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Pet Health Management System for Gebuu Veterinary Clinic

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***Abstract**: Pet Health Management System for GeBuu Veterinary Clinic is a way to help the pet owner set an appointment by using web bases system and not the old way by call the clinic to make appointment and fill in a form using pen each time visit the clinic. It is to ease the owner in applying appointment to check on their pet health. Owner can also check their pet vaccination or health history at the website, by choose which pet that he/she want to see if there multiple pets. With this system the owner does not need to search their pet card each time. While the admin that is the staff will manage the schedule of the appointment, make an order for medicine and reply to the question that will be ask and the vet can see the schedule and update the treatment that has been perform through the pet. While the supplier can also access the system but they can see the application order, update on the status application, delivery data and order history.*

***Keywords**: appointment, veterinary, pet health management system*

1.0 Introduction

Vaccination is a one for the easiest way to help it to a long and healthy life for your pets [2]. The pet owner needs to vaccinate their pets to avoid a deadly disease like canine parvovirus (parvo) or any disease/virus. The vaccination needs to be taken continually so that the pets body can develop antibody to fight the disease. Flu, fever, sore eyes and etc. can be cure before it gets worse, that is because from a mild disease or virus can also lead to a serious condition if not be treat fast. So, to prevent your pets to die or suffer, the owner need to keep updated on their pet health by sending to the veterinary clinic nearby for checkup.

The GeBuu Veterinary Clinic is Veterinarian that is a doctor that specialize in treating animal for example cat. The GeBuu Clinic Veterinary has 2 category service that they provide, that is in health like minor surgery, vaccination, dental scaling and the other part is related to grooming and pet hotel. The GeBuu Clinic has 2 clinics, the main clinic at Taman Idaman, Kluang and the branch clinic in Taman Kelisa Jaya, Batu Pahat. The branch clinic is newly open at the new location. The GeBuu clinic

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will register their patient by filling in a form that contain pet name, age and etc. The pet owner needs to fill that form each time they send their pet for a checkup or other services. Each pet that has been send there will receive a card that will get a vaccination shot.

The problem that arises, owner need to find the clinic phone number and chat them, so if the owner chats the clinic at a busy time the staff my overlook the chat. Also, from using a vaccination card the owner may sometime forget their pet's vaccination appointment. And if the happen they need to reschedule their pet vaccination at a later time but not too long so that it not overdue. If that happen the owner find or free their time to send their pets to the vet.

So, to avoid that problem the Pet Health Management System will provide the customer with a website so that the staff can get the notification and reply to them about the vaccination or other. It can also help in keep track of the next vaccination appointment date and give a reminder so that the owner can take their pets to get the shot on time. With the system the vet can also reduce the use of paper when a new patient admits to the clinic to take their vaccination because the pet's owner can just register in the clinic website and register their pets under their name. Also, the clinic can keep update what they will buy for the next month base on the report that has been generate previously.

2.0 Literature Review

2.1 Pet Health

To determine at what phase is your pet health the owner need to spend their time more with your pet. Other than spend more the owner need to know their breed type because each bread has their own way how to take care. Some pet needs to pay more attention about their health care to avoid any health issues that may occur if the owner has little knowledge about their pet breed. For example, Miniature Schnauzer prone to pancreatitis that cause by high level of fat in their blood, so that dog bread may need a special diet [1]. While some does not need to extreme care but still need to know about the pet bread so that can give the correct treatment if there any problem

Apart from knowing the breed type, their diet and nutrition also need to be known and apply in their daily life. The diet more on the calories that the pet will be intake. Give treats also has their own calories but limited the treat because it also not good give to many treats for the pet health. The treat can be given less than 10% from their daily calories. Also avoid given human food like chocolate, onions, garlic, raisins and grapes because it can cause harm to the pet health [2].

2.2 Veterinary Clinic Management System

Veterinary Clinic Management System is a tool that help to deal with the day-to-day operations of the veterinary. Also, to make it easier for the administration of the clients, employee, consultation (veterinary), services and products[3]. By providing the following basic features: pet, owners, employees registration so that they can manage their own page when they have login their account. The management system will handle the appointment that the owners has been made and arrange the date and time when the owner will need to be send. The employee will also handle the information that related to the treatment that the pet will be given.

With the management system the veterinary clinic can be uses to streamline tasks, reduce redundant operations, produce insightful business and operational reports in veterinary clinic. When use the management system every work will be under control so, it can increase the productivity of the team[4].

