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Development of Grave Tracker System

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Abstract: Grave Tracker is a web-based system that works to track and record the information about the grave at Kg TengluLaut, Mersing Johor. The proposed system aims to improve the weakness of the existing method which is the use of books as a medium to record information about graves. The prototype model was used to develop this proposed project. The development of this proposed system is by using the MySQL database. The programming languages used are Hypertext Preprocessor (PHP), Hypertext Mark-up Language (HTML) and using Laravel as Framework. Generally, the Grave Tracker was built to increase the effectiveness and efficiency in managing the collection of data or information by the grave management at Tanah Perkuburan Kg TengluLaut.

Keywords: Grave Tracker, Web-Based System, Laravel

1. Introduction

According to Kamus Dewan 2005 [1], a grave is a place to bury a corpse, or a hole in the ground where a corpse is buried. Whereas, an Islamic cemetery means an open field or area where people who have died are buried. Moreover, cemeteries have been defined as open land or areas where people who have died are buried. In terms of language Islamic cemetery means a place or area that has been reserved for burying the body. Thus, it can be defined that an Islamic cemetery is an area or open land used to bury or bury the body of a Muslim who has died in accordance with the conditions and specifications prescribed by law and regulations. Cemeteries can become the host of ritual events for families and post-funeral events, allowing the family to give their loved one a respectful and dignified burial process at the end of their life. Every person who died will be buried at someplace which it's called as a grave.

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It is recorded in history that humans from the stone age also made graves for corpses. That means grave is very important or its kind like a culture when a person die and will being buried in the grave. Grave is also important as a connection among family members. Cemeteries can also hold deep significance for families with loved ones buried in the area. Local cemeteries can help offer a space that brings comfort to families as they struggle with their grief while remembering loved ones. It can provide a serene environment in which to place flowers on important occasions and to spend time speaking on a spiritual level with the person that has passed. It’s a deeply personal process that can have many psychological benefits for those who have suffered a recent death in their family.

The case study in this project is conducted at Tanah PerkuburanTengluLaut, Mersing, Johor. Currently, in this area there are about 250 graves. So sometime the gravedigger can’t remember all of the graves at this graveyard and if someone who never came to visit the grave ask him, he can’t give the specific answer and location. For now, graves are marked with numbers as a way to help visitors find the graves of their family members. Nevertheless, data for the numbers represented a grave are not well stored. So, if the name at the tombstone is faded, the visitors could not be sure whether the number was the grave of their family member or not. Besides that, information about the grave is only being saved by the grave digger. There are no proper ways to save all the information and the location of the person’s grave. This project involved the society of this village and also a visitor who wants to pay a respect to their family member that being buried there.

Based on the current method, grave location and information remained with the grave digger with no proper way in saving the information. Maybe for the regular visitors, they know the exact place of their family member grave but for the first-time visitor, it will take time for the visitor to find the grave. It is impossible for a grave digger to be in a cemetery all the time to show the position of a grave. The current method of placing numbers on graves is less appropriate due to human ability to remember. Human is very weak to the number which human can’t even remember their family’s number phone although they always use it.

Therefore, Grave Tracker application is being proposed in this project. With this system, it helps the society to visit their family member’s grave as this system will save the information of the number at the grave. This system allows the cemetery management to manage grave’s data and information in a more organized way and can be updated, managed regularly and consistently. Using this system, graves can be marked and this system will show the direction to the grave. Compared if using the current system, visitor can arrive to graveyard but they still will take time to find the grave. If the name at the headstone faded, visitor need to ask the person who in charged at the grave but if that person is a novice, he also cannot show directions to the grave. Furthermore, if the visitor is lucky, perhaps a grave digger is there to ask. But if there is no one, visitors have to read all the names on the tombstone to find the grave and this will waste their time. So, with this system, it can solve the problems faced by visitors. The system also allows users to order tombstones for the graves of their family members. They can order or reserve tombstones based on their budget.

This article has been divided into five sections. The first part is an introduction where the content of the project will be explained in more detail. In the second part will discuss the analysis of related work. While the third part will describe the methodology used in this project. The implementation and testing of this system is described in the fourth section. Last section is a conclusion with some recommendations included in this section.

2. Related Work

The system that will be developed is the Grave Tracker Kg TengluLaut. Based on the study that have been done on the three existing system options, various functions that are more or less the same have been studied in order to be used as a guide so that the construction of new systems can be developed as best as possible. Throughout the study, it was found that there are several advantages and disadvantages that exist in the system. Table 1 shows a comparison of the existing systems, namely, Find A Grave, iCemetery and EPusara. These comparisons are made based on technology, system interface, system security and others.

Table 1: Comparison of Existing System Features

Feature/System	1 Find A Grave	2 iCemetery	3 Epusara	4 Grave Tracker
System Based	Mobile Apps	Mobile Apps	Web-Based	Web-based
Log in Module	No	No	No	Yes
Searching Module	Yes	Yes	Yes	Yes
Booking Grave Lot	No	No	Yes (just give the form and user need to download)	Yes
Booking Tombstone	No	No	Yes (just give the form and user need to download)	Yes
Report Module	No	No	Yes (only the activities been conducted)	Yes (list of the deceased person)

3. Methodology/Framework

The Grave Tracker development process is based to the prototype model. This prototype model covers several important phases. Table 2 below shows the activities that have been and will be carried out during the specified time period. Each phase involved has its own activities and tasks to provide the required results throughout the system.

