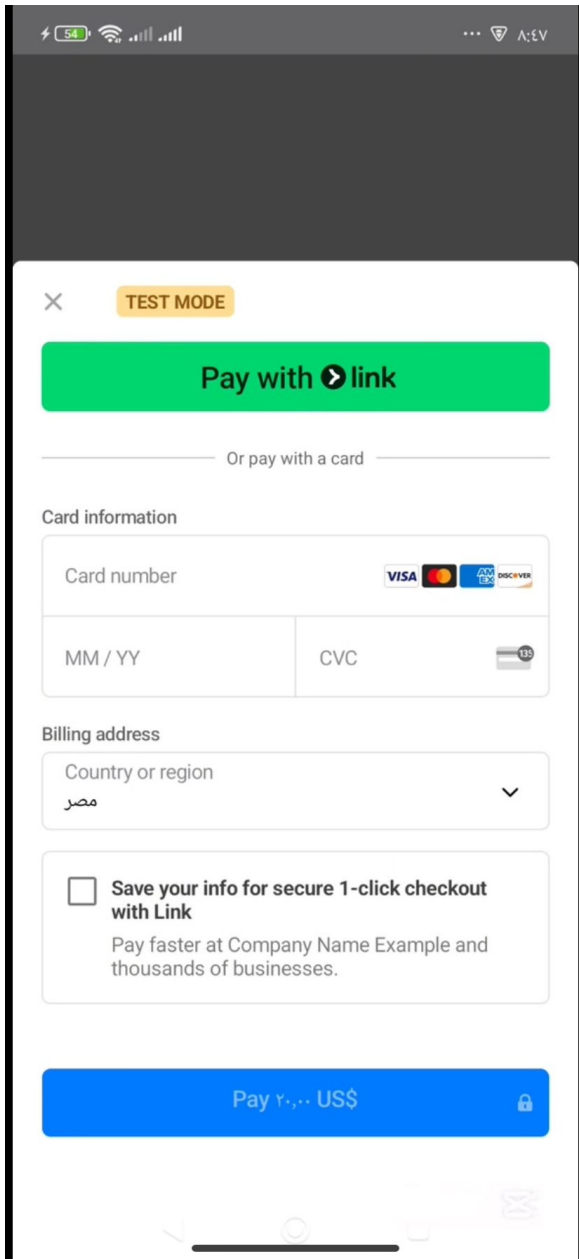


Figure 4.42: Stripe Payment Interface

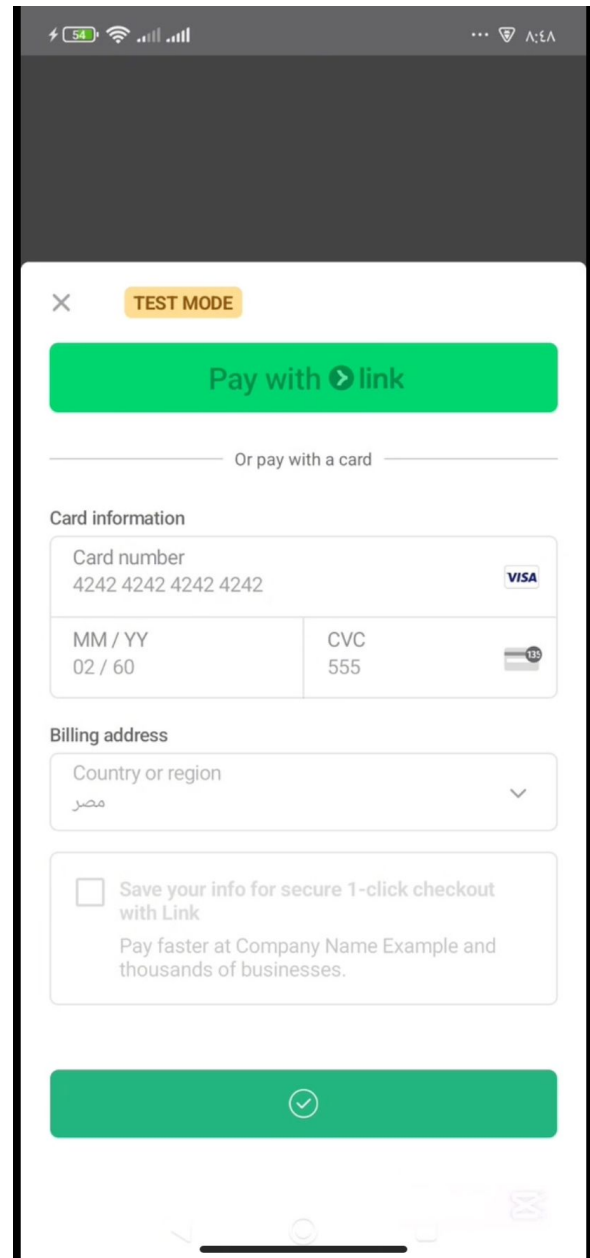


Figure 4.43: Payment Success Confirmation

### 4.2.18 Surprise Box Feature

To make gift-giving more exciting and spontaneous, the Cadeau platform offers a unique Surprise Box feature. This allows users to select a budget for a mystery gift, which is then randomly chosen from the store’s collection based on the selected price range.

Once the Surprise Box is opened, the user is shown a randomly selected gift. They can then choose to add it to their favorites or directly to their cart for purchase, adding a fun and engaging twist to the shopping experience.

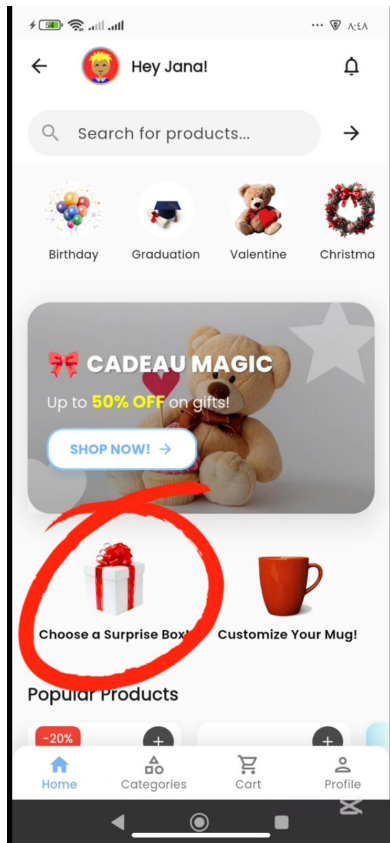


Figure 4.44: Selecting Box Price

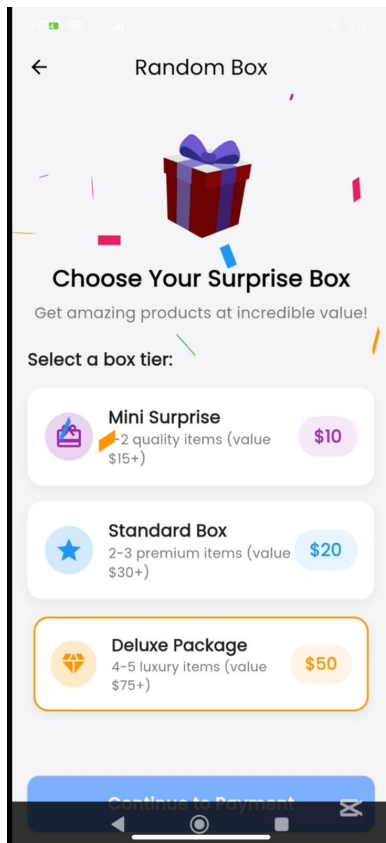


Figure 4.45: Gift Revealed

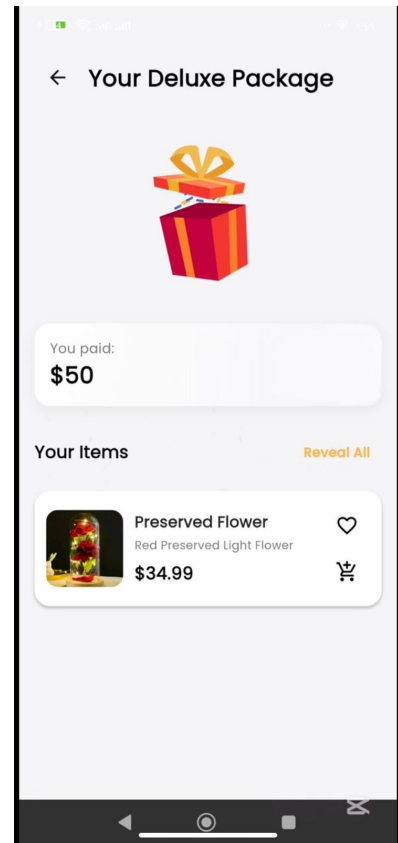


Figure 4.46: Add to Favorites or Cart

### 4.2.19 3D Cups Customization

The **Cups 3D Display** is one of the core interactive components in the Cadeau platform, designed to empower users to personalize their own cup designs in a visually engaging and intuitive way. This feature is powered by a **React Three Fiber** module and embedded within the mobile app using a **WebView**, enabling smooth cross-platform performance.

Upon entering the cup customization section, users are guided through a step-by-step 3D configurator where they can:

- **Choose from three different cup models**, each rendered as a 3D object with distinct shapes.
- **Select the color of the cup**, with real-time updates reflected on the 3D model to ensure accurate visual feedback.
- **Apply stickers** from a curated collection, which can be selected and positioned directly onto the cup's surface.

- **Specify the quantity** of customized cups they wish to order before proceeding to checkout.

This process is designed to be fully interactive. As users make adjustments, the live 3D preview helps them visualize their final product, enhancing confidence and satisfaction with their personalized gift. The customization data—including selected model, color code, sticker ID, and quantity—is saved and passed to the backend for order fulfillment.

By offering this level of flexibility, the **Cups 3D Customization** feature elevates the gifting experience from a transactional action to a creative and expressive activity.



Figure 4.47: 3D Cup Customization – Choosing the “Cozy Cup” model

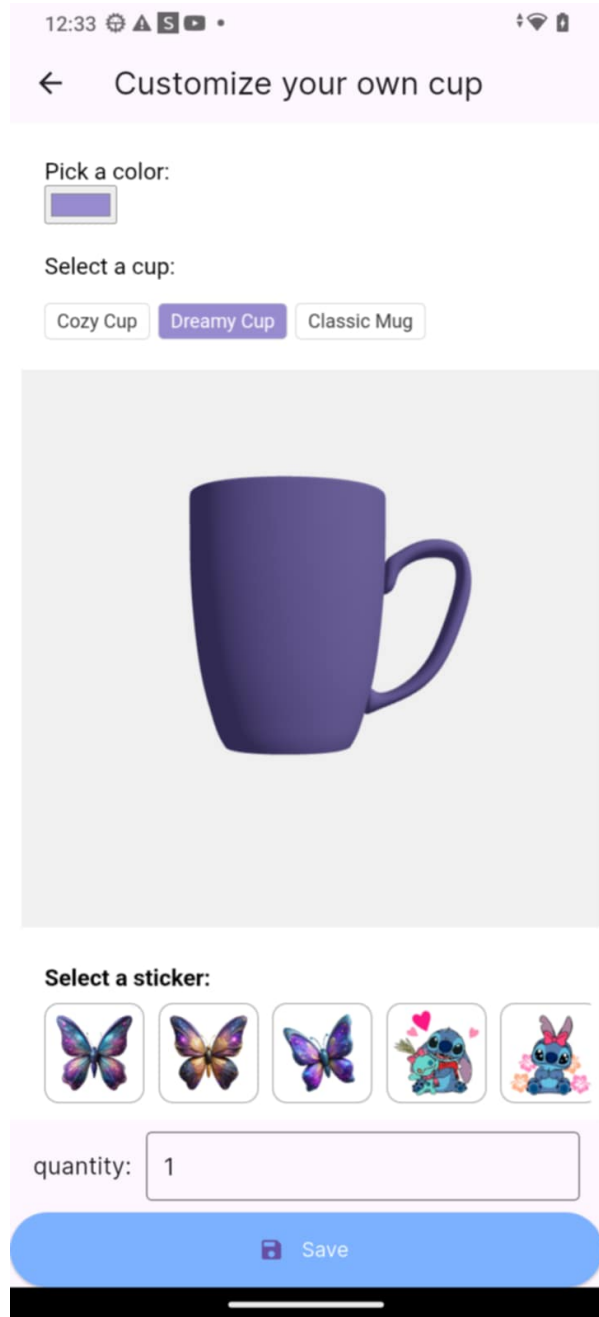


Figure 4.48: 3D Cup Customization – Choosing the “Dreamy Cup” model



Figure 4.49: 3D Cup Customization – Choosing the “Classic Mug” model



Figure 4.50: 3D Customization – Selecting cup color and viewing sticker ( 1 / 3 )



Figure 4.51: 3D Customization – Selecting cup color and viewing sticker ( 2 / 3 )



Figure 4.52: 3D Customization – Finalizing cup design with color and sticker ( 3 / 3 )

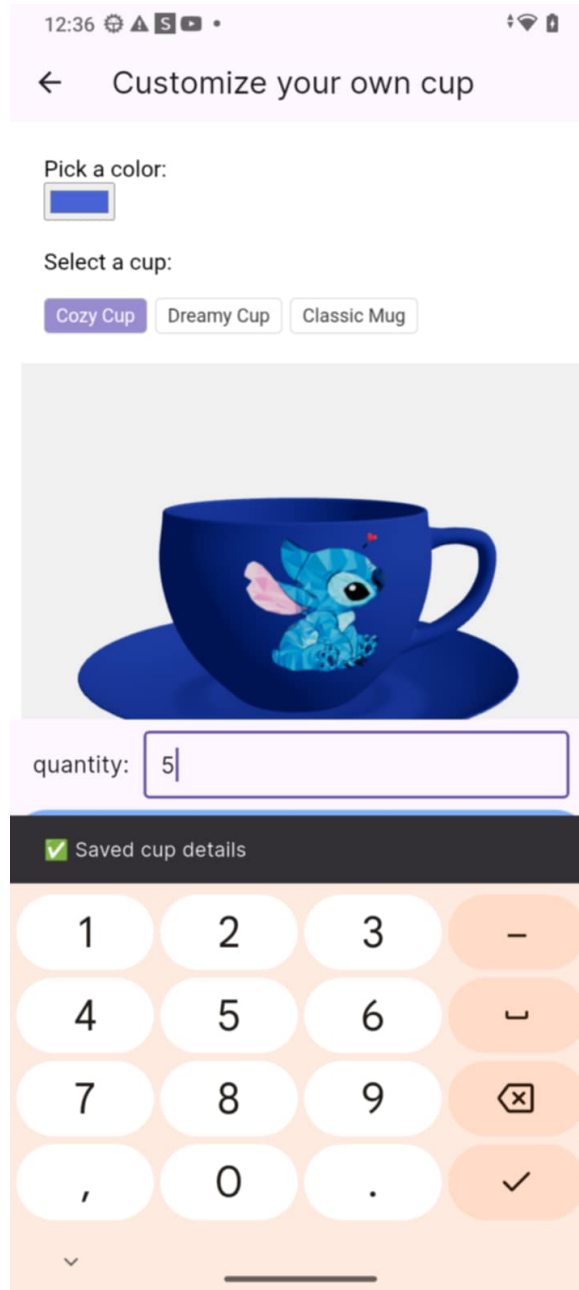


Figure 4.53: Full customization – Cup model, color, sticker, quantity selection, and confirmation message

#### 4.2.20 AI Avatar Chatbot Assistant

To enhance the user experience and provide personalized shopping assistance, the Cadeau platform features an AI-powered Avatar Chatbot. This virtual assistant is trained to understand user queries and provide intelligent gift suggestions based on data from the product database.

Users can interact with the chatbot using natural language to describe the occasion, recipient type, preferences, or budget. The AI then processes the input and returns a list

of suitable gift options, making the shopping journey easier, faster, and more engaging.

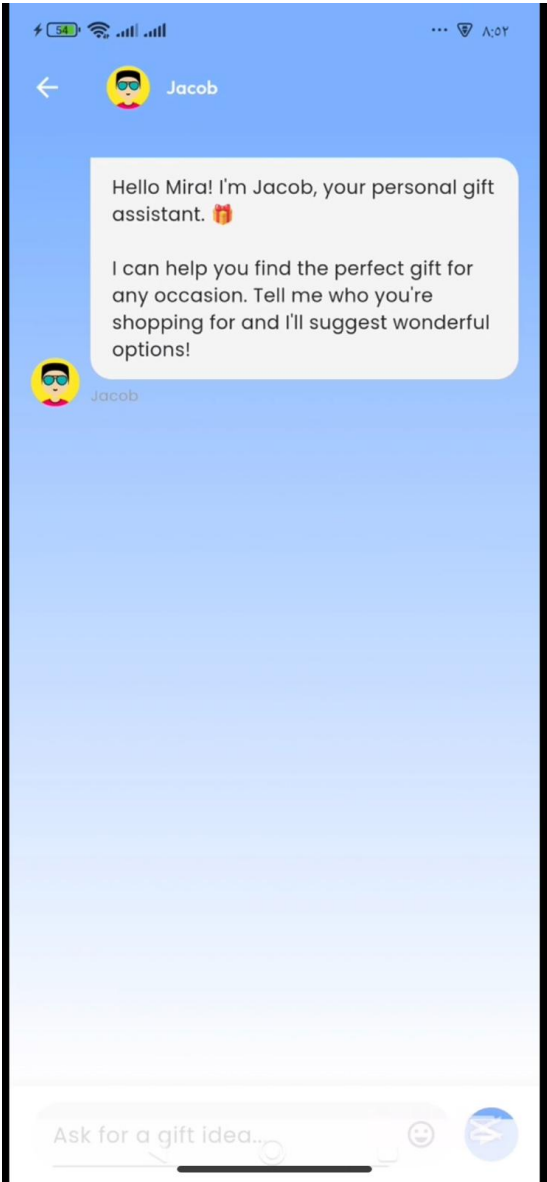


Figure 4.54: AI Avatar

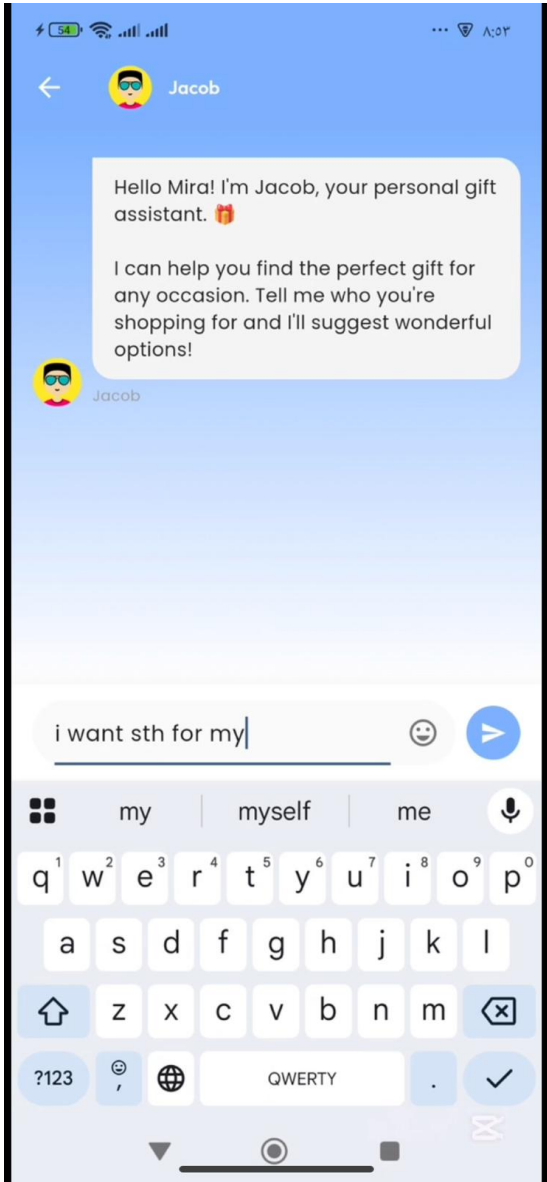


Figure 4.55: User Asking for Suggestions

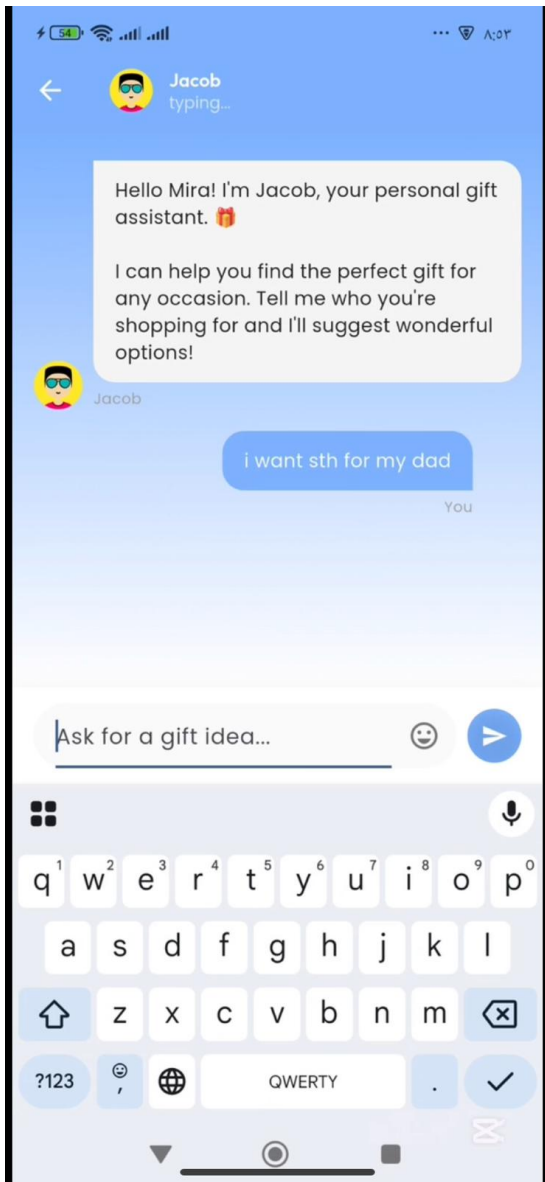


Figure 4.56: AI Responding with Gift Ideas

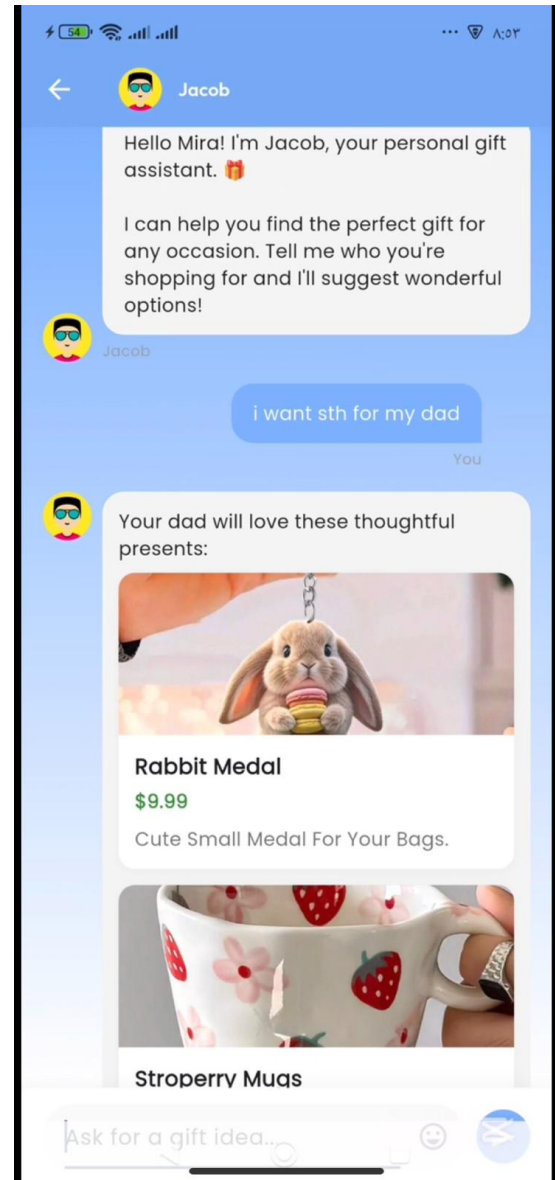


Figure 4.57: Suggested Gift Details

#### 4.2.21 Owner Dashboard and Features

When an owner logs into the Cadeau platform, they are greeted with a personalized dashboard. The avatar displayed at the top of the page is selected based on the owner's gender — a professional male or female illustration is shown accordingly to create a more relatable and inclusive experience.

The owner's dashboard includes the following menu options:

- **Profile** – Displays all products the owner has added, along with options to edit, delete, and view associated ratings and user reviews for each product.

- **View Notifications** – Displays system or admin notifications.
- **Add New Product** – Allows the owner to add a new item to their shop.
- **Add New Category** – Enables the creation of a new category.
- **Contact Admin** – Opens a direct messaging interface to communicate with the admin.
- **Log Out** – Safely signs the owner out of their session.

If the owner has unread notifications or messages, visual indicators (e.g., badges or highlighted buttons) appear on the relevant sections to draw attention. Additionally, the latest notification is prominently displayed at the top of the owner’s page to ensure it is seen immediately upon login.

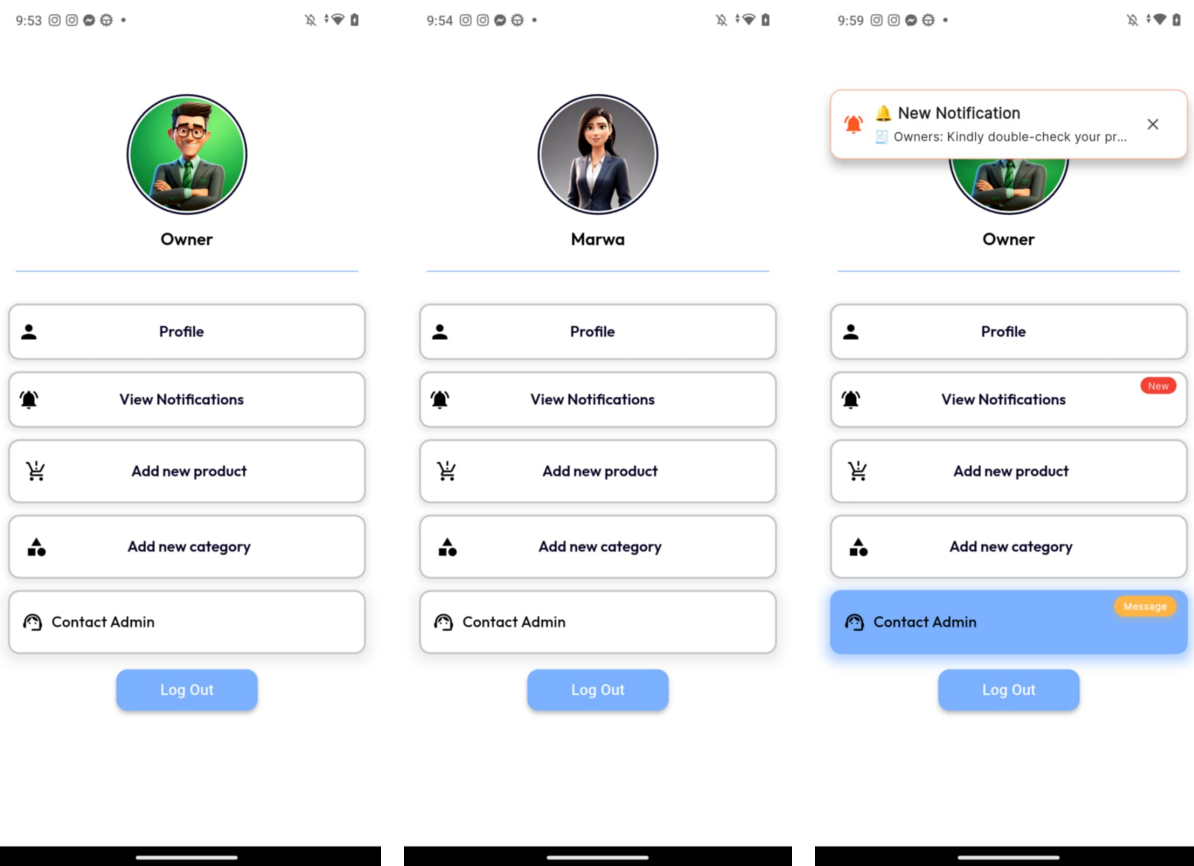


Figure 4.58: Owner Dashboard – Male

Figure 4.59: Owner Dashboard – Female

Figure 4.60: Owner Dashboard with Notifications

## 4.2.22 Owner Profile – Products and Reviews

Inside the profile section, the owner is presented with two main tabs: **My Items** and **Reviews**.

In the **My Items** tab, the owner can see a list of all the products they have added, including item name, image, and price. Each product has action buttons for editing, deleting. This allows owners to manage their store effectively and update offerings at any time.

In the **Reviews** tab, the owner can view real user feedback for each product they have listed. The reviews include the user's name, star rating, product name, and comment. This helps the owner track customer satisfaction and improve product quality accordingly.

**Owner Items View:**

**Customer Reviews View:**

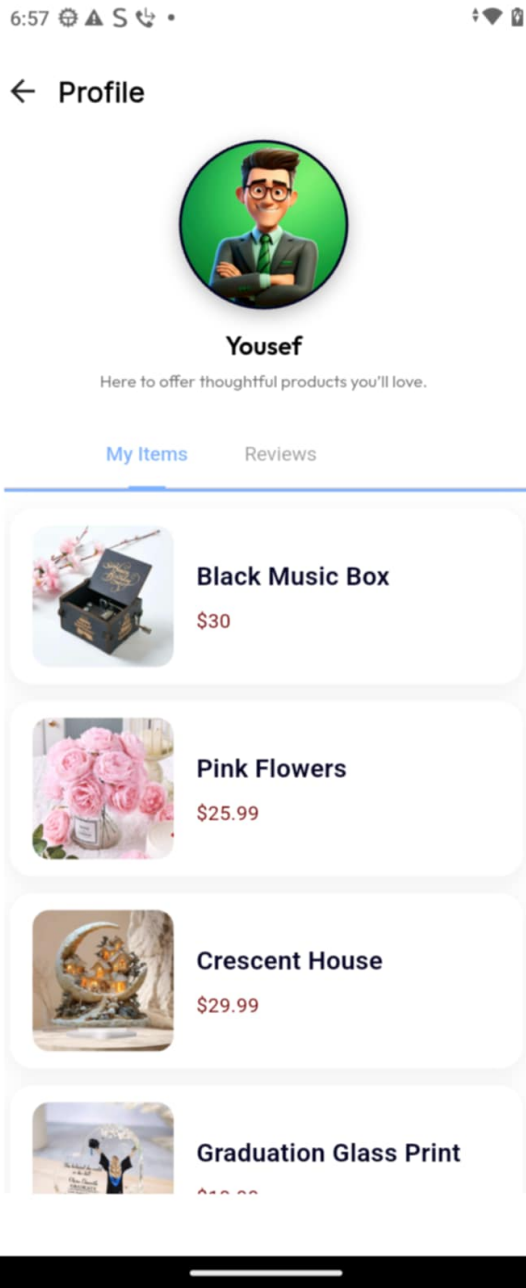


Figure 4.61: My Items – Owner Product List

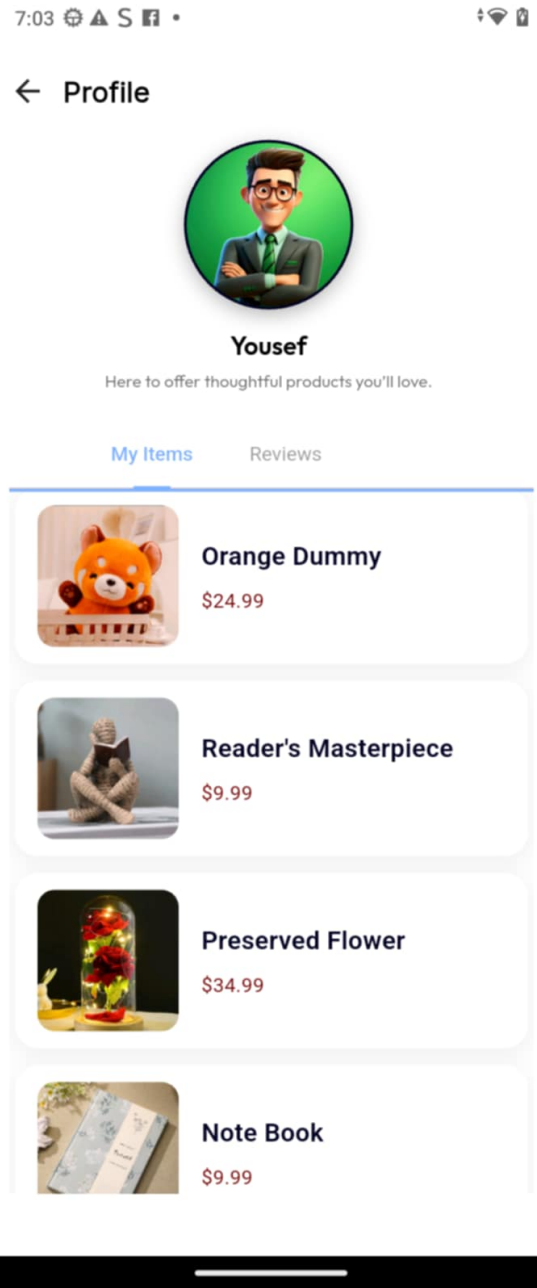


Figure 4.62: My Items – Scrollable Product Entries

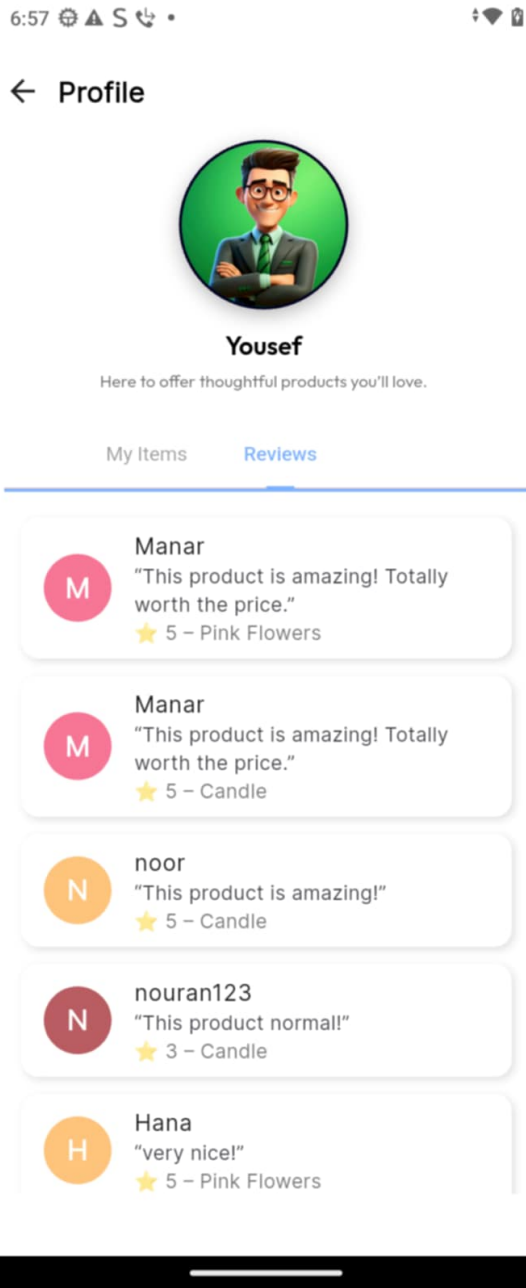


Figure 4.63: Reviews Tab – User Feedback and Ratings

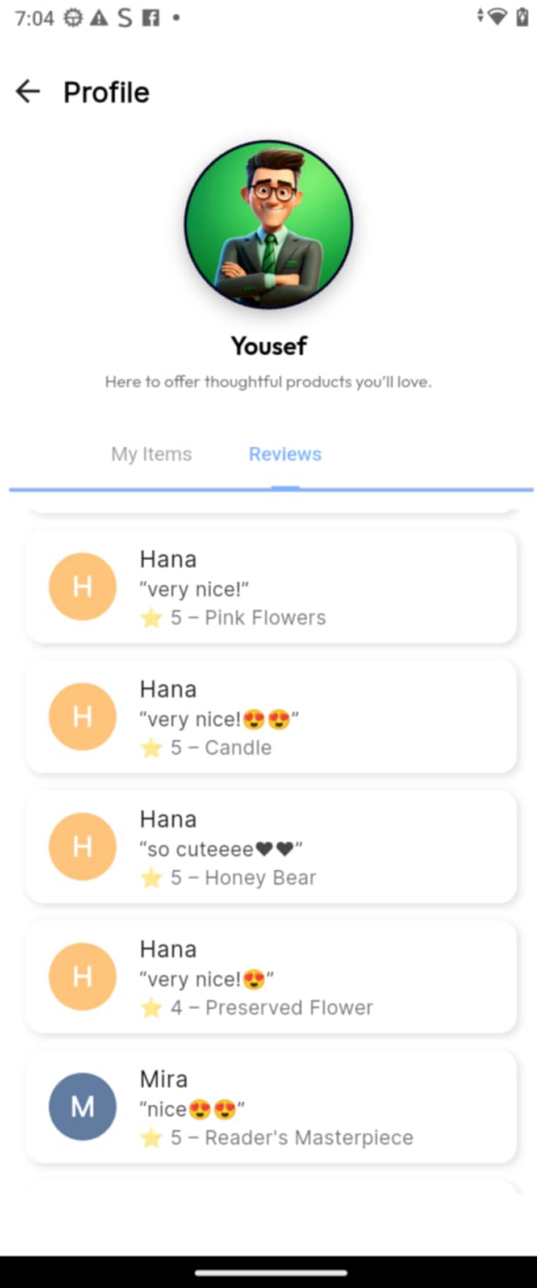


Figure 4.64: Additional Customer Reviews and Product Ratings

### 4.2.23 Adding a New Product

To begin listing items on the platform, the owner must first add a new product using the **Add Product Page**, as illustrated in the screenshots. This form enables the owner to fill in all necessary product details, including:

- **Upload Product Images** (e.g., *from one up to three photos*)
- **Product Name** (e.g., *Camera*)
- **Description** (e.g., *Highest Definition camera for kids*)
- **Category selection** (e.g., *toys*)
- **Suggested Recipients** (e.g., *Friends, Child, Siblings*)
- **Suitable Occasions** (e.g., *Birthday, Christmas*)
- **Related Keywords** (e.g., *Toy, Kids, Joyful*)
- **Starting Price** (e.g., *29.99*)
- **Highest Price** (e.g., *49.99*)
- **Is the Product on Sale?** (Yes)
- **Discount Amount** (if the product is on sale, e.g., *5.99*)
- **Available Stock Quantity** (e.g., *50*)

After filling out the required fields and uploading the image(s), the owner taps the **Add Product** button. A confirmation message appears, confirming that the product has been successfully added to the system.

This feature streamlines the product onboarding process, ensuring that owners can provide comprehensive and attractive listings for potential buyers.

