

QUICK SHIP

INTERDISCIPLINARY PROJECT

Submitted in partial fulfillment of the requirements for the award of
Bachelor of Technology in Information Technology

by

GOKUL RAJ N (Reg.No-41120062)



DEPARTMENT OF INFORMATION TECHNOLOGY

SCHOOL OF COMPUTING

SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

CATEGORY-1 UNIVERSITY BY UGC

Accredited "A++" by NAAC

12B Status by UGC |Approved by AICTE

JEPPIAAR NAGAR,RAJIV GANDHI SALAI,CHENNAI600119

MAY 2024



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www.sathyabama.ac.in

DEPARTMENT OF INFORMATION TECHNOLOGY

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of GOKUL RAJ N (41120062) who carried out the project entitled "QUICK SHIP" under my supervision from January 2024 to May 2024.

Internal Guide

Dr .L. MARY GLADENCE M.E.,Ph.D.,

Head of the Department

Dr.R. SUBASHINI, M.E., Ph.D.,

Submitted for Viva voce Examination held on 08/05/2024

Internal Examiner

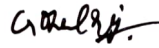
External Examiner

DECLARATION

I GOKUL RAJ N hereby declare that the Project Report entitled "QUICK SHIP" done by me under the guidance of **Dr .L. MARY GLADENCE M.E.,Ph.D.**, is submitted in partial fulfillment of the requirements for the award of Bachelor of Technology degree in Information Technology.

DATE: 08/05/24

PLACE: chennai



SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to **Board of Management of SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr. T.Sasikala M.E., Ph.D., Dean**, School of Computing **Dr.R.Subhashini M.E.,Ph.D.**,Head of the Department of Information Technology for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to my Project Guide **Dr.L.MARY GLADENCE, M.Tech., Ph.D.**, for her valuable guidance, suggestions and constant encouragement paved way for the successful completion of my project work.

I wish to express my thanks to all Teaching and Non-teaching staff members of the **Department of Information Technology** who were helpful in many ways for the completion of the project.

CERTIFICATE OF COMPLETION



149, 1C, 2nd Floor, Mount Poonamallee Rd,
Ramapuram, Chennai - 600089.
admin@hackwithechnologies.com
www.hackwithechnologies.com

10.02.2024

CERTIFICATE FOR INTERNSHIP

TO WHOMSOEVER IT MAY CONCERN

This is to Certify that **Gokul Raj N (Reg No: 41120062)** student of Sathyabama Institute of Science and Technology, B. Tech Information Technology, has successfully completed the Internship at Hackwit Technologies from 22nd January to 30th January 2024.

During the internship, **Gokul Raj N** has closely worked as a part of the **Flutter** by carrying out the project entitled "**Quick Ship**".

He demonstrated good developing and learning skill with self-motivated attitude to learn new things. His contribution to implement the Flutter was good. We wish him all the best for his future endeavors.

Best Regards,

A handwritten signature in black ink, appearing to be 'Ravikumar S', with a stylized flourish at the end.

Ravikumar S
CEO & Managing Director
Hackwit Technologies Pvt Ltd

CERTIFICATE OF COMPLETION



ABSTRACT

The QuickShip (EV) Bike Rental Mobile Application aims to provide a convenient and sustainable solution for urban transportation by offering users access to electric bikes for short-term rentals. The Quick Ship EV Bike Rental mobile application aims to provide users with a convenient and eco-friendly solution for renting electric bikes (e-bikes). The app allows users to locate nearby e-bike rental stations, view bike availability in real-time, reserve bikes in advance, and unlock bikes using their smartphones. By offering a quick and seamless rental experience, the app encourages users to choose e-bikes for short-distance transportation, reducing carbon emissions and promoting sustainable mobility. The app also provides features for users to track their ride history, view rental charges, and provide feedback, enhancing the overall user experience. With its user-friendly interface and robust functionality, the Quick Ship EV Bike Rental app aims to revolutionize urban transportation and promote a greener, healthier lifestyle. The Quick Ship EV Bike Rental mobile application is designed to revolutionize urban transportation by providing a convenient, eco-friendly, and efficient solution for renting electric bikes (e-bikes). With the increasing focus on sustainability and reducing carbon emissions, e-bikes have emerged as a popular choice for short-distance travel in urban areas.

TABLE OF CONTENTS

Chapter No.	TITLE	Page No.
	ABSTRACT	vii
	LIST OF ABBREVIATIONS	x
	LIST OF FIGURES	xi
1	INTRODUCTION	1
	1.1 Flutter	2
	1.2 Dart	3
	1.3 Firebase	4
	1.4 Problem Statement	5
	1.5 Objectives	6
2	METHODOLOGY	8
	2.1 Initial ProjectRequirements	8
	2.2 Proposed SystemArchitecture	11
	2.3 Flow Diagram	16
	2.4 Modules	17
	2.4.1 User Management	17
	2.4.2 Authentication	19
	2.4.3 ProfileManagemnt	20
	2.4.4 Ride Selection	21
	2.4.5.Ride Availability and Ride Duration	22
	2.5 Development and Deployment Setup	23
3	RESULTS AND DISCUSSION	26
4	CONCLUSION AND FUTURE WORK	32
	4.1 Conclusion	32

4.2	Future Work	33
	REFERENCES	35
	APPENDICES	37
A.	Sample Code	37
B.	Screen Shots	39

LIST OF ABBREVIATIONS

ABBREVIATION	EXPANSION
UI	- User Interface
UX	- User Experience
iOS	- iPhone Operating System
UAT	- User Acceptance Testing
IDE	- Integrated Development Environment

LIST OF FIGURES

Figure	Name of the Figure No.	Page No.
2.1	Proposed Application Architecture	11
2.2	Firebase Architecture	14
2.3	Flow Diagram	16
2.4	Project Creation	23
2.5	Firebase Connection	24
2.6	Firebase Authentication	25
3.1	Signup Page Interface	26
3.2	Booking Page Display	27
3.3	Payment Interface	28
3.4	SelectPage Screen	29
3.5	Firebase Configurations	30
3.6	Initialize Firebase	31
3.7	Firestore Database	31

CHAPTER 1

INTRODUCTION

The Quick Ship EV Bike Rental mobile application aims to provide users with a convenient and eco-friendly solution for renting electric bikes (e-bikes). The app allows users to locate nearby e-bike rental stations, view bike availability in real-time, reserve bikes in advance, and unlock bikes using their smartphones. By offering a quick and seamless rental experience, the app encourages users to choose e-bikes for short-distance transportation, reducing carbon emissions and promoting sustainable mobility. The app also provides features for users to track their ride history, view rental charges, and provide feedback, enhancing the overall user experience. With its user-friendly interface and robust functionality, the Quick Ship EV Bike Rental app aims to revolutionize urban transportation and promote a greener, healthier lifestyle. The Quick Ship EV Bike Rental mobile application is designed to revolutionize urban transportation by providing a convenient, eco-friendly, and efficient solution for renting electric bikes (e-bikes). With the increasing focus on sustainability and reducing carbon emissions, e-bikes have emerged as a popular choice for short-distance travel in urban areas. However, the traditional bike rental process can be cumbersome and time-consuming, often requiring users to visit rental stations in person and complete manual paperwork.

Moreover, the app offers features to track ride history, view rental charges, and provide feedback, enhancing the overall user experience. By promoting the use of e-bikes for short-distance travel, the app contributes to reducing traffic congestion, improving air quality, and promoting a healthier lifestyle.

1.1.FLUTTER

The QuickShip EV bike rental mobile application is powered by Flutter, Google's robust cross-platform UI toolkit. Flutter's single codebase approach transcends platform-specific limitations, enabling a visually captivating and responsive user interface that adapts seamlessly to iOS and Android environments. The framework's streamlined development process reduces complexities, accelerates cycles, and enhances productivity. With Flutter's hot reload feature, developers can make real-time code changes and receive instant visual feedback, facilitating quick iterations and adjustments. Additionally, Flutter ensures a consistent and high-quality user experience across diverse devices, thanks to its rich set of customizable widgets. Overall, Flutter's efficiency and versatility make it an ideal choice for the QuickShip app, delivering a compelling user experience while simplifying development and maintenance processes.