Table 2: Activities performed based on specific phases

Phase	Activities	Outcome
Planning	-Identify problem and stakeholder in this system. -making an interview session with the grave digger En. Alias Bin daud. -Identify objective and scope of the project.	-Proposal of the Grave tracker -Gantt chart

Analysis	-Making an analysis to the current system. -Making an analysis to a significance Thesis. -Making a Use Case. -Identify function of the system based on every process.	-Comparison the system with the current system. -Sequence Diagram and Activity Diagram. -Class diagram.

Table 2: (cont)

Design	-Design interface for every module -Design database system -Identify attributes for every plan at Database.	-Flowchart -Designing database -The interface of the system
Implementation	-Making a prototype using PHP language and also, the CSS. -Connecting the prototype system to the database for testing purpose.	-Prototype of the Grave Tracker -Test Care
Testing	-Making a testing using alpha and beta testing methods	-can get feedback from the user

A requirement is a statement that describes the functionality of a system to be built by covering various aspects clearly and consistently [2]. Therefore, identifying needs is a very important step in developing any new system. Table 3 describes the functional requirements found in the system.

Table 3: Functional Requirements

No	System Module	Description
1.	Login and Authentification	System will ask the user the username and also the password. System will detect if there is any mistake from the user when they enter the username and also password. System will give a message if there are any mistake when user want to login into the system.
2.	Registration Module	System should allow the new users to register their perosonal information. System should warn for any inputs errors. system should allow users to update and add their informations
3.	Search Module	System will ask user to enter about the person’s grave information like name, IC number, Date of birth or Date of death. System will show the output from the searching of the user if there are any similarity information. System should give the direction towards the grave location if the user ask. System should allow the user to delete the information that they place into the system.
4.	Report Module	System allow the administrators to get the booking applied from the users. System allow the administrator to make a report on the name of the deceased person name in every grave and its section
5.	Booking Module	System will ask user to sign up or login into the system before they make any booking.

	System should ask user to make their booking based on what they want. System will ask user to make a payment after make a booking

Non -functional requirements are about the constraints that exist on a system. According to [3] functional requirements, non -functional requirements also play a very important role during system development because it can be used as a selection criterion in designing in the implementation of a system to be built. Table 4 shows the non -functional requirements for the proposed system, namely, Grave Tracker for Kg TengluLaut.

Table 4: Non-Functional requirements

No	Non-Functional Requirements	description
1.	Security Requirements	The developed system should have high security features to store members' personal information.
2.	Operational requirements	The developed system should be able to generate the required reports in a minute.
3.	Performance requirements	The developed system should be accessible at all times.

Requirement analysis is usually obtained from analysis from a variety of sources. This analysis is needed to get a true and accurate definition of needs using a variety of methods. User needs analysis generally refers to any service offered by the system. In addition to being able to determine what users expect the system to be able to do. Table 5 shows the user requirements for the recommendation system.

Table 5: User Requirements for the Proposed System

No	User Requirements
1.	All users should could enter their ID and password in order to log in into the system.
2.	Every user can use this system without log in if they just want to search for information of the grave.
3.	Registered user can make a booking toward the grave lot and also the tombstone
4.	Registered user can make payment after making a booking using online banking.
5.	Public user can use this system just to make a searching about the grave.
6.	Public user can make a booking after they sign up into the system.
7.	Public user can insert their information when sign up into the system.
8.	Administator can log in into the system by insert their id and password.
9.	Administrator can add cvv file where they can insert the name of the deceased person easilly
10.	Administator can log in into the system by insert their id and password.
11.	Administator can update the grave information.
12.	Administator can check the booking made by the registered user.
13.	Administator can made a report about the name of the deceased person

3.1 Analysis

Figure 1 shows the next process (To-be Model) for the system to be developed. The scope of the study in the development of this system will focus on the development of systems based on web portals and adding with PWA [4] while the scope of users involved in using the system are registered user, public users and administrators.

