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UTHM Entrepreneur Service Management System

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Abstract: The UTHM Entrepreneur Service Management System is a management system for and could be user by the customer, seller and administrator at Universiti Tun Hussein Onn Malaysia (UTHM). The aim of developing this system is to solve the problems due to the absence of a proper system and to ease the process of entrepreneurial activity in UTHM. The system being developed using the Software Development Life Cycle (SDLC) model to ensure a smooth flow of work and organize. The system provide a central platform for advertisements, making it easier for sellers to promote their products and services, and for customers to access and purchase those product and service. At the same time, the administrator could monitor the entrepreneurial activities that been done and extract information from the system. By having this system, it will provide a safe and reliable marketplace, reducing the risk of fraud and scams, and making it easier for sellers to conduct their business. The development of this system able to make the process of entrepreneurship simpler and more efficient for users, helping users to improve their management process and achieve their goals.

Keywords: UTHM Entrepreneur Service Management System, entrepreneurship, Software Development Life Cycle.

1. Introduction

In today's technological progress, many aspects of our daily lives have been impacted by the use of technology. With the advancement of mobile phones and portable laptops, people have become connected to the digital world. Entrepreneurship is also not being left behind in shifting towards digital, which brings many benefits in various aspects such as management and operation. The shift in entrepreneurship brings convenience for customers as they can now easily buy and sell goods online.

In the other hand, Universiti Tun Hussein Onn Malaysia (UTHM) is focused on producing quality technopreneurs[14]. To achieve this goal, UTHM should provide a platform that acts as an intermediary between sellers and buyers among students or lecturers to offer products and services that can generate revenue or profit. However, currently, Pusat Teknousahawan Universiti (PTU), the responsible centre for monitoring and focusing on entrepreneurship in university, does not have an application or website that can encourage the development of interest in buying and selling activities within the UTHM community itself. Furthermore, there is currently no proper platform for new sellers to promote their business and this can be a challenge, as they are limited to use their social media accounts.

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Thus, to address this issue, this study proposes the development of the UTHM Entrepreneur Service Management System (UESMS). The main objective of this development are to analyze and design a service handling management system through application based by applying the object-oriented approach, to develop a service handling management system by using application-based and website-based and to evaluate the developed system by using alpha and beta testing.

This system will provide an application and website that caters to the needs of the users by adjusting the modules' features. The system will serve as an intermediary platform for three users namely customers, sellers, and administration. It will also help to solve the problems faced by users who are interested in entrepreneurship by simplifying the management process for each user and helping to realize the university's hopes of producing quality technopreneurs.

The rest of the paper is organized as follows: Section 2 discusses the literature review of the related work and existing applications. Next, the methodology used to develop the application including the analysis and design is described in Section 3. Besides that, Section 4 will describe on the result an discussion especially for overall test case result and the user acceptance testing result. Finally, the last section concludes the current work and highlights the future work of the UTHM Entrepreneur Service Management System.

2. Related Work

2.1 Service Marketplace Concept

A service marketplace is a business model, known as Service as a Product (SaaP), in which a seller can offer services to customers. When a customer needs the service, they will contact the seller and the seller will provide the service that was purchased. Examples of systems that have been developed using this model are Fiverr and Swifty. This model is popular among freelancers as it operates on a "demand-based" business model also known as gig economy, which has unique characteristics that create opportunities and can foster innovation for businesses[9]. Standard features of such system include categories, login, payment, review, chat and status modules. By implementing these features in the UTHM Entrepreneur Service Management System, both customers and sellers can use the system seamlessly. From the customer's perspective, they can explore the system and find the services they want and place an order, and for the seller, they can engage with the customers and discuss their product or service.

2.2 Technologies for the UTHM Entrepreneur Service Management System

For this project, some of the technology that the UESMS will use is mobile and website technology. Using mobile devices and internet technology is highly significant in the marketing world[3]. Nowadays, people mostly have mobile devices, making it easier for them to benefit from the application. In this project, Flutter will be utilized for the mobile application framework. Google developed Flutter on May 2017, and it has some supported programming languages such as Dart, C++, and C. Generally, Flutter uses a fundamental component named a widget, which functions as a logic, interaction and design of the user interaction (UI).

Besides that, the Firebase platform is been use in the UESMS as it support the flutter framework. By acting as a Backend-as-a-service (BaaS) app development channel, Firebase able to provide backend services including cloud storage, authentication and real-time database[5].

2.3 Study of Existing Related System

There are a few existing systems that have been developed, namely Swifty[13], Fiverr[6][12] and Go-eCommerce[8]. Those existing systems have been studied and researched to make a comparison according to the features and characteristics provided in each system. Therefore, the table below will also compare the proposed application, the UTHM Entrepreneur Service Management System, in Table 1.