2.3 Comparison of equivalent systems

Comparison between the existed system and recommended system will be summarized in Table 1

Table 1: Comparison Table between existing system and Pet Health Management System for Gebuu Veterinary Clinic

	HEALT CLINIC KUALA SELANGOR	CITYVETS IN EXETER, DEVON	ONLINE APPOINTMENT SYSTEM 2.0 DEPARTMENT OF IMMIGRATION MALAYSIA	PET HEALTH MANAGEMNET FOR GEBU VETERINARY CLINIC
Booking/ Appointment	Yes	Yes	Yes	Yes
Registration	Yes	Yes	No	Yes
Reminder	No	Yes	No	Yes
Generate Report	No	No	No	Yes
Layout	Portrait	Landscape	Landscape	Landscape
Medicine Inventory	No	Yes	No	Yes
Supplier	No	No	No	Yes

The outcome of the comparison is that before developing the system the design and each of the layout can be organize first and know each of the flow from register to book appointment. From this comparison also we can see the layout of the system that is more suitable and ease on the eyes when looking it. By experience the 2-orientation option the layout of the system can be decide either portrait or landscape orientation. From this comparison can also show us each of the feature activity that some existing system have and some do not have. With that different activity, the new develop system can include it to improve the functionality of the system.

3.0 Project Methodology

The methodology that will be use in the development of Pet Health Management System is Agile Methodology[5].With the word agile it's mean that the model will be flexible and adaptable that any change that will be happening in the develop of the system can be handle without much difficulty.

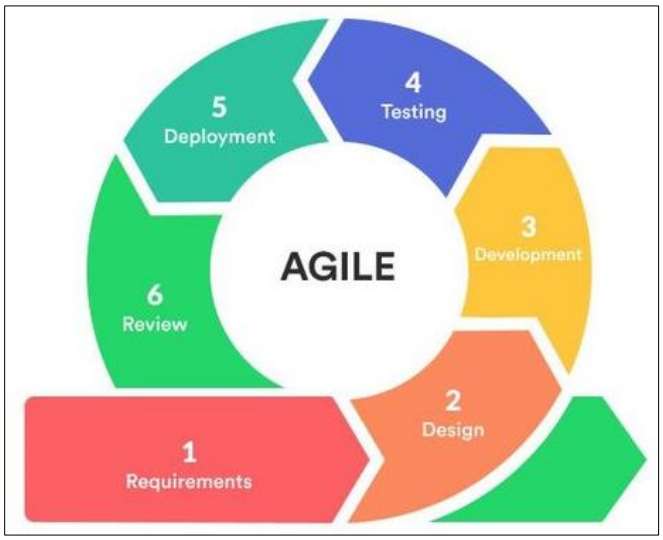


Figure 1: Agile Methodology

3.1 Requirements

Every system has their own interface that unique to their system. The function that will run in the system and if click that button what will happen or type this word what will happen. For that to happen the developer need to know what the client wants for them to design the interface that satisfy the customer/client requirement. Because of that the requirement is the first step/phase that need to be done so that the interface that will be develop contain what the client what for their system before develop process. So, everything that the client mention that need to be put in the system needs to be note down so that all the feature or function will be included in the system as what the client wants.

3.2 Design

After all the data or key requirement has been discuss and note down the next phase is design. There will be a team that responsible in design process that will sketch the rough view of the user interface base on the requirement that has be mention in the previous phase. This phase needs to be done so that the user interface has everything that the client wants in it. There also Data Flow Diagram (DFD) [6] that display the flow of the system that will happen in the system itself and Entity Relationship Diagram (ERD) that will also display an entity such as people, object that will involve in the framework of the system of Pet Health Management System [7].

With the DFD the flow of the system can be seen for example the customer what step will they take to make an appointment with the vet clinic for their pet. In that DFD the flow can be seen clearly, first they will login and if they are first timer they need to register first, then they need to input their pet's information, then what service that they want to make and etc.

Figure 2 will show the context diagram that is the function or entity that will be use the system and function that will happen in the system. While DFD leve1 1 will be show in Appendix C.