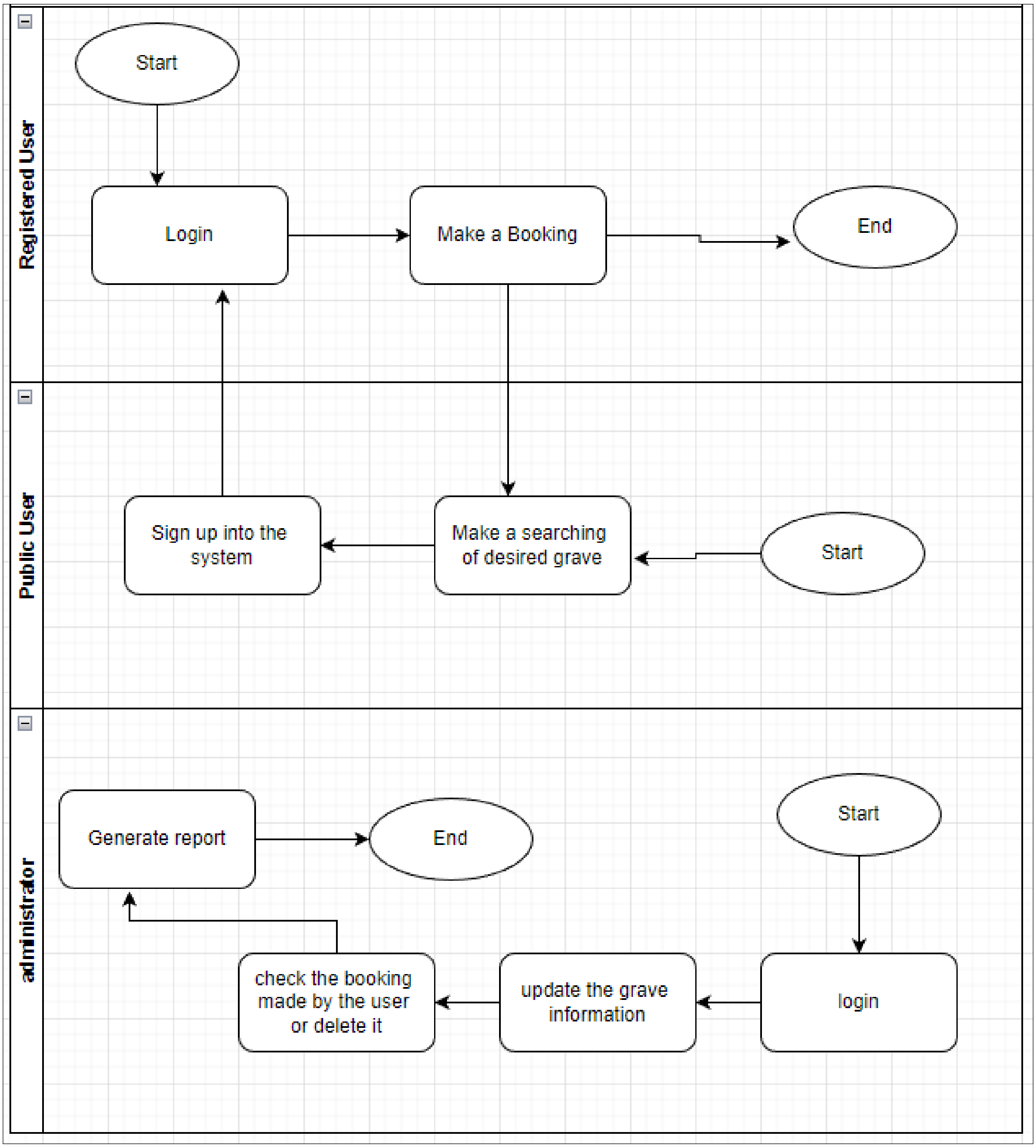


Figure 1: To-be model

3.2 Design

This section describes the overall system design process that determines the important elements in the formation of the system such as modules, architecture, components or system interfaces based on the specified requirements [5]. This method is also the most conceptual solution for the system to be developed. Therefore, the system architecture diagram has been sketched in Figure 2 to represent the system design. The method of object -oriented programming approach is translated in the diagram by using web portal and mobile application approach along with three (3) types of users who use this system.

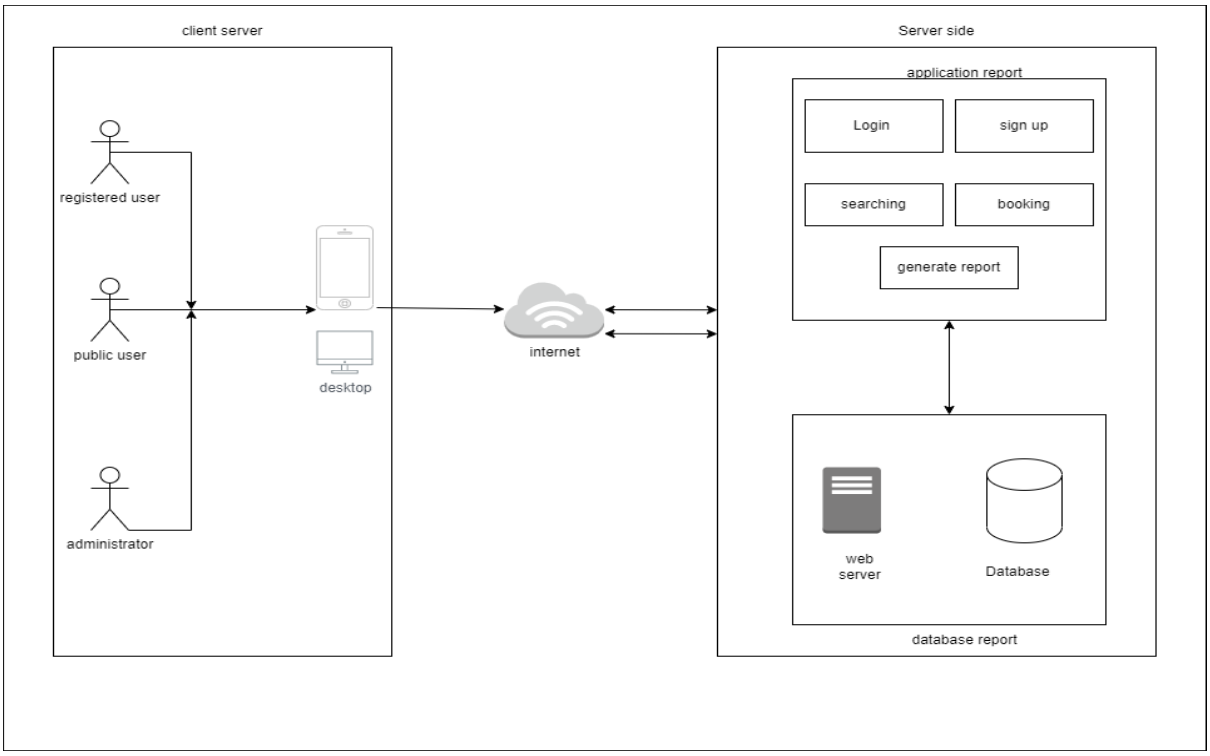


Figure 2: Grave Tracker Architectural Design

Database design is a design for the division of data contained in each database involved throughout the running system [6]. Following arethe relational schemes that have been written to plot the design in the database.

