

Development of Web-based system for Animal Shelter and Rescue in Johor State

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Abstract: Web-based System for Animal Shelter and Rescue is a platform for animal organisations in Johor state to accumulate, as there is currently no platform that focuses this group in Malaysia. During the pandemic, several animal shelters reached out to the public for donations to care for the animals in their care, and some unscrupulous people took advantage of the opportunity to scam others. Volunteers are also in short supply at some other shelters. System prototyping is the approach used to build the proposed system. Adobe Dreamweaver was utilised as the technology, and MySQL was used as the database. This website is designed to inform the public about available animal shelters in their region, as well as to make it easier for the public to donate.

Keywords: Stray Animal, Animal Organisations, Animal Rescue, Web-based System

1. Introduction

Animal homelessness is a complex problem, but the solution is simple: adopt animals from shelters or the streets rather than buying them from breeders or pet stores, and always have companion animals spayed or neutered to avoid unwanted animals from being born [1]. Nevertheless, there are also animals being abused, this issue led to some animal lovers opening up animal rescue organisations or animal shelters. Animal rescue is a private non-profit group that takes in certain animals from abusive homes and cares for them until proper forever homes can be found. Meanwhile, animal shelters are usually community-owned, operated by volunteer staff associated with homeless, abandoned animals [2]. These animal organisations normally have their own shelter or place for all rescued animals.

There are online platforms in Malaysia that specialize in finding homes for animals, where the public may simply upload photographs and details of homeless animals, missing animals, and animals for sale, but this website does not include any animal rescue organisations that handle large numbers of animals. Other than that, residents are unaware of any animal shelters in their area and are only aware of their presence because others mention it. This could be one of the factors causing an animal shelter

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to have fewer donations or volunteers. As we know volunteers can help get animals adopted by telling others about the animals they met with at the shelter [3]. Then there's the possibility of being scammed. Some irresponsible individuals create a fake social media account, pretending to be an animal rescue organisation, and simply begging the public to donate money to aid animals that do not exist. These scammers have collected tens of thousands, if not hundreds of thousands, of ringgit from animal lovers ready to donate to the upkeep of animal sanctuaries [4]. So, one of the solutions to those problems is to create a platform solely focus on animal organisation.

To attain the goal of this project, the following objectives have been set:

- (i) To design a system for animal shelter and rescue using a structured
- (ii) To develop a system for animal shelter and rescue using a web-based approach
- (iii) To test the developed system

This project is about making an online platform for animal shelter and animal rescue organisations in Johor. In the system, admin should be able to log in, check and register animal organisation. The admin is also able to manage donations and read animal abuse reports by the public. The animal organisation that were registered to this platform can login using the given username and password. The animal organisations can also change the login password, view volunteer forms and update the volunteer form status lastly view animal abused report. For the public, they can make donations by fist filling up the form and scanning the QR code, insert details into a volunteer form and make a report if there is a potential animal abuse crime.

2. Related Work

2.1 Stray Animal

Stray animals have always been an issue all over the world including Malaysia. These animals also have the rights like humans to live on earth but the only difference is that they do not have a voice to beg for help from humans. Stray animals do constitute a hazard to the community; for example, some individuals are terrified of dogs for security and safety reasons. Because of those reasons, some animals suffer from extreme brutality such as being poured by boiling water and being shot [5].

2.2 Animal Shelter and Rescue Organisation

Some companion animals end up in animal shelters due to changes in their owners' circumstances, such as personal crises, a lack of "pet-friendly" housing, travel, changes in relationships or finances, or unplanned canine pregnancies [6]. Unfortunately, shelters are unable to accommodate all of the animals who come into their care. More than half of all cats and dogs entering shelters are euthanized because they are sick, old, or unadoptable [7].

Animal shelters are also divided into two groups based on their euthanasia policies: traditional and adoption assurance. Those animals constitute a threat to society at a rate of up to 10% or gravely ill animals are being euthanized in adoption guarantee shelters [8]. Euthanasia is performed at traditional or open shelters owing to space constraints, financial problems, such as costly disease treatment, behavioral disorders that make a pet unadoptable, or the age, breed, and other characteristics of animals [9].

2.3 Study of the existing System

Stray Animal Project [10], PetFinder [11] and SPCA Penang [12] are similar existing systems that are chosen to be studied based on their feature and functionality. This is to identify each systems' advantages and disadvantages and make improvements that are needed to the proposed system. Table 1 shows the comparison of the existing system with the proposed system.

Table 1: Comparison between existing system and proposed system

Feature	Stray Animal Project	PetFinder	SPCA Penang	Proposed System
Web-based	Available	Available	Available	Available
Simple Interface	Available	Not Available	Available	Available
Login as User	Not Available	Available	Not Available	Available
Make Donation	Available	Available	Available	Available
Donation in Ringgit Malaysia	Not Available	Available	Available	Available
Involve few Organisation	Not Available	Not Available	Not Available	Available
Volunteer Request	Not Available	Not Available	Available	Available
Report Animal Abuse	Not Available	Not Available	Not Available	Available
Advertisement	Not Available	Available	Not Available	Not Available
E-commerce	Not Available	Not Available	Available	Not Available

3. Methodology

The prototyping model is a systems development process in which a prototype is built, tested, and changed if needed until an acceptable result is achieved. It aids in knowing the specific and complex things in the system as this is the first time exposed to the animal shelter and rescue organisations' system. The prototyping model has a few phases namely the planning phase, analysis phase, design phase and also implementation phase [13].

3.1 Planning Phase

The planning phase is to identify the problem statement, objective and scope of the project to get a clear path. After that, name the proposed system with a suitable title. A Gantt Chart is developed as a guide so that each task is completed on time and the tool that use to create this Gantt Chart is Project Libre.

3.2 Analysis Phase

The analysis phase is about formulating and formalizing the collection of user requirements and collecting related information about the proposed system. From there, process all the information and analyse it. In this project, an interview had been conducted with an NGO animal shelter. Apart from the interview, research is carried out on a few similar animal shelter-related systems in order to get the idea and produce alternative designs. Other than that, for the project to be developing smoothly, the context diagram, data flow diagram (DFD) need to be determined, but first, need to determine the functional and non-functional requirements.

3.3 Design Phase

The design in this phase involves user interface design and database design. Figma is being used to develop the low-fidelity prototype of the proposed system since it is simple to use and has all of the tools needed, as well as a clickable prototyping capability. The wireframes of the proposed system are being produced using Draw.io, the purpose is to be the guideline for the user interface design. The

database design like Entity Relation Diagram (ERD) is also created using Draw.io to construct models of the proposed system for both conceptual and practical ways.