Table 1: System comparison

Features/System	Swiftly	Fiverr	Go-eCommerce	UTHM Entrepreneur Service Management System
Register account module	Yes	Yes	Yes	Yes
Login module	Yes	Yes	Yes	Yes
Register service/business module	No	Yes	Yes	Yes
Search and filter module	Yes	Yes	No	Yes
Chat module	Yes	Yes	No	Yes
Service/Product status module	Yes	Yes	No	Yes
Payment module	Yes	Yes	No	Yes
Review service/product module	Yes	Yes	No	Yes
Cart module	No	No	No	Yes
Report Module	No	Yes	Yes	Yes
Statistical module	No	Yes	Yes	Yes
No extra fee	No	No	Yes	Yes
Available platform	Application	Application and website	Website	Application
Target user	Malaysian	Anyone all around the world	Seller	UTHM community

Thus, according to Table 1, it can be concluded that the proposed UESMS will implement all the stated features referring to the existing system. It is evident that all four systems share similarities, such as having a registration and login module. However, there are some variations, such as Swiftly lacking a register service/business module, report module, and statistical module, while the other three systems possess those modules. Additionally, the Go-eCommerce system is lacking a chat module, service or product status module, payment module, and review service or product module, which the other three systems have. Furthermore, it's observed that the Go-eCommerce system, as well as the proposed system, does not have additional fees for usage, unlike the other two systems. Lastly, the proposed system has an additional module for carts, which the other three systems do not possess. Therefore, the UTHM Entrepreneur Service Management System will merge and enhance these unique features to streamline the process and simplify the user experience, as the implemented features will be beneficial and improve the user's productivity.

3. Methodology/Framework

Throughout this project, the methodology that been use is the Software Development Life Cycle (SDLC) model. The Software Development Life Cycle (SDLC) is a systematic approach[7] that consists of a set of activities designed to complete software development on time and ensure its correctness. This process is divided into several phases, including planning, analysis, design, implementation, and testing. When implemented effectively and efficiently, the SDLC can facilitate smooth software production. Figure 1 illustrates the framework of the SDLC, which follows a step-by-step flow beginning with planning and ending with testing.

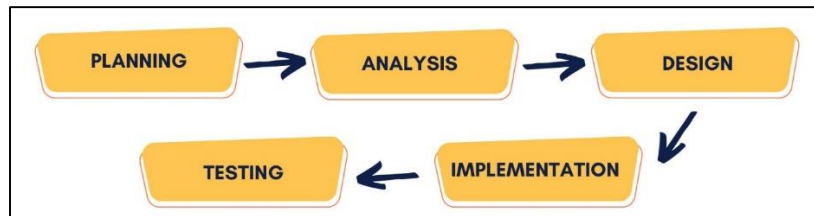


Figure 1: The framework of Software Development Life Cycle

3.1 System Development Workflow

To ensure the flow of the project is smooth and runs successfully, it is required to do proper project planning for the system development’s workflow. Generally, project planning is a part of project management that refers to the use of schedules to plan and then report progress within the project context. Thus, for this project, those activities that involve in the system development will be presented in Table 2.

Table 2: Software development activities and its task

Phase	Activities	Deliverable
Planning phase	<ul style="list-style-type: none"> • Meeting- Brainstorming Ideas • Find a Study Case • Gantt Chart • Proposal Preparation 	<ul style="list-style-type: none"> • Gained Basic Ideas, Gantt Chart and Submit Proposal.
Analysis phase	<ul style="list-style-type: none"> • Meeting- Client • Collect and analyze requirement • Analyze the existing system 	<ul style="list-style-type: none"> • The problem was analyzed as the Software Requirement Specification been produced and the report Chapter 2 is completed.
Design phase	<ul style="list-style-type: none"> • Design the to-be system (Use case diagram, sequence diagram and activity diagram) • Design Class Diagram • Design Framework of the User Interface (UI) • Design the Schema Table 	<ul style="list-style-type: none"> • Class diagram for the Project, Prototype’s Interface is Gained and the Chapter 3 and Chapter 4 are completed

Phase	Activities	Deliverable
Implementation phase	<ul style="list-style-type: none"> • Start the coding process • Give user the application to be download • Run the application 	<ul style="list-style-type: none"> • The source code of the program is been produced and database is been linked.
Testing phase	<ul style="list-style-type: none"> • Create the test case specification • Documented the test result 	<ul style="list-style-type: none"> • Test report and Chapter 5 are completed. Then, the complete Report is been Submitted.

3.2 Planning phase

In the planning phases, there are a few activities be done which relate with the process of determine project goals and establish a high-level plan of the project. Firstly, a meeting has been made with the supervisor in which to brainstorming ideas and consult those ideas for the system that has been chosen. In order to ensure that the organization that has been chosen could give cooperation, a formal letter has been prepared and been addressed to the Pusat Teknousahawan Universiti. In the letter, there will be information regarding the project that has been planned. Then, in order to keep the project in track, a Gantt Chart has been created and all the tasks that need to do has been include in it. It is crucial to ensure all related tasks are classified carefully to avoid any alteration happening in the middle of the process of developing the system which could consume too much time and energy.

3.3 Analysis phase

In the analysis phases, those requirements that have been gained from the existing system and its problem have been analyzed in depth. The technique that has been used in gathering information is by making a questionnaire and distributing it to the client to be answered. Besides, an interview session be carried out with the representative of the stakeholder which are Dr. Mohd Yussni bin Hashim, Head Department of Student Technopreneurs, PTU and Puan Nur Nabihah Binti Annuar, Executive Officer, PTU. This method been chosen due to the reason that the system that is being developed will be used by the stakeholder and it is a must to ensure that those requirements gained should suit in the UESMS. Therefore, in this section, it will include the functional and non-functional requirements that have been identified for the UESMS.