i. **Tbluseraccount**(USERID(Pk), U_NAME, U_USERNAME, U_PASS, U_ROLE)
ii. **booking_lot**(PEOPLEID(PK), GRAVE_NO, FNAME, LOCATION, BORNDATE, CATEGORIES, Tingkat, No_Tel)
iii. **booking_tomb**(PEOPLEID(PK),GRAVE_NO, FNAME, LOCATION, Tingkat, No_Tel)
iv. **tblcategory**(CATEGID(PK), CATEGORIES, USERID)
v. **tblpeople**(PEOPLEID(PK), GRAVE_NO, FNAME, LOCATION, BORNDATE, DIEDATE, CATEGORIES, Tingkat, No_Tel)
vi. **tbltingkat**(Tingkatid(PK), Tingkat)

3.3 Use Case Diagram

Use case diagrams are one of the methodologies adopted to identify, explain and organize the system requirements required in system analysis [7]. In addition, use case diagrams are also applied in the Unified Modelling Language (UML) as a modelling of real-world objects and systems. Figure 3 shows a use case diagram for the system developed, namely the Grave Tracker Kg TengluLaut. Based on the use case diagram, it has three (3) actors, registered user, public user and administrator.

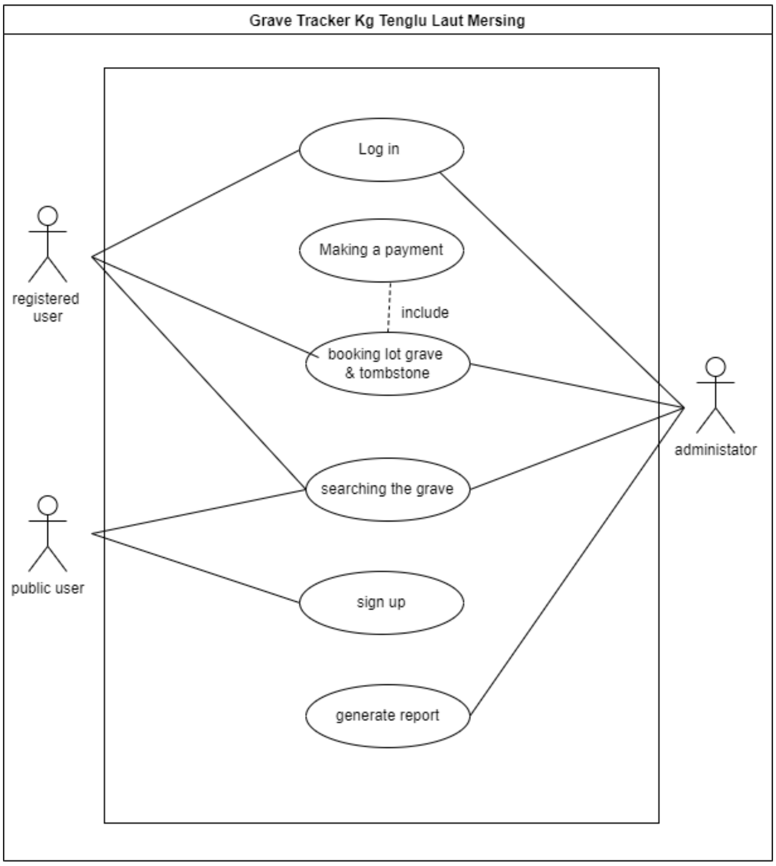


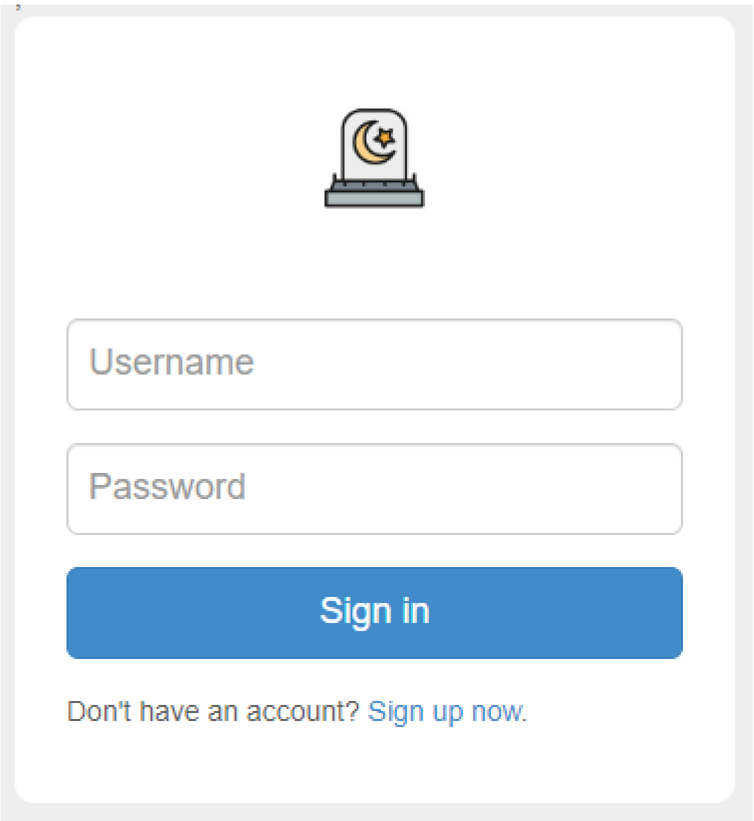
Figure 3: Use Case Diagram of whole system

