

Food Ordering Web-based System Applying QR-Code Technology in Covid-19 Time

¹Julaily Aida Jusoh, ²Ahmad Nazari Mohd Rose, ³M. Hafiz Yusoff, ⁴Syarilla Iryani A. Saany, ^{*5}Yousef A.Baker El-Ebiary, ⁶Nurhamizah Binti Marzukhi

¹Dr., Faculty of Informatics and Computing, UniSZA, Malaysia,
julaily@unisza.edu.my

²Assoc. Prof. Dr. Dean, Faculty of Informatics and Computing, UniSZA University,
Malaysia,
anm@unisza.edu.my

³Assoc. Prof. Dato' Dr., Deputy Vice Chancellor for Student Affairs, UniSZA, Malaysia,
hafizyusoff@unisza.edu.my

⁴Assoc. Prof. Dr., Faculty of Informatics and Computing, UniSZA, Malaysia,
syarilla@unisza.edu.my

^{*5}Assoc. Prof. Ts. Dr., Faculty of Informatics and Computing, UniSZA University, Malaysia,
(Corresponding Author) yousefelebiary@unisza.edu.my
<https://orcid.org/0000-0002-4392-8015>

²Student, Faculty of Informatics and Computing, UniSZA, Malaysia.

Abstract

Me2Odr is Food Ordering System, is a web-based system that using QR-Code for customer and admin to perform transaction and purchase more smoothly through the online to the internet. The aim of the system is to ease the customers to place the order as per they like without go to the café specially during Covid-19 pandemic. Then the admin will check the order and prepare the food then delivery food. Users of this system consist of user and admin. The aims or objectives of this research are to create a convenient to use this system for user to make an order or buy food using online by reducing time and cost for a student. It also, to develop a system that can facilitate UniSZA's Cafe and student to buy food without scrambling and long queue and test the system function with user. In addition, the main function of the cafe in this system is to provide food orders that have made by customers using the Priority Scheduling technique. By using this technique, it will update their status up to date by admin. It is significant to use the Priority Scheduling in café UniSZA because it helps to serve the order menu in bulk rather than serve it one by one and it can save many times. The expected outcome for this research is able to manage order by using the services from the website efficiently, display daily menus and prices for customers and allows customers to place an order directly. In conclusion, with the new technology implement in this system can help order food with systematic and properly for the future.

Keywords: Food Order System, QR-Code, UniSZA, Malaysia, Web-based System, Covid-19 Pandemic.

I. INTRODUCTION

Currently, our country is being hit by the covid-19 virus and its numbers are growing rapidly. With the occurrence of this virus, we must maintain the distance from each other, reduce face-to-face with outsiders and most importantly do not forget to wear face masks. Me2Odr is an online system that can be used in any browser on mobile or web devices such as Chrome, Mozilla and others. Unfortunately, the current ordering system at UniSZA cafe is done manually by students by writing order using pen and paper [1]. Therefore, this can cause the possibility of infection for the covid-19 virus to the public when they use the same items. So, this system will help the user to order food at Cafe UniSZA using the QR-Code which is meant by entering the requirement detail such as name, serve or take away, choose the menu and pay [2]. By using this system, user also can place orders, view and select the store where they really want to place an order and also make it easier for students to place orders without long queues at UniSZA cafe. Lastly, they also can cancel the menu by requesting a stall and paying it using online banking. With this system, we can learn new norms by keeping distance and not touching each other. The method of this system is using priority scheduling technique [3].

The manual system available for ordering in UniSZA cafe has limitations and inconveniences to students because there are still students who like to push, scramble while buying food. Manual ordering procedure is a very time consuming task because at lunch time, too many students and lecturers want to buy food without queuing until employees do not have time to serve students to buy food [4]. Furthermore, it becomes trivial for students to go down to the cafe merely to place orders in packs. However, students also find it difficult to identify the menu and daily food quantity each store provides when students are still in their faculty [5]. For this system, there will be a system administrator who is entitled to enter the menu at the current price [6].

The expected result of this research is the user can able to manage order by using the services from the website efficiently. The user also can display daily menu, prices and place an order directly using online.