Single Codebase: Flutter allows for a single codebase to be used for both iOS and Android platforms, reducing development time and effort.

Visually Captivating UI: Flutter's rich set of widgets and smooth animations enable the creation of a visually appealing and responsive user interface.

Efficient Development Process: Flutter streamlines the development process, reducing complexities and accelerating development cycles.

Hot Reload: Flutter's hot reload feature allows for real-time code changes and instant visual feedback, facilitating quick iterations and adjustments.

1.2.DART

i) Unified Codebase:

The QuickShip EV bike rental app relies on Dart, a versatile programming language, for both frontend (Flutter) and backend development. This choice allows developers to maintain a single codebase, ensuring consistency and facilitating collaboration.

ii)Asynchronous Programming:

Dart's support for asynchronous programming is crucial for managing concurrent operations efficiently. This feature enables the app to handle tasks like user requests, database operations, and API calls without compromising responsiveness.

iii)Scalability:

Dart's scalability plays a vital role in accommodating the app's potential growth. As the user base expands, Dart's scalability ensures that the app can handle increased traffic, providing a seamless experience for users.

Another advantage of Dart is its ability to compile to native code, making Quick Ship highly performant on both iOS and Android devices. Additionally, Dart's support for hot reload in Flutter allows developers to make changes to the application code and see the results instantly, speeding up the development process and enabling quick iterations.

1.3.FIREBASE

i) Real-time Location Tracking:

The QuickShip EV bike rental app utilizes real-time location tracking to provide users with up-to-date information on bike availability and rental station locations. This feature ensures that users can easily find and access bikes near their current location, enhancing the overall user experience.

ii) Secure Payment Processing:

To ensure the security of transactions, the app integrates secure payment processing systems. Users can confidently rent bikes and make payments through the app, knowing that their financial information is protected.

iii) Integration with Maps and Navigation:

The app seamlessly integrates with maps and navigation services to provide users with directions to the nearest rental stations and bike return locations. This feature helps users navigate the city efficiently and locate bikes with ease.

iv) User Feedback and Rating System:

To maintain a high level of service quality, the app includes a user feedback and rating system. Users can provide feedback on their rental experience and rate the bikes and rental stations, helping other users make informed decisions.

1.4.PROBLEM STATEMENT

Urban transportation is facing increasing challenges related to traffic congestion, air pollution, and limited parking space. Traditional modes of transportation, such as cars and public transport, often contribute to these issues. To address these challenges and promote sustainable mobility options, there is a need for a convenient and eco-friendly solution for short-distance travel in urban areas.

Electric bikes (e-bikes) have emerged as a promising alternative, offering a convenient and environmentally friendly mode of transportation. However, accessing and renting e-bikes can be cumbersome and inefficient, often requiring users to visit rental stations in person and complete manual paperwork.

To overcome these challenges, the Quick Ship EV bike rental mobile application aims to provide a seamless and user-friendly platform for renting e-bikes. The app will enable users to locate nearby rental stations, check bike availability in real-time, reserve bikes in advance, and unlock bikes using their smartphones.

By developing the Quick Ship EV Bike Rental mobile application, we seek to improve urban mobility, reduce carbon emissions, and promote sustainable transportation solutions for a greener future."

1.5. OBJECTIVES

Convenience: Enable users to easily locate nearby e-bike rental stations, check bike availability, and reserve bikes in advance, all through a user-friendly mobile application.

Efficiency: Streamline the rental process by allowing users to unlock bikes using their smartphones, eliminating the need for physical keys or cards.

Sustainability: Promote the use of e-bikes as a sustainable mode of transportation, reducing carbon emissions and promoting eco-friendly urban mobility.

Accessibility: Ensure that the app is accessible to a wide range of users, including those with disabilities, by implementing accessibility features and user-friendly design principles.

Safety: Incorporate safety features, such as real-time location tracking and user identification, to ensure the security of users and their rental bikes.

Scalability: Design the app with scalability in mind, allowing for future expansion to new locations and the addition of new features to enhance the user experience.

User Engagement: Encourage user engagement through features such as user feedback, ratings, and incentives for frequent users, to foster a sense of community and loyalty among users.

Key Challenges:

Infrastructure: Establishing a network of e-bike rental stations and ensuring sufficient bike availability in high-demand areas can be a logistical challenge.

User Adoption: Encouraging users to adopt e-bikes as a mode of transportation, especially in areas where traditional transportation methods are more prevalent, may require effective marketing and educational campaigns.

Regulatory Compliance: Ensuring compliance with local regulations and laws related to e-bike rentals, including safety standards and insurance requirements, can be complex and vary by location.

Technology Integration: Integrating the app with existing mapping, payment processing, and bike locking technologies to provide a seamless user experience can be technically challenging.

Security: Ensuring the security of user data, payment information, and bike tracking systems to protect against theft and misuse is a critical concern.

Maintenance and Repairs: Managing maintenance and repairs for a fleet of e-bikes to ensure they remain in good working condition and minimize downtime can be a logistical challenge.

User Experience: Designing an intuitive and user-friendly app interface that caters to the needs of both experienced and first-time e-bike users can be a design challenge.

CHAPTER 2

METHODOLOGY

2.1. INITIAL PROJECT REQUIREMENTS

The initial project requirements for Quick ship encompass various aspects such as functionalities, technologies, and packages.

i)Project Scope:

Develop a mobile application named "QuickShip EV Bike Rental".

Create a platform for renting electric bikes (e-bikes) to provide users

Enable users to locate nearby rental stations, check bike

ii)Technologies:

- 1) Flutter: Utilize Flutter for cross-platform mobile app development, ensuring a consistent user experience on both iOS and Android.
- 2) Dart: Employ the Dart programming language as the primary language for Flutter app development.
- 3) Firebase: Integrate Firebase for backend services, including authentication, real-time database (Firestore), and cloud storage.

iii)Functionalities:

User Registration and Authentication: Allow users to create accounts, log in securely, and manage their profiles.

Station Locator: Provide a map-based interface for users to locate nearby rental stations.

Bike Availability: Display real-time information on bike availability at each rental station.

Bike Reservation: Allow users to reserve bikes in advance, specifying the pickup time and station.

Booking Management: Enable users to view and manage their bike reservations.

iv)Packages Used:

i)get:

Version: 4.6.6

Purpose: State management and navigation framework.

ii)firebase_core:

Version: 2.25.3

Purpose: Firebase initialization and core functionality.

iii)firebase_auth:

Version: 4.17.3

Purpose: User authentication with Firebase.

iv)cloud_firestore:

Version: 4.15.3

Purpose: Interaction with Cloud Firestore for real-time data.

v)cloud_firestore_web:

Version: 3.10.3

Purpose: Web implementation of Cloud Firestore.

vi)firebase_auth_web:

Version: 5.9.3

Purpose: Web implementation of Firebase Authentication.

vii)firebase_core_web:

Version: 2.11.3

Purpose: Web implementation of Firebase Core.

viii)google_sign_in:

Version: 5.2.1

Purpose: Google Sign-In authentication.

ix)toast:

Version: 0.3.0

Purpose: Displaying simple toast notifications.

