Barangay Connect: Bridging Communities Through Digital Engagement

Propose project by:

Caballes, Michael Jun

Diaz, Izumian Thaise

Mendez, Glowny

Quintas, Micaela Cassandra

Subject Instructor:
Mr. Mark Daniel G Dacer

Date: 13/05/24

INTRODUCTION

In today's digital age, staying connected and involved in our barangays is more important than ever. That's why we're excited to introduce Barangay Connect, a new Android app designed to help villagers communicate and work together easily. Barangay Connect brings news, complaints, and community interaction all into one place, making it simpler for everyone to have their say and make a difference in their neighborhood.

By using technology in a user-friendly way, Barangay Connect empowers people to get involved, build stronger relationships with their neighbors, and improve their barangays. With features like news updates, complaint submissions, discussion forums, and local service listings, Barangay Connect makes it easy for residents of all ages and tech abilities to take part. We believe Barangay Connect will help create a more connected, engaged, and vibrant community right at our fingertips.

A. Project Overview

A number of helpful features are available in our Barangay Connect Android application, which is intended to improve community involvement and communication. The heart of the system is an intuitive News Feed that makes it simple for locals to stay informed about events in their barrio. Residents can keep informed and engaged by seeing posts about suggestions, complaints, emergency alerts, and local services on this News Feed.

Users can also maintain their profiles, which helps to keep their data current and conveniently obtainable. Additionally, Barangay Connect enables locals to take an active role in the community by publishing in the News Feed and communicating with one another about ideas, worries, and suggestions.

Overall, Barangay Connect uses its user-friendly features and Android platform to empower locals, facilitate communication, and promote unity among barangays.

Features and Functionalities:
1. Intuitive News Feed.
2. Posts about suggestions, complaints, emergency alerts, and local services
3. Active community participation through News Feed posting and communication.

B. Objectives

Below shows the main goals of this project. Showcasing the specific objectives and goal of the project.

1. Enable residents to voice their complaints to address issues and enhance the barangay's condition.
2. Empower residents to post suggestions aimed at improving the barangay.
3. Foster a platform where residents can share any contributions beneficial to the barangay's advancement.

C. Project Scope

Key Deliverables:

Outlined below are the key deliverables for our project, which encompass the milestones and outcomes critical to its success.

1. Fully functional Barangay Connect Android application.
2. Intuitive News Feed displaying posts about suggestions, complaints, emergency alerts, and local services.
3. Active community participation features for posting and communication.

Boundaries and Limitations:

Establishing clear boundaries and limitations is essential for defining the scope and parameters of our project, thereby ensuring its effectiveness and success. Here are the following.

1. Limited to the development and implementation of the Barangay Connect Android app.
2. Available exclusively on the Android platform.
3. Does not guarantee resolution of all complaints or suggestions.
4. Excludes provision of hardware or internet connectivity.
5. Does not include ongoing technical support. Functionality may be limited by Android platform capabilities.

D. Target Audience

The target audience for the Barangay Connect Android application includes residents of barangays within the municipality. Specifically, the app aims to cater to individuals residing in various barangays who seek to stay informed about local events, voice their concerns, contribute suggestions for improvement, and engage with their community members.

This audience encompasses a diverse demographic range, including residents of different age groups, occupations, and technological proficiency levels. Barangay officials and leaders may also utilize the app to communicate with constituents and gather feedback, further extending the audience to include local government representatives.

PROJECT PROPOSAL

A. Background

In today's rapidly evolving digital landscape, fostering strong community bonds and facilitating effective communication within barangays is crucial for promoting civic engagement and addressing local concerns. Recognizing the significance of these objectives, our team is proposing the development of Barangay Connect, an innovative Android application designed to bridge communities through digital engagement.

With Barangay Connect, residents can seamlessly connect with one another, share information, and collaborate to enhance the overall well-being of their barangays.

B. Problem Statement

Many barangays face challenges in fostering active community participation and addressing pressing issues due to limitations in communication channels and outreach efforts. Residents often lack accessible platforms to voice their concerns, provide feedback, or contribute ideas for barangay improvement. As a result, important community matters may go unnoticed, leading to a disconnect between residents and barangay officials.

Additionally, traditional methods of communication, such as physical meetings or paper-based announcements, may not effectively reach all residents, especially in today's digital age where online connectivity plays a significant role in daily interactions.

C. Goals and Deliverables

The primary goal of the Barangay Connect project is to empower residents to actively engage in their barangays, foster community involvement, and facilitate effective communication between residents and barangay officials. To achieve this goal, the following specific objectives and deliverables are outlined:

1. Enable residents to voice their complaints, suggestions, and contributions to address issues and enhance the barangay's condition.
2. Empower residents to actively participate in community discussions, share information, and collaborate with fellow residents and barangay officials.
3. Foster a platform where residents can stay informed about local events, announcements, and services, promoting a sense of community cohesion and belonging.

Key Deliverables:
1. Fully functional Barangay Connect Android application.
2. Intuitive News Feed displaying posts about suggestions, complaints, emergency alerts, and local services.
3. User profile management system.
4. Active community participation features for posting and communication.

D. Timeline

Phase 1: Planning and Design

Week 1-2:

- ❖ Project Kickoff: Define project objectives, requirements, and success criteria.
- ❖ Conduct initial research on similar apps and user needs.
- ❖ Formulate user stories and prioritize features.

❖ Finalize design mockups and app architecture.

Phase 2: Development

Week 3-4:

❖ Backend Setup: Implement Firebase Authentication for user management.

❖ Develop Firestore database schema for storing user profiles and posts.

❖ Integrate cloud-hosted NoSQL database provided by Firebase for external functionalities.