3.4 Implementation Phase

This is where the programming or coding during a software development [14]. The programming language of a web-based system for the proposed system is Hypertext Markup Language (HTML), Cascading Style Sheet (CSS), JavaScript, and Hypertext Preprocessor (PHP) and the development tool is Adobe Dreamweaver. The database that will be set to store data of the proposed system is the MySQL database by XAMPP. Each system module is first developed, and then only then incorporated into a real website that is connected to a database. The first development of the system is called prototype. Initial testing will also be carried out to ensure that the application functions properly.

3.5 Testing Phase

The goal of the testing phase is to eliminate problems, lower development costs, and boost the performance of the software. If there are any errors, the developers will correct them and retest the system. The testing phase can be done by doing user acceptance testing. By this method, the development team can use this strategy to make further improvements to the product if they are needed. The functional testing and user acceptability testing have been conducted to test the developed system.

4. Analysis and design

4.1 System Requirement Analysis

The functional and non-functional requirements of the proposed system are included in Table 2 and Table 3 respectively.

Table 2: Functional Requirements of the proposed system

Module	Functionalities	User
Organisation management	<ul style="list-style-type: none"> Admin can create, read, update, delete animal organization details. 	Admin
Login	<ul style="list-style-type: none"> User input valid username and password. System alert for any invalid input. 	Admin, animal organisation
Account management	<ul style="list-style-type: none"> Admin can change login password Organisation can change login password 	Admin, organisation
Logout	The admin and animal organisation is allowed to log out from the system after using it.	Admin, animal organisation
Donation	<ul style="list-style-type: none"> The public can insert details if they want to make donation The admin is able to see donations list	Admin, public
Animal welfare report	<ul style="list-style-type: none"> The public can insert details if they want to report animal welfare. The admin can read, update and delete the reports on animal welfare The organisation can read, update the reports on animal welfare 	Admin, public, organisation

Module	Functionalities	User
Volunteer	<ul style="list-style-type: none"> The public can request to volunteer for the organization if they want Each organisation can read and update volunteer requests 	Public, animal organisation

Table 3: Non-Functional Requirements of the proposed system

Requirement	Functionalities
Operational	The system only operates when connect to the internet.
Security	<ol style="list-style-type: none"> Only the correct username and password will log in to this system. The password need encryption to protect the user input view by others Password must between six and 20 character.
Availability	The system should be available 24 hours daily, except for scheduled maintenance.
Compatibility	The system should work on any type of operating system.

4.2 Data Flow Diagram (DFD)

Figure 1 and Figure 2 show the Context Diagram and Data flow Diagram level 0 of the proposed system respectively.

