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UTMCCOS (UTM Care Charity Online Shop)

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Abstract— UTM Care Charity Online Shop (UTMCCOS) is a final year project to replace the current system used by UTM students. UTMCCOS is proposed to allow users to purchase used items using a mobile app system because it is much easier to access. Using the current system is not efficient since the buyer must come to the seller to check the item and it depends on the availability or operating time. Next, there is always some mistake in terms of the miscalculated total price, stock, and items. The following existing system of UTM Care Charity Shop to perform donations can be made by UTM operator and students only. The limitation of people who can donate is limiting the fund to distribute to the people needed. The online mobile app system-based e-commerce platform is developed as an efficient system to sell the used item and increase the fund that everyone can access anytime and anywhere without worrying about the operating time and availability. This system requires knowledge using technology for user interface with great user experience, development frameworks, database, and backend hosting to help develop a mobile app system. This mobile app will have several main features which is to let the user login, view, purchase items. In conclusion, this mobile app system could give advantages and impact to both UTM Care operator and Students.

I. INTRODUCTION

Thrift shop or "Kedai bundle" as what we usually refer to in Malaysia, is a shop that sells second-hand stuff including clothes, household items, furniture and other kinds of used items. There are students in UTM that does not know how to dispose their items or find a way to get rid of it and some students also would like to buy a second-hand item since they are more affordable but cannot find a good platform to do it. There are few existing systems and in UTM, there is a platform that is used for buying second-hand items and perform donation called UTM Care Charity shop that could be improved by proposing a new solution. Therefore, the proposed solution for these cases is to make a mobile app that allows UTM students and operator to use this system to sell, buy second-hand stuff and perform donation conveniently in UTM. This mobile app system will be called UTMCCOS (UTM Care Charity Online Shop). This project also will integrate with UTM Care Charity Shop to help them to be more effective. Since this project is a mobile app system, it can replace the way they usually promote the item.

A. Problem Background.

UTM students lack a user-friendly platform to buy and sell second-hand goods. While they currently resort to social media like Facebook and Instagram, these platforms are designed for communication, making it difficult for potential buyers to discover what's for sale. Additionally, the success of such sales relies on finding a buyer interested in the specific item, and there's no guarantee of the item's condition from photos alone. Existing online marketplaces like Carousell offer a wider selection, but may present logistical challenges for UTM students, as sellers might be located outside the area, or the quality may not be accurately reflected online.

UTM's existing solution, the UTM Care Charity Shop, aims to support B40 students by reselling donated items. However, their website lacks e-commerce functionality and relies on Facebook promotion, which might not reach the intended audience, especially international students. Furthermore, their manual system for managing donations and sales is inefficient

II. LITERATURE REVIEW

The Centre for Community and Industry Network (CCIN) contributed significantly to building the UTM Care Charity Shop as part of their charitable fundraising efforts. UTM Care Charity Online Shop is registered with CCIN and is a charity shop run by UTM employees who volunteer for charity. All items in this shop are all from the UTM community. They are volunteers who donate unused items sold in this store, with the proceeds going to those in need. Donations are directed not only at UTM students, but also outside the community. UTM also helps with this as its mission is focused on serving disadvantaged communities.

A. Motivation for second-hand shopping

Second-hand shopping, the purchase of previously owned items (Oxford, 2019), has become increasingly popular due to a combination of economic and personal motivations. Financially, it offers significant savings across a wide range of

products, making it a practical solution for price-sensitive consumers (Razska & Borusiak, 2020). Beyond saving money, second-hand shopping can be a fun and rewarding experience. The excitement of finding unique treasures motivates many shoppers (Razska & Borusiak, 2020). This aligns with consumer behavior, which is the way people acquire, consume, and dispose of products based on their needs, desires, and beliefs (Haraldsson & Peric, 2017). One key motivator is economic – second-hand goods allow people to meet their basic needs without breaking the bank (Haraldsson & Peric, 2017). This is especially true for low-income consumers who can significantly reduce their financial burden (Haraldsson & Peric, 2017). Beyond economics, there's a leisure motivation. The thrill of the hunt and the chance to find something special fuels the desire for many second-hand shoppers (Haraldsson & Peric, 2017). They see themselves as collectors seeking unique items with personal meaning (Haraldsson & Peric, 2017). Fashion also plays a role. Second-hand stores offer a chance to find unique, vintage items and create a personalized style, capitalizing on the trend of vintage fashion (Haraldsson & Peric, 2017). Finally, there's an environmental motive. Some believe that second-hand shopping reduces product waste, pollution, and packaging use (Astoul, 2020). Overall, second-hand shopping offers a win-win for consumers and the environment, driven by a combination of economic practicality, personal enjoyment, and environmental consciousness.