Week 5-6:

❖ Core Feature Implementation: Develop a News Feed feature for displaying community posts.

❖ Implement user profile management functionality.

❖ Integrate additional features for active community participation.

Phase 3: Testing and Optimization

Week 7-8:

❖ Testing and Bug Fixing: Conduct unit tests, integration tests, and user acceptance testing.

❖ Identify and address any bugs or issues.

❖ Optimize app performance and user experience.

Phase 4: Presentation and Submission

Week 9:

❖ Present the app to the instructor for feedback.

❖ Make necessary revisions based on feedback.

❖ Submit the final app and documentation for evaluation.

	Planning	Design	Development	Testing/Optimization	Presentation
Milestones	Project Kickoff	Design Finalization	Backend Setup	Core Feature Implementation	Testing and Bug Fixing
Week 1	Project Kickoff				
Week 2	Design	Design Finalization			
Week 3			Backend Setup		
Week 4			Backend Setup		
Week 5				Core Feature	
Week 6				Core Feature	Testing and Bug Fixing
Week 7					Testing and Bug Fixing
Week 8					Presentation and Submission.

SYSTEM ARCHITECTURE

A. System Components

1) A. System Components Frontend: This includes the user interface components visible to the end-users, such as the News Feed, user profiles, and interactive features.

2) Backend: The backend consists of the server-side logic responsible for processing requests, managing user data, and facilitating communication between the frontend and the database.

3) Database: The database stores user profiles, posts, comments, and other relevant data. For this project, Firebase Firestore is utilized for its scalability and real-time data synchronization capabilities.

4) Authentication: Firebase Authentication is integrated to handle user authentication and authorization securely.

5) API Integration: cloud-hosted NoSQL database provided by Firebase may be incorporated to access external services or data sources, enhancing the functionality of the app.

B. Data Flow Diagram
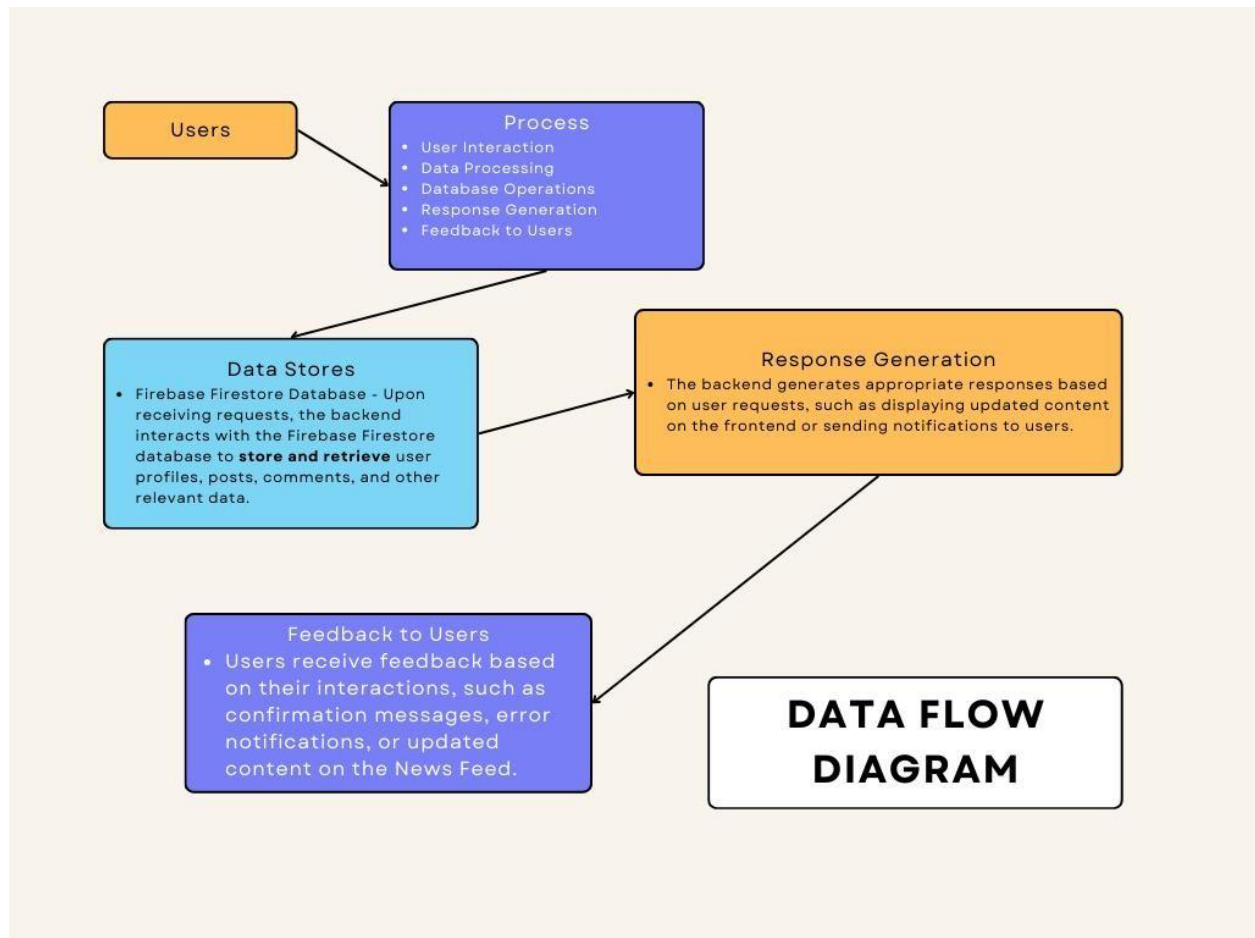
The data flow within Barangay Connect involves the following steps:

1. User Interaction: Users interact with the frontend interface to browse the News Feed, submit posts, and engage with community content.