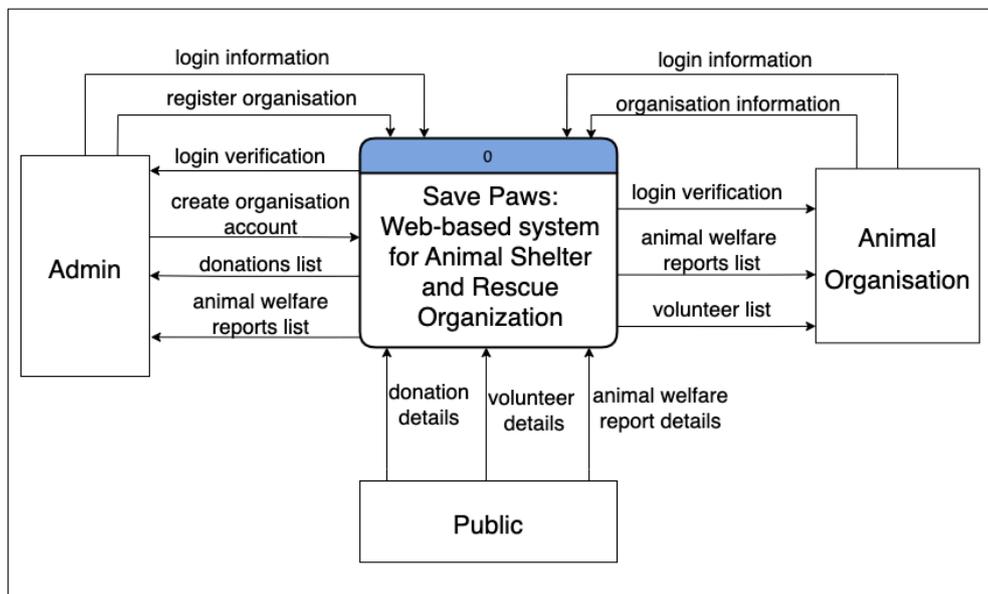


Figure 1: Context Diagram of the proposed system

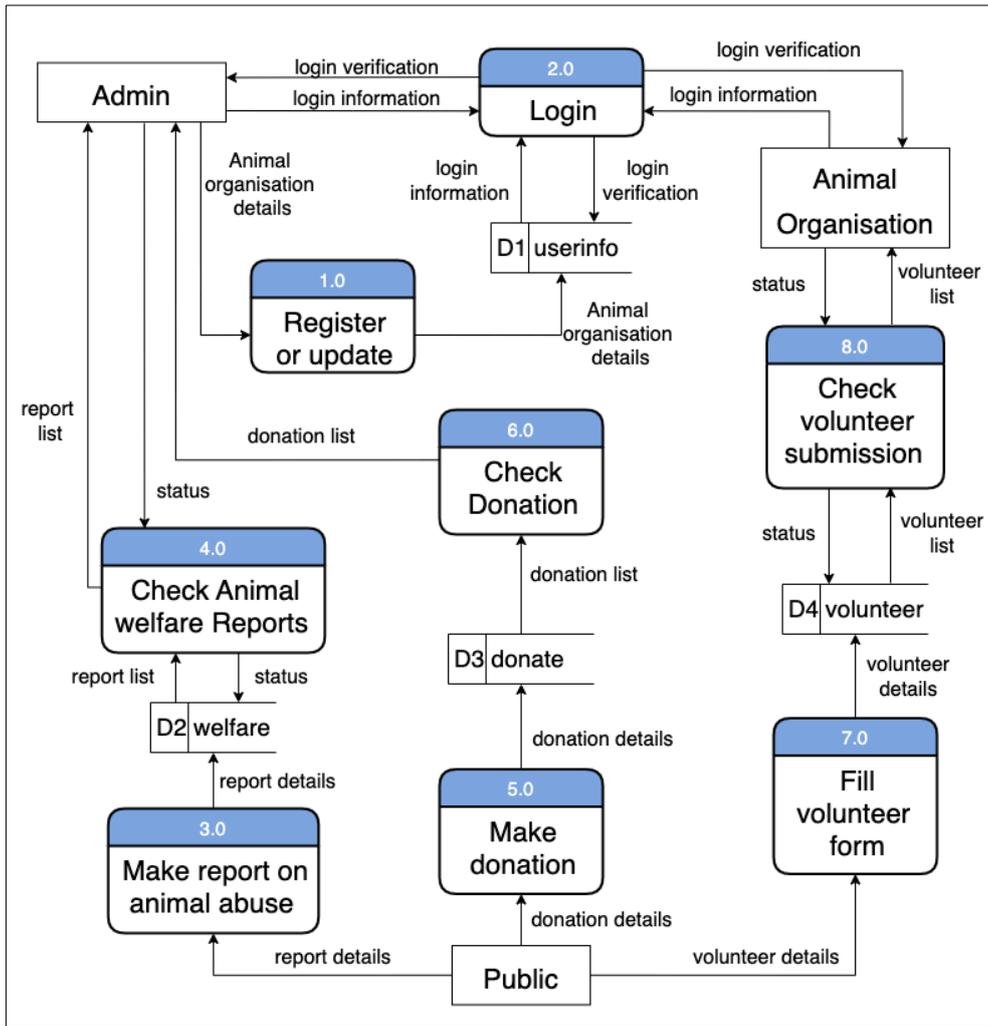


Figure 2: Data Flow Diagram Level 0 for the proposed system

4.3 Flow Chart

Figure 3 shows the flow chart for admin and Figure 4 is the flow chart for the animal organisation while Figure 5 illustrates the flow chart for the public.