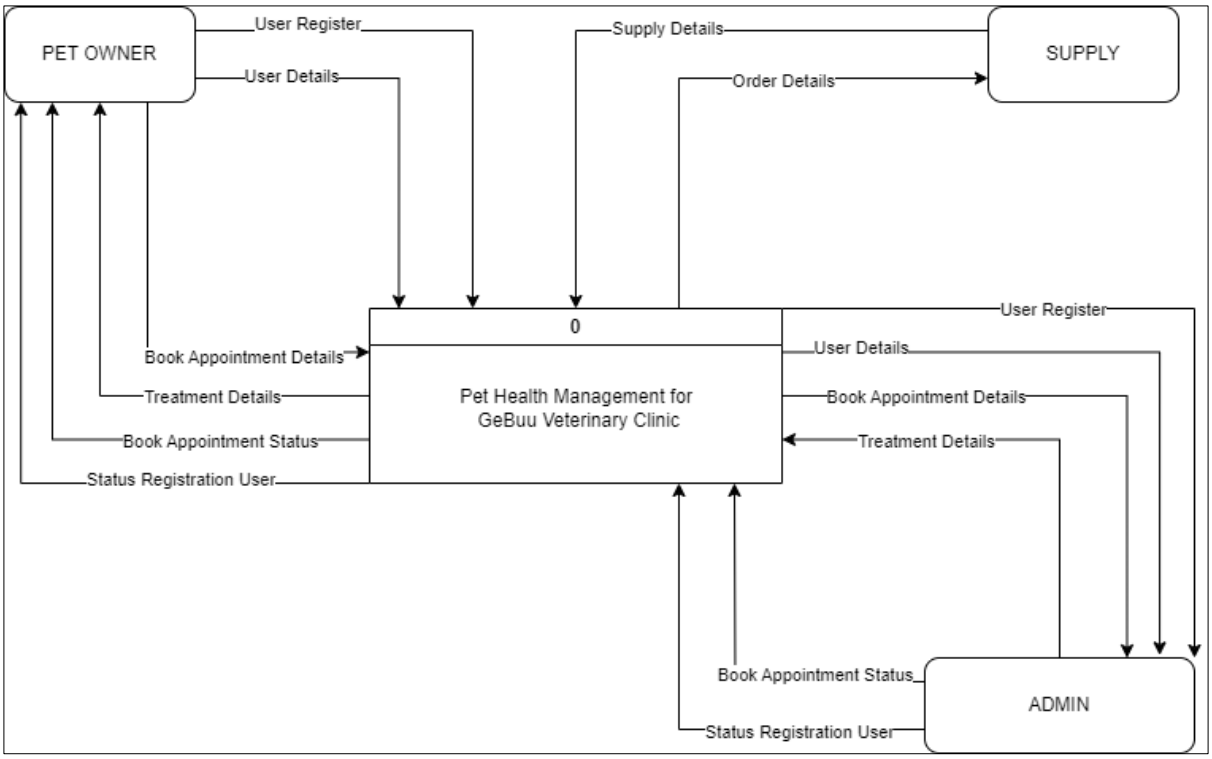


Figure 2: Context Diagram for Pet Health Management System GeBuu Veterinary Clinic

Figure 3 show the ERD is use to see the structure inside the database. Each of the data component in database will be call as an entity. In this part the database will store their own necessary data or information will be input by the user. For table pet it contain the information about the pet that has been register by their owner, the user is the personal details of each user that has register that is differentiated by their role (Owner, Staff, Vet and Supplier). The manage treatment table is what is the status of the pet that being treated either it is treated or in treatment. The medicine is the details regarding the medicine that the clinic uses to treat the pet. Pet medicine table is use to storge details of what medicine is given to that pet. Stock application table is the details of the order application when the medicine is running low.

