Trash Pick Scheduling Mobile App Report

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Chapter 1

Introduction

The **Trash Pick Scheduling Mobile App** is a technology-driven initiative aimed at addressing the critical issue of efficient waste management in urban and suburban areas. With rapid population growth and increased consumerism, managing waste responsibly has become an environmental and logistical challenge. This app aims to simplify the waste disposal process by allowing users to schedule pickups, ensuring that trash is collected and disposed of efficiently.

The app caters to various users, including households, businesses, and waste management authorities, providing a centralized platform for scheduling, tracking, and managing trash pickups. By promoting regular waste disposal, the app contributes to cleaner public spaces, reduces environmental pollution, and fosters a culture of environmental responsibility.

This report provides an in-depth look at the Trash Pick Scheduling App's purpose, target audience, development approach, UI/UX design, development environment, testing, and system requirements. The project demonstrates how technology can contribute to solving real-world environmental challenges and aims for scalability to support future growth.

Chapter 2

Purpose and Target Audience

2.1 Purpose

The app's primary purpose is to bridge the gap between waste collection services and end-users, allowing them to schedule trash pickups from their mobile devices. Key benefits include:

- Reducing the environmental impact of unmanaged waste by encouraging regular disposal.
- Simplifying waste management for households and businesses.
- Enhancing user awareness of recycling options and waste segregation.

2.2 Target Audience

The Trash Pick Scheduling App serves a wide demographic:

- **Households**: Families and individuals who generate daily waste and need a reliable way to schedule regular pickups.
- **Small and Medium Enterprises (SMEs)**: Businesses with moderate waste output that require scheduled collection for cleanliness and hygiene.
- **Municipalities and Recycling Firms**: Authorities and organizations seeking an organized platform for streamlined collection operations.
- **Environmentally Conscious Users**: Individuals motivated to reduce their carbon footprint through sustainable disposal options.

Chapter 3

Development Approach

3.1 Methodology

The development process followed the **Agile** methodology, known for its flexibility and iterative cycles. Agile facilitated:

- Faster delivery of app features in short sprints.
- Continuous integration of feedback to refine features based on user needs.
- Enhanced collaboration among developers, designers, and stakeholders.

3.2 Phases of Development

- **Requirement Gathering**: Conducted user research to define essential app features.
- **Design and Prototyping**: Created wireframes and prototypes to visualize the user interface.
- **Development**: Implemented key functionalities, including scheduling, notifications, and GPS tracking using React Native.
- **Testing and Quality Assurance**: Ensured functionality and reliability through unit and integration testing.
- **Deployment and Maintenance**: Prepared the app for deployment on Android and iOS platforms.

3.3 Collaboration Tools

Collaboration was facilitated through:

- **Slack** and **Microsoft Teams** for team communication.
- **GitHub** for version control and code management.
- **Jira** for Agile project management, sprint planning, and task assignment.

Chapter 4

UI/UX Design

4.1 Design Principles

The app's design follows principles of simplicity, accessibility, and an intuitive interface, adhering to best practices from both Google's Material Design and Apple's Human Interface Guidelines.

4.2 User Journey and Flow

The app is structured to provide a seamless user experience:

- **Home Screen**: Displays options for scheduling pickups, viewing history, and accessing account settings.
- **Scheduling Screen**: Users can select pickup dates, specify waste type, and add instructions if needed.
- **Tracking and Notifications**: Users receive reminders and updates on collection status.

4.3 Aesthetics and Theme

A green and blue color palette was chosen to reflect environmental responsibility. The UI supports both light and dark modes, with icons and typography optimized for readability.

Chapter 5

Development and Design Tools

5.1 Development Environment

5.1.1 Technology Stack

The app's development stack includes:

- **Dart Based** for cross-platform development.
- **Node.js and Express** for server-side operations.
- **MongoDB** as the database for user profiles, schedules, and notifications.
- **Firebase** for user authentication and real-time data synchronization.

5.1.2 Development Tools and Libraries

Libraries used include Firebase Cloud Messaging for notifications, Google Maps API for location-based services, and Redux for state management.

