

UNIKL MIIT SMART UniCafe System

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Abstract—This paper presents the development of the SMART UniCafe System—a web-based platform aimed at improving the food ordering system experience in UniKL MIIT cafeterias. The system addresses challenges such as manual ordering processes, unorganized order management, limited payment options, and lack of time estimation. XAMPP, MySQL, Visual Studio Code, and Draw.io were utilized in the development process. The objectives were to create a user-friendly web interface, improve the efficiency of the food ordering process, and enhance customer satisfaction. The SMART UniCafe System aims to revolutionize the dining experience by providing a seamless and user-friendly platform for customers, sellers, and administrators. The findings presented in this paper serve as a foundation for future updates to meet evolving user needs and remain competitive in the market. With the recommended improvements, the system has the potential to transform cafeteria dining into a more streamlined and convenient process.

Keywords—Food ordering system; web-based platform; future updates; customer satisfaction; streamlined and convenient process;

I. INTRODUCTION

The SMART UniCafe System is a web-based online ordering platform designed to enhance the dining experience for UniKL MIIT students and lecturers. It aims to streamline the ordering process, reduce queues, and save time for users. By utilizing this system, sellers can efficiently manage orders and prepare food promptly, while customers can conveniently pre-order their desired items and collect them without waiting in long lines. In today's life many restaurants have focused on quick preparation and speedy delivery of orders rather than offering a rich dining experience [6]. The system is tailored to the specific needs of UniKL MIIT, providing seamless and efficient dining experience for the university community.

The problem statements of the project are as follows:

- 1) Manual Ordering Process.
- 2) Unorganized Order Management.
- 3) Limited Payment Options.
- 4) Lack of Time Estimation.

The four objectives of the project are as follows:

- 1) To develop a user-friendly web-based interface for UniKL MIIT students to place food orders conveniently and efficiently.
- 2) To develop a time-efficient food ordering process that minimizes waiting time for UniKL MIIT students, allowing them to place their orders quickly and conveniently.
- 3) To improve customer satisfaction by providing a streamlined ordering process, accurate order tracking, and personalized recommendations based on customer preferences.

II. LITERATURE REVIEW

A. Web Application

The SMART UniCafe System is a user-friendly web application that allows UniKL MIIT students and staff to conveniently order food online. It eliminates manual ordering, reduces waiting times, and offers a responsive interface accessible from various devices. As web applications evolve, usability becomes crucial for creating effective and user-friendly websites [11]. With its three-tier architecture and efficient design, the system enhances the overall dining experience by simplifying the ordering process and providing convenient payment options. Usability is a key focus, ensuring an effective and functional web application for users.

B. Food Ordering System

A reservation food system enables customers to book meals at restaurants or food establishments, using methods like online, phone, or in-person. The study [8] aimed to understand the factors influencing internet users' attitudes towards online food ordering. In summary, a reservation food system offers benefits such as efficient reservation management, enhanced customer experience, and increased revenue for restaurants. It can also be integrated with other systems like inventory management and customer relationship management, leveraging modern technologies.

C. Existing Ordering System

An existing ordering system is a proven solution that simplifies and enhances the customer ordering process. Among the various online ordering systems available, some notable examples include Ombak Kitchen, Gordon Ramsay Restaurant, and Nasi Kukus Pahlawan Merah.

Ombak Kitchen, a renowned online ordering system, allows customers to browse their website but requires them to place orders through the WhatsApp application for ordering experience.



Fig. 1. Ombak Kitchen Website

Kay's Steak & Lobster website provides customers with the convenience of making reservations and opting for delivery services, ensuring a hassle-free dining experience.

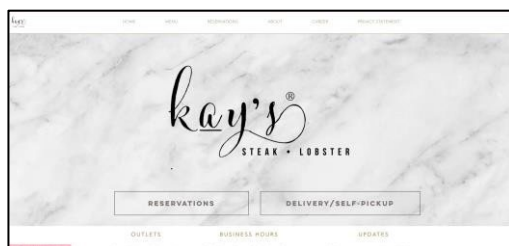


Fig. 2. Ombak Kitchen Website

The Nasi Kukus Pahlawan Merah website serves as an informative platform, providing customers with valuable insights into their business and offerings.