2. Data Processing: User actions trigger requests to the backend server, where data processing occurs. This includes authentication, validation, and storage of user-generated content.

3. Database Operations: Upon receiving requests, the backend interacts with the Firebase Firestore database to store and retrieve user profiles, posts, comments, and other relevant data.

4. Response Generation: The backend generates appropriate responses based on user requests, such as displaying updated content on the frontend or sending

notifications to users.

5. Feedback to Users: Users receive feedback based on their interactions, such as confirmation messages, error notifications, or updated content on the News Feed.
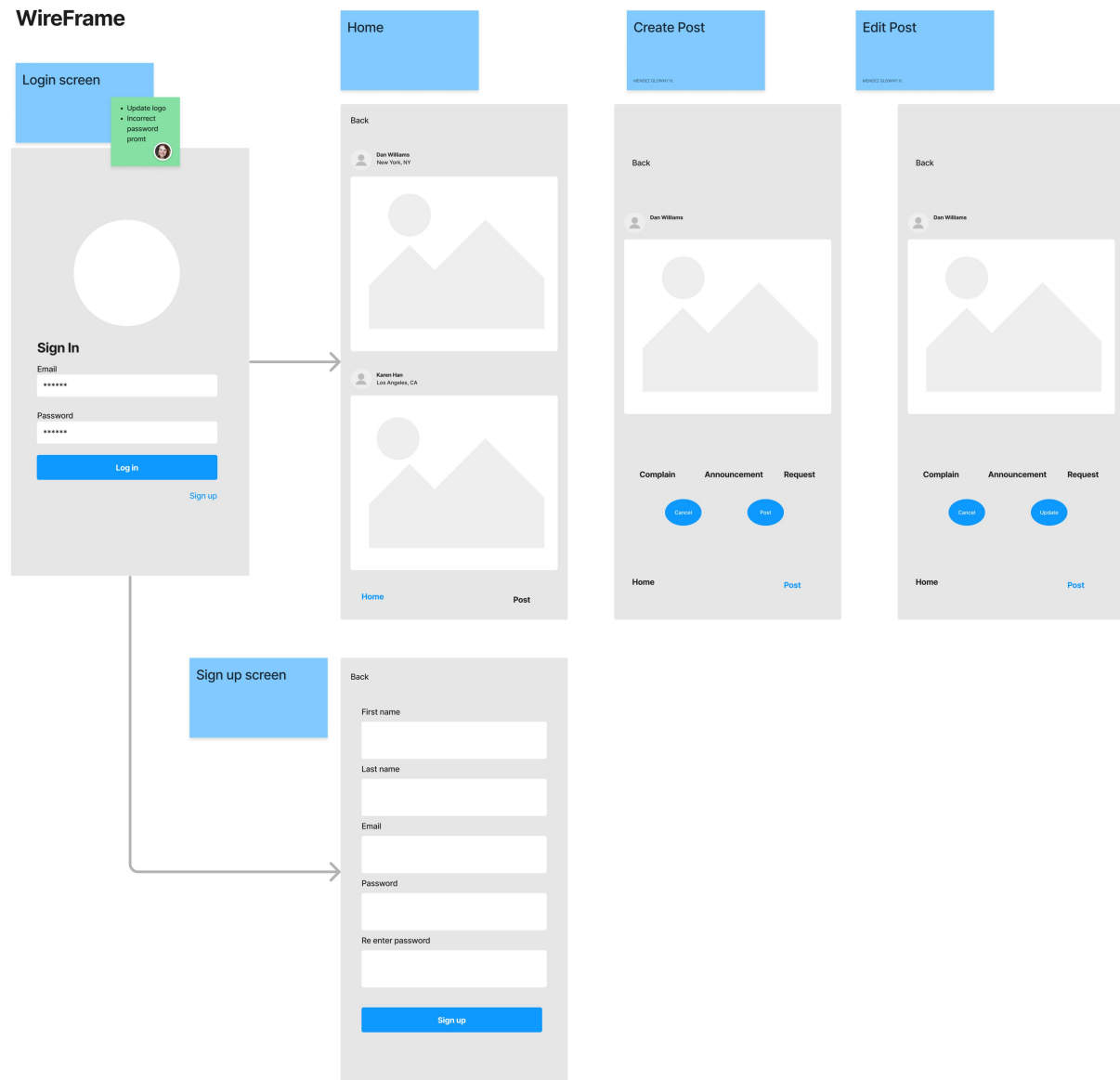
C. Technology Stack

Below are the main technologies used during development:

1. Programming Language: Kotlin is chosen for Android app development due to its concise syntax, null safety, and seamless interoperability with Java.

2. Android SDK and Android Studio: These tools are essential for developing Android applications, providing features like code completion, debugging, and performance analysis.

3. Firebase: Firebase services, including Firestore for the database and Authentication for user management, are utilized for backend infrastructure.

4. Cloud-hosted NoSQL database provided by Firebase Integration: External APIs may be integrated using Firebase SDK libraries to access additional functionalities or data sources.

