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Smart Food Bank Application: Towards Zero Hunger for UUM Community

Noraziah ChePa[1]*, Tan Jia Earn[1], Nur Azzah Abu Bakar[1], Rajwani Md. Zain[2], Laura Lim Sie-Yi[1]

[1]Human Centred Research Lab, School of Computing, Universiti Utara Malaysia,Kedah, Malaysia

[2]School of Applied Psychology, Social Work and Policy, Universiti Utara Malaysia,Kedah, Malaysia

*Corresponding Author Designation

Abstract : Universiti Utara Malaysia (UUM) is the fourth university to launch a food bank for its students and the launching ceremony was officiated by His Majesty the Sultan of Kedah. Since its launched in September 2019, it is operated manually. Due to overwhelming donations from many parties, there are some issues faced in managing the food bank efficiently, particularly in reaching out to students who are really in need. With the aim of having an efficient management of food bank towards achieving zero hunger among UUM community, a smart food bank application is designed and developed in mobile environment and running on Android platform. The application can be utilized by three main users; admin at the Division of Students Support and services (SSSD), under The Student Affairs Department (HEP), applicants (among less fortunate B40 students and admin staff of student's hostel, and potential donors. The main functions are the management of food stock, food allocation, application of food, donations, as well as managing the registered users. Applicants can utilize the application by requesting for food (share their location on UUM map) and view their application status. Potential donors can offer their donation by sharing their location to be picked up by the admin. All functions are designed in facilitating these three main parties towards better management of UUM food bank. The project is aligned with the second and third goal of Sustainable Development Goals (SDG) which focusing on zero hunger and good health and well-being, respectively. It can serve as a platform in providing good food to UUM community to achieve the targeted SDG goals. It is believed that this smart food bank application can also serve as a platform in planning a suitable food allocation program in serving the less fortunate group of UUM community and perhaps at some points may improve the quality of life of the students. Due to its positive findings, feedbacks, and impacts, smart food bank application can be further applied to other food bank facilities or similar bodies offering the same services towards achieving zero hunger in a bigger context.

> **Keywords**: Food survival, Foodbank, Zero hunger

1. Introduction

Food insecurity is one of the global humanitarian challenges, even before the COVID-19 pandemic there were over 820 million people who went to bed hungry, 155 million were living in acute conditions [1]. Hunger and malnutrition are among the dangers of food insecurity, as the repercussions of having to pick between food and other needs with the limited cash in hand [2–4]. Besides, food insecurity has been linked to an increased risk of poor health and hospitalization, and possibly psychological and behavioral disorders among children [5].

Many universities have adopted a strategy to cater for food-in-secured students on campuses. Besides food banks, they also established on-campus gardens, enabling sharing of meal plans, food recovery, ensuring students are aware of federal food assistance programs, and cost-saving approaches [6]. However, the effectiveness of each of these strategies to lower rates of food insecurity among university students has yet to be examined. Some universities have started to address food insecurity among students by having food pantries on campus to provide emergency food relief to students. Universiti Utara Malaysia (UUM) is the fourth university to launch a food bank for its students and the launching ceremony was officiated by His Majesty the Sultan of Kedah. Since its launched in September 2019, it is operated manually.

From the beginning of Movement Control Order (MCO) 1.0 until MCO 3.0, UUM is fortunate to receive variety type of donations for UUM community stranded in campus. The donations are managed by Division of Students Support and services (SSSD), under The Student Affairs Department (HEP). Due to overwhelming donations from many parties, there are some issues faced by SSSD in managing the donations, particularly the Food Bank efficiently. Due to manual approach of managing the donations, the following issues are discovered; poor management of stock, inefficiency of allocation management,, tedious process of food application, and manual communication with the donors.

Based on the current situations, there is a need to automate the management of UUM's Food Bank to resolve the issues. Smart management of UUM's FoodBank should be able to facilitate the tracking of donations items, management of records (type of goods, date of donation, date for the goods to be shipped out, date of distribution to students). Through smart UUM's Food Bank, students in need can also request for food. Systematic reporting will ease the management of UUM's Food Bank restock or requests from donors. Apart from that, if the donation is not received at certain times, smart system notify the management to plan the purchase of the shortage items.