3.3.1 Functional Requirements

Generally, the functional requirement could be defined as the features or activity that the system needs to perform in order to ensure that the system produce able to suit to the client’s environment. Thus, those functional requirements shall be clear stated and follow the scope of the project to avoid problem in the design and implementation’s process[4]. Therefore, Table 3 shows the 11 modules and its functional requirement.

Table 3: The Functional Requirement

No	Module	Functional Requirement
1	Register account module	<ul style="list-style-type: none"> • The system shall provide a safe and trusted environment for the application ensure that all users need to register their personal account before entering to the application.

No	Module	Functional Requirement
		<ul style="list-style-type: none"> • The system shall allow the new user to register account. • The system shall display an error to the new user when the is the same username is entered in the database.
2	Login module	<ul style="list-style-type: none"> • The system shall ensure that only registered users can access the available services or features in the application. • The system shall allow the user to login using a username and password. • The system shall alert the user if there any invalid input or unmatched input during login. • The system shall redirect the user to their respective home page after successful login.
3	Register business module	<ul style="list-style-type: none"> • The system shall seller set up a page to register a service require important documents and details of the company that to be uploaded for Administration review.
4	Profile information Module	<ul style="list-style-type: none"> • The system shall allow the user to update their personal detail.
5	Product and service Information module	<ul style="list-style-type: none"> • The system shall allow seller adding, remove, update, and delete the product or service information. • The system shall provide a search space for the desired service of the customer filtering services related to be display to the customer.
6	Chat module	<ul style="list-style-type: none"> • The system shall provide space for customers to interact with the seller (provider) regarding the product or service.
7	Service/Product order status module	<ul style="list-style-type: none"> • The system shall provide service status check (Ongoing, Completed or Cancelled). • The system shall allow seller to update current status in the application.
8	Payment module	<ul style="list-style-type: none"> • The system shall ensure money transactions run smoothly and precisely ensuring payment safety at any time.
9	Review service/ product module	<ul style="list-style-type: none"> • The system shall provide service or product review space on related pages that enable customer to review the service that given by the seller.
10	Cart module	<ul style="list-style-type: none"> • The system shall allow customer to add, update, view and delete items in the cart.

No	Module	Functional Requirement
11	Report and Statistical Module	<ul style="list-style-type: none"> • The system shall allow administration to monitor the progress of the seller's sales. • The system shall allow administration generate report that been gained from the seller. • The system shall display the statistical amount of the sold product and monthly profit. • The system shall display the number of customer that interested on the product or service to the seller. • The system shall allow the seller to track the order and see the history of the product that has been sold.

3.3.2 Non-Functional Requirements

This non-functional requirement will explain other requirement that differ from the functional requirement. Generally, non-functional requirement is referring to those features or activities that could support the system to work efficiently[10] and it consider as important in engineering field[2]. Therefore, the non-functional requirement, there are few aspects been considered which been stated in Table 4.

Table 4: The non-functional requirement

No	Module	Non-functional Requirement
1	Reliability	The system should never crash or hang.
2	Security and Privacy	The system should be able to be accessed by only authenticated users.
3	Usability	The user interfaces should be easy to be learn and use by users.
4	Performance	The system should run smoothly with minimum waiting time to ensure the best experience when using the system.
5	Integrity	The database of the application should be kept properly and secured by the system from any corruption and non-readable with user's concern.

3.4 Design Phase

This section describes the process of design will be discussed based on the object-oriented approach. Therefore, this section includes the use case diagram, class diagram, requirement traceability matrix and database schema.

3.4.1 Use Case Diagram

The use case diagram is one of a type of Unified Modeling Language (UML) diagram which help in identify the functional requirement of the system and also visualize the behaviour of the system or the stakeholder of the system. Thus, Figure 2 show the UESMS use case diagram which contain 11 use case and three actors namely customer, seller and admin.

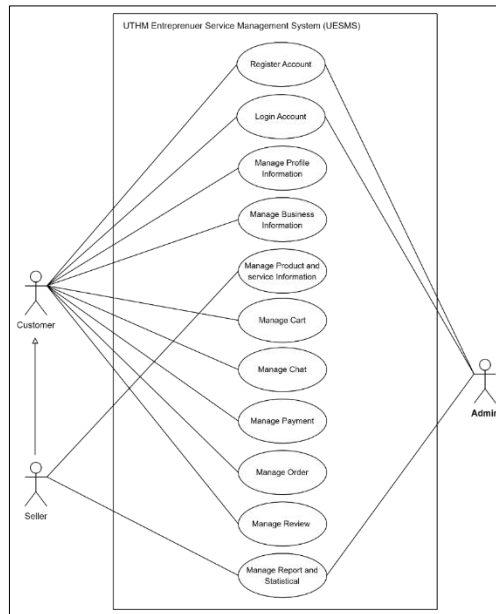


Figure 2: Use Case Diagram

3.4.2 Class Diagram

The class diagram can be referred as a type of diagram that been used in the object-oriented approach in which aim to provide a clear and concise visual representation about the system’s structure. It consists of a few elements which are the classes, attribute and relationship. Thus, Figure 3 shows the class diagram of the UESMS.