5.2 IDE/Code Editor

5.2.1 Primary IDE/Editor

- **Visual Studio Code**: Chosen for its extensibility, built-in terminal, and Git integration.
- **Android Studio**: Used for Android-specific testing and device compatibility.

5.3 Design Tools

5.3.1 Primary Design Tools

- **Figma**: Employed for interactive wireframes and real-time collaboration.
- **Adobe XD**: For mockups and to generate app icons and UI assets.

5.3.2 Graphic Creation Tools

Adobe Illustrator was used for custom icon creation, ensuring each icon aligns with the app's eco-friendly theme.

5.4 Project Management

5.4.1 Management Tool

- **Jira**: For Agile task tracking, sprint planning, and issue tracking.
- **Trello**: Used for Kanban-style task visualization and prioritization.

Chapter 6

System Requirements

6.1 Minimum Hardware Requirements

- **RAM**: Minimum 2GB of RAM for smooth app performance.
- **Storage**: 100MB of available storage space for installation, data, and updates.
- **Processor**: A processor speed of at least 1.4 GHz to support GPS, notifications, and real-time updates.

6.2 Supported OS Versions

- **Android**: Version 8.0 (Oreo) and above, providing access to all app features.
- **iOS**: Version 12 and above, ensuring reliable performance across Apple devices.

6.3 Network Requirements

A stable internet connection is required for real-time data exchange, notifications, scheduling updates, and pickup confirmations. The app is optimized for both Wi-Fi and mobile networks, ensuring reliable service across different environments.

Chapter 7

Testing

7.1 Types of Testing Conducted

- **Unit Testing**: Individual components were tested to ensure functionality.
- **Integration Testing**: Verified the interaction between components, including scheduling and notification systems.
- **User Acceptance Testing (UAT)**: Gathered feedback from beta users to refine the user interface and enhance usability.

7.2 Testing Tools

- **Jest**: Used for unit testing in the React Native environment.
- **Selenium**: Automated testing for end-to-end functionality verification.
- **Firebase Test Lab**: For device compatibility testing across various Android and iOS devices.

