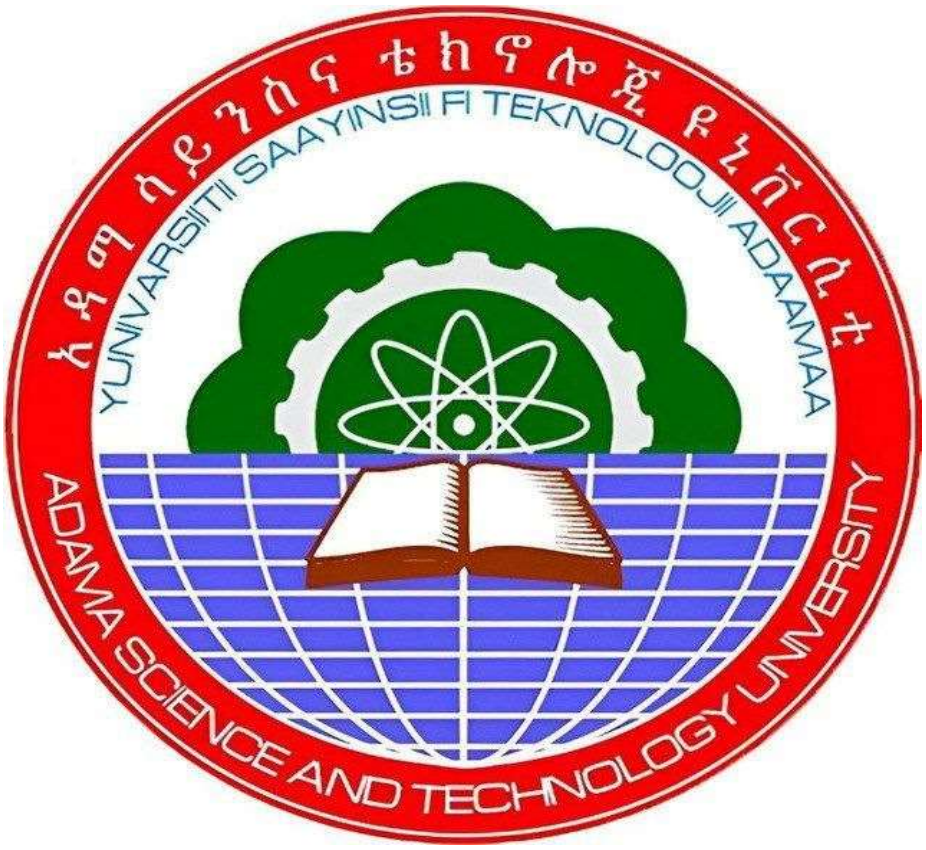


Adama Science and Technology University School of Electrical Engineering and Computing Software Engineering Mobile Application Design and Development

Betachin App

Department-software

Submitted on: May 2, 2025 Section-3

Name	Id
1.Abenezer Abebe	Ugr/30068/15
2.Aschalew Daraje	Ugr/30188/15
3.Aman Abdela	Ugr/30134/15
4.Bemnet Mussa	Ugr/30257/15
5.Etsehiwot Mengistu	Ugr/25562/14

1. Project Overview

The Betachin mobile application is designed to bridge the gap between property owners and potential buyers or renters in the Ethiopian real estate market. With the increasing demand for streamlined property search solutions, Betachin offers a user-friendly platform that enables users to sign up, log in, log out, and list properties for sale or rent.

Users can browse and search for available properties, add favorites, and contact owners directly. Property owners are given full control over their listings through options to edit, delist (mark inactive), or delete properties entirely. Deleted properties are removed from all pages and Supabase storage, while delisted properties remain visible only to their owners and are marked "inactive". The app also includes profile management and favorites page that are accessible only to the account owner.

2. User Requirements

For Property Seekers:

- View available properties for rent and sale
- Filter by criteria (price, type, location)
- View full property details with owner contact
- Save favorite listings
- Secure user authentication

For Property Owners:

- Create and manage property listings
- Add property images and descriptions
- Delist properties (inactive viewable only to them)
- Delete listings (permanently removed)

For All Users:

- Secure sign up, login, logout
- Manage profile settings
- Access personalized favorites
- No one can access another user's profile or favorites
- These user needs shaped the application's features, flow, and Supabase role-based access control.

