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Development of Waw Mdp Client Record Management System

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Abstract: Waw Mdp Services Sdn Bhd is a construction project consultancy company in Kelantan. Due to the manual process used by the company, it cannot be denied that the procedure for retaining their clients' data is time-consuming because client records are kept manually. Waw Mdp is a client record management system developed to save all client's data in a database, preventing data loss that is common in traditional bookkeeping. The system was developed using the prototype model. A record management system would minimize data redundancy caused by manual data input, which is one of the desired outcomes of this system. This system has been able to help reduce the problems in handling data manually, such as data redundancy, loss of data and difficulties retrieving information. Finally, numerous enhancements can be made to the developed system to improve its usabilities, such as user interface improvement and notification function.

Keywords: Record Management System, Web-based System, Prototype model

1. Introduction

Waw Mdp Services Sdn Bhd is a private company that provides construction project consulting services in Kota Bharu, Kelantan. Currently, the organization allows clients to use their quantity surveying services. Due to the manually run in Waw Mdp Services Sdn Bhd, it cannot be denied that the technique to retain their client's data requires a tedious and lengthy process. This is because client records are kept manually, which is a time-consuming process. Admin must go through many documents and files before manually entering data into the computer using Microsoft excel. In addition, the staff also need to save all documents into several files, consuming space and cost of paper. The security level of any data is minimal because documents might be misplaced or lost. The project's objective is to analyze and design the Client Record Management System for Waw Mdp Services Sdn Bhd. The second and third objectives are to develop and evaluate the Waw Mdp Client Record Management System.

As a result, an online client record management system is proposed to solve this problem. Waw Mdp client record management system is a web-based system that may be used to save all client's data in a database, preventing data loss that frequently occurs in traditional bookkeeping. There are eight modules in this system. The first is the login module, allowing clients and administrators to access the

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system. Clients must log in with their email and password, while the admin must input a username and password to access the system. Both clients and admin use the search invoices module to search and view invoices in the system based on invoice id. The invoices module lists all invoices depending on the services provided to the client. Because the admin has legal access to the system, they can use the add projects module to add new projects available in the company. Admins can also add clients using the add client's module and view all clients using the client list module. Admin also can manage projects by using the manage projects module. Finally, the reports module allows admins to access customer information and review sales reports for a specific period.

2. Literature Review

2.1 Record Management System

A records management system (RMS manages records for an organization across the records-life cycle. The development, preservation, and destruction of records and business transactions are controlled systematically and efficiently by this management. Electronic records are an asset that must be managed systematically through an appropriate system to avoid issues such as loss, change, or harm to its contents. Organizations frequently handle their records manually, resulting in significant problems with the data, such as being damaged or altered [1]. In addition, an electronic records management system (ERMS) helps organizations operate transparently, provides process stability in a crisis, and allows business activities to run smoothly, efficiently, and accurately. Storing and maintaining data securely and efficiently is solid evidence that a company has an effective records management program. The preservation of records is crucial because it allows them to be used for past events [2].

2.2 Web-based System

A web-based program allows users to use a web browser to connect with a distant server. It enables users to choose when and where they want to use the app. Browser-based applications are widely available on the internet; noteworthy examples include Google and Facebook [3]. Web-based has resulted in secure access to centralized data [4].

2.3 Comparison with The Existing System

When developing the proposed system, several existing systems might be compared to identify the system's flaws and obtain an explicit knowledge of the concepts involved in the system to be built. Beauty Salon Management System and Hajj and Umrah Package Management System and Alumni Information, Industrial Training, Admissions, and Student Records System are three existing systems used in the comparison.

Table 1 compares the existing system to the one that will be developed. There are some comparisons and similarities in terms of system implementation modules. The proposed system combines all three aspects into one system, and the issues can be resolved. Additionally, having all functionalities in one system will lower operational costs.