Chapter 8

Images

Figure 8.1: App Icon

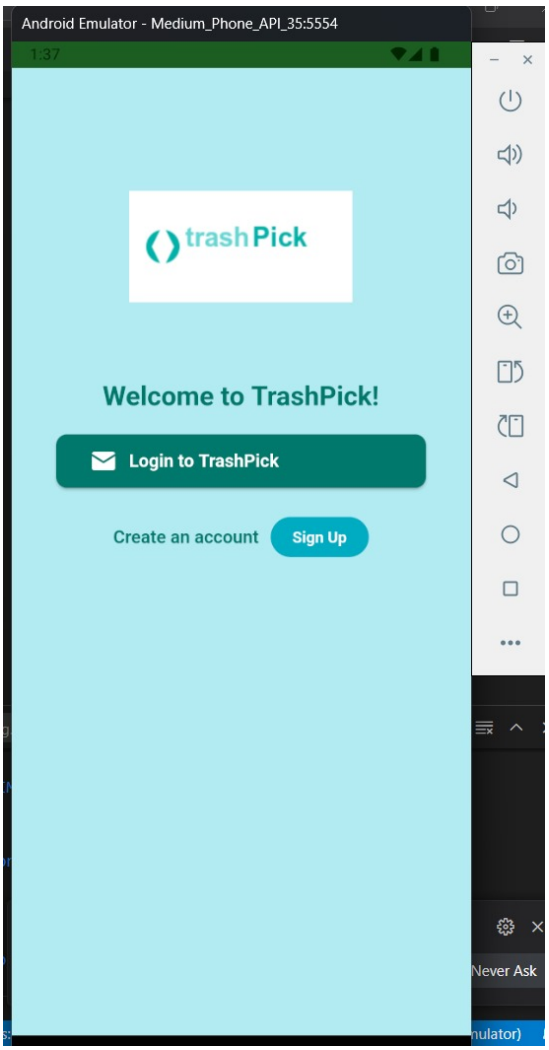

Figure 8.2: App Home Screen

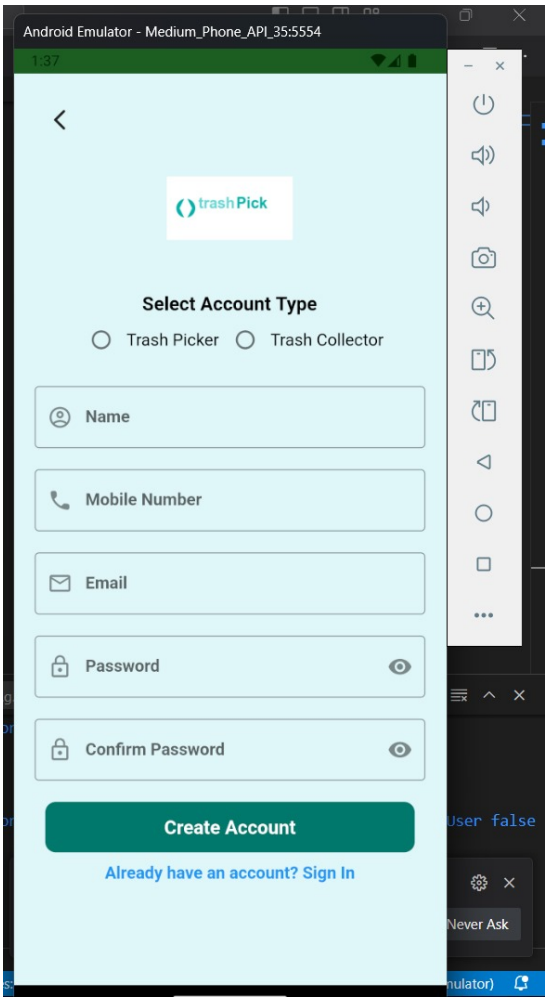

Figure 8.3: Login Screen

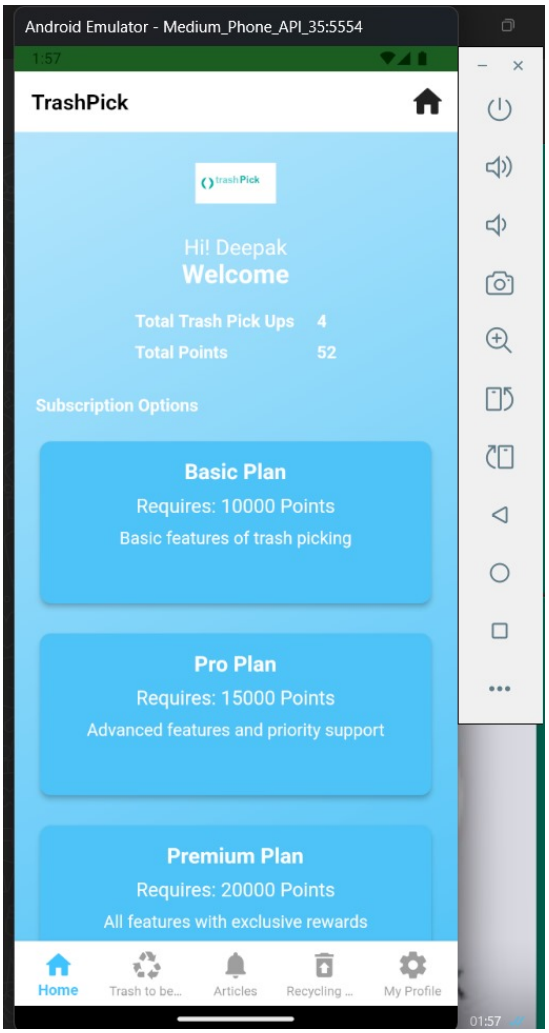

Figure 8.4: Pickup Scheduling Screen

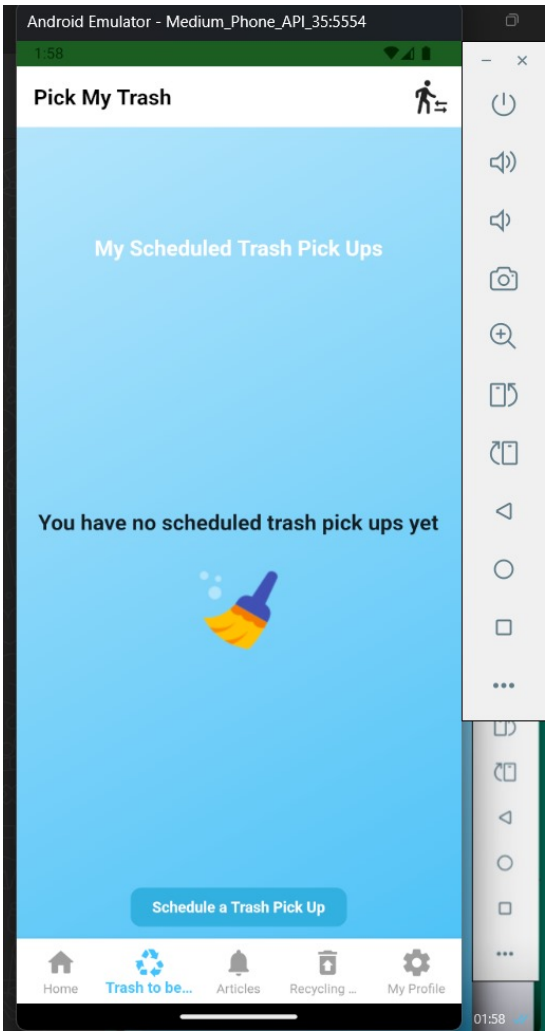

Figure 8.5: Pickup History Screen

```dart
import 'package:flutter/material.dart';
import 'package:trashpick/Pages/OnAppStart/sign_in_page.dart';
import '../../Theme/theme_provider.dart';
import '../../Widgets/button_widgets.dart';
import 'user_guide.dart';

class WelcomePage extends StatefulWidget {
  @override
  _WelcomePageState createState() => _WelcomePageState();
}

class _WelcomePageState extends State<WelcomePage> {
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      backgroundColor: AppThemeData().lightAqua, // Changed to light aqua
      body: SafeArea(
        child: SingleChildScrollView(
          child: Padding(
            padding: const EdgeInsets.all(20.0), // Increased padding
            child: Center(
              child: Column(
                mainAxisAlignment: MainAxisAlignment.center,
                crossAxisAlignment: CrossAxisAlignment.center,
                children: [
                  SizedBox(height: 40),
                  Image.asset(
                    'assets/logos/trashpick_logo_banner_2.png',
                    height: 200,
                    width: 200,
                  ), // Image.asset
                  SizedBox(height: 20),
                  Text(
                    "Welcome to TrashPick!",
                    style: TextStyle(
                      fontSize: 24,
                      fontWeight: FontWeight.bold,
                      color: AppThemeData().darkAqua, // Changed text color
                    ), // TextStyle
```