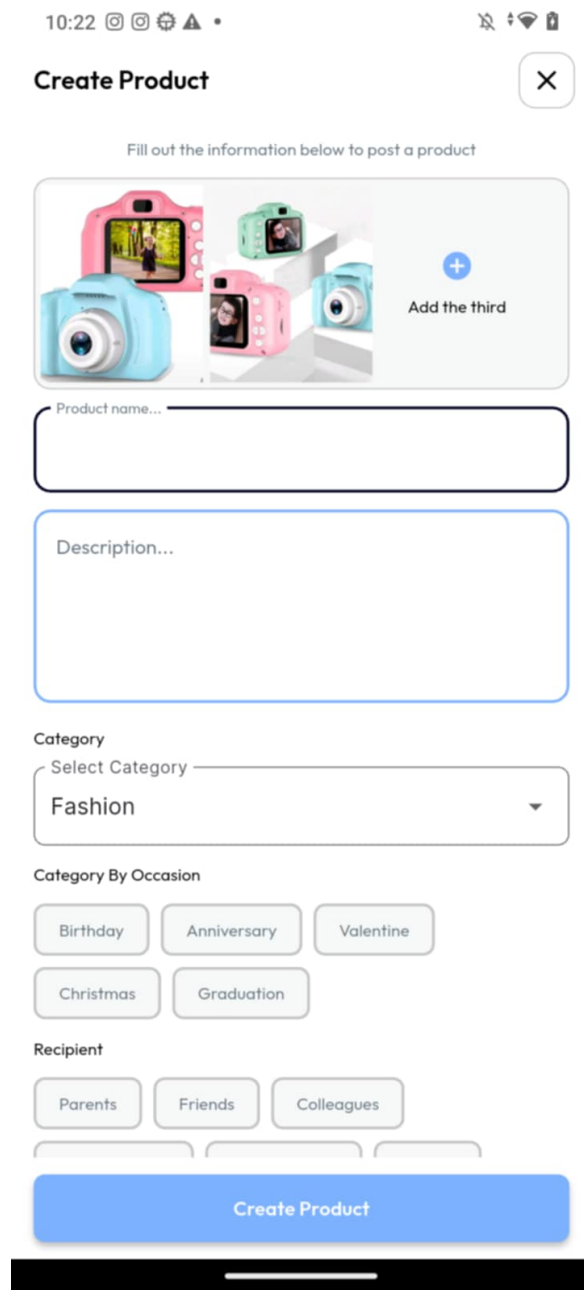
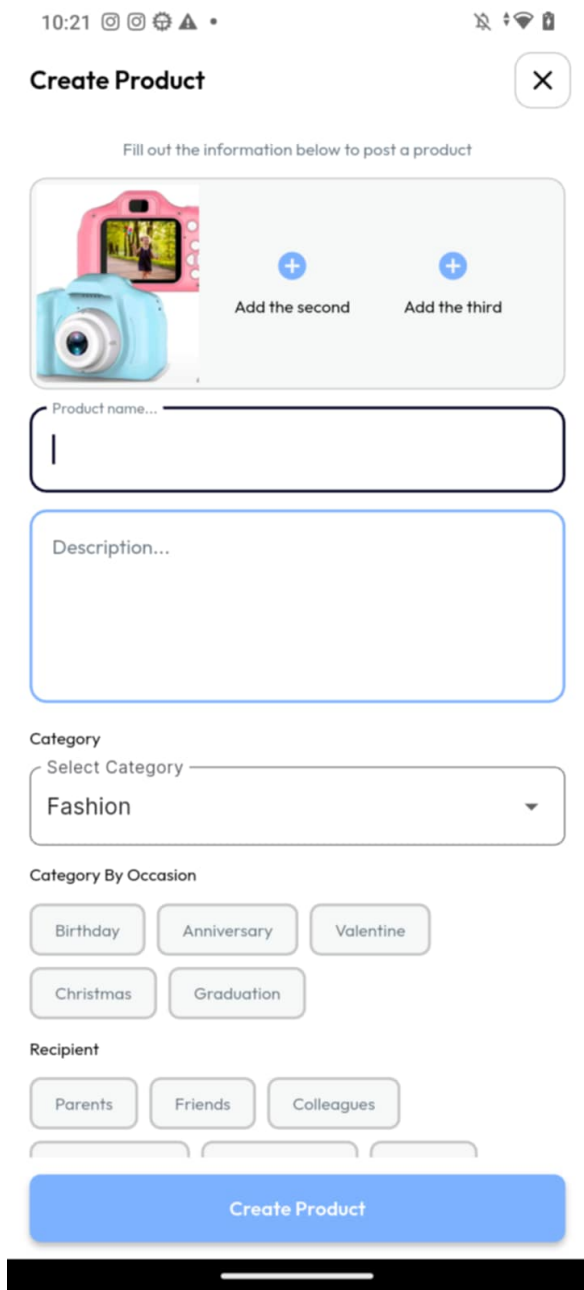


Figure 4.65: Add Product Form – Filling in Basic Details (1/5)

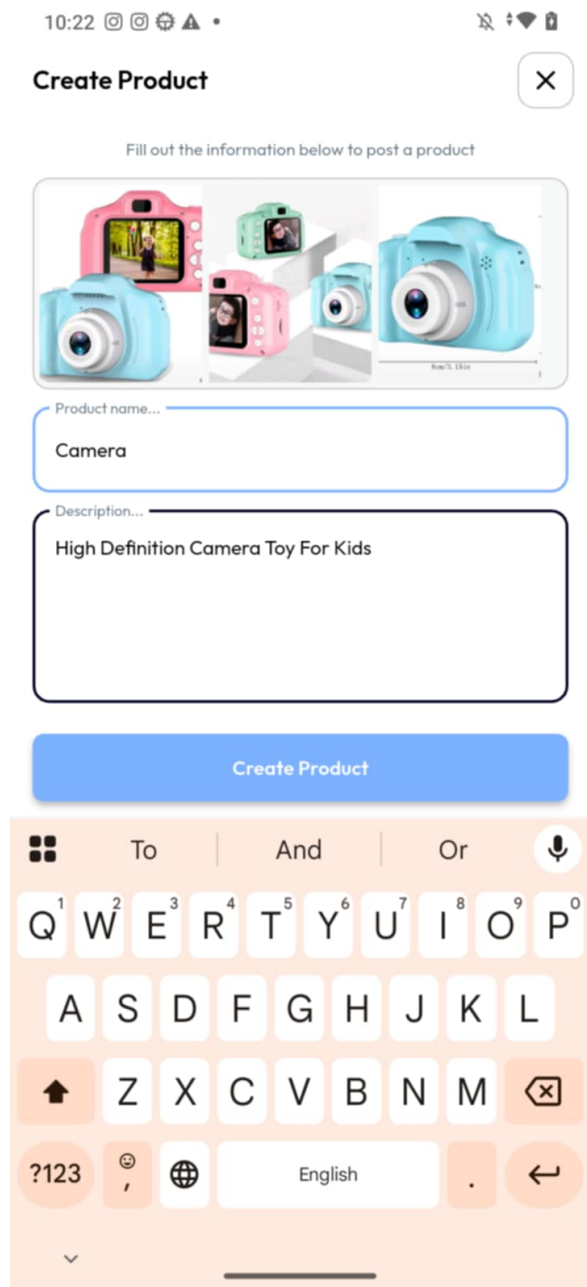
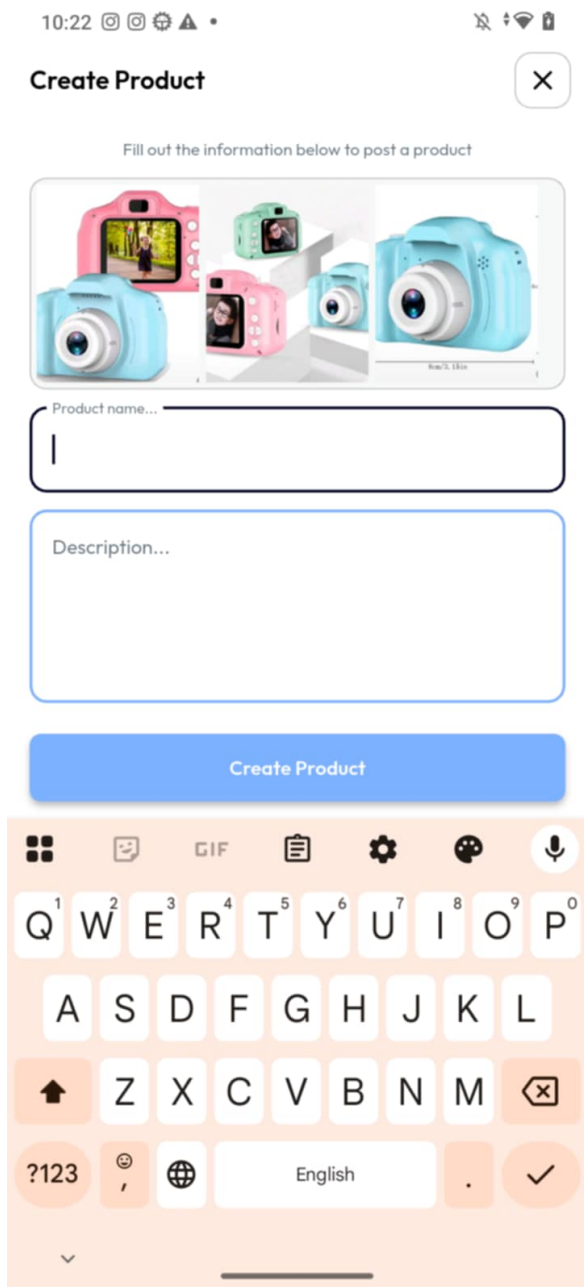


Figure 4.66: Add Product Form – Filling in Basic Details (2/5)

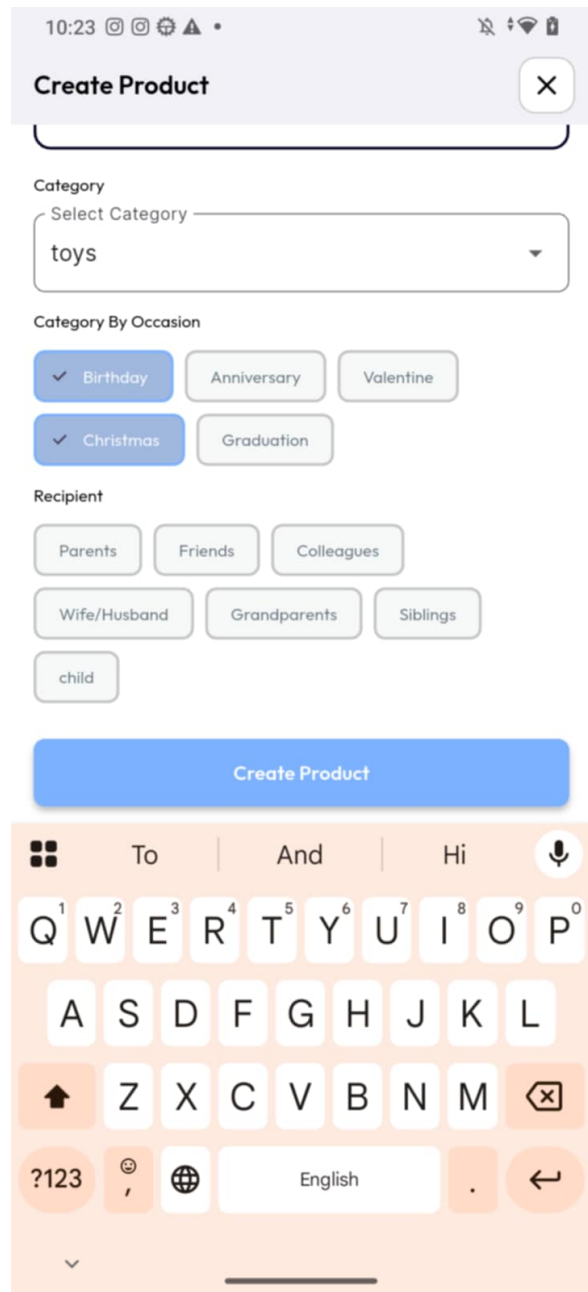
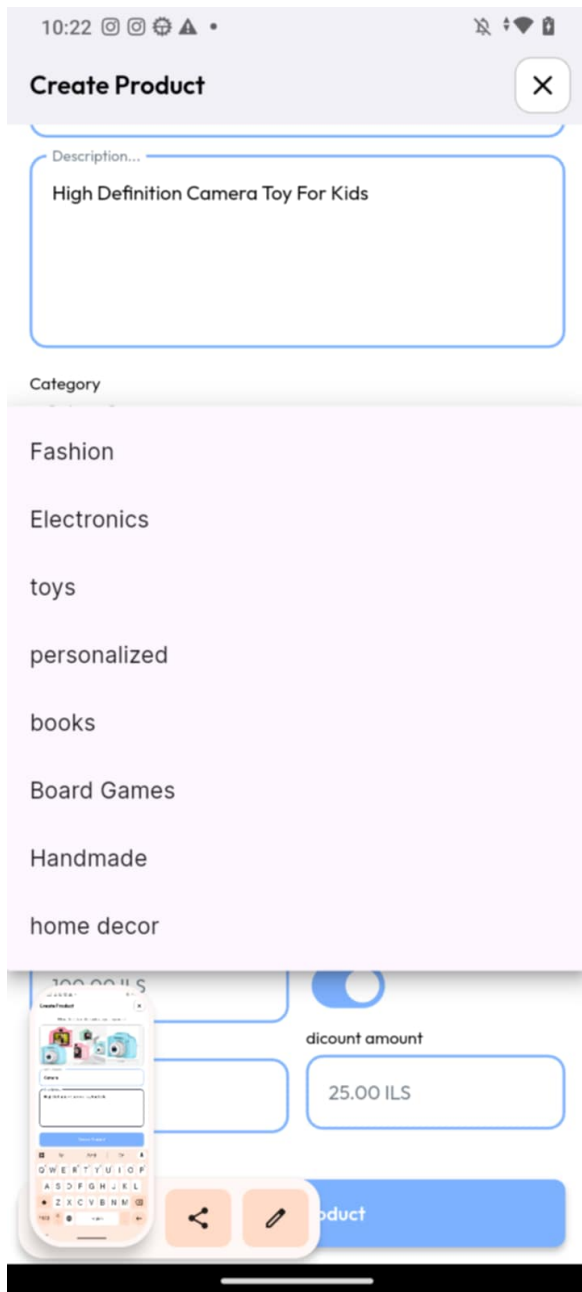


Figure 4.67: Add Product Form – Filling in Basic Details (3/5)

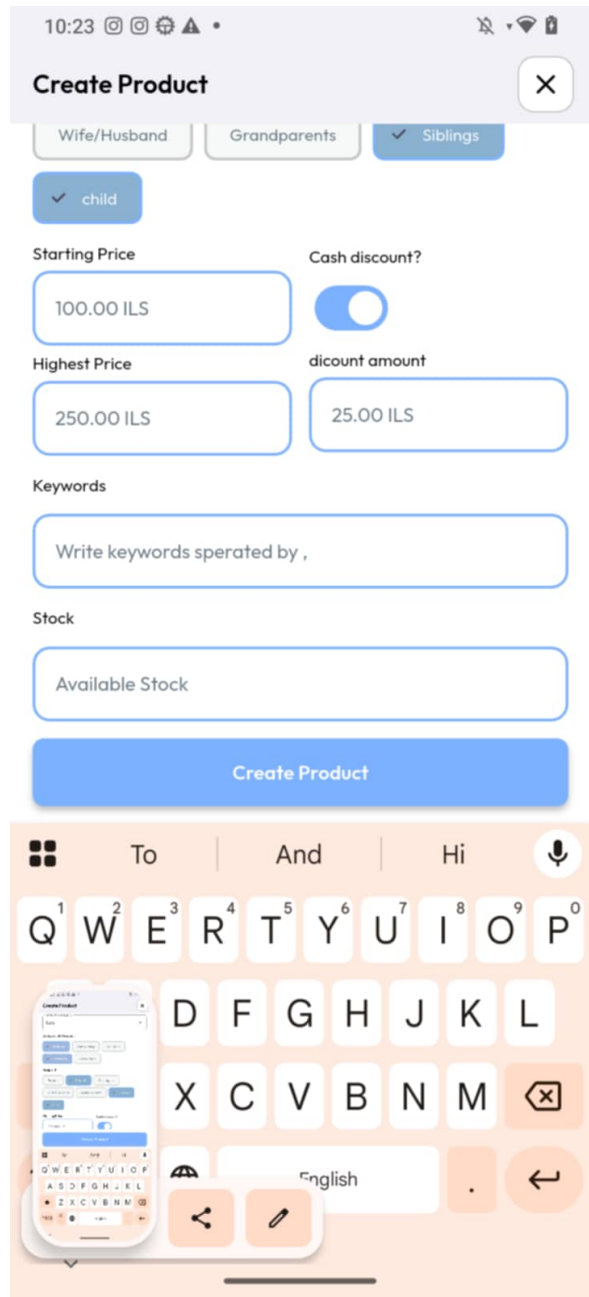
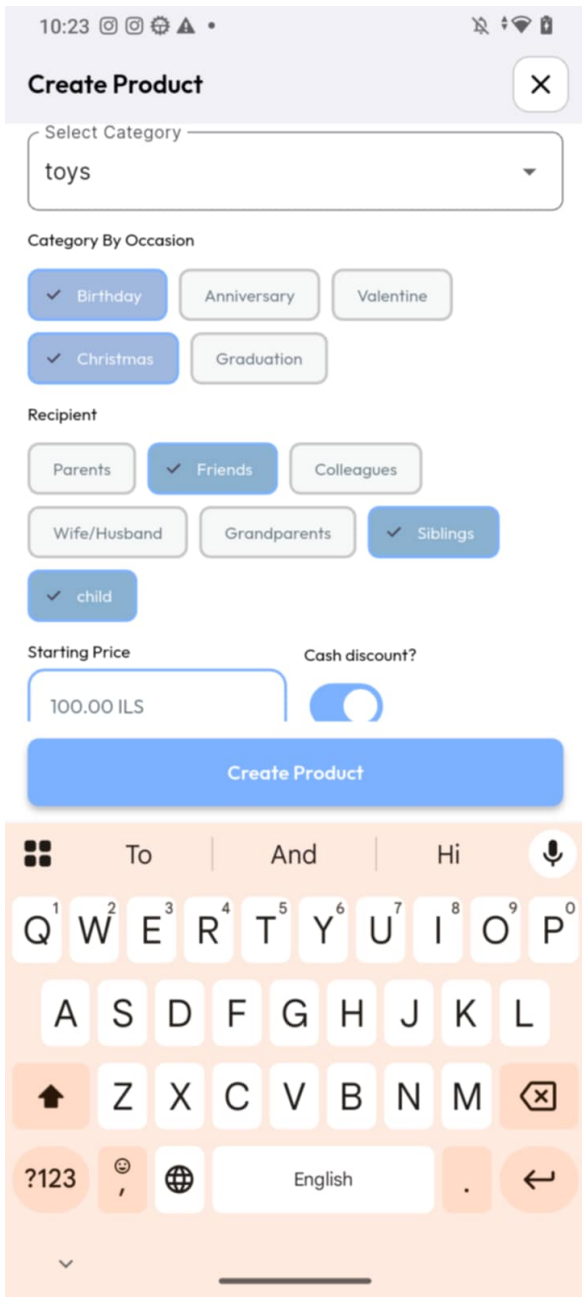


Figure 4.68: Add Product Form – Filling in Basic Details (4/5)

**Create Product** [X]

Category  
Select Category  
toys

Category By Occasion

Birthday   Anniversary   Valentine

Christmas   Graduation

Recipient

Parents    Friends   Colleagues

Wife/Husband   Grandparents    Siblings

child

Starting Price  
100.00 ILS  
29.99

Cash discount?

Highest Price  
250.00 ILS  
49.99

dicount amount  
25.00 ILS  
5.99

Keywords  
Write keywords sperated by ,  
Toy,Kids, Joyful

Stock  
Available Stock  
50

Create Product

**Create Product** [X]

Category  
Select Category  
Fashion

Category By Occasion

Birthday   Anniversary   Valentine

Christmas   Graduation

Recipient

Parents   Friends   Colleagues

Wife/Husband   Grandparents   Siblings

child

Starting Price  
100.00 ILS

Cash discount?

Highest Price  
250.00 ILS

dicount amount  
25.00 ILS

Keywords  
Write keywords sperated by ,

Stock  
Available Stock

Product created successfully!

Figure 4.69: Add Product Form – Filling in Basic Details (5/5)

#### 4.2.24 Product Details Page

After the owner adds a new product to the platform, they can later view its full details through the **Product Details Page**, as shown in the images. This page displays all essential information about the product, including: **Name, Description, Starting Price, Whether the product is on sale, Discount amount, Highest price, Available stock quantity, Suggested recipients, Suitable occasions, Related keywords.**

As seen in the screenshots, the owner also has the ability to **edit or delete** the product

directly from this page, which makes managing inventory much easier and more efficient. The page includes the product image, name, and a brief description to help owners keep their listings clear and attractive.

This interface plays a vital role in enabling owners to maintain and update their listings quickly while ensuring a smooth and user-friendly experience.

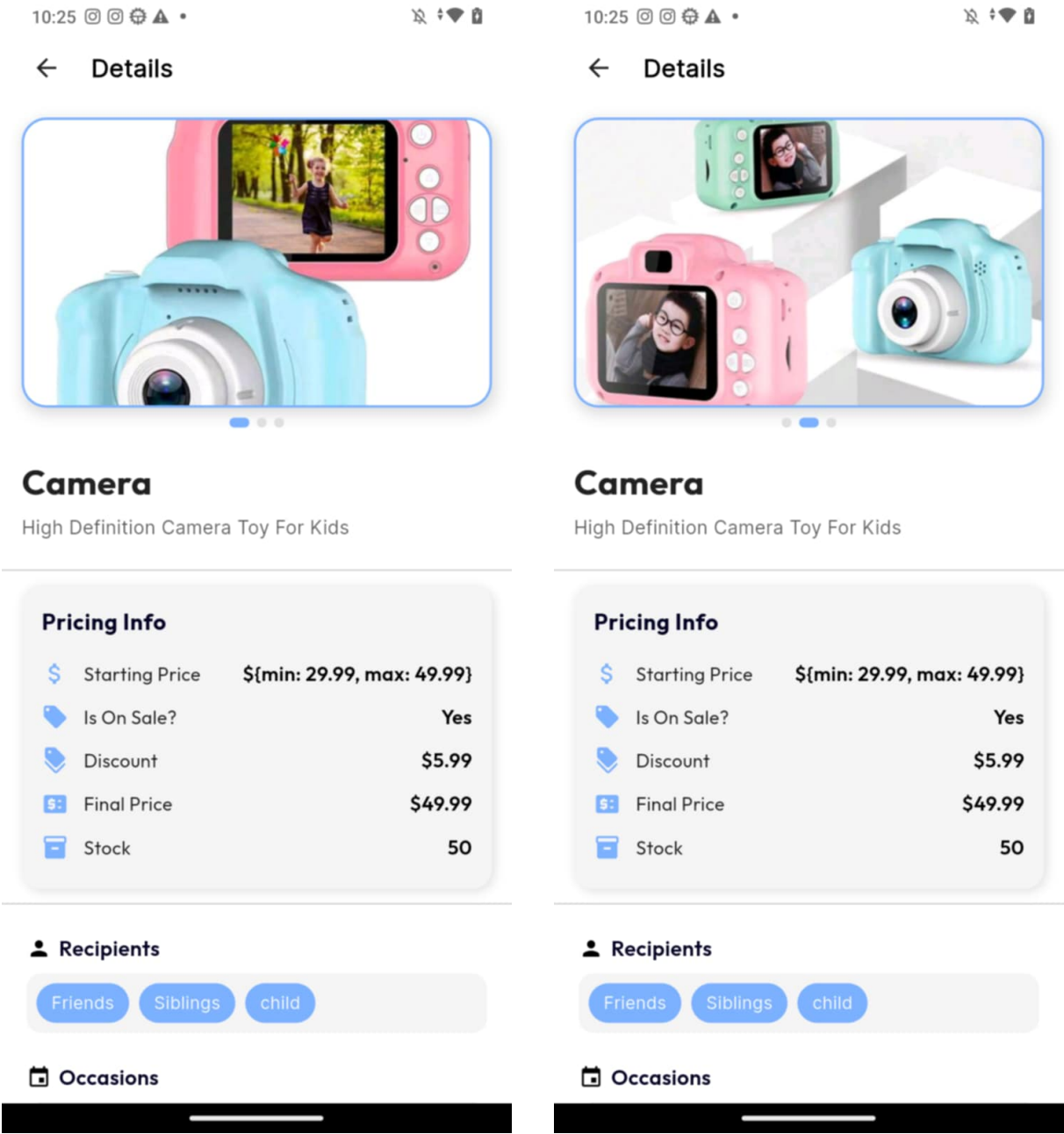


Figure 4.70: Product Details View – Camera (1/2)



- Highest price
- Is on sale
- Discount amount
- Stock quantity

The owner can also toggle whether a cash discount is enabled. Once all desired changes are made, the owner simply taps **Save Changes** to update the product.

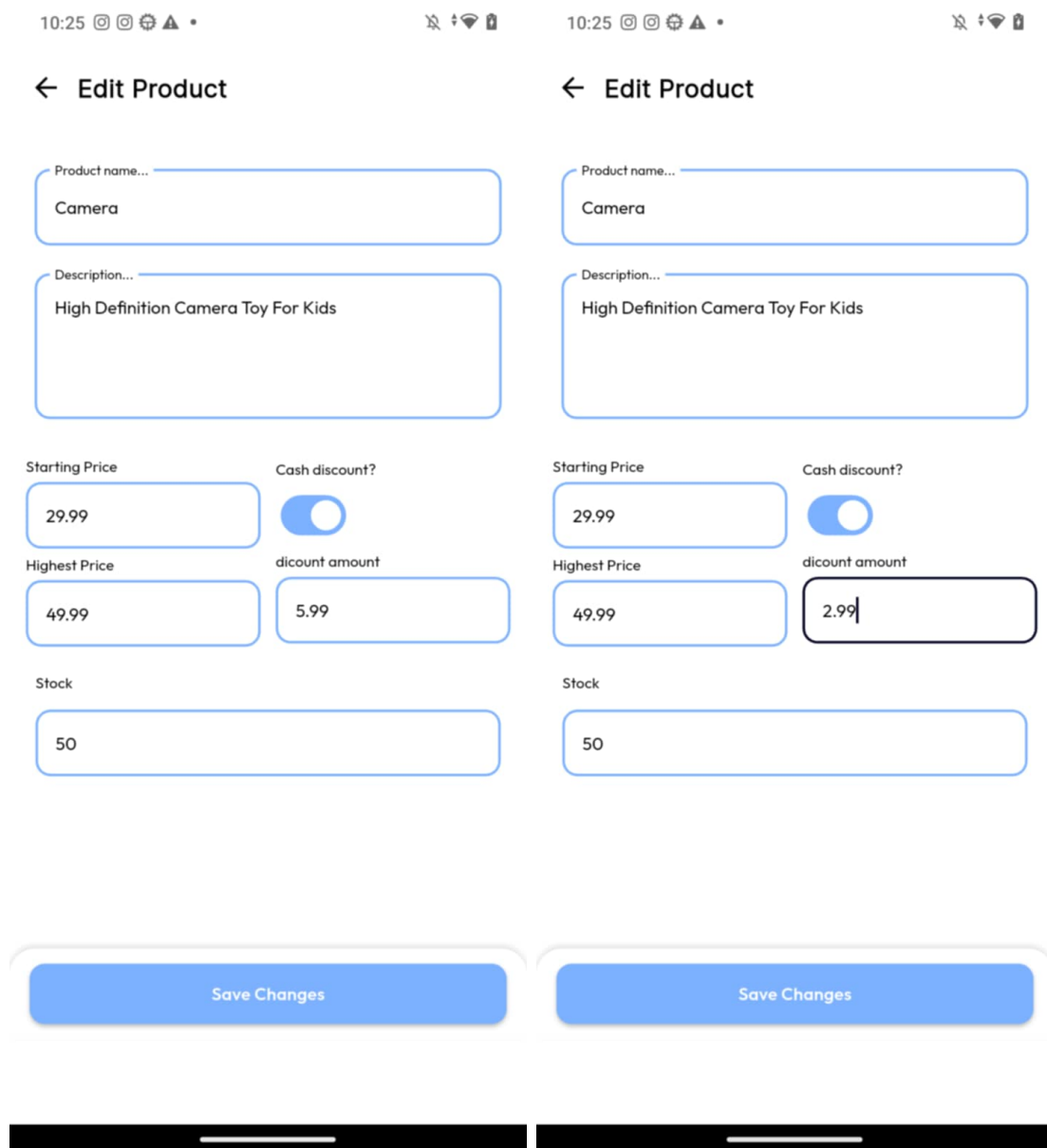


Figure 4.72: Editing Product Information

As shown in the interface above, the owner is in the process of editing an existing product. In this specific case, the discount amount is being changed from **\$5.99** to **\$2.99**. However,

the owner can freely modify any other field as well. The owner tapped the **Save Changes** button to apply the update.

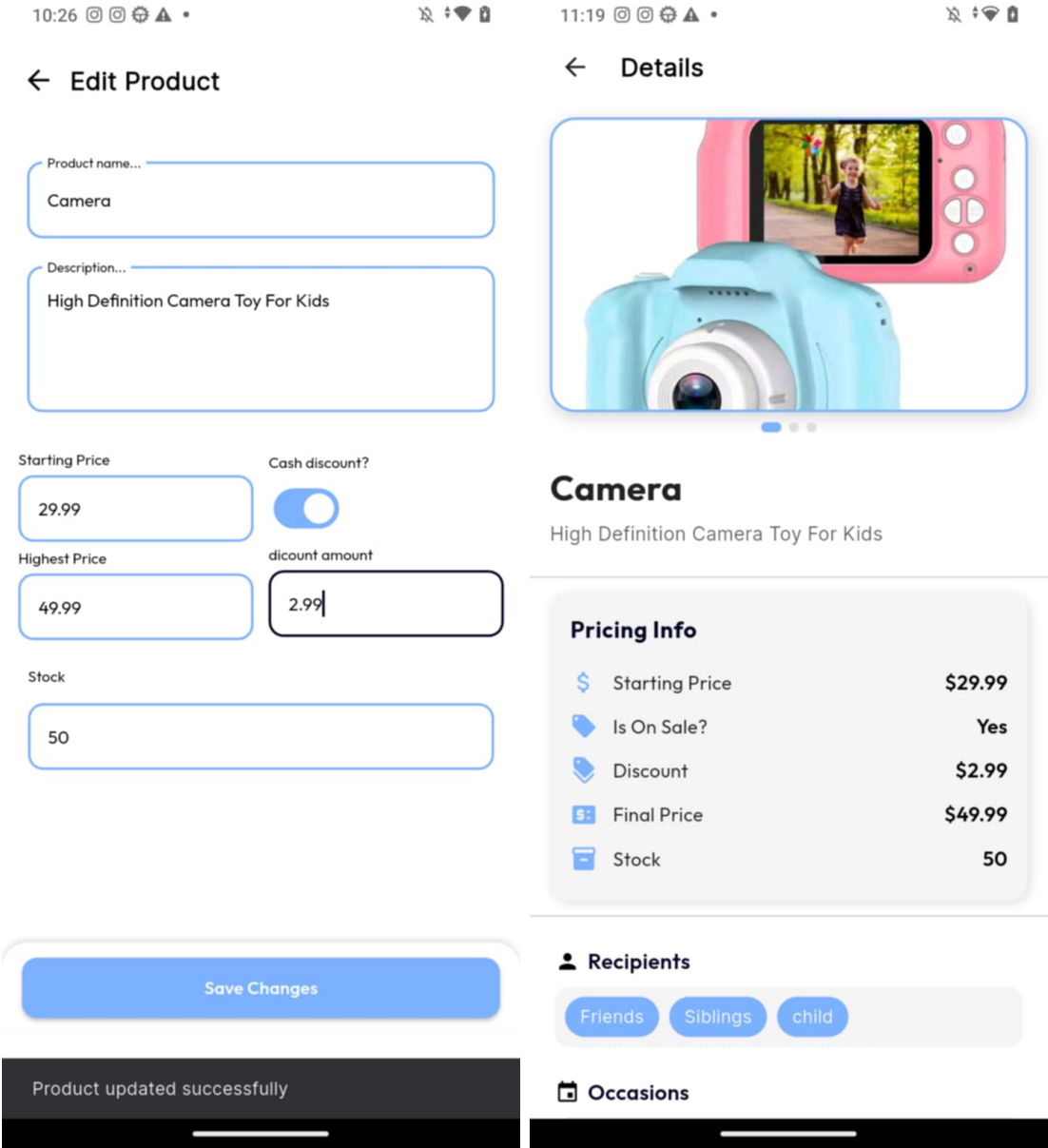


Figure 4.73: Final Edits and Confirmation Message

### 4.2.26 Deleting a Product

The Cadeau platform provides a straightforward way for owners to remove products from their listings when they are no longer available or relevant. This ensures that customers only see active and up-to-date inventory.

To delete a product, an owner navigates to their My Items tab within their profile. Each product listing includes a prominent delete button in the each product details page.

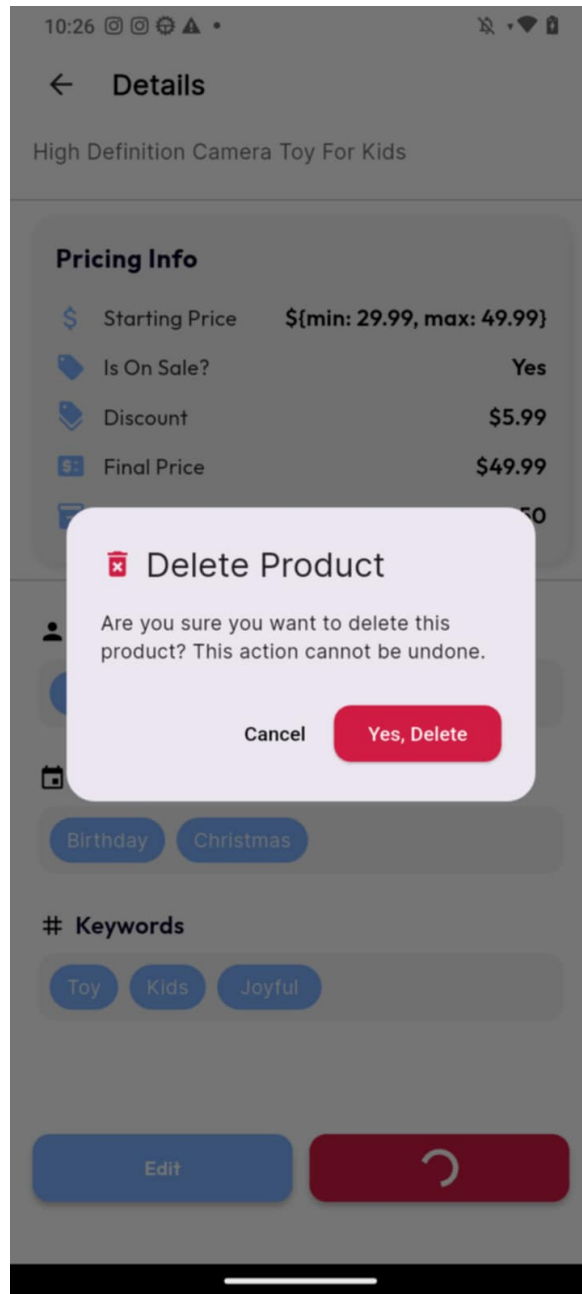


Figure 4.74: Delete product Camera by owner

#### 4.2.27 Adding a new category

The owner also has the permission to add a new category if they don't find one in the app that suits the product they want to list. While adding a category, the owner can set:

- Category name
- Upload category image
- choose category icon

to represent it — as shown in the screenshots. This helps ensure that their products are organized under the most relevant and visually recognizable categories.

However, only the admin has the authority to edit or delete existing categories, which will be discussed in detail later.

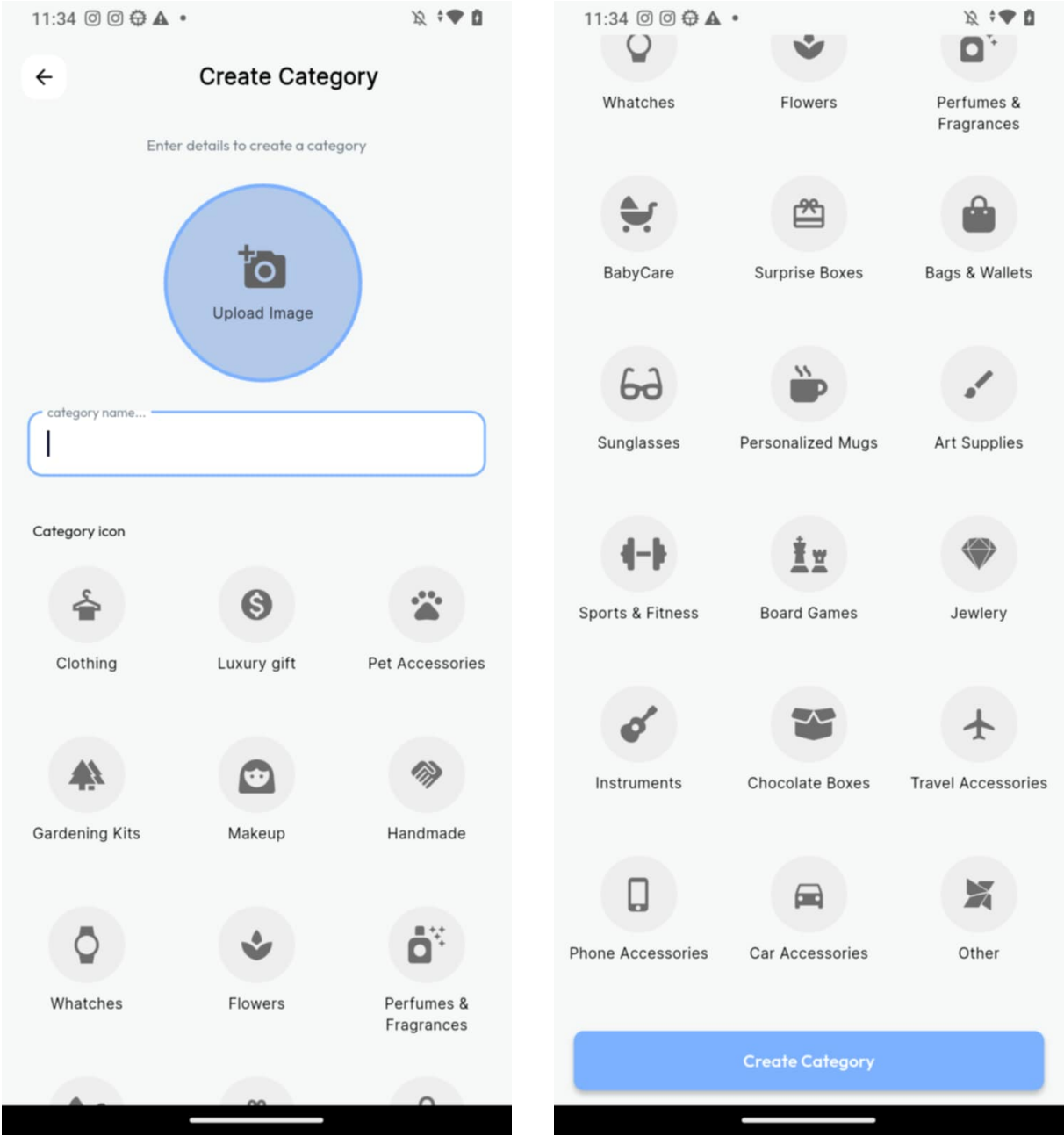


Figure 4.75: Creating Category - Empty Fields

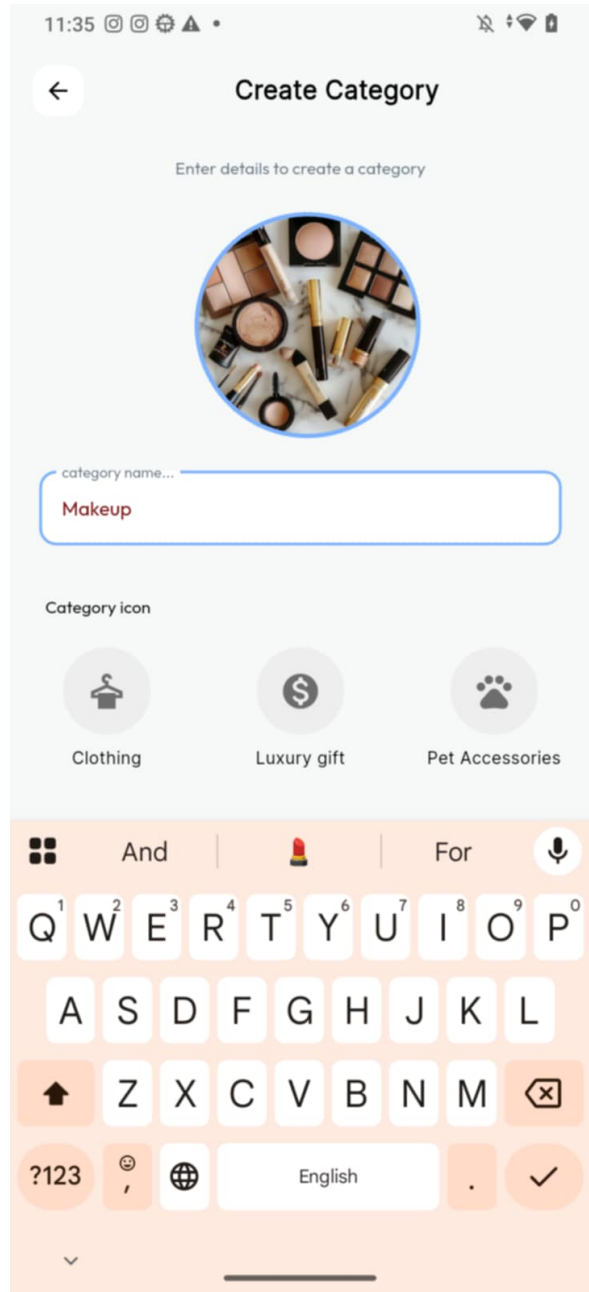
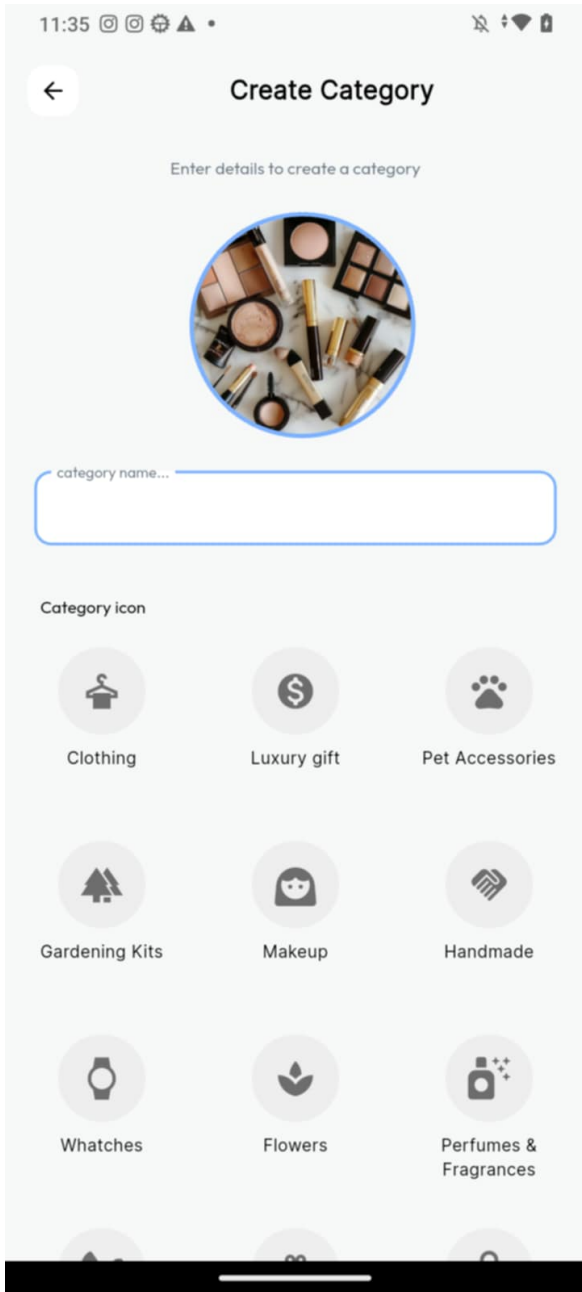


Figure 4.76: Creating Category with owner inputs

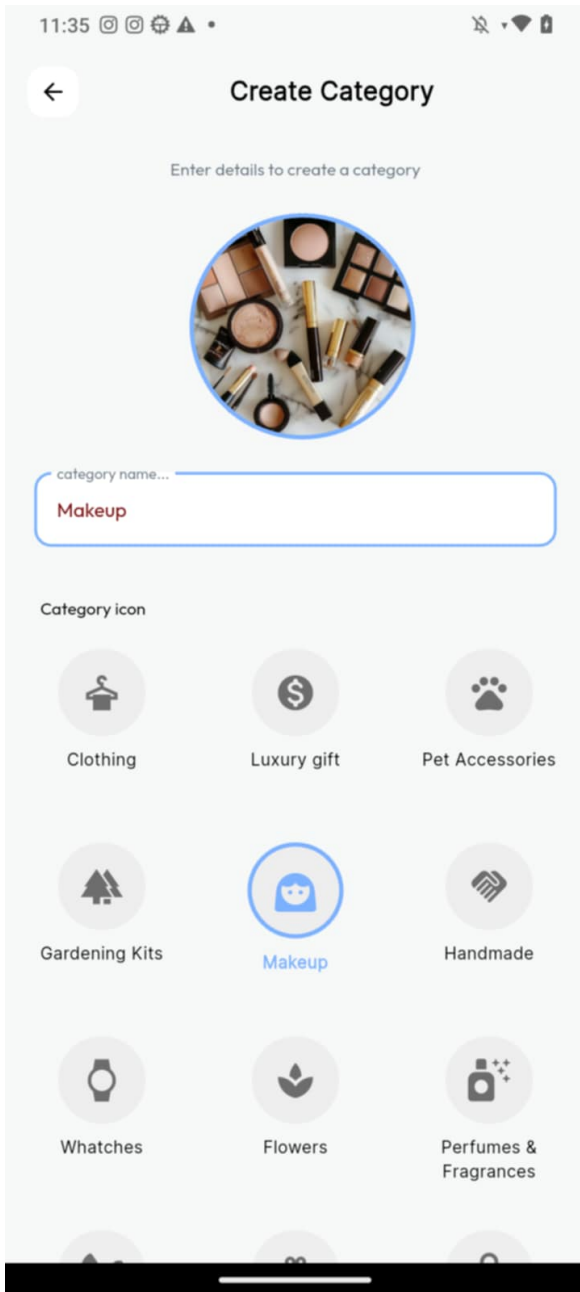


Figure 4.77: Creating Category - Choosing Category icon

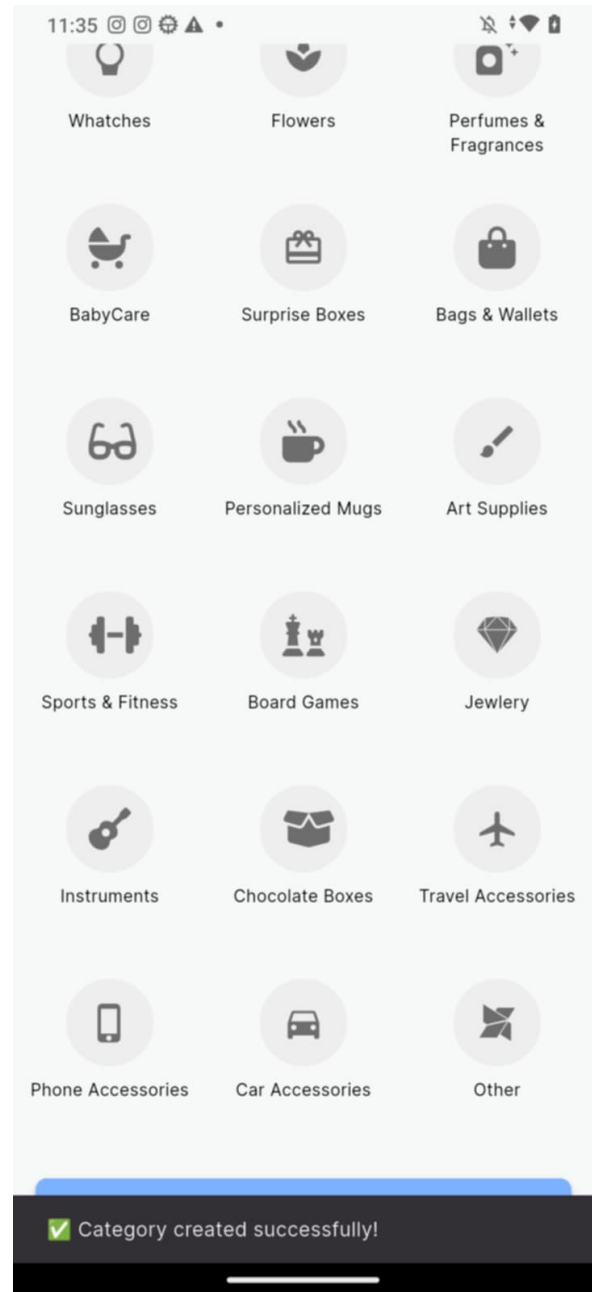


Figure 4.78: Creating Category – Confirmation Message

## 4.2.28 Owner Notifications Upon Login

When the owner logs into their account and lands on their homepage, a notification panel appears at the top of the screen. This panel displays important messages, including:

- **System alerts** — such as platform updates.
- **Admin messages** — including moderation warnings or announcements

This feature ensures that owners stay informed about important events or actions requiring their attention. For example, if the admin sends a warning related to a product policy violation, or if there are system updates affecting their store, these appear prominently at the top of the screen immediately after login. As illustrated above, the interface ensures that notifications are clearly distinguishable. This allows the owner to quickly identify and prioritize messages.

