

# A Food Delivery Mobile Application in University Campus Based on Market Demand

Siok Yee Tan<sup>1</sup>, Mei Yien Chin<sup>2</sup>

<sup>1,2</sup>Center for Artificial Intelligence Technology, Fakulti Teknologidan Sains Maklumat,  
Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia  
<sup>1</sup>esther@ukm.edu.my, A161209@siswa.ukm.edu.my

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## Abstract

Most of the public universities' student in Malaysia do not have transportation, this causes them do not have the opportunity to enjoy the food outside their campus. Most of the food delivery system available in the market at the time being do not provide delivery services to most of the public university. Besides that, some of the food delivery system only provide delivery services with minimum amount ordered. This causes students who are unemployed or do not have extra income cannot afford this kind of food delivery service. Some of the students who possess transportation like car or motorcycle have to bear expensive petrol cost when they travel outside from the university campus just to enjoy their meal. Therefore, the purpose of this research is to develop a food delivery mobile application called "Dabao" to reduce the financial burden of students and at the same time allow them to enjoy variety of foods outside university campus. Students able to register themselves as a food hunter or food driver through Dabao application. Food driver can share their current location information through Dabao application to all the food hunters when they are dining in a restaurant. Food hunter can order meal from the food driver and able to track the food driver location in real time. Food driver will then deliver the food and collect payment from food hunter with a 20% delivery charges. As a result, students with transportation can choose to earn some side income by involving themselves in food delivery service to cover their petrol cost and students without transportation will be able to enjoy variety of food outside university campus. Based on the evaluation, students claimed that this mobile application is in demand and can be very useful to them.

## Article History

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## 1. Introduction

Food and transportation had been identified as the basic need for a university student who live in the campus[1]. Students are not satisfied with canteen's food

in university are one of the most common problem in most of the Malaysia public universities due to repeating menu or dishes offer from the canteen. There are variety of food choices outside university campus but most of the students do not possess vehicle for them to grab the food outside the university campus. The current food delivery system or application available in the market such as Grab Food is not convenient or benefit to the students due to the delivery service provided is not reachable within university campus or often request a minimum order amount as a condition required to provide the delivery service. For instance, Domino Pizza delivery

application only provide delivery service when the order amount exceed twenty Ringgit Malaysia. Imagine if one has to pay more than twenty Ringgit for a meal in order to access to the food deliver services. Students who are unemployed cannot afford the delivery service charges deploy by the existing food delivery application. On the other side, petrol fees for citizens who stay in Selangor, Malaysia would easily cost up to two hundred Ringgit Malaysia per month based on the latest news [2]. Students with transportation need to encounter the high petrol cost if they dine in at food avenue or restaurant outside university campus everyday. Hence, the purpose of this study is to investigate the market demand and function requirement for the food delivery application in university campus. The food delivery mobile application should fulfil the students' demand which allow them to order the food with low delivery fee and allow them to

track the food driver location. This research is carried out at The National University of Malaysia (UKM). Hence, the market demand survey and usability testing are completed by UKM students only.

This paper is organized as follows: Section 2 briefly reviews the food delivery mobile application especially the application used in university campus that had been developed previously. The research methodology is presented in Section 3. It discusses the market demand, proposed framework and output of the application for this study. Section 4 presents the evaluation procedure and the results of the proposed application. Section 5 gives the conclusion of this research.

## 2. Food Delivery Mobile Application

There are many existing food deliveries mobile application in the market, for instance, Grab Food, Food Panda and Dah Makan. Grab Food is the food delivery application introduced by Grab Holdings company and it is available in both Android and iOS platform [3]. Users are required to manually fill up their current location in order the application can suggest the restaurants nearby. Location tracking feature is available for Grab Food application to enable users to track the food location. The operation hours for Grab Food is only from 8.00 a.m. to 11.00 p.m. and the average delivery fees is five Ringgit Malaysia. Users of Grab Food can earn some points with every successful order and they can redeem their point with various types of vouchers.