2. Methodology

This main aim of this project is to propose a smart food bank application that can reach all UUM community towards achieving zero hunger among UUM community, particularly the students. Main process of producing the proposed smart food bank application consists of four main stages as illustrated in **Figure 1**.

2.1 Awareness of research goals

This phase is about understanding the current issues of managing UUM's Food Bank and analyzing the needs of Smart Food Bank mobile application for UUM community. To achieve these, two sessions were conducted involving potential users of UUM's Smart Food Bank mobile application who are the admin of Division of Students Support and services (SSSD), staff at student's hostels, and students.
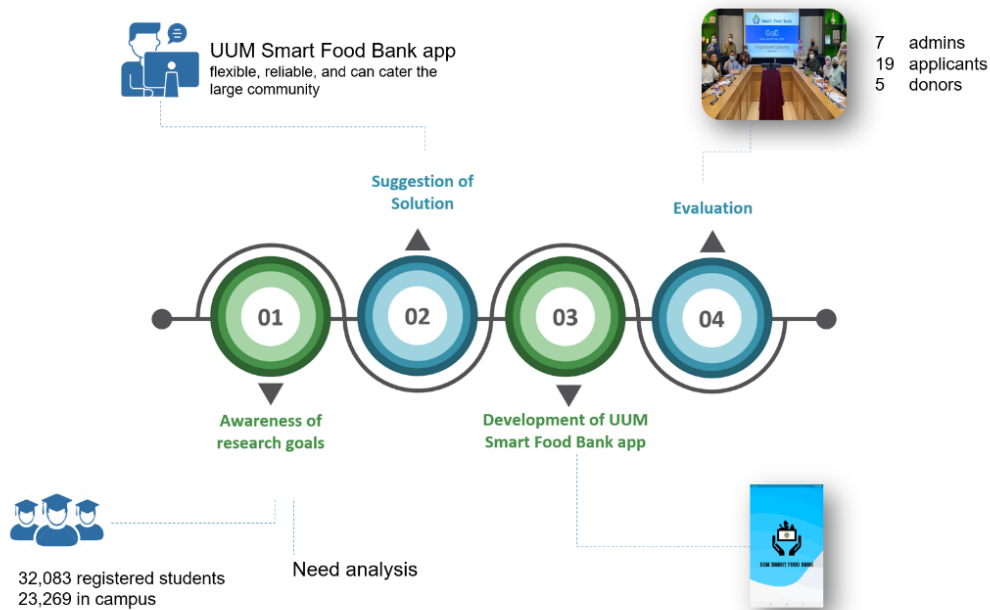
Figure 1: Phases involved in developing UUM Smart Food Bank Application

2.2 Suggestion of solution

Based on early findings gathered in Phase One, UUM's Smary Food Bank application is proposed which is believed to be flexible, reliable, and will be able to cater large group of UUM community. Five main functions are designed to be included in the application which are food management, allocation management, and donation management by the admin, application of food by applicants among students and staff, and offering donation by potential donors. **Figure 2** illustrates a detail flow and functions designed for UUM Smart Food Bank application.
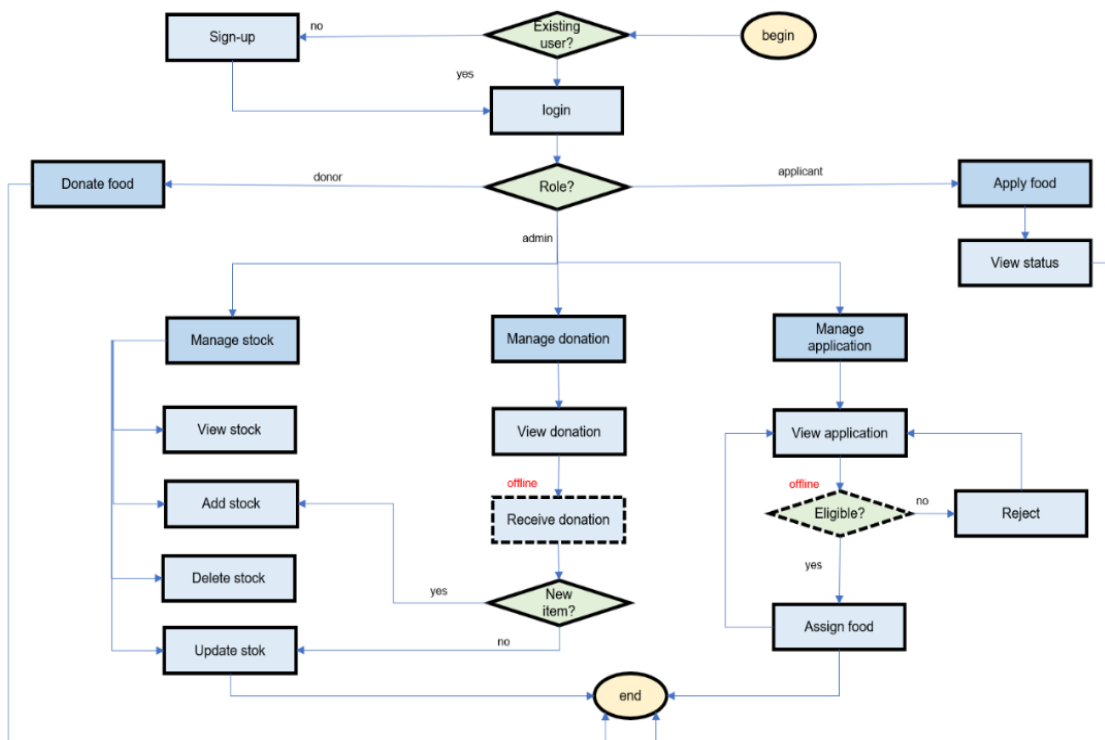