This streamlined notification system enhances communication between the platform and the owner, promoting smoother operations and quicker response times for necessary actions.

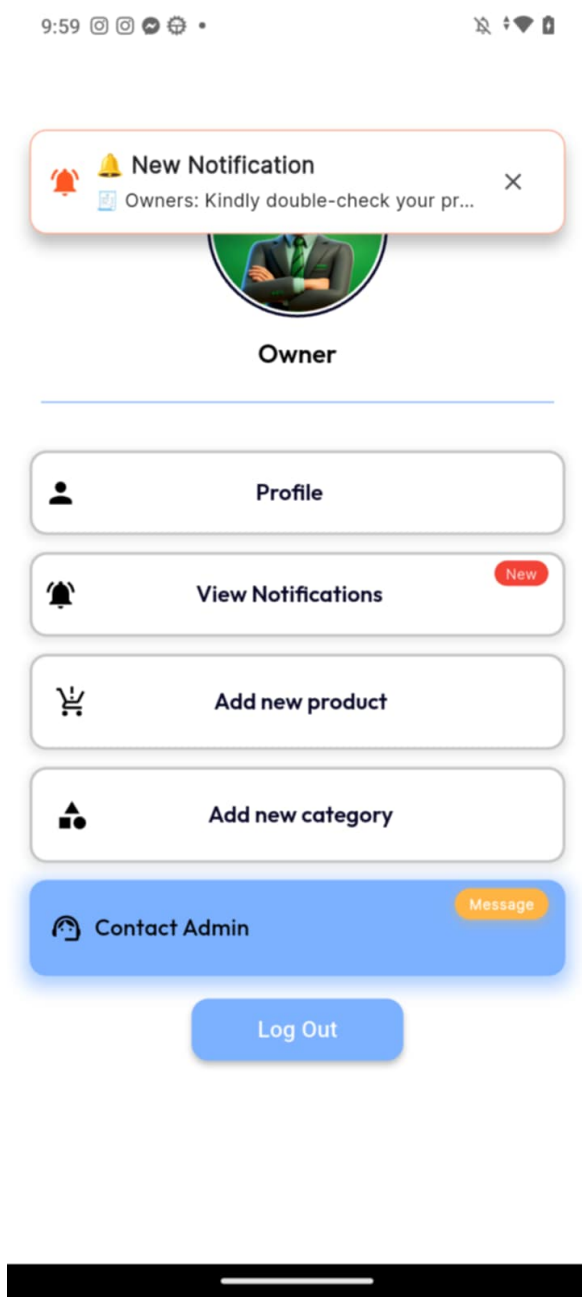


Figure 4.79: Owner Viewing Notifications After Logging In

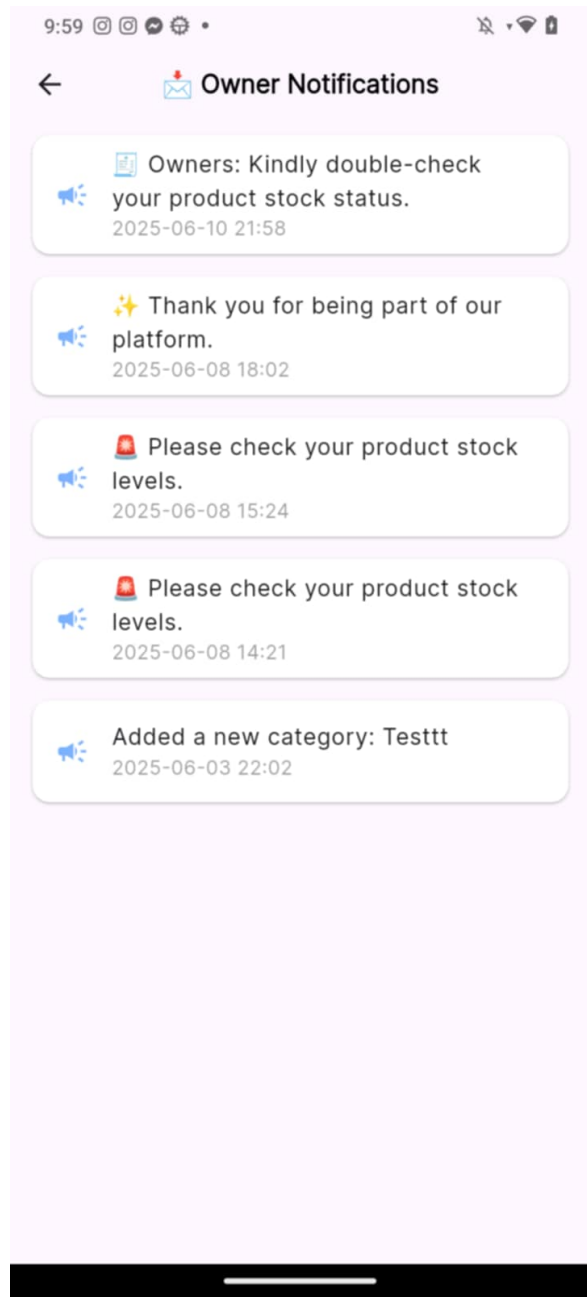


Figure 4.80: Owner Notification Panel – Warnings and Latest Updates

### 4.2.29 Owner messaging with Admin

In addition to system notifications, the platform provides a direct messaging feature that allows the owner to communicate with the admin in real-time. This feature enhances collaboration and ensures quick resolution of any issues or inquiries.

When a new message is received from the admin, the chat icon on the owner’s dashboard turns **blue** and a **brief notification message appears**, drawing the owner’s attention. This visual cue helps ensure that no important communication is overlooked.

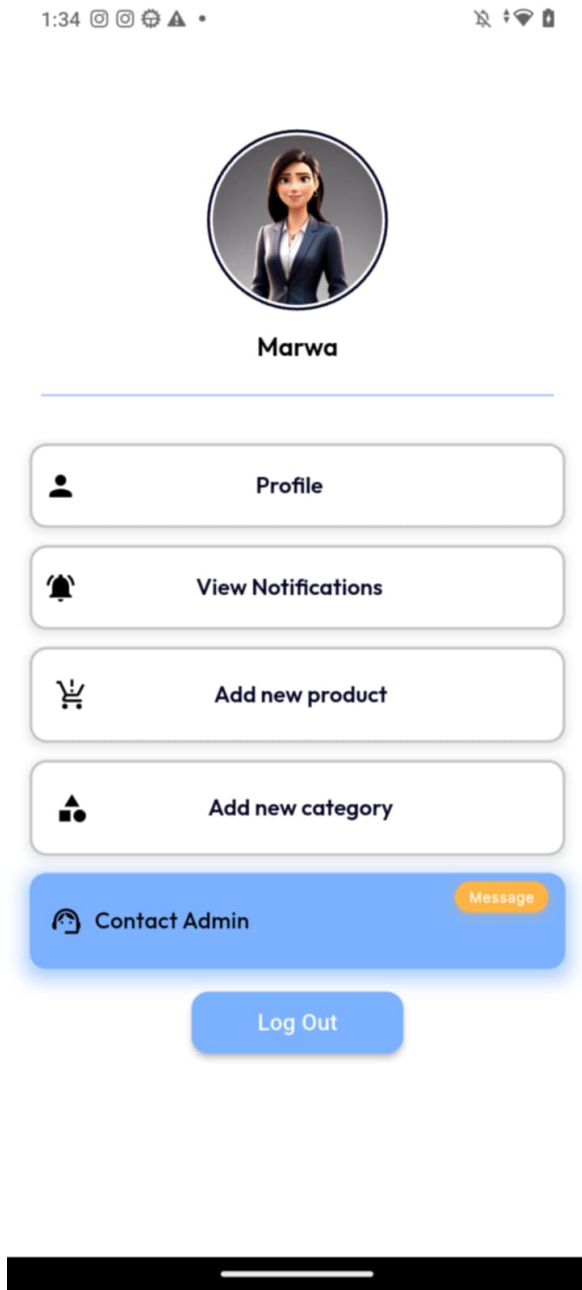


Figure 4.81: The owner is notified of a new message from the admin through a visual alert.

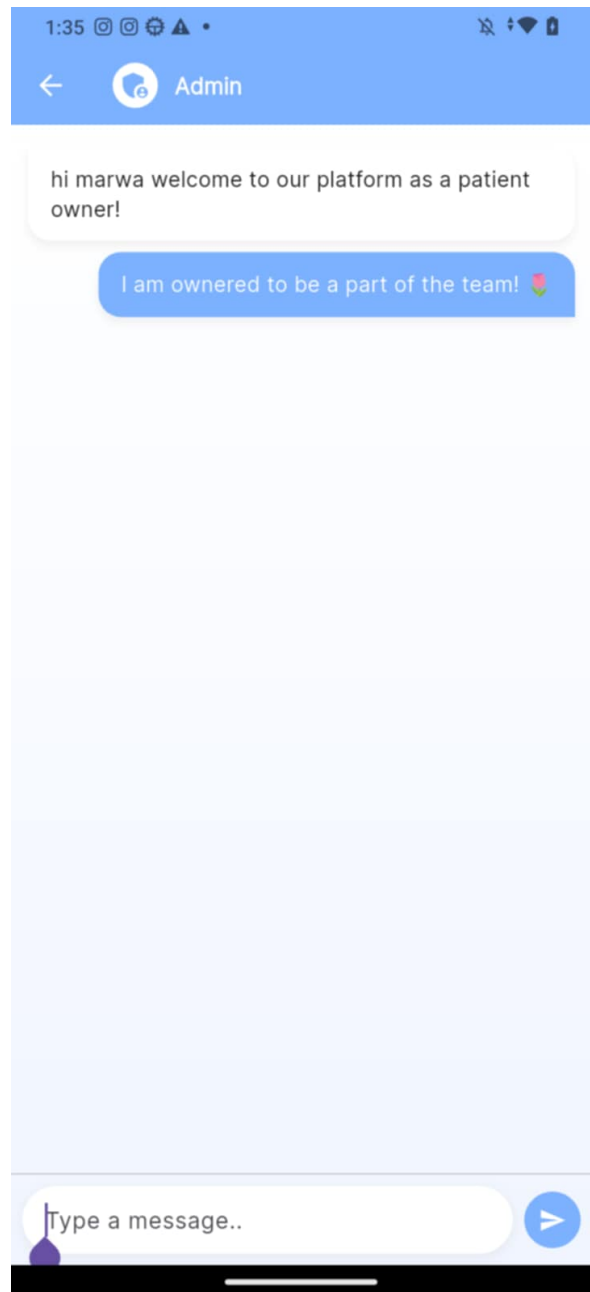


Figure 4.82: Direct Messaging Between Owner Marwa and Admin

### 4.2.30 Owner Logout

After completing their tasks, the owner has the option to securely log out of their account via the Dashboard page.

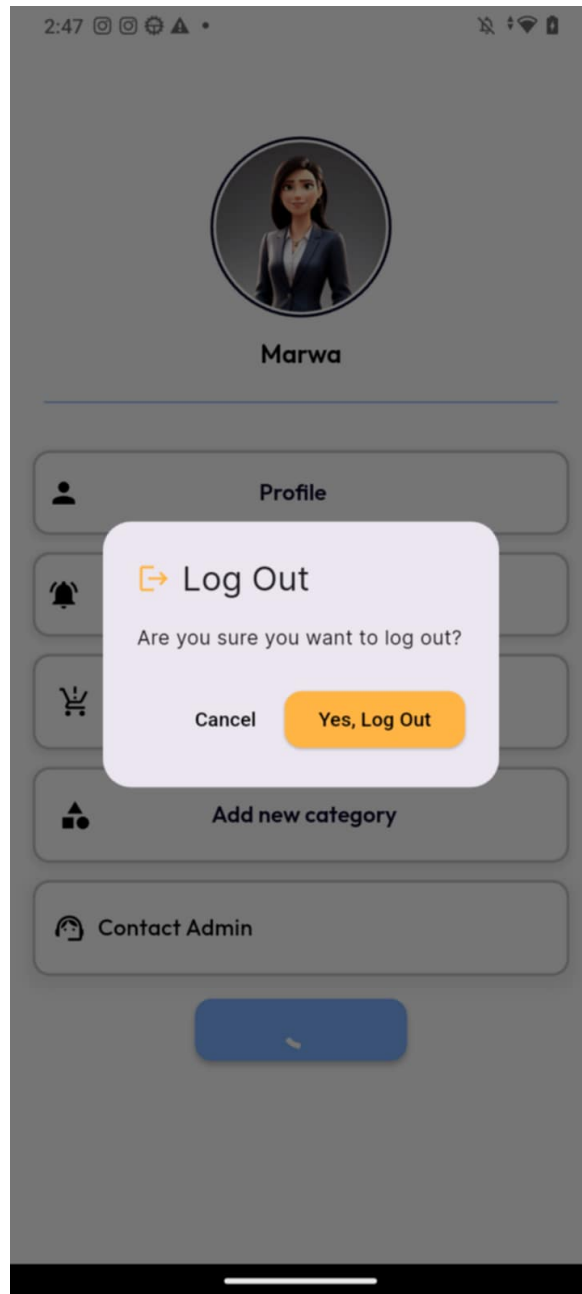


Figure 4.83: Owner log out

### 4.2.31 Admin Widget and System Overview

Now lets move on to the admin's functionalities. This is the Admin widget:

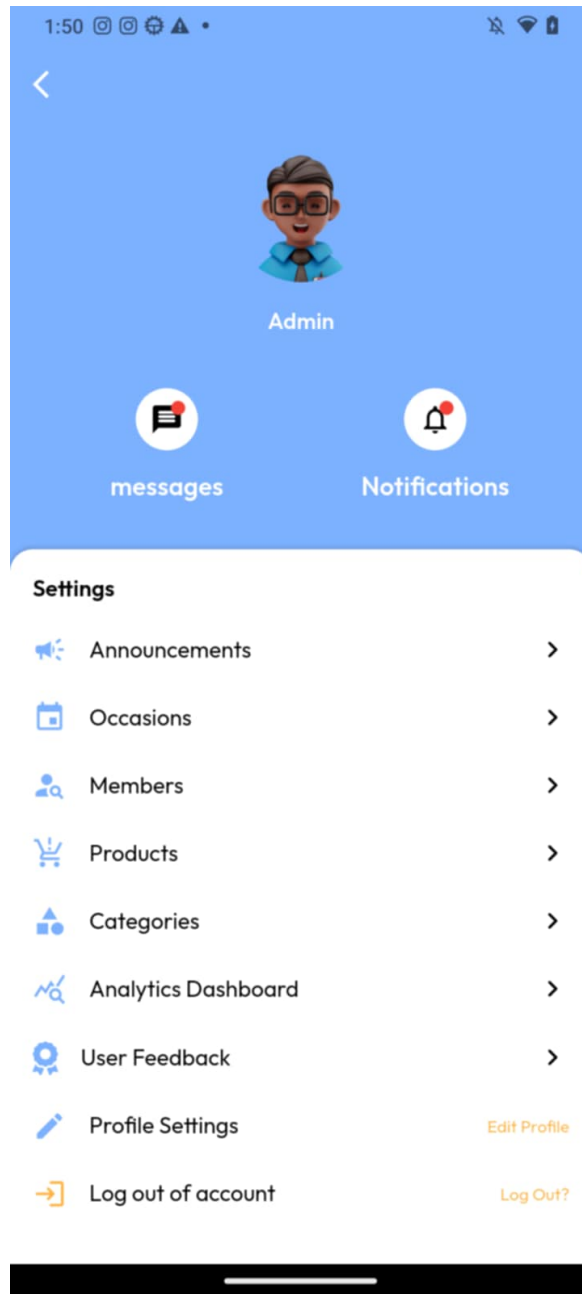


Figure 4.84: Admin Widget

### 4.2.32 Admin Notifications System

When the admin logs into the system, the platform immediately provides notifications related to system activities. This ensures that the admin is always up to date with the operations occurring within the app. The notification banner appears at the top of the screen, indicating any new or pending updates such as:

- New products or categories added by the owners.
- New orders placed by users.

- Any orders that are still in pending status.

The notification icon at the top continues to display a red dot whenever there are unseen or pending notifications, drawing the admin's attention immediately upon logging in.

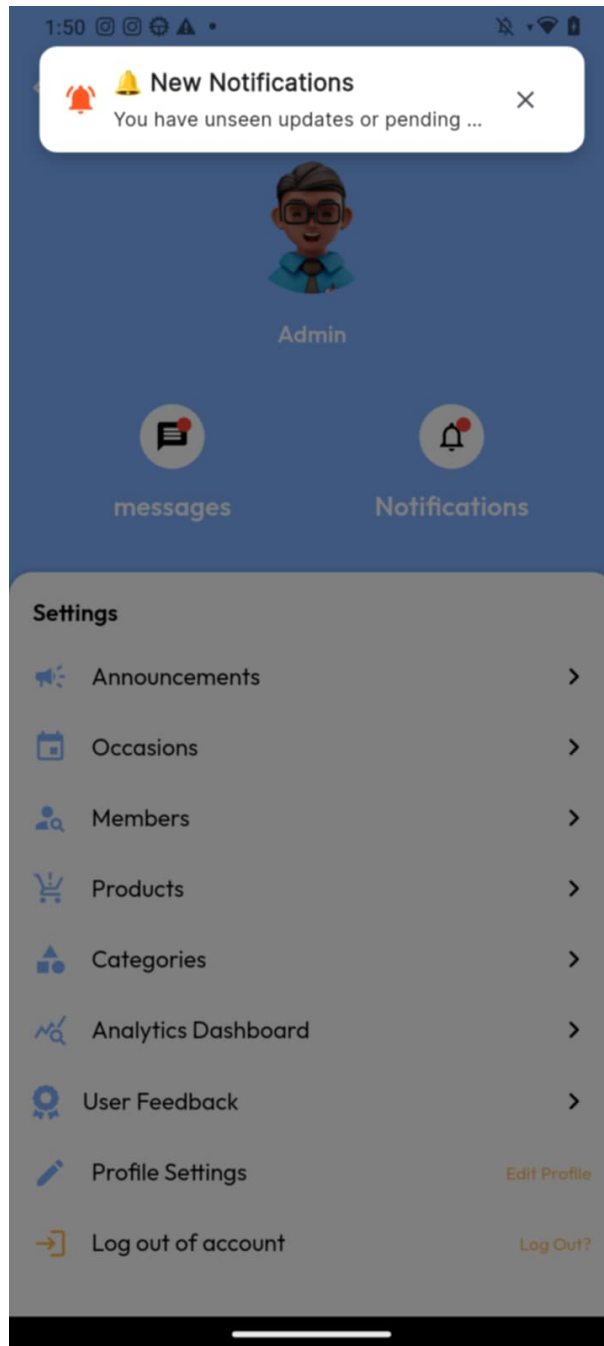


Figure 4.85: Admin main dashboard showing new notifications banner.

### 4.2.33 Notifications Details Page

By clicking on the notification icon, the admin can view a detailed list of all system-triggered events (see Figure 4.86). These include:

- Notifications of new product or category additions.
- A complete list of all pending orders, clearly labeled with the user's name, order ID, and timestamp.
- Each order notification includes a "Mark as Delivered" button that allows the admin to update the delivery status directly from the notifications screen.
- The timestamp of each activity is displayed for transparent tracking and history reference.

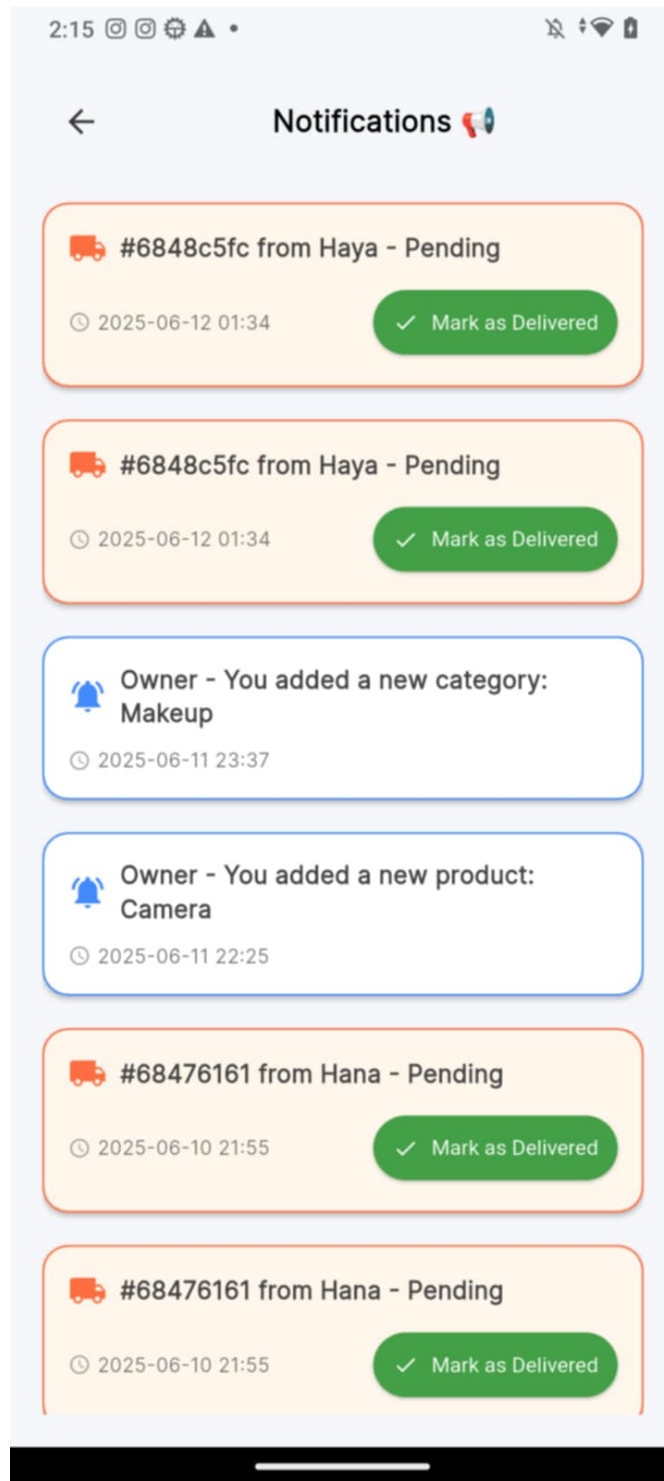


Figure 4.86: Admin Notification Panel with Pending Orders and System Updates

#### 4.2.34 Viewing Order Details:

Before marking any order as delivered, the admin can tap on a pending order notification to open a full Order Details View (see Figures 4.87 and 4.88). This expanded view includes:

- All products included in the order, with their images, names, quantities, and prices.
- Gift Box customization details, which is the selected 3D giftbox shape, box color, lid color, and ribbon color in hexadecimal codes.
- Gift Card information, including sender, recipient, and the message written.
- Delivery section, which contains the payment method, total amount, shipping address (if provided), and the current status (e.g., "pending").
- This detailed breakdown ensures that the admin can verify the content, price, and customization before confirming delivery.

After reviewing the full order details, the admin can confidently mark the order as delivered—either directly from the order details page or from the notifications panel. Once marked, the order status updates to "Delivered" and the interface visually reflects this change in notifications page (e.g., the order card turns grey). At this stage, the package proceeds to the delivery phase and is handed over to the user.

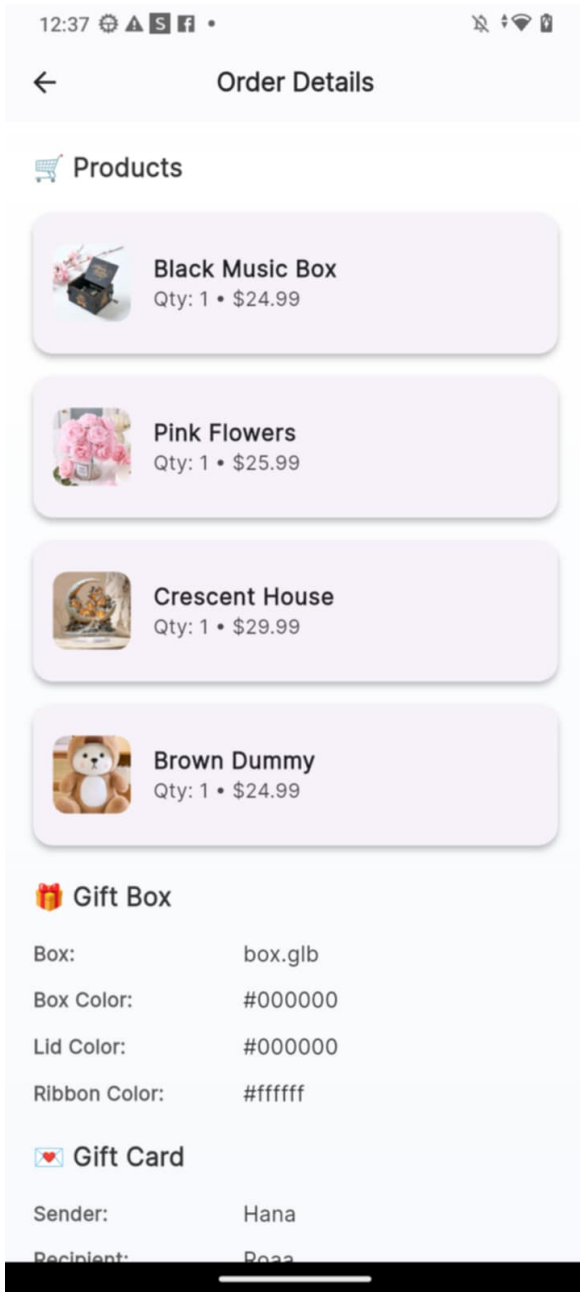


Figure 4.87: Expanded list of all purchased items in the order

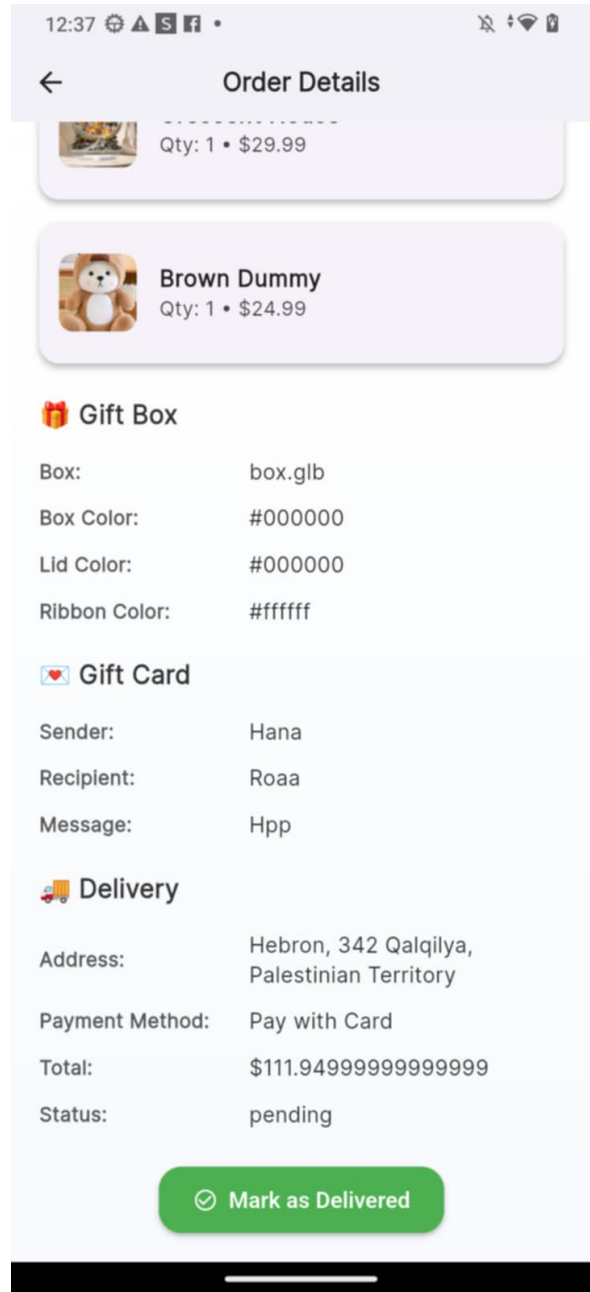


Figure 4.88: Detailed view of products, gift box, and gift card in the order

After the admin clicks the "Mark as Delivered" button, the status of the order is automatically updated in the database from "pending" to "delivered". This change is visually reflected in the notification panel, where the corresponding order card turns grey, indicating that the order has been successfully delivered.

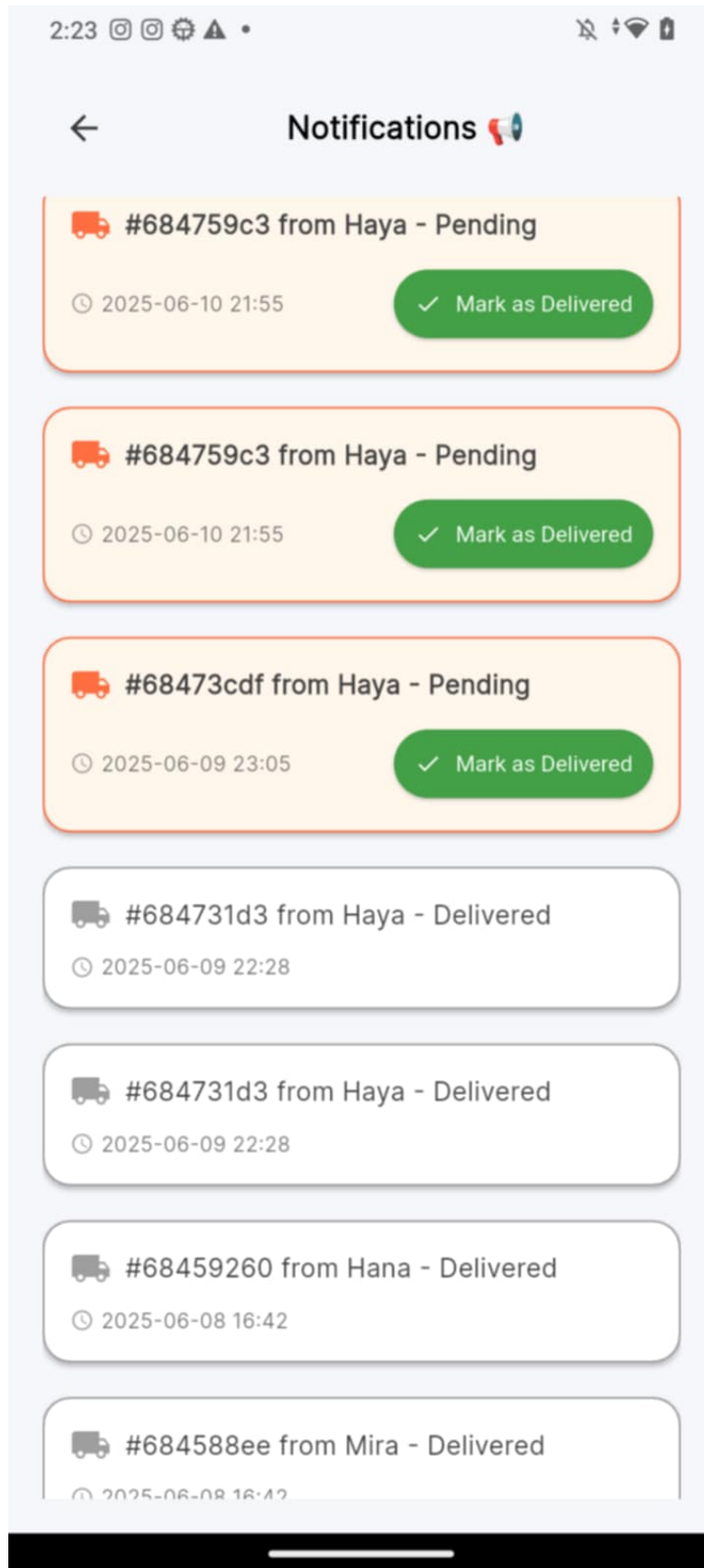


Figure 4.89: Admin Notification Panel after making the order in delivery status

### 4.2.35 Admin Messaging with Owners

In addition to handling orders and system updates, the admin has a dedicated messaging system allowing him to communicate directly with each owner individually. This feature ensures seamless coordination and fast resolution of any operational issues or inquiries.

#### Key Features

- The admin can see a list of all owners (Figure 4.90), with their names and emails displayed.
- If there are unread messages from any owner, a red badge appears next to their name indicating the number of unread messages.
- The admin can initiate new conversations or reply to existing ones.
- Every time a new message is received from an owner, the **messages icon** in the admin dashboard displays a red dot notification, ensuring no communication is missed.

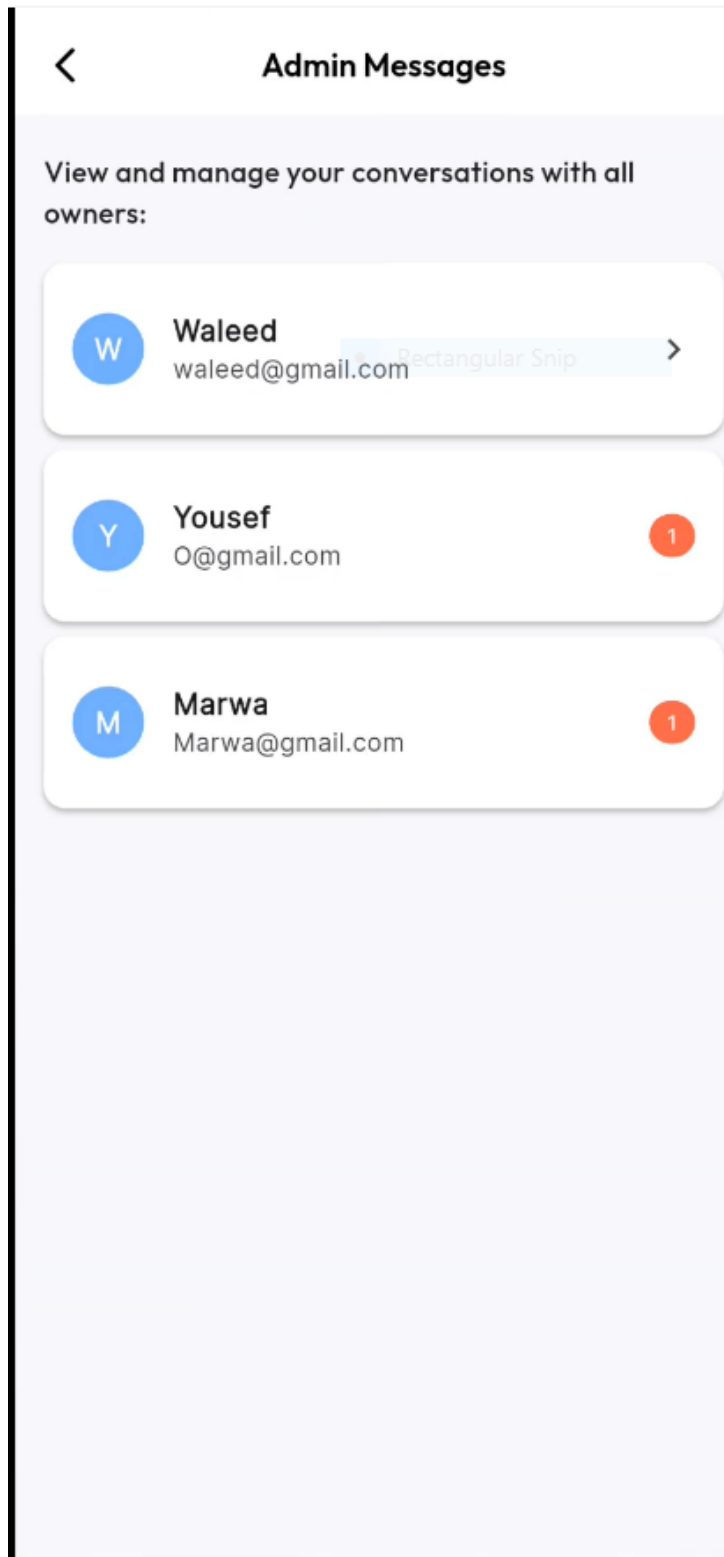


Figure 4.90: Admin Messaging Dashboard with Multiple Owners and Message Notifications

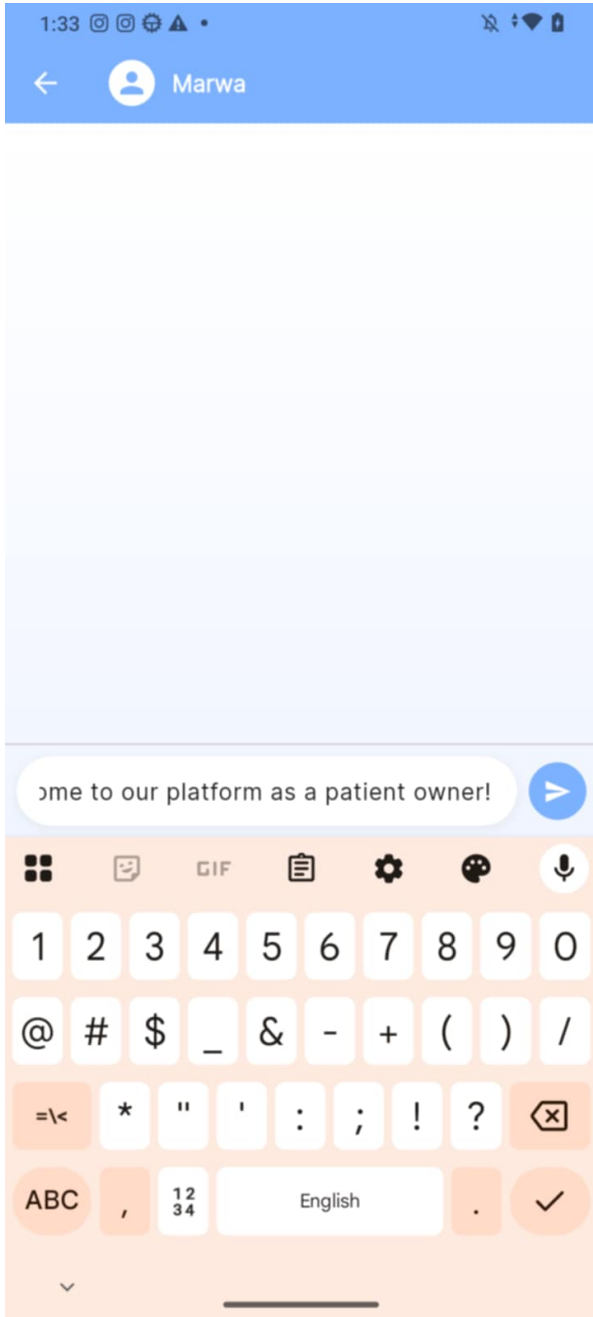


Figure 4.91: Admin typing a message to one of the owners called Marwa

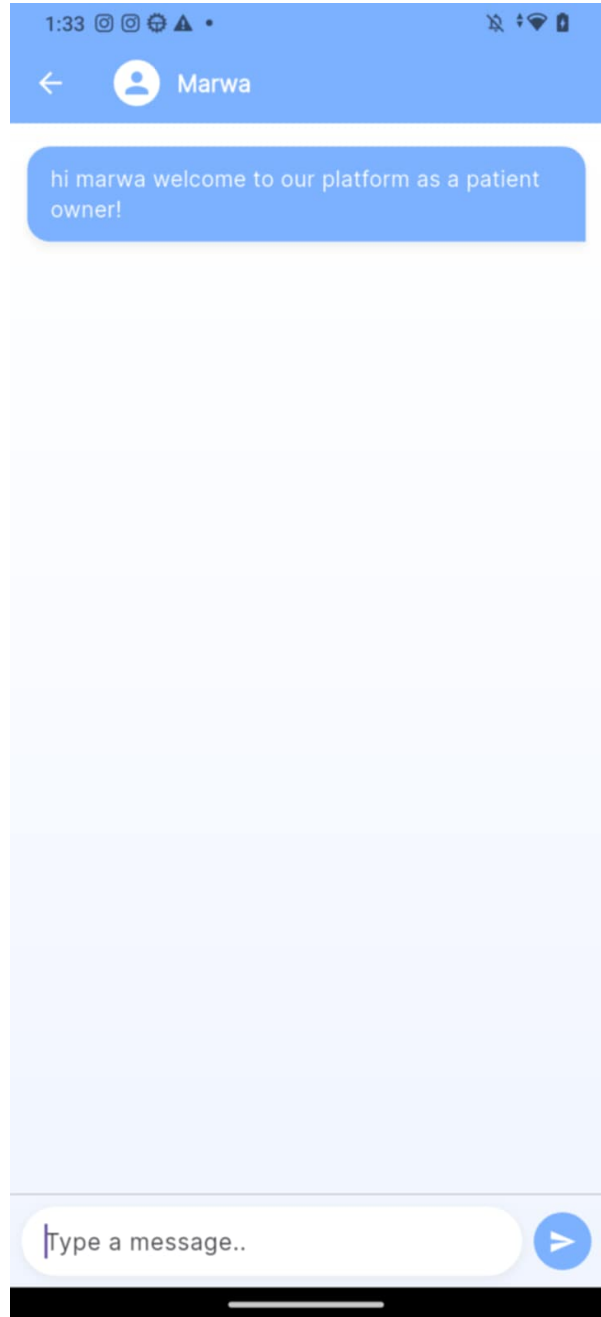


Figure 4.92: Admin sending a message to owner Marwa

### 4.2.36 Occasions and Holidays Page

The application provides a dedicated page where the admin can view all upcoming holidays and occasions relevant to the system users. This data is automatically fetched from an external API <https://calendarific.com/>, with Jordan selected as the target country. Since Palestine is not officially listed in the API, Jordan is used as a geographically close alternative to provide similar holiday data.