Food Panda is a food delivery mobile application developed by Foodpanda GmbH company and it is available in both Android and iOS platform [4]. This application is similar to Grab Food, it allows users to search the restaurants nearby and track the food location after ordered. The special feature of Food Panda is to provide pre-order services which allow users to make the order in advance. The average delivery fees for Food Panda is five Ringgit Malaysia but it does collect additional service tax.

Dah Makan is an in-house food delivery application introduced by Farm to Fork Sdn Bhd and it also available in both Android and iOS platform [5]. The service mode of Dah Makan is something different compared to Grab Food and Food Panda. Instead of searching the restaurant nearby user's location, Dah Makan only provide pre-order services and they have their own chefs to prepare the foods. Dah Makan application also provide the calories and ingredients information of each menu. Dah Makan provide free delivery and no minimum order if the delivery area is within certain coverage for example Kuala Lumpur, Malaysia. However, there is a delivery charge for order below eighteen Ringgit Malaysia and a minimum order of fifteen box meals if the delivery area is outside their coverage area for example Bangi, Selangor.

There is a food delivery service currently available in University Putra Malaysia (UPM) campus; Putra Food Delivery. The Putra Food Delivery service involved a

collaboration with several restaurant around UPM campus and Serdang [6]. Students can only place their order through WhatsApp application. The mobile number of food delivers are available on posters placed at residential colleges and some common areas in university campus. This service is not available in any mobile application or system platform. However, they planned to develop a food delivery mobile application for their student in the future [6].

Based on the study, all the three applications mentioned above have three important features; food ordering, online payment and food location tracking. Users can have multiple choice of restaurant if they using Grab Food or Food Panda but Dah Makan provide different menu set from the same chef. The average money spent for all three mobile applications is around ten Ringgit Malaysia per meal. All the applications mentioned above do not provide any food delivery service inside UKM campus. Most of the food delivery mobile application available in the market are not suitable for university's students due to delivery services are not available in university campus area and the delivery fees is rather expensive.

## 3. Methodology

The methodology section discusses the analysis of the market demand survey in order to construct a food delivery mobile application. Researcher can develop a food delivery mobile application based on the framework suggested.

### Market Demand Survey

Market demand survey is conducted among UKM students only and this survey have 7 question. There are total 60 respondents participate in this survey. The market demand survey questions are as below:

1. Do you possess transportation (car/motorcycle) in UKM? (Yes or No)
2. Do you willing to help someone to deliver the food from outside of UKM with delivery charges? (Yes or No or No Transport)
3. Do you wish for food delivery service from outside of UKM to your doorstep? (Yes or No)
4. Do you experience before taking unhealthy meal (oily and salty) due to no other food choices when you fall sick in University campus? (Yes or No)
5. What is/are the food ordering system/application you used before?
6. What do you think about the food delivery fees on the current application? (Scale 1 – Cheap, Scale 5 – Expensive)
7. Do you face any problems with living cost like food or petrol fees during your study in UKM? (Yes or No)
8. How much for the delivery fees do you think is reasonable to pay/collect?

The analysis of market survey demand of all the 8 questions are shown in Figure 1. Based on the analysis,

most of the student agree that they not able to have food outside of UKM campus due most of them (73.3%) do not have a transportation in the campus. All of the students(16 out of 16 students) with transportation are willingto help someone to deliver the food from outside of UKM with delivery charges.Furthermore, majority students (91.7%) are desire to have food delivery service from outside of UKM to their doorstep. There are total 44 students out of 60 students claimed that they had been experience to take oily or unhealthy meal in the university's canteen due to no other food choices when they fall sick. The most popular food delivery application had been used by students are Domino Pizza and

McDonald. However, most of the students (81%) thought the food delivery fees on current application is too high.Up to 29 students out of 60 students claimed they having difficulties with living cost like food or petrol fees during their study in UKM. 60% students suggested a 15% of food delivery fees isreasonable. Dabao application will make a 20% delivery fees due to all the students with transportation suggested a 20% of food delivery charges because they need to pay for the petrol cost. Based on the market demand survey, a food delivery service is in high demand for university's student. Afood delivery mobile application should buildto meet the student's requirement with reasonable delivery fees.

