UTHM Cafe Food Ordering and QR Code Payment System for Efficient Café Management

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Abstract: During lunch hour, UTHM café is crowded and people have to wait in a long queue to make payments. This is worse when payment counters have limited cash change. Thus, this paper proposes a food ordering and QR code payment system to ease food ordering and payment developed based on the Waterfall model. System testing and evaluation showed that users were satisfied. In the future, the system could include order history for checking purposes.

Keywords: food ordering system, QR code payment, online banking

1. Introduction

The days of walking into restaurants and having to choose between cash and credit cards are over, and eateries are adjusting their payment systems to reflect this change. Every year, new payment options for restaurants emerge. As a result, people often want more options at their favourite eateries. Following the current payment flow can be time-consuming and when new ways or things emerge, people want to try and they need to think of a few things. Today, there are some perplexing concerns about how to receive payments from customers. Therefore, several currents and up-to-date payment methods will be discussed. However, users also can make a payment using the QR code. the user just needs to scan the QR code to get a resit and make a payment at the cashier.

All students can only place orders at cafes where students need to queue to order food at each store. In addition, students waste a lot of time queuing up to buy food and they need to place orders physically some stores require students to wait for the orders. This can make students at high risk for Covid-19 virus infection. This is because students are exposed to crowded conditions in cafes to buy food and in this situation, students find it difficult to comply with SOP (Standard Operator Procedure).

The effect that students have to face if physical purchases still happen is that the process of buying food will take a long time. This is due to the many processes that have to be done by the server busy scenario [1]. Usually, restaurants will find it difficult to deal with problems if the store has many

customers. This will cause the process of taking food orders to be slow. If this physical recruitment is still done at the UTHM cafe campus, it is possible that the Covid-19 disease outbreak will easily spread to other students.

Nowadays, technology is evolving rapidly [2]. People are ordering food using gadgets. In today's era, there are many applications that users can use to order food. The application is used online and users can order food at home only. The example application that user can use to order is foodpanda, halo, grab food, and others. People can order food in advance using this application and the seller also can receive and manage orders placed online. Apart from making payments online, people can also make payments using a QR code. Make payment using a QR (Quick Response) code, a type of matrix barcode that can be read by a QR barcode reader or a smartphone with a high-resolution camera. This is because the QR Code is a faster reading and larger storage capacity than regular barcodes. People will get information faster because the required information is already in the QR Code. QR code payment is also secure. Rather than storing sensitive payment information, a QR code simply links the customer's application, so the customer be able to pay the seller without sharing personal information like account numbers. Customers also can make a payment while offline if their use a QR code payment [3]. Qr code can work without the internet if the user generates an offline QR code in a QR code generator. The payment system can resolve itself if the user confirms the payment information and requests approval [4]. QR code payment also can minimise physical touch. It means users will be able to reduce contact with other users and it can prevent users from contracting diseases from other people, especially Covid-19.

The benefit that users will get if they make a payment using a QR code is the user does not have to queue long only to make a payment. It eliminates the drawbacks of the standard queueing technique [1]. People can save their time and energy with things that are more beneficial than standing in long queues just to buy a portion of food. It can also prevent the occurrence of crowds in a certain place. Other than that, it can reduce the rate of Covid-19 virus infection. This is because the Covid-19 virus is easily infected in crowded conditions and the crowded conditions will make skin contact with each other easier. QR code payment is the faster way and easier to make a payment. People just need to point the camera at the QR code to get the information or resit to make the payment. QR code is one of the technical facilities that are often used in the current era, especially when there is a Covid-19 infection around the world. QR code is one of the efficient methods for technology in obtaining information. The scope for this project is for people that buy and sell food at UTHM cafe.

Table 1 shows a comparison of several payment methods. It can be concluded that QR code payment is better than other payment methods because QR code payment makes it easier to start making contactless payments and it is faster and safer to make payments than other payment methods.

Table 1: Comparison of payment method at restaurant

Criteria	Method of payment		
	Cash	Online	QR code
Allow customers to order food using the internet		/	/
Allow employees to store data for each customer			/
Allow customers to book food in advance	/	/	/
Allow customers to make food payments remotely and contactless		/	/
Allow customers to make a payment using cash only	/		
Allow customers to place orders at the restaurant.	/		
Allow customers to choose between cash or online banking for the payment			/
Allow customers to make quick payments by simply scanning using the phone			/

2. Materials and Methods

2.1 Materials

Hypertext preprocessor (PHP) used to enter, export, display, and save data in My Structured Query Language (MySQL) functions to store and manipulate data, construct a database and specify the connections between each table. XAMPP is an abbreviation for cross-platform, Apache, MySQL, PHP and Perl used to enable a local host or server to test its website and clients via desktop and laptop devices before releasing a website or server to the primary server. Barcode scanner is used for payment. The language to make the barcode appear and randomly change each order made by the student is PHP and HTML using Brackets software.