The admin can select any year within the range of 2025 to 2035, and also choose a specific month to filter and display the corresponding holidays and occasions. Each holiday is displayed along with its date and type (e.g., National holiday, Observance, Season), offering the admin a clear view of upcoming events that might affect sales, customer behavior, or require special preparations.

This page is designed to help the admin stay informed about national occasions and plan for them accordingly (see Figure 4.93).

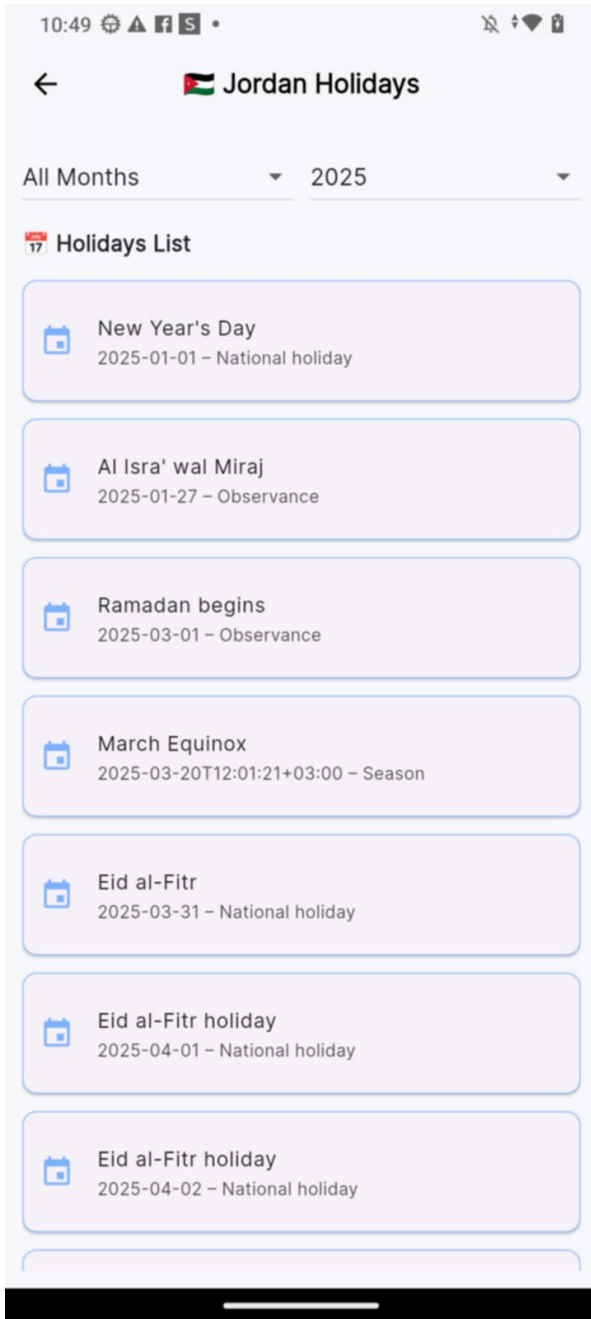


Figure 4.93: Occasions and Holidays Page

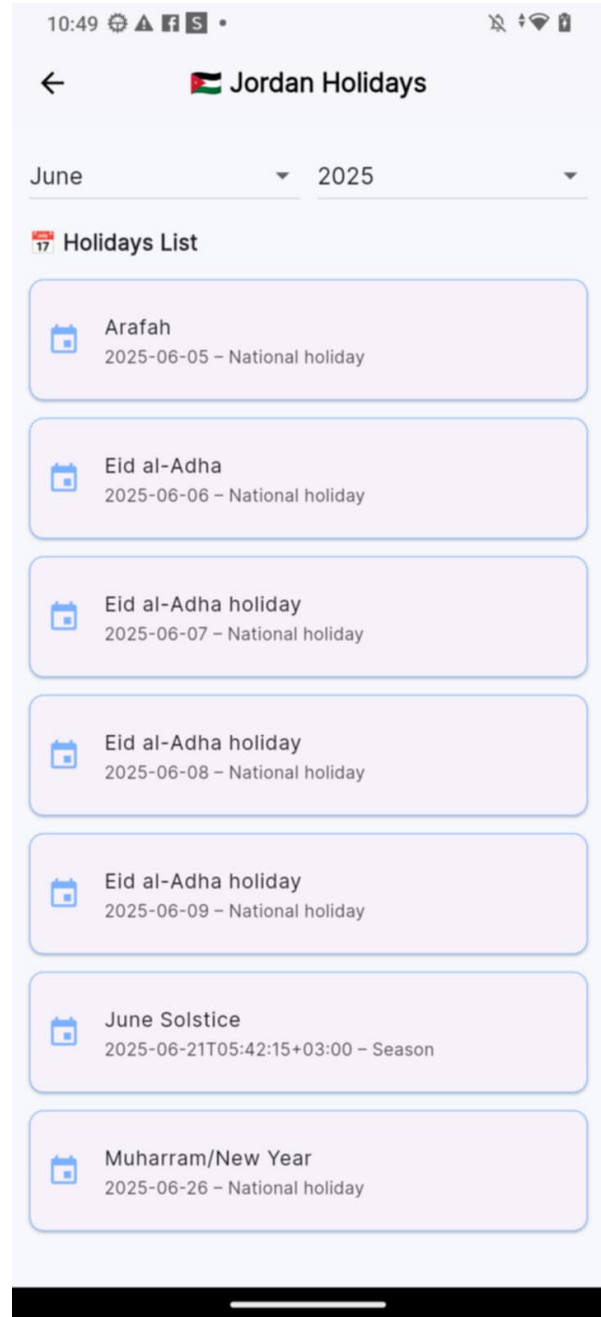


Figure 4.94: Occasions and Holidays Page - Displaying June's (2025) Holidays

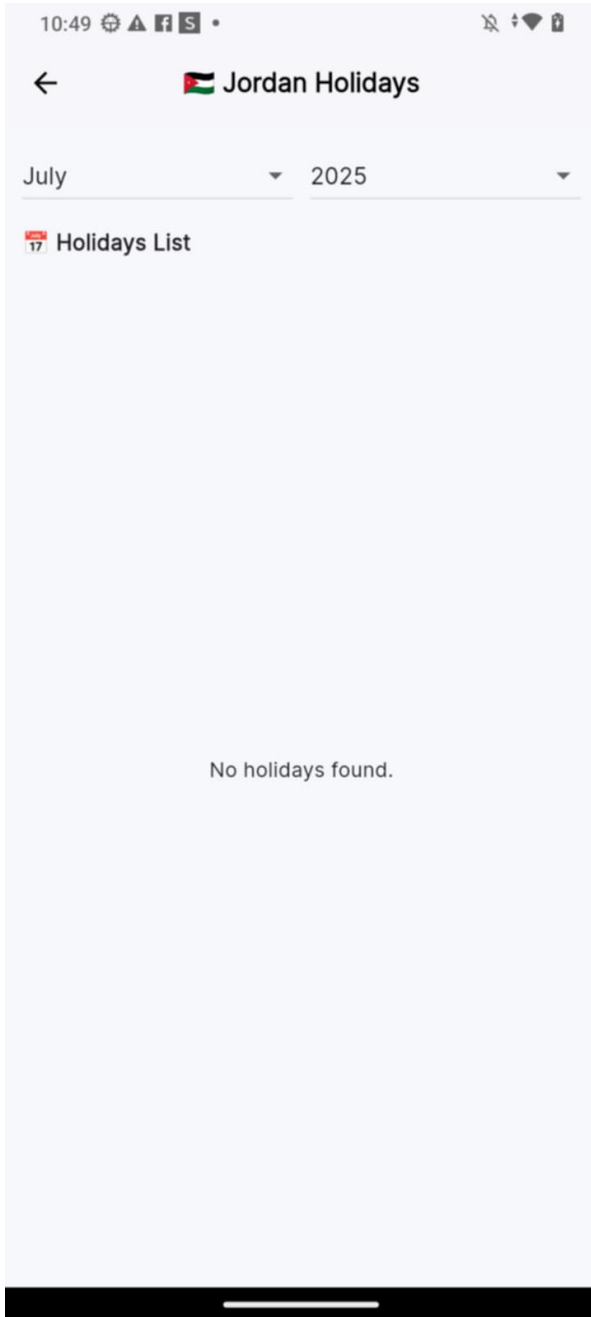


Figure 4.95: Displaying July's (2025) with No Holidays

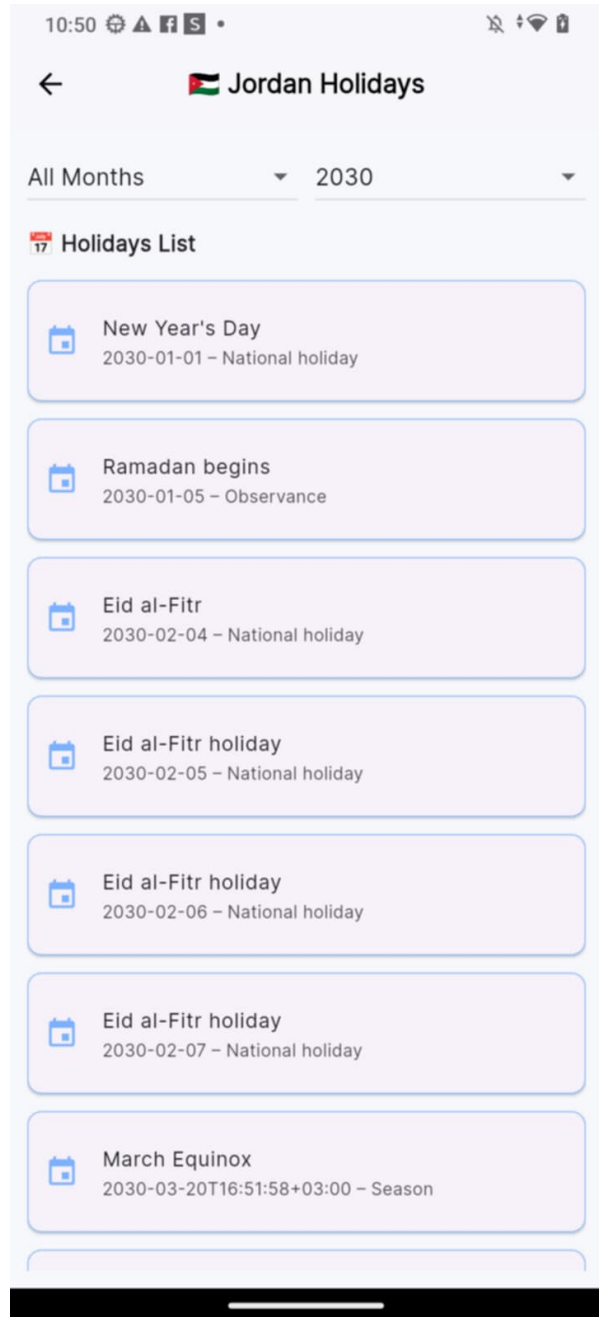


Figure 4.96: Displaying 2030 Holidays

## 4.2.37 Admin Announcements System

The admin has the ability to send announcements and notifications directly to the app users. This feature allows the admin to send messages either to all customers, to all owners, or to specific owners selected from a list. This ensures targeted communication depending on the admin's needs.

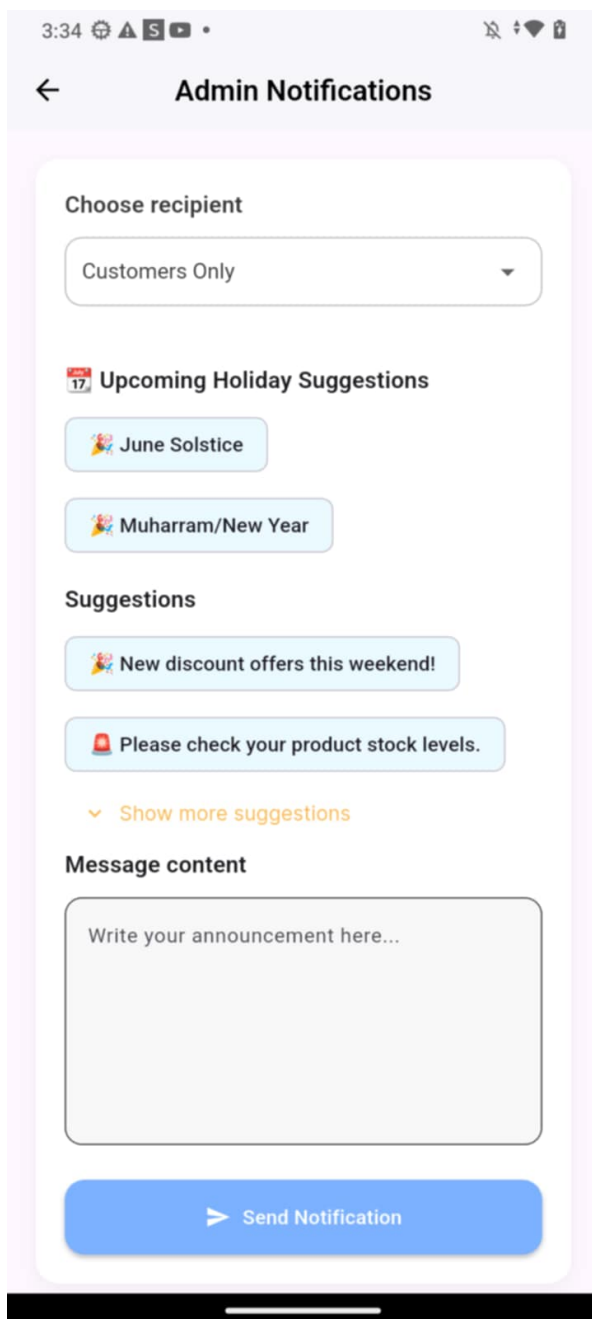


Figure 4.97: Admin announcement page

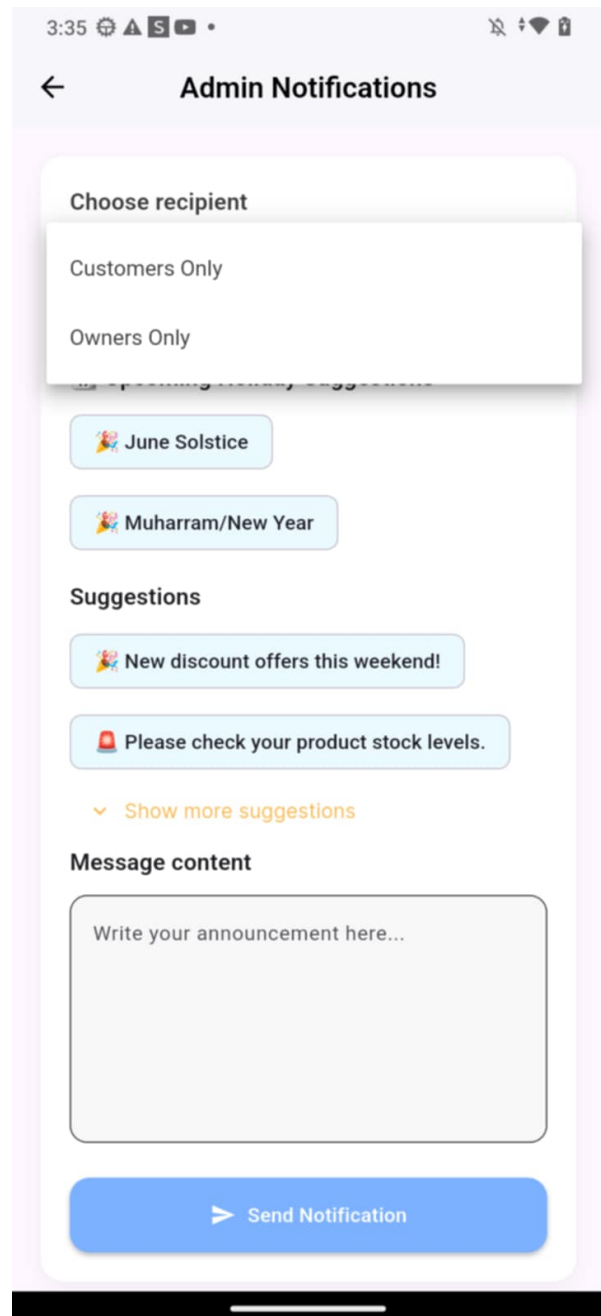


Figure 4.98: Admin announcement page selecting the recipient group

The admin can either manually write the announcement content or benefit from the system's provided suggestions to help create relevant notifications depending on the occasion

or current events. These suggestions are categorized into two sections:

- **Upcoming Holiday Suggestions:** The application includes a dedicated occasions page, as described in the previous section. **From this data, the system filters and displays only the occasions occurring within the next 14 days directly on the announcement creation page.** This allows admins to stay informed about relevant upcoming holidays and send timely notifications—for example, to owners (e.g., reminding them to restock products for upcoming holidays) or to customers (e.g., sending festive greetings).
- **Additional Suggestions:** General notification templates are also provided, such as discount offers or stock level reminders. These are optional tools to assist the admin while composing announcements.

When the admin clicks on a specific Holiday suggestion (e.g., “Muharram/New Year”), the system automatically generates a message based on the selected recipient type. If the recipient is set to “Customers,” the message includes a holiday greeting (e.g., “Wishing you a joyful Muharram/New Year. . .”). On the other hand, if the recipient is “Owners,” the message is customized to prompt action (e.g., “June Solstice is approaching on 2025-06-21-make sure your products are up”). This dynamic behavior ensures that announcements are appropriately tailored based on the target audience and the context of the occasion

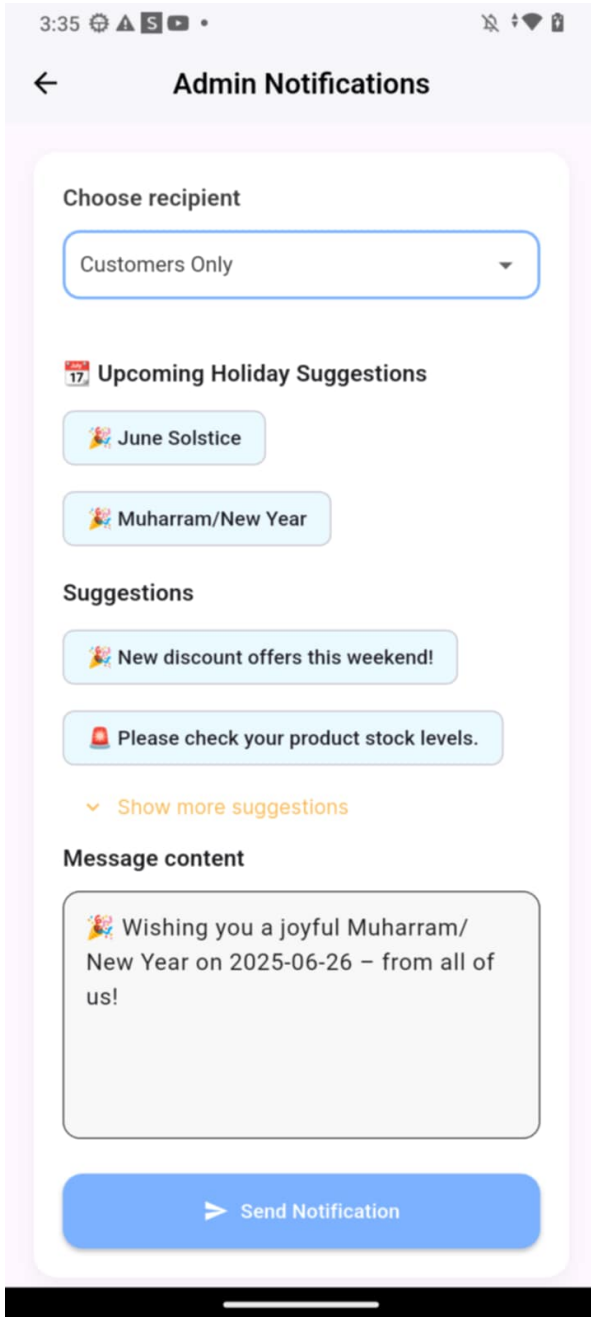


Figure 4.99: Admin Holiday suggestion Message content for customers

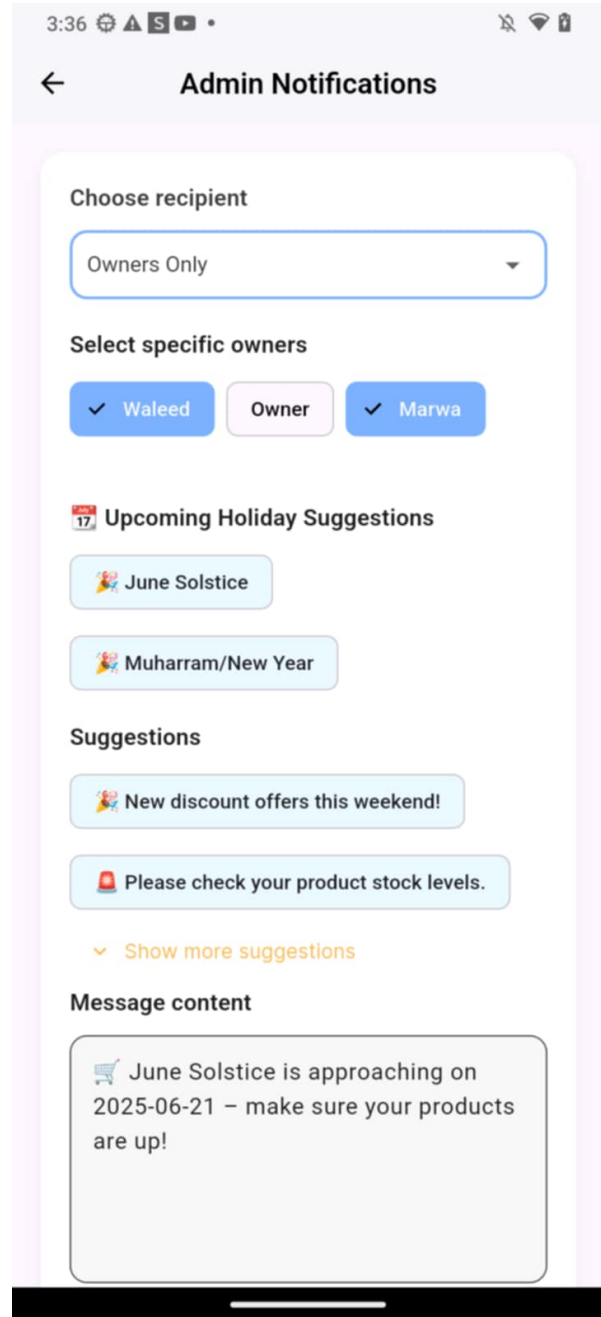


Figure 4.100: Admin Holiday suggestion Message content for selected owners

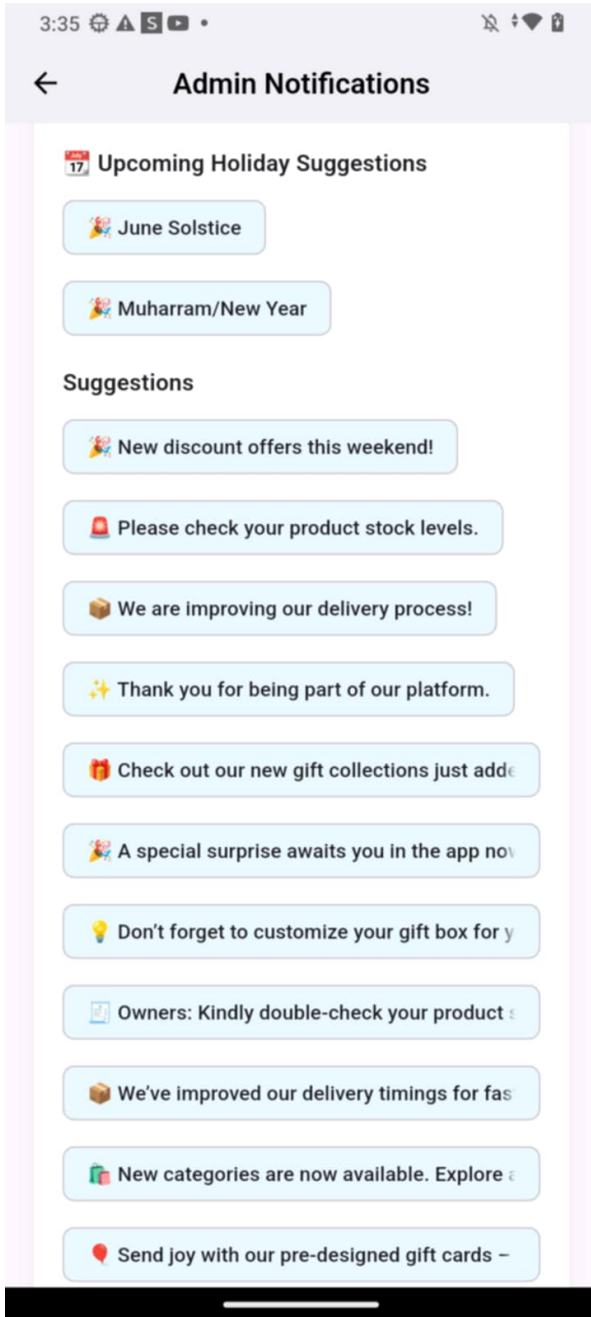


Figure 4.101: Additional suggestions to help the Admin

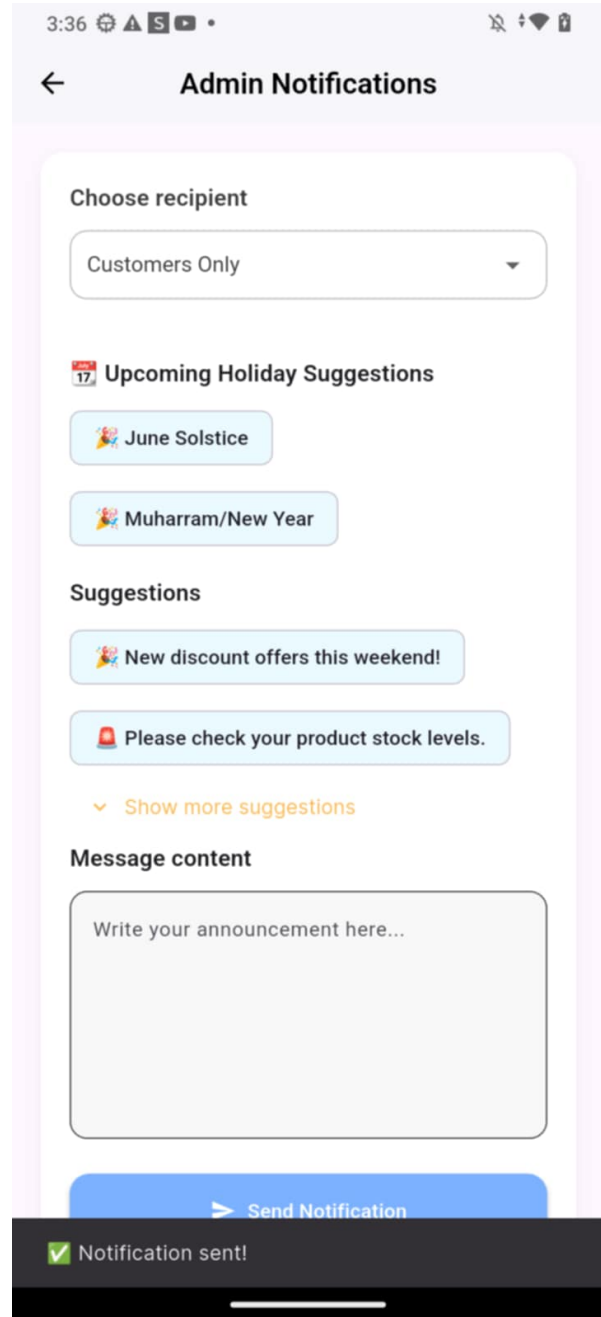


Figure 4.102: Admin sending announcement and the confirmation message

### 4.2.38 Members Management Interface

In addition to managing announcements and holidays handling, the admin has full access to view and manage all registered users in the system, including both **owners** and **customers**. This is facilitated through a user-friendly interface that offers search and filtering capabilities to streamline administrative tasks.

As shown in Figure 4.103, the admin can view a list of all members, along with their names, emails, and the role is visually represented through the avatar's background color—helping differentiate between roles at a glance. The interface includes a segmented control that allows the admin to filter the displayed members by group:

- **All:** Shows both owners and customers.
- **Owners:** Filters the list to show only users with owner privileges.
- **Users:** Displays only standard app customers.

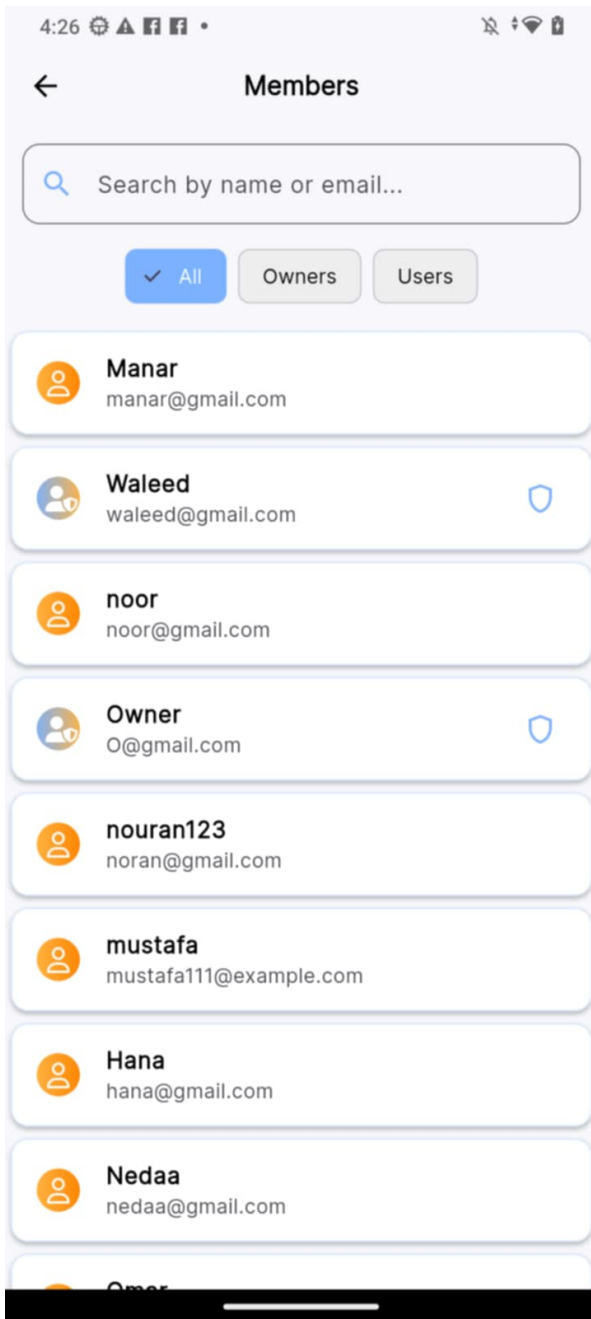


Figure 4.103: Admin view of all members with filter options

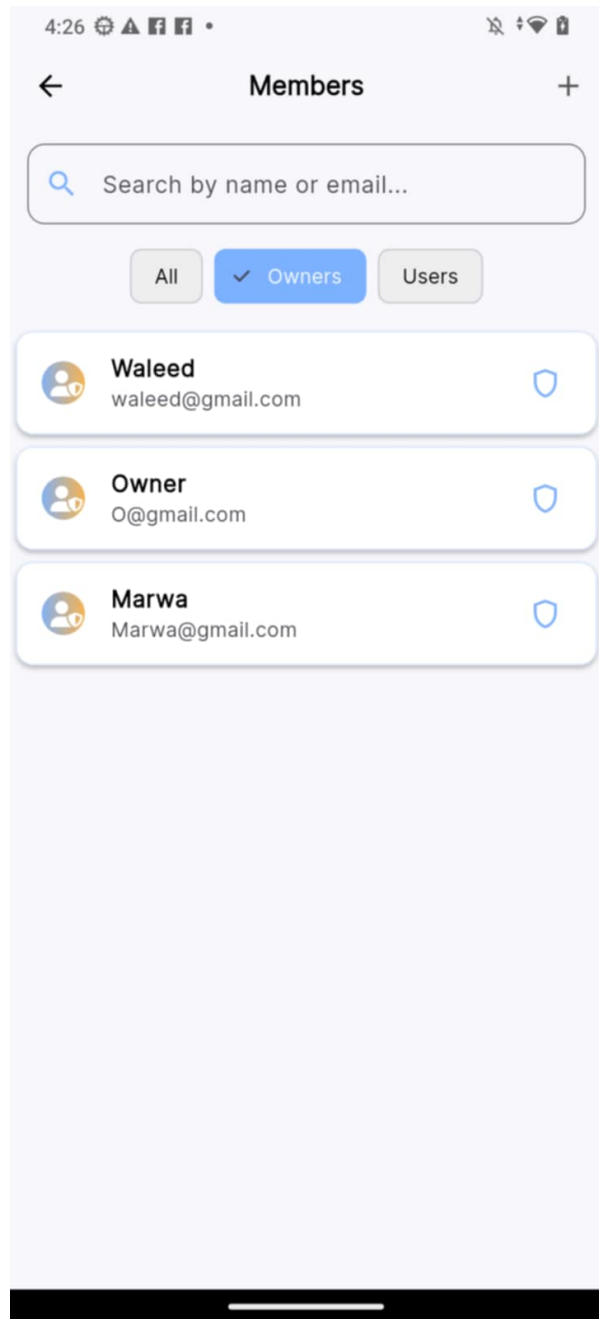


Figure 4.104: Filtered view showing only owners with add icon

When the **Owners** tab is selected, the admin sees a curated list of registered owners (see Figure 4.104), each marked with a distinctive shield icon for clarity. In this view, a + icon is available in the upper-right corner, allowing the admin to add new owners directly. This design ensures that only the admin has authority to register new owners into the system, providing a layer of control and verification.

When the admin wants to add a new owner, pressing the + icon opens the **Owner Creation** page, as illustrated in Figure 4.105. On this page, the admin fills in the owner's personal and account information, including:

- **Name**
- **Email address**
- **ID number**
- **Age**
- **Phone number**
- **Gender** (selectable via button controls)
- **Date of birth**
- **Owner description** (optional field to add further information about the owner)
- **Password and password confirmation** for account security

After completing all required fields, the admin finalizes the process by clicking the **Add Owner** button at the bottom of the form. This process ensures that only verified owners are added into the system by authorized personnel.

4:27 [status icons]

## Owner Creation

Please fill out the form below to continue.

name

email

Id number

Age

Phone number

Gender

Female Male

Date of birth

Please describe the owner...

password

Add Owner

Figure 4.105: Owner creation page (initial view 1 / 2)

4:27 [status icons]

## Owner Creation

email

Id number

Age

Phone number

Gender

Female Male

Date of birth

Please describe the owner...

password...

confirm password...

Add Owner

Figure 4.106: Owner creation page (initial view 2 / 2)

4:48 [status icons]

### Owner Creation

Please fill out the form below to continue.

name  
**Issa**

email  
**Issa@gmail.com**

Id number  
**407678901**

Age  
**24**

Phone number  
**0599853654**

Gender  
 Female  Male

Date of birth  
**06/06/2001**

Please describe the owner...  
**New Owner**

password

**Add Owner**

4:49 [status icons]

### Owner Creation

**Issa@gmail.com**

Id number  
**407678901**

Age  
**24**

Phone number  
**0599853654**

Gender  
 Female  Male

Date of birth  
**06/06/2001**

Please describe the owner...  
**New Owner**

password...  
**12345**

confirm password...  
**12345**

**Add Owner**

Figure 4.107: Owner creation page (after admin starts filling the form)

Figure 4.108: Owner creation page (after admin filled the full form)

A **search bar** is also available, allowing the admin to search by name or email across all users or within a selected group.

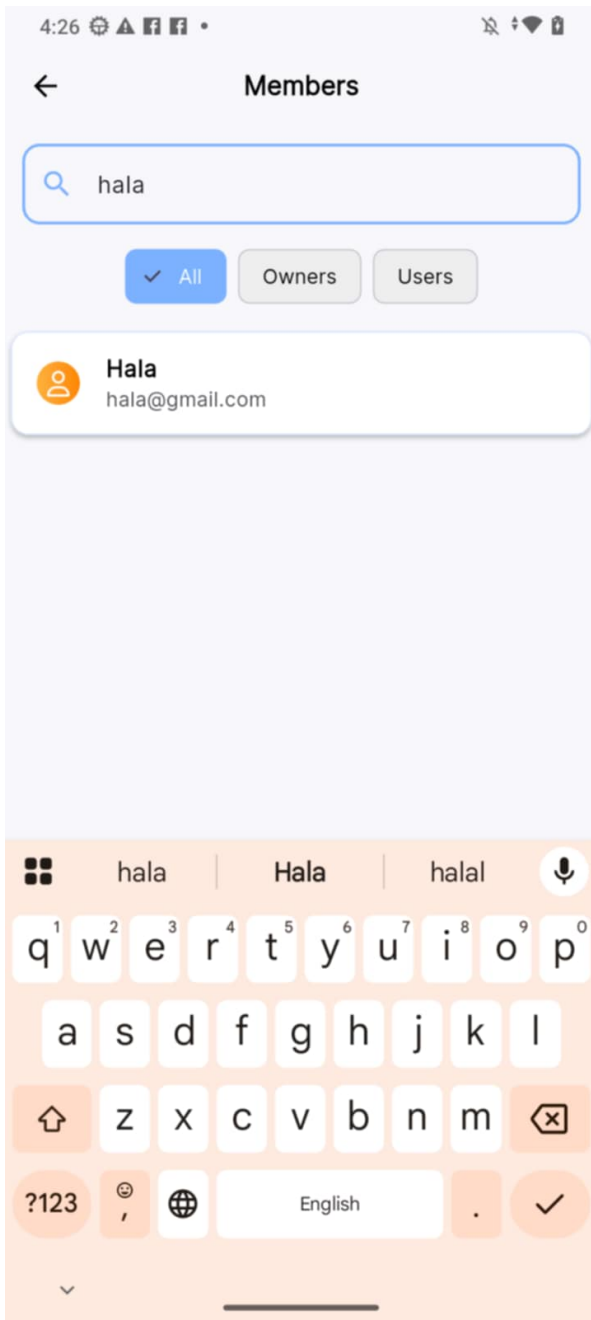


Figure 4.109: Admin searches by name in all Users

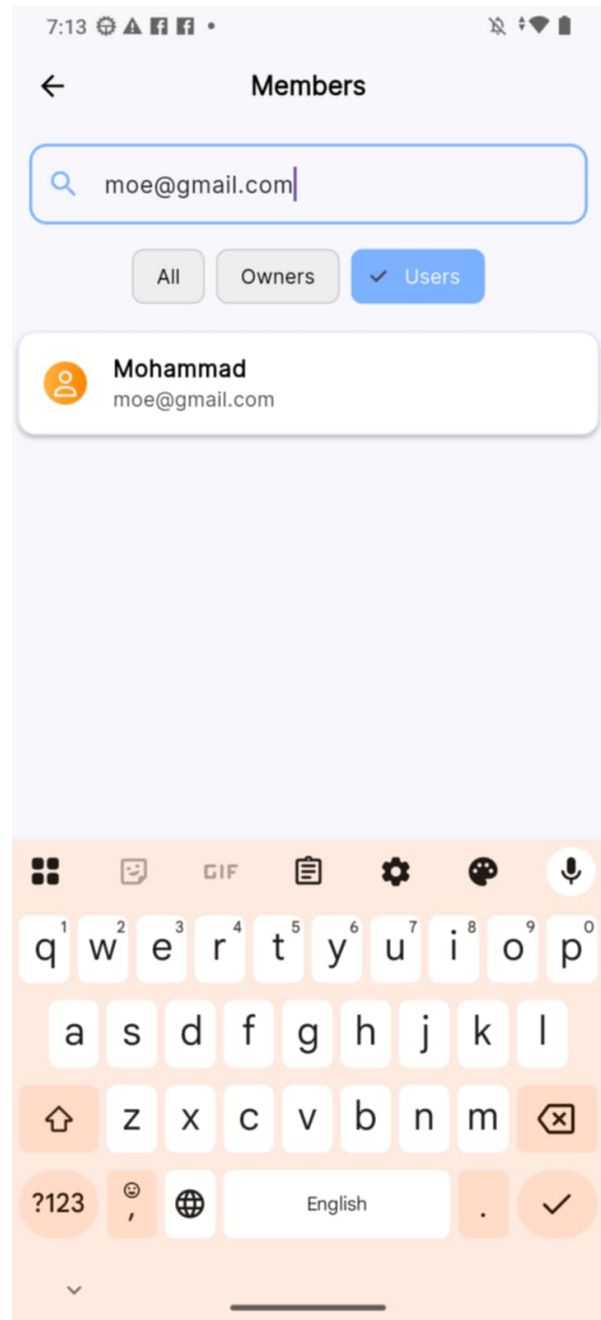


Figure 4.110: Admin searches by email in Customers

Furthermore, the admin possesses full authority to remove any user or owner from the system. This action is initiated by performing a long press on the specific user account intended for deletion, thereby providing comprehensive control over account management.