II. TECHNOLOGY AND TECHNIQUES

Different technique or method has been analyzing through the previous research and articles. All the article that related to the specific technique will be observe on their advantage for implementation the suitable technique in this research [7]. Only one technique was chosen for the literature review.

This research will implement Priority Scheduling. Priority scheduling is a method of scheduling processes based on priority. In this method, the scheduler chooses the tasks to work as per the priority which is different from other types of scheduling, for example, a simple round robin. Priority scheduling involves priority assignment to every process, and processes with higher priorities are carried out first, whereas tasks with equal priorities are carried out on a first-come-first-served (FCFS) or round robin basis [8].

The difference between a priority scheduling and the normal scheduling is the priority scheduling based on values comes out in order by priority instead of being a “first-in-first-out”

data structure, see Figure 1 [9]. A priority scheduling is implemented in Food Ordering System (Me2Odr) during the process of the queue the order that will be selected by the customer. The order that has the same type or exact food will be set into the the highest priority along with the current order that is being processed. The main problem with priority scheduling is starvation which is low priority order may never execute. A solution to this problem is aging, as time progress the priority of the order in the ready queue is increased, check Table 1.

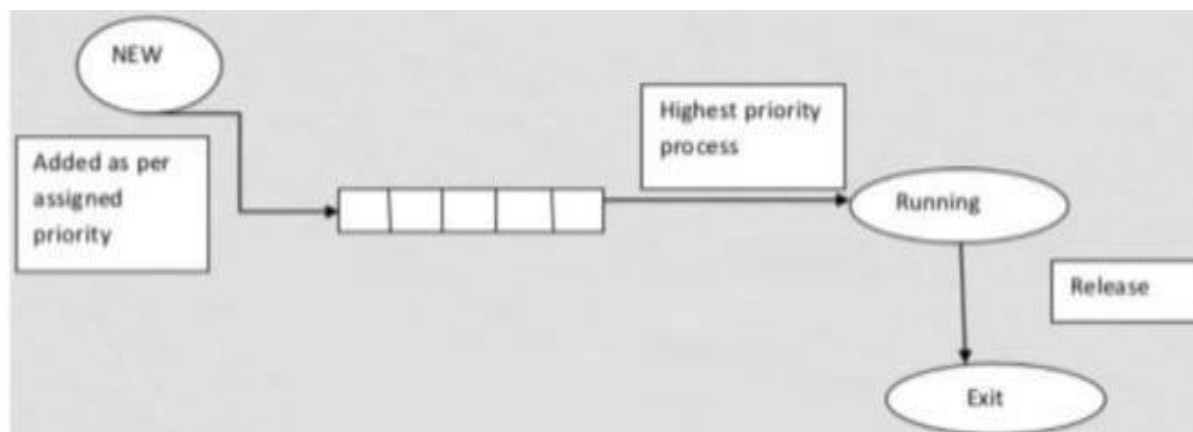


Figure 1: Priority Scheduling Technique

Table 1: Table of Comparison for Each Technique

No	Authors / Year	Title	Objective	Method	Future Work	Advantages
1.	Robert I. Davis Real-Time Systems Research Group, University of York, 2014	Schedule ability Tests for Tasks with Variable Rate Dependent Behaviour under Fixed Priority Scheduling	The objective for this system is to introduce the reaction time analysis for systems covering VRB and sporadic tasks under fixed priority scheduling.	Priority Scheduling	-	Be able complex the analysis by using information about the physical limitations of the system to provide constraints for an ILP formulation of the problem
2.	Wen-Hung Huang and Jian-Jia Chen Department of Informatics TU Dortmund University, Germany. Husheng Zhou and Cong Liu Department of Computer Science The University of Texas at Dallas. 2014	PASS: Priority Assignment of Real- Time Tasks with Dynamic Suspending Behaviour under Fixed- Priority Scheduling	To find a feasible priority assignment on a speed-2 uniprocessor	Priority Scheduling	-	Can produce a feasible schedule for a given input task