3. Design Concepts

3.1 UI Design

- Color: Primary theme of blue and white with accent green
- Layout: Card-style for property display, clear hierarchy
- Fonts: Modern sans-serif for clarity
- Icons: Simple and meaningful

3.2 UX Design

- Seamless navigation with bottom tabs
- Progressive disclosure of content
- Clear error handling and confirmations
- Accessibility considerations

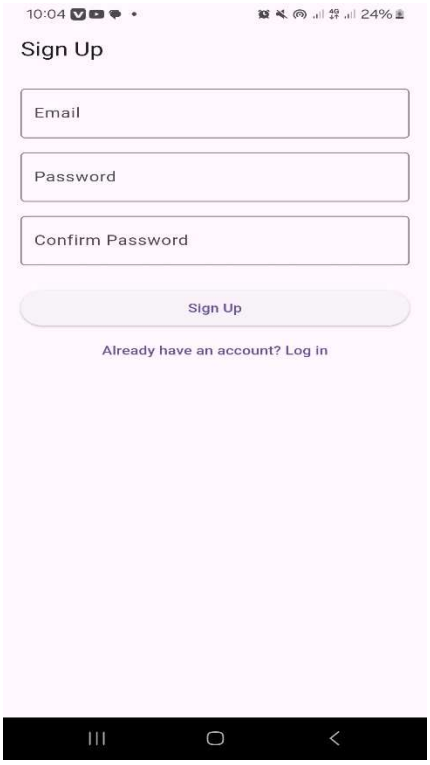
3.*3 Navigation Flow*

- Home (View Listings)
- My Properties (User Listings)
- Add Property(in My Property page)
- Favorites
- Profile