Fig. 3. Nasi Kukus Pahlawan Merah Website

Table I: Comparison between 3 ordering system websites.

Case Study	Case 1	Case 2	Case 3	SMART UniCafe System
Module				
Online order	Not available	Not available	Not available	Available
Web-based system	Available	Available	Available	Available
Payment method	Manual online banking	Manual online banking	Not available	FPX Online Banking
Select Multiple stall	Not available	Available	Not available	Available

III. RESEARH METHODOLOGY

Agile methodologies, such as eXtreme Programming (XP), have been touted as the programming methodologies of choice for the high-speed, volatile world of Internet and Web software development [13]. Agile methodology is a flexible and collaborative approach to software development that emphasizes rapid iteration and adaptability. It allows teams to easily respond to changes and promotes effective communication and collaboration among team members [13].

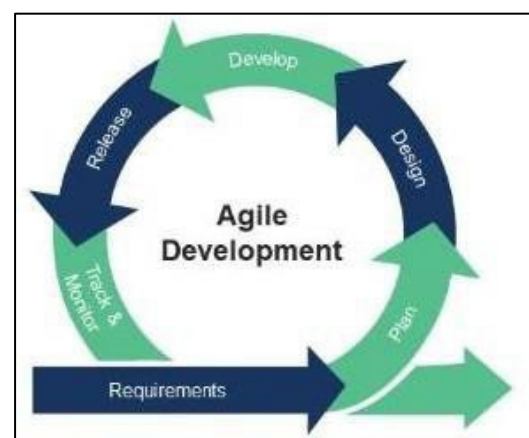


Fig. 4. Agile Model

A. Requirements

The first stage of the agile model is the requirements phase, where various titles for the final year project can be generated. These titles will be discussed with the project supervisor before proceeding to meet with the client to gather information about the processes at UniKL MIIT Cafe. Once the information is collected, a proposal for the chosen title will be created. This proposal will be reviewed by the client, the supervisor, and then submitted to the assessor for further evaluation.

B. Plan

After completing the requirements section, the next phase is the plan phase. During this phase, a comprehensive strategy will be developed to enhance the project's effectiveness. The focus will be on organizing all plans meticulously. Extensive research will be conducted to identify the stakeholders involved in the movement in and out of UniKL MIIT Cafe. This research will contribute to creating a detailed project scope that facilitates better understanding. Subsequently, the project will involve the creation of SRS and STP documents, which will undergo thorough review by the project supervisor.

C. Design

The design phase commences by constructing a UML diagram based on the listed scope. This diagram facilitates comprehension of the operational processes at UniKL MIIT Cafe. Subsequently, the module system and flow system are established to enhance understanding of the interconnections between various systems. An ERD will be formulated to visualize the database's data structure. Additionally, software design concepts compatible with the chosen title will be developed, and their approval will be sought from the project supervisor.

D. Develop

Starting with this phase, the implementation process commences with a focus on attention to detail. It involves dividing the project into multiple parts to ensure systematic development. The initial step is to create the graphical user interface (GUI) and seamlessly integrate it with the system. Thorough testing and verification are conducted upon completing each part before proceeding to the subsequent phase. This approach ensures optimal utilization of time and resources.

E. Release

In the release phase, the coded components are deployed to observe any potential errors or bugs that may affect the system's functionality. Prompt attention is given to resolving any issues that arise during this process, ensuring a smooth and efficient system operation.

F. Track & monitor

Conduct user evaluations to gather valuable feedback on potential enhancements. Share comprehensive documentation and the anticipated product with the client. Maintain regular communication and attentiveness to avoid overlooking critical information.

IV. DESIGN AND IMPLEMENTATION

The development process of the SMART UniCafe System includes requirements gathering, design, implementation, and interface development. These stages ensure the system meets user needs and provides a user-friendly interface.