3.	Younès Chandarli, Nathan Fisher and Damien Masson, 2014	Approximate Response Time Analysis for Thermal Aware Real-time Systems Under Fixed-Priority Scheduling and Reactive Control	To investigate schedule ability analysis for thermal-aware real-time systems	Priority Scheduling	To study deeply the possible similarities between energy harvesting model and the thermal-aware's one and to explore more adaptable and extensible results of each model.	The energy-harvesting systems to thermal-aware ones and efficiency of the proposed bounds via extensive simulation over randomly generated task systems
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III. EXISTING ATTENDANCE SYSTEM

This part will focus on the research that is directly or indirectly to the research. The related journal and article about the various technique and approach was analysed to find the best implementation technique that can used in this food ordering system. Therefore, with this information, it can be used to develop new systems that can provides better functionality compared to existing systems.

i. Mohd Chan (Chinese Muslim Restaurant)

Mohd Chan (Chinese Muslim Restaurant) is a Chinese Muslim restaurant that serving „halal“ menu, tasty, and nutritious comfort food, done in home-cooked Cantonese style per. Besides, this system was developed for Mohd Chan Restaurant by oddle.me in 2017 [10]. It also used to be used to provide delivery services for food and catering around Klang Valley, Kelana Jaya, Shah Alam, Ampang, Damansara and Kuantan. However, the system also has additions to cart and allow consumers to order as much food as they want. The system also has a map aims to make it easier for users to know the location of the store. Menu for this the system is organized by category, see Figure 2 [11].

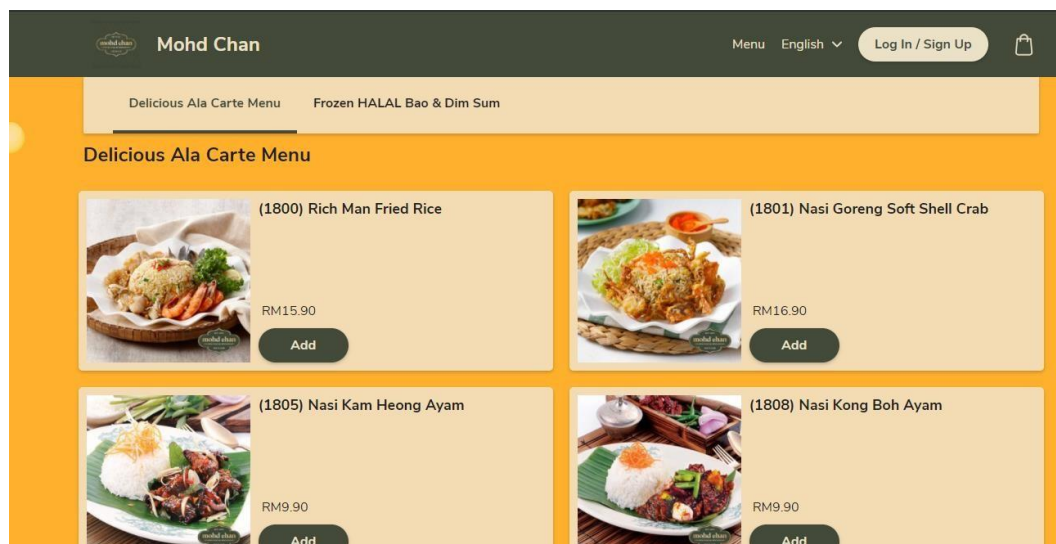


Figure 2: Print Screen of Mohd Chan (Chinese Muslim Restaurant)

ii. Radiance Restaurant App

Radiance Restaurant Application is a restaurant located in Brooklyn, New York City and this application was developed in 2017. This application also aims to place orders and delivery food. The restaurant has a variety of main dishes such as sautéed broccoli carrots with grilled salmon, shrimp parmesan, garlic butter shrimp and more, see Figure 3 [12]. To make an online order must use Uber eat and seamless. Besides, it also can make an order by phone and pick it up at the restaurant. Furthermore, this restaurant can also make a reservations or an order for catering. For the payment it only pays using cash on delivery and cash [13].