Table 1: Comparison Table of Three Existing Systems with The Proposed System

Features/System	Beauty Salon Management System	Hajj and Umrah Package Management System	Alumni Information, Industrial Training, Admissions, and Student Record System	Waw Mdp Client Record Management System
Login Module	User id and password	User id and password	User id and password	Email and password
Update/ edit Information	Unknown	Unknown	Edit alumni/student information	Edit client information
Search Module	Search customer/product	Search registration information by ic number	Search alumni/ student by student id	Search invoices by invoice id
List Module	Unknown	Unknown	Unknown	View all invoices/clients in the database
Add Module	Add customer	Add new registration	Add alumni/student	Add new project/client into the database
Report Module	Report on all customer/product	Report on registered package	Report on all alumni/students	Sales report based on selected dates
Programming Language	Microsoft Visual Basic 6.0	Microsoft Visual Basic 6.0	Microsoft Visual Basic 6.0	PHP
Database	Microsoft Access 2000	Microsoft Access 2000	Microsoft Access 2000	MySQL
Technology	Stand-alone	Stand-alone	Stand-alone	Web-based

3. Methodology

The prototyping model was chosen as the software development approach for this project since the input, processing, and output requirements are unknown [5]. This strategy is well-suited to resolve

misunderstandings between the user and the analyst due to the user's inability to express his requirements [6]. This approach allows for the development of a system in a short amount of time while maintaining a high level of quality. Furthermore, a prototype model is a software development method in which a prototype is built, tested, and refined until it is accepted or pleased by the user. There are six stages to the prototype process. The requirement gathering phase comes first, followed by the quick design phase. The third phase requires the developer to create a system prototype. The building phase will be followed by a user evaluation, in which the user will assess the prototype that has been developed. Following the user evaluation phase, the developer will go on to the prototype refining phase, during which the prototype will be altered in response to the user feedback. The fourth and fifth phases will be repeated until the prototype is acceptable to the user. Finally, the final system will be fully developed and launched during the implementation and maintenance.

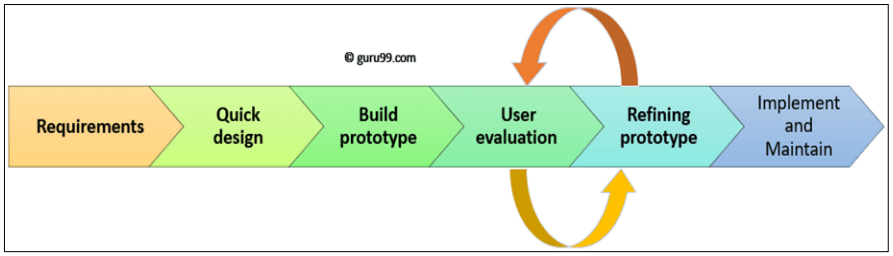

Figure 1: Prototyping model [7]

3.1 Requirements Phase

The system requirements were specified in detail in this stage. En Mohd Zaili, the office coordinator in charge of the Waw Mdp manual client record management system was interviewed to discover what he expects from the system. As part of the initial analysis, system requirements are assessed to determine fundamental problems and requirements [8]. In this phase, the following tools or software will be used:

- Microsoft Word

3.2 Quick Design Phase

In this step, a basic client record management system design was created. The design was produced quickly and represented all the software's known components and served as the basis for prototyping. The following tools or software will be used in this phase:

- Notepad++
- Lucid Chart
- PhpMyAdmin
- Microsoft Word

3.3 Build Prototype Phase

The developer will develop an actual prototype based on the specifications gathered during the fast design phase. This phase's task is to convert the data that has been designed into a programming language. For example, constructing a temporary design focused on presenting to users, such as input and output samples. The following tools or software will be used in this phase:

- Notepad++
- PhpMyAdmin

3.4 User Evaluation Phase

The proposed system is delivered to the user for preliminary testing at this step. This assists the team in determining the qualities and weaknesses of the working model. The customer evaluates to see if the prototyping that has been developed is following the customer's wishes [8]. Suggestions and feedback from users have been gathered and submitted to the developer.

3.5 Refining Prototype Phase

If the user is dissatisfied with the current prototype, the developer will modify depending on the user's feedback and suggestions. The developer re-creates, and consumers evaluate the system until it meets their requirements. The final system is developed if the user is satisfied with the acceptable prototype. The following tools or software will be used in this phase:

- Notepad++
- PhpMyAdmin

3.6 Implement and Maintain Phase

This stage involves implementing a ready-to-use system. System maintenance is performed to reduce downtime and avoid problems [7]. The following tools or software will be used in this phase:

