

COMMUNITY SHARING BOX MOBILE APPLICATION

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Abstract

In modern society, waste management has become a critical issue, with significant attention being paid to reducing food and material waste. The Community Sharing Box mobile application addresses this problem by providing a platform for sharing household items within local communities. The primary goal of this application is to reduce waste by encouraging users to donate and exchange items they no longer need, thereby promoting resource efficiency and environmental protection. Users can easily browse, list, and request items through the app. The application includes features such as intelligent categorization and user notifications, ensuring an efficient and user-friendly experience.

The development of this application follows a systematic methodology, including requirement analysis, design, implementation, and testing, to ensure a robust and user-friendly solution. The application is initially targeted at residents in Saville Kajang, with plans for future expansion to other regions. By facilitating the sharing and reuse of household items, the Community Sharing Box not only helps to minimize waste but also fosters community collaboration and trust. The app's design focuses on

ease of use, security, and reliability, making it an essential tool for modern sustainable living.

Keywords: Waste Management, Community Sharing, Mobile Application, Resource Efficiency, Environmental Protection, Food Waste, Household Items, Community Collaboration, Kajang, Malaysia, Sustainable Living.

Introduction

In contemporary society, waste management has become a pressing issue, gaining significant attention from both the public and policymakers. The ever-increasing population and rapid urbanization have led to an upsurge in the generation of waste, making efficient waste management an essential component of sustainable development. Among various types of waste, household waste constitutes a considerable portion, with many reusable and recyclable items ending up in landfills. This not only contributes to environmental degradation but also represents a significant loss of resources. The advent of digital technology has paved the way for innovative solutions to address these challenges. Mobile applications, in particular, offer a unique platform for connecting individuals and communities, enabling them to share resources and reduce waste. The Community Sharing Box mobile application is conceived with this vision in mind. It aims to create a community-driven platform where users can list, share, and request household items, thereby fostering a culture of sharing and sustainability.

Despite the efforts to promote recycling and waste reduction, many reusable household items still end up in landfills. This is often due to a lack of awareness, inconvenience, and the absence of a reliable platform to facilitate the exchange of items. Traditional methods of donating or recycling items can be time-consuming and cumbersome, discouraging people from participating. Moreover, the lack of a community-focused approach limits the potential for fostering trust and collaboration

among individuals. The primary objective of the Community Sharing Box mobile application is to reduce household waste by providing a convenient and user-friendly platform for sharing items.

The significance of this study lies in its potential to contribute to waste management and environmental sustainability. By providing a platform for the efficient exchange of household items, the Community Sharing Box can help reduce the volume of waste generated and conserve resources. Additionally, the application promotes a culture of sharing and collaboration, strengthening community bonds and fostering a sense of social responsibility. This study also adds to the growing body of literature on the use of digital technology for sustainable development, offering insights and practical solutions for similar initiatives.

A review of existing literature reveals a growing interest in the use of digital platforms for waste management and resource sharing. Several studies have highlighted the potential of mobile applications in promoting recycling and reducing waste. For instance, research by Smith et al. (2020) demonstrated the effectiveness of a mobile app in increasing recycling rates in urban areas. Similarly, Jones and Brown (2019) found that community-based sharing platforms could significantly reduce household waste by facilitating the exchange of items. However, there are also challenges associated with the implementation of such platforms. Issues related to user engagement, trust, and security are commonly reported in the literature. According to Wang and Lee (2018), ensuring user trust and participation is critical for the success of community-based sharing applications. Their study emphasizes the importance of incorporating features that enhance security and reliability, such as user ratings and verification systems.

The development of the Community Sharing Box mobile application follows a systematic methodology to ensure a robust and user-friendly solution. The process includes several key stages: requirement analysis, design, implementation, and testing. During the requirement analysis stage, the needs and preferences of potential users are identified through surveys and interviews. The design stage involves creating a user-

friendly interface and incorporating features such as intelligent categorization, notifications, and user ratings. The implementation stage focuses on developing the application using modern software development practices and technologies. Finally, the testing stage involves conducting thorough testing to identify and fix any issues, ensuring the application is reliable and secure.