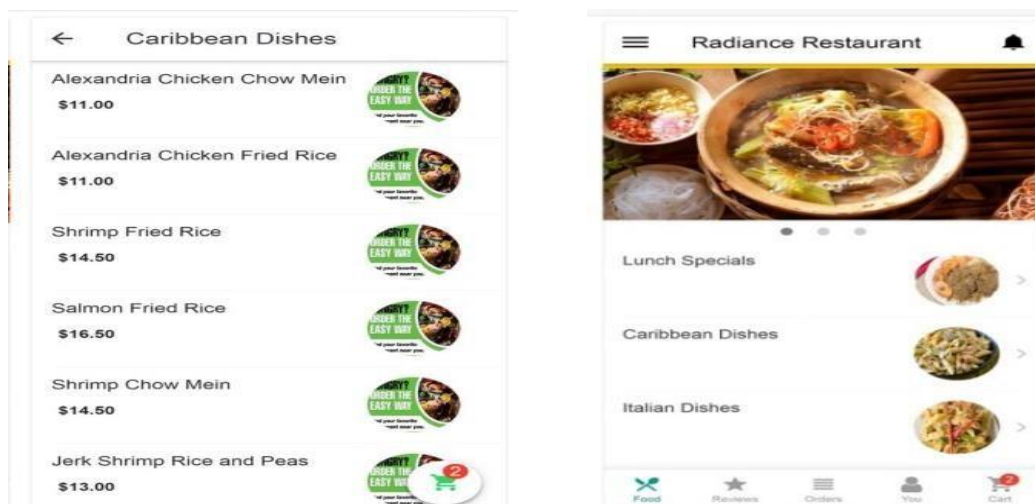


Figure 3: Print Screen Radiance Restaurant Apps

iii. Dapur Mama Food Delivery Service

Dapur Mama Food Delivery Service is a system that combines all the food choices such as Malay, Thailand and Indonesia under one roof. This system was built by GloriaFood and it based in the district of Sepang, Selangor [14]. The restaurant has taken away or make delivery for their customers. Besides that, through this web system, customers can see various menus and prices and also can add menus to the cart what they want. Then, they have to choose whether to take away or delivery [15]. If a customer chooses a delivery, then they will need to fill in their information to confirm their order confirmation, see Figure 4 [16].

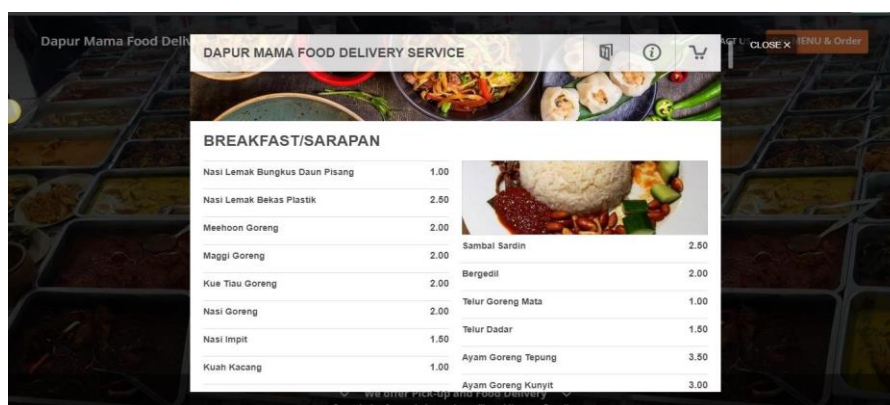





Figure 4: Print Screen of Dapur Mama Food Delivery Service

Table 2: System comparison

	Mohd Chan (Chinese Muslim Restaurant)	Radiance Restaurant Apps	Dapur Mama Food Delivery Service
Location	Selangor, Malaysia	Brooklyn, New York	Klang and Kuantan
Logo			
System Overview	<ul style="list-style-type: none"> - Order and delivery food. - Add to cart. - Payment by Online and cash 	<ul style="list-style-type: none"> - Order and delivery - No need adds to cart - Payment by cash on delivery and online 	<ul style="list-style-type: none"> - Order and delivery - Add to Cart -Payment by cash on delivery and cash
Method	Web-based system	App for IOS	Web-based system