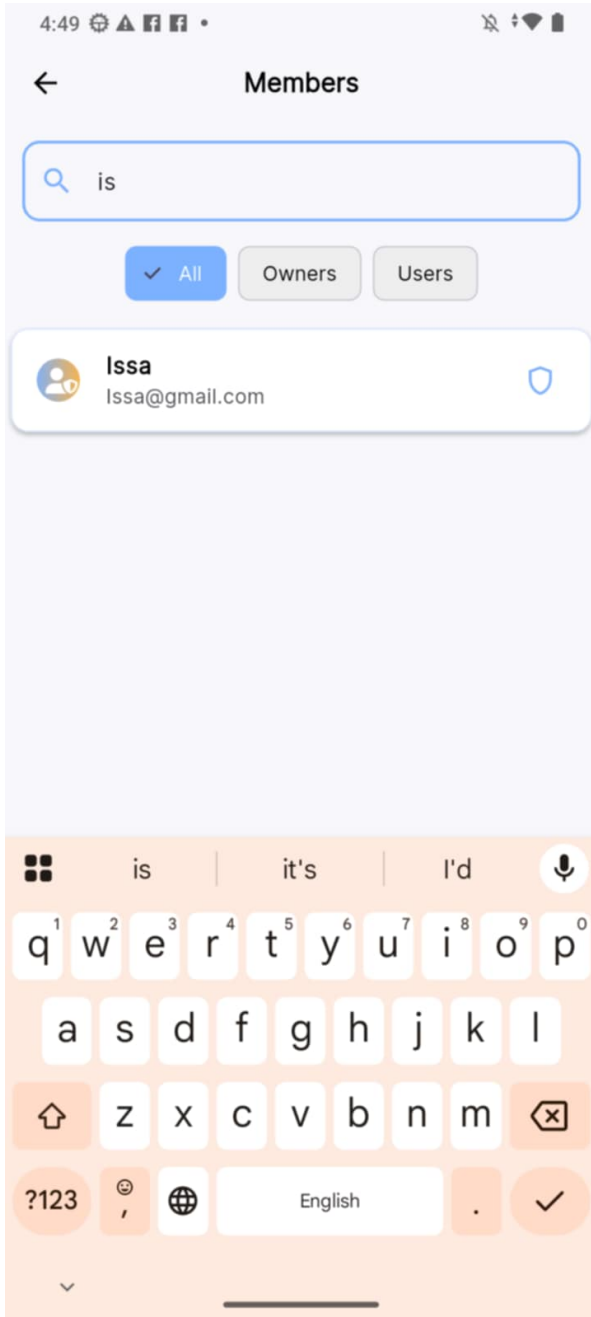


Figure 4.111: Admin searching for the owner recently added

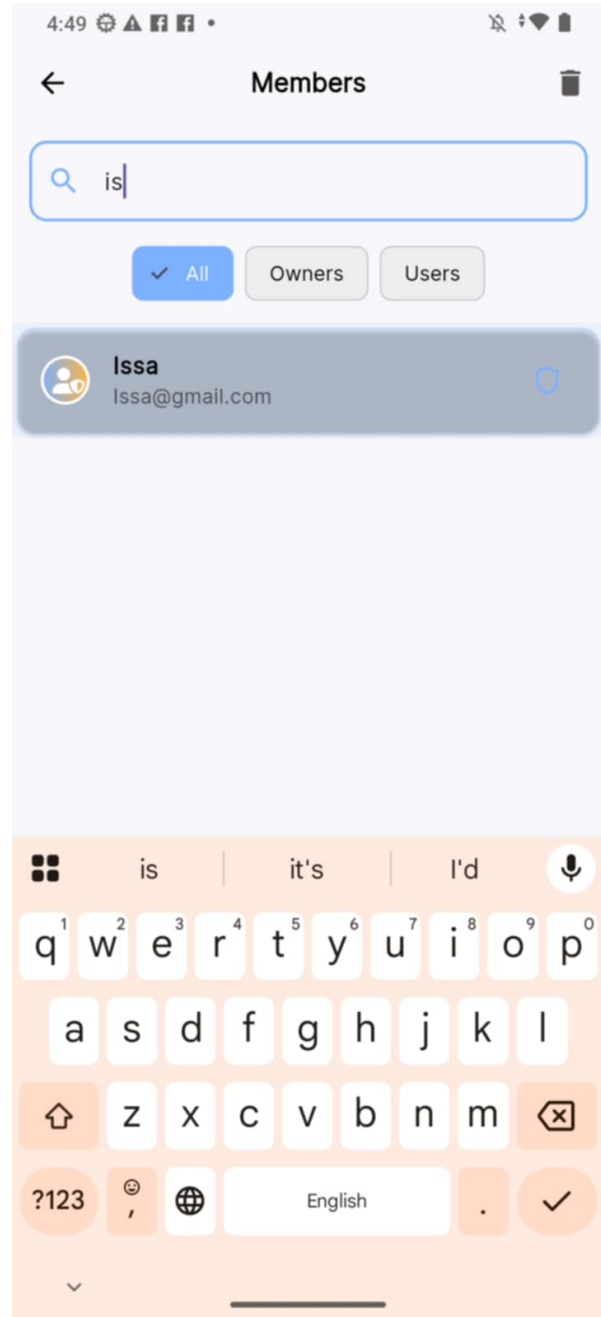


Figure 4.112: Admin initiating the deletion process by long-pressing the owner

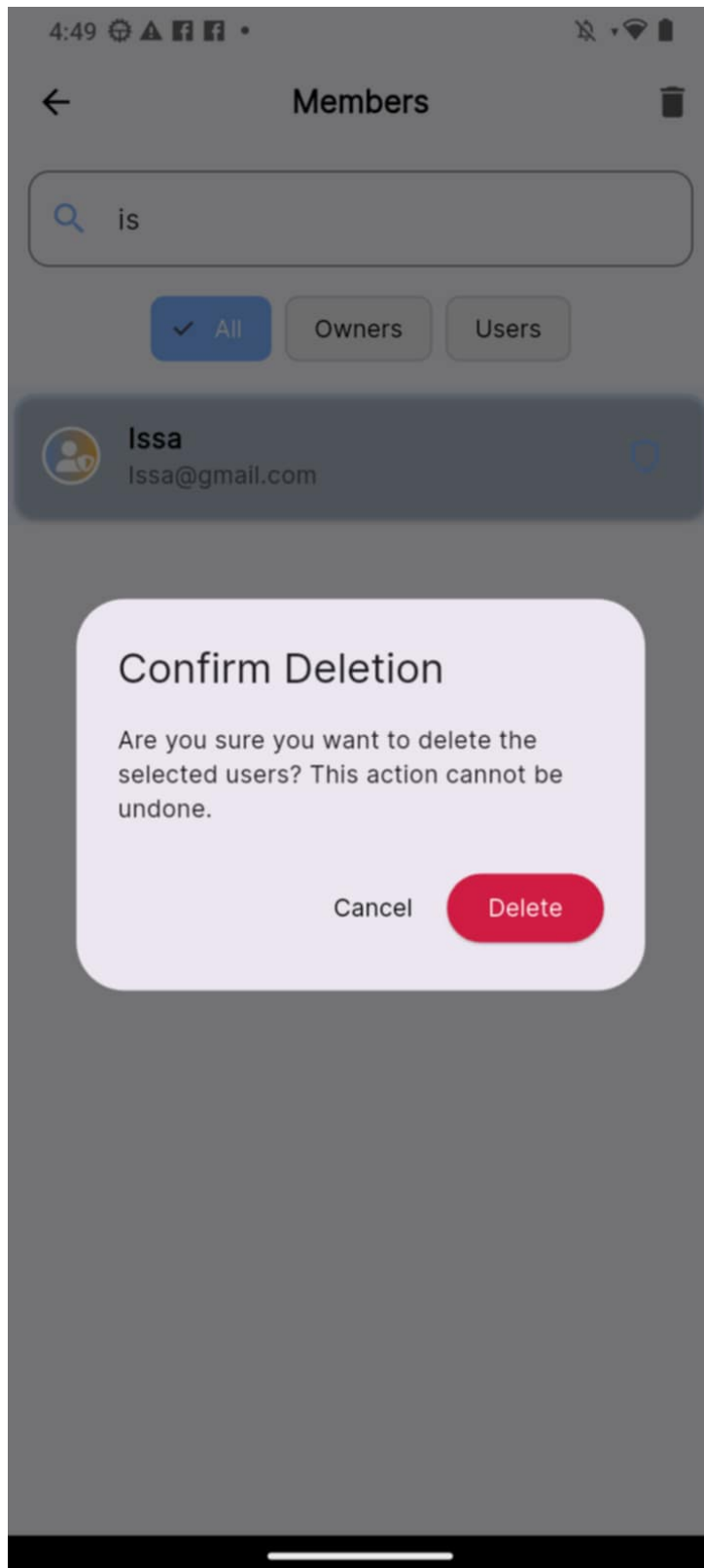


Figure 4.113: Delete confirmation dialog displayed

This structured member management interface helps the admin maintain an organized, secure environment by easily tracking user roles, managing entries, and enforcing role-based controls within the application.

### 4.2.39 Products Management

The admin has full access to view and manage all products added to the system. Upon entering the products management section, the admin is presented with a complete list of all products currently available on the platform. The total number of products is displayed at the top of the page, where this count reflects the total number of distinct products added, regardless of their available stock quantities.

For each product, the following key information is displayed directly in the list:

- Product image
- Product name
- Product price
- The owner who added the product (displayed by name)

This allows the admin to quickly monitor and oversee all product entries across the platform. When the admin selects any product from the list, they are navigated to the **Product Details Page, which presents the same comprehensive details available to product owners**. These include: product image, product name, description, starting price, sale status, discount amount, highest price, available quantity, suggested recipients, suitable occasions, and related keywords.

In addition to viewing these details, the admin is granted elevated privileges, allowing them to directly **edit or delete** any product from the system same as the owners. This level of access ensures the admin maintains full control over the marketplace inventory, enabling swift resolution of any errors, inappropriate content, or necessary updates across all products listed on the platform.

This interface contributes significantly to the overall integrity and quality control of the system, ensuring that product data remains accurate, relevant, and professionally managed.

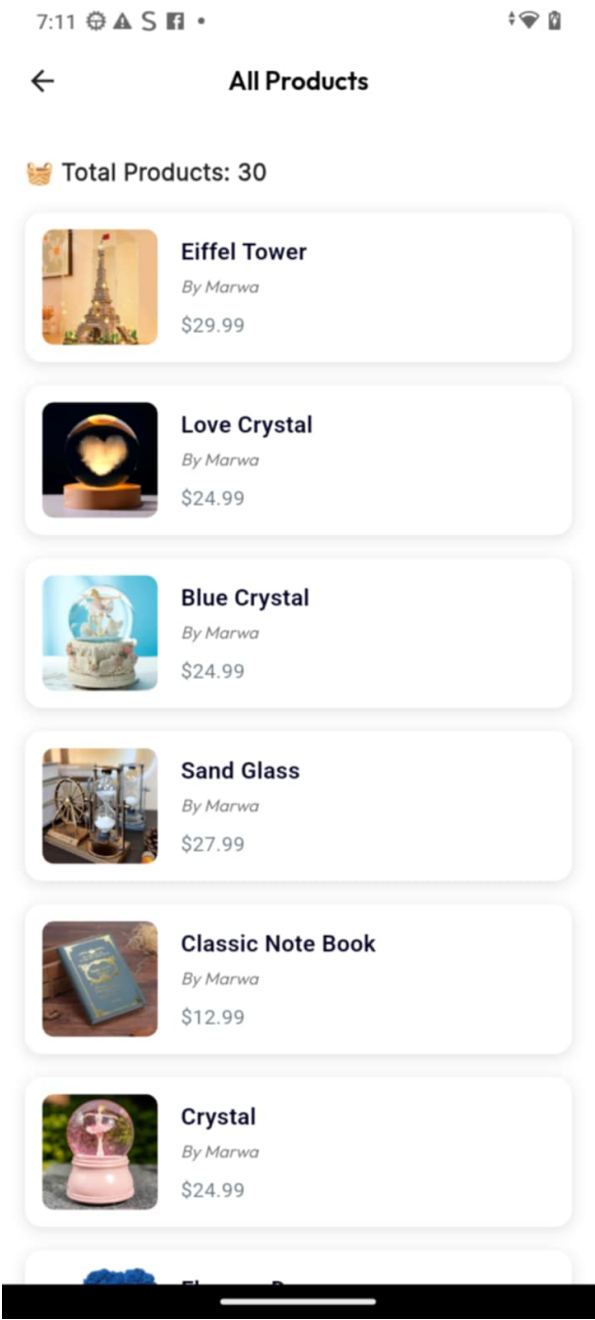


Figure 4.114: Admin view of all products

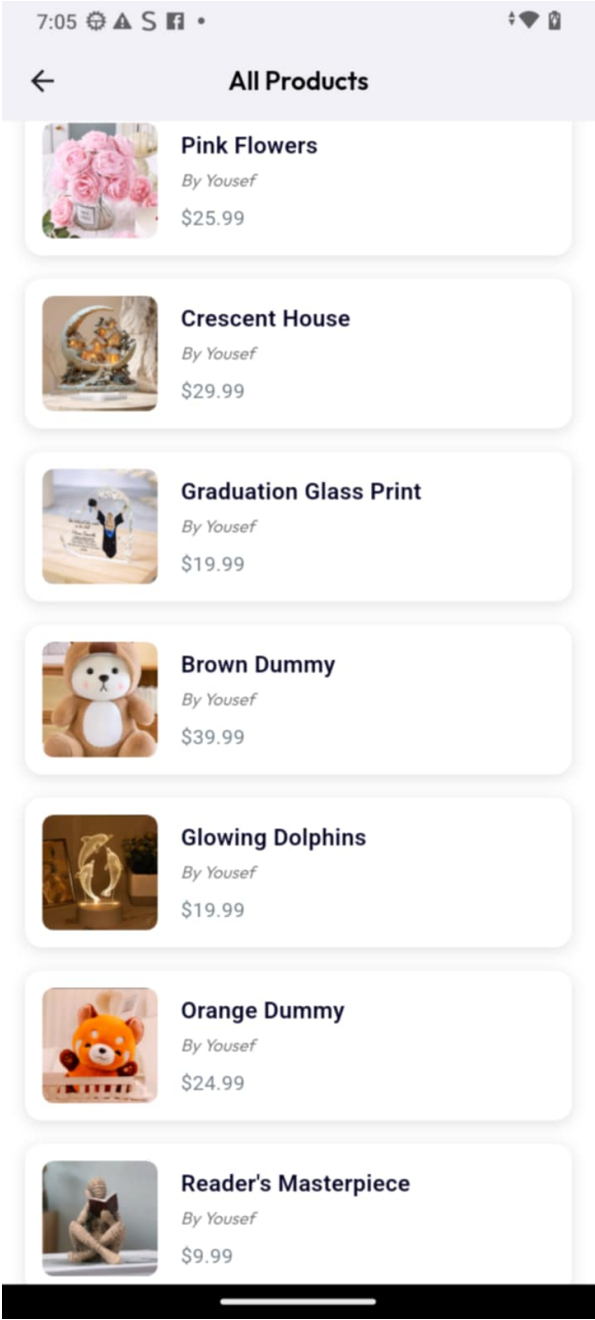


Figure 4.115: Admin view of all products

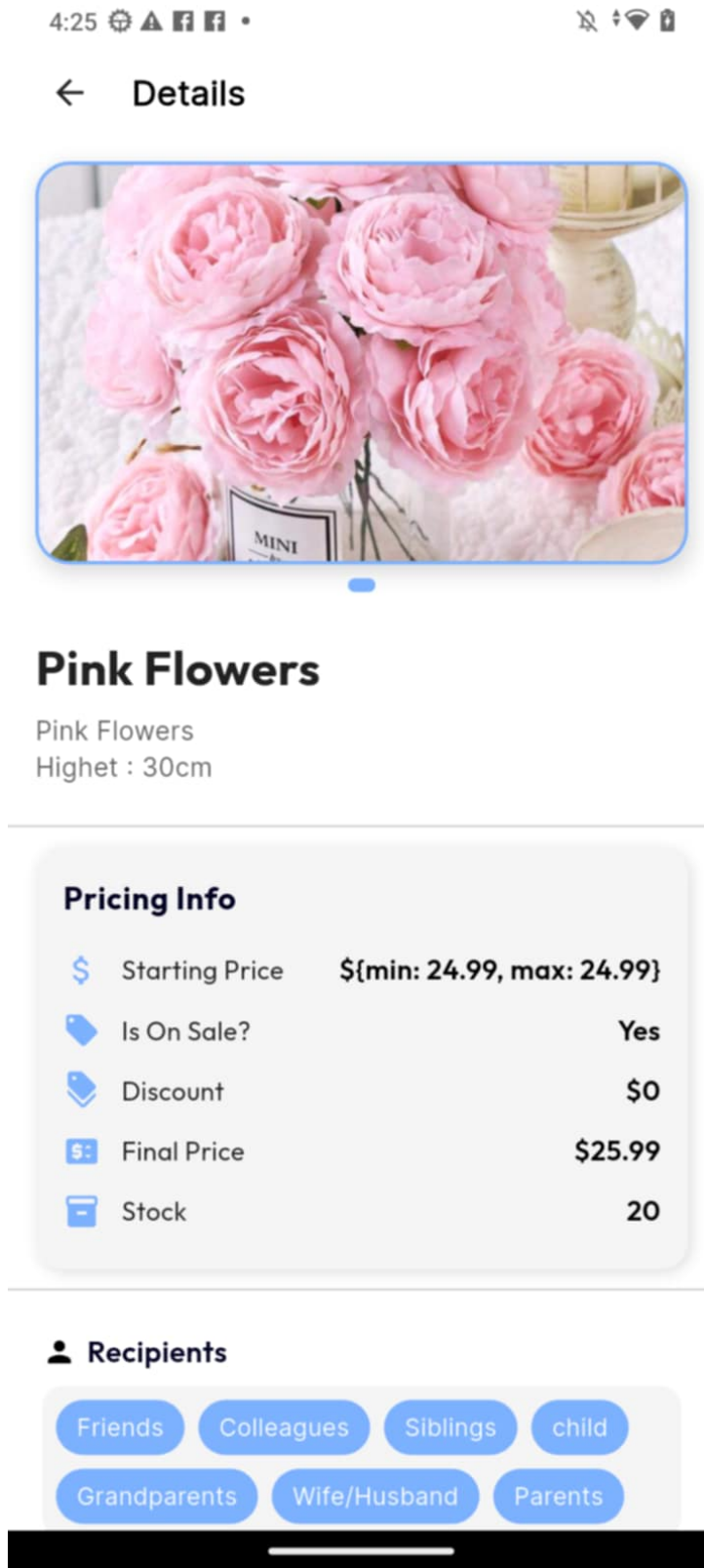


Figure 4.116: Admin view of product details, identical to the owner's product details page

#### 4.2.40 Category Management Interface

In addition to managing members , products and announcements, the admin also has full access to manage the product categories that organize all offerings in the system.

Through a dedicated, visually structured interface, the admin can **add**, **edit**, and **delete** categories that will appear to customers during product browsing.

As illustrated in Figure 4.117, each category is displayed as a card containing the category's image, name, and action icons. These action icons allow the admin to perform the following tasks:

- **Edit:** Modify the name or image of the category.
- **Delete:** Permanently remove the category from the system.

Only the admin has the authorization to perform these actions. Owners do not have permission to modify or remove existing categories, ensuring centralized control over the organizational structure of the catalog.

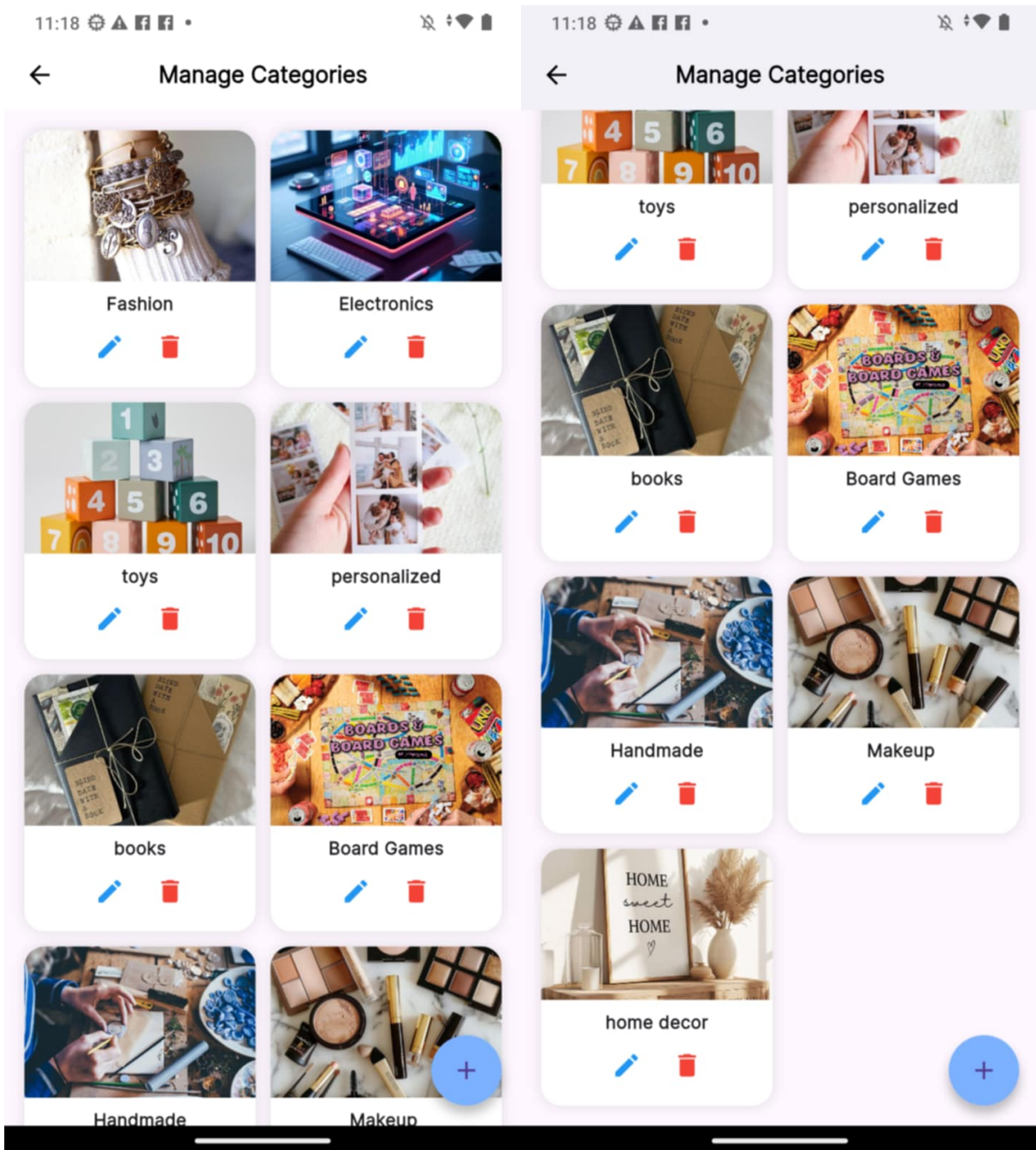


Figure 4.117: Admin category management panel with edit and delete options ( 1 / 2 )

Figure 4.118: Admin category management panel with edit and delete options ( 2 / 2 )

When the admin wants to create a new category, they can tap the + icon located in the lower-right corner of the interface. This action navigates to the **Add Category** form, where the admin is prompted to provide the following details:

- **Category Name**
- **Category Image** (selected from the device gallery)
- **Category Icon** (selected from a predefined set)

This creation process closely mirrors the **owner** registration workflow, promoting a consistent and intuitive experience across the admin functionalities. Figure 4.119 provides a view of the category creation screen.

Once the category is added, it becomes immediately visible to all users of the system. However, only the admin retains the authority to update or remove any category, preserving data integrity and visual consistency.

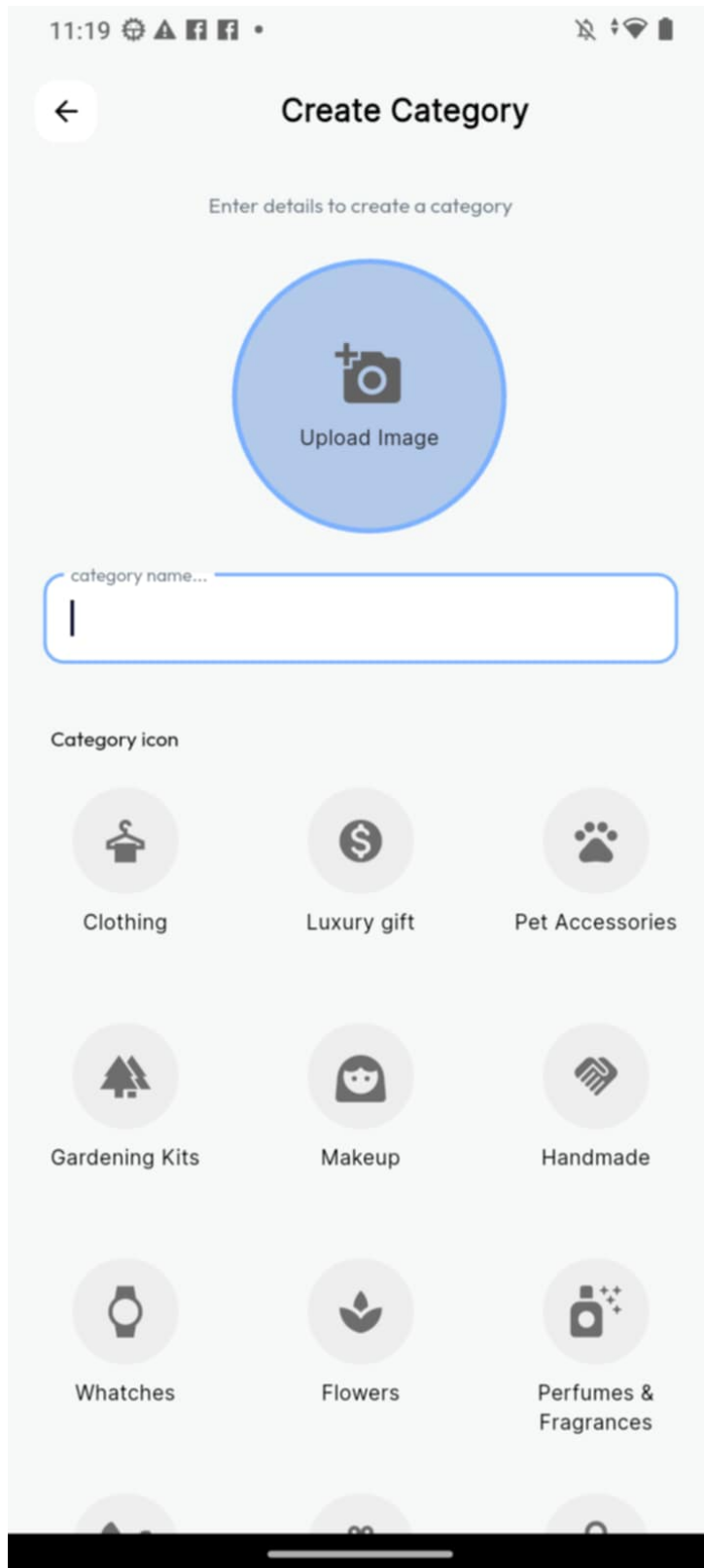


Figure 4.119: Add Category screen allowing admin to input name, image, and icon

**Editing Categories:** When the admin taps the pencil icon associated with a category, they are redirected to the **Edit Category** screen (see Figures 4.120 and 4.121). This interface allows the admin to update the category's name and image. A circular preview of the current category image is shown at the top, followed by an editable text field for the

name. Once changes are made, pressing the Save Changes button commits the update to the system.

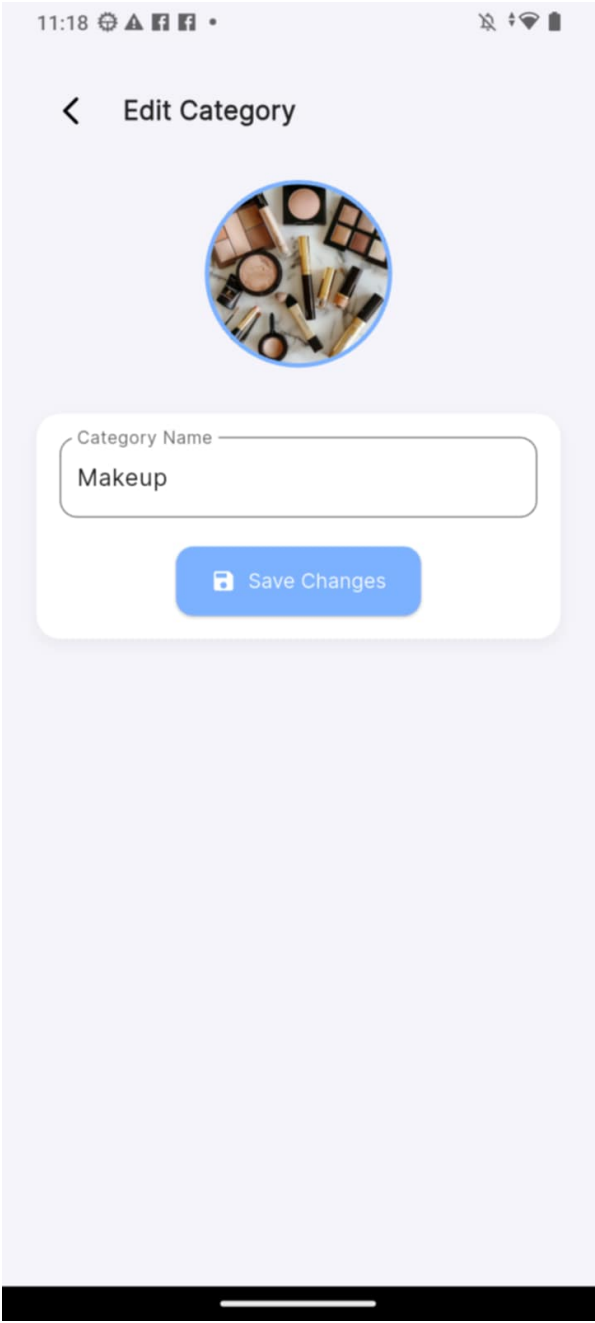


Figure 4.120: Edit Category – initial view before editing

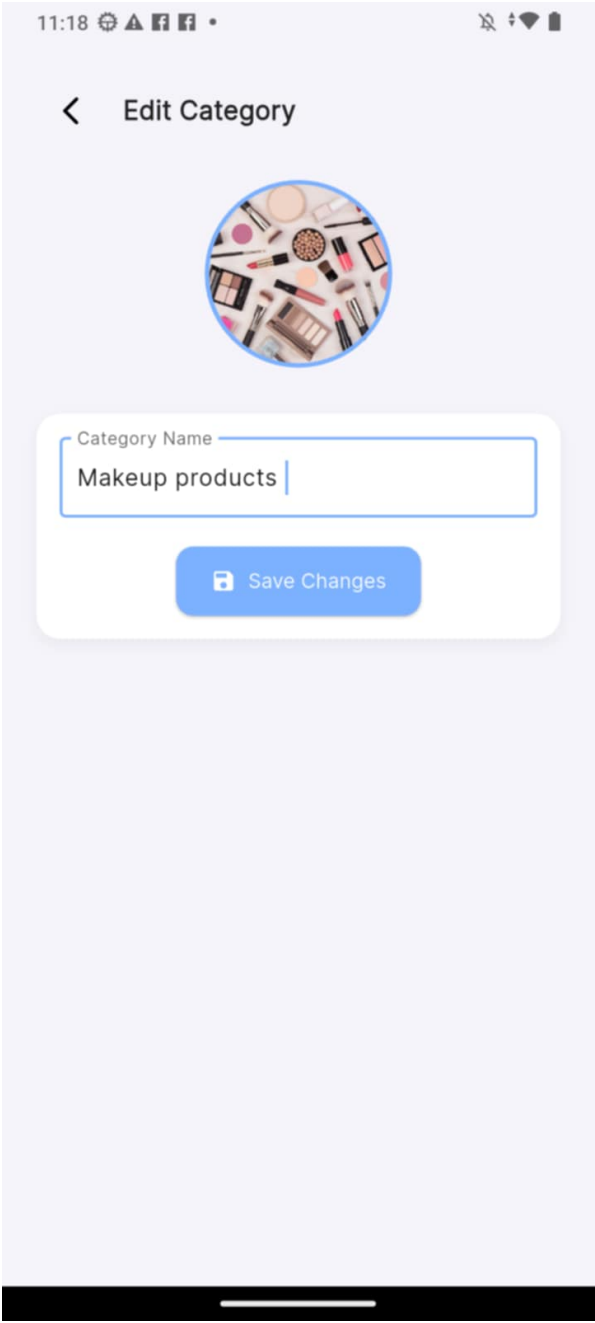


Figure 4.121: Edit Category – updated view after editing

**Deleting Categories:** To remove an outdated or unnecessary category, the admin can press the trash bin icon under any category card. This action prompts a confirmation dialog to avoid accidental deletions. Once confirmed, the category is permanently removed from the system (as depicted in Figure 4.122). This helps ensure the catalog remains clean, relevant, and user-friendly.

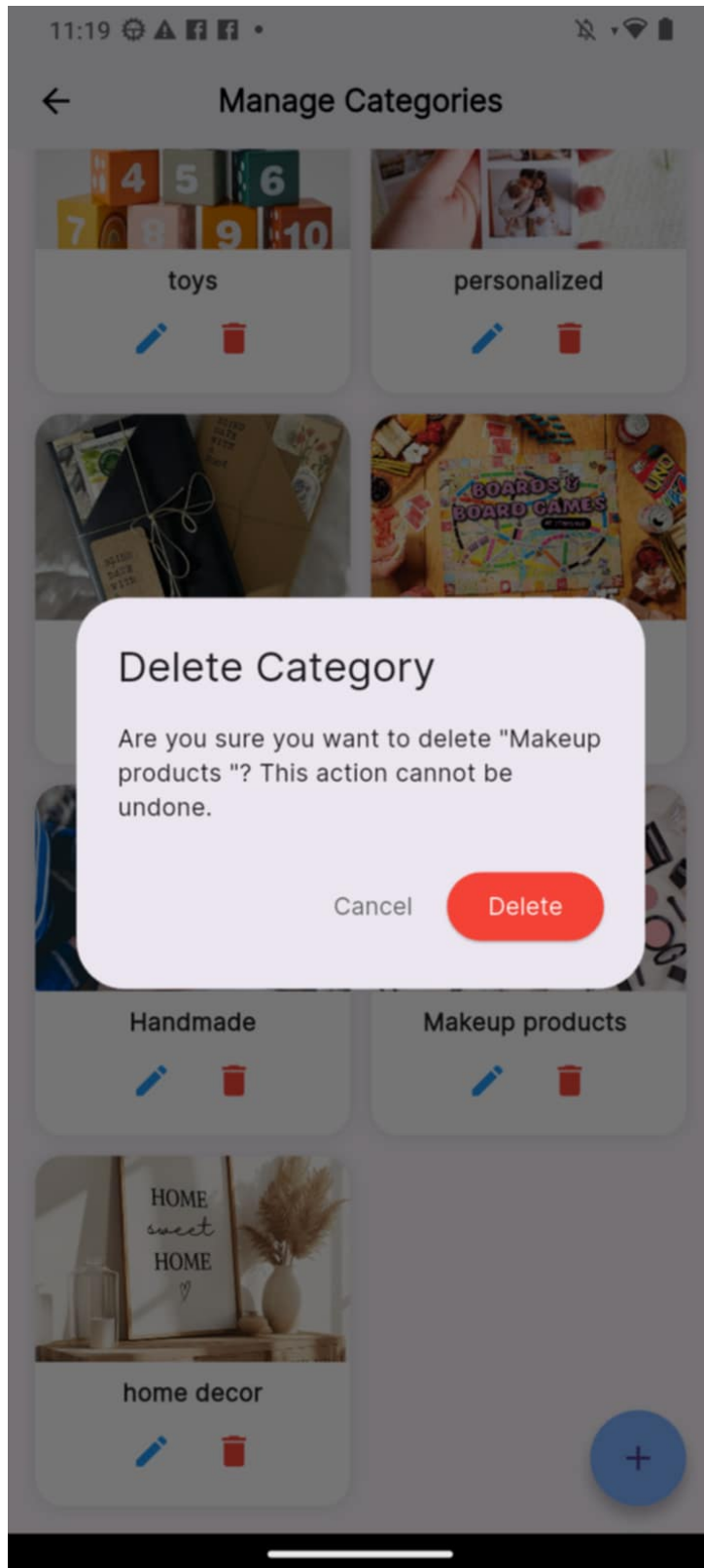


Figure 4.122: Delete confirmation dialog for category removal

These editing and deletion capabilities allow the admin to maintain full control over the structure and presentation of categories, ensuring flexibility while preserving content quality across the app.

#### 4.2.41 Admin Dashboard Overview

The Admin Dashboard serves as a centralized control panel that provides the administrator with real-time insights and control over the application's operations. It prominently displays key summary statistics, including:

- **Users:** Total number of registered users on the platform.
- **Owners:** Number of users with owner privileges who manage product listings.
- **Orders:** Total number of orders placed within the system.
- **Revenue:** The cumulative revenue generated from all processed orders.

These metrics allow the admin to quickly assess the platform's usage and performance. Figure 4.123 shows the main dashboard with these statistics.

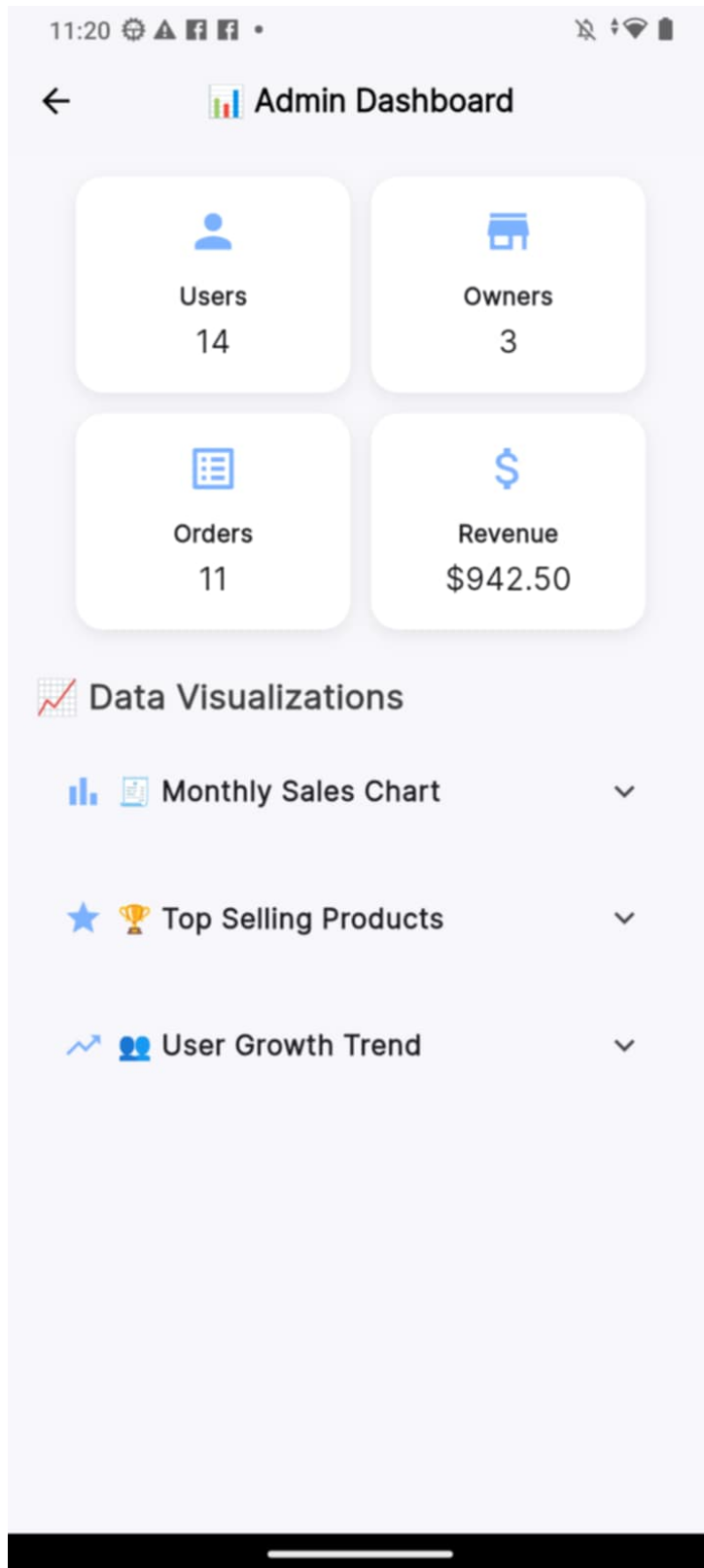


Figure 4.123: Admin dashboard summary including users, owners, orders, and revenue

Below the summary statistics, the admin is presented with three dynamic data visualizations sourced from the MongoDB backend. These charts provide valuable insights derived from the `orders` and `users` collections:

- **Monthly Sales Chart:** A bar chart displaying total sales per month. The x-axis represents the month (based on order creation dates), and the y-axis indicates the revenue sum per month. (Figure 4.124)
- **Top Selling Products:** A chart showing the most frequently purchased products, derived by aggregating product quantities across all orders. This helps identify popular and high-performing products. (Figure 4.125)
- **User Growth Trend:** An area chart visualizing the increase in user registrations over time. The x-axis denotes time (timestamps), while the y-axis tracks the number of users. (Figure 4.126)

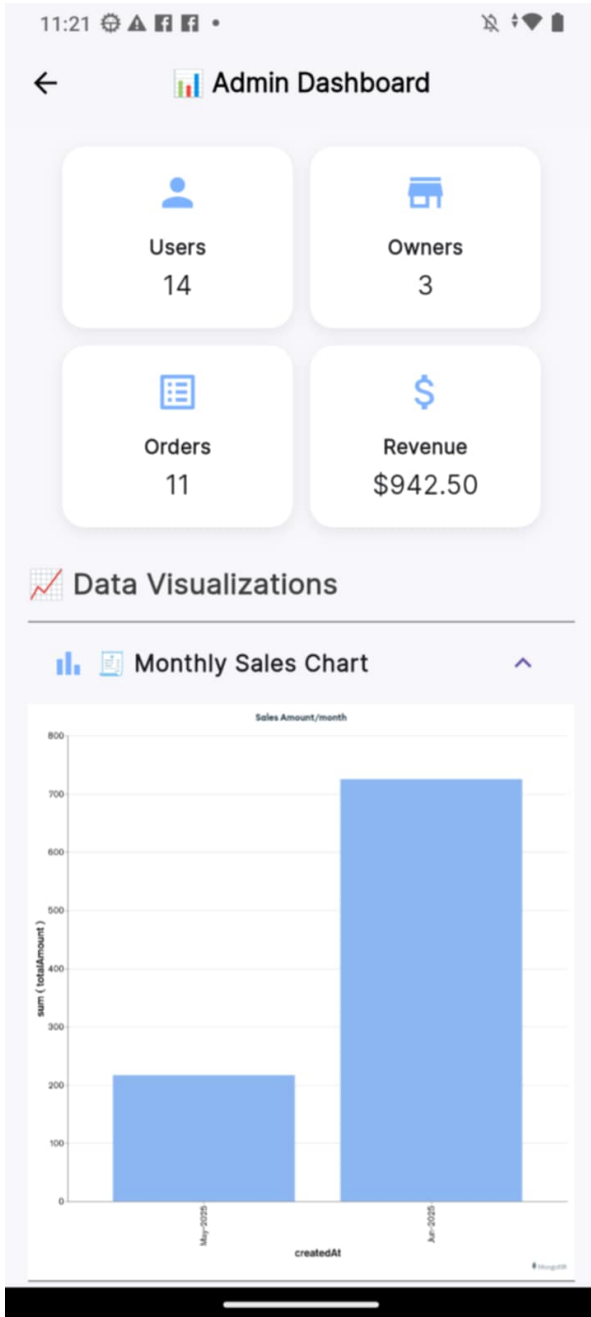


Figure 4.124: Monthly Sales Chart showing revenue per month

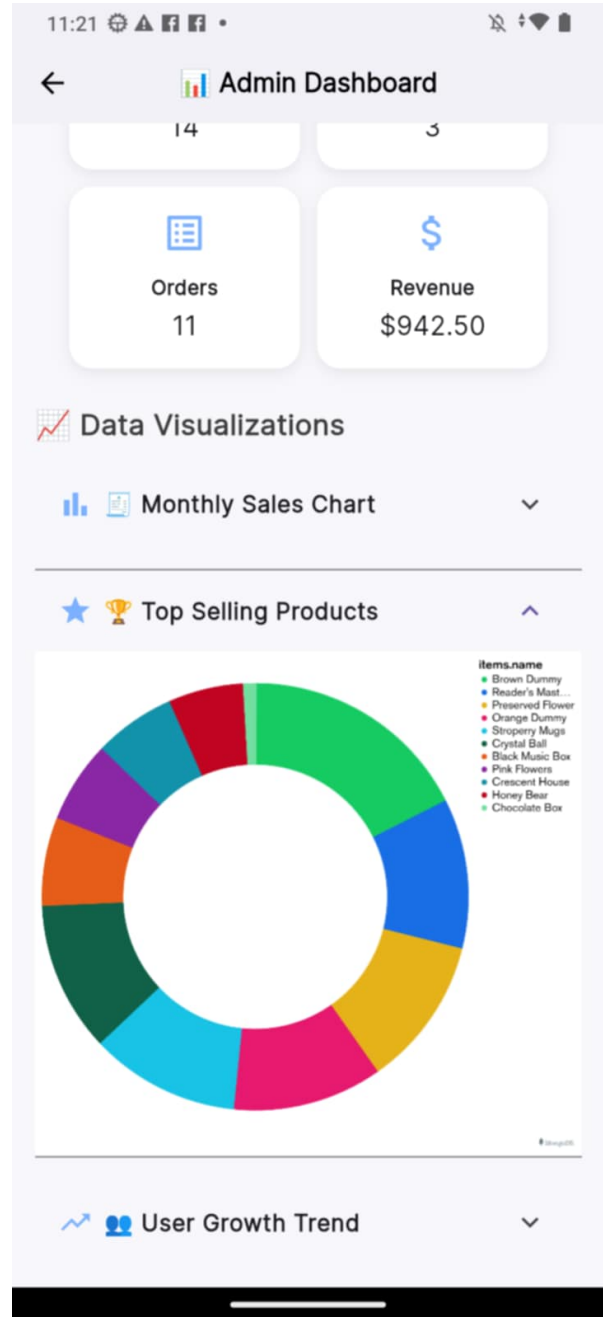


Figure 4.125: Top Selling Products pie chart based on aggregated sales data

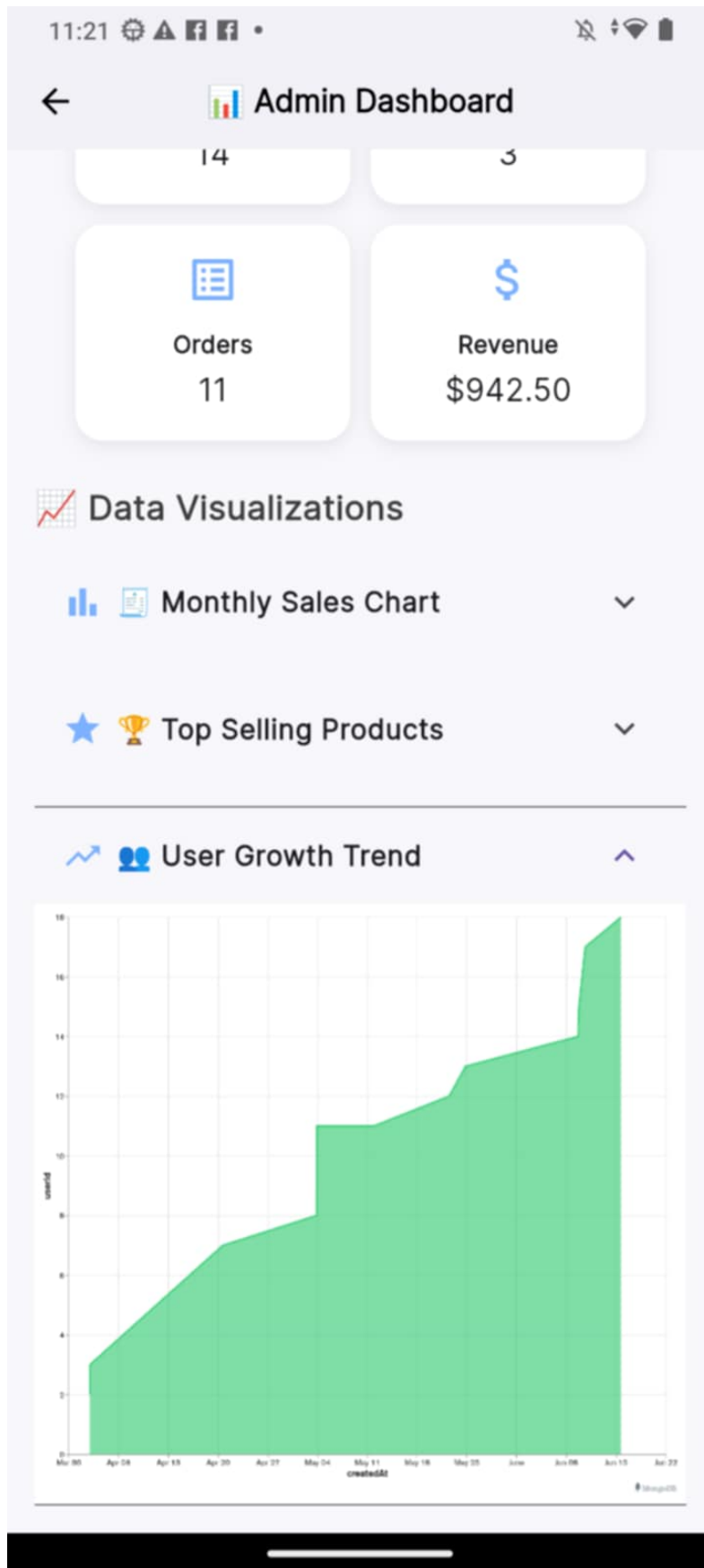


Figure 4.126: User Growth Trend chart showing user count over time

#### 4.2.42 User Feedback

The admin has access to a comprehensive feedback interface that allows them to review user opinions about products listed on the platform. This section plays an essential role in maintaining product quality, and ensuring customer satisfaction.