Figure 2: Main functions and flow of UUM Smart Food Bank Application

2.3 Development of UUM Smart Food Bank Application

UUM Smart Food Bank Application is developed using Flutter. It is running in mobile environment and currently available on Android platform. All functions and design are translated from the outcome of Phase Two. The proposed UUM Smart Food Bank Application consists of five main functions to be operated by admin staff of Division of Students Support and services (SSSD), applicants, and potential donors. Figure 3 shows selected interfaces of UUM Smart Food Bank Application.
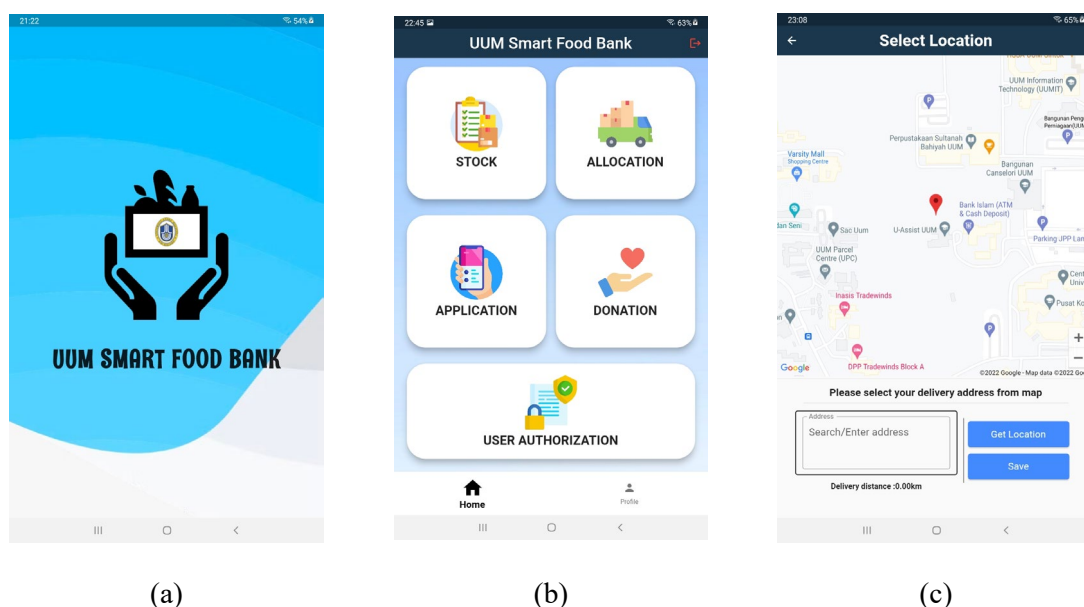

(a)   (b)   (c)

Figure 3: Main interfaces of UUM Smart Food Bank Application

2.4 Evaluation

To evaluate the developed application, two testing sessions have been conducted involving potential users of UUM Smart Food Bank Application. There are seven admins, 19 applicants, and five donors involved in the test. Prior testing, a demo of the proposed application is conducted followed by a session where the testers are giving opportunity to experience and test the application. Their feedbacks are recorded for documentation and improvement purposes.