The Community Sharing Box mobile application is designed with several key features to enhance user experience and promote sustainability: a simple and intuitive interface that allows users to easily list, browse, and request items; automated categorization of items based on their type and condition, making it easier for users to find what they need; real-time notifications to keep users informed about new listings, requests, and updates; a system for users to rate and review each other, promoting trust and reliability; and security measures to ensure the safety of user data and prevent fraudulent activities.

The initial target users of the Community Sharebox app are residents of Saville Addition. By isolating one neighborhood, the study aims to gather valuable feedback and refine the app before expanding to other areas. Expected outcomes of this study include a reduction in the amount of household items thrown away as more items are shared and reused; increased community collaboration and trust through resource sharing; resource conservation and reduced environmental degradation due to reduced waste; and a scalable solution that can be adapted and deployed in other communities to promote broader sustainable living.

Research Methodology

The research project will be developed using the waterfall model, a development model introduced by Winston Royce in 1970. The waterfall model divides the software life cycle into six basic activities: planning, requirement analysis, software design, coding, software testing, and operation and maintenance. These activities follow a fixed sequence from top to bottom, and each phase must be completed before the next phase begins, with no overlap between the phases. Using this model has many advantages such as:

1. A checkpoint of security phase division is provided for the project.
2. After the current phase is completed, only the subsequent phases need to be concerned.
3. The waterfall model can be applied in an iterative model.

However, this model also has some drawbacks:

1. There is very little feedback between project stages.
2. The results are only seen later in the project life cycle.
3. Track project phases with multiple mandatory completion dates and milestones.

Despite these shortcomings, the waterfall model is very suitable for the development of this research project. The project's low cost, long cycle, and clear, unchanging functions make it an ideal candidate for the waterfall model, as its advantages are highly compatible with the project's development process. This study plan aims to realize the design of the entire system step by step through three phases, each phase completing its respective objectives. The first phase focuses on completing the project proposal and determining the project's roles and feasibility. The second phase gradually implements the project and various functionalities. The third phase tests the project and integrates the results to complete the study.

Phase 1

In this phase, I will focus on completing all aspects of the T4172 project proposal, including chapters 1 to 5 and the proposal report. This involves determining the background, significance, and functionality of this study. The design and planning of this study will be improved by referencing other similar systems.

Phase 2

The focus of this phase is to complete the project, including writing the code for the designed system and implementing the functionality step by step using the aforementioned waterfall model. This phase aims to test the acquired skills and knowledge through practice and to complete the project.