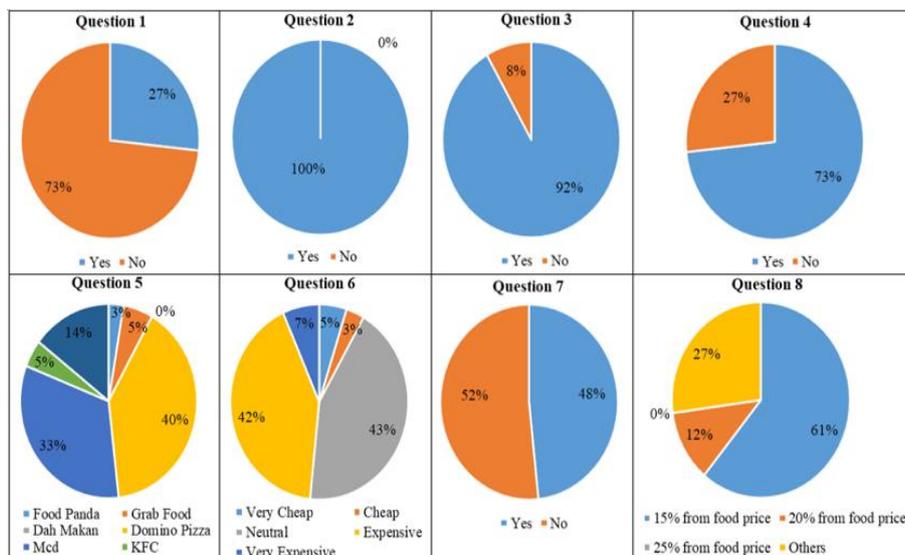


Figure 1:Market Demand Survey Analysis

### Dabao Frameworks

To develop a complete food delivery mobile application, two modules should be integrated together; food driver module and food hunter module. Figure 2 shows the framework diagrams to develop a food delivery mobile application.

Once the food driver is ready for the delivery service, the driver information will be uploaded to the database and the food hunter will be able to retrieve the driver availability from the database. Food hunter can contact with the food driver via WhatsApp through the application. If the food driver agreed to take the order, he

or she will then receive the order details and they can generate order for food hunter. Once the food hunter confirmed the order details from food driver, food hunter will then be able to track food driver's current location in real time. After the food delivery process is completed, all the data will then be removed from the database.