Each feedback entry in the list includes the following details:

- **User Name:** The name of the user who submitted the feedback.
- **Comment:** The content of the user's review regarding the product.
- **Rating:** A star-based rating (1 to 5 stars) provided by the user.
- **Product Name:** The name of the product that the feedback refers to.
- **Feedback Date:** The exact date when the feedback was submitted.
- **Product Owner:** The name of the owner who listed the product in the system.

This structured feedback list allows the admin to quickly identify high-performing products, dissatisfied users, and potentially problematic product listings or owners.

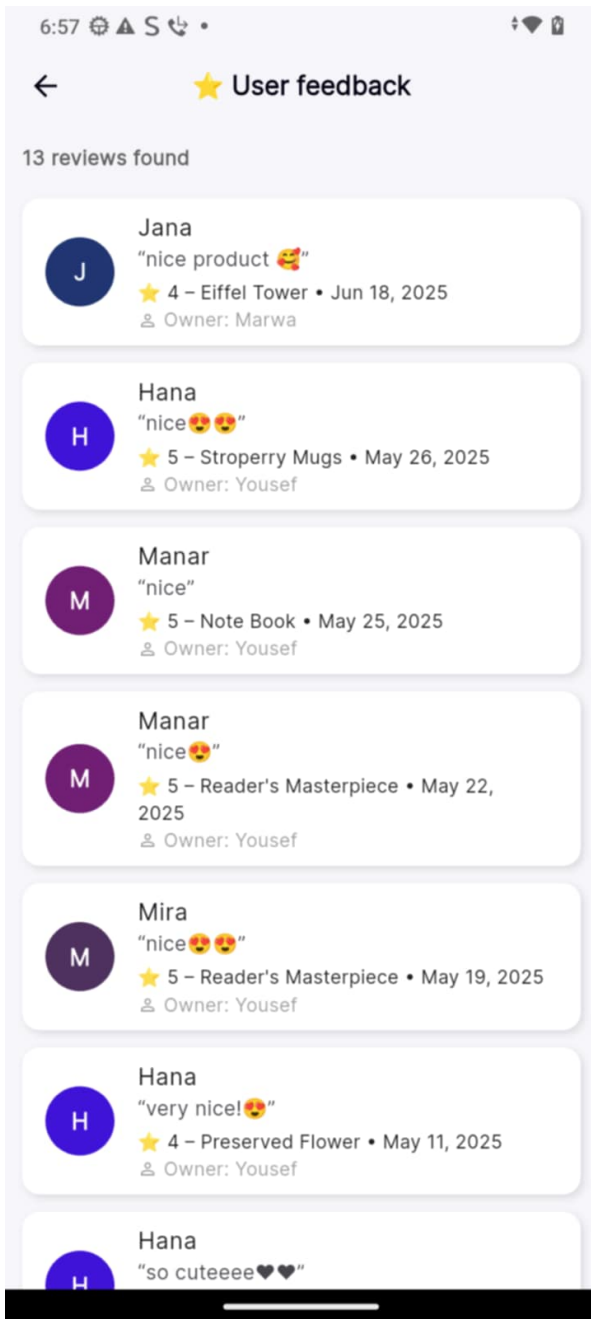


Figure 4.127: Admin interface showing user feedback with product, rating, and owner ( 1 / 2)

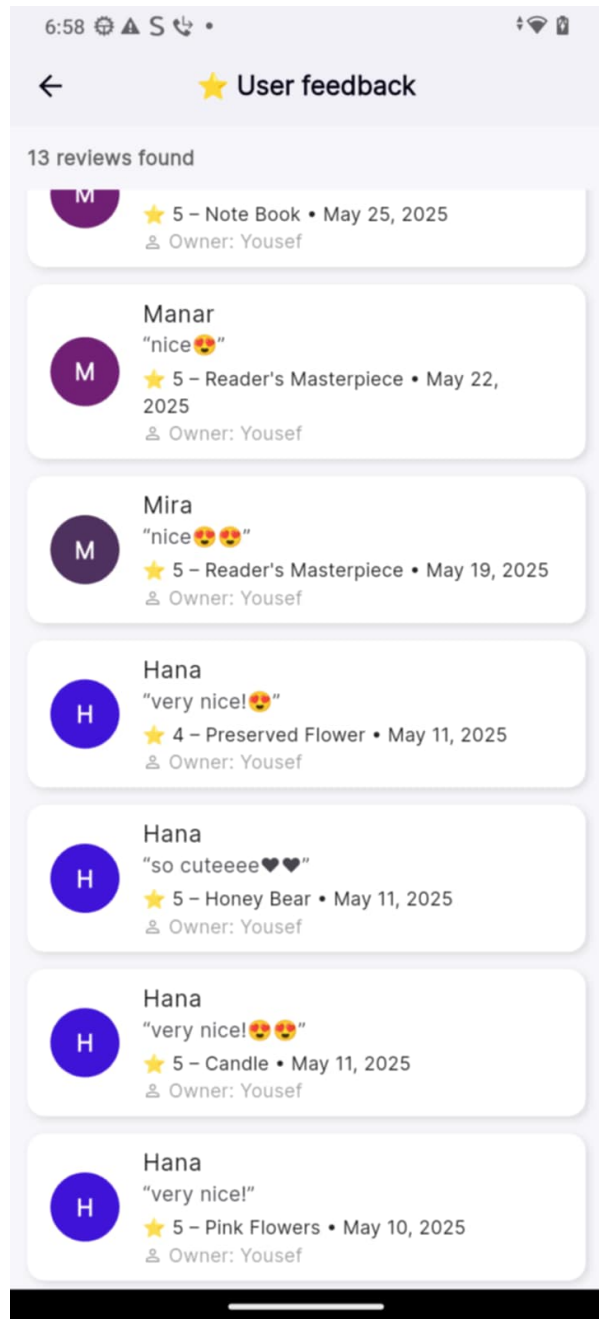


Figure 4.128: Admin interface showing user feedback with product, rating, and owner ( 2 / 2)

### 4.2.43 Profile Settings

The admin has access to a personal Profile Settings page that allows basic account management actions. This interface ensures that the admin can keep their profile information up to date and maintain the security of their account.

The profile settings page includes two main functionalities:

- **Edit Name:** The admin can update their display name by entering a new name in the provided input field. Once the desired changes are made, clicking the *Save Changes* button will update the profile information in the system.
- **Reset Password:** A dedicated *Reset Password* widget allows the admin to initiate the password reset process. This ensures that the admin can securely update their login credentials whenever necessary.

This section provides an intuitive and secure way for the admin to manage their personal profile.

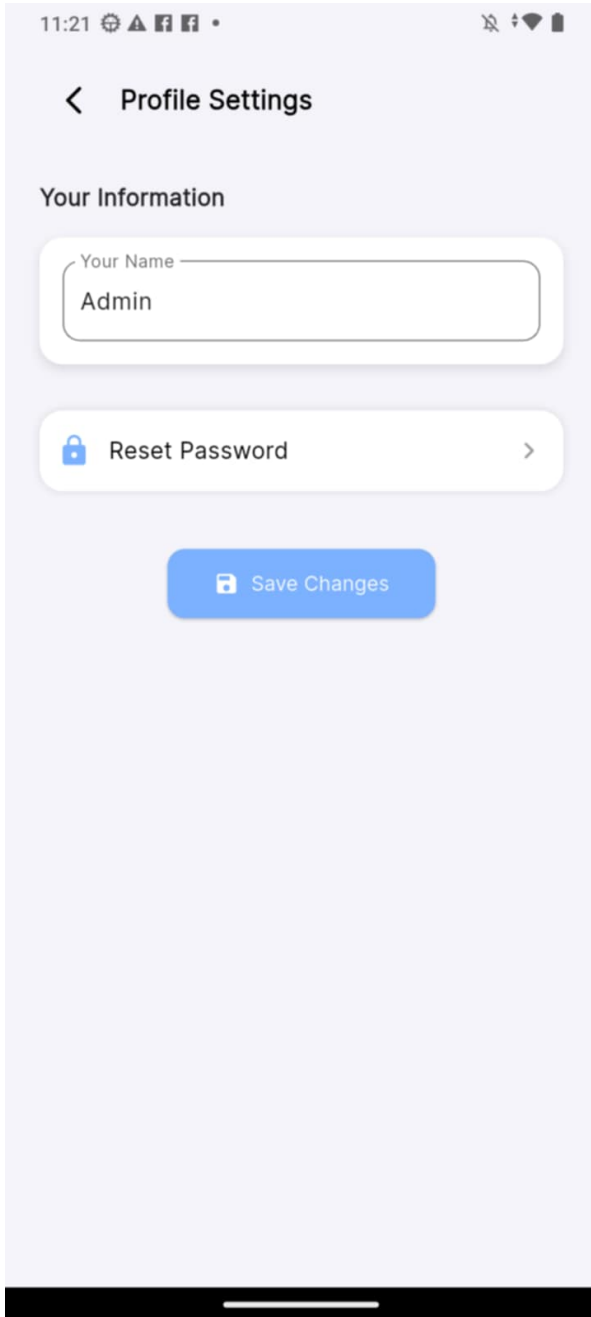


Figure 4.129: Admin Profile Settings page with name edit and reset password option

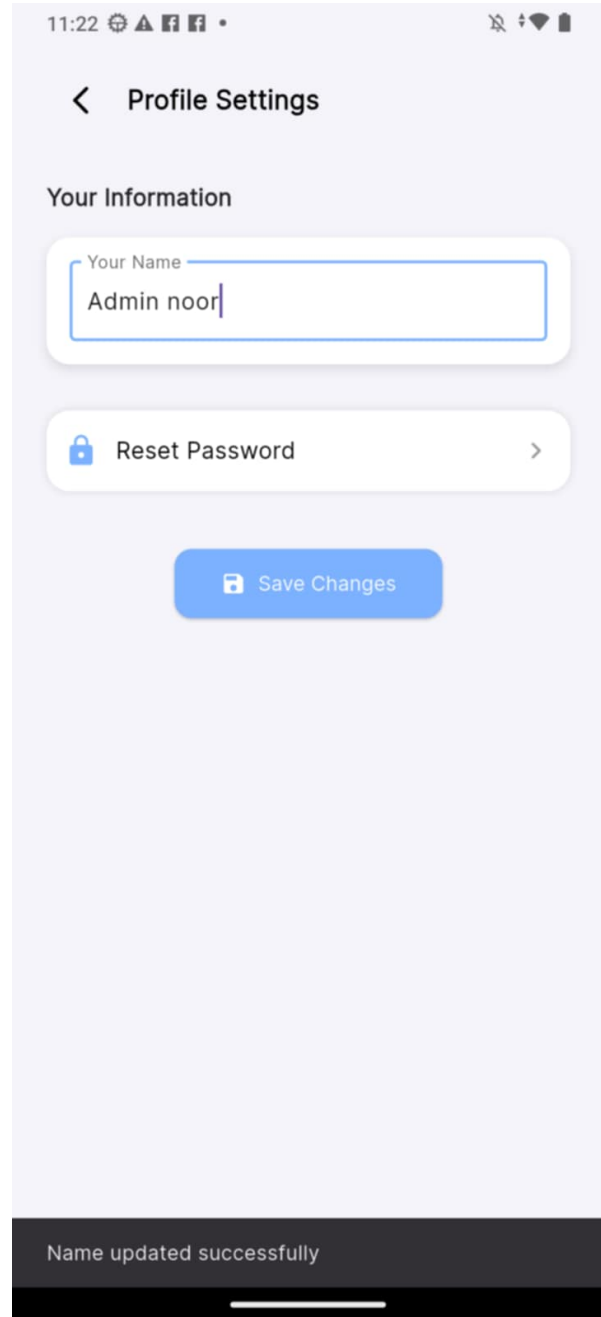


Figure 4.130: Admin updated his name and the confirmation message

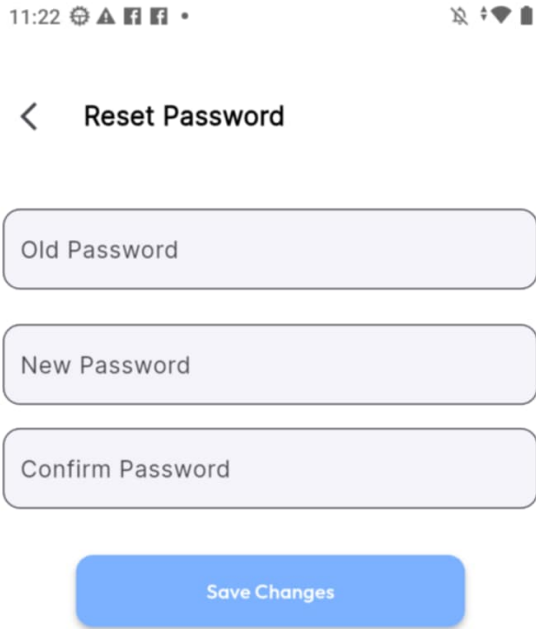


Figure 4.131: Admin reset password Page - Empty Fields

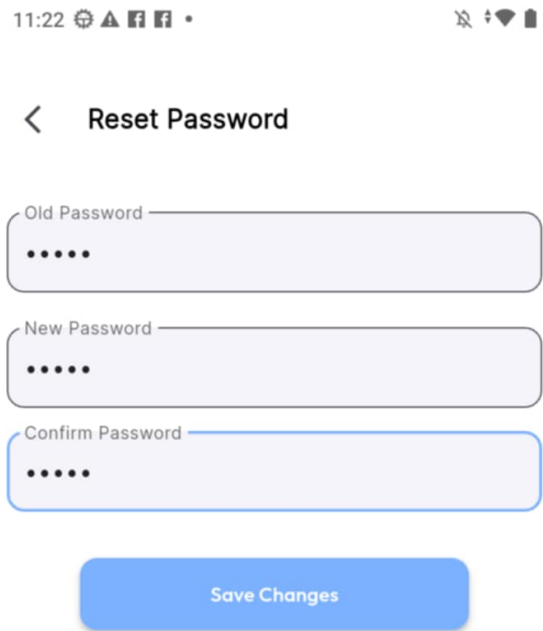


Figure 4.132: Admin resting his password

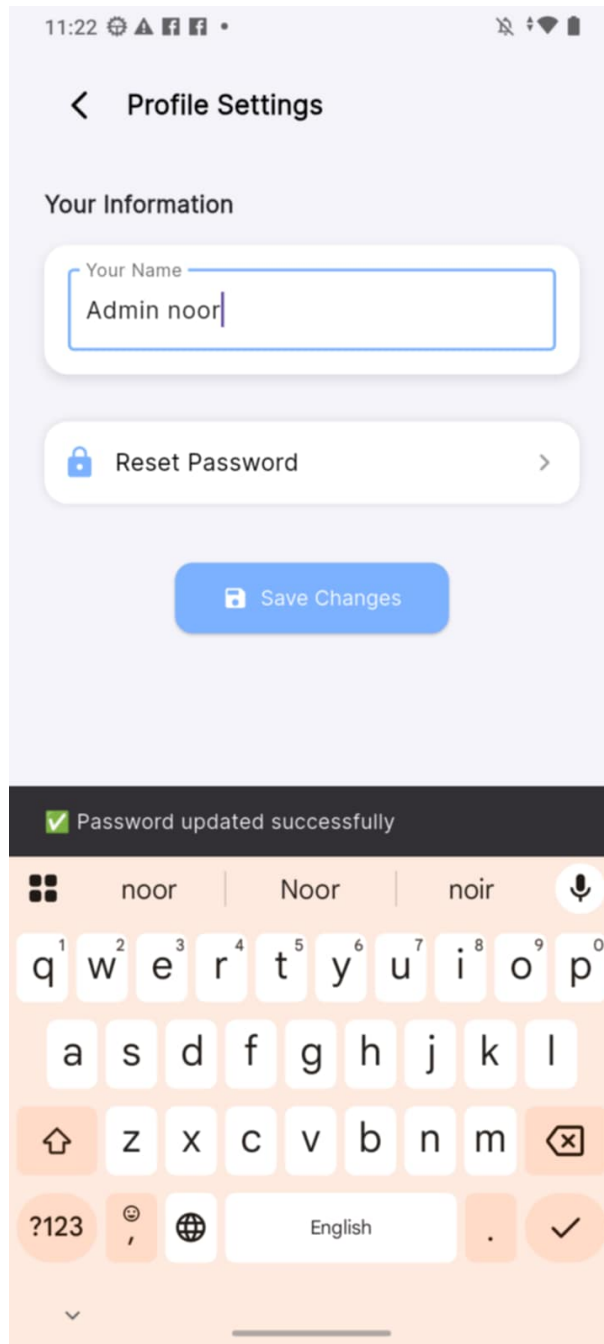


Figure 4.133: After Admin resets his password and the Confirmation message

After completing his tasks, the Admin has the option to securely log out of their account.

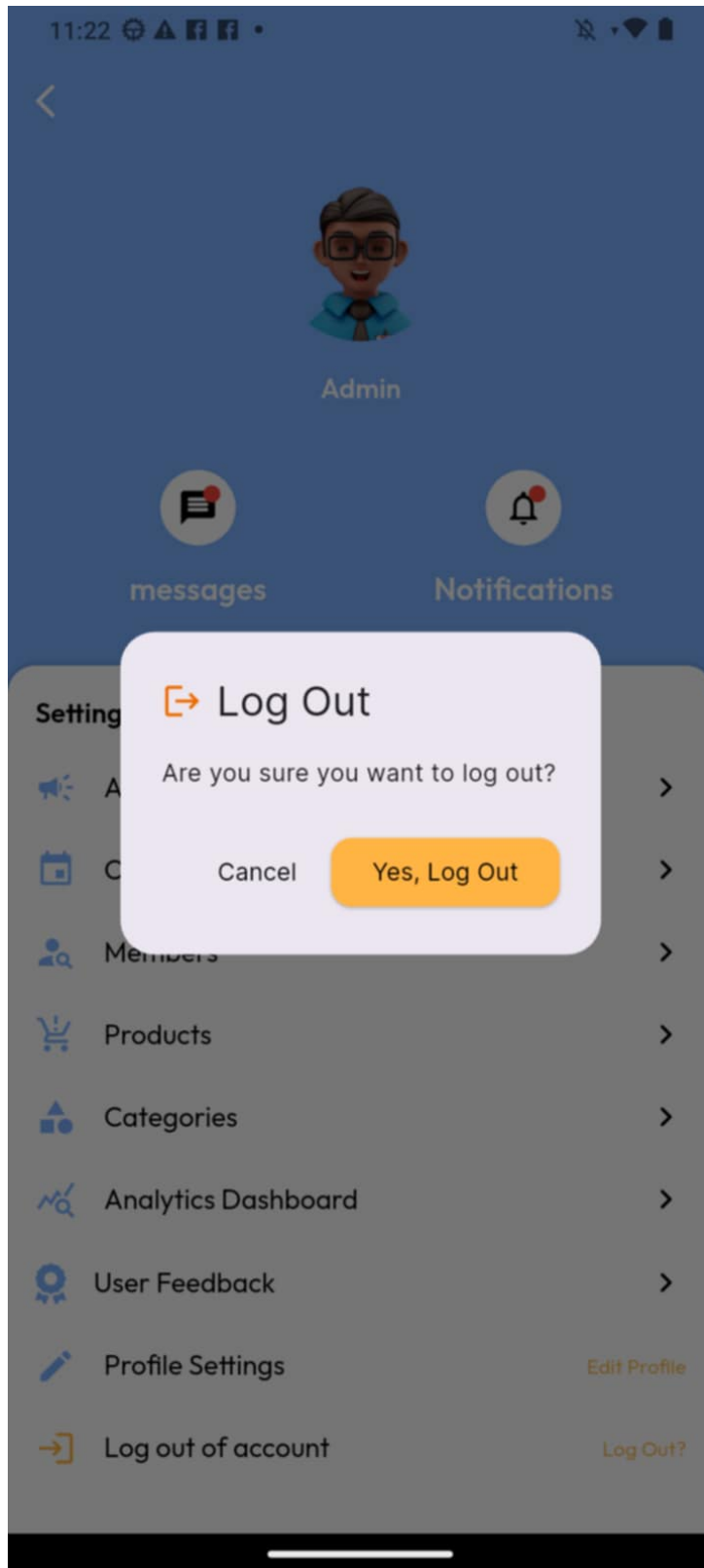
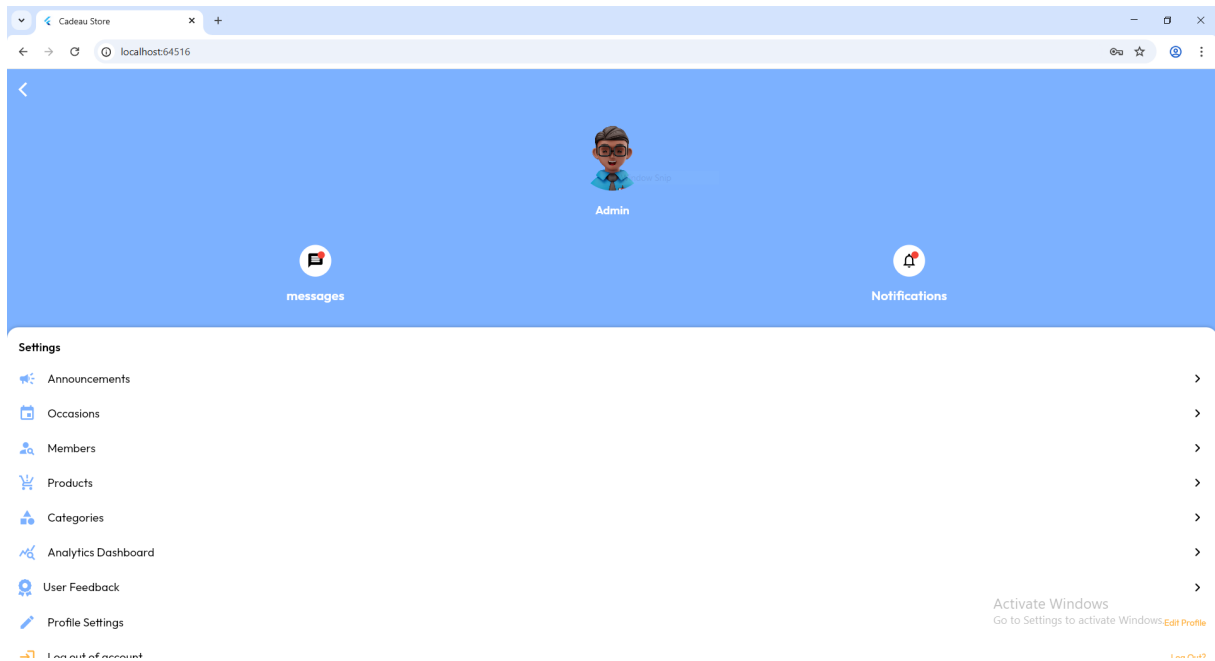


Figure 4.134: Admin log out

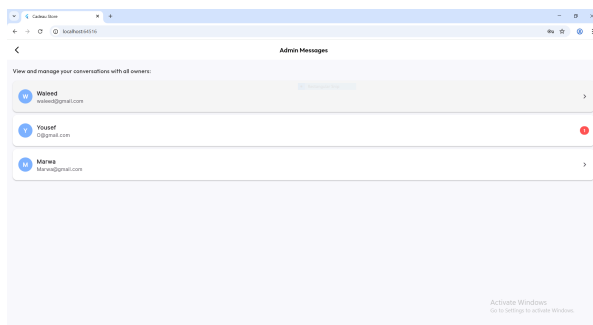
## 4.3 Website

All features mentioned for the mobile app are also available on the website without any exceptions.

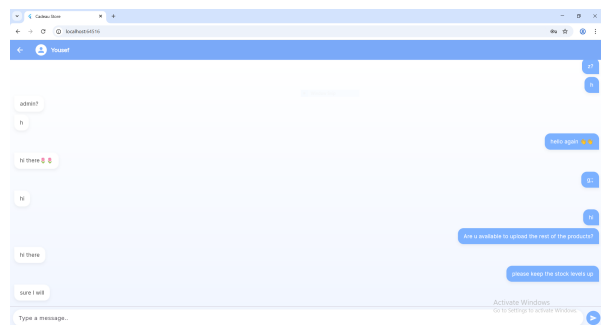
### 4.3.1 Admin



(a) Admin Widget



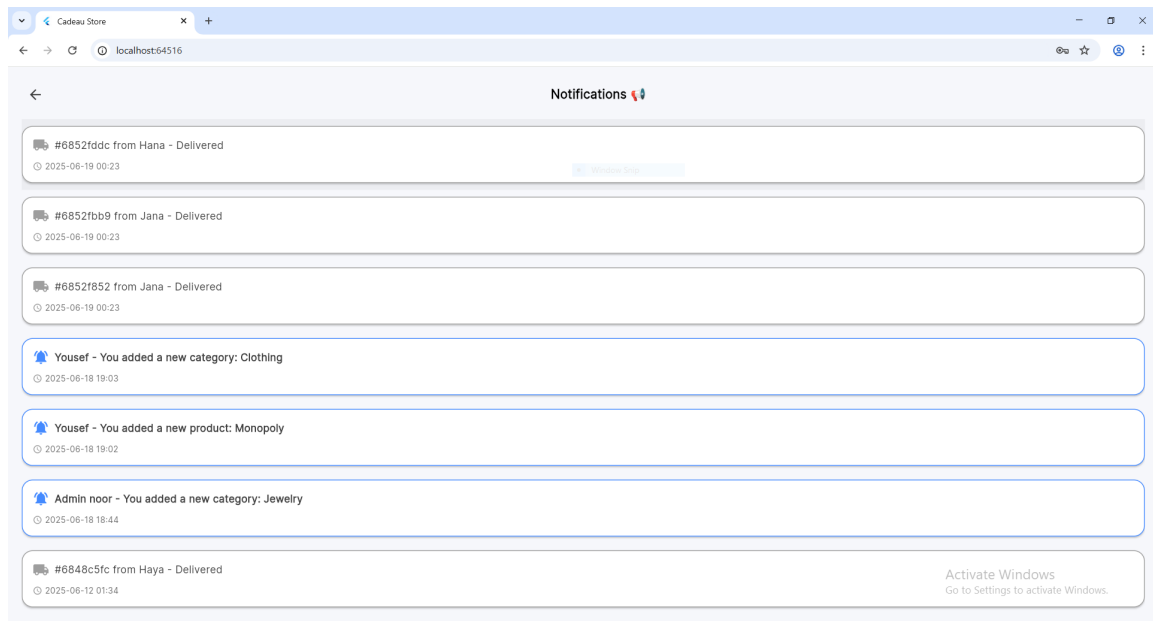
(b) Admin messaging with owners



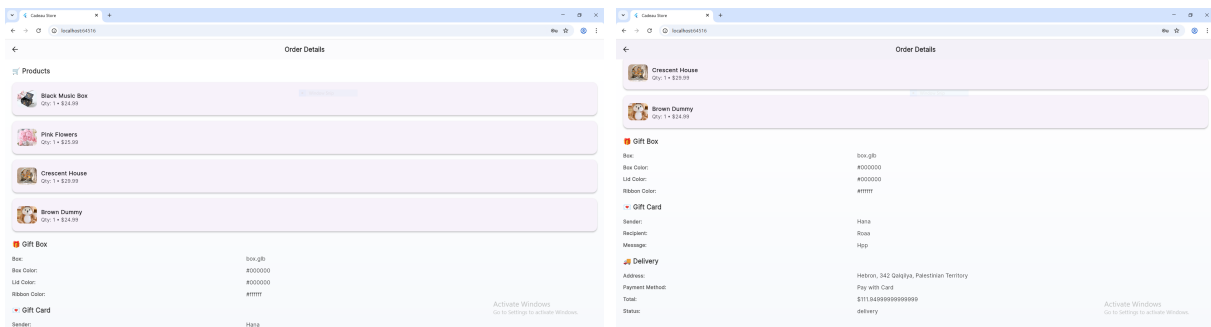
(c) Admin messaging with owner Yousef

Figure 4.135: Admin Home Page and messaging Page.

## 4.3.2 Admin notifications



(a) Admin notification page

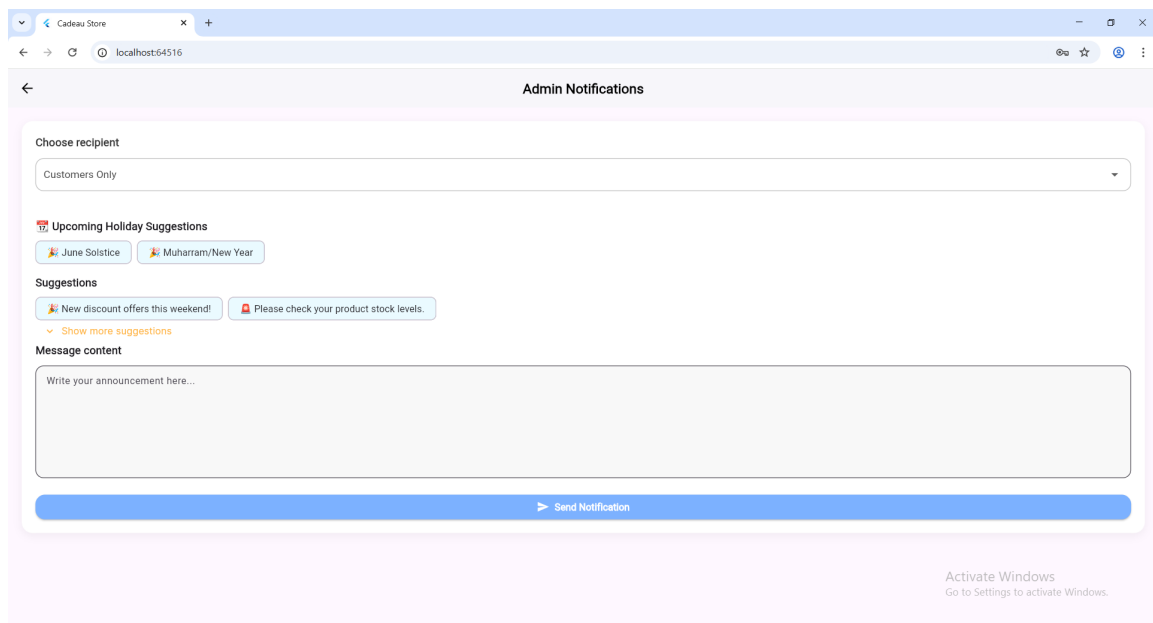


(b) Order details

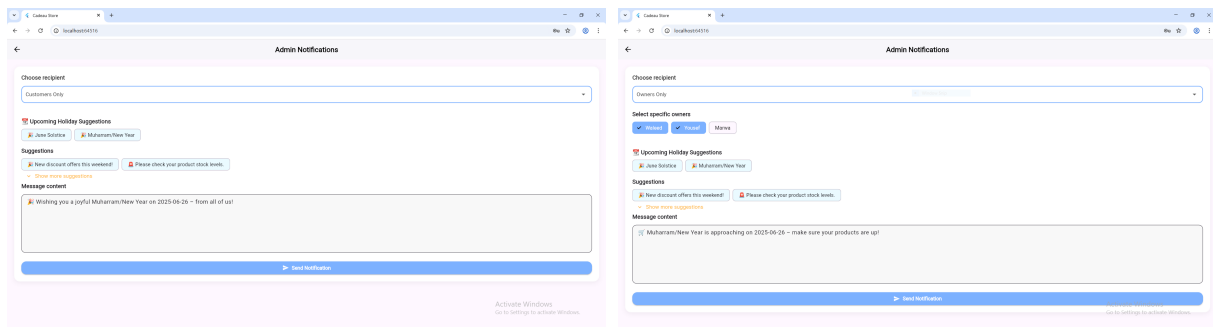
(c) Order details 2

Figure 4.136: Admin notifications and order detail pages

### 4.3.3 Admin Announcements



(a) Admin Announcements Page



(b) Admin Announcements for customers

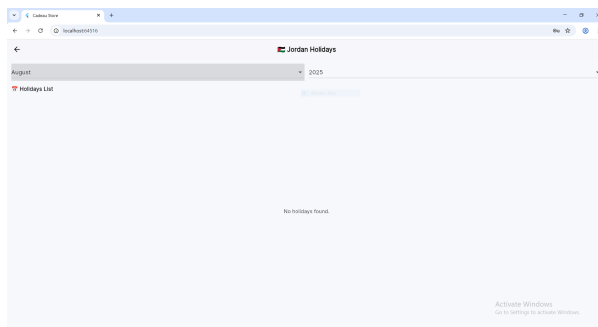
(c) Admin Announcements for owners

Figure 4.137: Admin Announcements for owners and customers

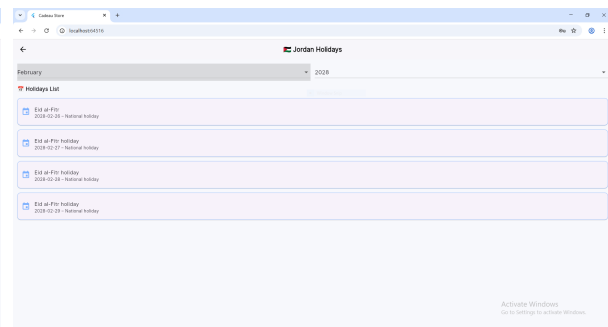
## 4.3.4 Admin occasions and holidays Page