4. Result and Discussion

4.1 System Implementation

The implementation phase is the phase to develop a system using a programming language that has been selected during the beginning of system development. The implementation phase must always refer to the system requirements specifications and design documents. The programming languages used for the development of SPKS are Hypertext Preprocessor (PHP) and Hypertext Mark-up Language (HTML). The main software used for system development is Visual Studio Code while the database is MySQL.

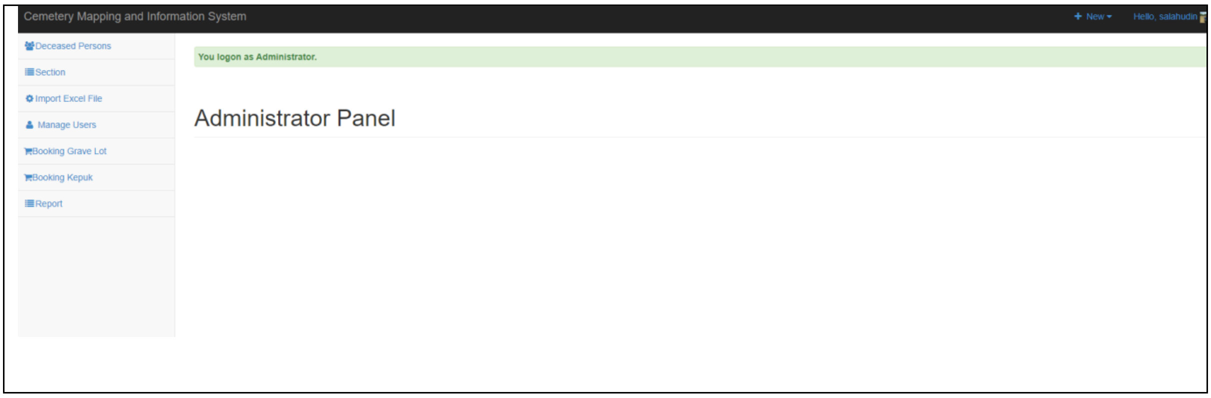
Public user can directly use the system but it’s restricted to a certain functionality which is public user only can use searching, registration and login module. When public user clicks on booking, they need to log into the system first. When the user wants to login into the system and they enter invalid username or password, the system will display error message. Figure 4 show the interface of login page for grave tracker.



Don't have an account? Sign up now.

Figure 4: Login Interface Grave Tracker

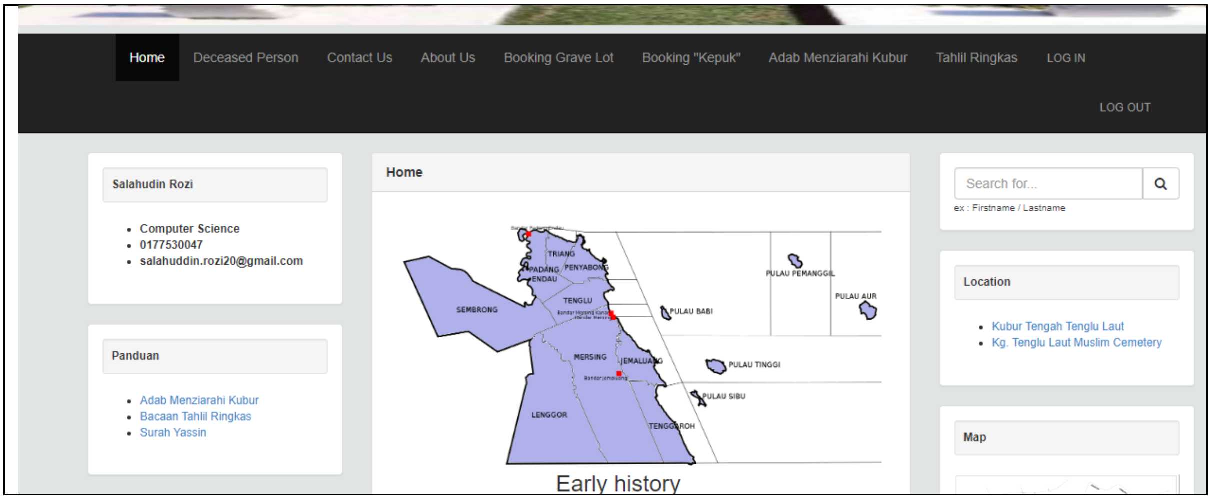
After user sign in into the system, system will determine the role of the user, if the user role when login if admin, the system will redirect to admin page while when user role is user, the system will redirect user to the user page. Figure 5 will show the admin page while figure 6 will show the user page.