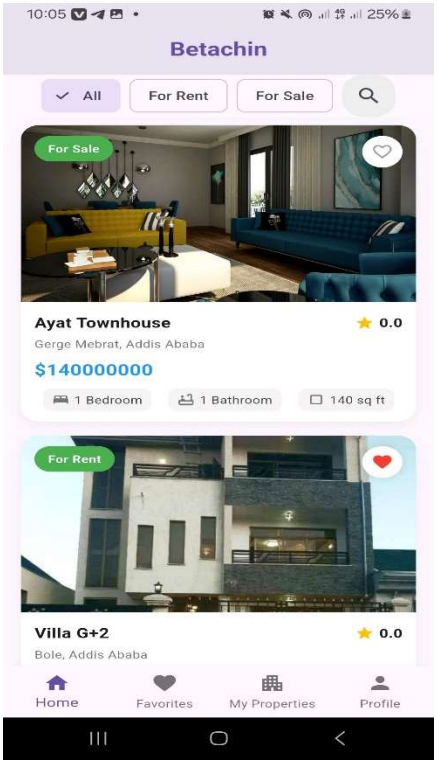
NAVIGATION FLOW

3.4 Mockups

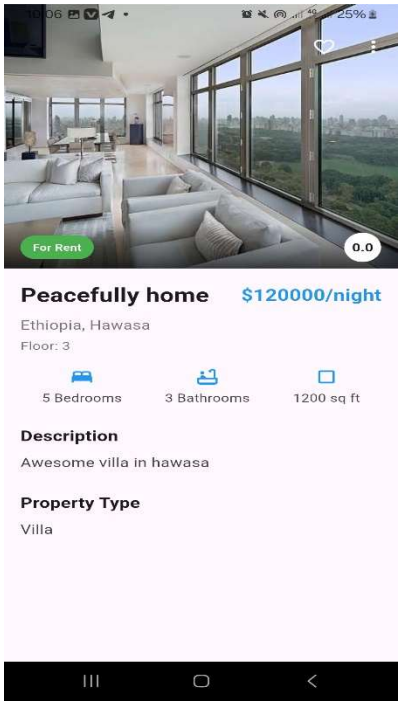
Sign up/log in page



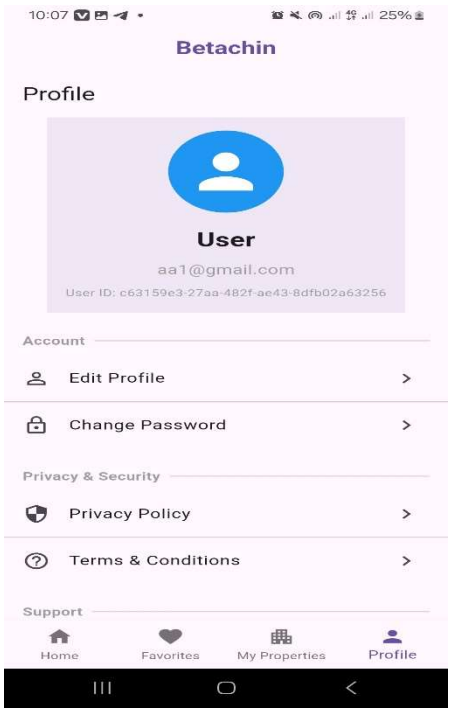
Home pag



Property Details page(on screen)



Profile page



4. Development Approach

4.1 Methodology

We used the Agile methodology with weekly sprints, enabling flexibility and regular feedback.

4.2 Challenges & Solutions

In the development of the Betachin mobile app, several challenges were addressed with effective solutions. For handling image uploads, Supabase Storage was utilized in combination with image compression techniques to ensure efficient storage and faster loading times. To manage property access control securely, Supabase's Row-Level Security (RLS) was implemented, allowing only authorized users to view or modify their own data. For reliable data synchronization, a local cache with refresh logic was employed to maintain smooth offline functionality and keep data up to date when connectivity is restored. Lastly, to provide a seamless user experience across different device sizes, Flutter's adaptive design widgets were used to build a responsive and visually consistent interface.

5. Technological Stack

5.1 Frontend

- Flutter (cross-platform, fast UI dev)
- Provider & Bloc (state management)

5.2 Backend

- Supabase
    - PostgreSQL database
    - Auth for user management
    - Storage for images
    - RLS for access control

5.3 Tools

- Figma (design)
- VS Code, Android Studio
- GitHub (version control)

6. Implementation Details

6.1 Authentication

- Email sign up with Supabase
- JWT-based session
- Secure reset password

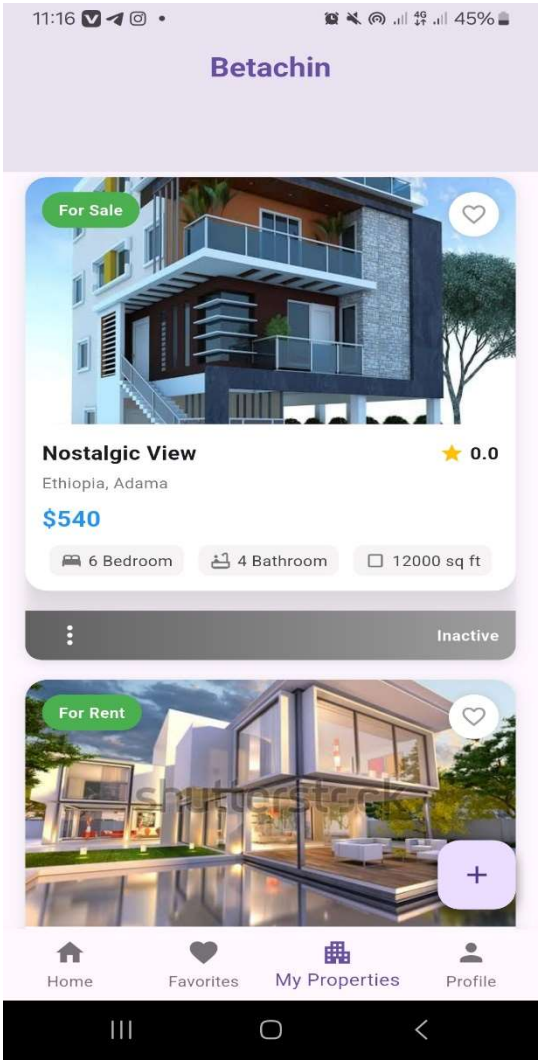
6.2Features Implemented

- User Authentication (Email & Password)
- Home Page (view all properties)
- Favorites Page
- My Properties Page (add, edit, delete, delist)
- Image Upload with Supabase Storage
- Row-Level Security (RLS) for data access
- Local Cache with Data Sync
- Responsive Layout using Flutter widgets
- Profile Page