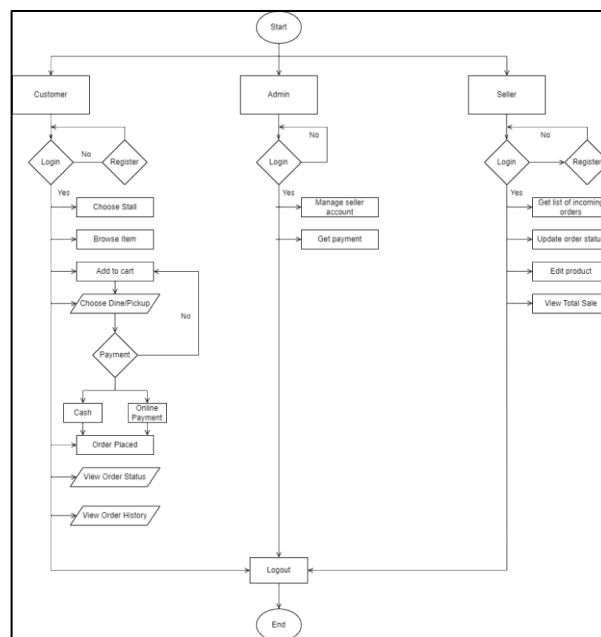


Fig. 5. Flowchart of SMART UniCafe System

The flowchart based on Fig. 5 provides a visual representation of the overall flow of the SMART UniCafe System, showcasing the sequential progression of activities and interactions within the system.

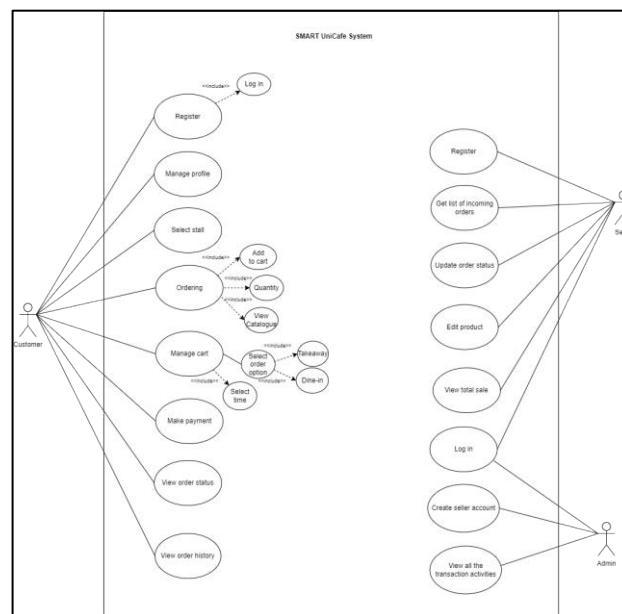


Fig. 6. Use Case Diagram of SMART UniCafe System

The case diagram in Fig. 6 presents a simplified representation of the interactions among the three main system actors within the SMART UniCafe System. It effectively captures the relationships between the actors and the use cases, which encapsulate the essential actions, services, or functions of the system. Ensuring the accurate construction of the use case diagram is crucial, as it serves as a blueprint based on the specific requirements and needs of the system's users.

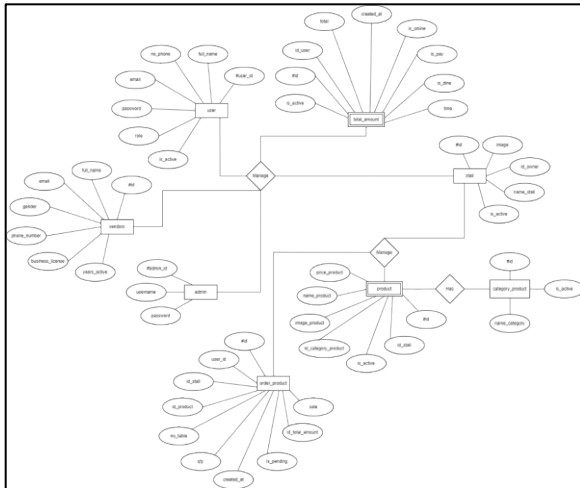


Fig. 7. ERD of SMART UniCafe System

Fig. 7 displays the ERD for the SMART UniCafe System, outlining the key elements of its data structure. These entities serve as the basis for the system's database during product development, ensuring an effective and well-designed foundation.