5. Material Design Components: Material Design guidelines are followed for designing the user interface, ensuring a modern and intuitive app experience for users.
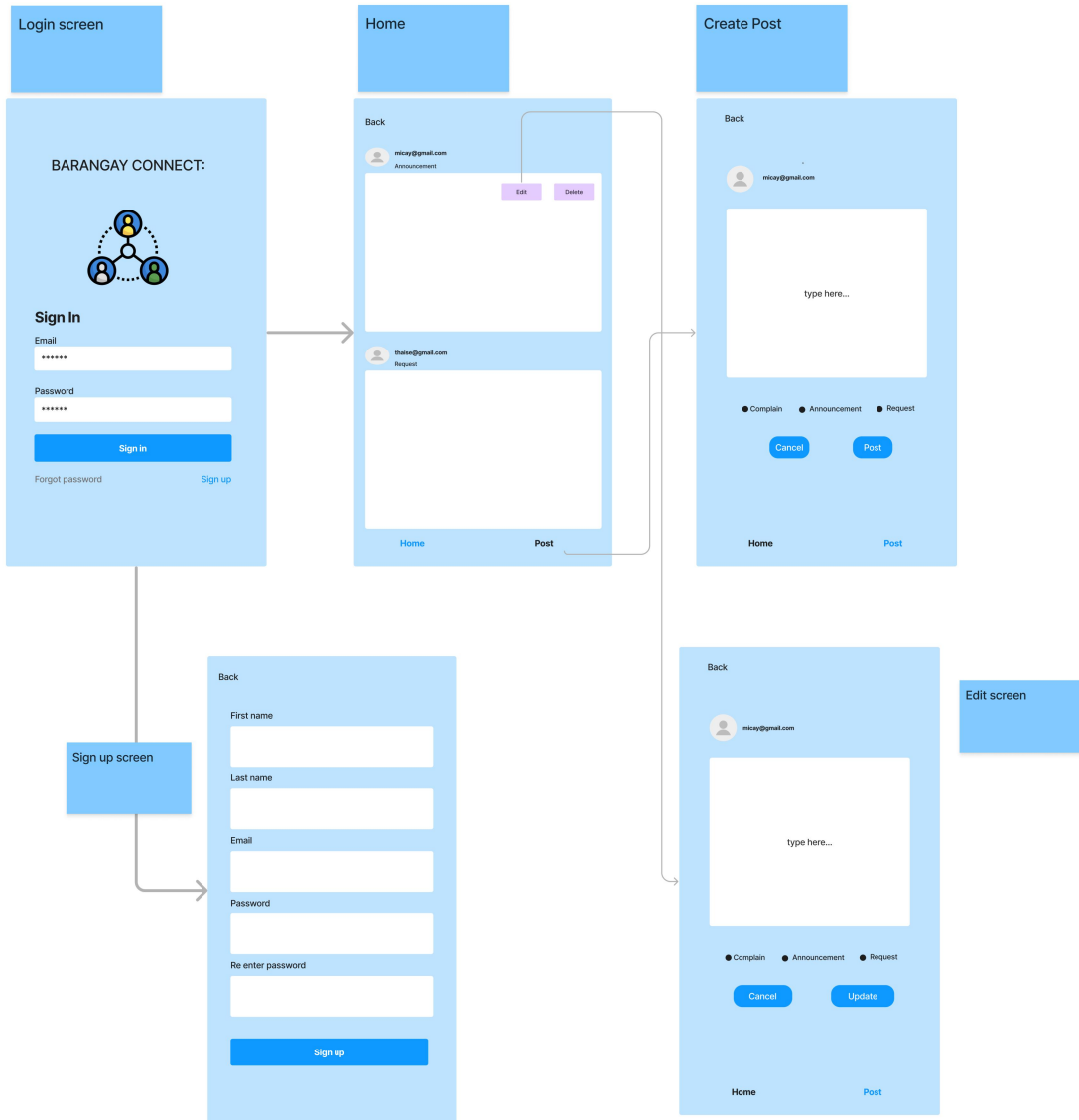
DESIGN

A. Wireframes

B. UI/UX Design

App Prototype

Login screen

Home

Create Post

BARANGAY CONNECT:

Sign In

Email

••••••

Password

••••••

Sign in

Forgot password   Sign up

Back

micay@gmail.com
Announcement

Edit   Delete

thaise@gmail.com
Request

Home   Post

Back

micay@gmail.com

type here...

● Complain   ● Announcement   ● Request

Cancel   Post

Home   Post

Sign up screen

Back

First name

Last name

Email

Password

Re enter password

Sign up

Edit screen

Back

micay@gmail.com

type here...

● Complain   ● Announcement   ● Request

Cancel   Update

Home   Post

DEVELOPMENT

A. Development Environment Setup

1. Android Studio Installation: Install Android Studio, the official integrated development environment (IDE) for Android app development.
2. Project Setup: Create a new Android project in Android Studio, selecting Kotlin as the primary programming language.
3. SDK and Libraries: Ensure the necessary Android SDK components are installed and configure project dependencies, including Firebase SDK and any additional libraries for cloud-hosted NoSQL databases provided by Firebase integration.
4. Firebase Setup: Create a new Firebase project and configure Firebase Authentication and Firestore database services. Obtain necessary configuration files and integrate them into the Android project.
5. Version Control: Set up version control using Git and create a repository to manage project code.

B. Code Repository

1. Git Initialization: Initialize Git in the project directory and create an initial commit with the project setup.
2. Branching Strategy: Establish a branching strategy (e.g., feature branching) to organize development efforts and facilitate collaboration among team members.
3. Code Structure: Define the project directory structure and organize code files according to best practices and project requirements.
4. Coding Standards: Adhere to Kotlin coding standards and maintain consistent code formatting throughout the project.
5. Regular Commits: Commit changes regularly with descriptive commit

messages to track progress and facilitate code review.

C. API Integration

1. API Research: Identify relevant cloud-hosted NoSQL databases provided by Firebase for integration based on project requirements (e.g., location services, weather data, etc.).

2. API Documentation: Review API documentation to understand endpoints, authentication methods, request/response formats, and usage limits.

3. Integration Implementation: Use Retrofit or Volley libraries to integrate APIs into the Android app, handling network requests and parsing responses.