- Notepad++
- XAMPP

Table 2: Software Development Activities

Phase	Task	Output
Requirements Gathering Analysis	1. Analyze the existing system. 2. Create a Waw Mdp Client Record Management System Module requirement elicitation and analysis. 3. Analyze the software aspects for the Waw Mdp Client Record Management System Module	A Software Requirement Document contains requirement elicitation and software aspects for the Waw Mdp Client Record Management System Module.
Quick Design	1. Creating a high-level design document (HLDD) document for Waw Mdp Client Record Management System Module. 2. Create a low-level design document (LLDD) for Waw Mdp Client Record Management System Module.	A document consists of the module's high-level and low-level designs for the Waw Mdp Client Record Management System Module.
Build Prototype	Developing the prototype of the Waw Mdp Client Record Management System Module based on design and specification.	Prototype of the Waw Mdp Client Record Management System Module.
Initial User Evaluation	Perform user evaluation to observe one user and quickly evaluate how they can navigate the system while performing a task.	A full report of user evaluation to refine the prototype
Refining Prototype	Refining the prototype of the Waw Mdp Client Record Management System Module based on user evaluation.	Prototype of the Waw Mdp Client Record Management System Module.
Implementing and maintaining	1. Perform system testing on the whole of Waw Mdp Client Record Management System modules. 2. Launch Waw Mdp Client Record Management System. 3. Continuously monitor the system and keep the system up to date.	Full system test report on Waw Mdp Client Record Management System Module.

4. Design and Results

The project's flowchart, Use Case Diagram, Use Case Specification, and UML Class Diagram are all included in the analysis and design, representing the flow of information for any process or system. The requirement analysis aims to identify and describe limitations with restricted solutions, requirements and customer needs [9].

4.1 Use Case Diagram

A UML use case diagram is the primary system requirement for an undeveloped software program. One of the essential concepts in use case modelling is that it aids in designing a system from the end user's perspective. As shown in Figure 2, the actors are the client and the administrator.

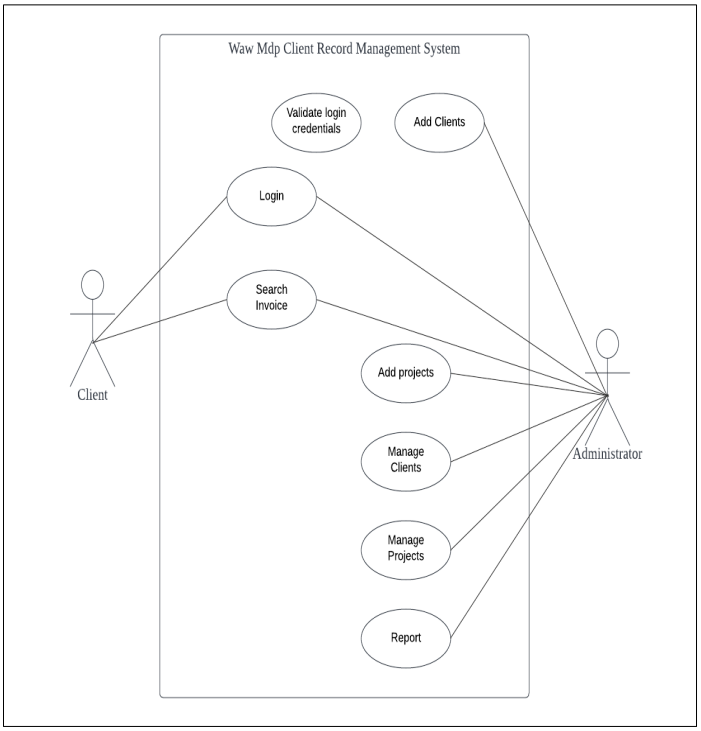

Figure 2: Use Case of Proposed System

4.2 UML Class Diagram

A class diagram is a form of a static structure diagram that depicts the structure of a system by displaying the system's classes, attributes, operations (or methods), and relationships among objects. A class diagram is created to determine the attributes and methods in the proposed system. The four classes are shown in Figure 3: Client, Admin, Invoice, and Projects. Each class has its own set of characteristics and operations.

