

Laza Mobile Application Project Report

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1. Introduction:

The Laza Mobile Application is a Flutter-based e-commerce mobile app inspired by the *Laza* UI design. The project was developed as a final project for the **Mobile Programming** course. The main goal of the application is to provide users with a modern, responsive, and user-friendly shopping experience, while applying real-world mobile development concepts such as API integration, Firebase authentication, and clean project architecture.

2. Project Objectives:

The primary objectives of this project are:

- To design and implement a modern mobile UI inspired by the Laza design.
 - To develop a fully functional Flutter application.
 - To integrate external APIs for product data.
 - To use Firebase for authentication and user management.
 - To apply clean code structure and modular architecture.
 - To gain hands-on experience with mobile app development using Flutter.
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3. Technologies Used:

3.1 Flutter & Dart

- Flutter framework for cross-platform mobile development.
- Dart programming language for application logic.

3.2 Firebase

- **Firebase Authentication:** User sign-up, login, and logout.
- **Cloud Firestore:** Storing user data and future scalability for cart and favorites.

3.3 REST API

- External REST API (FakeStore API) used to fetch product data dynamically.

3.4 Development Tools

- Visual Studio Code
- Android Emulator
- Flutter SDK
- Firebase Console

4. Application Features:

4.1 Authentication

- User registration using email and password.
- User login and logout.
- Authentication state persistence using Firebase.

The image contains two screenshots of the Firebase console interface, demonstrating the integration of authentication and real-time databases.

Screenshot 1: Authentication Section

This screenshot shows the Authentication section of the Firebase console. It displays a list of users with their email addresses, creation dates, sign-in times, and unique user IDs. A message at the top indicates that certain authentication features will stop working when Firebase Dynamic Links shuts down soon.

Identifier	Providers	Created	Signed In	User ID
jerome@test.com	Email	Dec 26, 2025	Dec 26, 2025	vMw69YDJSjDuHMsDIQgr...
test@test.com	Email	Dec 26, 2025	Dec 26, 2025	QX8k4f44qehNh2df5bEphle...
student@test.com	Email	Dec 26, 2025	Dec 26, 2025	OBwOsQ2TWCRXWh6Ex5vfNNNToi1

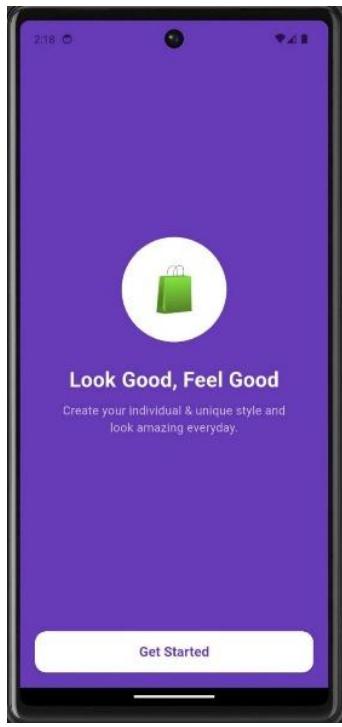
Screenshot 2: Firestore Database Section

This screenshot shows the Cloud Firestore section of the Firebase console. It displays a document structure under the 'users' collection. The document 'OBwOsQ2TWCRXWh6Ex5vfNNNToi1' contains fields for 'email' (student@test.com) and 'createdAt' (December 26, 2025 at 3:21:30 AM UTC+2).

```
graph TD; users((users)) --> OBwOsQ2TWCRXWh6Ex5vfNNNToi1[OBwOsQ2TWCRXWh6Ex5vfNNNToi1]; OBwOsQ2TWCRXWh6Ex5vfNNNToi1 --> email["email: student@test.com"]; OBwOsQ2TWCRXWh6Ex5vfNNNToi1 --> createdAt["createdAt: December 26, 2025 at 3:21:30 AM UTC+2"];
```