4. Error Handling: Implement error handling mechanisms to gracefully manage API errors, network failures, and other exceptions.

5. Testing: Test API integration thoroughly to ensure proper functionality and compatibility with the Android app.

DOCUMENTATION

A. User Manual

1. Installation and Registration
2. Login and Account Creation
3. Navigation and Main Features
4. Creating and Interacting with Posts
5. Editing and Deleting Posts
6. Logging Out

1. Installation and Registration.

Download the App: Click the download button in the app's website. Tap on the app, then click "Install" to download it.
Open the App: Once installed, open BarangayConnect by tapping on its icon.
Registration: If you are a new user, click the "Sign Up" button to create your account. Fill in all the required fields such as name, email, password, etc. After completing the form, click "Sign up" to register.

2. Login and Account Creation.

Login: After registration or if you already have an account, click the "Login" button on the main screen.
Enter Credentials: Input your registered email and password in the respective fields.
Logging In: Click the "Log In" button to access your account.

3. Navigation and Main Features.

Newsfeed: Upon logging in, you will be directed to the newsfeed, where you can see updates from your village.

4. Creating and Interacting with Posts.

Creating a Post: To create a post, click on the "Post" button located in the app's toolbar.

Post Types: Choose the type of post you want to create (e.g., Announcement, Complaint, Request).

Fill in Details: Enter the relevant information for your post.

Posting: Once ready, click the "Post" button to publish your post to the community.

5. Editing and Deleting Posts.

Editing : Simply click the edit icon, type new post and click post.
Deleting: Click the delete button.

6. Logging Out.

Logout: To log out of your account, simply click on the menu icon and select the "Logout" option.

BARANGA YCONNECT

USER MANUAL

CONNECTED,
ENGAGED AND
VIBRANT COMMUNITY

PREPARED BY:

CABALLLES, MICHAEL
DIAZ, IZUMIAN THAISE
MENDEZ, GLOWNY

BARANGA YCONNECT

TABLE OF CONTENTS

BARANGAY CONNECT:

Sign In

Email

••••••

Password

••••••

Sign in

Forgot password   Sign up

BARANGA YCONNECT

1. Installation and Registration.

Download the App: Click the download button in the app's website. Tap on the app, then click "Install" to download it.
Open the App: Once installed, open BarangayConnect by tapping on its icon.
Registration: If you are a new user, click the "Sign Up" button to create your account. Fill in all the required fields such as name, email, password, etc. After completing the form, click "Sign up" to register.

2. Login and Account Creation.

Login: After registration or if you already have an account, click the "Login" button on the main screen.
Enter Credentials: Input your registered email and password in the respective fields.
Logging In: Click the "Log In" button to access your account.

3. Navigation and Main Features.

Newsfeed: Upon logging in, you will be directed to the newsfeed, where you can see updates from your village.

**BARANGA
YCONNECT**

4. Creating and Interacting with Posts.

Creating a Post: To create a post, click on the "Post" button located in the app's toolbar.
Post Types: Choose the type of post you want to create (e.g., Announcement, Complaint, Request).
Fill in Details: Enter the relevant information for your post.
Posting: Once ready, click the "Post" button to publish your post to the community.