You logon as Administrator.

Administrator Panel

Figure 5: Admin page



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- Bacaan Tahlil Ringkas
- Surah Yassin

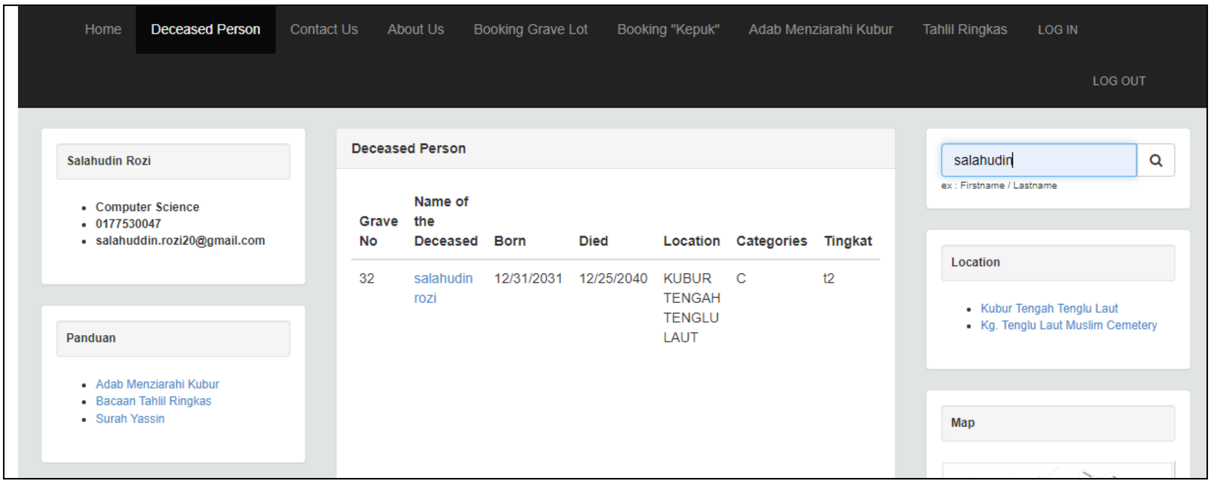
Home

Location

- Kubur Tengah Tenglu Laut
- Kg. Tenglu Laut Muslim Cemetery

Figure 6: User page

For searching module, user need to enter name of deceased person and then the system will filter all name that had in the system database. Then the list of searched names will be being list. Figure 7 will show the interface when user make a searching part.



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Deceased Person

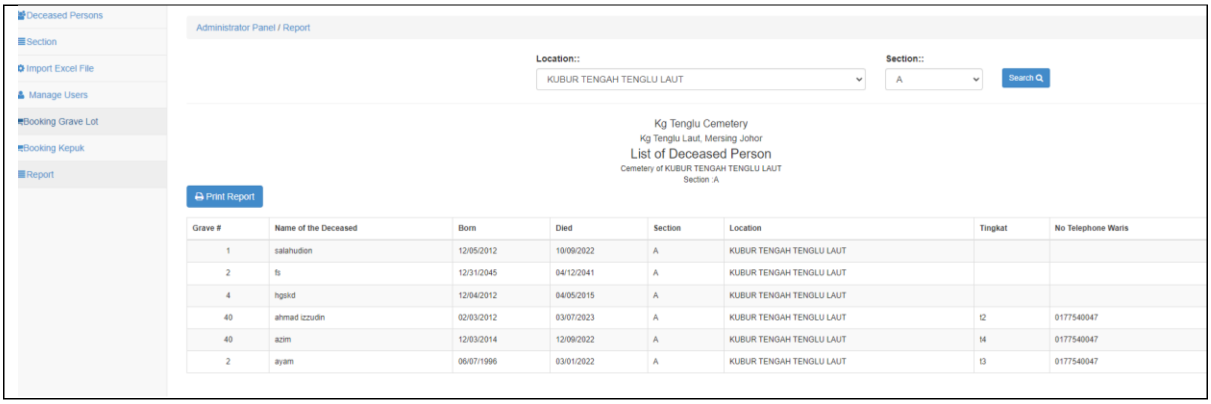
Grave No	Name of the Deceased	Born	Died	Location	Categories	Tingkat
32	salahudin rozi	12/31/2031	12/25/2040	KUBUR TENGAH TENGLU LAUT	C	t2

Location

- Kubur Tengah Tenglu Laut
- Kg. Tenglu Laut Muslim Cemetery

Figure 7: Interface for searching module

For report module, only administrator can use this function. When admin click on the report page, administrator need to choose the location and categories. Then the system will display all the deceased person of the chosen location and categories. Figure 8 show the result when admin had chosen the location and the categories.