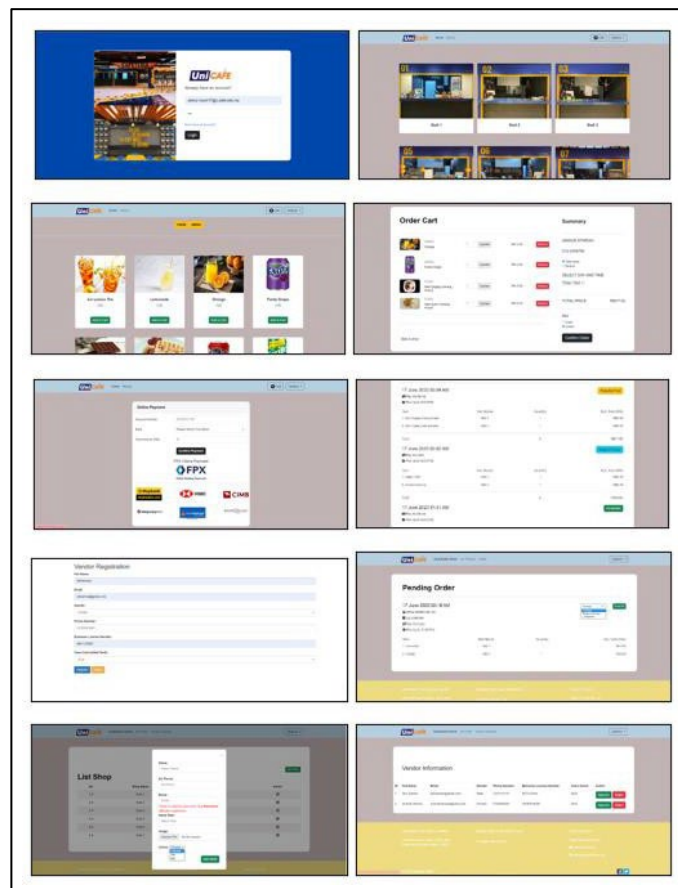


Fig. 8. Interfaces of Customer, Seller and Admin

Based on Fig. 8, the main prototype of the system includes key functionalities for different user roles, such as customers, admins, and sellers. Customers can log in, select a stall, browse menus, add items to their cart, manage cart and view order status. Sellers can register, update order status, and admins can create seller accounts and manage seller approvals. This comprehensive prototype aims to streamline the login process, facilitate stall and menu selection, simplify cart management, and provide specific features for sellers and admins.

V. TESTING AND RESULTS

A. Scope of Testing

The testing scope for the SMART UniCafe System includes functional, user interface, integration, performance, security, compatibility, usability, error handling, accessibility, and system integration testing. These tests ensure the system's functionalities, user interface, interaction with external components, performance under various loads, security measures, compatibility across platforms, ease of use, error handling, accessibility compliance, and integration with external systems are thoroughly evaluated for quality and reliability.

B. Testing Approach and Techniques

The testing approach for the SMART UniCafe System involves testing its functionality testing, conducting system validation, and performing user acceptance. These techniques ensure that the system functions correctly, meets requirements, and is accepted by users. Functional testing verifies system functions, system validation testing ensures objectives are met, and user acceptance testing validates usability and compatibility. This comprehensive testing approach guarantees the system's functionality and user acceptance.

C. Testing Schedule

The Validation Testing phase, scheduled from 6th March 2023 to 12th May 2023, focuses on testing the system's functionality and adherence to requirements. Techniques like functional, integration, and system validation testing are used to identify and address defects. Following this, the User Acceptance Testing phase begins on 15th May 2023 until 2nd June 2023, evaluating usability and user acceptance. User feedback is collected to enhance the system's interface, workflow, and overall user experience.

D. Test Case

The test cases were meticulously executed to verify the system's functionality, guaranteeing its compliance with the specified requirements and seamless operation. Each test case encompassed test scenarios, pre-conditions, post-conditions, and procedural steps, providing a comprehensive overview of the testing process. Table II exemplifies one of the test cases from the entire system, showcasing the systematic approach taken to ensure its quality and reliability.