Figure 8.6: Code Snippet - Welcome page Configuration

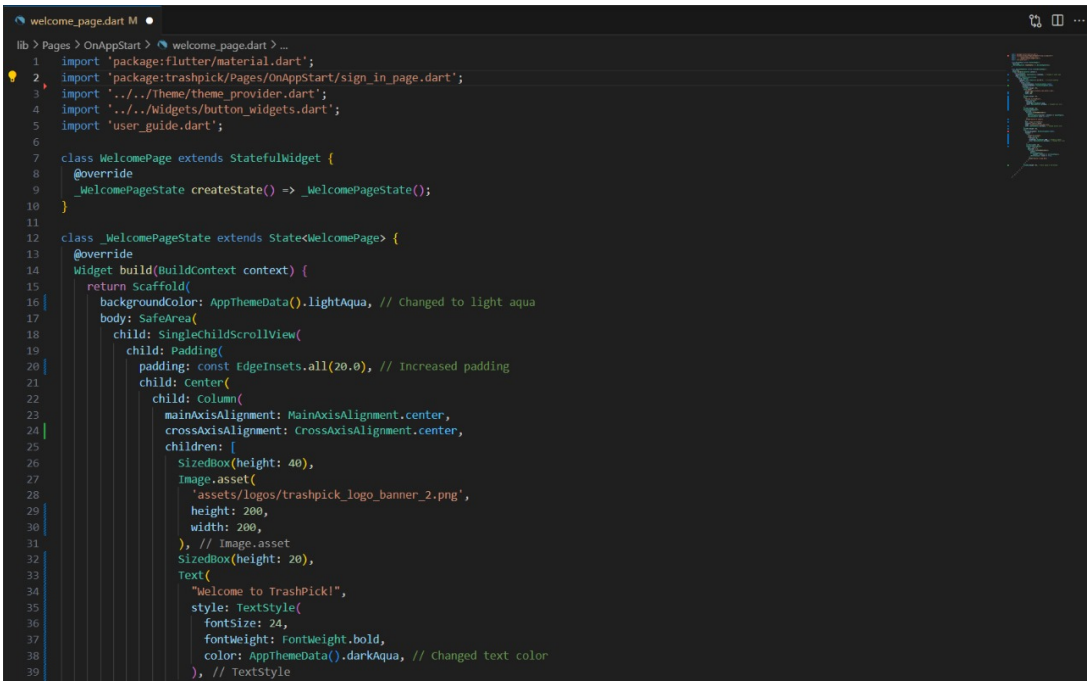

Figure 8.7: Code Snippet - welcome page Authentication

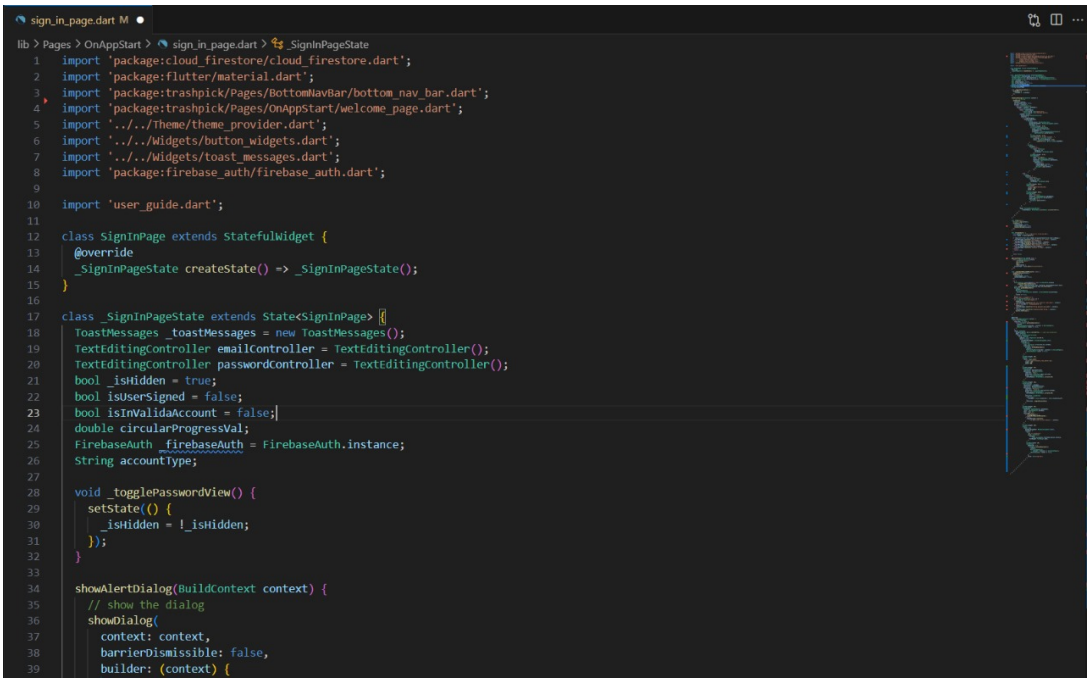

Figure 8.8: Code Snippet - User Authentication

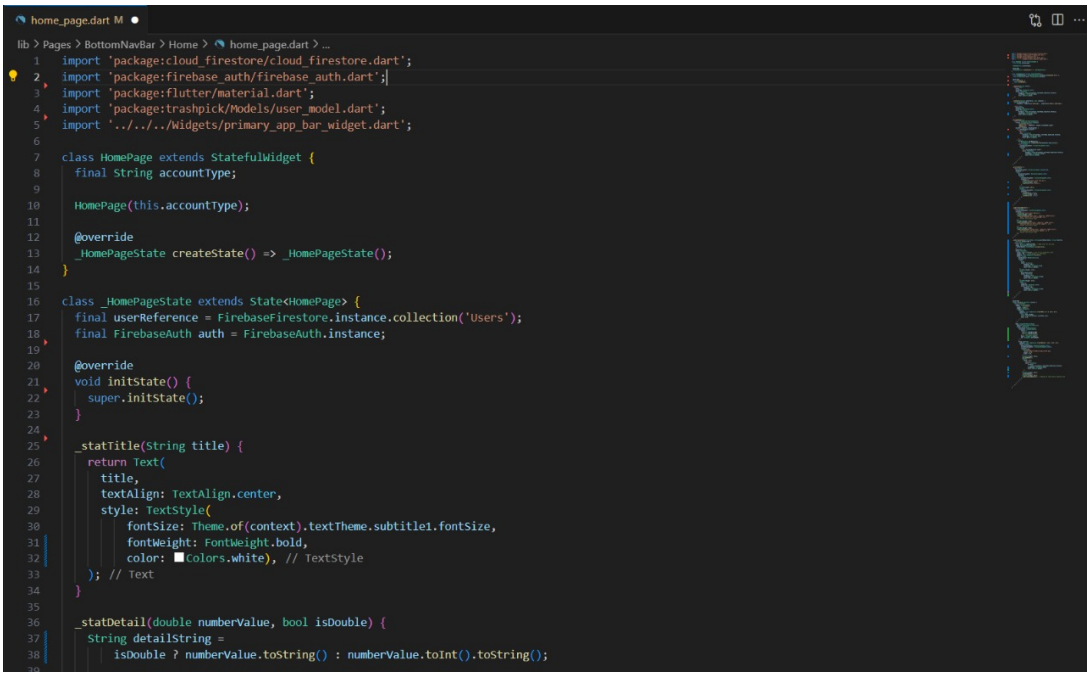

Figure 8.9: Code Snippet - Home page configuration

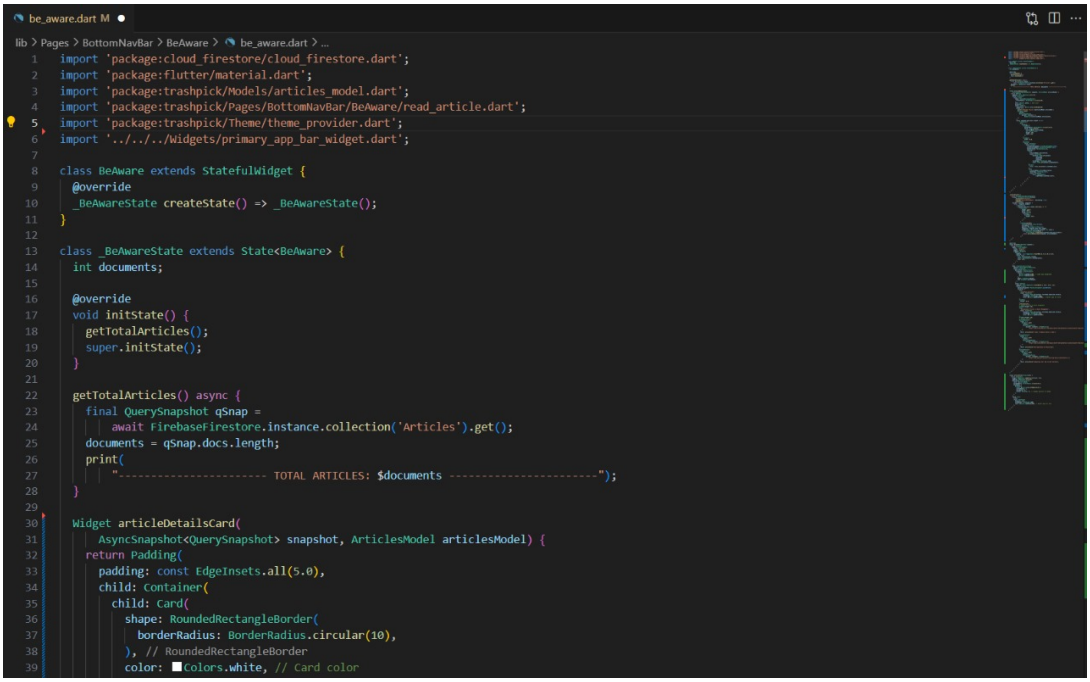

Figure 8.10: Code Snippet - Firebase Services

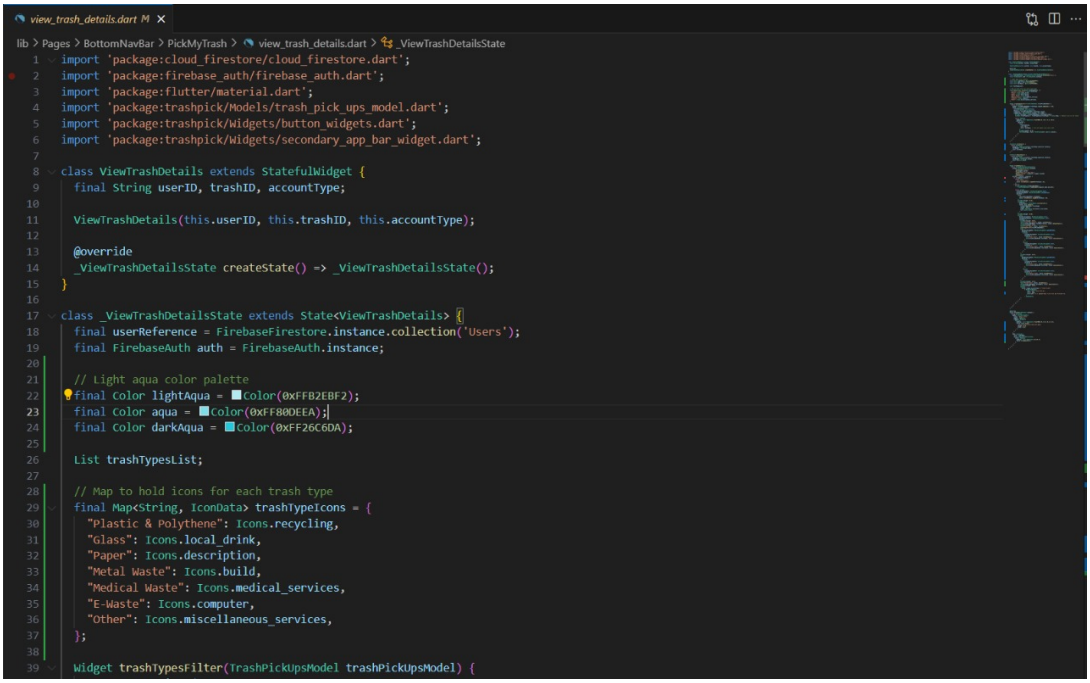

Figure 8.11: Code Snippet - Scheduling Integration

Chapter 9

Conclusion

The **Trash Pick Scheduling Mobile App** fulfills its mission to simplify waste management for users, promoting environmental sustainability. By facilitating easy scheduling, the app encourages responsible waste disposal, reducing accumulation in public areas and supporting recycling efforts.

The app's impact extends beyond convenience. By promoting regular waste collection, it plays a significant role in reducing environmental and health risks caused by improper waste disposal. The integration with local waste management services also ensures efficient recycling and disposal.

Future enhancements could introduce reward programs for consistent users, more integration with recycling services, and in-app payments for premium services. As demand for eco-conscious solutions rises, this app is well-positioned to promote sustainable waste management practices.

In summary, the Trash Pick Scheduling Mobile App is a practical digital solution to an environmental challenge, aligning user convenience with ecological goals and ensuring adaptability for future needs.

Chapter 10

References

- Reference 1: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://pdfs.semanticscholar.org/374b/79917feb36a6838dbea8f4d84eba53a7295f.pdf/
- Reference 2: https://iocscience.org/ejournal/index.php/mantik/article/view/2724/
- Reference 3: https://www.e3s-conferences.org/articles/e3sconf/abs/2023/40/e3sconf_escp2023_06013/e3sconf_escp2023_06013.html/
- Reference 4: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://acrs-aars.org/proceeding/ACRS2020/fy5qnm.pdf/