IV. (Me2Odr) DESIGN AND IMPLEMENTATION

This topic describes the features of (Me2Odr) Food Ordering System that consists of two parts of implementation which are for admin and user. In this system, admin will be able to log into the system. Admin has authority to manage product that have at the cafe into the system. For example, admin can view product, delete product, update product and others. The user can log into the system after registered and make an order which is add product into the cart. After that, user will confirm the orders and make a payment. They also can manage their order and add to cart the new product that they interesting before make a payment. In addition, the admin can log into the system to manage the placed food orders and serve the food according to the queue that are sorted by using Priority Scheduling Technique. When the food preparation is done, they will update the order status and proceed to the next order. They also can manage their profile including view and updating their details. Last but not least all the two users can generate reports based on their privilege.

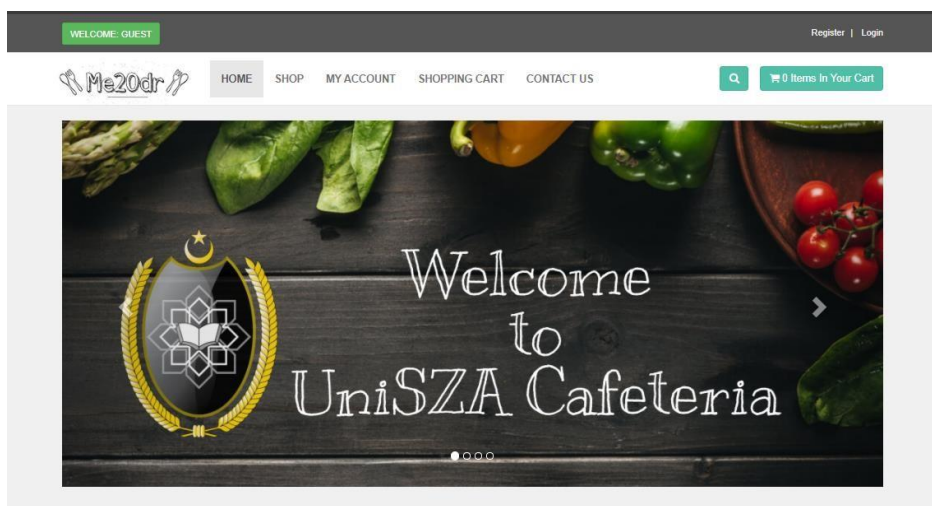


Figure 5: Homepage

Figure 5 shows the homepage of the system for all users. When users click on „Login“ button, it will directly go to login page.

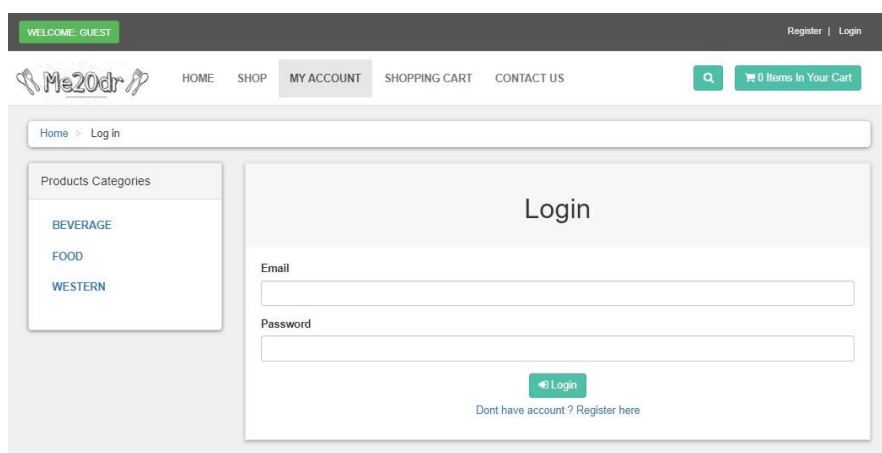


Figure 6: Login Page

Figure 6 shows the login page of the system for all users. When users enter the correct username and password and click on „Log in“ button, it will directly go to the homepage.