5. Editing and Deleting Posts.

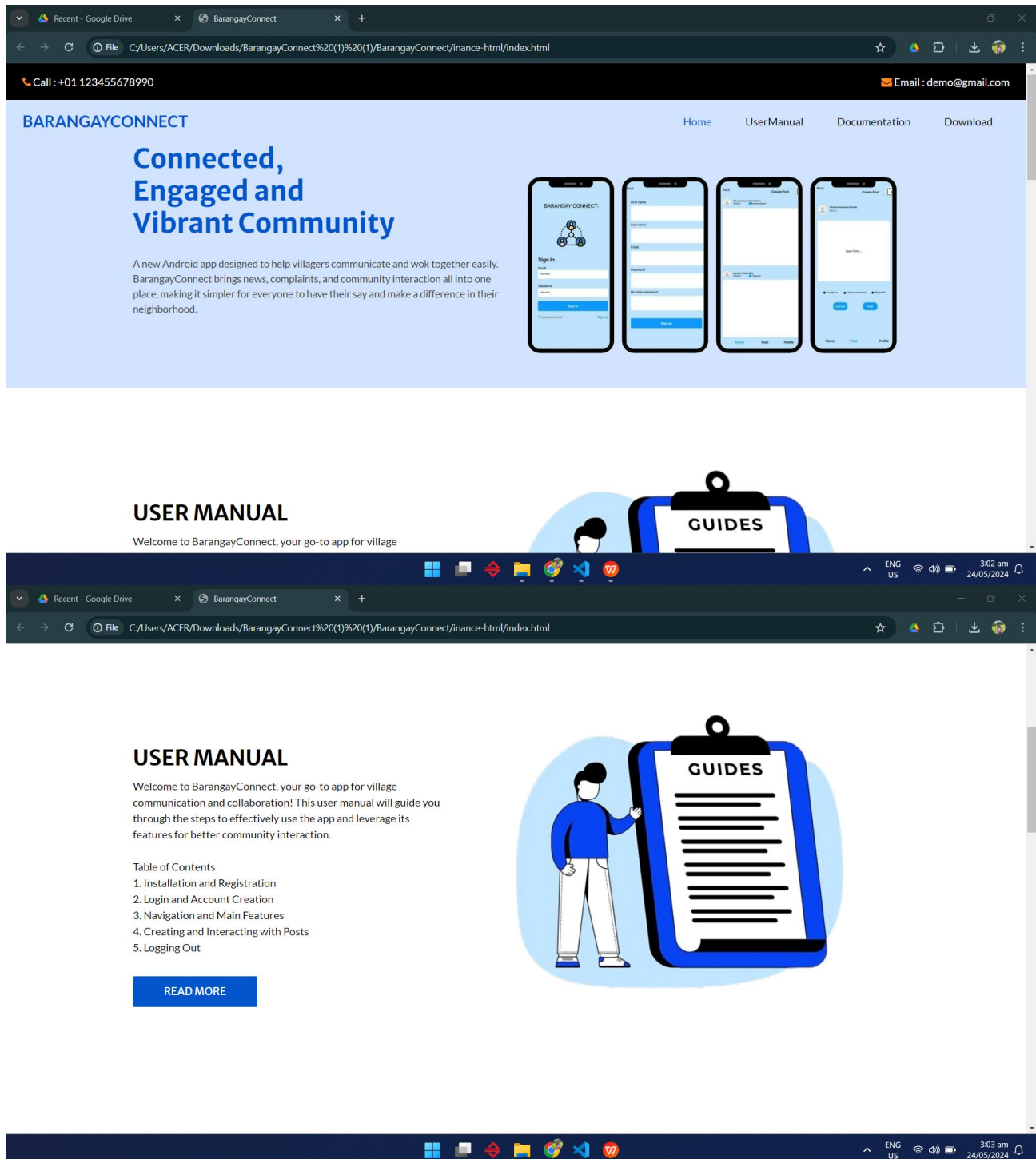Editing : Simply click the edit icon, type new post and click post.
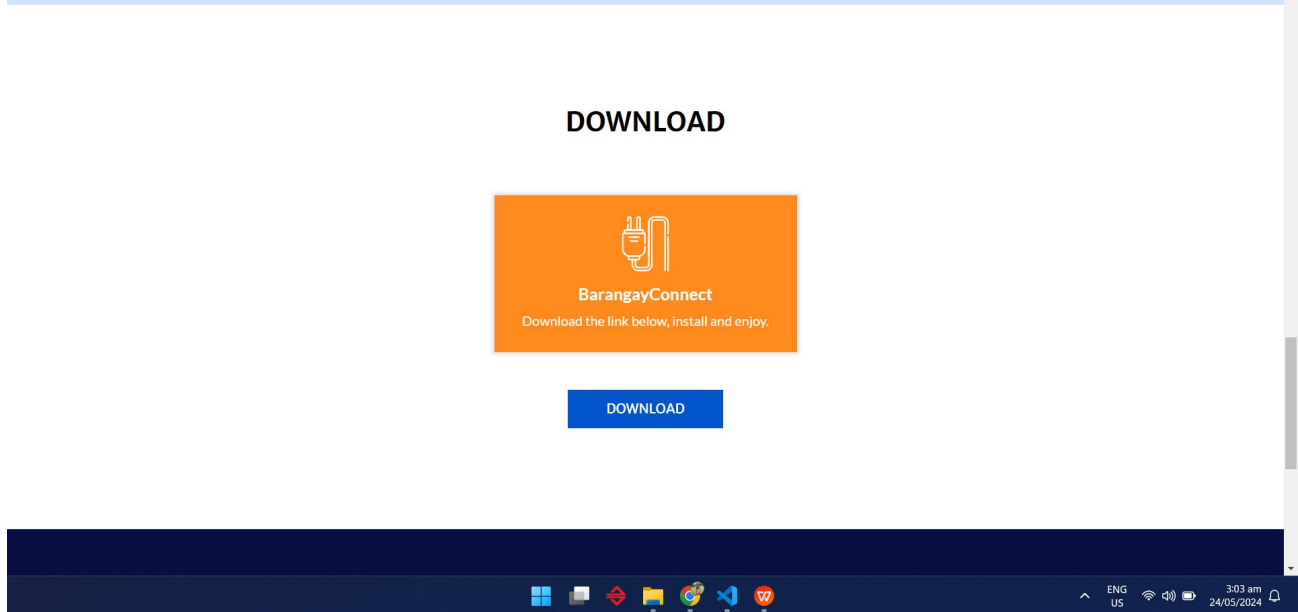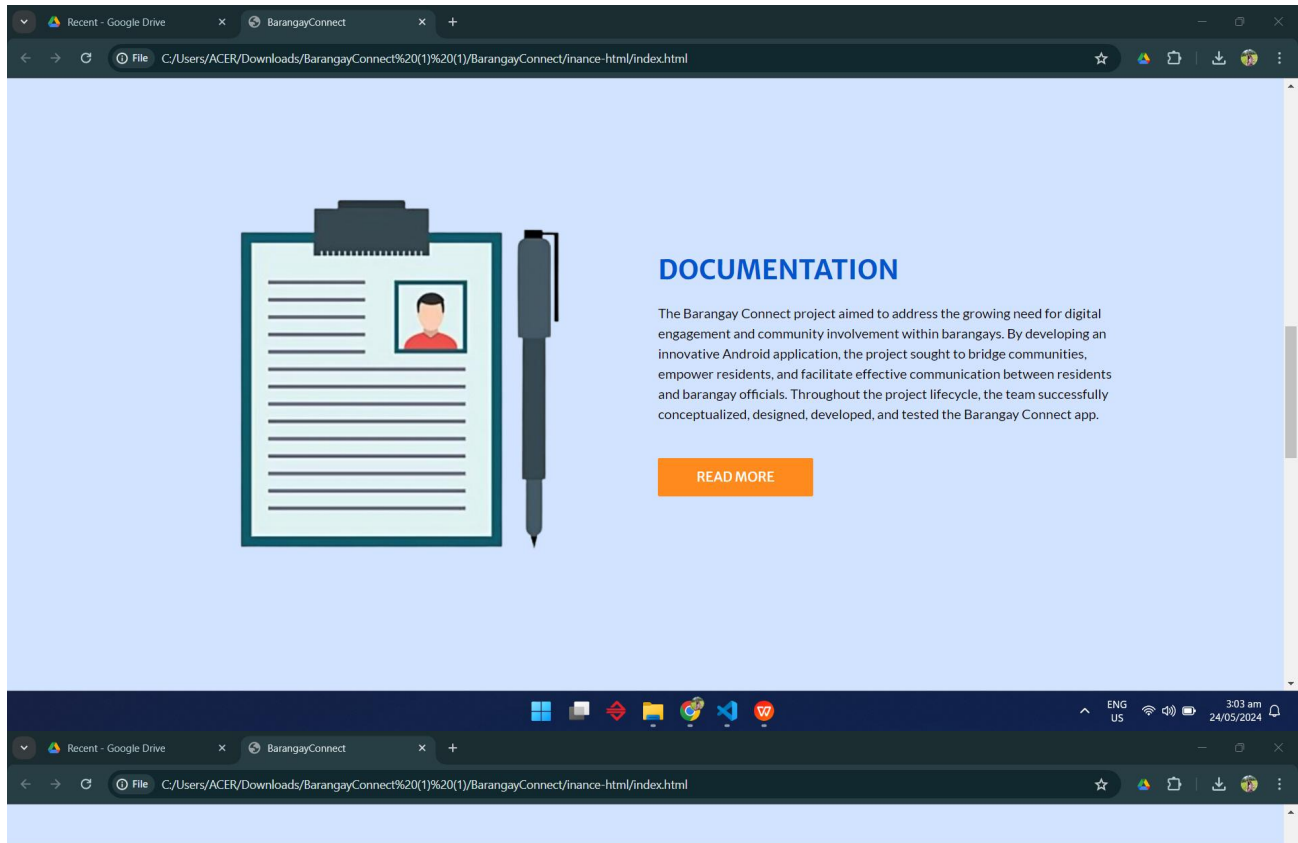Deleting: Click the delete button.