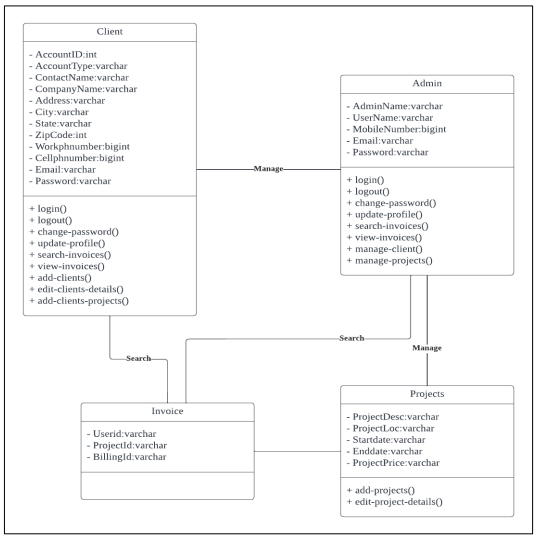

Figure 3: UML Class Diagram of Waw Mdp Client Record Management System

4.3 Flowchart

A flowchart is a diagram that depicts a process using various symbols and contains information about a step or sequence of events. An arrow in a flowchart represents the process flow directions linked to each symbol. Two flowcharts below illustrate the administrator and the client in this section.

This system's client process is depicted in Figure 4. Clients must enter their email addresses and password. The system will display the main page if the email and password are entered correctly, but an alert error will appear if they are incorrect. The client part comprises three components: change password, update profile, and search invoices. First, the password change module is used to change their old password for a new one. Users can then search invoices in the search invoices module based on invoice id. The system will display the invoice that matches the search criteria.

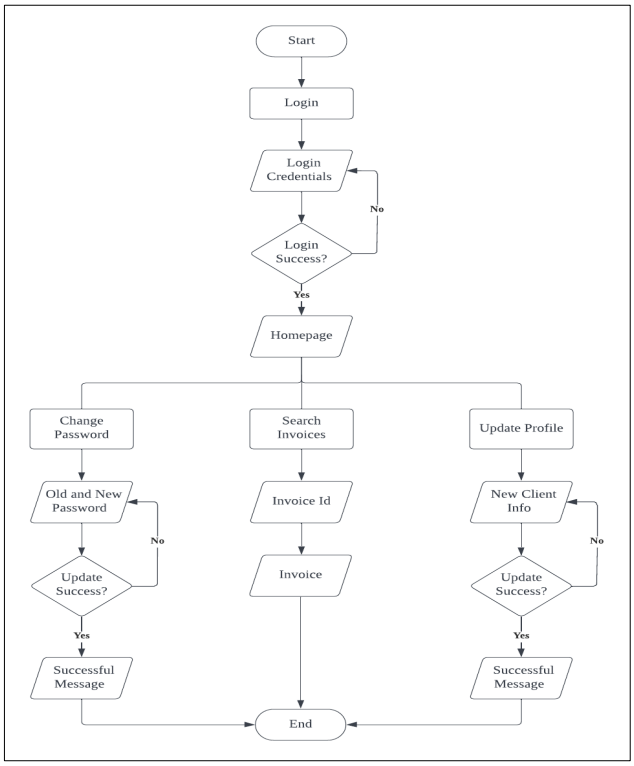

Figure 4: Flowchart of Clients' Process

The administrator flow chart is shown in Figure 5. The administrator will have the ability to change their password. Admins can also search invoices by invoice id. The system will display the invoice that corresponds to the information entered. The admin can also manage projects, adding, editing and assigning projects to specific clients. The administrator will then manage clients by adding and editing the system's client list. Finally, the administrator can view sales reports for specific dates.

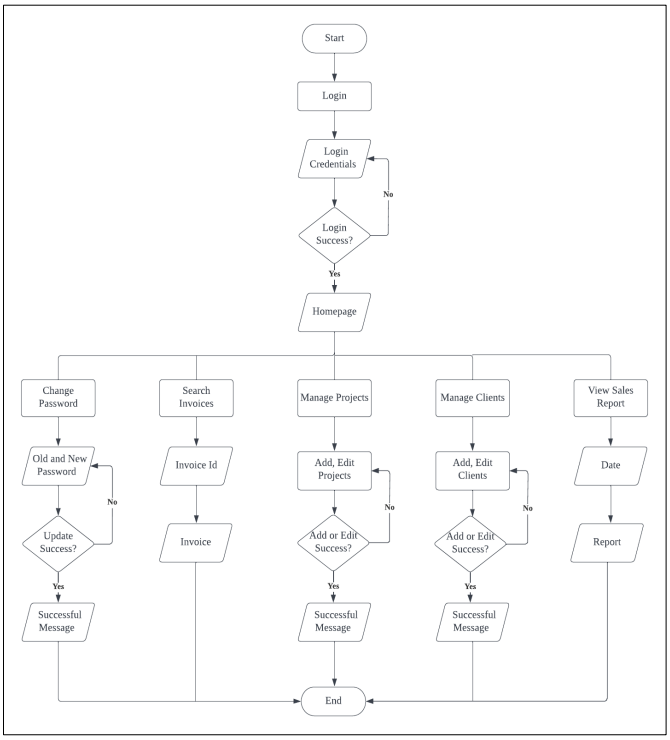

Figure 5: Flowchart of Admin's Process

4.3 System Implementation

Implementation is crucial in developing a system where the development team designs the system to turn it into a working software system for user service or client implementation. The system has all essential features, including a complete database and data security.