Phase 3

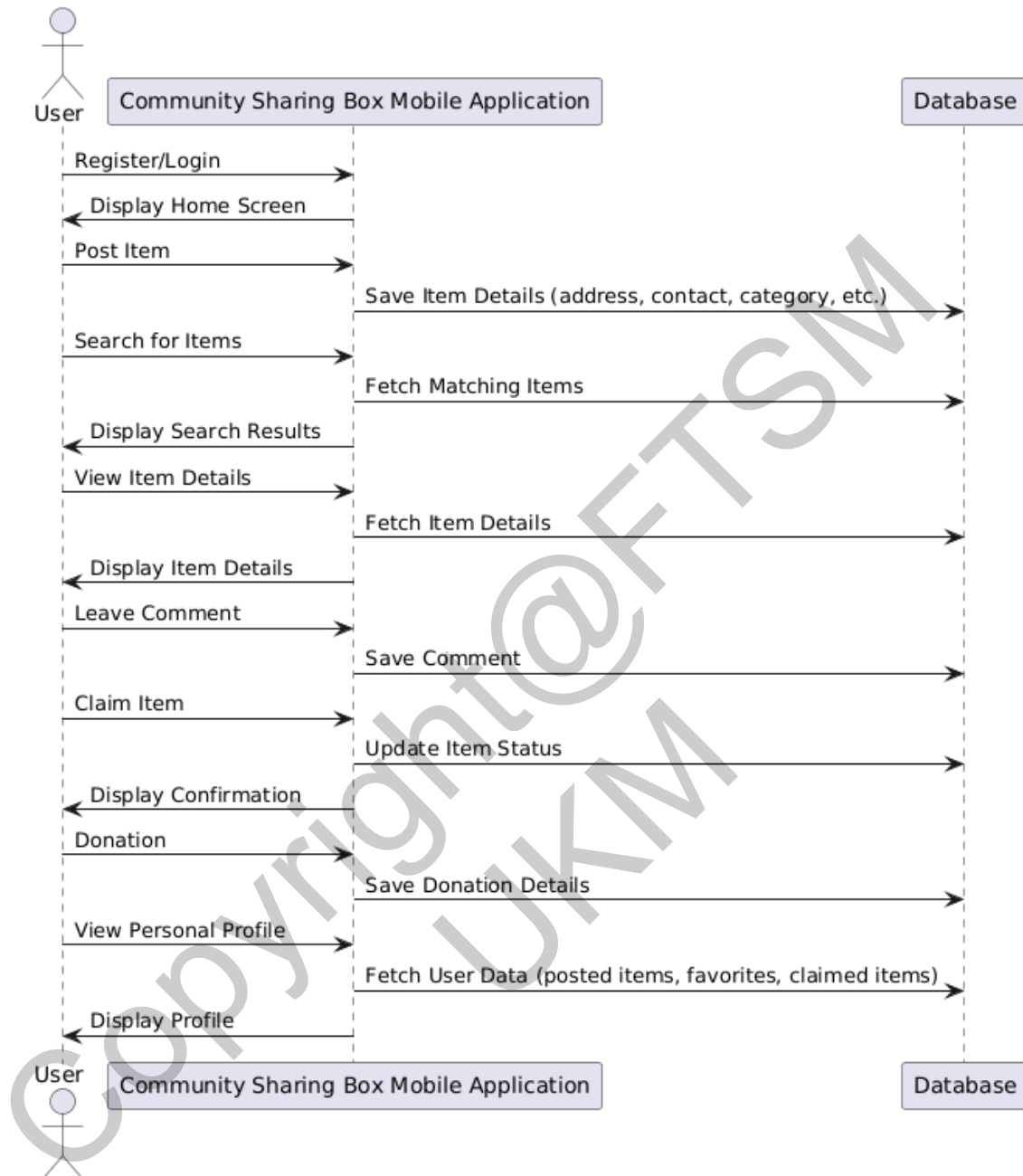
The final phase will focus on testing the built system. This involves integrating the results of Phase 1 and Phase 2, and completing the final report of this study.

For the development of the Community Sharing Box mobile application, I utilized various tools and technologies to ensure a robust and efficient system. The primary development environment was Android Studio, which provided a comprehensive suite of tools for designing, coding, and testing the application. Android Studio's integrated development environment (IDE) was instrumental in managing the project's files, debugging code, and leveraging Android's extensive libraries. The application's backend was powered by SQLite, a lightweight database engine ideal for mobile devices. SQLite was used to store and manage data locally on the user's device, including item details, user profiles, comments, and transaction records. The database schema was designed to handle various tables such as users, items, comments, and transactions, ensuring data integrity and efficient retrieval. To facilitate user interactions with the database, I employed SQL queries within the Android application code. This included inserting new records, updating existing ones, and querying data

based on user input. For example, when a user posts a new item, an SQL INSERT statement is executed to save the item details into the database. Similarly, when a user searches for items, SQL SELECT statements are used to fetch matching records from the database. The application also featured an intuitive user interface (UI) designed with XML. The UI components included registration and login screens, home screen, item posting and searching interfaces, item detail views, comment sections, and personal profile pages. Each screen was carefully crafted to provide a seamless user experience, with attention to navigation flow and usability. To manage dependencies and libraries, Gradle was used as the build automation tool. Gradle allowed for easy integration of external libraries and streamlined the build process, ensuring that all necessary dependencies were correctly configured and up to date.