6. Logging Out.

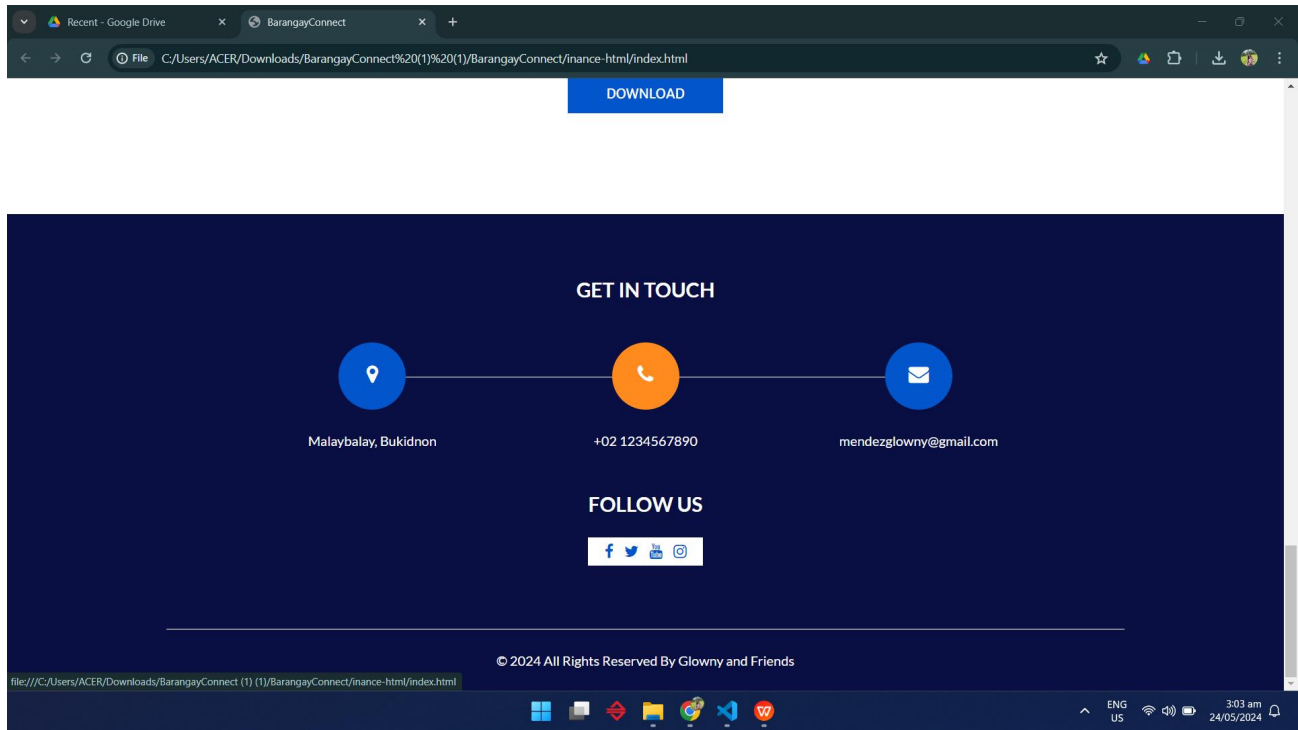Logout: To log out of your account, simply click on the menu icon and select the "Logout" option.

B. Technical Documentation

Below are our website features and function.

DOCUMENTATION

The Barangay Connect project aimed to address the growing need for digital engagement and community involvement within barangays. By developing an innovative Android application, the project sought to bridge communities, empower residents, and facilitate effective communication between residents and barangay officials. Throughout the project lifecycle, the team successfully conceptualized, designed, developed, and tested the Barangay Connect app.