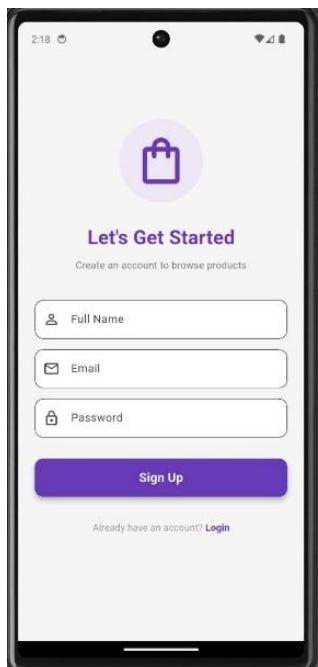
4.2 Welcome / Onboarding Screen

- Presents a motivational message encouraging user engagement.
- Includes a clear call-to-action button (“**Get Started**”) to begin the registration process.



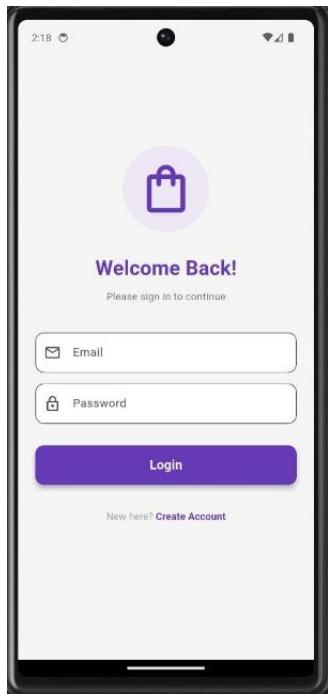
4.3 Sign-Up Screen

- Guides new users through account creation using name, email, and password fields.
- Includes navigation back to the login screen for existing users.



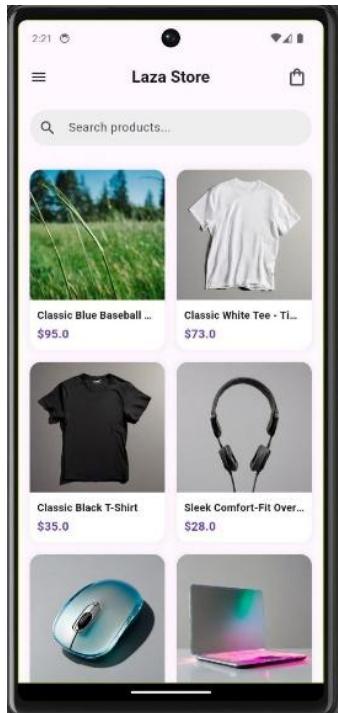
4.4 Login Screen

- Prompts returning users to sign in using email and password.
- Provides an option for new users to navigate to the sign-up screen.



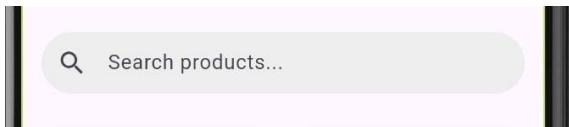
4.5 Home Screen

- Displays a list of products fetched from the API.
- Clean and modern UI layout.



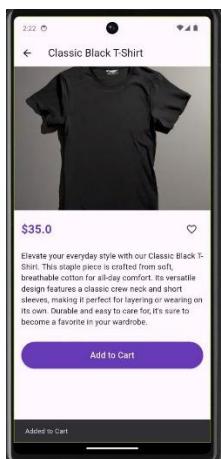
4.6 Home Search Screen

- Displays search functionality with placeholder text.
- Provides quick access to browse available products.