The Waw Mdp Client Record Management System's login interface is shown in Figure 6. It allows users to log in by inputting their email addresses and password.

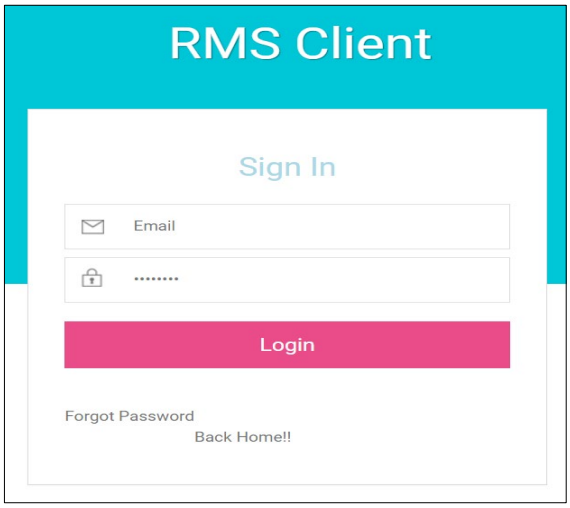

Figure 6: Log-in Page

The user interface for search invoices is shown in Figure 7. Users must input the invoice id to get the desired invoice. Following that, the invoice that corresponds to the invoice id will be displayed.

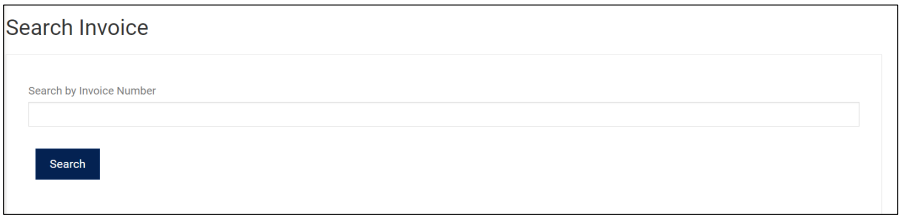

Figure 7: Search Invoice Page

Figure 8 shows the admin interface for adding projects. The administrator must enter the project description, location, start and completion date, and cost. A notification will appear If the project is successfully added to the database.

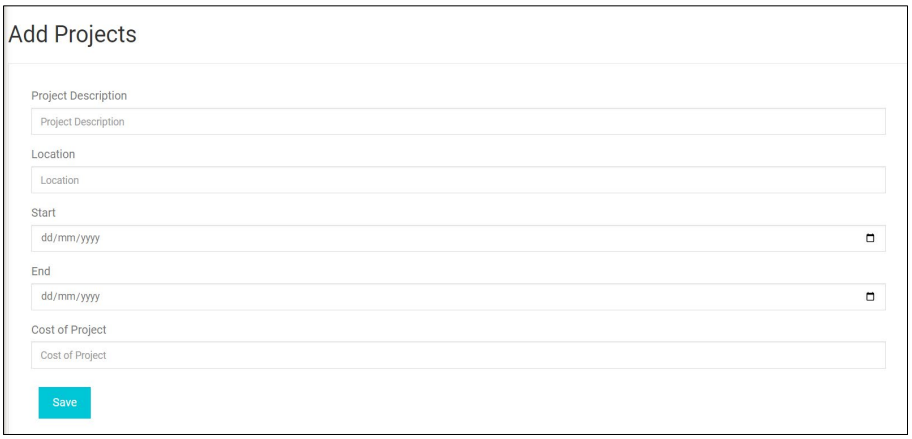

Figure 8: Add projects Page

Figure 9 shows the sales report page for the admin to view the sales report monthly or annually.