READ MORE

DOWNLOAD

BarangayConnect
Download the link below, install and enjoy.

DOWNLOAD

DOWNLOAD

GET IN TOUCH

Malaybalay, Bukidnon

+02 1234567890

mendezglowny@gmail.com

FOLLOW US

C. API Documentation

Firebase Authentication API. Firebase Authentication provides backend services to authenticate users using email and password, and it handles other authentication methods as well.

Key API Calls and Methods

1. Firebase Authentication Instance:

FirebaseAuth mAuth = FirebaseAuth.getInstance();

This initializes an instance of Firebase Authentication.

2. Checking Current User:

FirebaseUser currentUser = mAuth.getCurrentUser();

This checks if a user is already signed in.

3. Creating a New User:

mAuth.createUserWithEmailAndPassword(email, password)

This method is used to create a new user with an email and password. It returns a Task<AuthResult> which you can attach a listener to, in order to handle success or failure.'

4. Signing Out:

FirebaseAuth.getInstance().signOut();

This signs out the current authenticated user.

5. signInWithEmailAndPassword(email, password):

Used to sign in a user with an email address and password.

Syntax: signInWithEmailAndPassword(email, password)

Parameters:

email: The user's email address.

password: The user's password.

Returns a Task<AuthResult> which represents the result of the authentication operation.

6. Firebase Realtime Database API:

Used for storing and retrieving data in real-time.

Methods used:

FirebaseDatabase.getInstance(): Retrieves an instance of FirebaseDatabase.

getReference(): Gets the reference to the root of the Firebase Database.

7. Firebase Cloud Firestore API:

Used for storing and retrieving structured data on the Cloud Firestore.

Methods used:

FirebaseFirestore.getInstance(): Retrieves an instance of FirebaseFirestore.

collection(): Gets a CollectionReference for the specified Firestore path.

document(): Gets a DocumentReference for the specified Firestore document.

add(): Adds a new document with a generated ID to the specified Firestore collection.

8. Firebase Realtime Database DataSnapshot API:

Used for reading data from a Firebase Database.

Methods used:

getValue(): Retrieves the value of the snapshot as an Object.

CONCLUSION

A. Project Recap

The Barangay Connect project aimed to address the growing need for digital engagement and community involvement within barangays. By developing an innovative Android application, the project sought to bridge communities, empower residents, and facilitate effective communication between residents and barangay officials. Throughout the project lifecycle, the team successfully conceptualized, designed, developed, and tested the Barangay Connect app.

Key features such as the intuitive News Feed, user profile management, and active community participation functionalities were implemented to provide residents with a platform to voice their concerns, share suggestions, and contribute to the improvement of their barangays. The project adhered to defined objectives and scope, delivering fully functional deliverables including the Barangay Connect Android application, an intuitive News Feed displaying relevant community posts, a user profile management system, and active community participation features for posting and communication.

Despite facing challenges such as technical limitations and resource constraints, the team demonstrated resilience and dedication, ultimately presenting a comprehensive solution to promote civic engagement and community cohesion within barangays. Moving forward, the Barangay Connect app holds the potential to make a meaningful impact on barangay governance, fostering stronger bonds between residents and barangay officials, and contributing to the overall well-being of barangay communities.

B. Lessons Learned

Throughout the Barangay Connect project, the team gained valuable insights and lessons that will inform future endeavors in software development and community engagement initiatives. Some key lessons learned include:

1. User-Centric Design: Prioritizing user needs and preferences is essential for creating impactful solutions that resonate with the target audience.
2. Effective Communication: Clear and open communication among team members, stakeholders, and end-users is crucial for project success and alignment of objectives.
3. Agile Development: Adopting agile methodologies facilitates adaptability, collaboration, and iterative improvements throughout the project lifecycle.
4. Technical Proficiency: Continuously updating technical skills and staying abreast of emerging technologies is necessary to overcome technical challenges and deliver innovative solutions.

Community Engagement: Engaging with end-users and stakeholders early and often fosters ownership, trust, and buy-in, leading to greater acceptance and adoption of the solution.

C. Acknowledgments

The success of the Barangay Connect project would not have been possible without the support, guidance, and contributions of various individuals and organizations. The project team extends heartfelt gratitude to:

- ❖ Mr. Mark Daniel G. Dacer, Subject Instructor, for providing valuable insights, mentorship, and guidance throughout the project lifecycle.
- ❖ Bukidnon State University for providing resources, facilities, and support for

project development and implementation.

❖ Team members, including Michael Jun Caballes, Izumian Thaise Diaz, Glowny Mendez, and Micaela Cassandra Quintas, for their dedication, collaboration, and contributions to the project.

Together, these individuals and organizations played a vital role in bringing Barangay Connect to life and advancing the cause of digital engagement and community empowerment within barangays.

APPENDIX

A. Additional Resources

1. Community Engagement Resources: Links to resources on community engagement strategies, best practices, and case studies.

2. Android Development Tutorials: Tutorials and guides on Android app development, Kotlin programming, and Android Studio usage.

3. Firebase Documentation: Official documentation and guides for Firebase services, including Firestore, Authentication, and Cloud Messaging.

4. Material Design Guidelines: Resources and documentation on Material Design principles, components, and UI/UX best practices.

5. Firebase Firestore: This library provides the necessary classes and methods to interact with the Firestore database. It allows you to perform CRUD (Create, Read, Update, Delete) operations on your Firestore collections and documents.

B. References

Google Developers - Android Studio

Firebase Documentation

Kotlin Programming Language

Material Design Guidelines

RESTful API Design - Best Practices

Git Documentation

Android Developers - User Interface

Android Developers - Testing