B. *Current System Analysis and Comparison Between Existing System*

There are several existing systems that have similar features for the proposed product. For the online system, there are already websites that offer selling and buying second-hand items online such as mudah.my, secondhand.my and some users use social media such as Facebook, Instagram and WhatsApp for those purposes. However, those websites are not convenient for UTM students staying inside UTM. Those websites offer second-hand shopping but most of the items are located all over in Malaysia. There is no guarantee that all the second-hand items are in good condition since the buyer (UTM students) can only judge the second-hand items from photo and video, some of the sellers are located far from UTM so the buyer cannot check the quality of the items in real time, and other concern is the satisfaction of the seller and buyer. Next limitation is the items that specifically for UTM students are not available in those websites. Another limitation is there is no integration with UTM Care Charity Shop since the proposed product UTMCCOS will implement that.

Table 1: Comparison between systems

	Mudah.my	Facebook Marketplace	WhatsApp	UTM Care Charity Instagram Account
User registration and login	Yes	Yes	Yes	Yes
requirements				
Auto update item catalogue	Yes	Yes	No	No
Perform donation	No	No	No	No
Payment methods	Yes	No	No	No
Stock availability	Displayed	Displayed	Not Displayed	Displayed
Auto Notify users about item update	Yes	No	No	No
Reachable location within UTM	No	No	Yes	Yes

III. SYSTEM DEVELOPMENT METHODOLOGY

The method chosen for developing the proposed system is the *Waterfall model*, which is the sequential development model. Which means this method consists of phases where the input of the current phase is taken from the result of the previous phase. In the waterfall model each step is frozen before the next step. That is the requirements are frozen before the design starts, and once the design is frozen the coding starts etc. (Balaji & Sundararajan, 2012). This method is chosen for the proposed system because the requirements are defined at the beginning of the project and the limitation of resources available to complete the project.

Another justification why waterfall model is suitable for the proposed system is as follows: First, the requirement is clear before development starts. Second, each phase is completed in a specified period of time after which it moves to the next phase. Third, as its linear model, it's easy to implement. Forth, the amounts of resources required to implement this model are minimal. Lastly, each phase proper documentation is followed for the quality of the development.

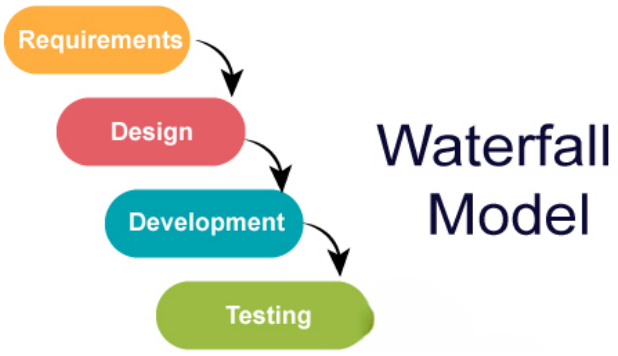

Figure 1: Waterfall mod

A. Technology used and Development

The development of this project requires the use of several technologies. Android smartphone or emulator are required in this project for the purpose of testing the application. The Android application was built using the Flutter framework which uses Dart as its programming language. One big advantage of using the Flutter framework is its ability to create cross-platform applications, which means Flutter projects can be compiled into Android and IOS applications. However, the App was only tested on Android system. Android Studio integrated development environment (IDE) is used to write the code for the application. For the backend, Firebase service and Hive are used, while Firebase Real-time Database is used to store data. Hive is used for other parts of the backend to store the data in memory.

IV. SYSTEM ANALYSIS AND DESIGN

During the requirement analysis and design phase, numerous diagrams are created to analyze and design the system. These diagrams include the use case for this project. Result of this project also will be shown below

A. Functional Requirements

The functional requirements detailed the behavior of the system and was being constructed using the UML diagram that consists of use cases, sequence diagram and activity diagram.

a. Student shall be able to register and login account.

b. Student shall be able to view including edit account.

c. Student shall be able to buy items including search and sort items.

d. Student shall be able to sell items including manage items.

e. Student shall be able to make payments.

f. Student shall be able to perform donation.

g. Operator shall be able to register and login account.

h. Operator shall be able to view including edit account.

i. Operator shall be able to sell items including manage items.

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j. Operator shall be able to manage donation by students.

B. Use Case

Figure 2: Use Case Diagram

There are a total nine use cases and two actors in CCOS. New users can register for accounts (UC001) and login to existing ones (UC002). Both user types can view and edit their account details (UC003 & UC004). Buyers can browse items through search and sort functionalities (UC006 & UC007) and ultimately purchase items (UC005). Sellers can list items for sale (UC008), manage their listings (UC009), and make payments (UC010). The platform also integrates with the UTM Care Charity Shop, allowing users to donate unwanted items (UC011) and enabling shop operators to manage those donations (UC012).