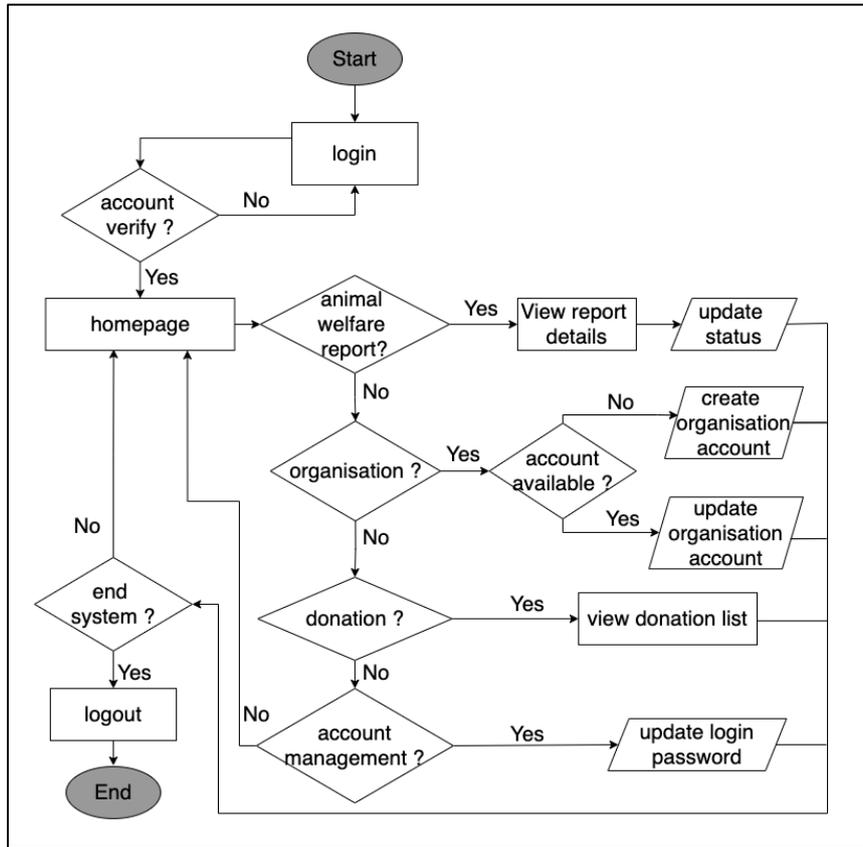


Figure 3: Flowchart for admin

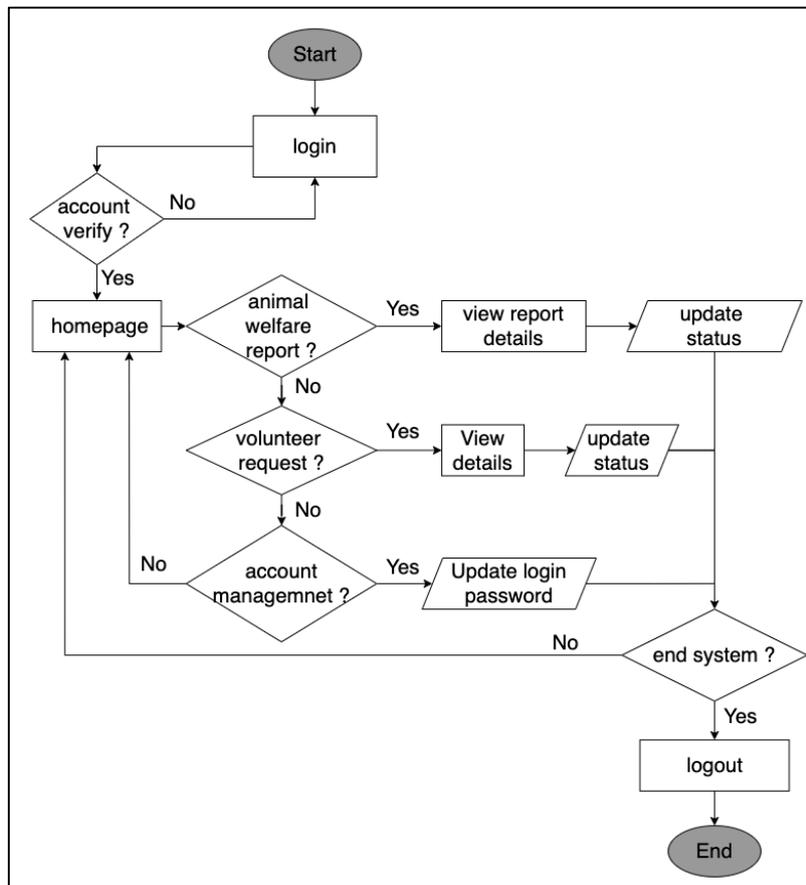


Figure 4: Flow chart for animal organisation

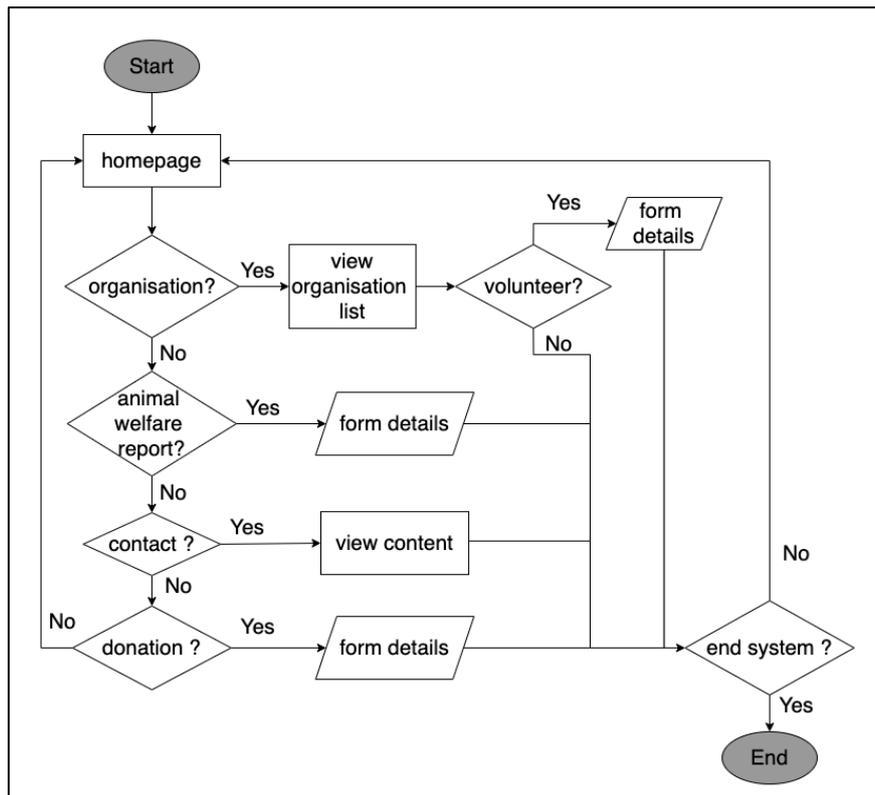


Figure 5: Flow chart for the public

4.4 Entity Relation Diagram (ERD)

Figure 6 shows the entity relation Diagram of the proposed system.

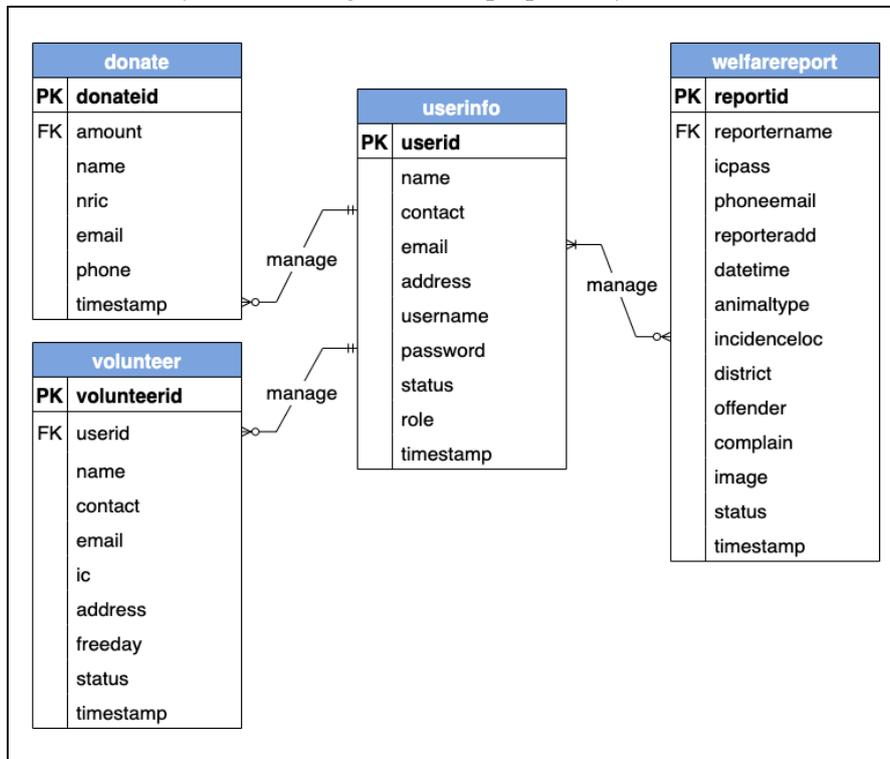


Figure 6: Entity Relation Diagram (ERD) for the proposed system

4.4 User Interface Design

Figure 7 shows the wireframes for the homepage of the public and Figure 8 is the wireframes for the home page of the admin while Figure 9 is the volunteer request page for the animal organisation.