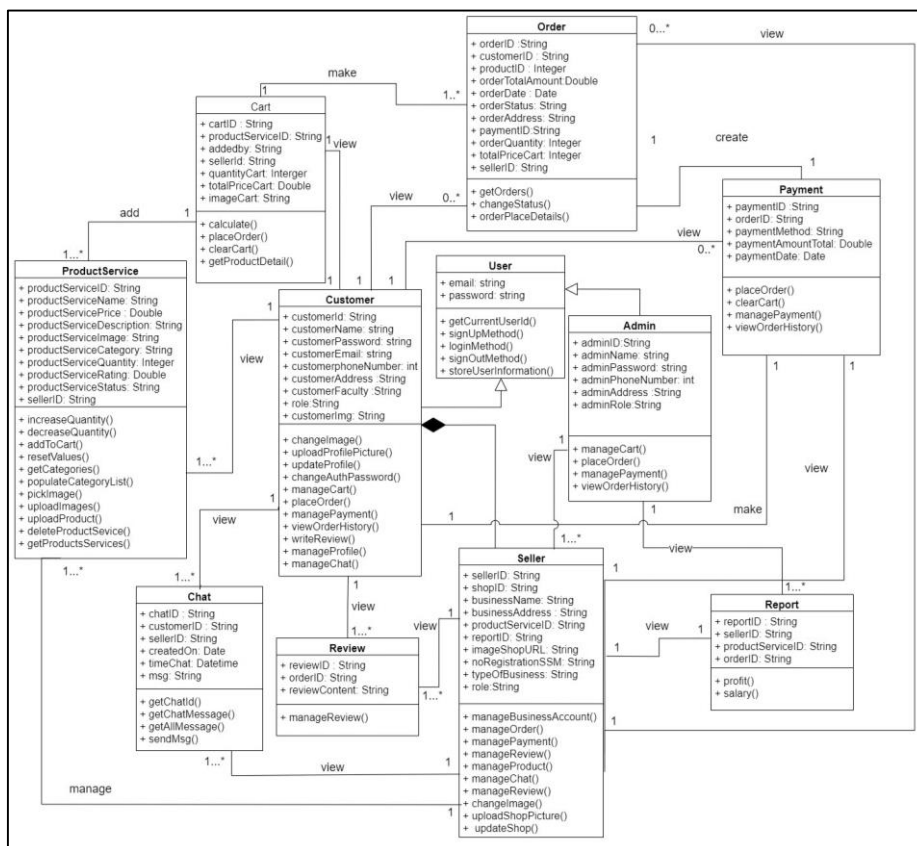


Figure 3: Class diagram of the UESMS.

3.4.3 Database Schema

This section describes the schema tables of the database used in the UESMS. Generally, the schema table can be referred to as a database table that contains metadata or information about the structure of other tables in a database. Thus, below are the schema tables of the database that have been used in the UESMS.

1. **User** (email, password)
2. **Seller** (sellerID, shopID, businessName, businessAddress, productServiceID, reportID, imageShopURL, noRegistrationSSM, typeOfBusiness, role)
3. **Customer** (customerID, customerName, customerPassword, customerEmail, customerphoneNumber, customerAddress, customerAddress, customerFaculty, role, customerImg)
4. **Admin** (adminID, adminName, adminPassword, adminPhoneNumber, adminAddress, adminRole)
5. **ProductService** (productServiceID, productServiceName, productServicePrice, productServiceDescription, productServiceImage, productServiceCategory, productServiceQuantity, productServiceImage, productServiceRating, productServiceStatus, sellerID)
6. **Cart** (cartID, productID, customerID, addedby, sellerId, quantityCart, totalPriceCart, imageCart)
7. **Order** (orderId, customerID, productServiceID, orderTotalAmount, orderDate, orderStatus, orderAddress, paymentID, orderQuantity, totalPriceCart, sellerID)
8. **Chat** (chatID, customerID, sellerID, timeChat, msg, createdOn)
9. **Payment** (paymentID, orderID, paymentMethod, paymentAmountTotal, paymentDate)
10. **Report** (reportID, sellerID, productServiceID, orderID)
11. **Review** (reviewID, orderID, reviewContent)

3.5 Implementation Phase

In this phase, the coding and the development of the system will start and shall follow the module's flow that already been designed. Thus, in this phase, those requirements that have been received must be implemented in the system including the functional and non-functional requirements. Hence, mobile application of the UESMS will be using Microsoft Visual Studio as the platform for coding the source code. Therefore, in this section will include a few User Interface of the UESMS which following the module's scope of the project.

In Figure 4(a) and Figure 4(b), it shows the register and login module page respectively. This feature is quite related as the user need to have account to access the UESMS system. Hence, the user could choose to register their account at the sign-up page and fill up the information needed and correctly. Then, the user can click at the "Sign Up Now" button to login to the account. Similar to the register account's process, the user needs to fill up the detail regarding their registered email and password in the login page.