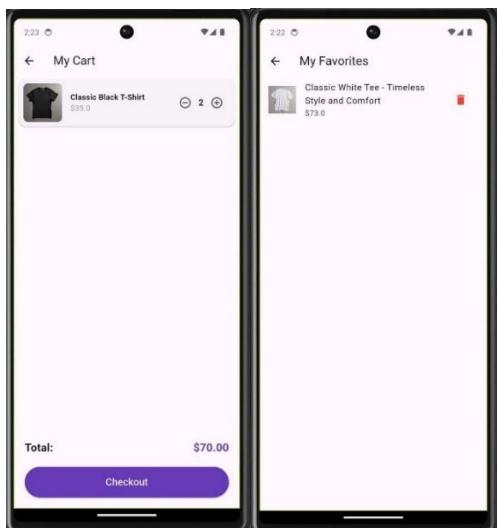
4.7 Product Details

- Detailed view for each product.
- Displays product image, price, and description.



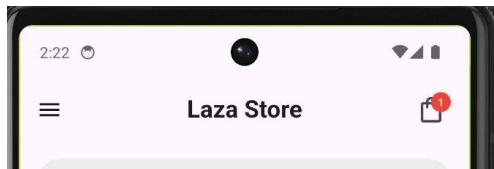
4.8 Cart & Favorites

- Add products to cart.
- Add products to favorites.
- Ready for Firestore integration



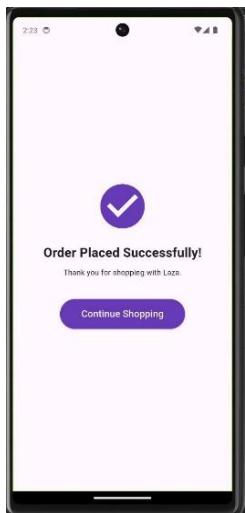
4.9 Store Header

- Features a cart icon with a real-time item counter, allowing users to easily track the number of products added to their cart.



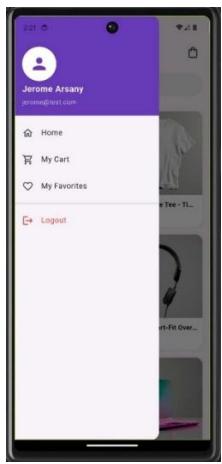
4.10 Order Confirmation Screen

- Displays a success message confirming the successful placement of the order.
- Includes a call-to-action button that allows users to continue shopping.



4.11 Profile Screen

- Displays user information.
- Logout functionality.



5. Project Structure:

The project follows a modular and scalable folder structure:

```
lib/
  └── main.dart
  └── firebase_options.dart

  └── models/
    ├── product.dart
    ├── user.dart
    └── cart_item.dart

  └── services/
    ├── api_service.dart
    └── firebase_service.dart

  └── screens/
    ├── login_screen.dart
    ├── home_screen.dart
    ├── product_details_screen.dart
    ├── cart_screen.dart
    ├── favorites_screen.dart
    └── profile_screen.dart

  └── widgets/
    ├── product_card.dart
    └── custom_button.dart

  └── utils/
    └── constants.dart
```

This structure ensures readability, maintainability, and scalability.

6. Database Design:

6.1 Firestore Collections

- **users**
 - userId
 - email
 - createdAt

Future extensions may include:

- cart
 - favorites
 - orders
-

7. Application Flow:

1. App starts and initializes Firebase.
 2. Authentication state is checked.
 3. User is redirected to Login or Home screen.
 4. Products are fetched from API.
 5. User interacts with products (view, add to cart, favorites).
 6. User data is stored securely in Firebase.
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8. Challenges Faced:

- Firebase setup and configuration issues.
- Android SDK and emulator configuration.
- UI consistency with Laza design.
- Managing state and navigation efficiently.

These challenges were resolved through debugging, documentation review, and testing.

9. Future Improvements:

- Full Firestore integration for cart and favorites.
 - Payment gateway integration.
 - Search and filter functionality.
 - Improved animations and UI enhancements.
 - Admin panel for product management.
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10. Conclusion:

The Laza Mobile Application successfully demonstrates the use of Flutter for building modern mobile applications integrated with Firebase and REST APIs. The project meets its objectives and provides a strong foundation for future expansion. Through this project, valuable experience was gained in mobile app architecture, Firebase services, and real-world Flutter development.

11. References:

- Flutter Documentation
 - Firebase Documentation
 - FakeStore API
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