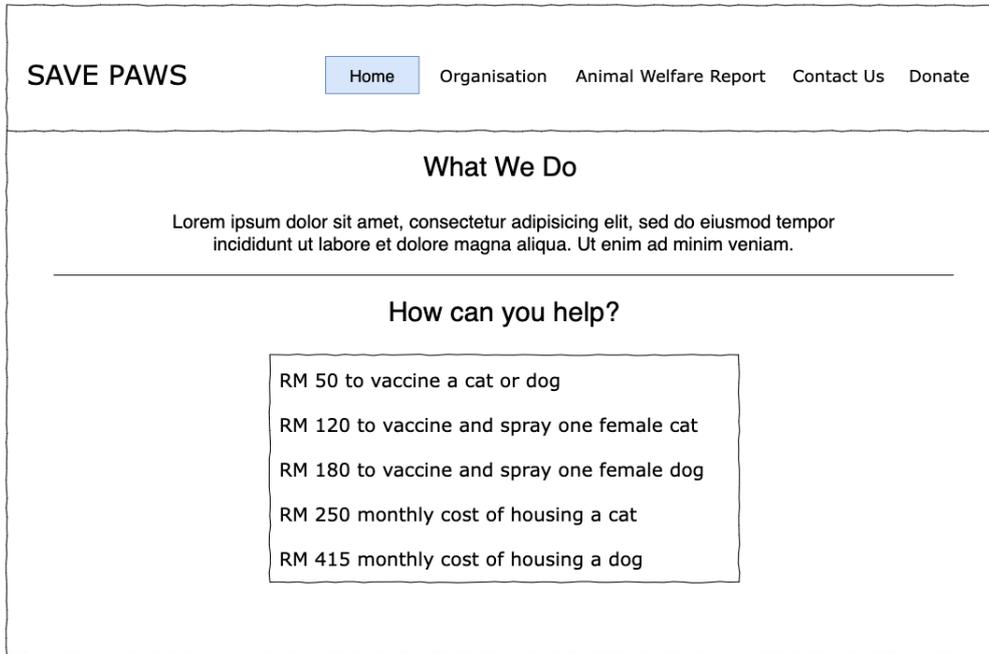


Figure 7: Wireframes for homepage of the public

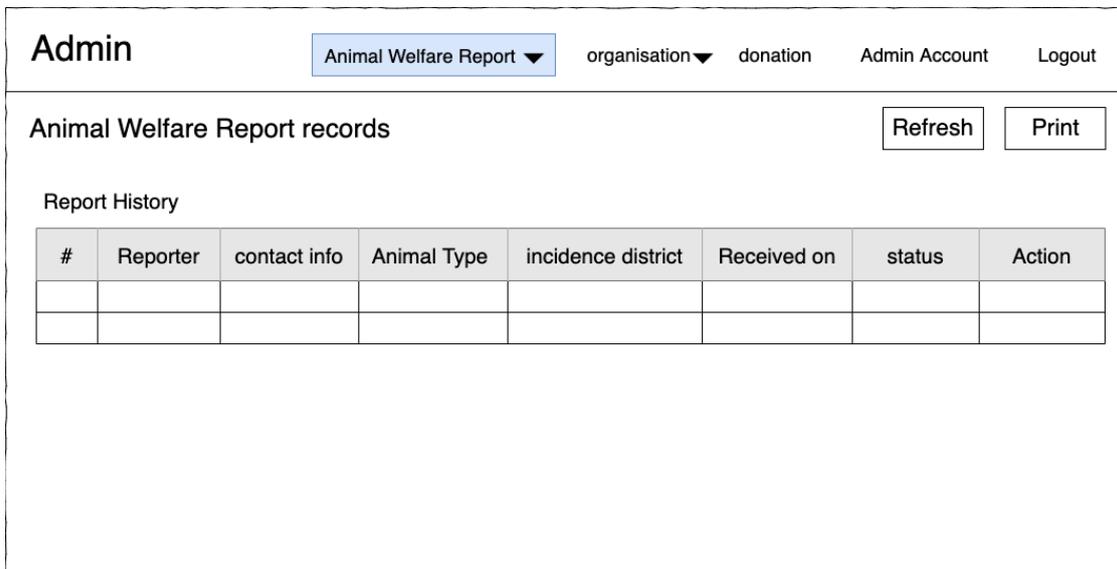


Figure 8: Wireframe for homepage of the admin

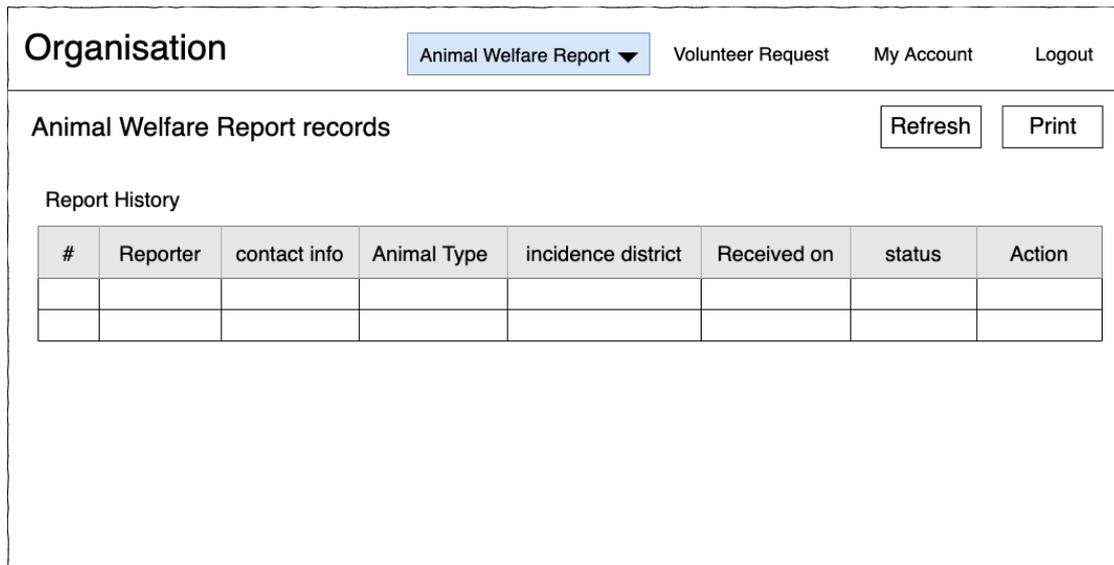


Figure 9: Wireframes for homepage of the animal organisation

5. Implementation and Testing

5.1 User Interface Design

The proposed system is implemented using procedural PHP coding and a MySQL database by phpMyAdmin to store data in the database. PHP code is used to manage forms like gathering data from files, saving, sending, and returning data. PHP is also used to handle databases, such as creating, reading, updating, and deleting data. Furthermore, PHP is employed in the proposed system to monitor the user’s session. Figure 10 is the interface for the login module. The login module is used by both admin and animal organisations.