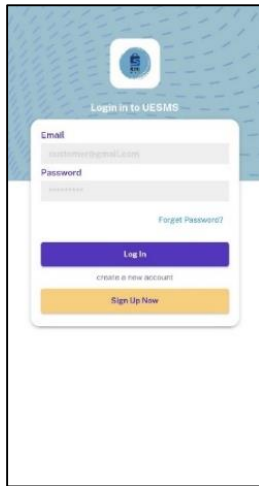


Figure 4(a) : Login Account page

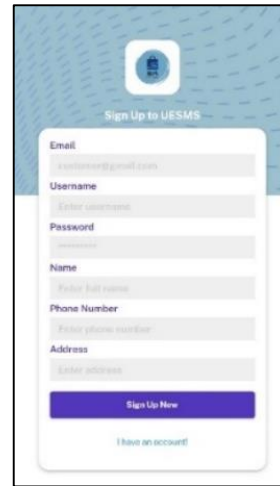


Figure 4(b) : Register page

In figure 5, there is a Profile page of the user when they successfully have login into the system. In this profile page screen, the user could view their current personal information and able to edit the information by clicking at the edit button. Those information will be fetch from the database and any changes that been made will be updated in the Firebase.

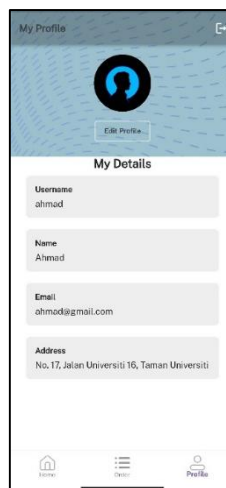


Figure 5 : Profile page

In the module manage product and service information, the system could implement the product or service information page as been display in Figure 6 (a). The page provide information like product or service name, price, quantity available, seller name, and also the description. Apart form that, in this module also allow the seller to add new product or service by inserting the information in the Add Product/Service's page like been displayed in Figure 6 (b).

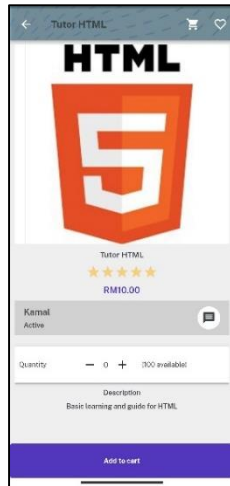


Figure 6 (a): Product and service page

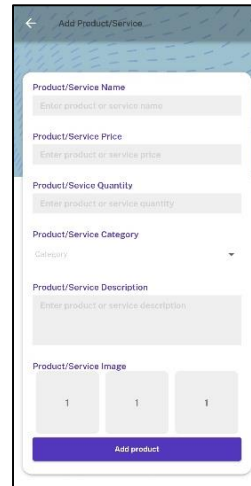


Figure 6 (b): Add product and service page

In Figure 7 (a) and (b), there is a chat page been shown where the chat history will be shown in this page. It will connect the customer and the respective seller which the customer could asked for any information regarding the product or service that been provided.

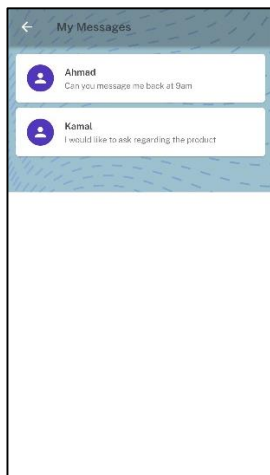


Figure 7 (a): User's all chat page



Figure 7 (b): Customer message with seller

3.6 Testing Phase

In the testing phase, the test case has been developed in which align with the Requirement Traceability Matrix. The technique that has been used is functional testing for the alpha testing and user acceptance testing for beta testing. In the testing phase, it shall give a significant impact on the system as those modules will be tested accordingly which includes the process in the same module and the process of interaction of the modules in the system. On the other hand, the beta testing also will be performed by the real user which is the Pusat Teknousahawan Universiti as the admin, customer and seller. Here, the significant of the testing phases is to check the system either all requirement is been fulfilled or vice versa. Thus, this phase will involve the use of test case plan has been created. All in all, those requirements and needs of the stakeholder will be tested and be reported its successfulness of the requirements. Therefore, in Appendix's section has been included the list of test cases based on those modules that been covered to be tested in the system. Generally there are 11 modules that been cover and the total of the test cases involve are 59 test cases in total.

4. Results and Discussion

In this section, the result of the test cases and the user acceptance testing will be discussed accordingly. As mentioned in section 3.6, the list of test cases has been attached in the Appendix's section. The test case attached explain the test case, the description, expected outcome and the test status either it pass or fail. Therefore, in this section, the overall test case result will be discussed and the user acceptance testing for the UESMS been explain accordingly. The user acceptance testing's result will be include the scenarios, module, number of respondent, and the number of answers given either positive or negative response.

4.1 Overall Test Case Result

As all the test case has been conducted during the testing phase, the full result has been obtained and will be shown in the Table 5.

Table 5: Overall test case result

Test case	Module	Number of test cases passed	Total passed test cases	Total failed test cases
TC-01	Register	4	4 (100%)	0 (0%)
TC-02	Login	4	4 (100%)	0 (0%)
TC-03	Register Business	8	8 (100%)	0 (0%)
TC-04	Profile information	3	3 (100%)	0 (0%)
TC-05	Product and Service Information	8	8 (100%)	0 (0%)
TC-06	Chat	3	3 (100%)	0 (0%)
TC-07	Order	7	6 (86%)	1 (14%)
TC-08	Payment	5	5 (100%)	0 (0%)
TC-09	Review	4	4 (100%)	0 (0%)
TC-10	Cart	6	6 (100%)	0 (0%)
TC-11	Report and Statistical	5	3 (60%)	2 (40%)

According to Table 5, the test cases for all the modules passes except for three test case which are from Order Module has one test case failed while from Report and Statistical module have two test case failed. Hence, this shows that the majority of the test case of the UESMS does not face any error during the testing and almost all modules correlated with the UESMS able to function correctly as about 54 out of 57 test cases passed.