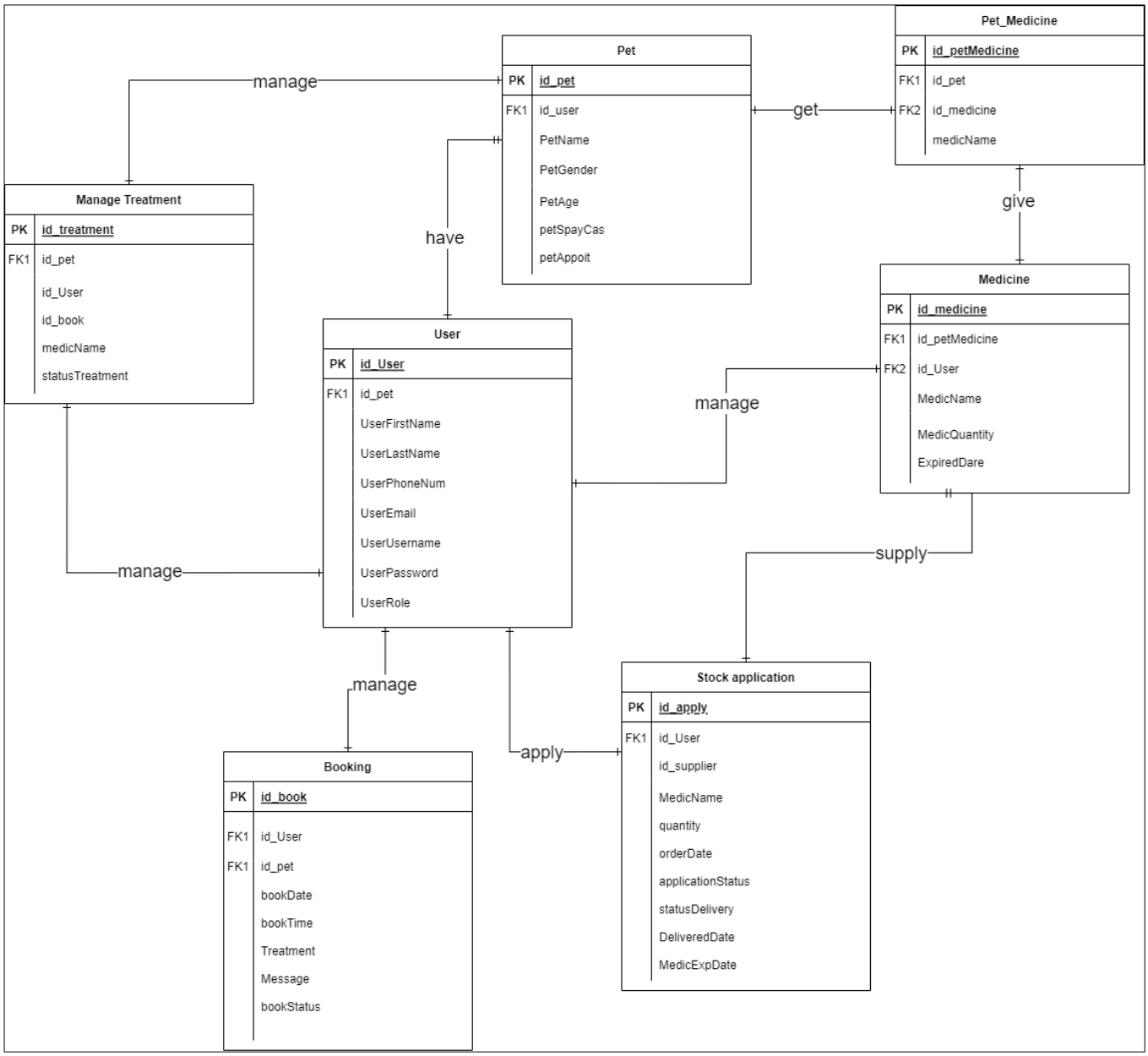


Figure 3: Entity Relationship Diagram for Pet Health Management System GeBuu Veterinary Clinic

Figure 4 show the that is a represent of workflow or the process that will be running inside the system. This flowchart can help the client in understand more about the flow of the system even if the client is not an IT student.

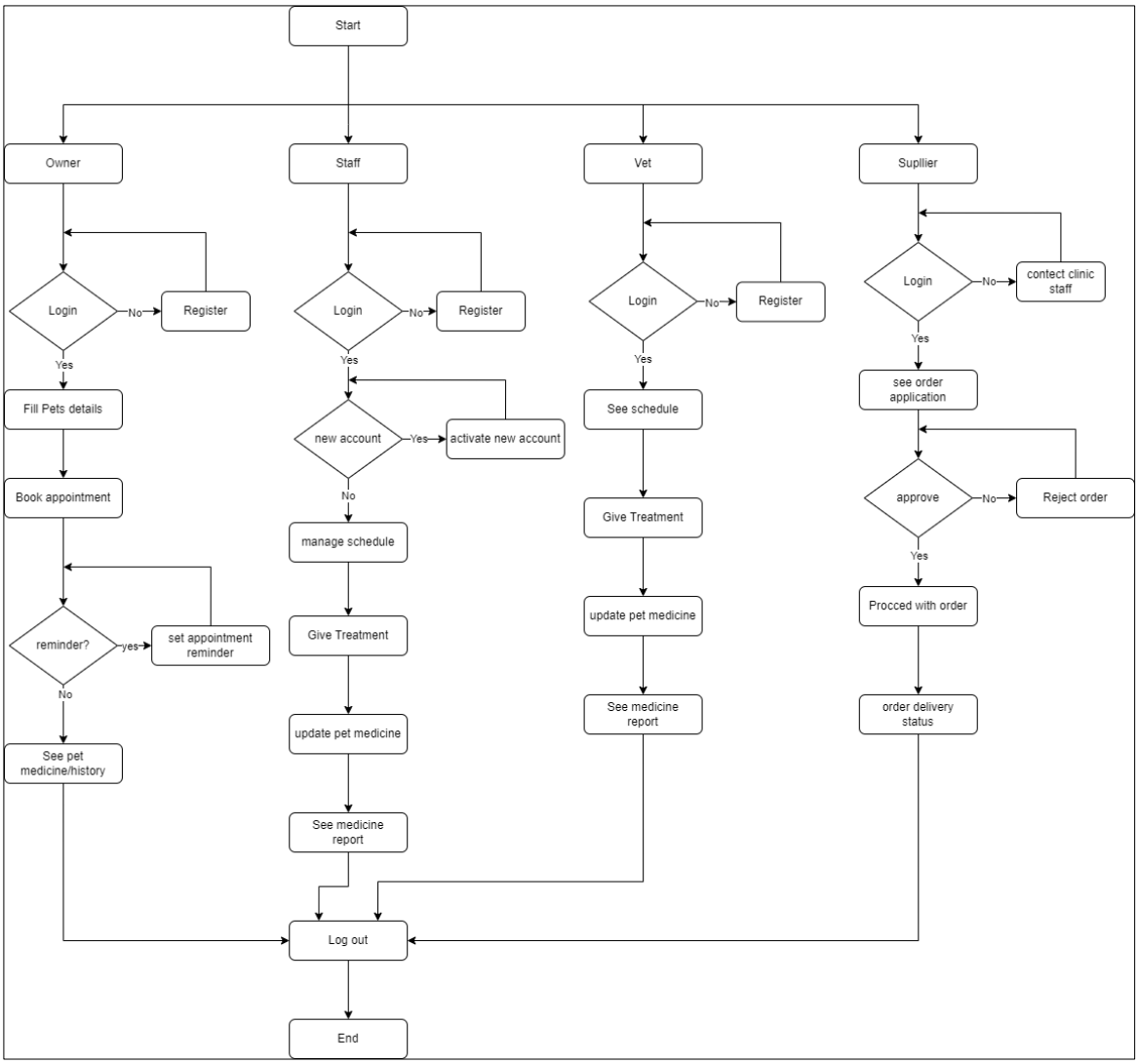


Figure 4: Flowchart of Pet Health Management System for GeBuu Veterinary Clinic.