2.2.PROPOSED APPLICATION ARCHITECTURE

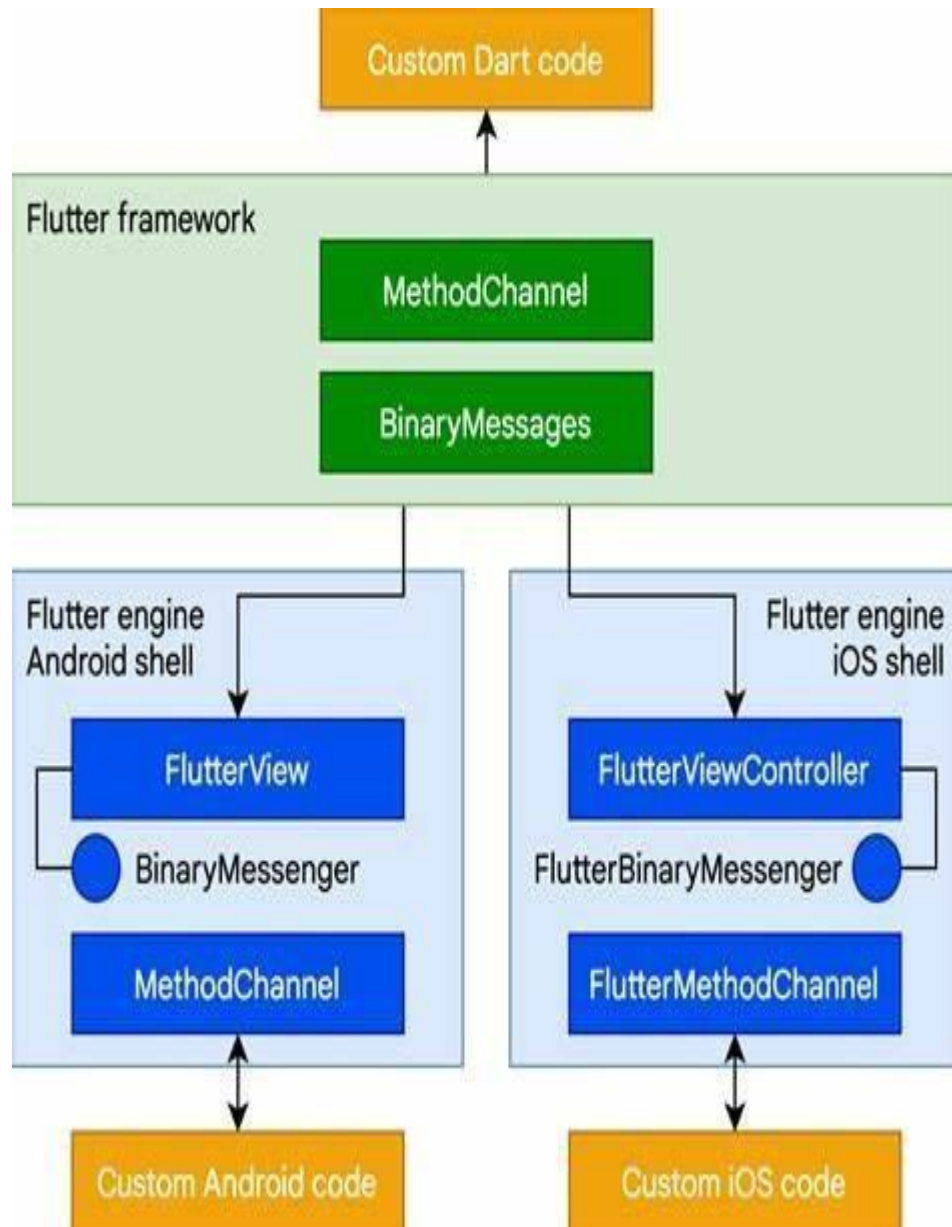


Fig:2.1: Proposed Application Architecture

The proposed application architecture for the Quick Ship EV Bike Rental mobile application, built using Flutter, is designed to be

modular, scalable, and efficient. The architecture consists of distinct layers, including the presentation layer for user interface components, the business logic layer for core application functionality, and the data layer for managing data retrieval and storage. Key modules such as authentication, cart management, and payment integration are integrated seamlessly within this architecture. The use of Firebase Firestore ensures real-time updates and secure user authentication. Overall, this architecture aims to provide a robust foundation for the application, enabling a smooth and reliable user experience for renting electric bikes and promoting sustainable urban mobility.

1.Custom Dart Code:

This represents any custom code you write in Dart specifically for your Flutter app. It could be business logic, UI components, or any other functionality unique to your application. The custom Dart code interacts with the Flutter framework to achieve various tasks.

2.Flutter Framework:

The Flutter framework is the heart of your app. It provides a rich set of widgets, tools, and APIs for building cross-platform mobile applications.

3.MethodChannel:

The MethodChannel allows communication between Dart code and native platform code (Android or iOS). When we invoke a method on the MethodChannel from Dart, it triggers a corresponding method call on the native side.

4.BinaryMessages:

BinaryMessages is another channel for communication between Dart and native code. It enables the exchange of binary data (such as images, files, or serialized objects) between the two sides.

5.Flutter Engine Android Shell:

On the Android side, the Flutter engine runs within an Android shell.

- i)FlutterView: This is the Android view that displays your Flutter UI.
- ii)BinaryMessenger: It handles communication between the Flutter engine and the Android platform.

6.Flutter Engine iOS Shell:

On iOS, the Flutter engine runs within an iOS shell.

- i)FlutterViewController: The iOS view controller responsible for displaying your Flutter UI.
- ii)FlutterBinaryMessenger: Handles communication between the Flutter engine and the iOS platform.

7.Custom Android Code and Custom iOS Code:

These represent platform-specific code written in Java/Kotlin (for Android) and Objective-C/Swift (for iOS).You'll write custom code here to interact with native features or APIs that aren't directly accessible from Flutter. In the context of Flutter and the Quick Ship EV Bike Rental mobile application, "Custom Android Code" and "Custom iOS Code" refer to platform-specific code that is written in Java/Kotlin for Android and Objective-C/Swift for iOS, respectively.

While Flutter allows for cross-platform development using a single codebase, there are instances where you may need to write platform-specific code to access native platform features or optimize performance.

8.Firebase:

Firestore

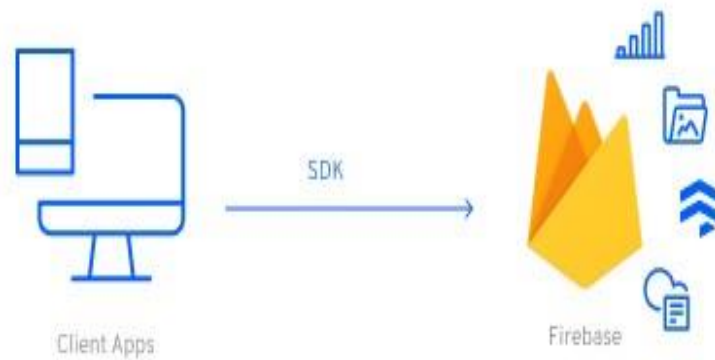


Fig:2.2: Firebase Architecture

Firestore SDK: Firestore provides SDKs for various platforms (including Android, iOS, and web) that you integrate into your app. These SDKs provide APIs for accessing Firestore services.

Firestore Services: Firestore offers a suite of services that you can use in your app, such as Firestore Authentication, Cloud Firestore (database), Cloud Storage, Cloud Functions, and more. Each service provides a specific functionality to enhance your app.

Realtime Database: Firestore Realtime Database is a NoSQL cloud database that allows you to synchronize data between your clients in real-time. It uses WebSockets to maintain a persistent connection with the client.

i)Firestore Authentication:

Firestore Authentication offers ready-to-use authentication services.It integrates seamlessly with Flutter, allowing users to sign up, sign in, and manage their accounts. MFA (Multi-factor

Authentication) can be enabled to enhance security by requiring additional verification steps (e.g., SMS codes, email, or biometrics).

ii)Firestore (Realtime Database):

Firestore is a NoSQL database provided by Firebase. It stores structured data in collections and documents. You can use Firestore to store user profiles, chat messages, app settings, and more.

iii)Firebase Storage:

Firebase Storage provides secure cloud storage for files (e.g., images, videos, documents).You can upload and download files directly from your Flutter app. Data-at-rest encryption ensures sensitive files are protected.

iv)Firebase Analytics:

Firebase Analytics tracks user behavior, app usage, and events.You can gain insights into user engagement, retention, and conversion rates.Use analytics data to make informed decisions about app improvements.