Location:: KUBUR TENGAH TENGLU LAUT

Section:: A

Kg Tenglu Cemetery
Kg Tenglu Laut, Mersing Johor
List of Deceased Person
Cemetery of KUBUR TENGAH TENGLU LAUT
Section :A

Grave #	Name of the Deceased	Born	Died	Section	Location	Tingkat	No Telephone Waris
1	salahudion	12/05/2012	10/09/2022	A	KUBUR TENGAH TENGLU LAUT		
2	fs	12/31/2045	04/12/2041	A	KUBUR TENGAH TENGLU LAUT		
4	hgskd	12/04/2012	04/05/2015	A	KUBUR TENGAH TENGLU LAUT		
40	ahmad izzudin	02/03/2012	03/07/2023	A	KUBUR TENGAH TENGLU LAUT	t2	0177540047
40	azim	12/03/2014	12/09/2022	A	KUBUR TENGAH TENGLU LAUT	t4	0177540047
2	ayam	06/07/1996	03/01/2022	A	KUBUR TENGAH TENGLU LAUT	t3	0177540047

Figure 8: report module

4.2 Functionality Testing

System functionality testing is done after the system construction is ready. User acceptance testing is conducted based on the Grave Tracker System module. System testing is divided into two parts namely expected results and outcomes. Table 6 - Table 8 describe the tests performed.

Table 6: System Functionality Testing for Administrators

Function	Expected Result	Outcomes
• Log in	• Displays the homepage for Grave Tracker administrator if the username and password are incorrect, the system is inaccessible.	• Administrator can log in into the system
• Add new deceased person • Update the already person name • Delete the deceased person	• Register new deceased person information, update deceased person information or delete retired person information.	• Administrators can add, update and delete the deceased person information
• Add new user for the system • Edit user of the system • Delete user information	• Register new user, update the user information and delete the user of the system	• Administrators can add, update and delete the user of the system
• Check booking made by the user • Delete booking that being made	• Administrators can check the booking made by the user for the grave lot and the tombstone. Administrator also can delete the booking made by the user	• Administrators can check the booking and delete the booking.
• Make a report	• Administrator can make a report of the name of the deceased person where there can choose the specific place of the grave	• Admin can generate report based on the grave

Table 7: System Functionality Testing for public user

Function	Expected Result	Outcomes
• Register into the system	• Registration of the user is completed if the user enters the valid username and password at the form	• User can register into the system
• Search the deceased person in the system.	• User can see the display name after the user make the searching based on the name entered. Its display the name, location, and others description.	• User can get the desired name and the grave no

Table 8: System Functionality Testing for Registered User

Function	Expected Result	Outcomes
• Log in	• Displays the homepage for Grave Tracker registered if the username and password are incorrect, the functionality of registered user can be used.	• User can log in into the Grave Tracker
• Booking Grave Lot	• Display the page where the user can make a booking form for the grave lot and make the payment after the form is filled up.	• User can make booking of the grave lot.
• Booking the tombstone	• Display the page where it shows some of the 'Kepuk' that user can choose. User need to filled up the form if they have selected the 'Kepuk' and make payment after fill the form	• User can make booking of the tombstone

4.2 Test Result by Target Users

A total of 10 respondents were involved in this test. Their feedback was collected and framed in the form of graphs. Table 9, Table10, Figure 9 and Figure 10 show the results and feedback related to the interface and system modules involved. Figure 9 shows the results of the user interface evaluation in the form of a graph. While Figure 10 is also the result of the evaluation of the system module which is illustrated in the form of a graph.

Table 9: User Interface Evaluation Results

No	Characteristics	Scale					Total
		1	2	3	4	5	
1.	The system is easy to understand	0	0	0	6	4	10
2.	The text style used in terms of font size, color and font type is user friendly	0	0	0	7	3	10
3.	Attractive interface design in terms of use of background colors and pictures	0	0	0	5	5	10
4.	The layout of the content in the interface is arranged accordingly	0	0	0	5	5	10

Table 10: System Module Evaluation Results

No	Characteristic	Scale					Total
		1	2	3	4	5	
1.	Every function for user Registration works fine	0	0	0	4	6	10
2.	Every function for users logs in is works fines	0	0	1	5	5	10
3.	Every Function for searching grave location is well functions	0	0	0	6	4	10

4.	Every Function for Making booking for tombstone and grave lot is functions	0	0	0	6	4	10
5.	Every Functions for making payment is well functions	0	0	0	7	3	10
6.	Every function for admin to checking the booking is well functions	0	0	0	5	5	10
7.	Functions for admin to generate report is well functions	0	0	0	9	1	10