C. System Interfaces

Figure 3 shows the screen where users are able to see the Home screen where there is appbar that contain the app title and search icon to go to search screen. The body contains a product list of items fetch from Firebase database. There is a bottom navigation to let user to switch to another selected pages

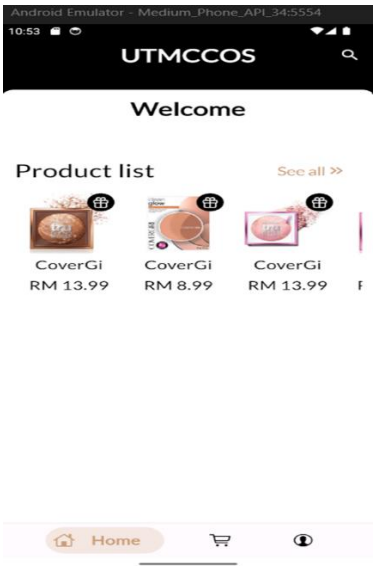

Figure 3: Home screen

Figure 4 shows the screen where users can see the detailed info of the selected item from the home screen. The information is item name, description, price. There is a gift button on bottom where users supposedly able to add item to donation. On the bottom, there is a "Add to cart" button where users are able to add item to cart.

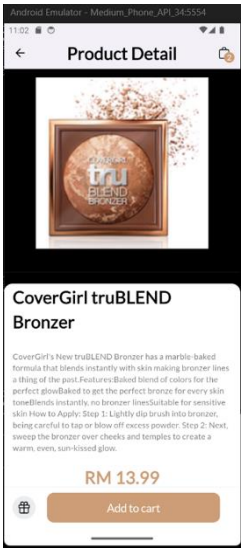

Figure 4: Item screen

Figure 5 shows the items were clicked "add to cart" from the detail screen will be added to the database to make it into list and it displays here. This lets users to check the items and delete it if there is unwanted item before proceeding to click checkout button.

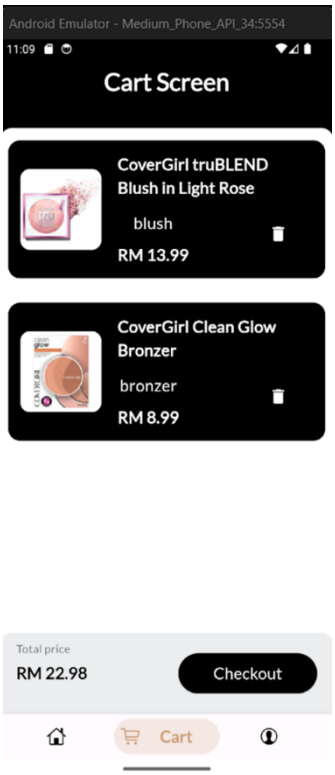

Figure 5: Cart screen

V. TESTING

Testing is a crucial step where the system is thoroughly checked to uncover any problems or malfunctions from what users originally requested. To ensure the system works as intended, this project will use a testing approach called Black Box testing and User Testing

A. *Black Box*

TC001_01: Register (name)

Test Case ID	Input Data	Expected Result	Actual Result	Pass/Fail
TC001_01_01	<blank>	Name must not be empty	A message is showed that this item is required	Pass
TC001_01_02	ilhm	Characters must not less than 4	A message is showed cannot input less than 4 characters	Pass
TC001_01_03	ilham	No errors, able to submit	The name is filled successfully	Pass

D. *User Acceptance Testing*

Requirements ID	Requirements Description	Output
R001	User shall be able to create a new account	Success
R002	User shall be able to login to an existing account	Success
R003	User shall be able to view their profile details (Account)	Success, email and name
R004	User shall be able to edit their profile details such as username, email, phone number, address, and password.	Not fully success, only able to edit address
R005	User shall be able to buy item by selecting the item.	Success, Tested and able to add to cart
R006	User shall be able to search the items	Success
R007	User shall be able to sort the items	Failed to implement
R008	User shall be able to sell the items by listing their item	Success, however only admin can add manually in database
R009	User shall be able to manage the listed item such as set price and details.	Success, only admin
R010	User shall be able to make payment	Success, then add to order history
R011	User shall be able to donate their items	Not fully success, only able to add products to the list
R012	UTM Care operator shall be able to manage the donated items	Failed to implement, only view

VI. CONCLUSION

This project proposes a mobile application to help UTM people to buy, sell and donate. This project also integrated with UTM Charity Shop to help them manage their stuff. The objectives of this project include requirements elicitation, mobile application creation and development, and evaluating the system to pass the quality assurance. As discussed from the research done in Chapter 2, the author compares several existing systems that have similar functionalities, thus the proposed system will include some of the features necessary for the proposed system. Based on the project objectives specified in Chapter 1, this project has successfully achieved the first objective, which is to gather the requirements of the UTMCCOS system from targeted stakeholders which are UTM students and UTM Care Charity Shop. Referring to the requirements defined, the system was designed along with its architectural pattern and interface design.

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