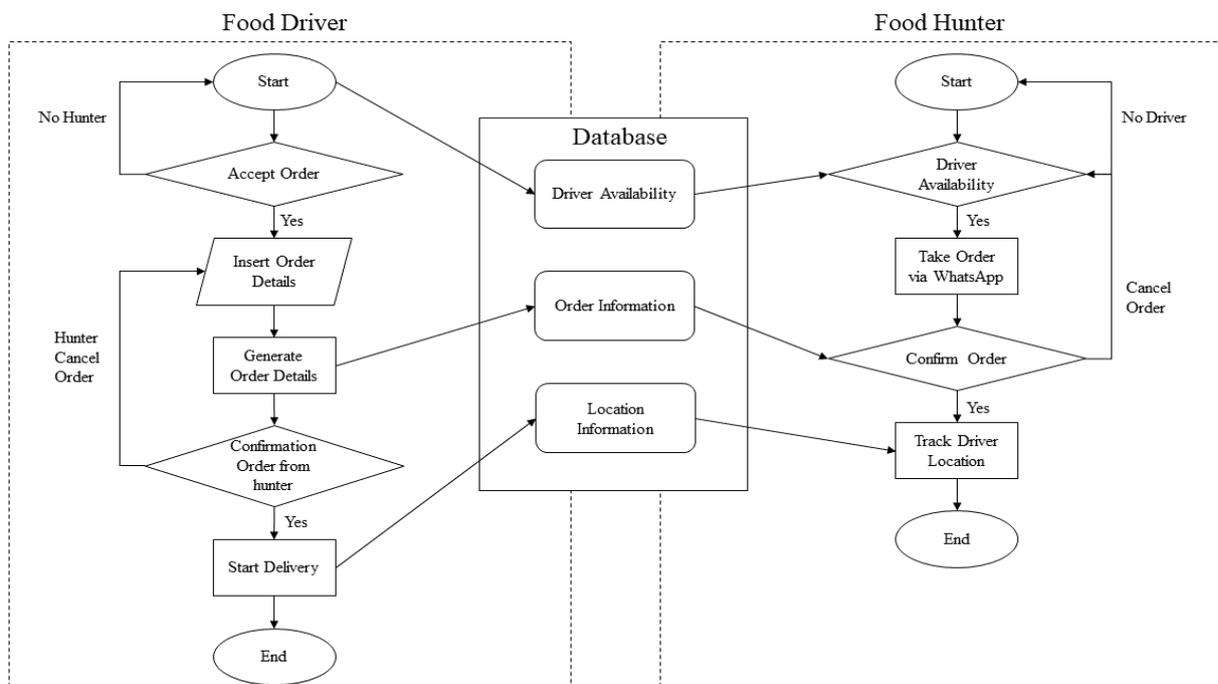


Figure 2: Dabao Application Framework

### Output

Figure 3 show the food driver module user interface. Once they successfully login using email address and password, they have to select the restaurant they are currently dine in and he or she can generate order details then all the driver details and restaurant details will auto-generated. Driver just need to select which food hunter they would like to generate order details and fill up the food price column. The total price with extra 20% delivery fee will be generated. After driver confirm with all the details, they can then send the order details to the food hunter. Food hunter will need to confirm the food

order. After confirm the first order, food driver can choose either proceed directly with food delivery or accept another new order as an accumulative order before they leave the restaurant. Figure 4 show the food hunter user interface. Main menu for food hunter is to select the current college location. Once they proceed with the hunt for food function, a list of restaurants will show up. Food hunter can select the desired restaurant and contact the driver via WhatsApp. After the selected food driver generate the order details, food hunter can view and confirm the order and they can start tracking the driver location.