3. Results and Discussion

User acceptance and usability tests have been conducted on 9 May 2022 and 12 May 2022 involving two group of testers which are admin and donors for the first session and combination of applicants and donors in the second session. Six dimensions have been used in evaluating the developed application which are design and layout, simplicity, usefulness, effectiveness, learnability, and satisfaction. There are three items used for design and layout, simplicity, learnability, and satisfaction. While for usefulness and effectiveness, four items have been used.

Overall, all items have received good response and feedback from the testers with high average score (for full score of 5.0, the minimum score is 4.55, and the maximum score is 4.81). it can be concluded that all testers agreed that the proposed UUM Smart Food Bank Application is good in terms of its design and layout, simple, usefull, effective in its operation, and has learnability elements. They basically satisfied with the application. The whole scores of the items are shown in Figure 4.
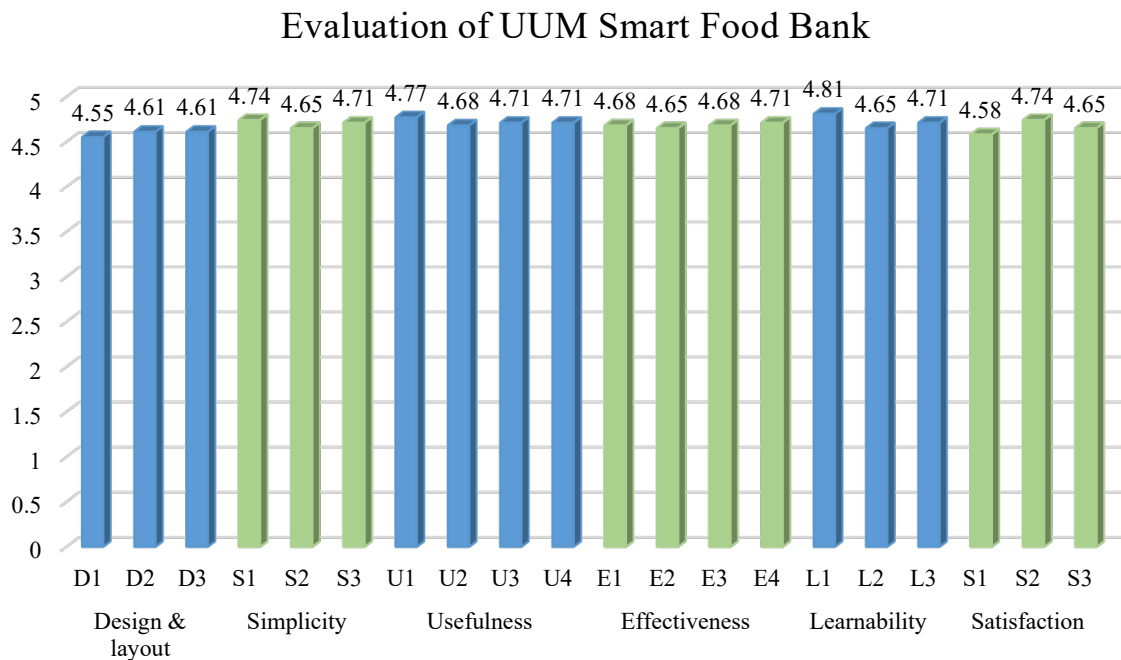
Evaluation of UUM Smart Food Bank

Figure 4: Evaluation of UUM Smart Food Bank Application

4. Conclusion and future works

UUM Smart Food Bank application is believed to be beneficial to many parties particularly the admin of UUM Food Bank and UUM community in general. Systematic and efficient management of UUM Food Bank will be the main benefits. More potential applicants can be reached and helped. This application is significant towards achieving SDG Goals 2 (Zero hunger) and Goal 3 (Good health and well-being) among UUM community.

Acknowledgement

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