In summary, the development of the Community Sharing Box mobile application involved the use of Android Studio for development, SQLite for local data storage, XML for UI design, Authentication for user management, Gradle for dependency management. This combination of tools and technologies enabled the creation of a feature-rich application that enhances community resource sharing and interaction.

Community Sharing Box Mobile Application Methodology



The Community Sharing Box mobile application is designed to provide a platform for community members to share and borrow items. Users can enter the application by registering or logging in, and view various functions on the homepage. Users can post items and fill in detailed information such as address, contact information and item category, which will be saved in the database. Users can also search for the items they need, and the application will retrieve matching items from the database and display

the search results. After clicking on the item, users can view the detailed information of the item and can leave a message to communicate with the publisher. When the user decides to obtain an item, the application will update the status of the item and display a confirmation message to the user. After obtaining the item, users can also donate the item through the donation function, and the donation details will also be saved in the database. In the personal interface, users can view the items they have posted, the items they have collected, and the records of the items they have obtained. The whole process is designed to promote the sharing and efficient use of community resources and enhance the interaction and cooperation among community members.

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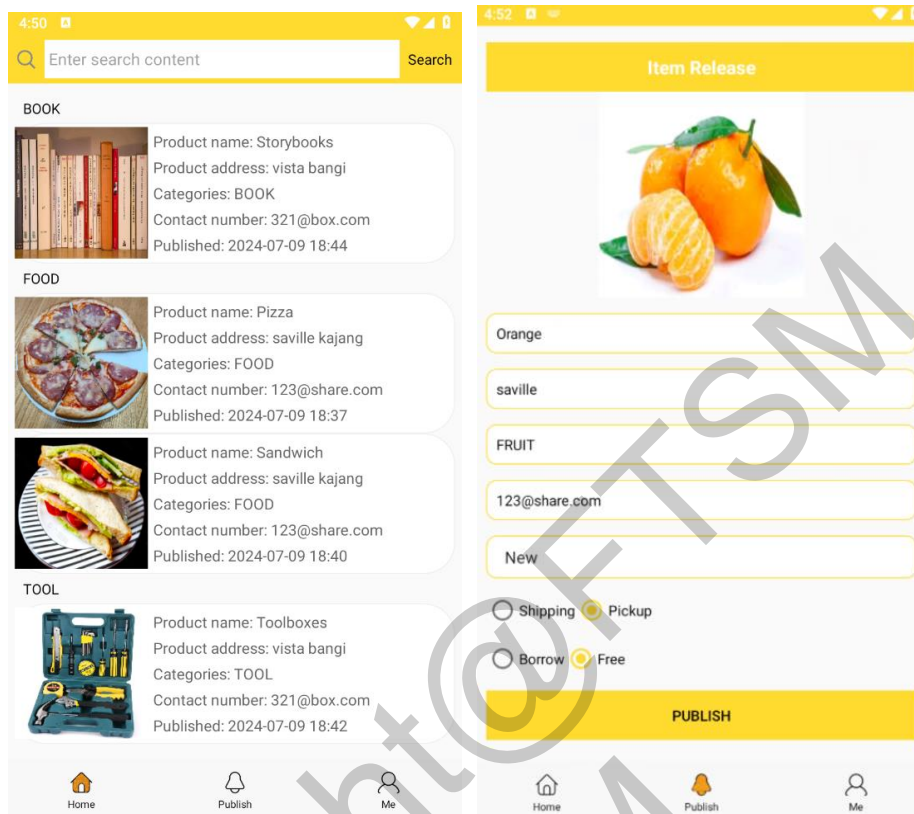
Results and discussion

1. Login and registration interface

The screenshot displays two side-by-side mobile application screens. The left screen, titled 'Log in', shows a cartoon character, a text input field for the account, a password input field with a visibility toggle, a checked 'Remember Password' checkbox, and a yellow 'LOG IN' button. The right screen, titled 'Register', shows three text input fields for account, password, and password confirmation, radio buttons for 'Male' and 'Female' gender selection, and a yellow 'REGISTER' button. A 'New User Registration' link is also visible on the right screen.