3.3 Development

Development is coding that will be write in Visual Studio Code that involve UX and UI that will be code. The UI is about the user interface that has be finalize or discuss in the design phase so after agree upon the design the programmer will write the code to design the interface same as the sketch for example where the login button will be or where to put drop menu and etc. While UX is the inside of system that run or make the system function. For example, what will happen when click at appointment function or click contact me function where will it when and etc.

There will also connect with database so that all the information like for user their pet's names, phone number, name, username and password will be store under the customer table will staff or doctor information like name, phone number, email, username, password will be saved under employee table. So that when there any update the user of the system can change and the system will overwrite the previous information with new one. The database that will be use is PHP My Admin that need to download XAMPP so that the database can be use. The Programming language that will be use is HTML that will be the structure of the code, PHP the connection with the database, JavaScript the language that will make each button function and CSS that is for the design of the system interface

3.4 Testing

The testing phase where the code has been completed and need to be test if each function where to where it supposes to be like login button will when to login page where the customer or staff need to fill in their username and password. This phase also where the staff that that responsible to fill in the input will try to enter wrong input and see if there will be error message that indicate it is wrong and need to enter the correct input.

Other that the tester that tests or run the system by enter wrong data, the user or customer will be also testing it. User acceptance test will be conduct to make sure that the system can handle a real-world task and work as the requirement want. This is also an opportunity to the user to test the system before it is being release.

3.5 Deployment

The deployment phase is when the system is complete and has no error and can generate error message when enter wrong input. When all of that has been take care of the link will be release to GeBuu Veterinary Clinic customer or pet owner to test functionality of the system widely and also to make sure that the release of the system when smoothly without any error after release the system to the society. This also a change to get more feedback from the user about the functionality of the system.

3.6 Review

The review phase where the system will make a maintenance to upgrade the system or fix if there any problem with the system that has been release. After the release the company will maintain the system and see if there any bug so that they staff can do the debugging so that the system has no problem when the user or customer using it.

4.0 Results and Discussion

For the part in the result and discussion is to discuss and see if the system will run smoothly and each of the button will when to the correct page when click it. It will also test the system functionality to see if enter a wrong input, an error message will generate or not. So, if there any problem when run the system, a solution can be given to uphold the problem.

4.1 System Implementation

The system implementation is consisting of several module that is including in the system. Each of the module has their own activity that the user can use it when their access the system. The Pet Health Management System for GeBuu Veterinary Clinic consist of 8 modules. Some of the module is Registration module, Login Module and Pet Module. Each of that module has their own activity like add new pet and make an order for medicine

Figure 5 will show the login and register for pet's owner, staff (staff vet, vet) and login supplier and other interface will be show at the Appendix A and B.