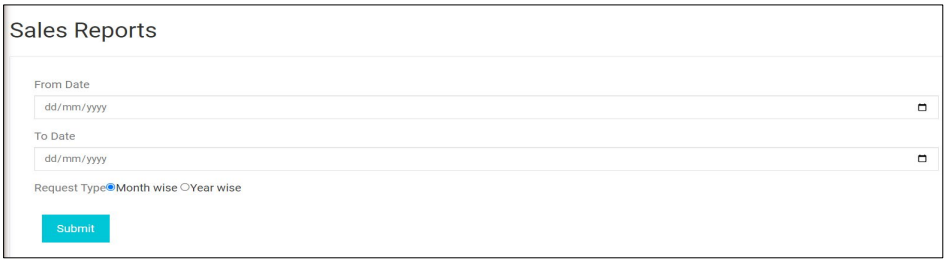

Figure 9: Sales Report Page

4.4 Testing

This test aims to ensure that system design and development meet user needs. Table 5.9 shows the results of the ten questions that were examined. On a scale of 1 to 5, 1 indicates strongly disagree, 2 indicates disagree, 3 indicates neutral, 4 indicates agree, and 5 indicates strongly agree.

Table 3: User Acceptance Testing Questionnaire

No	Description	1	2	3	4	5
1.	The system is user-friendly.					10
2.	The user interface of the system is attractive.				6	4
3.	The system uses the themes/colours accordingly.				1	9
4.	The system has the necessary security features.					10
5.	The system is easy to use and understandable.				2	8
6.	The system works according to the specifications.				6	4
7.	The system allows for deletion, add, edit, and search of the data.			6	2	2
8.	The system helps to record the information of clients properly.				6	4
9.	All buttons in the system are functional.					10
10.	The system allows to generate sales reports monthly and annually.					10

5. Conclusion

This chapter will discuss the system evaluation undertaken to identify the system's weaknesses and strengths, as well as suggestions for future improvements. The system was developed to solve Waw Mdp Services Sdn Bhd's challenges with keeping client information. There was no record on the automated system. Therefore, everything was done manually. There is a chance that some of the documents will be missing. The record-keeping process will be more efficient with this new technology. This is also the most effective technique to improve management quality while simultaneously reducing time constraints.

5.1 Achievements

In general, the majority of the scope of this system can be met, but many more elements can be added to improve the system's efficiency and trustworthiness. The system is simple to use even if users do not have advanced computer abilities. Furthermore, the system's user interface is straightforward to comprehend. This system's structure is similarly simple, ensuring no data simulation overlaps. The system's simple structure makes upgrading to a newer version easier. This is a web-based application. Its goal is to create a database as well as a recall system. In conclusion, this system achieved the goals, and the project was completed on time.

4.4 Limitations

Various limitations were discovered during the analysis and development of the Waw Mdp Client Record Management System. Firstly, due to the limited time allocated to develop this system, a proper division of time is required to learn a new programming language while ensuring system development is not disrupted. Furthermore, the lack of relevant and reliable reference resources that correspond to the developed system obstructs the system's smooth evolution.

In addition, this system required internet access to operate. Even though internet connection is now widely available, dependable internet access is essential to use this system. Finally, there is a data constraint. Because all of the data is stored on the server, there is no backup or hardcopy of the data. The data may be lost. Some or all information may be lost if the server database is corrupted. As a result, the administrator will have to either recover all of the data or reupdate all of the data in the system, which will take a long time and effort.

4.4 Future Works

To make the system more advanced and helpful, future improvements are required. The system's weaknesses must be addressed. Numerous enhancements can be made to the developed system to improve its usability. Some additional modules could be added, such as an email notification feature so that clients are notified when their invoice is ready. This can be used as a payment reminder message delivered directly to the client's email. Next, improvements to the user interface also can be made. Produces a more attractive interface since the interface used in this system is relatively simple. Therefore, certain parts' interfaces must be upgraded to generate a high-quality presentation.

Acknowledgement

The authors would like to thank the Faculty of Computer Science and Information Technology, Universiti Tun Hussein Onn Malaysia for its support.