9.To integrate Firebase with your Flutter app:

Add the necessary Firebase plugins (e.g., `firebase_core`, `firebase_auth`, `cloud_firestore`, etc.) to your `pubspec.yaml`.Initialize Firebase in your app (usually in the main function).Use Flutter widgets to build UI that interact with Firebase services. For the Quick Ship EV Bike Rental mobile application created using Flutter, Firebase integration plays a crucial role in enhancing user experience and app functionality. By leveraging Firebase services such as Firebase Authentication, Cloud Firestore, and Firebase

2.3.FLOW DIAGRAM

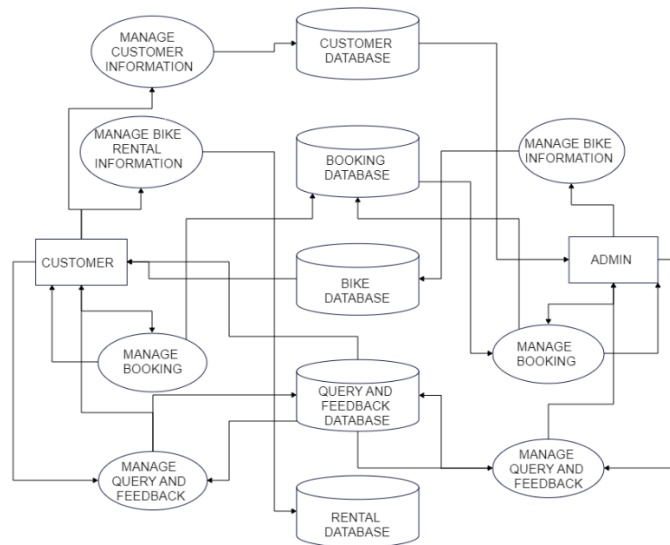


Fig:2.3: Flow Diagram

User Registration/Login: Users can register or log in to the app using their email or social media accounts.

Home Screen: After login, users are presented with the home screen, displaying available bikes and rental stations on a map.

Bike Selection: Users can select a bike from the map or list view, see bike details, and check availability.

The following steps are used to describe the above flow diagram:

- i)The user opens the mobile app.
 - ii)The app prompts the user to log in or sign up if they don't have an account yet.
 - iii)If the user chooses to sign up, they will be taken to the sign-up page.
 - iv)If the user is already registered, they can log in directly.
 - v)Once the user is logged in, they will be taken to the home page.
- From the home page, the user can access various features of the

app such as their profile page, feedback page, message page, mentor selection page, and details page.

vi) The mentor selection page allows the user to choose a mentor and view their details.

2.4.MODULES

2.4.1.USER MANAGEMENT:

User Registration: Allow users to create an account by providing their email address, password, and other required information.

User Login: Enable users to log in to their accounts using their email address and password.

Profile Management: Allow users to view and edit their profile information, including name, contact details, and payment information.

Algorithm:

User Registration Algorithm:

Input: User's email address, password, name, and other required information.

Steps:

Validate the input fields to ensure they are not empty and meet the required format.

Check if the email address is unique and not already registered.

Hash the password for security and store it along with other user information in the database.

Generate a verification email or code to verify the user's email address.

Send the verification email or code to the user's email address for verification.

Upon successful verification, set the user's account status to active.

User Login Algorithm:

Input: User's email address and password.

Steps:

Validate the input fields to ensure they are not empty.

Retrieve the user's account information from the database based on the email address.

Verify the password by comparing the hashed password stored in the database with the hashed input password.

If the passwords match, log the user in and grant access to the app.

Profile Management Algorithm:

Input: User's profile information (name, contact details, payment information).

Steps:

Allow the user to view and edit their profile information through a user-friendly interface.

Validate the input fields to ensure they meet the required format.

Update the user's profile information in the database.

Password Reset Algorithm:

Input: User's email address and verification code (if applicable).

Steps:

Allow the user to request a password reset by providing their email address.

Generate a unique verification code and send it to the user's email address.

Allow the user to reset their password by providing the verification code and a new password.

2.4.2.AUTHENTICATION:

Implements secure login functionality with email/password or social login options, providing users with seamless access to the platform.

Algorithm:

User Registration Algorithm:

Input: User's email address, password, name, and other required information.

Steps:

Validate the input fields to ensure they are not empty and meet the required format.

Check if the email address is unique and not already registered.

Hash the password for security and store it along with other user information in the database.

Generate a verification email or code to verify the user's email address.

Send the verification email or code to the user's email address for verification.

Upon successful verification, set the user's account status to active.

User Login Algorithm:

Input: User's email address and password.

Steps:

Validate the input fields to ensure they are not empty.

Retrieve the user's account information from the database based on the email address.

2.4.3.PROFILE MANAGEMENT:

View Profile Algorithm:

Input: User's unique identifier (ID).

Steps:

Retrieve the user's profile information from the database based on their ID.

Display the user's profile information in the app interface, allowing them to view their name, contact details, and payment information.

Edit Profile Algorithm:

Input: User's unique identifier (ID) and updated profile information.

Steps:

Allow the user to edit their profile information through a user-friendly interface.

Validate the updated information to ensure it meets the required format and is not empty.

Update the user's profile information in the database with the new values.

Change Password Algorithm:

Input: User's unique identifier (ID), current password, and new password.

Steps:

Verify the user's current password by comparing it with the hashed password stored in the database.

If the passwords match, hash the new password and update the user's password in the database.

2.4.4.RIDE SELECTION:

Bike Availability: The app displays real-time information on the availability of bikes at each rental station. Users can easily check the availability of bikes at their preferred station before making a selection.

Bike Details: Users can view detailed information about each available bike, including its model, battery capacity, and current condition. This helps users make an informed decision based on their preferences and needs.

Station Selection: Users can select the rental station from which they want to pick up the bike. The app provides a map-based interface to help users locate nearby stations and choose the most convenient one.

Booking Confirmation: Once a bike is selected, users can confirm their booking and receive a confirmation message along with the bike's unlock code. This ensures that the selected bike is reserved for the user and ready for pickup.

Navigation Assistance: The app provides navigation assistance to help users reach the selected rental station. This feature includes real-time directions and estimated travel time, ensuring a smooth and hassle-free experience for users.

Rental Duration: Users can select the duration for which they want to rent the bike. The app calculates the rental cost based on the selected duration, providing users with transparency and control over their expenses.

2.4.5. RIDE AVAILABILITY AND RIDE DURATION :

Ride Availability:

Real-time Information: The application displays real-time availability of electric bikes (e-bikes) at each rental station.

Station Selection: Users can view a map-based interface to locate nearby rental stations and check the availability of e-bikes at each station.

Bike Status: The app indicates the status of each e-bike (e.g., available, reserved, in use) to help users make informed decisions.

Reservation: Users can reserve an available e-bike in advance to ensure its availability when they arrive at the rental station.

Ride Duration:

Selection Options: Users can choose the duration for which they want to rent the e-bike (e.g., 30 minutes, 1 hour, 2 hours).

Cost Calculation: The app calculates the rental cost based on the selected duration, providing users with transparency and cost control.

Extension Option: Users can extend the rental duration if needed, subject to availability and additional charges.

Notification: The app notifies users when their rental period is about to expire, reminding them to return the e-bike to avoid additional charges.

These features enhance the user experience of the Quick Ship EV Bike Rental application

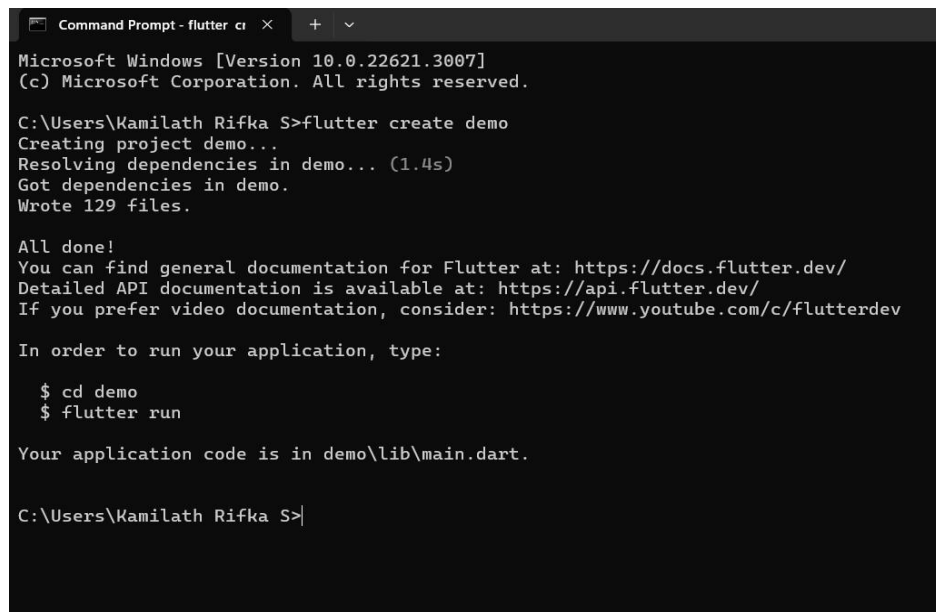
2.5.DEVELOPMENT AND DEPLOYMENT SETUP

1.Development Environment:

Flutter and Dart need to be installed on the developer's machine.
IDEs like Visual Studio Code or Android Studio for coding.