This interface allows users to log in or register their account, you are free to choose your account password select the gender and then register.

2. Browse and publish interface



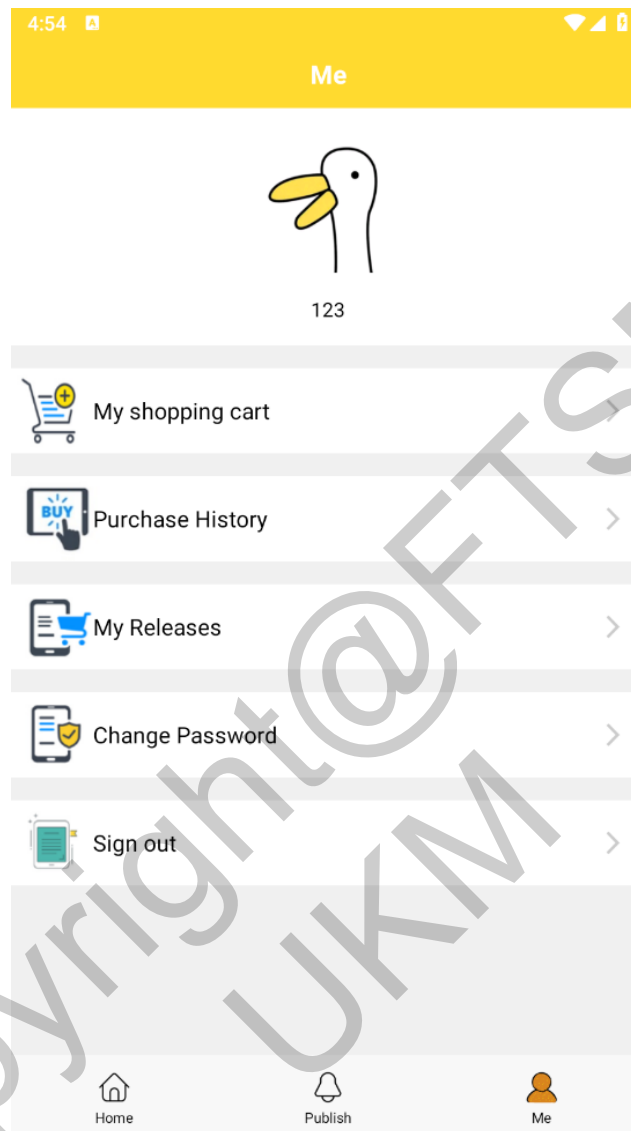
This interface is the core page of the application, you can browse the items posted by other users in the main interface, when you have a desired item you can tap into it to view the details of the item so as to make a choice, you can also post the items you want to share and specific information for other users to refer to in the publish page.

3. Product detail interface



This interface you can view the detailed information of the goods, you can have chosen to add to the shopping cart or choose to buy directly, at the same time, you can also leave a comment for this item, make a good suggestion or evaluation.

4. Personal interface



This screen allows you to view the items you've added to your cart and the history of purchases you've made. If you have posted an item, you can also view it and choose to take it down. You can also change your password or log out of your account.

Conclusion

Community Sharing Box is a mobile application designed to facilitate the sharing of household items within a community with the aim of reducing waste and protecting the environment. Through the app, users can easily view and share items around the neighbourhood and communicate transaction details via chat. The application contains intelligent search function, and user evaluation system. The background of the project is due to the serious waste problem in the current society, especially in food and household items. Globally, a large amount of food and items are discarded every year, leading to resource waste and environmental pollution. Community Sharing Box helps users make better use of the surrounding resources by creating a safe, efficient, and convenient community sharing platform to maximize the use of resources and reduce waste and environmental pollution. The main goal of the project is to develop a user-friendly and feature-rich application through which users can easily share and access household items, thus realizing resource sharing and community mutual assistance. In addition, the project focuses on user experience by providing detailed categorization and intelligent search functions to enable users to quickly find what they need, while ensuring the quality of the items and the reputation of the users through a user review and rating system.

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