2.2 Methods

Waterfall model (**Figure 1**) was used to create the system because the software development method is easy to apply. The waterfall model defines definite starting and ending points of a project and ensures early detection of errors and misunderstanding in each stage [5]. The waterfall model provides templates on planning, analysis, design, implementation and testing methods.

Figure 1: Waterfall model

2.2.1 Planning

The proposed system was to be completed in 13 weeks. By maintaining constant contact between customers and system analysts, the SDLC planning phase aims to comprehend the system requirements. [6]. In this phase, we can get all the information about project suggestions and selection and discuss work division, project objectives, scope, and issues that are faced in the project.

2.2.2 Analysis

An online survey was administered to 30 students through Google Forms to determine system feasibility. 90% of them are uncomfortable going to the cafe during the pandemic for various reasons; crowded (57.1%), no social distancing (39.3%), long queue (50%). 96.7% of them want a system that simplifies food ordering at the café.

2.2.3 Design

Requirement specification was transformed into complete and detailed system design specifications [7]. The activity that is done for this system is roughly sketching designs using Canva for the system.Canva is used to create mock-ups of user interfaces.

Figure 2 shows a mock-up of the Register page where students need to fill in their username and password. After that, they must log into the system through the Login page. **Figure 3** shows the mock-up for the Menu page. Students can view the menu of shops at the café and place orders.
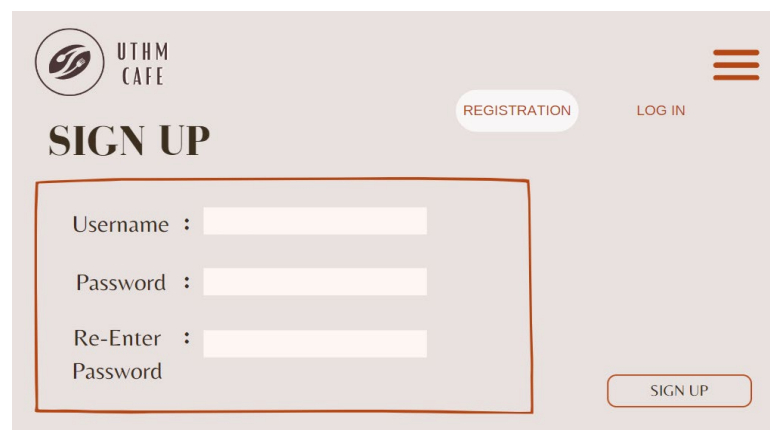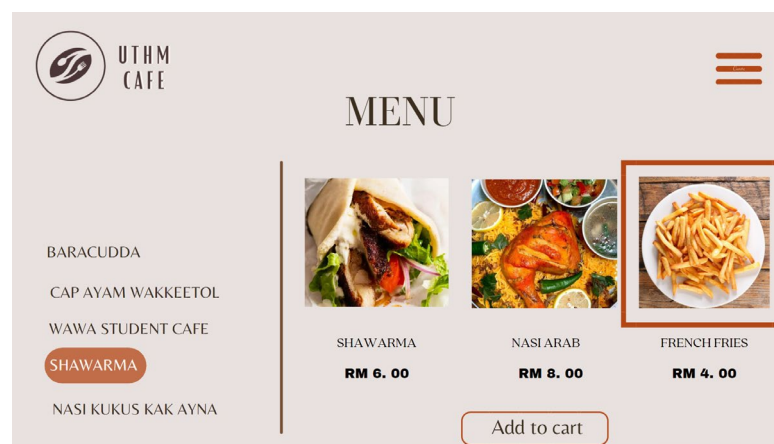

Figure 2: Register page

Figure 3: Menu page

Figure 4 shows the mock-up for the Cart page. Students can review their orders from the stall at the café.
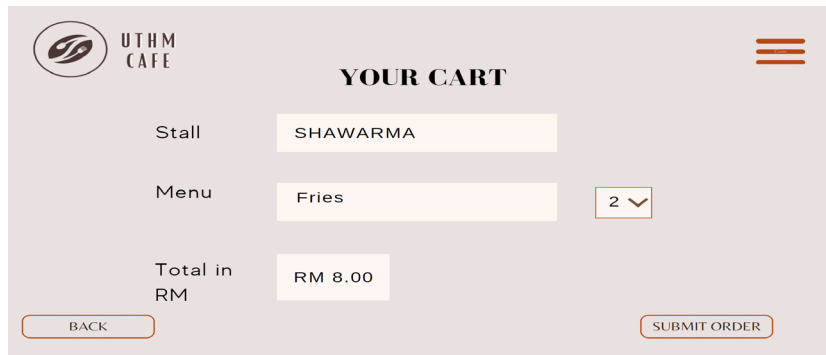

Figure 4: Cart page

Figure 5 shows the mock-up of the Receipt page. After students finish ordering food, they will be given a receipt which displays the QR code and order details.