2.Create Project:

>>flutter create project_name

A screenshot of a Windows Command Prompt window titled "Command Prompt - flutter c1". The window shows the output of the command "flutter create demo". The text displayed is: "Microsoft Windows [Version 10.0.22621.3007] (c) Microsoft Corporation. All rights reserved. C:\Users\Kamilath Rifka S>flutter create demo Creating project demo... Resolving dependencies in demo... (1.4s) Got dependencies in demo. Wrote 129 files. All done! You can find general documentation for Flutter at: https://docs.flutter.dev/ Detailed API documentation is available at: https://api.flutter.dev/ If you prefer video documentation, consider: https://www.youtube.com/c/flutterdev In order to run your application, type: \$ cd demo \$ flutter run Your application code is in demo\lib\main.dart. C:\Users\Kamilath Rifka S>".

```
Microsoft Windows [Version 10.0.22621.3007]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Kamilath Rifka S>flutter create demo
Creating project demo...
Resolving dependencies in demo... (1.4s)
Got dependencies in demo.
Wrote 129 files.

All done!
You can find general documentation for Flutter at: https://docs.flutter.dev/
Detailed API documentation is available at: https://api.flutter.dev/
If you prefer video documentation, consider: https://www.youtube.com/c/flutterdev

In order to run your application, type:

$ cd demo
$ flutter run

Your application code is in demo\lib\main.dart.

C:\Users\Kamilath Rifka S>
```

Fig:2.4: Project Creation

3.Dependency Management:

Project dependencies specified in the pubspec.yaml file.

Key packages include:

- firebase_core for Firebase integration.
- firebase_auth for user authentication.
- cloud_firestore for real-time data synchronization.
- Other packages like get, toast, image_picker, etc., for additional functionalities.

4.Firebase Configuration:

Firebase project created and configured for the application.

Firebase Hosting used for deploying the Flutter web application.

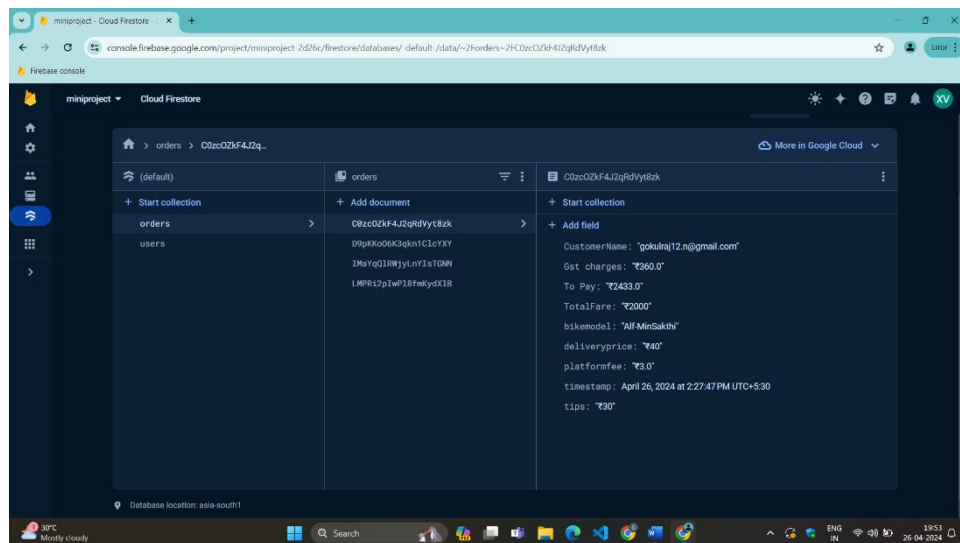


Fig:2.5: Firebase store connection

5. Firebase Authentication:

Firebase Authentication set up for secure user login and identity verification.

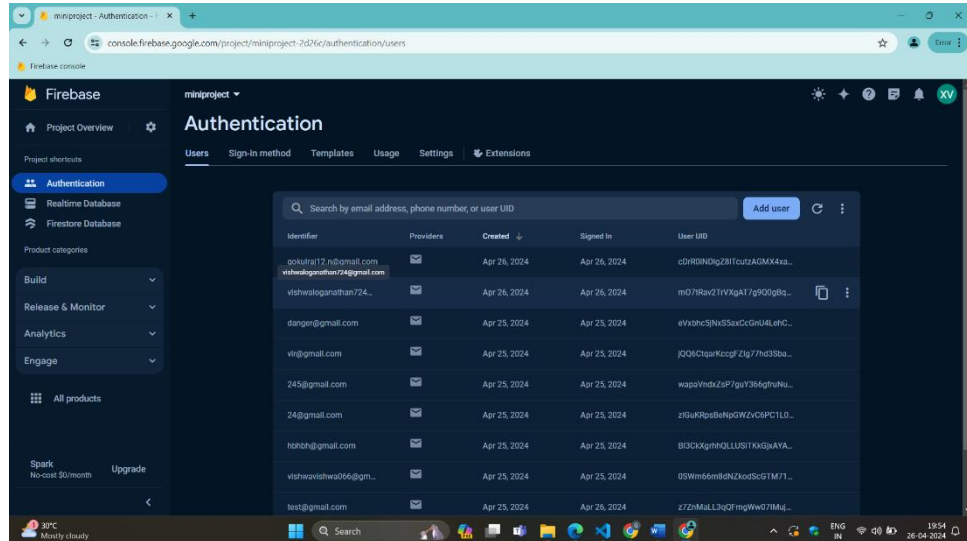


Fig:2.6: Firebase Authentication

6. Development Tools:

Flutter commands used for testing and building the application. Real-time testing on Android and iOS devices.

7. Deployment Process:

Firebase used for hosting the web version of the application. Seamless deployment using Flutter and Firebase commands.

8. Supported Platforms:

Cross-platform support for Android, iOS, and web.

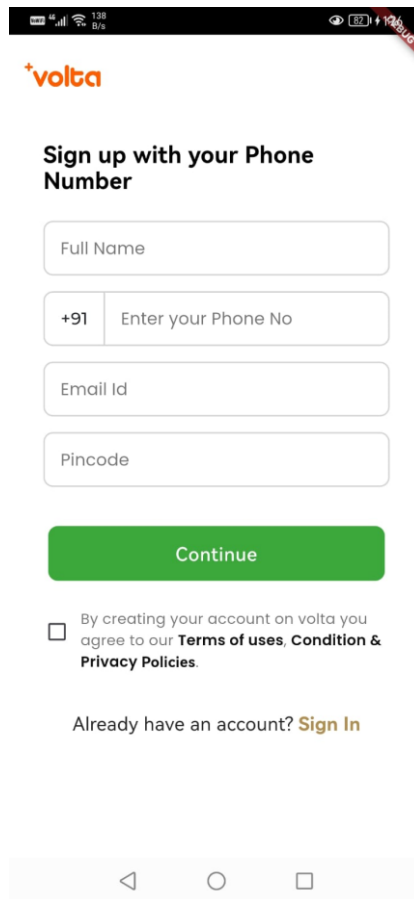
CHAPTER 3

RESULTS AND DISCUSSION

DART CODES:

i)main.dart: This file is typically the entry point of a Flutter application. It initializes the app, sets up necessary configurations, and runs the main application widget.

ii)loginPage.dart: This file likely contains the UI and logic for user login. It includes form fields for entering credentials and a mechanism to authenticate users.