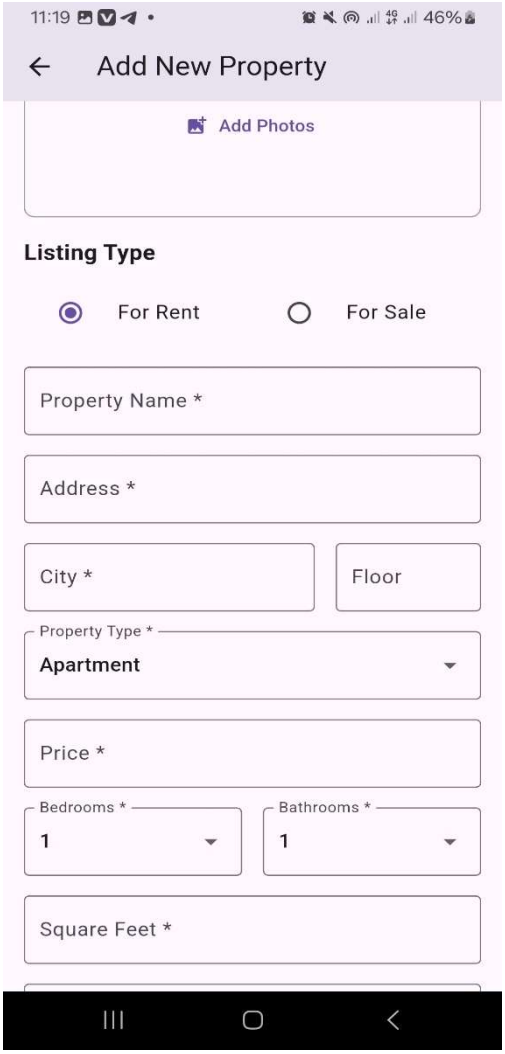
6.3 Database Tables

Table	Key Fields
users	user_id, name, email, profile_pic
properties	id, owner_id, price status, details
property_images	image_id, property_id
favorites	user_id, propertyd

MY PRPERTY PAGE



ADD PROPERTY PAGE



6.4 Code Sample (Flutter + Supabase)

```dart
final supabase = SupabaseClient('url', 'key');

Future<void> addProperty(Map<String, dynamic> data) async {
  await supabase.from('properties').insert(data);
}

Future<List<Map<String, dynamic>>> fetchActiveProperties() async {
  final res = await supabase.from('properties')
    .select('*, property_images(*)')
    .eq('status', 'active');
  return res;
}
```

7. Testing and Quality Assurance

7.1 Strategy

- *Manual testing for each feature*
- *Unit tests for service classes*
- *UI tests for screen widgets*

7.2 Bug Tracking

- GitHub branches for each errors and functionalties
- Weekly review and fix cycle

7.3 Metrics

- 80%+ feature test coverage
- Avg. bug resolution: < 48 hrs
- UAT success rate: 90%+

8. Future Enhancements

- Map Integration with location pins
- Chat between buyers and sellers
- Push Notifications
- Rating and Review system
- Multi-language support
- Admin Dashboard (for moderation)
- Multi-language support
- Search & Filter by location, price, property type
- Map View using Google Maps API
- In-app Chat for buyer-seller
- Push Notifications
- AR/360° Tour Support
- AI-based Property Suggestions

Conclusion

Betachin is a powerful mobile app that digitizes property renting and buying in Ethiopia. With a focus on simplicity, user control, and security, it offers all the essential tools property owners and seekers need in a modern real estate marketplace. Built with Flutter and Supabase, it’s scalable, secure, and ready for real-world impact.

Thank you!