Figure 5: Receipt page

2.2.4 Implementation

The gathering and analysis of requirements is followed by system development, system implementation, and system coding during the implementation phase [8]. Developers coordinate the features that need to be present in the system to meet the objectives of the project and choose programming language suitable for the system. Programming languages that have been chosen are PHP, HTML, CSS and SQL.

2.2.5 Testing

During the testing phase, a software solution is examined to see if it adheres to the original requirements and specifications and serves the intended purpose [9]. The purpose of the system is also to test the system and fix any errors. 30 students tested and evaluated the system and gave their feedback about the system in google from that given in the WhatsApp group. There are nine statements about the system that need to get feedback from students and some of the statements are "The system provides accurate information about the food in the UTHM Cafe", "The system makes it easier for students to make payments faster", "The organization of information on the system screen is clear" and "The system makes it easier for students to make payments faster".

3. Results and Discussion

83% of respondents were very satisfied with the system (**Figure 6**) while 64% were satisfied. This system gives satisfaction to users because it is easy for customers to order food online, and remotely. Customers and staff may conveniently maintain a safe distance from each other thanks to the online meal ordering system. Instead of delaying the transaction and raising the risk of delivery, customers may just pick up their meal from a designated pickup location within the restaurant or pick it up at the counter. Making order management straightforward is the greatest approach to handling any food shopping. The whole order management procedure becomes rapid and flexible when a restaurant or eatery offers an online ordering option to allow consumers to make quick orders at the table or from home. Additionally, a well-organised web order may make the business work more efficiently. One of the most crucial tasks for every stall owner is order handling, which, if made simpler, may indirectly improve the business's performance as a whole. With this system, congestion in the stall when buying food can be reduced. As we all know, nowadays many dangerous viruses such as covid-19 can be transmitted just by touch, therefore if people order food by just using current technology such as ordering food through this system, the percentage of covid-19 infection can be reduced.
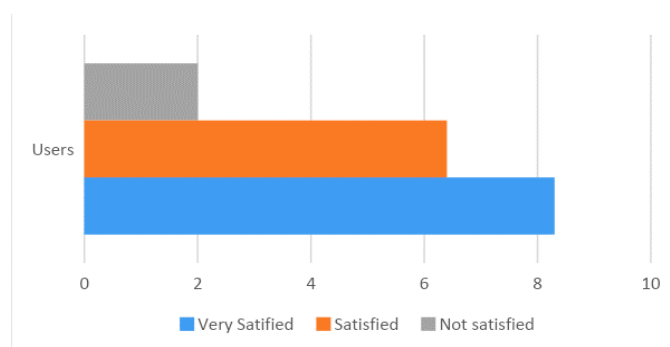

Figure 6: User satisfaction

20% of respondents were not satisfied with the system. Among the weaknesses found during system testing is that users do not know when their food is ready. The developers originally planned to send WhatsApp notifications but didn't have enough time to make it work. This system also does not have many other features such as the need to add another language to make it easier for users to use this system. In addition, other features such as a calculator to calculate food calories are also among the features that the Developer wants to include but due to time constraints to complete the system and the developer also plans to also beautify the interface of this system so that it is easier for users to understand and use the system.

4. Conclusion

Now there are still many people who order food at restaurants the old way, which is by going to the counter, some still call the restaurant waiter to take the order and some still stand in long queues at the restaurant waiting for their turn to order food. That method wastes a lot of their time by just waiting to pick up their order but also wastes their time by waiting for the food they ordered to be ready. The payment method is also that many people still use the old method of making payments using cash. If someone makes a cash payment, it will take a long time compared to online banking and QR Payment because a person needs to provide enough money for the amount he bought, if there is a balance, the seller needs to calculate the money back correctly. Therefore, payment through QR Payment can overcome the problem because the user only needs to scan the provided QR code and make the payment. This can shorten the time for users to make payments at the counter and also make it easier for the seller to no longer have to prepare the balance. The test results also show positive feedback because QR

payment can make it easier for them when they want to make a payment at the counter. They no longer need to think about providing enough money when they want to make a payment.

Acknowledgement

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