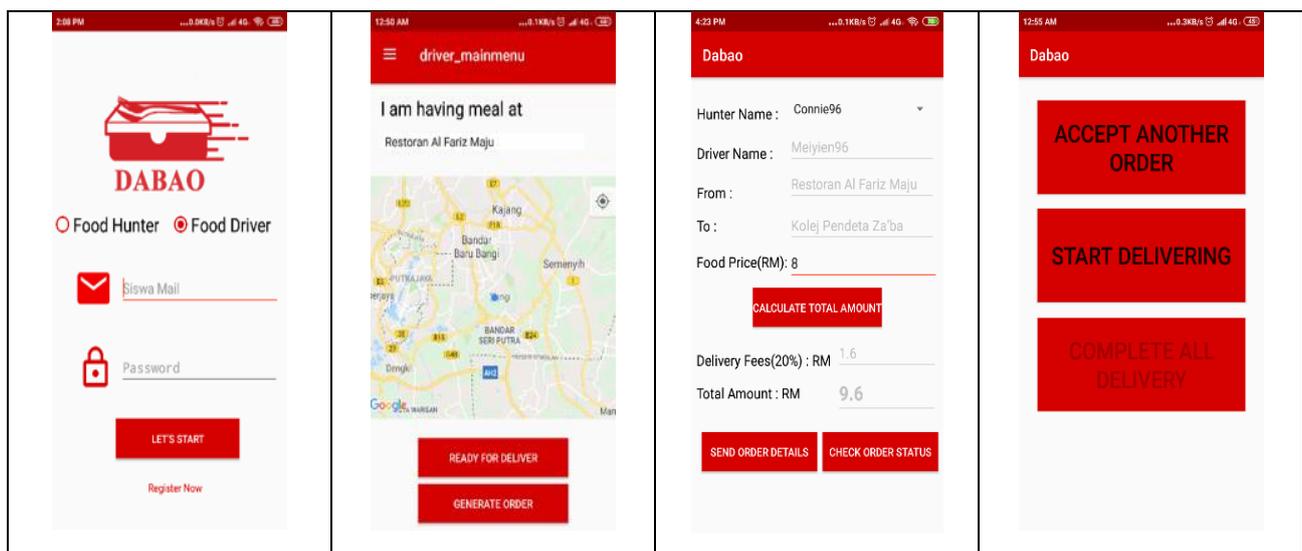


Figure 3: Food Driver User Interface

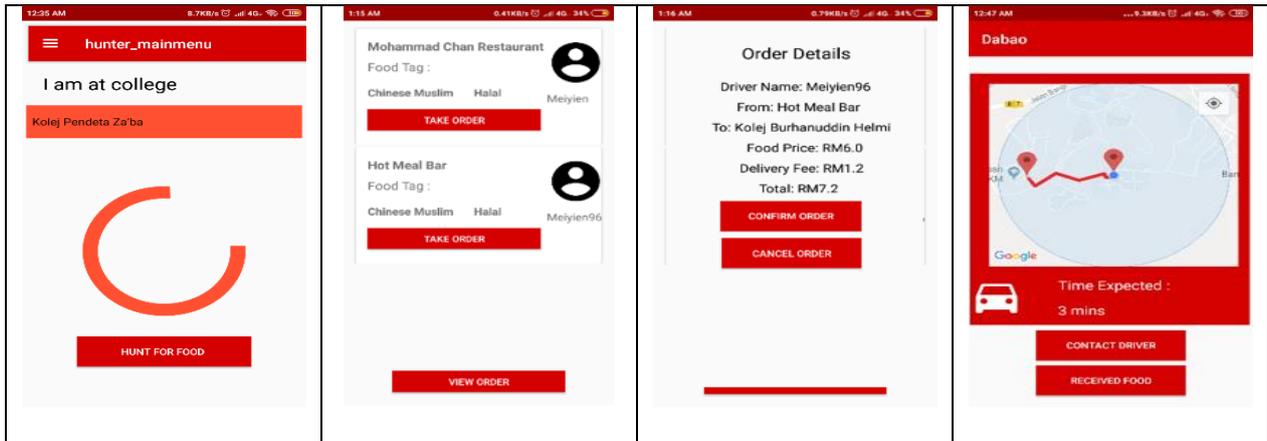


Figure 4: Food Hunter User Interface

#### 4. Evaluation Procedure and Result

Evaluation procedure is defined as a process of evaluation that either the specific application or system meets its originally specific requirement or not[7]. Functional testing had been carried out in this research to tested against each functional specification. Functions of the application are tested by feeding the tester input and examining the output. Usability evaluation also had been carried out to ensure the satisfaction of users toward this application. There are a few factors of usability had been included in the testing; intuitive design, ease of learning, efficiency of use, error frequency and subjective satisfaction. Fifteen testers are recruited in for both functional and usability testing.

##### Functional Testing

Functional testing in this research involves four simple steps; identify functions of the application is expected to perform, determine the output based on the function's specification, tester execute the test case and lastly compare the actual and expected outputs. This functional testing is separated into two different part which are food hunter application and food deliver application.

There are total ten testers out of fifteen testers are assigned to test the food hunter application. The functions tested in this application are Sign Up, Log In, Setting, Food Ordering, Contact with Driver and Food Tracking. The results show that all the ten testers able to perform the function and the all actual outputs are same as the expected output. Five testers out of fifteen testers had been assign as a food driver to perform the task in food deliver application. There are total six functions had been tested; Sign Up, Log in, Setting, Detect Current Location, Generate Order Details and Accepting Multi-Order. All the actual output generate by the testers are same with the expected output. Based on the testing, researcher can conclude that all the functions offer in this application are performing well and researcher able to verified that each

function of Dabao application operates in conformance with the requirement specification.