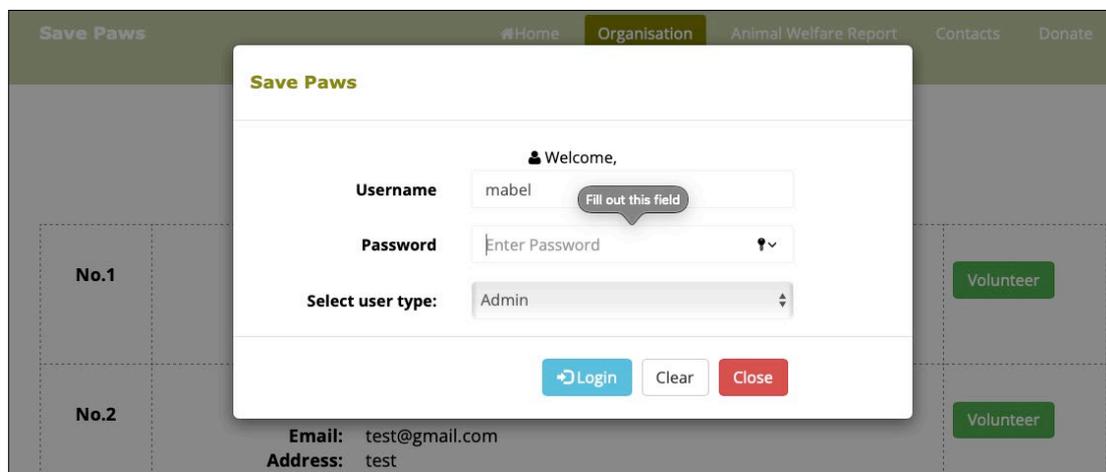


Figure 10: The interface for login module

Figure 11 is the interface to create animal organisations. This module is only managed by the admin. All the files are required to be filled in, the admin can also set the status animal organisation to be visible to the public.

The screenshot shows a web interface for creating an organization. At the top, there is a navigation bar with 'Admin', 'Animal Welfare Report', 'Organisation', 'Donation', 'Admin Account', and 'Logout'. The main content area is titled 'Create Organisation' and contains a form with the following fields:

- Organisation name*: Stray Dog Home
- Contact*: 012-1234567
- Email*: stray@gamil.com
- Address*: 21, Jalan Putera 8/8, Bandar Dato Onn, 8
- Username*: Enter a username
- Password*: Enter a password
- Confirm Password*: Repeat password
- Status*: Select Status

 There are 'Clear' and 'Save' buttons at the bottom of the form. A note at the top left states 'Note: Fields with (*) are required'. The footer contains the copyright notice '© 2021 Save Paws. FYP Mabel Wee.'

Figure 11: The interface to create animal organisation

Figure 12 is the interface for account management. Both admin and animal organisation have the same interface, where they are required to input old passwords, new passwords, and confirm passwords to change their login password.

The screenshot shows the 'Admin Account Information' page. The navigation bar is similar to Figure 11, but 'Admin Account' is highlighted. The main content area displays the following information:

- Admin Name:** Mabel
- Username:** mabel
- Phone:** 012-9209138
- Email:** weemabel27@gmail.com

 Below this, there are three password input fields:

- Old Password: Enter Old Password
- New Password: Enter New Password
- Confirm Password: Repeat New Password

 A note at the bottom of the form reads 'Note Fill up the fields before hitting save changes button'. A green 'Change Password' button is located at the bottom of the form. The footer contains the copyright notice '© 2021 Save Paws. FYP Mabel Wee.'

Figure 12: Interface for account management for admin and animal organisation

Figure 13 is the interface of donations for the public. The public is required to key in all the fields and then only able to click donate button.

The image shows a web form for donating to 'Save Paws'. The form is divided into three steps:

- Step 1: Donnor Details**
 - Name / Company Name***: Input field containing 'Jonny'.
 - NRIC / Passport Number / Company Registration Number***: Input field containing '123456-00-1234'.
 - Email Address***: Input field containing 'jonny@gmail.com'.
 - Contact Number***: Input field containing '012-1234567'.
- Step 2: Scan DuitNowQR**
 - Text: 'You may use the Touch'n Go eWallet or online banking apps that support DuitNow QR.'
 - A large QR code is displayed. Below it, the text reads: 'KLUANG STRAY DOG HOME MALAYSIA NATIONAL QR'. At the bottom, it says 'Accepted by participating Banks and e-Wallets Merchant Partner' with the MAE logo.
- Step 3: Donation Amount**
 - Text: 'Enter the amount you have donated'.
 - Input field containing '20'.

At the bottom right of the form, there are two buttons: 'Close' and 'DONATE'.

Figure 13: The interface of donation for the public

Figure 14 is the interface of report animal welfare. The public is required to fill in all the information and proof of picture. After filling up all the information only the public can submit the form.

Animal Welfare Report

Note: All field are required.

1.	Reporter Name:	<input type="text" value="Jonny Doe"/>
2.	NRIC / Passport Number:	<input type="text" value="123456-00-1234"/>
3.	Contact Number / Email Address:	<input type="text" value="012-1234567"/>
4.	Reporter Address:	<input type="text" value="21, Jalan Puteri 7/7, Bandar Dato Onn, 81100 Johor Bahru, Johor"/>
5.	Issue / Complain	
	Incidence Date and Time:	<input type="text" value="12/06/2022, 12:30"/>
	Animal Type:	<input type="text" value="Dog"/>
	Incidence location:	<input type="text" value="Provide address and/or description"/>
	District:	<input type="text" value="-----Select District-----"/>
	Offender (If Identify):	<input type="text" value="Darren"/>
	Complain:	<input type="text" value="Cage dog under the sun and does not provide food or water"/>
6.	Proof (If Available)	<input type="text" value="no file selected"/>

© 2021 Save Paws. FYP Mabel Wee. [Home](#) [Contacts](#) [Admin](#)

Figure 14: The interface of report animal welfare

Figure 15 is the interface for the animal welfare report list. The admin and animal organisation have the same interface. Those users can filter the list based on the status of the report. The report also can be viewed in detail, and have a print function.

ANIMAL WELFARE REPORT REC

Report History

#	Reporter	Contact Info	Case Closed Report	Incidence District	Received on	Status	Action
1	Thurga	012-0000001	hamster	Kota Tinggi	2022-06-11 05:26:41	Under Observation	<input type="button" value="View"/> <input type="button" value="Delete"/>
2	Mabel	012-9209138	Dog	Kluang	2022-05-29 15:52:36	New	<input type="button" value="View"/> <input type="button" value="Delete"/>
3	Aaron	aaronwee97@gmail.com	dog	Kulai	2022-04-21 15:55:41	New	<input type="button" value="View"/> <input type="button" value="Delete"/>
4	ling li	2302180412	cat	Segamat	2022-04-20 15:58:24	New	<input type="button" value="View"/> <input type="button" value="Delete"/>

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Figure 15: The interface of animal welfare report list

Figure 16 is the interface of the volunteer form for the public. The public is required to insert all the information to be able to submit the form.