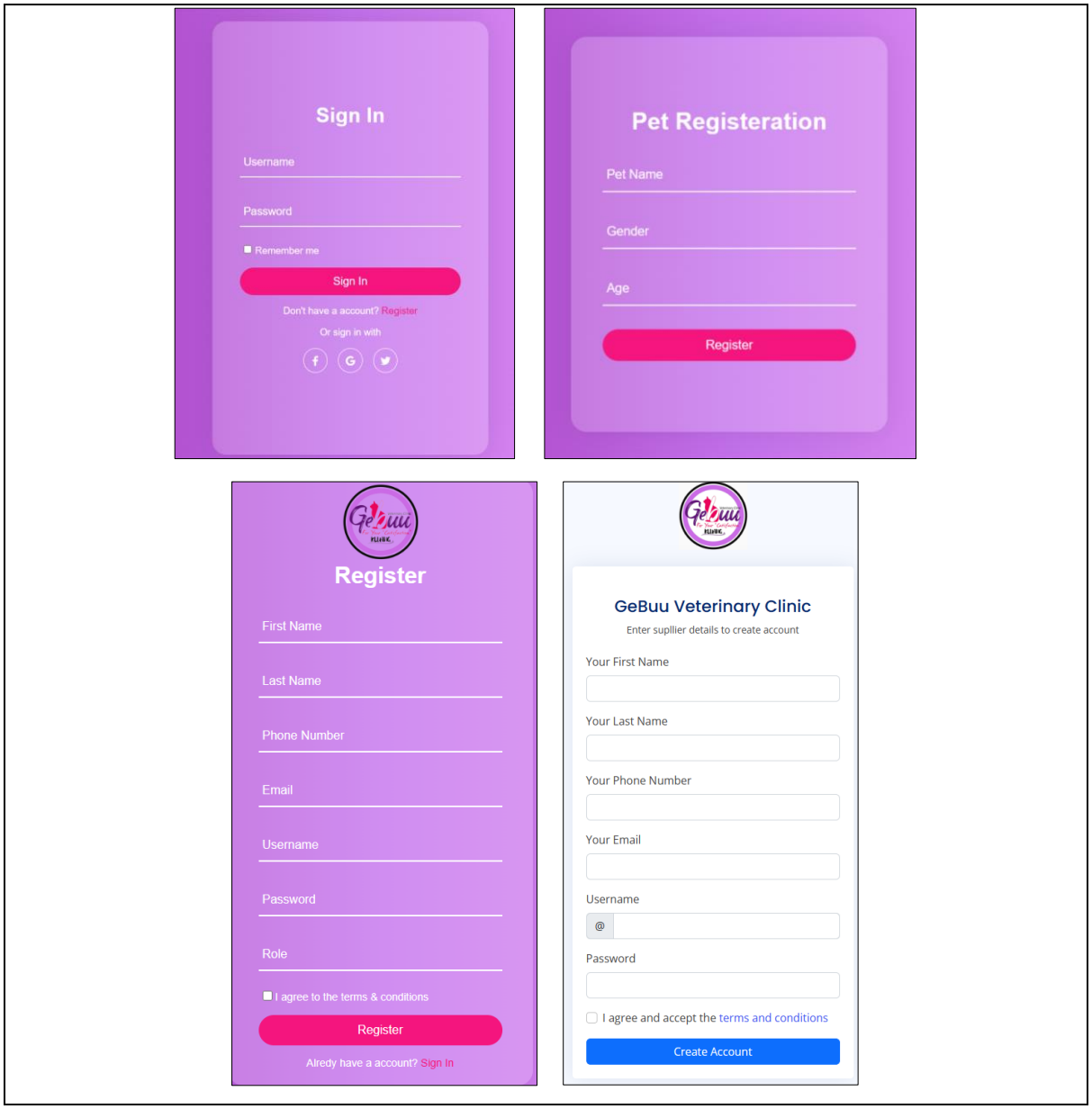


Figure 5: Login and register for pet's owner, admin (staff, vet) and login supplier

4.1.1 Registration Module

The registration module is an activity where the first-time user, new employee needs to do because in that form their personal detail required to be fill in so that their detail can be record and save. The Figure 6 show the interface of the registration form that consisting of name, email, number phone, username, password and role. The position part is the role of the person register. It needs to be fill in as Owner, Staff or Vet. The supplier also consisting the same detail but supplier registration will be fill in by the staff so that unauthorize or unknow supplier can be filter.