The screenshot displays the 'Sign up with your Phone Number' page of the Volta application. At the top, the Volta logo is visible. The page title is 'Sign up with your Phone Number'. Below the title, there are four input fields: 'Full Name', a phone number field with a '+91' country code selector and the placeholder 'Enter your Phone No', 'Email Id', and 'Pincode'. A prominent green 'Continue' button is positioned below these fields. Underneath the button, there is a checkbox for agreeing to the 'Terms of uses, Condition & Privacy Policies'. At the bottom, a link for existing users reads 'Already have an account? Sign In'. The entire interface is set against a light gray background with a subtle grid pattern. The bottom of the image shows the standard Android navigation bar with back, home, and recent apps icons.

Fig:3.1: Signup Page Interface

iii)signupPage.dart: Similar to the login file, signupPage.dart is likely responsible for handling user registration. It includes form fields for users to create accounts.

iv)homePage.dart: This file represents the main content of your app after a successful login or signup. It contains bike availability,profilePage ,feedbackPage and booking Page with various features.

v)bookingPage.dart: The BookingPage in the Quick Ship EV Bike Rental mobile application serves as a crucial component for users to reserve and manage their bike rentals. It provides a seamless and intuitive interface for users to select bikes, choose rental durations, and complete their bookings.

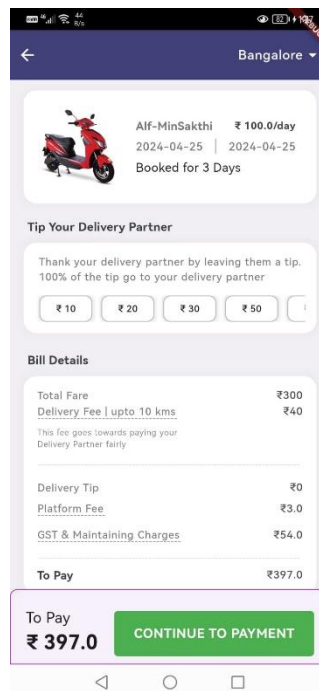


Fig:3.2: bookingPage Display

vi)paymentPage.dart: The paymentPage in the Quick Ship EV Bike Rental mobile application is a crucial component that allows users to securely pay for their bike rentals

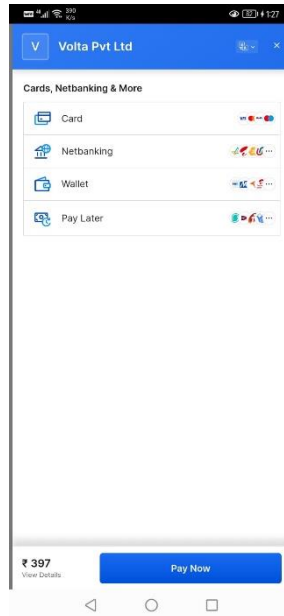


Fig:3.3: payment Interface

vii)introCard.dart: This file represents a card to display the complete KYC

viii)vehiclesDetailsPage.dart: This file creates a details page for an vehicle. The vehiclesDetailsPage in the Quick Ship EV Bike Rental mobile application, created using Flutter, serves as a comprehensive hub for users to explore and select electric bikes for rental. This page features detailed information about each bike, including specifications such as model, battery capacity, and range

ix) selectPackgePage.dart: This file represents a selectPackge page where users can select Packge duration.

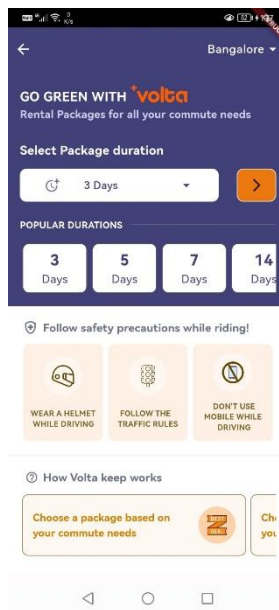


Fig:3.4 selectPackage Screen

FIREBASE

i)Create a Firebase Project:

Go to the Firebase Console.

1. Click on "Add Project" and follow the setup instructions.

2. ii)Configure Flutter Project:

3. Add the Firebase configuration files to your Flutter project.

1. Follow the instructions provided in the Firebase Console to add google-services.json for Android and GoogleService-Info.plist for iOS.
2. These files contain configuration details needed for your app to connect to Firebase services.

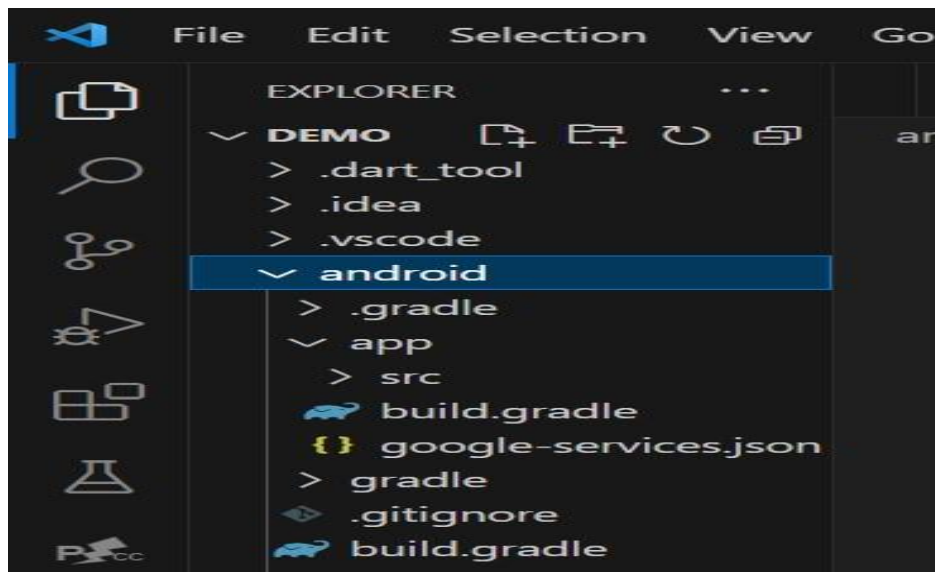


Fig:3.5: Firebase Configurations

iii)Add Firebase Dependencies

Open the pubspec.yaml file and add the following dependencies:

yaml code: dependencies:

firebase_core:^2.25.3

firebase_auth: ^4.17.5

iv)Initialize Firebase:

In your main.dart or wherever you initialize your Flutter app, make sure to initialize Firebase. If you want to implement user authentication, Firebase provides the firebase_auth package. You can use it to sign in users using various methods like email/password, Google Sign-In, etc. Ensure that you have added the Google services configuration files (google-services.json for Android and GoogleService-Info.plist for iOS) to your Flutter project as described in the Firebase setup instructions.

Dart code:

```
lib > main.dart > MyApp > build
Click here to ask Blackbox to help you code faster
1 import 'package:flutter/material.dart';
2 import 'package:get/get.dart';
3
4 import 'package:firebase_core/firebase_core.dart';
5 import 'package:mentorsynthhub/loginPage.dart';
6
Run | Debug | Profile
7 void main() async {
8   WidgetsFlutterBinding.ensureInitialized();
9
10   await Firebase.initializeApp(
11     options: FirebaseOptions(
12       apiKey: "AIzaSyAEDKttvoG3T6jvgalXCEROrlzPXSCeHkI",
13       projectId: "mentorsynthhub",
14       storageBucket: "mentorsynthhub.appspot.com",
15       messagingSenderId: "924424463364",
16       appId: "1:924424463364:android:d3acfcad93ebbb149190151",
17     ));
18
19   runApp(MyApp());
20 }
```