Tested By:	Ainnur Athirah	
Test level	User Acceptance Testing	
Test Type	Functional Testing	
Test Case Number	TC_001	
Test Case Name	Register Customer	
Test Case Description	To test registration for customer	
Item(s) to be tested		
1	Full Name	
2	Email	
3	Phone Number	
4	Password	
Specifications		
Input		Expected Output/Result
i.	Name: Ainnur Athirah	All input successfully registered.
ii.	Email: ainnur.munir17@s.unikl.edu.my	
iii.	Phone Number: 0123456789	
iv.	Password: 123	
Pre-Condition: The customer registration page is accessible and functional.		
Post-Condition:		
1. The customer can log in using the registered email and password.		
2. The customer's profile information is saved in the database.		
Procedural Steps		
1.	Click "Don't have an account" button.	
2.	Fill in their Full Name, Email, Phone Number, Password	
3.	Click on the "Submit" button to submit the registration form.	

Table II: Test Case for Register

E. User Acceptance Testing (UAT)

User Acceptance Testing (UAT) validates system functionality, usability, and user satisfaction. It involves distributing an evaluation form to UniKL MIIT and UniKL Cafeteria users. Based on Fig. 9, the form collects feedback on various aspects of the SMART UniCafe System. Results showed high user satisfaction with cart management (64% highly satisfied, 20% satisfied, 16% neutral) and seamless order placement navigation for 80% of users. The majority (96%) found it easy to navigate stalls and the catalogue, highlighting the system's effective user interface. A small percentage (4%) encountered difficulties, warranting further investigation. UAT ensures the system meets requirements and gathers insights into improvement.

F. Test Summary

The UAT feedback for the SMART UniCafe System was predominantly positive, with users expressing high satisfaction and positive experiences. The interface's ease of use and navigation received excellent ratings from 72% of respondents, while an additional 20% rated it as very good. Only a small percentage considered it to be good or fair, indicating room for minor improvements. Importantly, no users rated the interface as poor, highlighting the overall user-friendliness of the stall and menu selection system in Fig. 10.

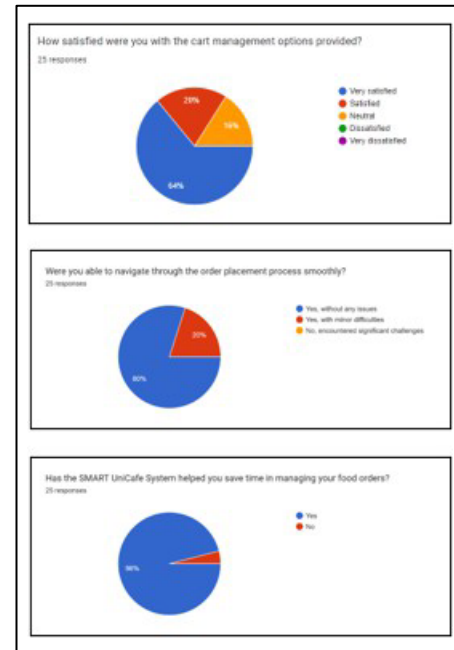


Fig. 9. User Acceptance Testing Feedbacks

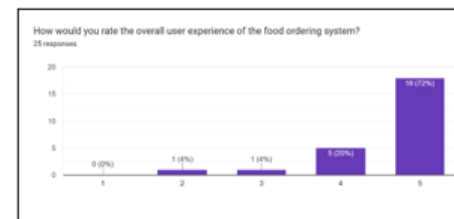


Fig. 10. User Acceptance Testing Feedback

VI. CONCLUSION

The implementation of the SMART UniCafe System aims to enhance the overall dining experience for UniKL MIIT students and staff by providing a seamless online ordering platform. By transitioning from manual order handling to an automated system, the time-consuming processes and potential human errors can be minimized. This system streamlines order placement, customization, and management, resulting in improved efficiency for both customers and the cafeteria staff. The SMART UniCafe System serves as a reliable platform that simplifies the ordering process, enhances customer satisfaction, and increases operational efficiency for the UniKL community.

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