(a) Occasions and holidays Page for Admin



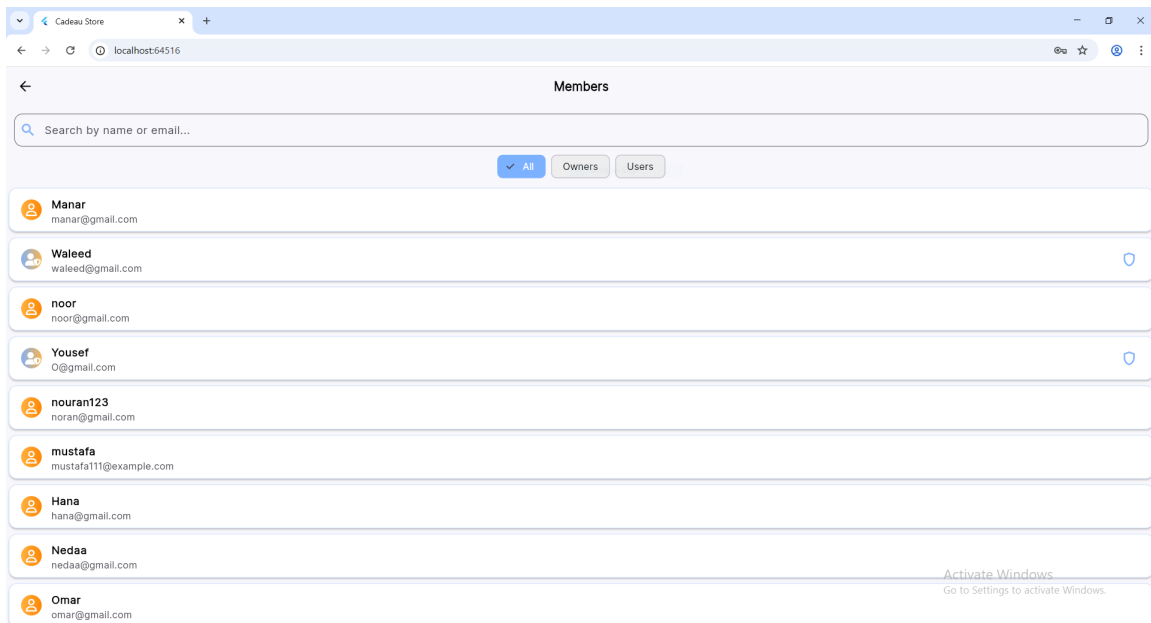
(b) August's 2025 Occasions



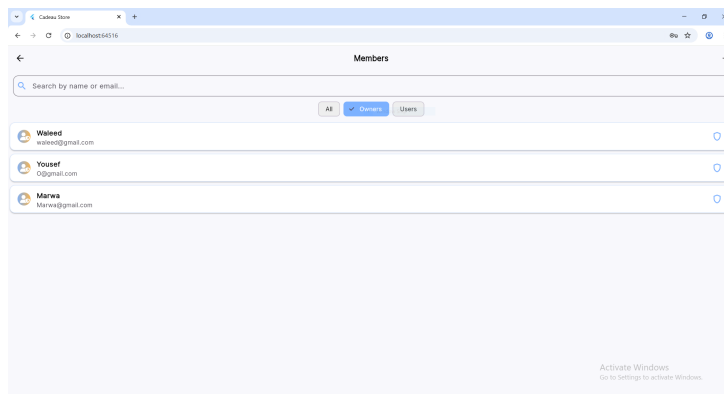
(c) February's 2028 Occasions

Figure 4.138: Jordan Occasions and holidays

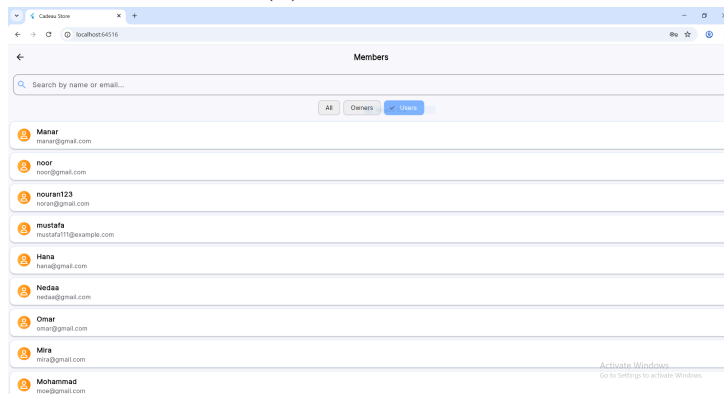
### 4.3.5 Admin members page



(a) All members



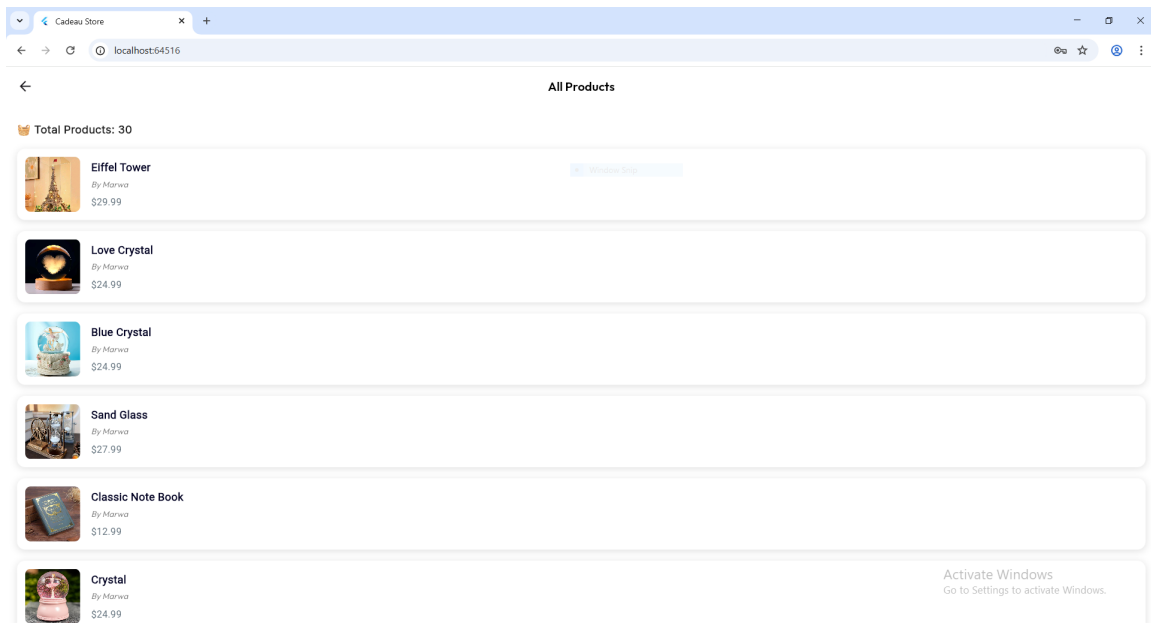
(b) Owners Only



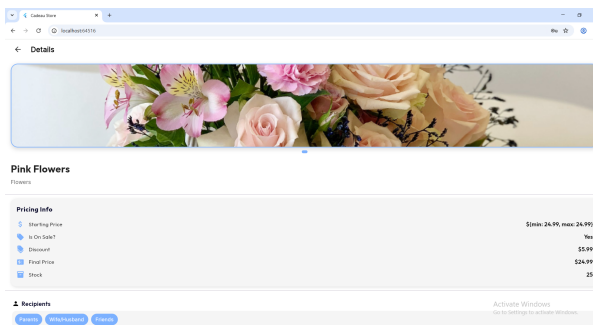
(c) Users Only

Figure 4.139: Admin members page

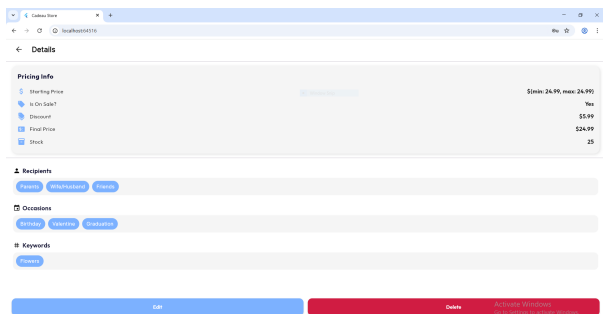
### 4.3.6 All products page for Admin



(a) All products

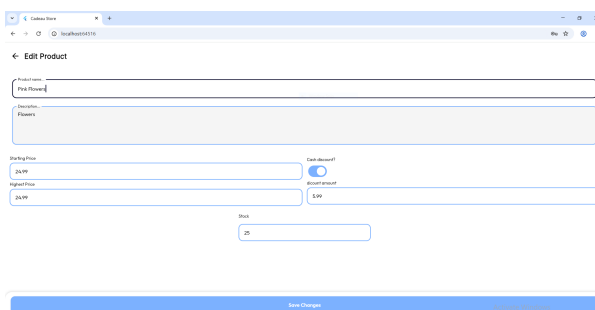


(b) Pink flowers product details display

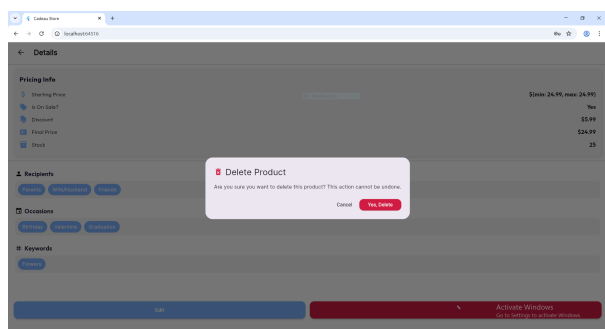


(c) Pink flowers product details display 2

Figure 4.140: products page



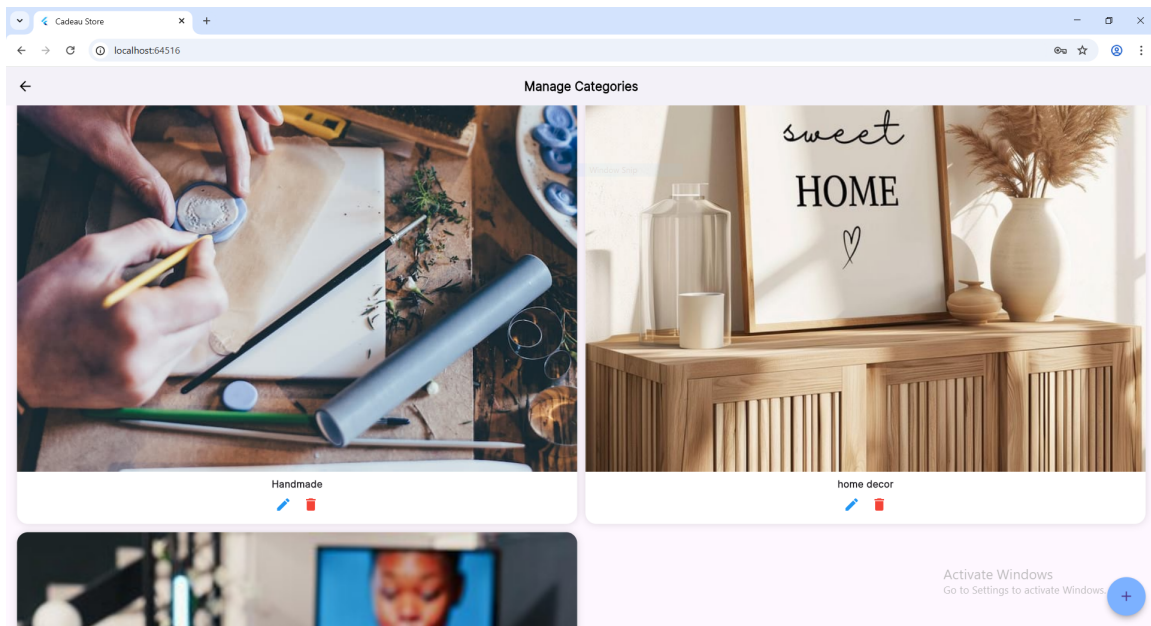
(a) Pink flowers product details edit



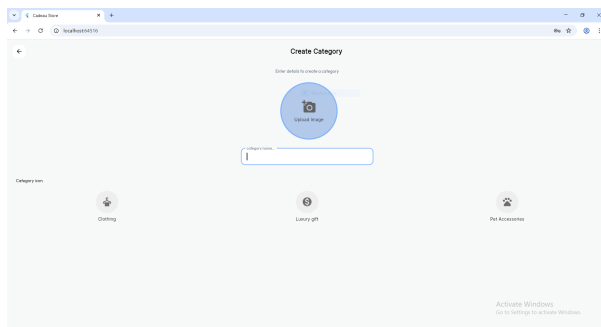
(b) Pink flowers product delete

Figure 4.141: product edit and delete

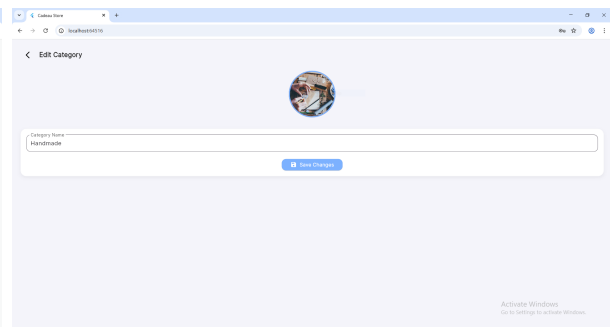
### 4.3.7 Categories page for Admin



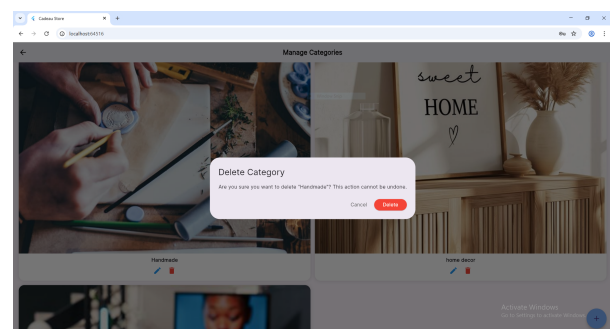
(a) All categories



(b) Category add



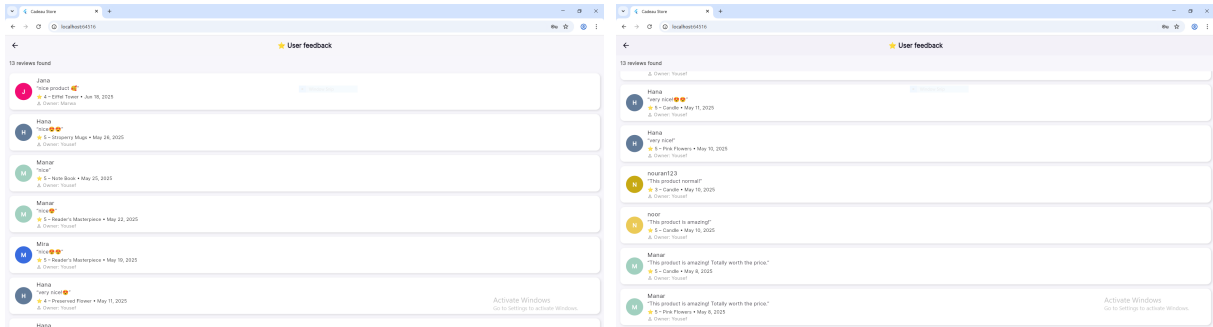
(c) Category Edit



(d) Category delete

Figure 4.142: Categories pages - Add, edit, delete

### 4.3.8 User Feedback for Admin

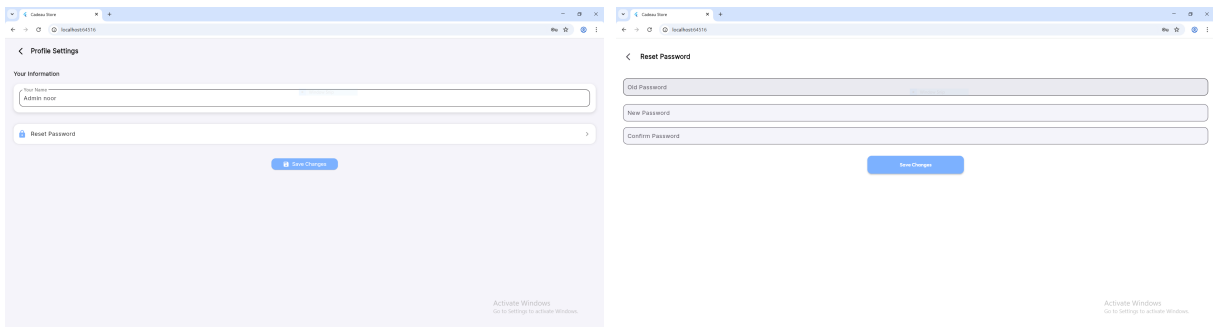


(a) User ratings and reviews

(b) User ratings and reviews

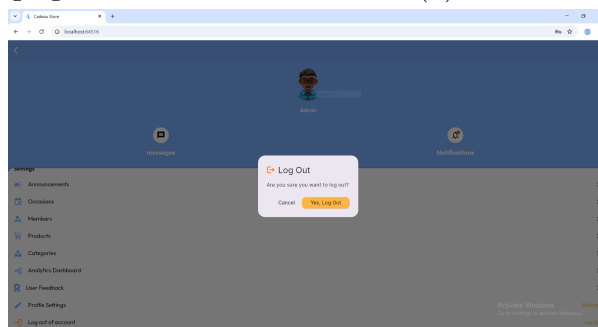
Figure 4.143: User Feedback

### 4.3.9 Admin settings and log out



(a) Admin changing his name

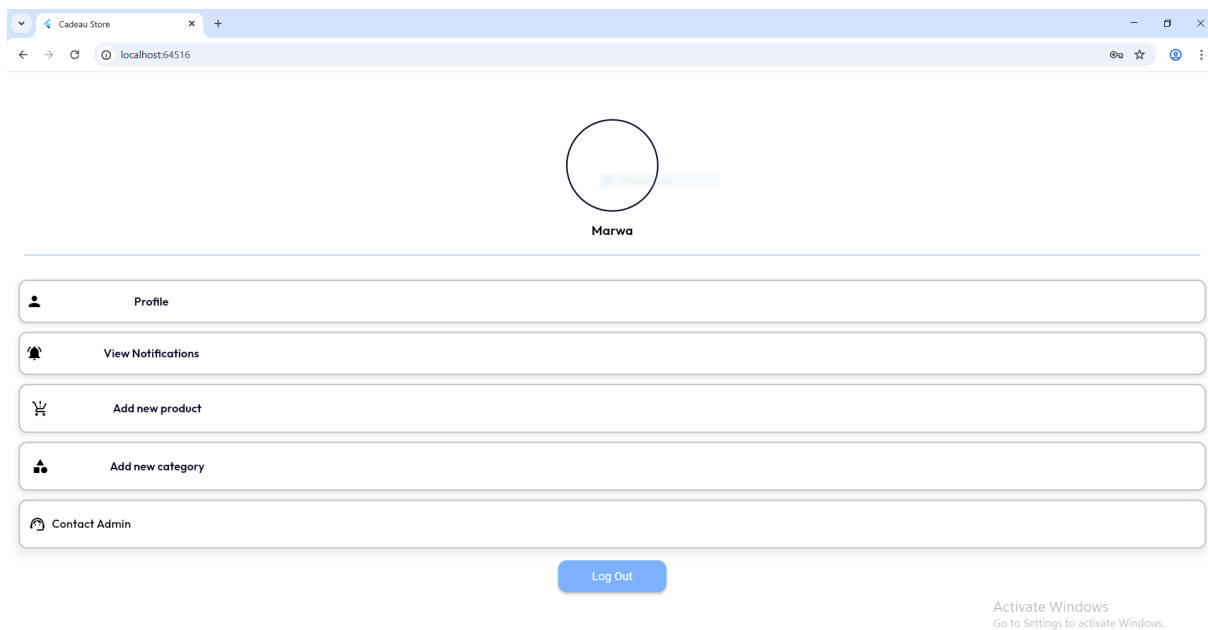
(b) Admin changing password



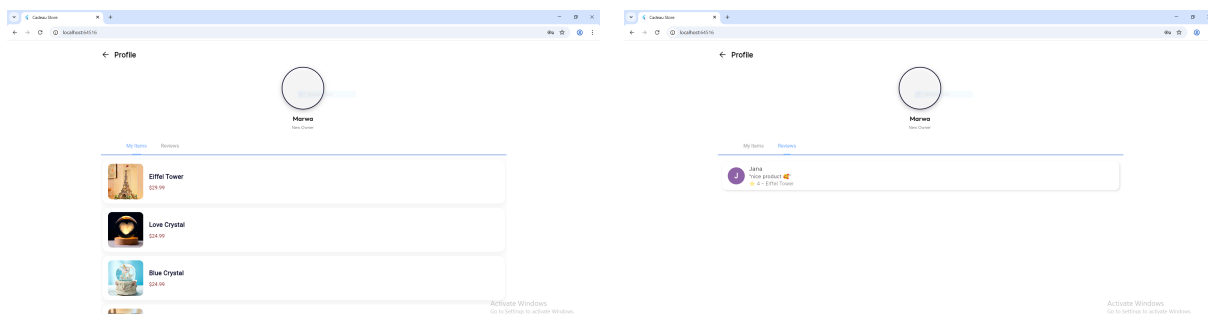
(c) Admin Log out

Figure 4.144: Admin settings

### 4.3.10 Owner's menu and profile



(a) Owner's menu

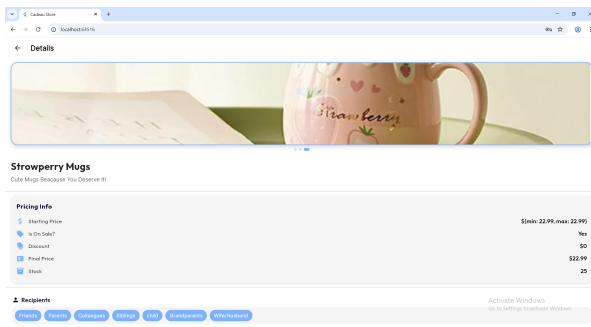


(b) Owner's items

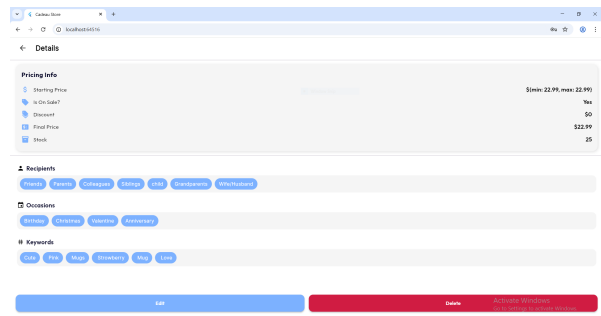
(c) Owner's item's reviews

Figure 4.145: Owner menu and profile.

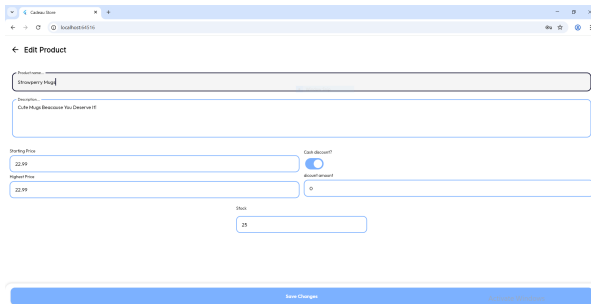
### 4.3.11 Product display for Owner



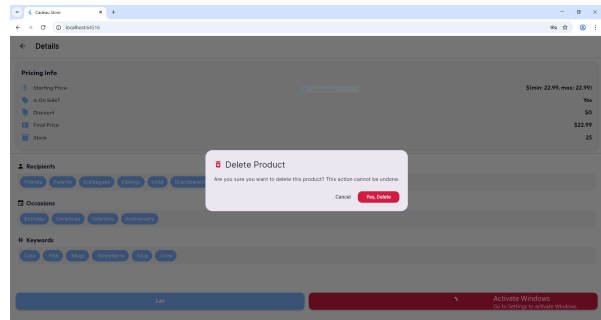
(a) Items display



(b) Items display 2



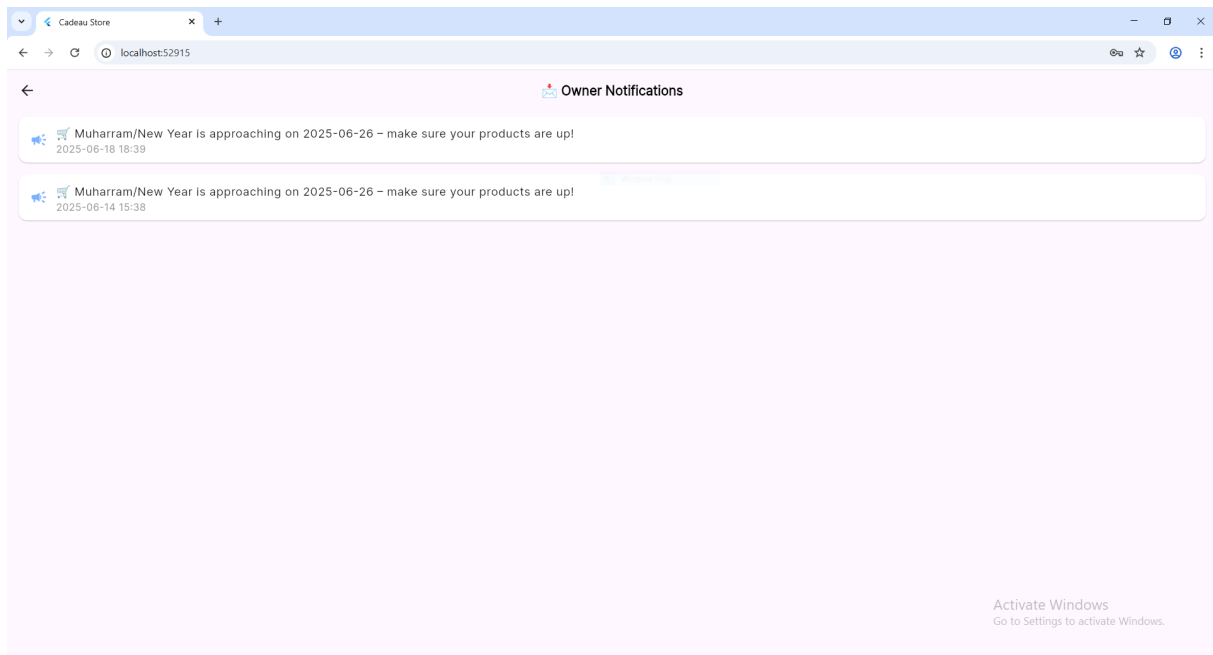
(c) Owner's items edit



(d) Owner's items delete

Figure 4.146: Product display for Owner.

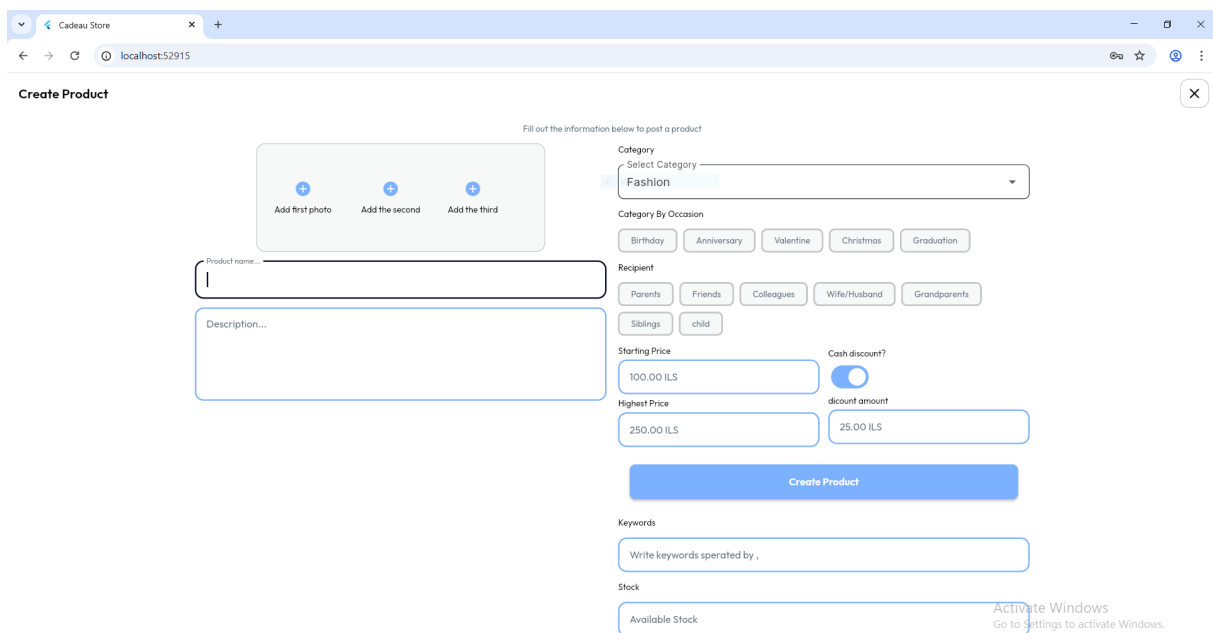
### 4.3.12 Owner's notification page



(a) notification page

Figure 4.147: Owner's notification page.

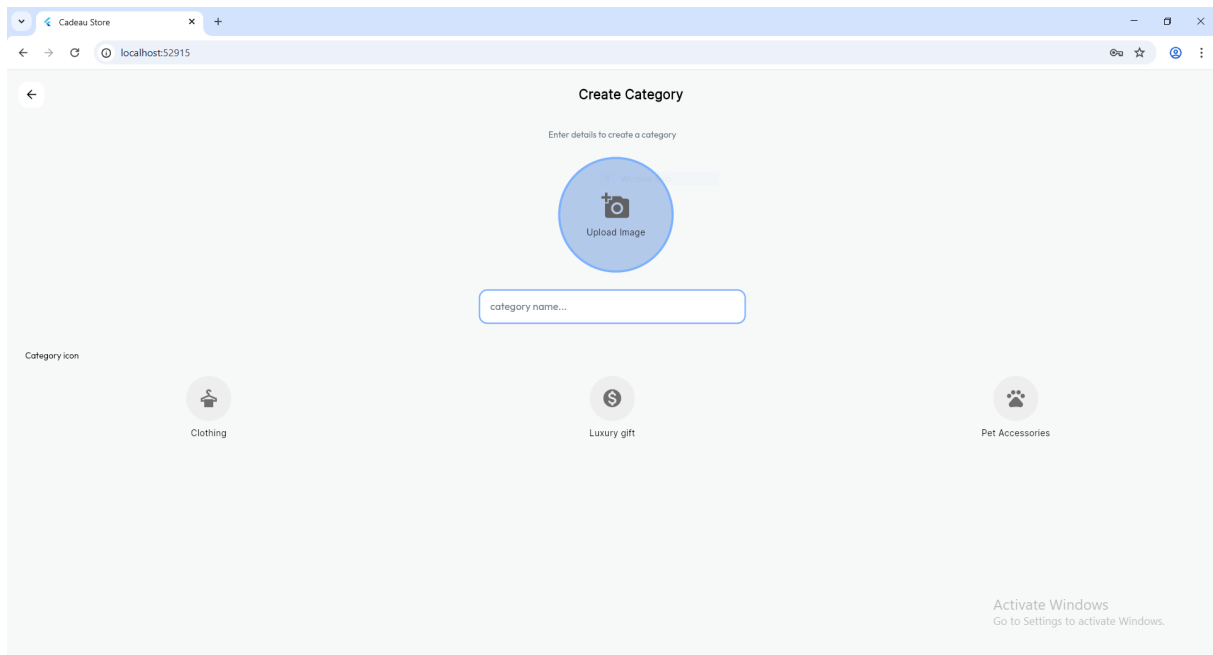
### 4.3.13 Add product page for Owner



(a) Add product

Figure 4.148: Add product page for Owner.

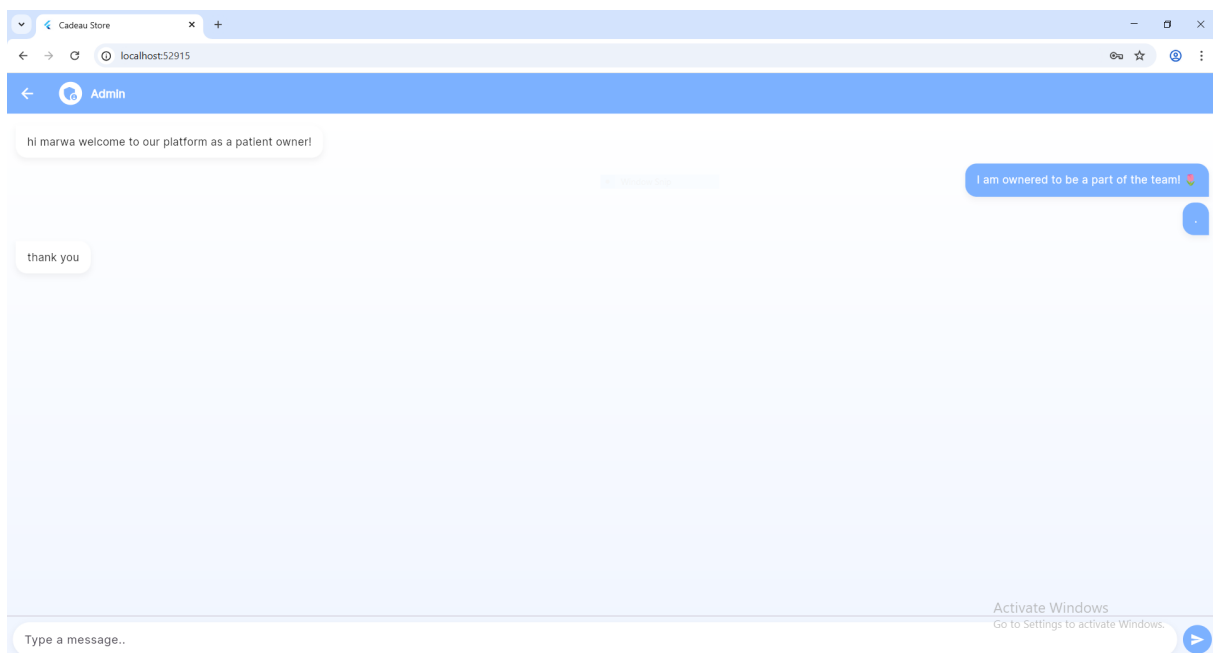
### 4.3.14 Add Category page for Owner



(a) Add Category

Figure 4.149: Add Category page for Owner.

### 4.3.15 Messaging Admin



(a) Add Category

Figure 4.150: Messaging Admin page for Owner Marwa.