4.2 User Acceptance Testing

The user acceptance testing has been made in which it aims to get response from the target user of the system specifically seller, customer and administrator regarding the UESMS project. Therefore, the way to conduct this user acceptance testing is via making a form that asks a few questions regarding the performance and the functionality of the system to the users. For this UESMS project, the users will answer closed ended questions according to their preferences and favor on the system that been developed. For this user acceptance testing the total respondent is 13 respondents where 10 respondent

is a customer, 2 respondent is a seller, and 1 respondent is an administrator. Therefore, Table 6 shows the response of the user interface of the UESMS which has been answered by 13 respondents.

Table 6: Response regarding the user interface of UESMS

Scenarios	Number respondent	Total of answers Yes/Pass	Total of answers No/Fail
The terms use in the system is easy to understand	13	11 (85%)	2 (15%)
The visual design of the user interface visually appealing and consistent throughout the system	13	13 (100%)	0 (0%)
The user interface provide clear and organized information about each product or service	13	13 (100%)	0 (0%)
The buttons and clickable elements in the user interface clearly visible and distinguishable	13	13 (100%)	0 (0%)
The icon used in the system is matchable with the action	13	10 (77%)	3 (23%)

From the Table 6, it could be seen that most of the respondents satisfied with the user interface design of the UESMS as almost all scenarios get 100% positive response and only two scenarios get negative response which is 15% for the terms use in the system and 23% for icon in the system. Therefore, it can be concluded that the user interface design is well designed, visually appealing, consistent and almost meets all the user's acceptance criteria. Apart from that, the Table 7 shows the response of the respondents which is a customer when they use the UESMS.

Table 7: Response regarding the functionality of UESMS as a customer

Scenarios	Number respondent	Total of answers Yes/Pass	Total of answers No/Fail
I successfully register a new account in the system	10	10 (100%)	0 (0%)
The login function allow me to access my account securely.	10	10 (100%)	0 (0%)
I able to register my business and provide all the necessary information and document	10	10 (100%)	0 (0%)
I able to view and update my profile information, such as name, contact details, and other details.	10	10 (100%)	0 (0%)
I can easily view product information in the system	10	10 (100%)	0 (0%)

Scenarios	Number respondent	Total of answers Yes/Pass	Total of answers No/Fail
I can effectively use the chat feature to communicate with the sellers.	10	10 (100%)	0 (0%)
I able to place orders for products or services and track their status	10	10 (100%)	0 (0%)
The payment functionality work smoothly and allowing me to make payments	10	10 (100%)	0 (0%)
I able to provide feedback and reviews for the products or services that I have purchased.	10	10 (100%)	0 (0%)
My personal cart function correctly and allow me to add, update, and remove items as needed	10	10 (100%)	0 (0%)

From the Table 7, it could be seen that the respondents could perform all functions and module in the UESMS that correlated with the role of the customer. This is due to the reason that, all of the scenarios get 100% for the positive response from the respondent. It can be concluded that the customers are satisfied with the UESMS system as it provides a functional system and meets the customer expectation. Besides that, the Table 8 shows the response of the respondents which is a seller when they use the UESMS.

Table 8: Response regarding the functionality of UESMS as a seller

Scenarios	Number respondent	Total of answers Yes/Pass	Total of answers No/Fail
There is a register page in the system	2	2 (100%)	0 (0%)
I able to register new account in the system	2	2 (100%)	0 (0%)
The forget password feature work correctly	2	2 (100%)	0 (0%)
There is a login page in the system	2	2 (100%)	0 (0%)
I able to login to the system	2	2 (100%)	0 (0%)
There is a page to manage my profile	2	2 (100%)	0 (0%)
I able to view my profile	2	2 (100%)	0 (0%)
I able to edit my profile	2	2 (100%)	0 (0%)
There is a page to manage my Business Account	2	2 (100%)	0 (0%)
I able to create of a Business Account	2	2 (100%)	0 (0%)
I able to view my Business Account	2	2 (100%)	0 (0%)
I able to update my Business Account	2	2 (100%)	0 (0%)
I able to termination my Business Account	2	2 (100%)	0 (0%)

Scenarios	Number respondent	Total of answers	Total of answers
		Yes/Pass	No/Fail
There is a page to manage my Product and service Information	2	2 (100%)	0 (0%)
I able to View list of product or service information functionality for a seller	2	2 (100%)	0 (0%)
I able to create a new product or service information	2	2 (100%)	0 (0%)
I able to Update of product or service	2	2 (100%)	0 (0%)
I able to Delete product or service information	2	2 (100%)	0 (0%)
There is a page to manage chat	2	2 (100%)	0 (0%)
I able to View chat function	2	2 (100%)	0 (0%)
There is a page to manage my customer order	2	2 (100%)	0 (0%)
I able to view order functionality	2	2 (100%)	0 (0%)
I able to update order status functionality	2	2 (100%)	0 (0%)
I able to approve delete order functionality	2	2 (100%)	0 (0%)
There is a page to manage payment	2	2 (100%)	0 (0%)
I able to view all payment related to my business	2	2 (100%)	0 (0%)
There is a page to manage report and statistical	2	2 (100%)	0 (0%)
I able to view seller report and statistical data	2	2 (100%)	0 (0%)
I able to print all report	2	2 (100%)	0 (0%)

From the Table 8, it could be seen that the respondents could perform all functions and module in the UESMS that correlated with the role of the seller. This is due to the reason that, all of the scenarios get 100% for the positive response from the respondent. It can be concluded that the seller are satisfied with the UESMS system as it provide functional system and meet the seller expectation. Apart from that, the Table 9 shows the response of the respondents which is an administrator when they use the UESMS.