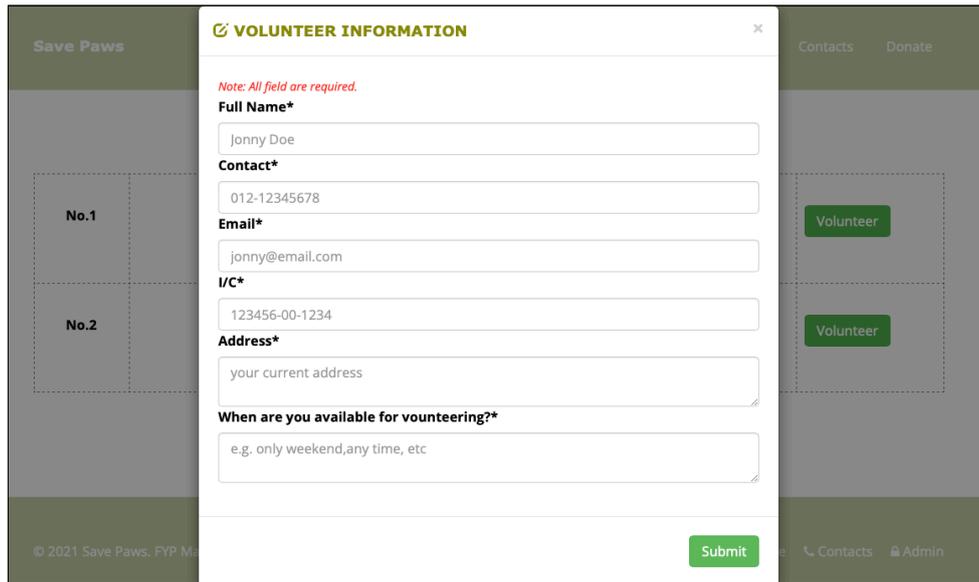


Figure 16: Interface of volunteer form for the public

Figure 17 is the interface of the volunteer request list of the animal organisation. The volunteer request list’s status can be changed and the volunteer request can also be deleted.

5.2 User Acceptance Testing Result

User acceptance testing is conducted with the potential user and the admin of the proposed system. The purpose is to test their satisfaction while using the system so that the improvement to be made towards the system is based on the user acceptance testing. Figure 17 until Figure 20 are the outcome of the testing after the user has test the system. Due to the limitation of time, only 20 users are involved in the testing. which consist of two people for admin testing, four people for the animal organisation, and 14 people for the public testing.