Appendix A

Table 4: Use Case Specifications for Login Module

History Log	1.0.0	1. Create an initial use case	
Version	1.0.0		
Use Case ID	UC-1		
Use Case Name	Login		
Created By	Shahiba	**Updated By**	Shahiba
Date Created		**Last Revision Date**	
Actors	Client, Administrator		
Description	System users log in to access the system.		
Preconditions	1. Clients need to insert their email and password. 2. Admin needs to insert their username and password.		
Post conditions	Redirect to the dashboard.		
Normal Flow	**1.0 Login to the system** a) Insert email/username. b) Insert password. c) Click the login button. d) Redirect to the dashboard.		
Alternative flow	NONE.		
Exceptions	**E.1 Wrong password or username** 1. The system shows an error message. 2. Redirect to the login page. **E.2 Account is not registered** 1. The system shows an error message. 2. Redirect to the login page.		
Related requirement	**Requirement**		**Priority**
	The system can verify the users.		Basic
	The system should redirect validated users to the respective homepage based on their identity.		Basic
	The system can reset the form when the login is invalid.		Basic
	While an exception occurs, the system shall return to the previous state.		Performance

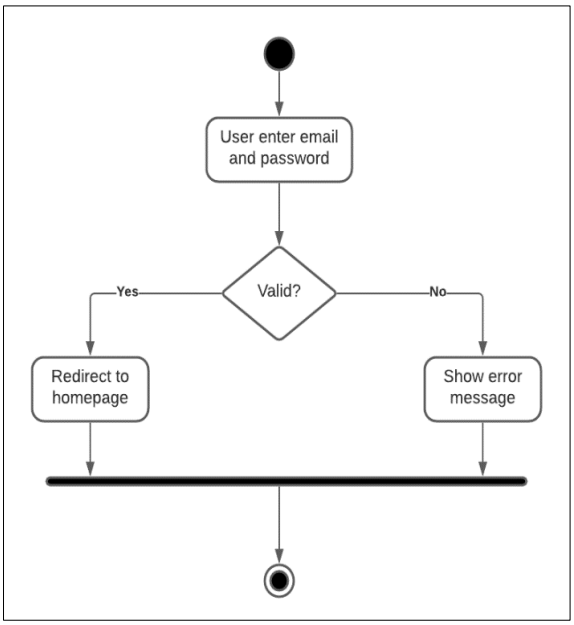

Figure 10: Activity Diagram for Login

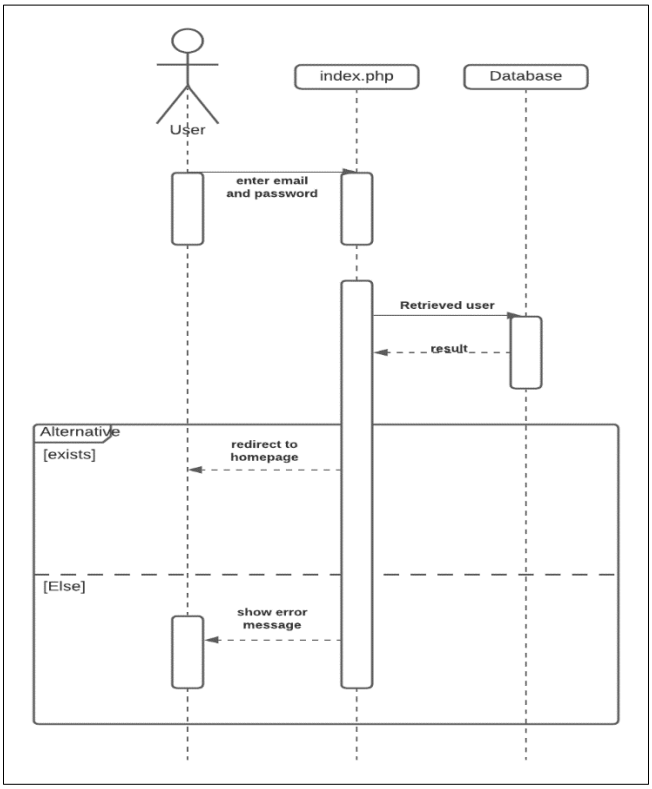

Figure 11: Sequence Diagram for Login

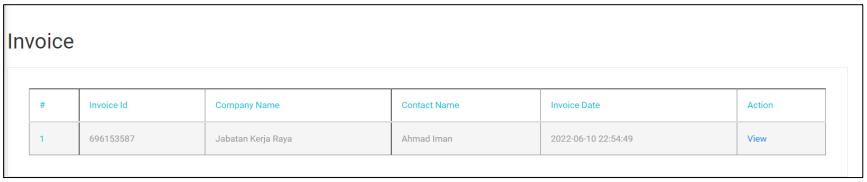

Figure 12: Invoice Page

Figure 13: Manage Projects Page

Figure 14: Manage Clients Page

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