Table 9: Response regarding the fuctionality of UESMS as an adminstrator

Scenarios	Number respondent	Total of answers	Total of answers
		Yes/Pass	No/Fail
There is a register page in the system	1	1 (100%)	0 (0%)
Admin able to register new account in the system	1	1 (100%)	0 (0%)

Scenarios	Number respondent	Total of answers	
		Yes/Pass	No/Fail
The forget password feature work correctly	1	1 (100%)	0 (0%)
There is a login page in the system	1	1 (100%)	0 (0%)
I able to login to the system	1	1 (100%)	0 (0%)
There is a page to manage my profile	1	1 (100%)	0 (0%)
I able to view my profile	1	1 (100%)	0 (0%)
I able to edit my profile	1	1 (100%)	0 (0%)
There is a page to manage report and statistical	1	1 (100%)	0 (0%)
I able to view seller report and statistical data	1	1 (100%)	0 (0%)
I able to print all report	1	1 (100%)	0 (0%)

From the Table 9, it could be seen that the respondents could perform all functions and module in the UESMS that correlated with the role of the admin. This is due to the reason that, all of the scenarios get 100% for the positive response from the respondent. It can be concluded that the customers are satisfied with the UESMS system as it provide functional system and meet the admin expectation. Next, the Table 10 shows the response of the respondents which is an administrator when they use the UESMS.

Table 10: Response regarding the user experience of UESMS

Scenarios	Number respondent	Total of answers	
		Yes/Pass	No/Fail
I find it easy to learn even without extensive documentation	13	13 (100%)	0 (0%)
I find that the system is user-friendly	13	13 (100%)	0 (0%)
I did not encounter any difficulty using this system	13	13 (100%)	0 (0%)
The system is lack-free and able to response in time	13	10 (76.9%)	3 (23.1%)
The error message help me to know my mistakes in the system	13	13 (100%)	0 (0%)

From the Table 10, it could be seen that most of the respondents satisfied with the user experience of the UESMS as almost all scenarios get 100% positive response and only one scenario get negative response which is 23.1% for response in time of the system. Therefore, it can be concluded that the user has a good experience when using the UESMS.

5. Conclusion

In conclusion, the UTHM Entrepreneur Service management system is a system develop that could benefit the customer, seller and also administration of Pusat Teknousahawan Universiti (PTU), UTHM.

The purpose of this has bring significant benefit as it empower the process of entrepernal activies among UTHM communities due to having structured and secured environment. Apart from that, this developed system has help to automate the process of managing and reporting information which clearly reduce the burden on both seller and the adminstration. However, there are still some limitation in this system which it could not be available in website's and only depend on the mobile application. Therefore, the improvement that could be done for future work is by integrating the UESMS project for both platform, website and application in real time. Besides that, for future work, this system could implementing its own wallet where the users could topup their e-wallet in the system and able to make any transaction in the UTHM's compound.

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Appendix A

Table Appendix: List of Test Cases

Test Cases	Description	Expected Outcome	Status
TC-01 (Register Module)			
TC-01-01	Registration with Valid Detail	Customer should be successfully registered and redirected to the Home page	Passed
TC-01-02	Registration with Invalid Password	System should display an error message for an invalid password and prompt the user to follow the validation rules	Passed
TC-01-03	Registration with Existing email	System should display an error message stating that the email has already registered.	Passed
TC-01-04	Cancel registration	Customer should be redirected to the login page	Passed
TC-02 (Login module)			
TC-02-01	Login with Valid Credentials	User should be successfully authenticated and redirected to the Home page.	Passed
TC-02-02	Forgot Password and Successful Password Reset	Testing the forgot password process with correct email and registered phone number.	Passed
TC-02-03	Login with Invalid Credentials	System should display an error message stating that the login failed and prompt the user to try again.	Passed
TC-02-04	Wrong Username and Registered Phone Number during Password Reset	System should display an error message stating that the email and phone number are not in the system, and prompt the user to sign up first.	Passed
TC-03 (Register business module)			
TC-03-01	Create Business Account for a customer who is not a seller.	Business Account should be successfully created and the system should display the details of the Business Account	Passed
TC-03-02	View Business Account functionality for a seller.	System should display the details of the Business Account.	Passed
TC-03-03	Update Business Account functionality for a seller	Business Account information should be successfully updated and the system should display the updated details.	Passed
TC-03-04	Termination of a Business Account for a seller	Business Account should be successfully terminated and the system should display a success message	Passed
TC-03-05	Business Registration form is not completed	System should display an error message prompting the user to complete all required fields	Passed
TC-03-06	Information in the update form is not completed	System should display an error message prompting the user to complete all required fields	Passed
TC-03-07	The reason for termination is not entered	System should display an error message prompting the user to enter the reason for termination	Passed
TC-03-08	Cancellation of the termination process	User should be redirected to the Business Information page	Passed