### 4.3.16 Customer

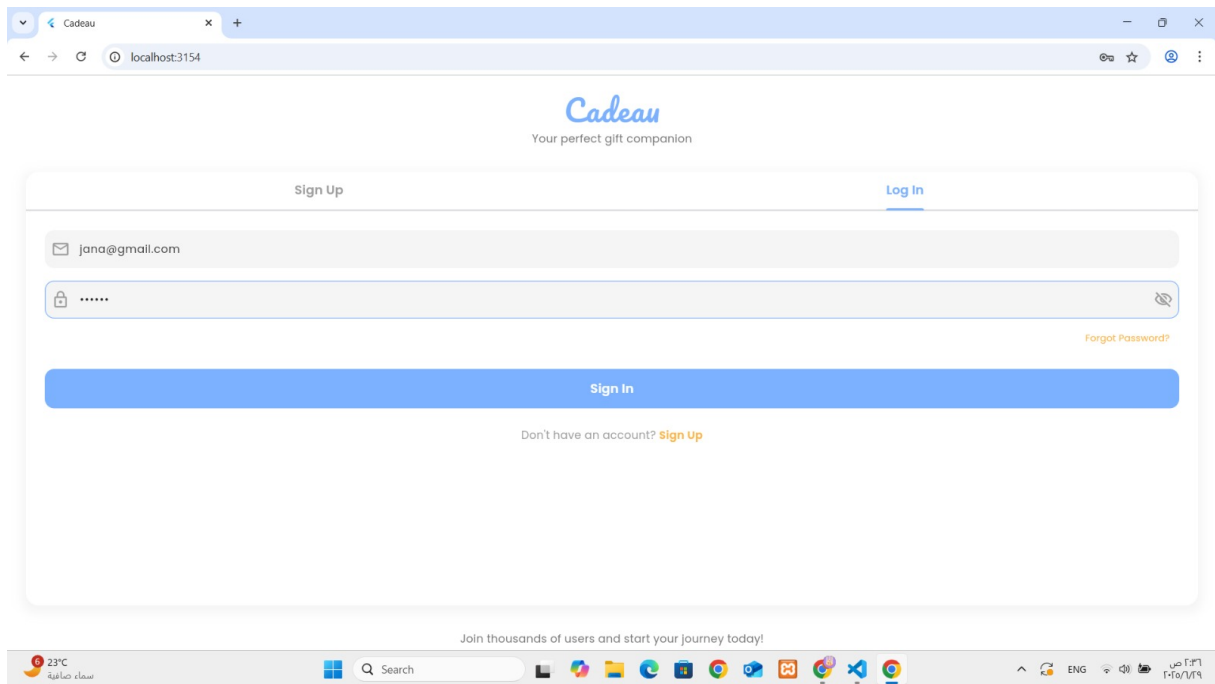


Figure 4.151: Customer login

### 4.3.17 Customer Home Page

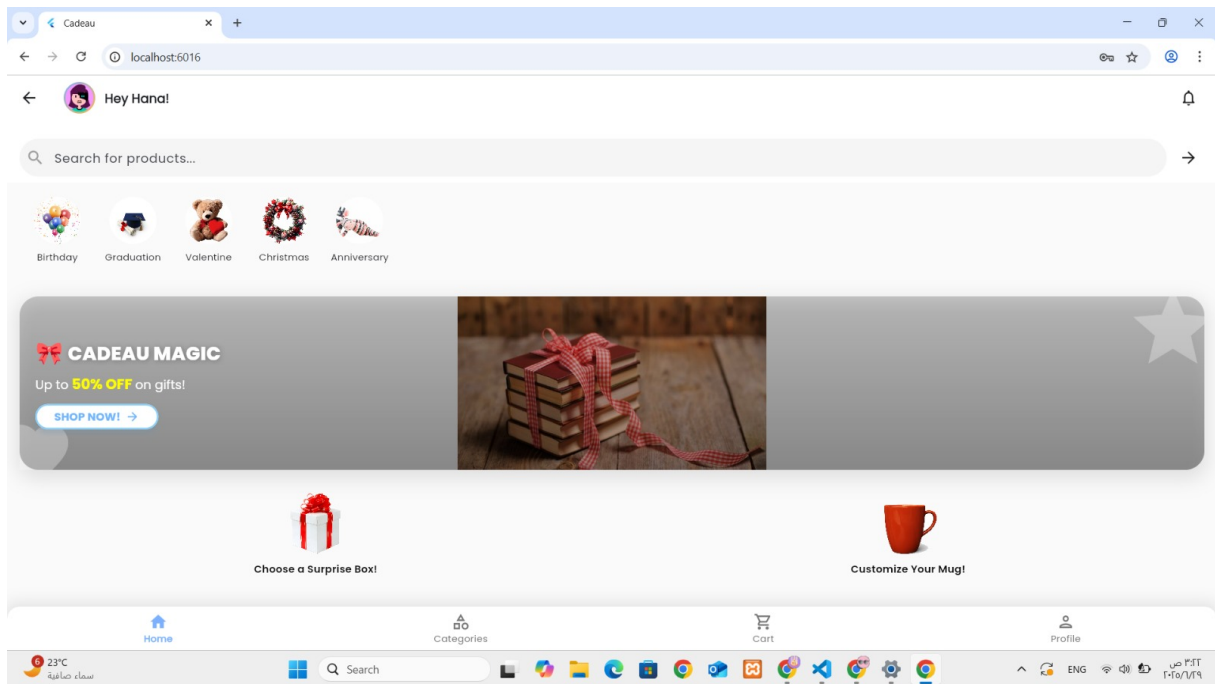


Figure 4.152: Customer home page

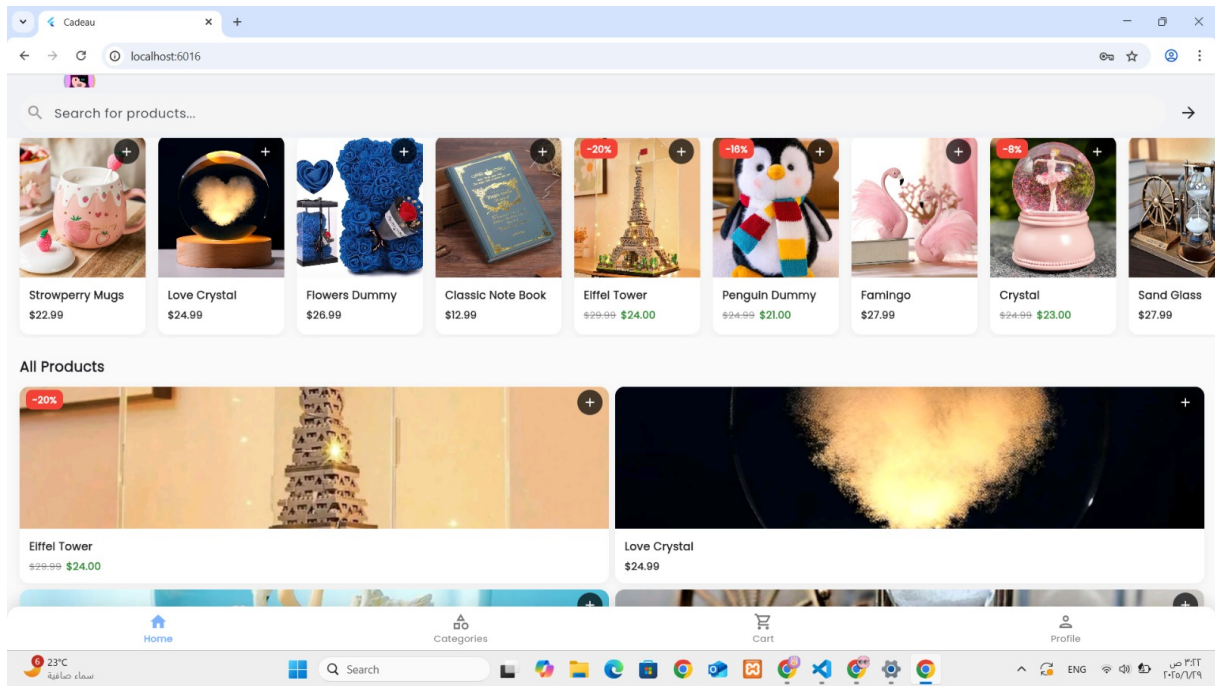


Figure 4.153: Customer home page

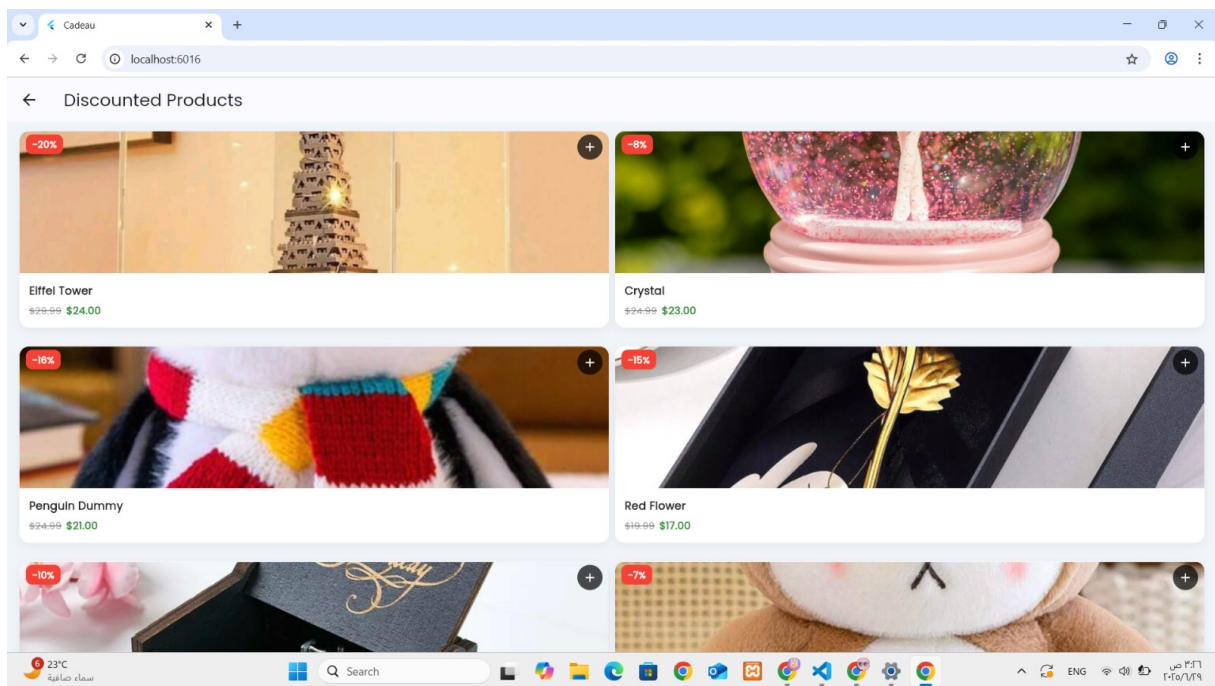


Figure 4.154: Discounted Products

### 4.3.18 Customer's Assistant Ai Avatar

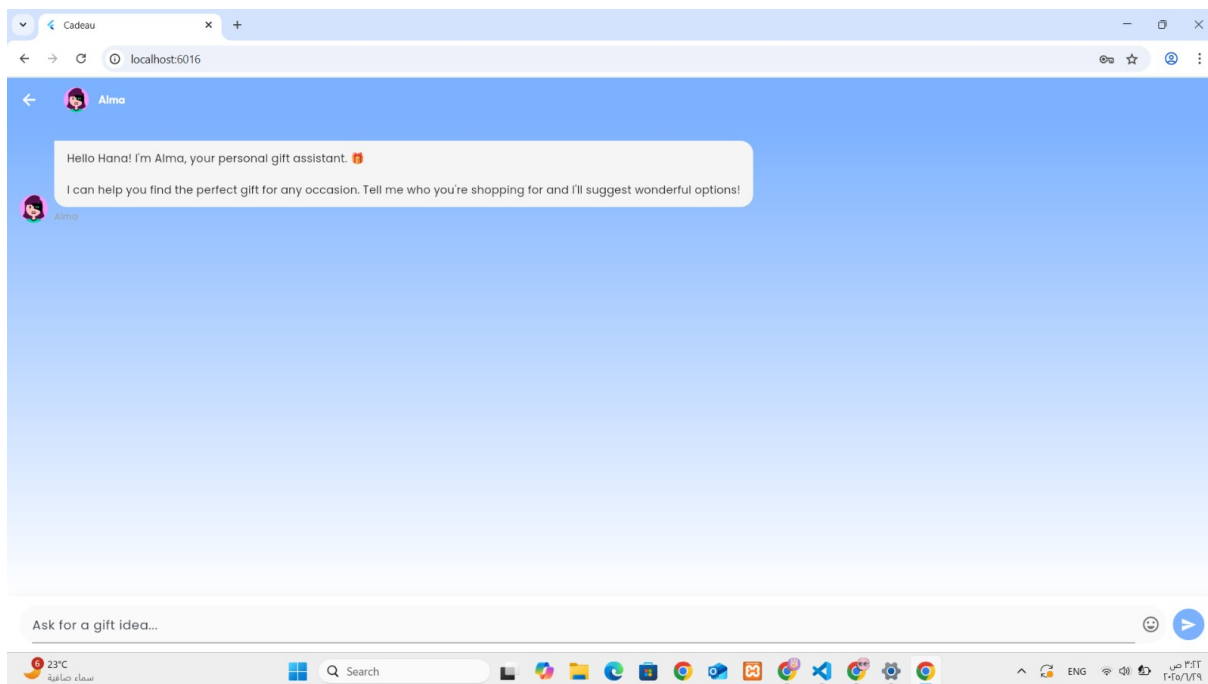


Figure 4.155: Ai Avatar

### 4.3.19 Filter Products by occasion

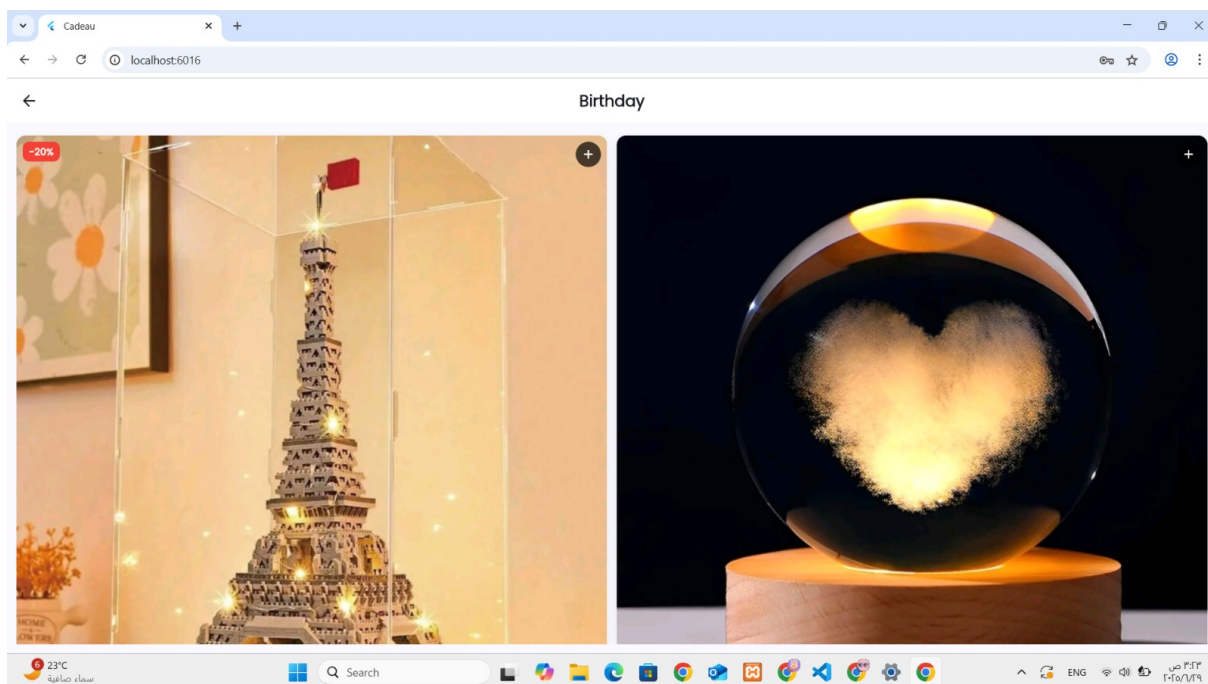


Figure 4.156: Filter Products by occasion

### 4.3.20 Surprise GiftBox

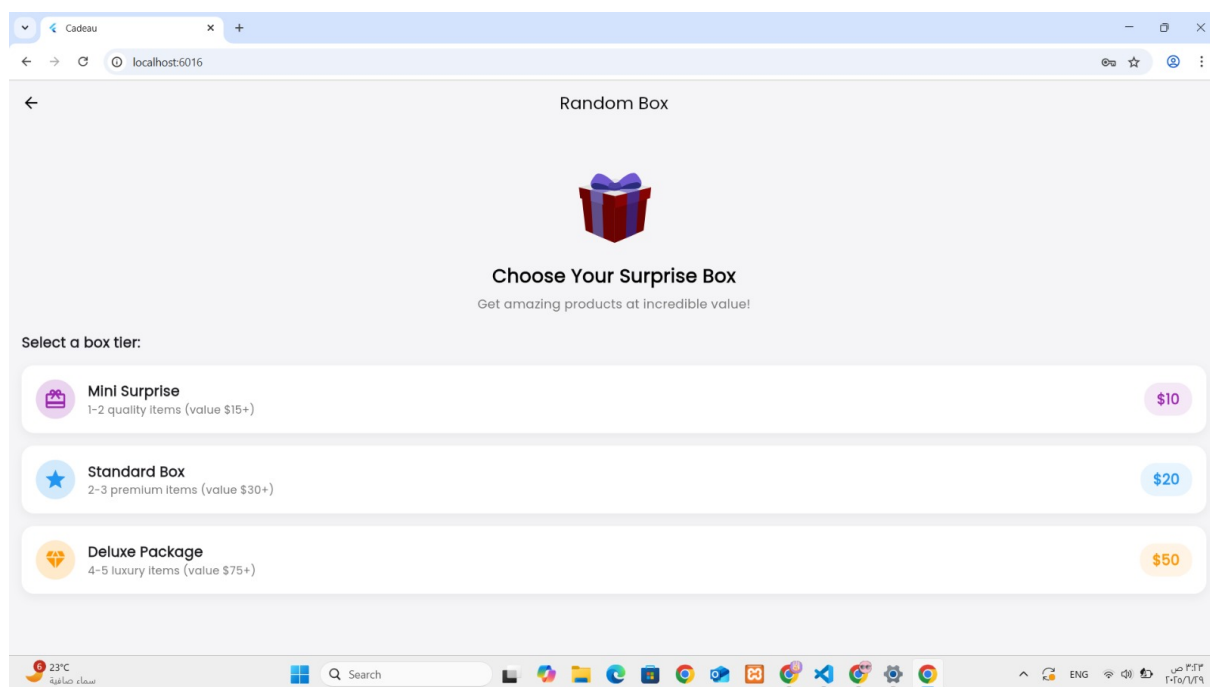


Figure 4.157: Surprise GiftBox

### 4.3.21 Product Details

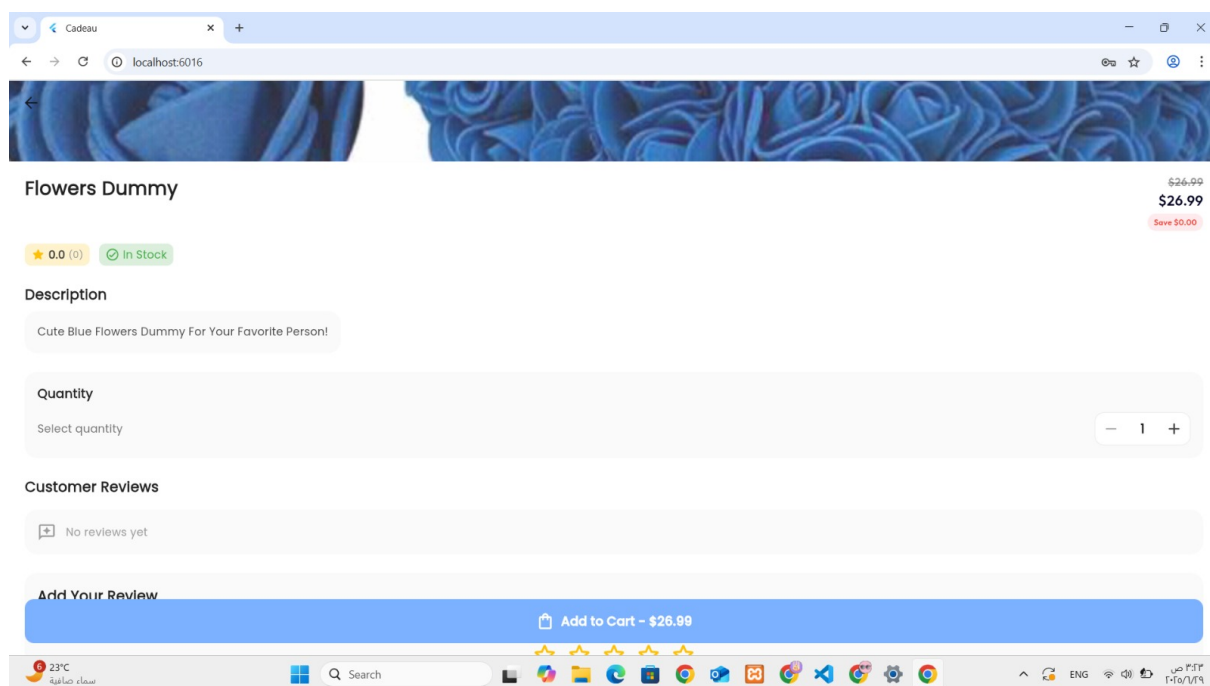


Figure 4.158: Product Details

### 4.3.22 Categories

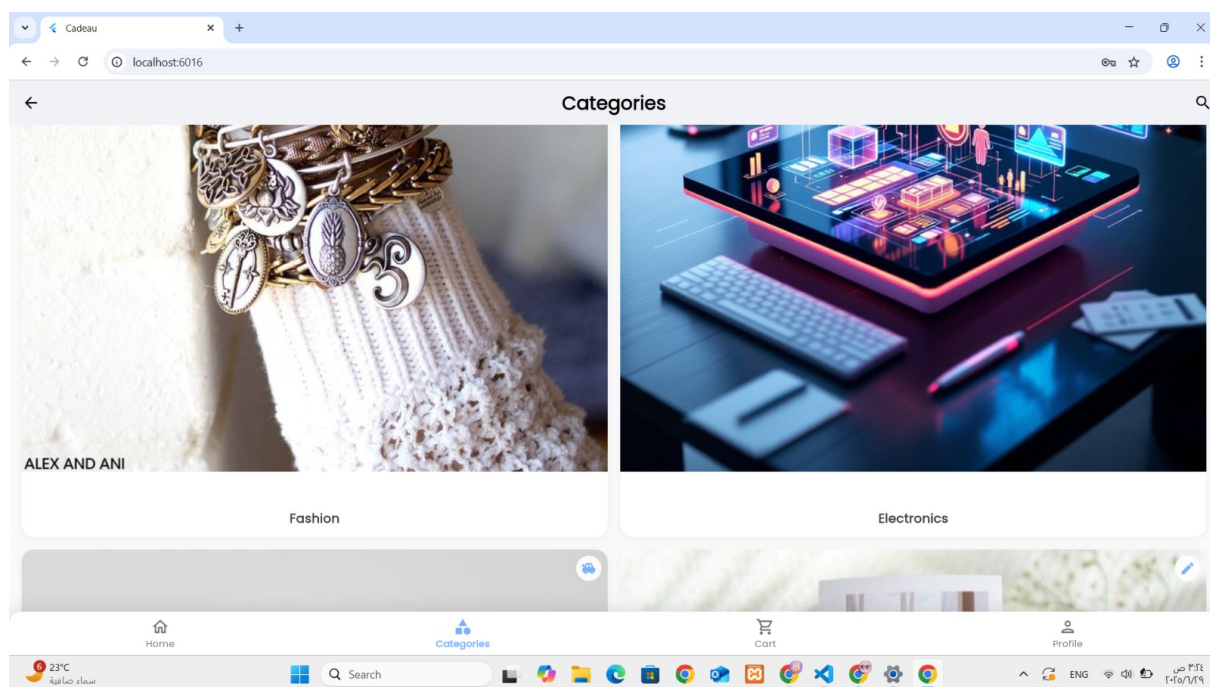


Figure 4.159: Categories

### 4.3.23 Filter By Categories

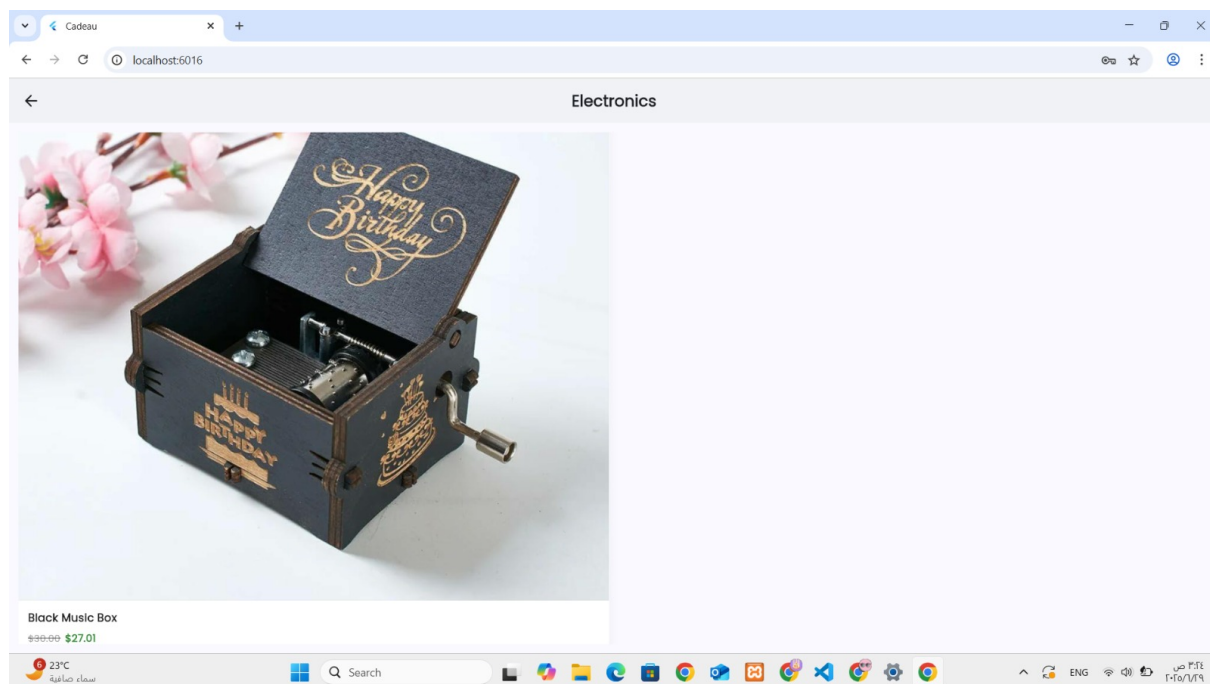


Figure 4.160: Filter By Categories

### 4.3.24 Customer Cart

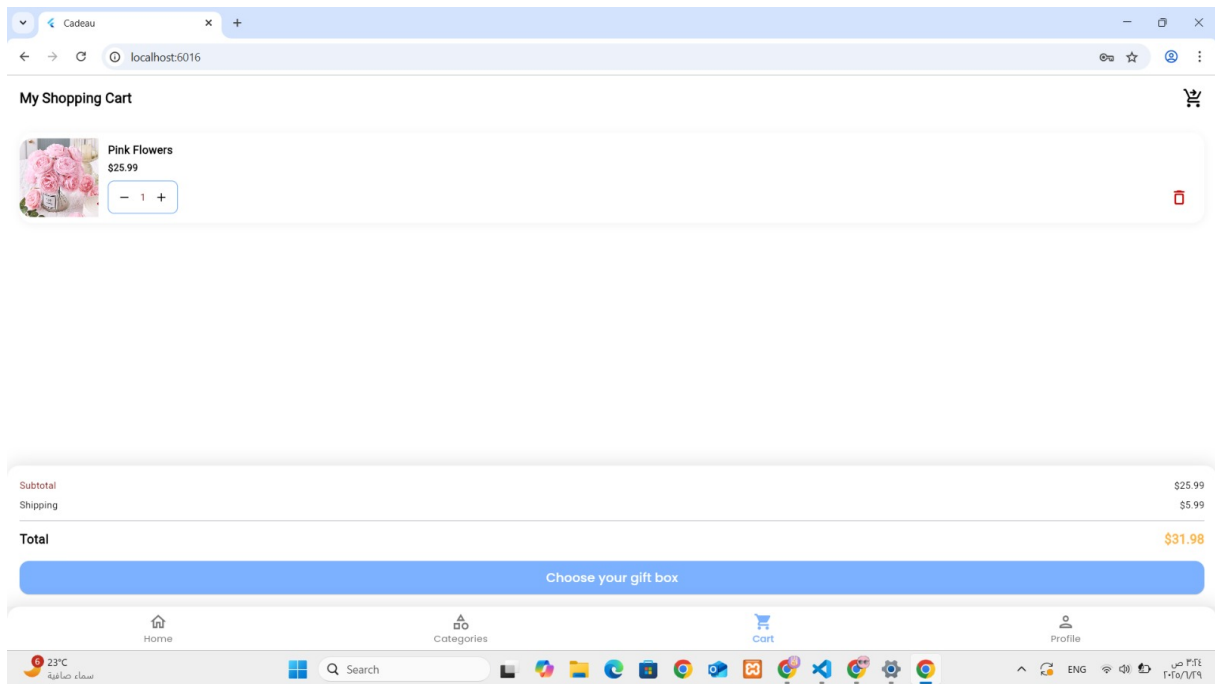


Figure 4.161: User's Cart

### 4.3.25 3D Gift Box

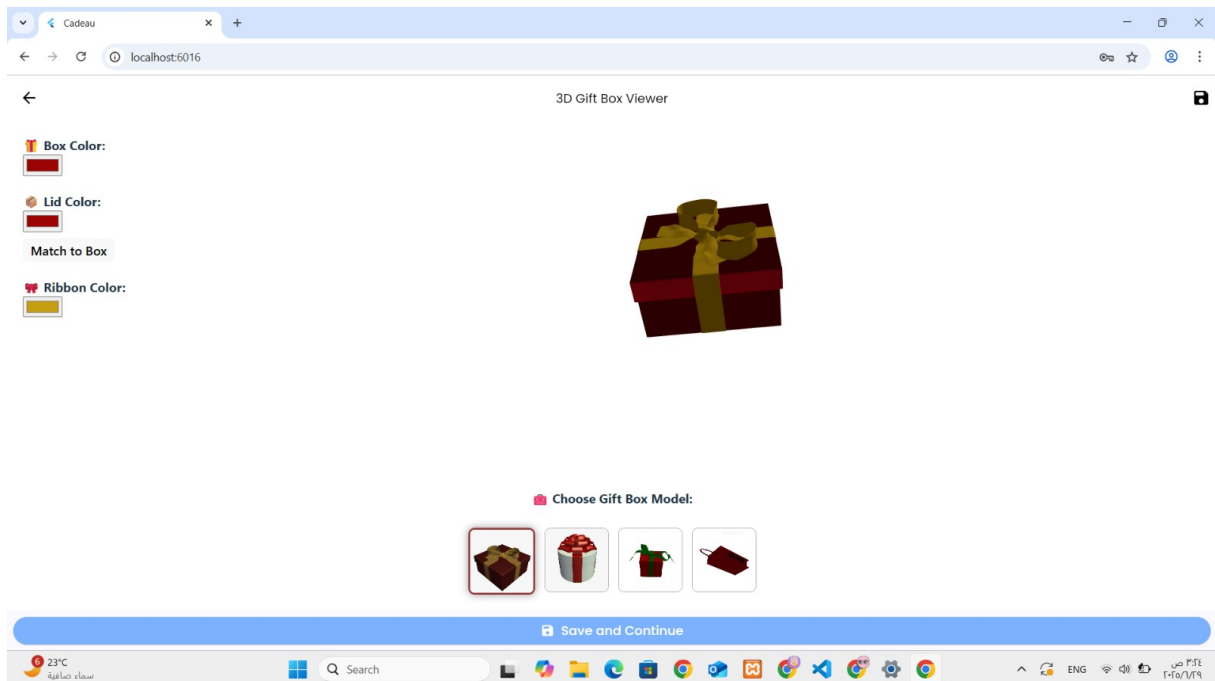


Figure 4.162: 3D Gift box1

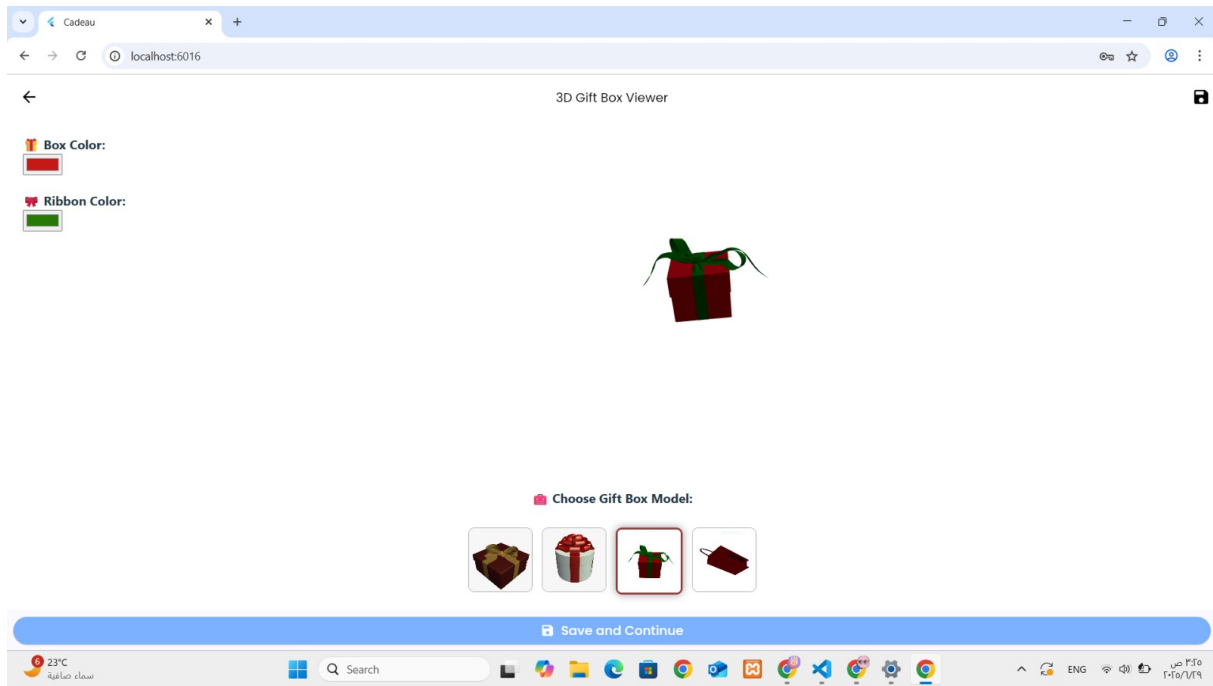


Figure 4.163: 3D Gift box2

### 4.3.26 Customer's Orders

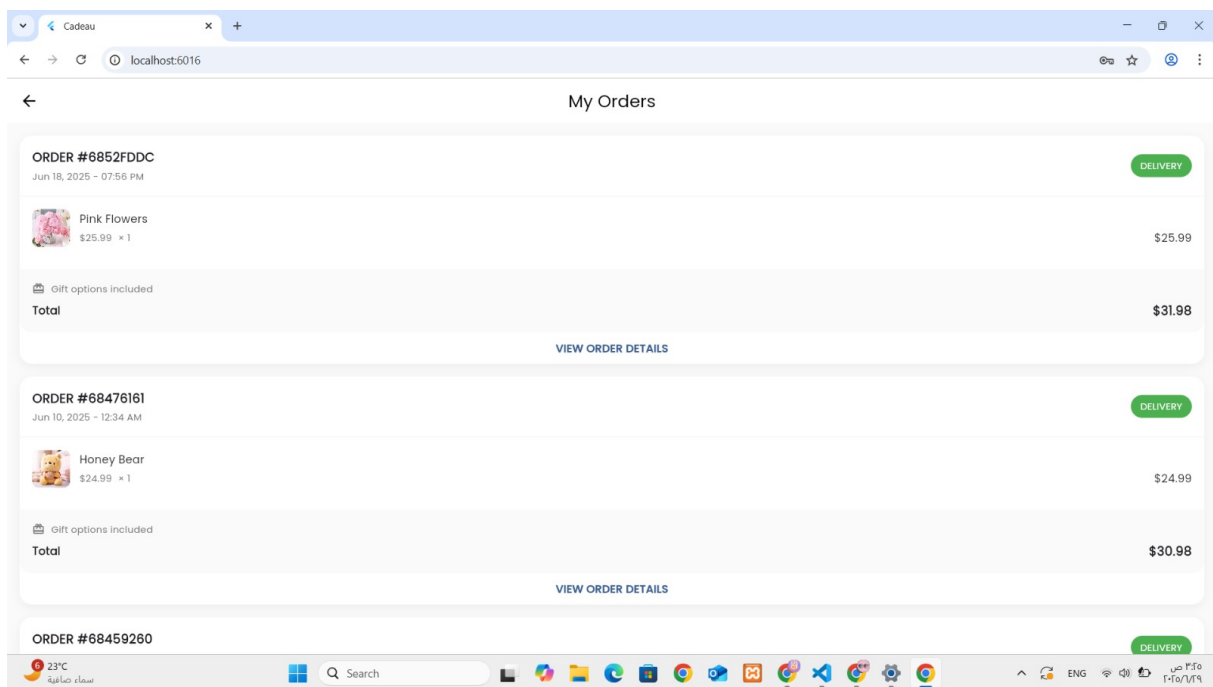


Figure 4.164: User's Orders

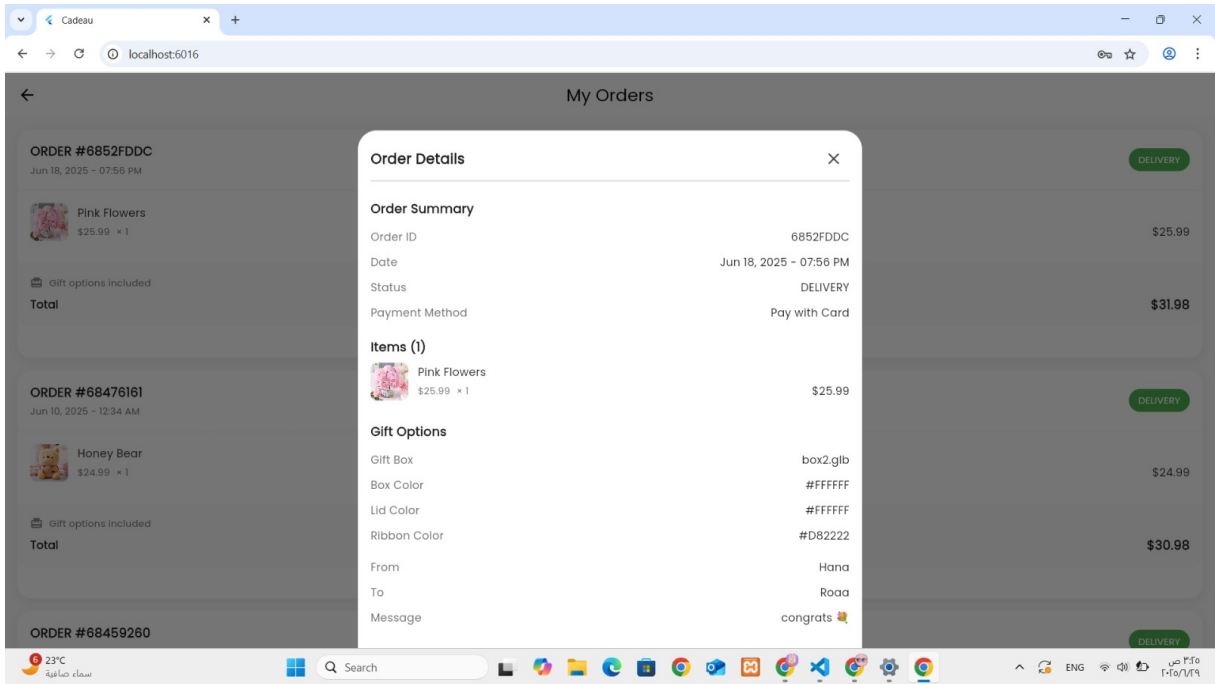


Figure 4.165: Order's Details

### 4.3.27 Customer's Profile

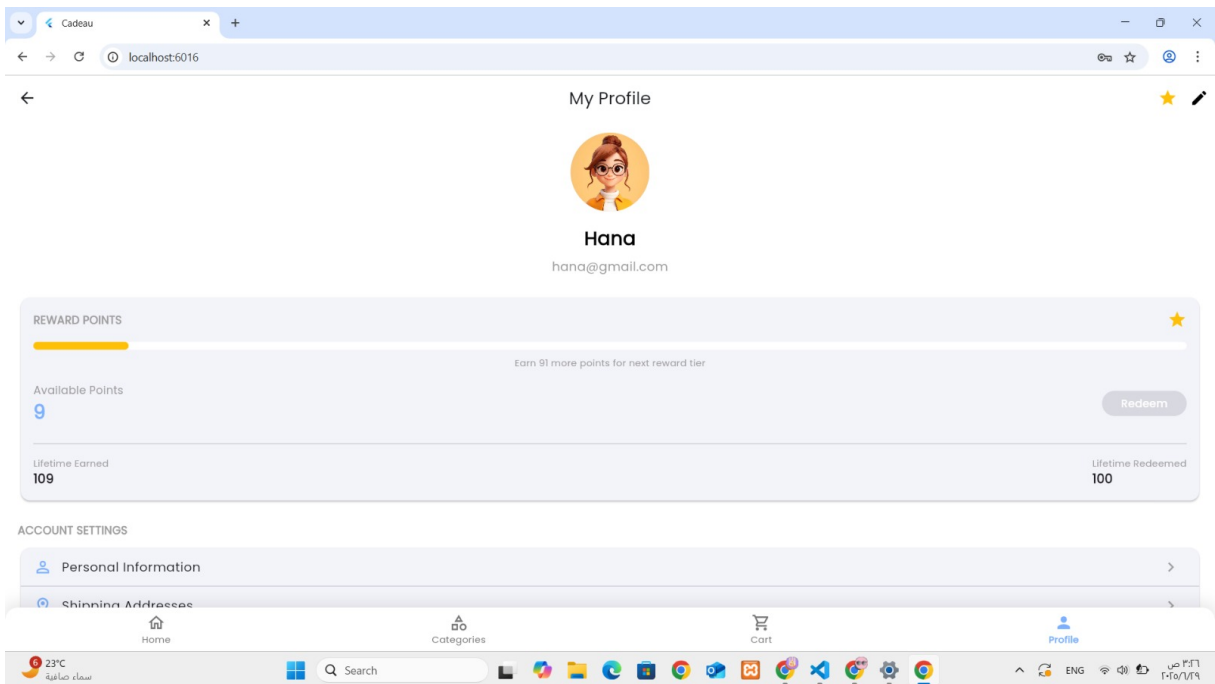


Figure 4.166: User's Profile

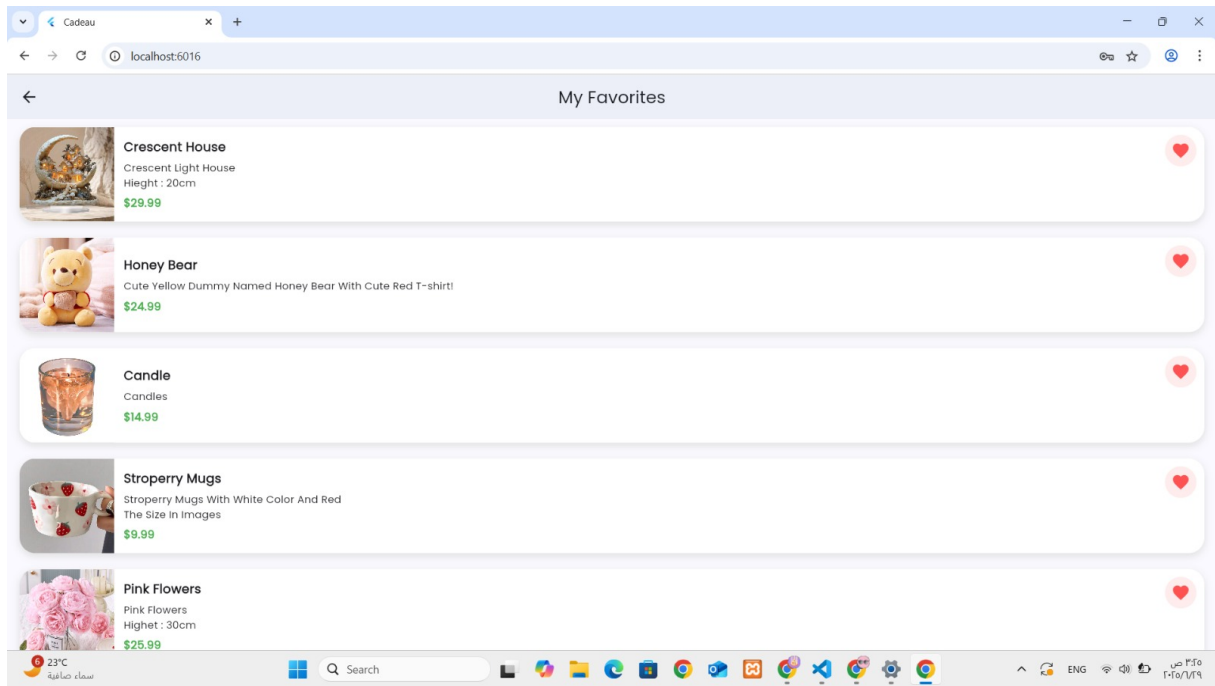


Figure 4.167: User's wishlist

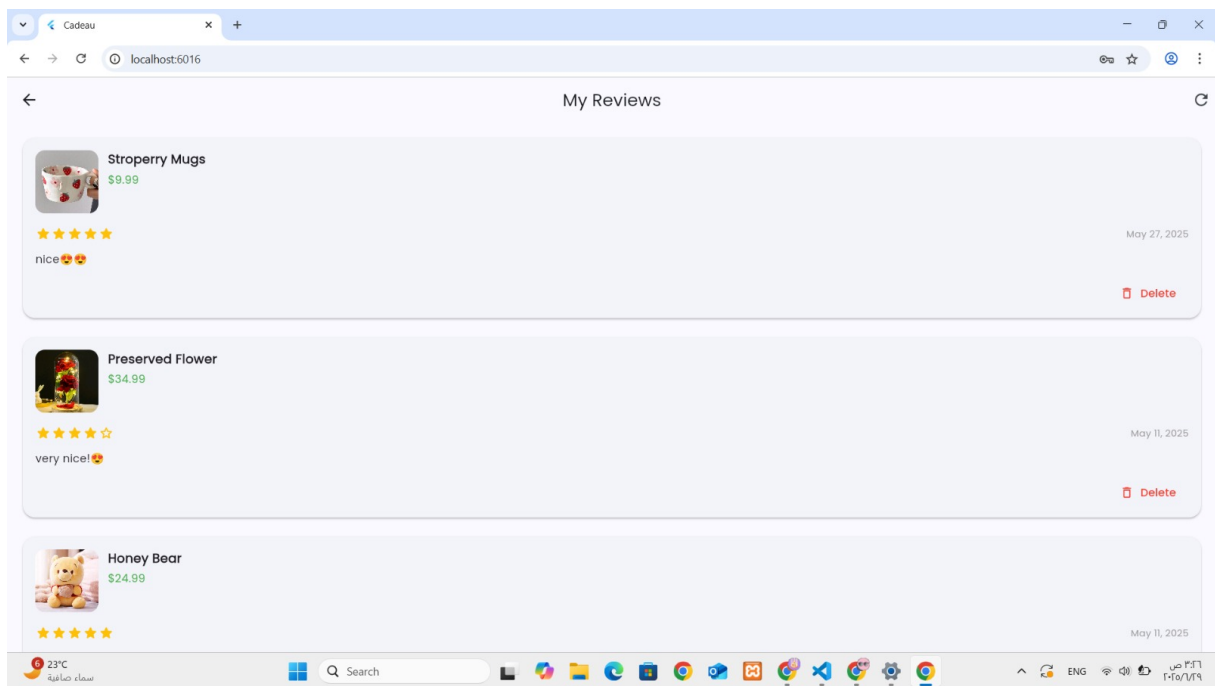


Figure 4.168: User's reviews

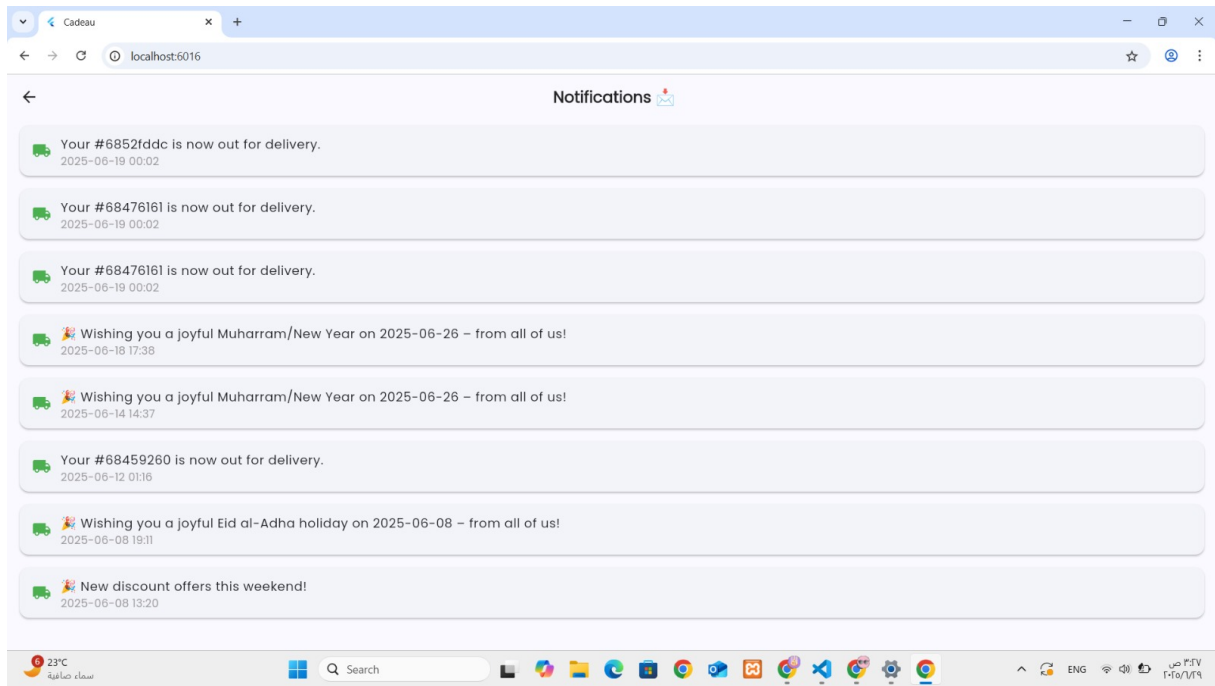


Figure 4.169: User's Notifications

# Results and Discussion

## 5.1 Results

The Cadeau platform—comprising a mobile application and integrated web components—was designed to deliver a personalized and seamless gifting experience. Throughout development and testing, the following functionalities were successfully implemented and validated:

- **Authentication and User Roles:** The app allows users to sign up, log in securely, and perform role-based actions as admin, owners, or customers.
- **AI Avatar and Assistance:** A virtual AI-powered avatar helps users navigate the platform, recommend gifts, and enhance the overall user journey.
- **Interactive Product Listings:** Business owners can upload and manage products, including details like suggested recipients, occasions, discounts, and images. Real user reviews and ratings are also supported.
- **Admin Management Tools:** Admins can monitor all users, products, categories, announcements, and orders through a centralized dashboard, complete with visual analytics and feedback systems.
- **Notifications and Messaging:** A role-specific notification system is integrated for both admin and owners, along with direct messaging functionality to improve

communication.

- **3D Customization Support:** Users can view real-time 3D previews of gift boxes and cups with selectable options for color, stickers, and quantity, powered by a React Three.js module.
- **Smart Occasions Handling:** Admins can view and respond to upcoming holidays through an integrated calendar, allowing them to send timely announcements using dynamic templates.
- **Surprise Mode and Rewards:** Customers can enjoy a gamified shopping experience with mystery gifts and earn points for continued engagement.

## 5.2 Discussion

Cadeau combines modern UI/UX practices with powerful backend architecture to create an innovative and emotion-driven shopping platform. Key innovations such as the AI avatar, dynamic occasion-based messaging, and real-time 3D previews set it apart from traditional e-commerce platforms.

The modular structure of the app ensured smooth implementation of complex features like role-specific access control, interactive dashboards, and owner-customer interactions. Integrating 3D product previews with the Flutter frontend via a WebView bridge was a major technical achievement that enabled high customization without sacrificing usability.

The platform succeeded in aligning user expectations with modern software capabilities, ensuring that customers, business owners, and admin all benefit from personalized, interactive tools that enrich the gifting experience.

## 5.3 Achievements

- Developed and maintained platform parity across web and mobile views.

- Successfully integrated and displayed dynamic 3D models using Three.js and React within a Flutter environment.
- Designed and implemented a secure and scalable backend using Node.js, Express, and MongoDB.
- Enabled interactive customization of products with real-time feedback.
- Built intelligent systems for AI-generated content, avatar recommendations, and gamified shopping.
- Delivered a professional administrative interface that centralizes operations and boosts decision-making through integrated analytics.

# Conclusion and Future Work

## 6.1 Conclusion

Cadeau exemplifies the fusion of emotional intelligence and technology within the gifting domain. By prioritizing user experience and personalization, it transforms gift shopping from a routine activity into a guided, joyful journey. From product browsing to AI-powered suggestions and 3D previews, every aspect of Cadeau was designed with creativity and ease-of-use in mind.

The platform demonstrates how digital tools can elevate traditional practices, empower local businesses, and bring communities closer through meaningful interactions. Admin, owner, and user interfaces work together seamlessly to maintain operational efficiency while fostering emotional connection and personal expression.

## 6.2 Future Work

While Cadeau successfully delivers its core objectives, the following enhancements are proposed to expand functionality and improve user experience:

1. **Multi-language Support:** Enable users to change the application language dynamically, improving accessibility for global users.
2. **Currency Selection:** Extend the currency system to support conversions, allowing

customers to view and pay using their preferred currencies.

3. **Custom Delivery Location:** Although the current implementation detects the user's location automatically, future versions will allow users to manually select a different delivery location, enhancing flexibility for gifting to others.
4. **Advanced AI Avatar Capabilities:** Evolve the AI avatar from a recommendation engine into a full help center that can answer FAQs, guide users step-by-step, and provide support across the app.
5. **Expanded 3D Product Catalog:** Introduce more product types with full 3D previews to give users a more accurate understanding of size, shape, and design before purchasing, increasing buyer confidence and reducing return rates.

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