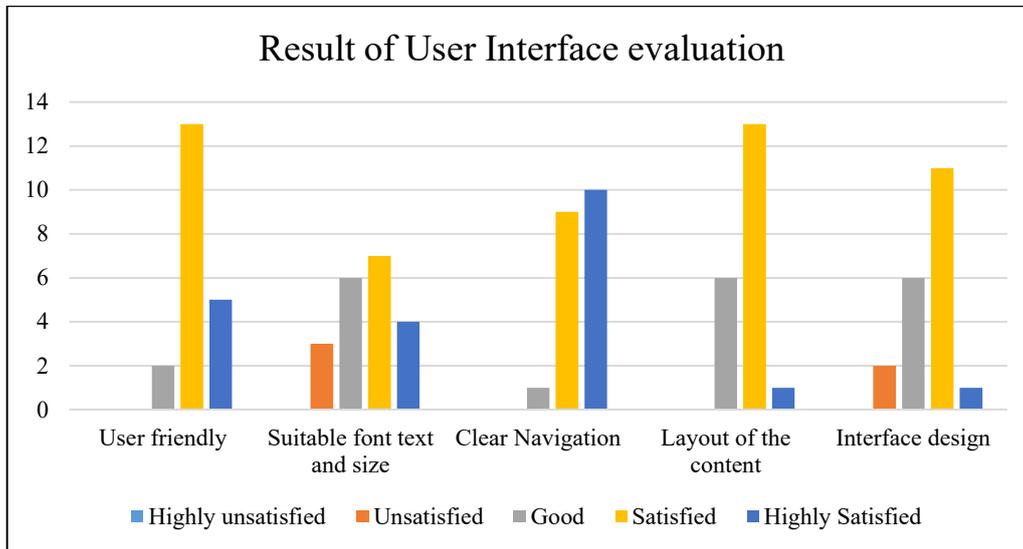


Figure 17: Result of user interface evaluation

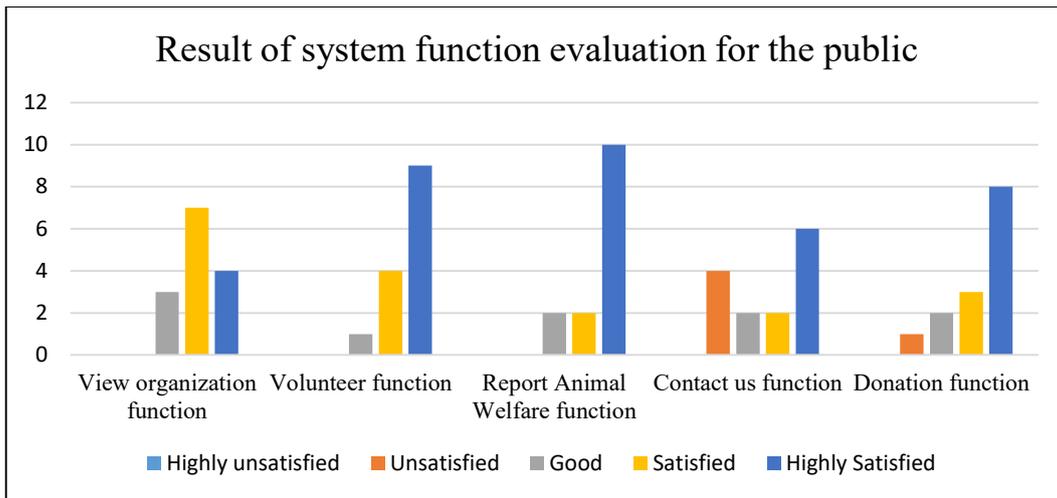


Figure 18: Result of system function evaluation for the public

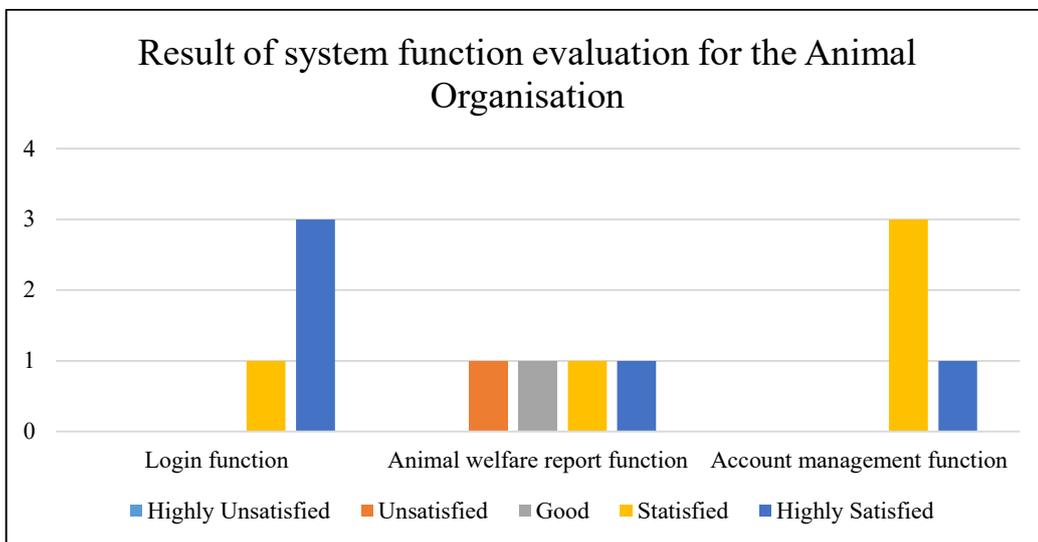


Figure 19: Result of system function evaluation for the Animal Organisation

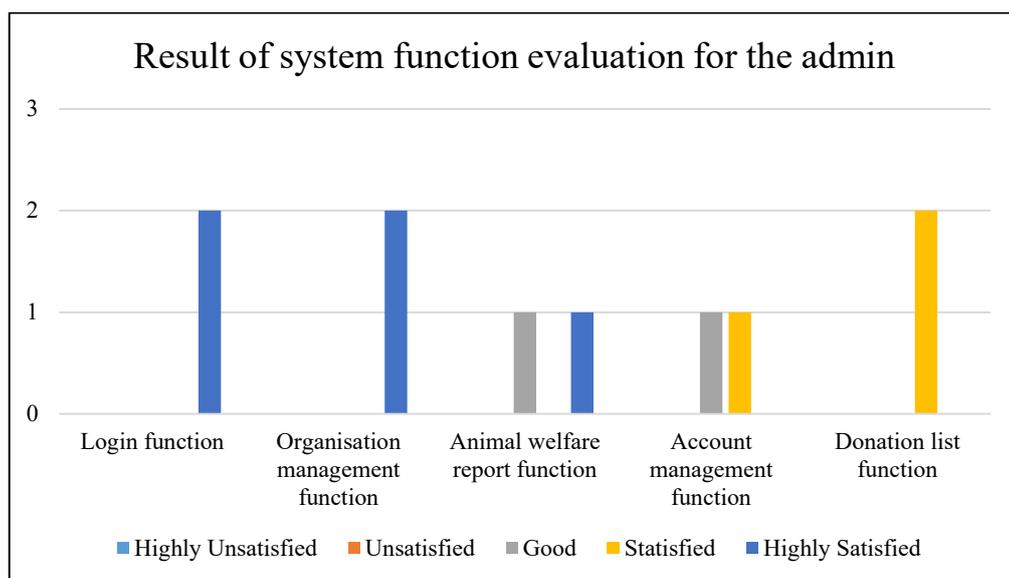


Figure 20: Result of system function evaluation for the admin

6. Conclusion

In conclusion, the proposed system is developed using the system prototyping development methodology. The phases that are involved in the system prototyping are planning, analysis, design, implementation, and testing. These phases are to ensure the completeness and quality of the web-based system for animal shelter and rescue is completed appropriately. All the context diagrams, flow charts, and database must be designed properly to be able to build the proposed system.

Few enhancements can be made to improve the system is adding more donation methods, such as online banking, and credit and debit cards should be added to give the public more options and raise the likelihood of donations. An invoice can also be issued to the public as proof of donation. Next, on the list of animal organisations, can be improved by including images or a logo for the animal organisation, as well as placing the precise location on Google Maps so that the public can use it as a reference while visiting the animal shelter to volunteer.

Appendix A

	Name	Duration	Start	Qtr 3, 2021		Qtr 4, 2021		Qtr 1, 2022			Qtr 2, 2022				
				Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	
1	Planning	65 days	7/1/21 8:00 AM	█		█									
2	Find supervisor	2 days	7/1/21 8:00 AM												
3	Find potential FYP title	2 days	7/5/21 8:00 AM												
4	Discuss with SV about project title	2 days	7/8/21 8:00 AM												
5	Mini Proposal	2 days	7/13/21 8:00 AM												
6	Project Research	30 days	7/16/21 8:00 AM	█											
7	Proposal	25 days	8/26/21 8:00 AM	█											
8	Analysis & Requirement	18 days	10/18/21 8:00 AM	█		█									
9	Determini hardware and software	4 days	10/18/21 8:00 AM	█											
10	Identify user requirement	5 days	10/22/21 8:00 AM	█											
11	Define functional requirement	3 days	10/29/21 8:00 AM	█											
12	Define non-functional requirement	3 days	11/3/21 8:00 AM	█											
13	Analyze data gathering	3 days	11/6/21 8:00 AM	█											
14	Design	39 days	11/11/21 8:00 AM	█		█									
15	Data flow design	5 days	11/11/21 8:00 AM	█											
16	Interface design	17 days	11/18/21 8:00 AM	█											
17	Database design	17 days	12/11/21 8:00 AM	█											
18	Implementation	58 days	1/8/22 8:00 AM	█		█									
19	Development the system	45 days	1/8/22 8:00 AM	█		█									
20	Connect with database	14 days	3/11/22 8:00 AM	█											
21	Testing & Maintainence	29 days	3/31/22 8:00 AM	█		█									
22	System testing	10 days	3/31/22 8:00 AM	█											
23	Identify limitation	10 days	4/14/22 8:00 AM	█											
24	Fix the bug	7 days	4/28/22 8:00 AM	█											
25	Release final system	3 days	5/6/22 8:00 AM	█											

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