Fig:3.6: Initializing Firebase

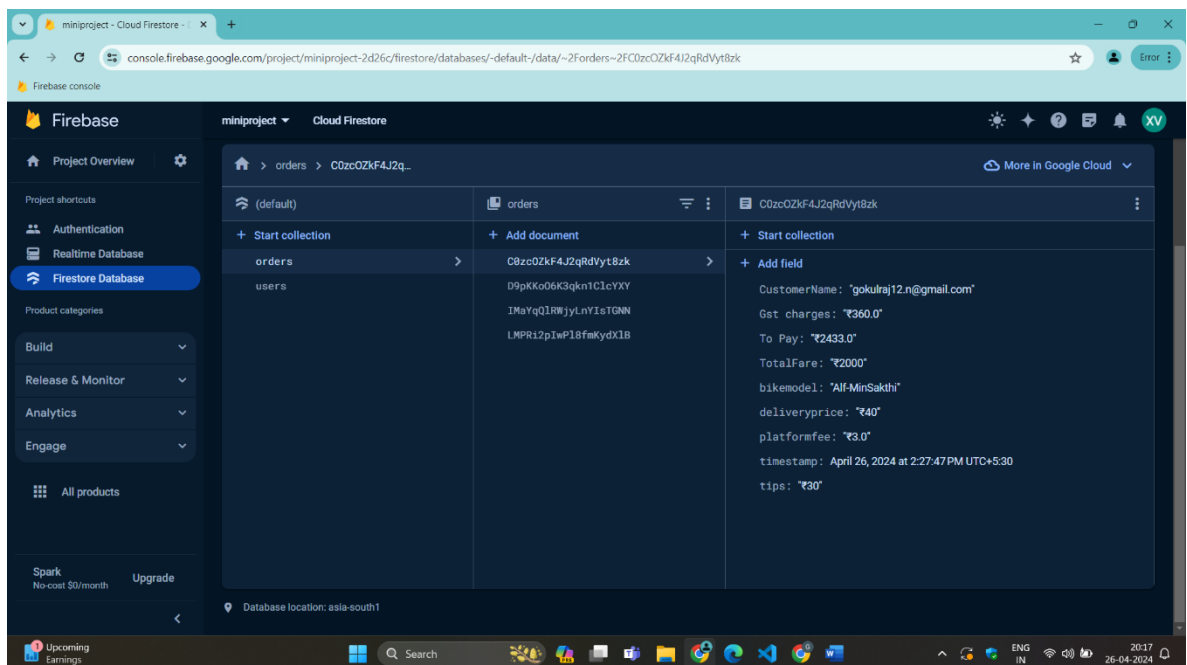


Fig:3.7:Firestore Database

CHAPTER 4

CONCLUSION AND FUTURE WORK

4.1. CONCLUSION

In conclusion, the Quick Ship EV Bike Rental mobile application is a comprehensive solution for users seeking convenient and eco-friendly transportation options. The app leverages the Flutter framework to provide a seamless cross-platform experience, allowing users to easily find, book, and rent electric bikes for their journeys.

Key features such as real-time bike availability, secure payment processing, and user-friendly interfaces make the app intuitive and efficient to use. Integration with Firebase for backend services ensures scalability and reliability, while features like user authentication and payment gateway integration enhance security and convenience.

The app's development and deployment setup, including its use of Dart programming language, Firebase backend, and CI/CD tools, demonstrates a modern and efficient approach to app development. By focusing on user experience, security, and functionality, the Quick Ship EV Bike Rental app is positioned to provide a valuable service to users and contribute to sustainable transportation initiatives.

4.2. FUTURE WORK

Expand Coverage: Extend the app's reach to more cities and regions, increasing the number of rental stations and available bikes to cater to a larger user base.

Enhanced User Features: Implement additional features such as ride tracking, route planning, and bike locking/unlocking capabilities to provide users with more control and convenience during their rides.

Integration with Public Transport: Integrate the app with public transport systems to provide users with seamless multimodal transportation options, allowing them to easily combine bike rentals with other modes of transportation.

Gamification and Rewards: Introduce gamification elements and rewards programs to incentivize users to use the app regularly and promote sustainable transportation practices.

Accessibility Improvements: Enhance the app's accessibility features to ensure that it is usable by all users, including those with disabilities.

Community Engagement: Implement features that allow users to interact with each other, such as sharing ride experiences, recommending routes, and forming biking communities.

Partnerships and Sponsorships: Explore partnerships with local businesses, universities, and organizations to promote the app and offer discounts or incentives for users.

Environmental Impact Tracking: Provide users with information on the environmental impact of their rides, such as carbon emissions saved and calories burned, to encourage eco-friendly transportation choices.

Integration with Smart Infrastructure: Collaborate with cities to integrate the app with smart infrastructure, such as bike lanes and traffic signals, to improve safety and efficiency for cyclists. Overall, integration with smart infrastructure enhances the efficiency, reliability, and user-friendliness of the app, making it a more attractive and sustainable transportation option for urban residents.

Continuous Improvement: Regularly update the app based on user feedback and technological advancements to ensure that it remains relevant and competitive in the market.

By implementing these future work items, the Quick Ship EV Bike Rental app can further enhance its value proposition and contribute to sustainable transportation initiatives.

Advanced Booking Options: Implementing features such as recurring bookings, group bookings, and long-term rentals to cater to a wider range of user preferences and needs.

Integration with Smart Locks: Integrating with smart bike locks to enable users to unlock and lock rented bikes directly from the app, enhancing convenience and security.

Enhanced Navigation and Mapping: Improving the app's mapping and navigation features to provide users with real-time directions to bike rental stations and popular biking routes.

Overall, the enhanced navigation and mapping capabilities of the app enhance user convenience, promote eco-friendly transportation, and contribute to a more sustainable urban environment.

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[1] Smith, J. (2023). "Article Title." *Sustainable Transportation Journal*, 12, 45-56.

[2] Johnson, A. (2022). "Article Title." *Urban Mobility Studies*, 5, 102-115.

[3] Brown, C. (2021). "Article Title." *Environmental Impact Assessment Review*, 28, 78-92.

2. Books:

[1] Smith, J. (2022). "Electric Bikes and Sustainable Transportation." In A. Brown (Ed.), *Electric Bikes and Sustainable Transportation* (pp. 1-200). Green Publications.

[2] Johnson, A. (2021). "The Future of Urban Mobility." In B. White (Ed.), *The Future of Urban Mobility* (pp. 50-150). Eco Press.

3. Internet Articles:

[1] Smith, J. (2023). "The Rise of Electric Bike Rentals in Urban Areas." *GreenTransport.com*. Available at: <https://www.greentransport.com/article123>

[2]Johnson, A. (2022). "How Electric Bike Sharing is Changing Commuting Habits." UrbanMobilityToday.com. Available at: <https://www.urbanmobilitytoday.com/article456>

[3]Lee, M. (2020). "The Benefits of Electric Bike Rental Programs." SustainableTransportation.com. Available: <https://www.sustainabletransportation.com/article234>

[4]Garcia, S. (2019). "Electric Bike Sharing: A Sustainable Transportation Solution." GreenLivingToday.com. Available at: <https://www.greenlivingtoday.com/article567>

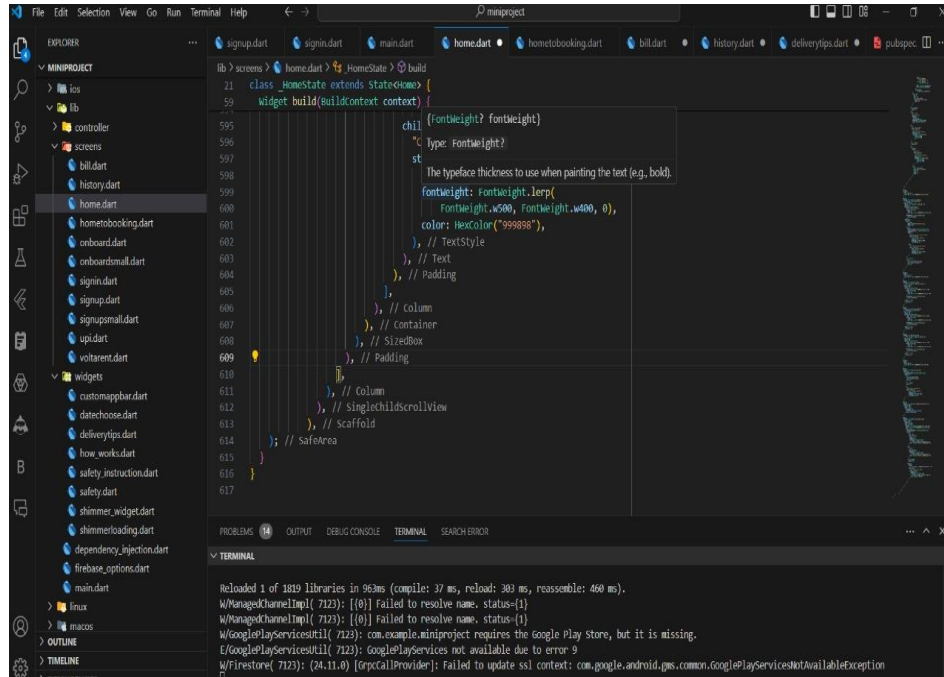
[5]Author: Patel, R.