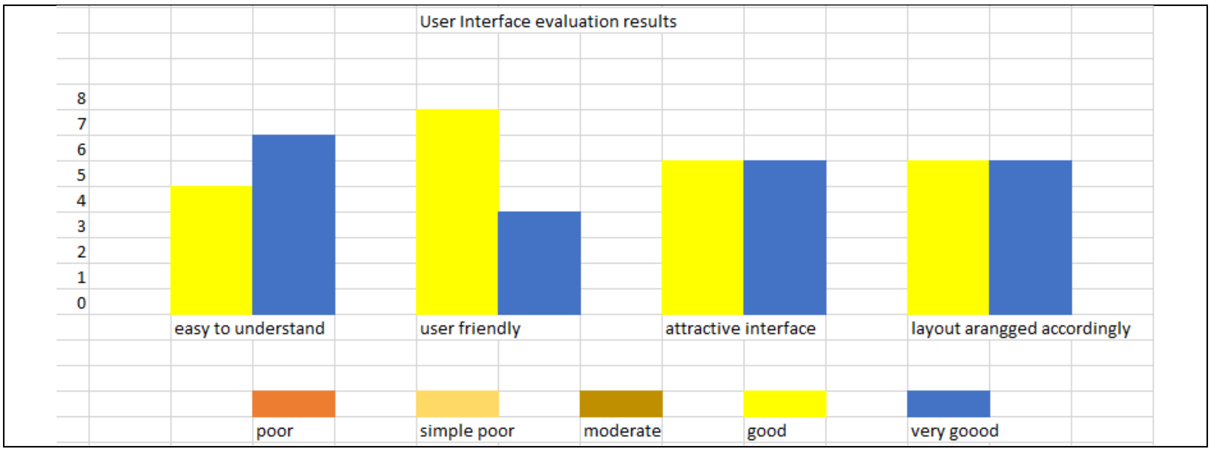


Figure 9: User Interface Evaluation Results

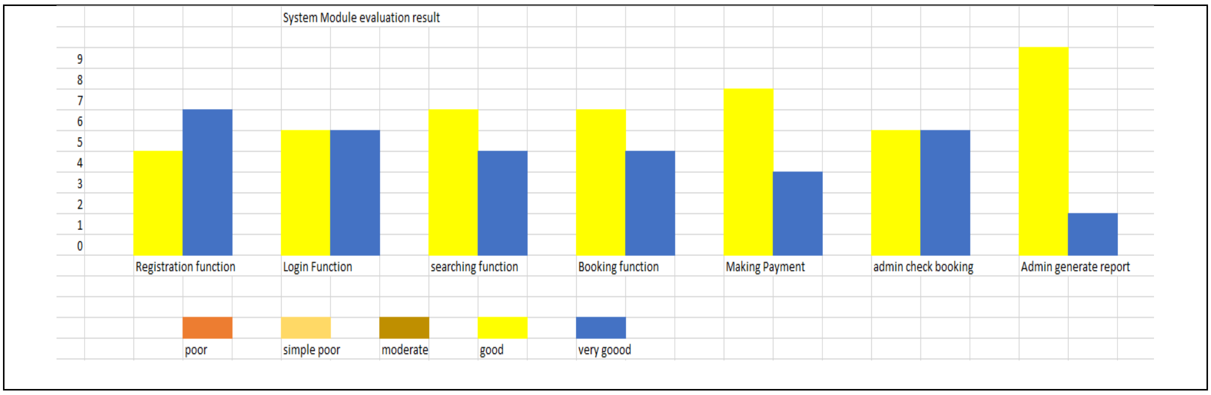


Figure 10: System Module Evaluation Result

5. Conclusion

The absence of a platform that can manage the information of the grave at Kg TengluLaut, has forced parishioners to rely entirely on a manual system, namely book. The results of the interviews found that the existing method is less effective. Therefore, the Grave Tracker system was developed to overcome this problem. A comparative study with the existing system was conducted to obtain information on the death benefit system. However, there is still room for improvement on the proposed system. Among the improvement proposals identified is to introduce a notification feature to all registered users who book a tombstone or grave lot when their booking is being accepted. This proposal is seen as good for the Grave Tracker system in further enhancing its effectiveness.

Acknowledgment

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Appendix A

Table 11: Proposed System Matrix Traceability Requirements.

Case ID	Software Requirement	Description
Registration new user SRS_REQ_100	SRS_REQ_101	User can fill up the registration form
	SRS_REQ_102	All user information needs to being filled up
	SRS_REQ_103	User click on “submit” button
	SRS_REQ_104	System shows the registration is success and redirect to the login page
	SRS_REQ_105	Admin can add new user at administrator panel
	SRS_REQ_106	Administrator need to fill up the form.
Log In and Log Out SRS_REQ_200	SRS_REQ_201	User need to fill up the username and password
	SRS_REQ_202	User click on “login” button
	SRS_REQ_203	System verifies the username and also the password
	SRS_REQ_204	System will show the dashboard of the user
	SRS_REQ_205	User can log out by click on “logout” button
Booking Tombstone or Grave LotSRS_REQ_300	SRS_REQ_301	User go to booking page
	SRS_REQ_302	System will verify if the user is already log in into the system
	SRS_REQ_303	User need to choose for making tombstone booking or grave lot booking
	SRS_REQ_304	System will show the list of tombstone or grave lot
	SRS_REQ_305	User need to fill the form of the booking
	SRS_REQ_306	User need to click on “booking” button
	SRS_REQ_307	System will ask user to make a payment
	SRS_REQ_308	User make a payment by fill up the form
	SRS_REQ_309	Administrator can check the booking made by the user
	SRS_REQ_310	Administrator can delete the booking made by the user
Searching Grave SRS_REQ_400	SRS_REQ_401	User can make search at the right bar of every page of the system
	SRS_REQ_402	User need to fill up the searching indicator
	SRS_REQ_403	User click “search” button
	SRS_REQ_404	System will show the search list
	SRS_REQ_405	User clicks on the correct grave
	SRS_REQ_406	System will show the information of the grave
	SRS_REQ_407	System will show the location of the grave
Generate Report SRS_REQ_500	SRS_REQ_405	Admin go to report page
	SRS_REQ_502	Administrator need to choose the location of the grave and the categories
	SRS_REQ_503	System will display the name of the deceased person at the location and the section
	SRS_REQ_504	Admin can print out the report of the list of deceased persons

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