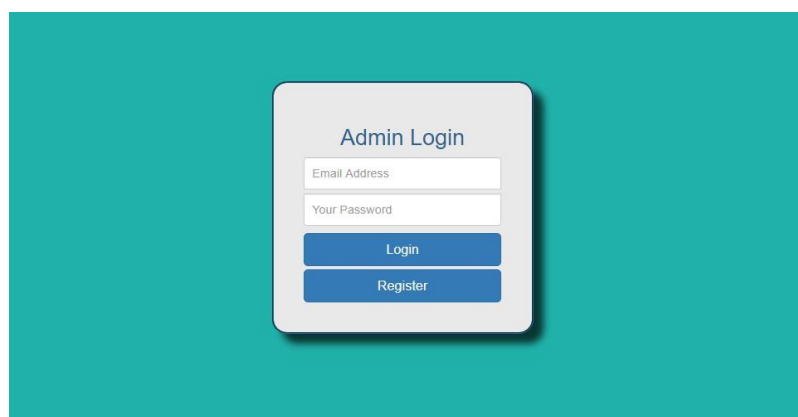


Figure 7: Admin Homepage

Figure 7 shows the homepage of the system for admin. It will show a welcome message with the name of the admin. Admin will have its own menu navigation that redirect to the designated pages.

Product ID:	Product Title:	Product Image:	Product Price:	Product Sold:	Product Keywords:	Product Date:	Product Delete:	Product Edit:
1	Teho Ais		RM 2	1	Teho Ais	2021-04-11 04:29:58	Delete	Edit
2	Nasi Lemak		RM 3	1	Nasi Lemak	2021-04-11 04:50:29	Delete	Edit
3	Nasi Kerabu		RM 3	0	Nasi Kerabu	2021-04-11 04:51:39	Delete	Edit
4	Bubur		RM 2	0	Bubur Ayam	2021-04-11 04:52:41	Delete	Edit
5	Chicken Chop		RM 10	1	Chicken Chop	2021-04-11 05:07:22	Delete	Edit
6	Waffle		RM 3	1	Waffle	2021-04-11 05:08:57	Delete	Edit
7	Fries		RM 3	2	Fries	2021-04-11 05:10:07	Delete	Edit

Figure 8: Manage Product

Figure 8 shows the manage product page of the system for admin. Admin can view then can redirect to pages for inserting, updating and deleting the product data inside the database.

Figure 9: Add Product

Figure 9 shows the add product page of the system for admin. Admin will fill in the product details into each form and the data will be stored inside the database.

Figure 10: Update Product

Figure 10 shows the update product page of the system for admin. Admin will edit in the product details into each form as necessary and the data will be updated inside the database.

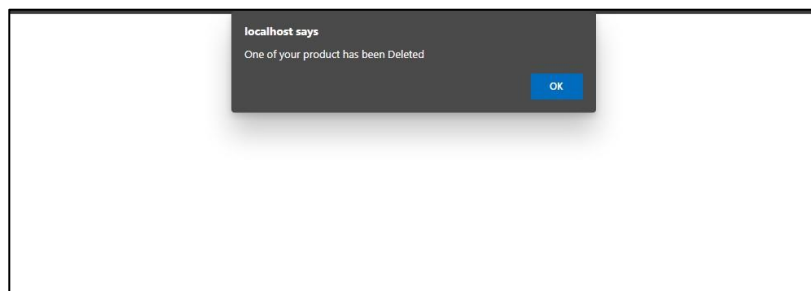


Figure 11 Delete Product

Figure 11 shows the delete product of the system for admin. Admin will select which product they want to delete and the data will be deleted from inside the database. Also admin will view and cook the food according to queue and the same food will be combined accordingly by priority scheduling. After the food is cooked, admin will press the check button for confirmation. Admin can view the payment details of each user as well.