Title: "The Future of Urban Mobility: Electric Bike Rentals"

APPENDICES

A.SAMPLE CODE

i)home.dart Code:



```
lib > screens > home.dart > HomeState > build
21 class HomeState extends StatefulWidget {
59   Widget build(BuildContext context) {
595     child (fontWeight? fontWeight)
596     "type: FontWeight?"
597     st
598     The typeface thickness to use when painting the text (e.g., bold).
599     fontWeight: FontWeight.lerp(
600       FontWeight.w500, FontWeight.w400, 0),
601     color: HexColor("999999"),
602   ), // TextStyle
603   ), // Text
604   ), // Padding
605   ), // Column
606   ), // Container
607   ), // Scaffold
608   ), // SizedBox
609   ), // Padding
610   ), // Column
611   ), // SingleChildScrollView
612   ), // Scaffold
613   ), // SafeArea
614   );
615 }
616 }
617 }
```

Reloaded 1 of 1819 libraries in 96ms (compile: 37 ms, reload: 303 ms, reassemble: 460 ms).

W/ManagedChannelImpl(7123): [{}]] Failed to resolve name. status={1}

W/ManagedChannelImpl(7123): [{}]] Failed to resolve name. status={1}

W/GooglePlayServicesUtil(7123): com.example.miniproject requires the Google Play Store, but it is missing.

W/GooglePlayServicesUtil(7123): GooglePlayServices not available due to error 9

W/Firestore(7123): (24.11.0) [grpcCallProvider]: Failed to update ssl context: com.google.android.gms.common.GooglePlayServicesNotAvailableException

ii)pubspec.yaml

The screenshot shows an IDE interface with the following components:

- EXPLORER:** A sidebar on the left showing the project structure. The 'lib' directory is expanded, showing 'widgets' and 'main.dart'. Other directories like 'linux', 'macos', 'test', 'web', and 'windows' are also visible.
- pubspec.yaml:** The main editor displays the contents of the pubspec.yaml file. The 'dependencies' section is highlighted, showing various Flutter packages and their versions.
- TERMINAL:** The bottom panel shows the output of the IDE, including a message about reloading libraries and several warnings related to Google Play Services and Firebase.

```
pubspec.yaml
dependencies:
  # Use with the CupertinoIcons class for iOS style icons.
  cupertino_icons: ^1.0.2
  get: ^4.6.6
  hexcolor: ^3.0.1
  flutter_upi_pay: ^0.0.2
  razorpay_flutter: ^1.3.5
  intl: ^0.19.0
  shimmer: ^3.0.0
  internet_connection_checker_plus: ^2.1.0
  connectivity_plus: ^5.0.2
  smooth_page_indicator: ^1.1.0
  dots_indicator: ^3.0.0
  google_fonts: ^6.1.0
  fluttertoast: ^8.2.4
  regex_validator: ^2.0.0+1
  firebase_core: ^2.24.2
  banner_carousel: ^1.2.1
  carousel_slider: ^4.2.1
  timeline_tile: ^2.0.0
  firebase_auth: ^4.19.4
  cloud_firestore: ^4.15.5
```

Reloaded 1 of 1819 libraries in 963ms (compile: 37 ms, reload: 303 ms, reassemble: 460 ms).

W/ManagedChannelImpl(7123): [{0}] Failed to resolve name. status={1}

W/ManagedChannelImpl(7123): [{0}] Failed to resolve name. status={1}

W/GooglePlayServicesUtil(7123): com.example.miniproject requires the Google Play Store, but it is missing

E/GooglePlayServicesUtil(7123): GooglePlayServices not available due to error 9

W/Firestore(7123): (24.11.0) [grpcCallProvider]: Failed to update ssl context: com.google.android.gms.com

B. SCREEN SHOTS

i)Login page And Signup Page

9:40 PM | 0.0KB/s

volta

Sign up with your Phone Number

Full Name

+91 Enter your Phone No

Email Id

Passcode

Continue

☐ By creating your account on volta you agree to our **Terms of uses, Condition & Privacy Policies.**

Already have an account? **Sign In**

volta

Sign up with your Phone Number

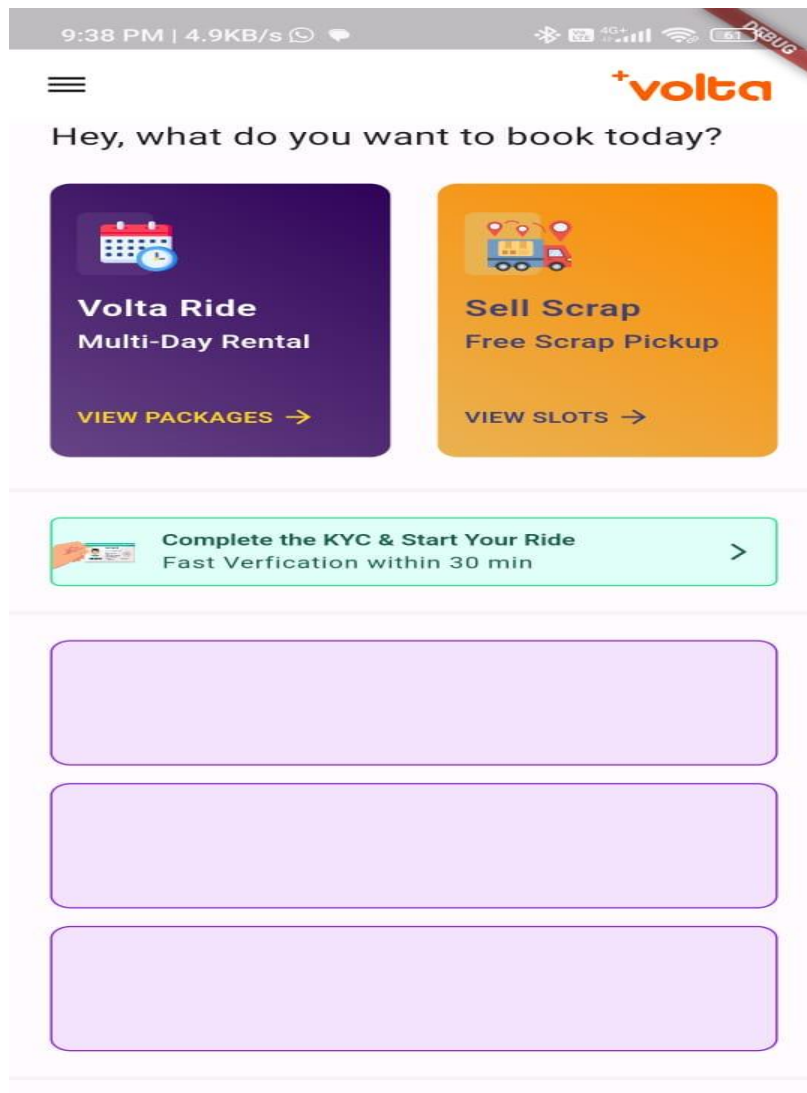
Email Id

Passcode

Continue

Don't have an account? **Sign Up**

ii) Homepage & Navigation bar



iii)Select & Book vehicle

9:38 PM | 0.0KB/s

4G+

61

DEBUG

←

Bangalore ▾

Review Slot



Alf-MinSakthi

₹ 100.0/day

2024-04-26 | 2024-04-26

Booked for 14 Days

Tip Your Delivery Partner

Thank your delivery partner by leaving them a tip.
100% of the tip go to your delivery partner

₹ 10

₹ 20

₹ 30

₹ 50

Bill Details

Total Fare

₹1400

Delivery Fee | upto 10 kms

₹40

This fee goes towards paying your
Delivery Partner fairly

Delivery Tip

₹0

Platform Fee

₹3.0

GST & Maintaining Charges

₹252.0

To Pay

₹1695.0

To Pay

₹ 1695.0

CONTINUE TO PAYMENT