TC-04 (Profile information Module)			
TC-04-01	View profile functionality	User should be able to view their personal information displayed in the system.	Passed
TC-04-02	Update profile functionality with all required fields filled	User's profile should be successfully updated and the system should display the updated personal information	Passed
TC-04-03	Update profile functionality when required fields are not filled.	System should display an error message prompting the user to fill in all required fields	Passed
TC-05 (Product and service Information module)			
TC-05-01	View list of product or service information functionality for a seller	System should display the list of product and service information owned by the seller.	Passed
TC-05-02	Create a new product or service information by a seller	Product or service information should be successfully created and the system should display a success message	Passed
TC-05-03	Update of product or service information by a seller	Product or service information should be successfully updated and the system should display a success message	Passed
TC-05-04	Deletion of product or service information by a seller	Product or service information should be successfully deleted and the system should display a success message	Passed
TC-05-06	View product or service information functionality for a customer	System should display the product or service information based on the search query or category selected by the customer	Passed
TC-05-07	Product or service information form is not completed during creation	System should display an error message prompting the user to complete all required fields	Passed
TC-05-08	Product or service information form is not completed during update	System should display an error message prompting the user to complete all required fields	Passed
TC-05-09	Cancellation of the deletion process	User should be redirected to the list of product page	Passed
TC-06 (Chat module)			
TC-06-01	View chat	System should display the existing chats and allow the user to select a chat to view the messages between both users	Passed
TC-06-02	Create of a new chat and sending messages between users	System should create a new chat between the users and allow them to send messages to each other	Passed
TC-06-03	No existing chat ID between users while viewing a chat	System should create a new chat ID and connect the users, allowing them to view and send messages	Passed
TC-07 (Order module)			
TC-07-01	View order functionality for customers	System should display the list of orders according to the order status for the respective user to view.	Passed
TC-07-02	Request cancel order functionality for customers	System should update the status of the order to "pending delete" upon user's request and redirect to the order's page	Failed
TC-07-03	View order functionality for sellers	System should display the list of orders in the seller's business account for them to view	Passed
TC-07-04	Update order status functionality for sellers	System should allow the seller to change the status of the order, update it in the database, and save the information.	Passed
TC-07-05	Approve delete order functionality for sellers	System should allow the seller to approve the delete order request, update the status in the database, and save the information.	Passed
TC-07-06	Cancellation of the request cancel order process.	System should cancel the request cancel order process upon user's cancellation and redirect to the order's page.	Passed

TC-07-07	There are no existing orders	System should display a message informing the user that there are no orders yet.	Passed
TC-08 (Payment module)			
TC-08-01	Make payment	System should process the payment using the chosen payment method, verify the private information, and display a success message. It should create an order and redirect the user to the order page.	Passed
TC-08-02	View payment history	System should display the payment history, including payment amount, date, time, and payment method, for the customer to view.	Passed
TC-08-03	View all payment for the seller.	System should display all existing payments made by customers related to the products or services offered by the seller.	Passed
TC-08-04	The payment is declined due to invalid private information.	System should display a decline message and allow the user to re-enter valid private information.	Passed
TC-08-05	Cancellation of the payment process	System should cancel the payment process and redirect the user to the cart page.	Passed
TC-09 (Review service/ product module)			
TC-09-01	View feedback review for customers	System should display the product and service information along with the reviews given by other users.	Passed
TC-09-02	Make feedback review for customers.	System should allow the user to insert their feedback review regarding the purchased product or service, update the database with the review information, and display a success message	Passed
TC-09-03	Update feedback review for customers	System should allow the user to edit their existing feedback review, update the database with the new review information, and display a success message.	Passed
TC-09-04	There are no existing reviews for the order	System should display a message informing the user that there are no reviews yet for the order and redirect to the home page	Passed
TC-10 (Cart module)			
TC-10-01	View product and service in the cart	System should display the current product details in the cart	Passed
TC-10-02	Addition of a product or service to the cart	Product or service should be successfully added to the cart and the system should display the updated product details in the cart	Passed
TC-10-03	Update of product or service quantity in the cart	Product or service quantity should be successfully updated in the cart and the system should display the updated product details	Passed
TC-10-04	Deletion of a product or service from the cart	Product or service should be successfully deleted from the cart and the system should display the updated product details in the cart.	Passed
TC-10-05	An invalid quantity is entered while adding a product to the cart	System should display an error message prompting the user to enter a valid quantity	Passed
TC-10-06	There are no products in the cart	System should display a note indicating that there are no products added to the cart yet	Passed
TC-11 (Report module)			
TC-11-01	Generate report function for administration users	System should display the list of business names in the system, allow the user to search for a specific business, display the business report, and provide an option to generate and print the report.	Passed
TC-11-02	Generate report for seller users.	System should display the business's report that is associated with the user's account and provide an option to generate and print the report.	Passed
TC-11-03	The user wants to print all business reports	System should provide an option to generate and print reports for all businesses.	Passed

TC-11-04	The user want to track the order details and see the history of the product that has been sold graphically.	System should show the respective order details graphically	Failed
TC-11-05	The user want to see the history of the product that has been sold graphically.	System should show the respective history of the product graphically	Failed

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