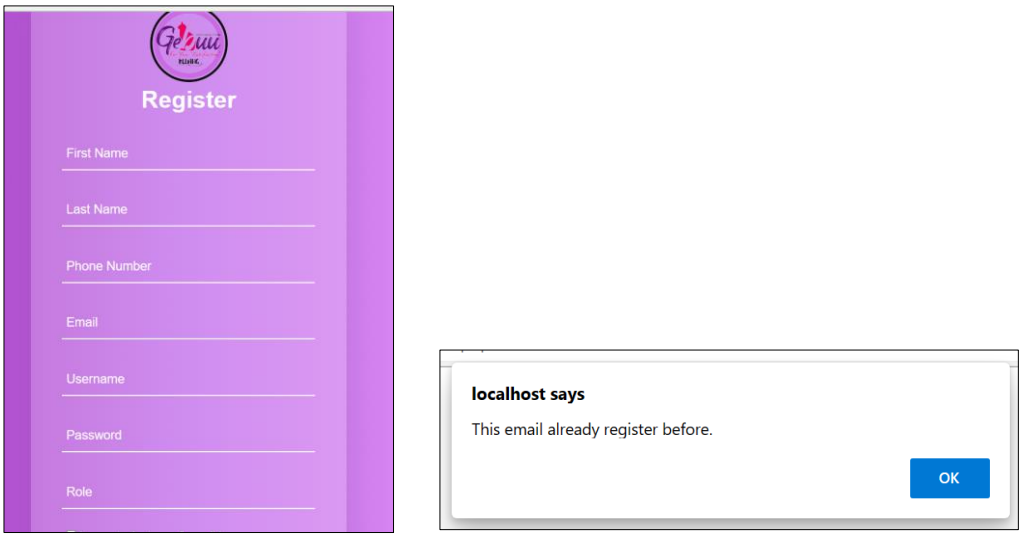


Figure 6: Registeration Module

The user will register their details through the form and if there are a similar email or username there will be a warning message that say it already register and give a message when succefully register. With that any duplicating email or username can be prevent. The Figure 7 show the code where the system will filter any same email and username. `$num` check the data from the `$names` to see if there are the same data and if there a same data the `$num` will became 1 and the if condition will be TRUE and the `$mesej` will be generate. If the condition for `$names` and `$names2` is FALSE the registeration is succesful.

```
$names = mysqli_query($con, "SELECT * FROM `user` WHERE userEmail='$Email'");
   $num = mysqli_num_rows($names);
   $myrow = mysqli_fetch_array($names);
   if($num>0){
      $mesej = "This email already register before.";
      ?><script type="text/javascript"> alert("<?php print $mesej; ?>");</script><?php
      ?><script type="text/JavaScript"> setTimeout("location.href='Register.php';",0);</script>
<?php
      exit;}
   $names2 = mysqli_query($con, "SELECT * FROM `user` WHERE
userPhoneNum='$Phone_Num'");
   $num2 = mysqli_num_rows($names2);
   $myrow2 = mysqli_fetch_array($names2);
   if($num2){
      $mesej = "This Phone Number already register before.";
      ?><script type="text/javascript"> alert("<?php print $mesej; ?>");</script><?php
      ?><script type="text/JavaScript"> setTimeout("location.href='Register.php';",0);</script>
<?php
      exit;
   }else{
    $sql = "INSERT INTO user (userFirstName, userLastName, userPhoneNum, userEmail,
userUsername, userPassword, userRole)
    VALUES ('$First_Name', '$Last_Name',
'$Phone_Num','$Email','$Username','$Password','$Role')";
```

```
    if (mysqli_query($con, $sql)) {
      $mesej = "Registration Success !!.";
      ?><script type="text/javascript"> alert("<?php print $mesej; ?>");</script><?php
      ?><script type="text/JavaScript"> setTimeout("location.href='../indexOut.php';",0);</script>
<?php
    } else {
      echo "Error: " . $sql . "
" . mysqli_error($con);}
```

Figure 7: Register Validation

4.1.2 Login Module

The login module the user will login their username and password to enter their account. The login module required the user to enter the correct username and password. If the either the username or password or both is wrong, there will be an error message mentioning the input data is incorrect.

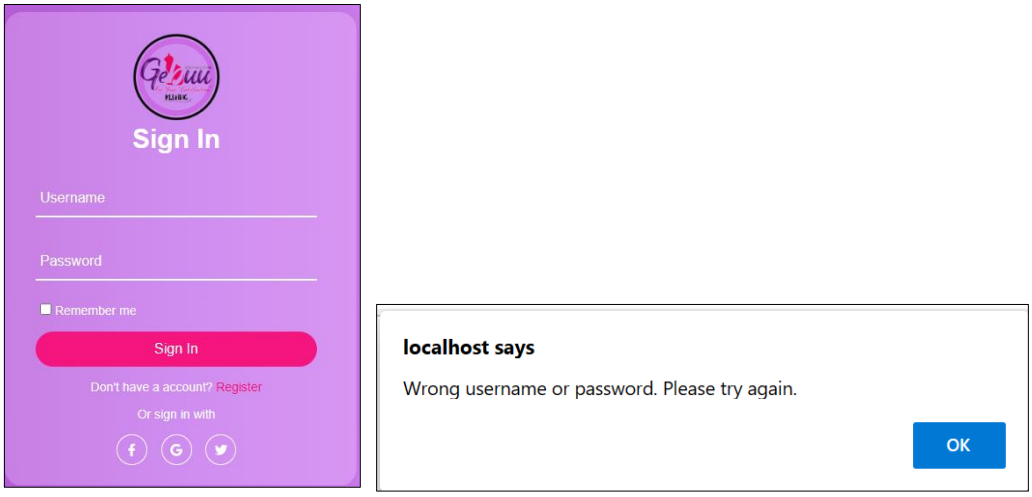


Figure 8: Login Module Interface

The code that shows in Figure 9 is the validation function that will check if the username and password that has been input is the same as in the database and that process will be done in the `$result`. From that the system will check which role they are so that the user will be send to the correct page.

```
//$result = mysqli_query($con, "SELECT * FROM user WHERE userUsername = '" . $Username.
"' and userPassword = '" . $Password . "'");
   $result = mysqli_query($con, "SELECT * FROM user WHERE userUsername = '" . $Username.
"' and userPassword = '" . $Password . "' and userRole = '" . $User . "'");

   if (mysqli_num_rows($result) > 0)
   {
      $row = mysqli_fetch_array($result);
      $_SESSION['Username']=strtoupper($row['userUsername']);
      $_SESSION['Password']=$row['userPassword'];
```

```
        $_SESSION['Name']=$row['userFirstName']." ".$row['userLastName'];
        //$_SESSION['Name']=$row['Name'];
        $_SESSION['User']=$row['id_user'];
        $_SESSION['userRole']=$row['userRole'];
        $_SESSION['email']=$row['userEmail'];

        if($_SESSION['userRole']=='Staff'){
           header('location:../NiceAdmin/AdminIndex.php');
        }
        if($_SESSION['userRole']=='Owner'){
           header('location:../indexOut.php');
        }
        if($_SESSION['userRole']=='Vet'){
           header('location:../NiceAdmin/VetIndex.php');
        }
        if($_SESSION['userRole']=='Supplier'){
           header('location:../NiceAdmin/SupplyIndex.php');
        }
    }
    else
    {
           $mesej = "Wrong username or password. Please try again.";
           ?><script type="text/javascript"> alert("<?php print $mesej; ?>");</script><?php
           ?><script type="text/JavaScript"> setTimeout("location.href='login.php';",0);</script>
<?php
           exit;}
```

Figure 9: Login Validation

4.1.3 Pet Module

The pet module consisting of the list of pets that is register under the owner that has login. The owner can add as many pets in the pet page. Where the owner needs to fill in a pet registration form, that is name, age and gender. After register the owner can see the treatment history that pet has undergoing. The owner can also update their pet details that is the name, age and gender, the owner can also delete pet details if the it has pass away. The spaying and castrated date and next vaccination appointment date will be set by the vet.