##### Usability Testing

Testers are requested to use the application and familiar the function of the application before they answer the questionnaire. There are total 17 questions in the questionnaire in order to test the intuitive design, ease of learning, efficiency of use, error frequency and subjective satisfaction of the application. Testers are required to respond to the question with a scale of 1 (Strongly Disagree) up to scale of 5 (Strongly Agree). The usability testing questions are as below:

1. The information and function in Dabao application is useful to me.
2. Dabao application is a good idea for university students.
3. Dabao application has no problem of failure or hang.
4. Tasks on Dabao application successfully completed within a reasonable time.
5. The information displayed by the Dabao application is accurate.
6. I have full confidence in the quality of the information in the application.
7. Generally, I am satisfied with the Dabao application.
8. The terms on the screen are clear and not confusing.
9. Dabao application can be used without any written instructions.
10. Dabao application requires only the fewest steps possible to accomplish what I want to do.
11. Contents in Dabao application are clear and easy to read.
12. The input and text entry methods for Dabao application are easy.
13. Color used in Dabao application is comfortable for me.
14. I found the user interfaces of Dabao application are attractive.
15. In your opinion, what is the positive aspect of Dabao application? Please explain.

16. In your opinion, what is the negative aspect of Dabao application? Please explain.

17. What function need to be added or suggestion to improve the application?

Figure 5 shows the analysis of the usability testing (Question 1 to Question 14) from the 15 testers. Overall

results show that users are satisfied with Dabao app. Most of them are strongly agreed that Dabao application have intuitive design, working probably, effective and easy to learn.

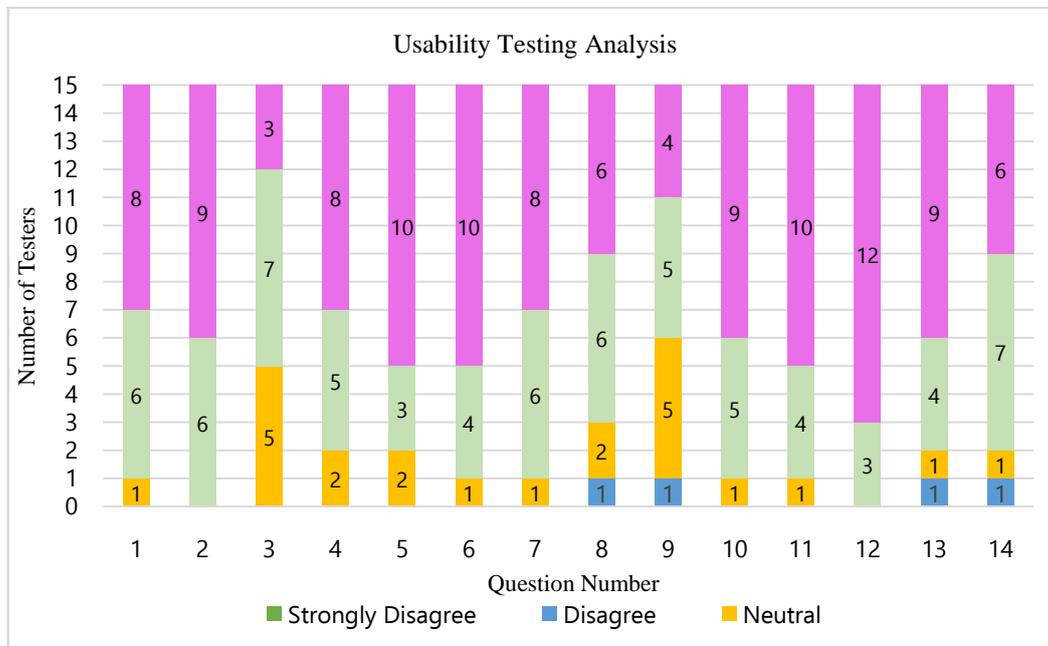


Figure 5: Usability Testing Analysis

Based on the usability testing analysis, researcher can conclude that Dabao application able to help students to obtain food outside university campus at a cheaper price. Tester had mention that the 20% fees collected from the food delivery able to benefit them in their livelihood in university. However, some of the tester had concern about the security issues which the application should go through an email or phone number verification during the registration process. This application can be further improved by taking into the tester's feedback.

### 5. Conclusion

The main objective of developing this application has been achieved successfully based on the evaluation. Dabao application able meet user's needs regardless for food hunter or food driver in university campus. This application allows food hunter to order food at cheaper price compared to other food delivery applications. Food hunter able to use this application to track the location of food driver to estimate the arrival time of their food. Overall, the Dabao application is in demand by the end users and they also claimed that this application would able to facilitate their lives in university.

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