V. (Me2Odr) SYSTEM TESTING

i. Black-Box Testing

Use Case	Login
Description	The user (Admin and User) login to access the system
Pre-Condition	The user is on the Login page
Basic Flow	<ol style="list-style-type: none"> 1. The first page that user will see in this system is Homepage. 2. User will go to the login page using the link button. 3. The user enters their email and password. 4. The system verifies email and password from database. 5. If the parameter exists, the system will allow the user to access their account
Post-Condition	User successfully login and able to access the system.
Rules	The user must have authorized to access the system.

Table 3: Test Case Login

ii. White-Box Testing: Add Product

Use Case	Login
Description	Add product is used to add new product for food ordering system.
Pre-Condition	The admin has to login the system and accesses the product module.

Basic Flow	<ol style="list-style-type: none"> 1. The admin goes through „Product“ button. 2. The admin inserts the „Product Title“. 3. The admin clicks on „Insert Product“ button. 4. The admin selects „Product Category“. 5. The admin select browse to select which picture to upload. 6. The admin fills in the food information such as name and price. 7. The waiter clicks on „Insert Product“ button. 8. The systems process the addition and save into database.
Post-Condition	The admin successfully adds new product.
Rules	The user must have authorized to access the section.

Table 4: Test Case for Admin Add Product

iii. Update Food

Use Case	Update the Food
Description	Update the product is used to update the product for food ordering system.
Pre-Condition	The admin has to login the system and accesses the update module.
Basic Flow	<ol style="list-style-type: none"> 1. The admin goes through „Product“ button. 2. The admin clicks on „View Product“ button. 3. All the food information is displayed. 4. The admin clicks on edit button to update the selected product data. 5. The admin fills in the changes for the food in the form. 6. The admin clicks on „Update Product“ button. 7. The system processes the changes and save into database
Post-Condition	The admin successfully updates the product.
Rules	The admin must have authorized to access the section. The product must be available before it can be updated.

Table 5: Test Case for Admin Update Product

iv. Delete Food

Use Case	Delete the Food
Description	Delete the product is used to delete the product for food ordering system.
Pre-Condition	The admin has to login the system and accesses the product module.
Basic Flow	<ol style="list-style-type: none"> 1. The admin goes through „Food“ button. 2. The admin clicks on „Manage Food“ button. 3. All the food information is displayed and can be

	<p>searched if necessary.</p> <p>4. The admin clicks on delete button to delete the selected food data.</p> <p>5. The admin confirms the deleting data by pressing OK.</p> <p>6. The system delete the data from the database</p>
Post-Condition	The admin successfully deletes the product.
Rules	The user must have authorized to access the section. The product must be available before it can be deleted.

Table 6: Test Case for Admin Delete Food

all the interfaces described the functions and the flow of the system. The information of the implementation of the system is delivered by using test cases. The testing method is used to test functionality and validations of the system on every main module in the system.

VI. CONCLUSION

The Food Ordering Systems are developed mainly to upgrade the old system into an improved system. This system is focused on the customer to make an order in a more organized way compared to the old way and the admin to process the order more efficiently. By using Priority Scheduling method, Food Ordering System will be queue the food order in a smarter way to process the order faster. The system also helps admin to manage sales as well generate report for which will result in an improved productivity of the business.

In conclusion, Food Ordering System (Me2Odr) System has two main users which are admin and user. This system is to develop a food ordering and management system using web development in a more efficient way that can help to reduce human errors and improve food services. The database and interface design are also included in this report to act as guide for the development. The most important thing in this system is to help local businesses ventures to manage their services as well ease users for better productivity.

There are several limitation and constraint that occurred throughout the development of the system. Firstly, the systems are only focus on food ordering and not involve the food stock and ingredient management. Second, only the waiter can make the food ordering. Any customer cannot make an order by themselves without consulting the waiter.

Food Ordering System still needs a lot of improvement. There are still a lot of functions that has not been implemented into this system. In programming language side, it is recommended Food Ordering System implemented fully on website platform. This is because nowadays mobile technology is growth rapidly. In addition, the system can also be developed to eliminate the use of waiter as the customer can fill the order themselves at each table without the need for waiter.

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