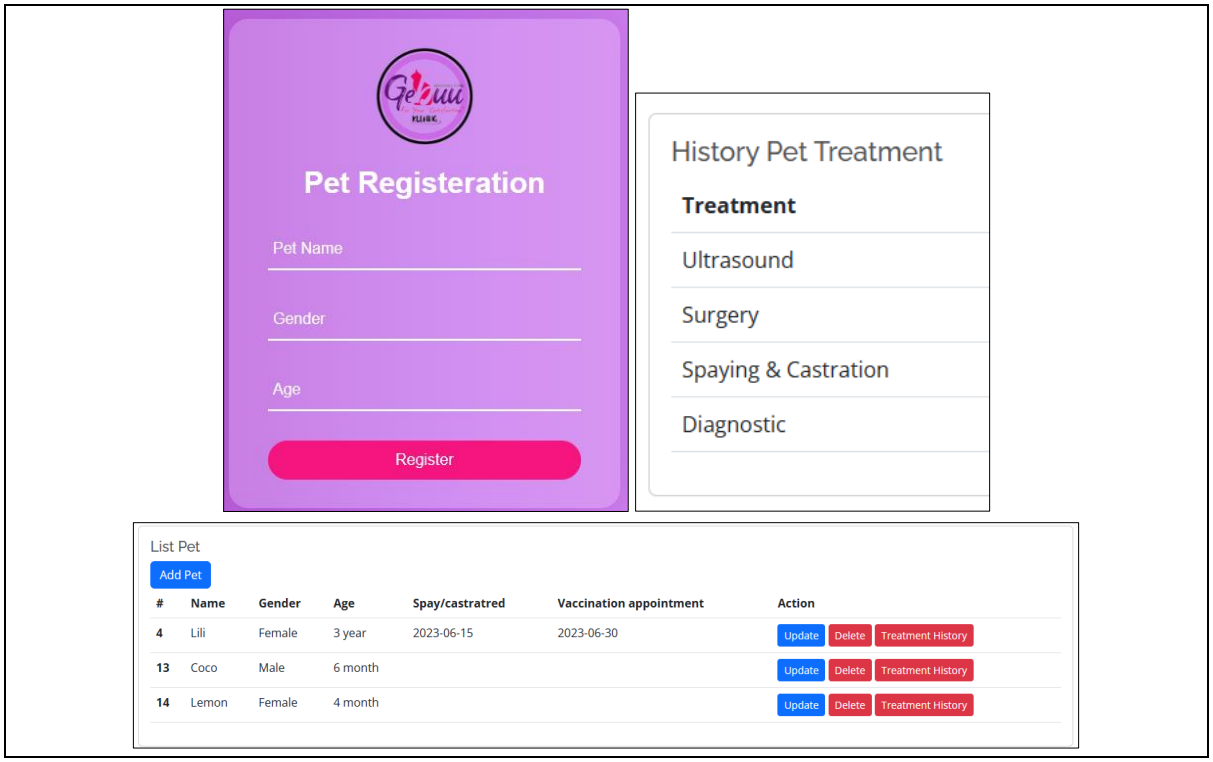


Figure 10: Pet Module

The Figure 11 and 12 show the function to update the pet details and display all the treatment history that the pet has undergoing. For Edit.php there will be a if condition that will check is the space has been fill and if it empty there will be error message but if there all has been fill the system will update a new data that has been fill (if any) and that will be done by `$sql` to update new data in database. TreatmentHis.php will retrieve and display all the treatment that had been done by the same `$id_pet`. So, that the owner can see what treatment that he/her pet has been undergoing so that they can monitor their pet health.

EditPet.php

```
if (empty($id_pet) || empty($Pet_Name) || empty($Pet_Gender) || empty($Pet_Age)) {
        $errorMessage = "All the fields are required";
    } else {
        $sql = "UPDATE pet " .
            "SET petName = '$Pet_Name', petGender = '$Pet_Gender', petAge = '$Pet_Age' " .
            "WHERE id_pet = $id_pet";
        $result = $con->query($sql);
        if (!$result) {
            $errorMessage = "Invalid query: " . $con->error;
        } else {
            $successMessage = "Pet details updated successfully";
            header("location: /Medilab/app/User/Pet.php");
            exit;} }
```

Figure 11: Update pet function

TreatmentHis.php

```
$sql = "SELECT DISTINCT p.petName, b.Treatment, mt.statusTreatment FROM booking b, pet p,
manageTreatment mt where b.id_pet=p.id_pet and b.id_pet=$id_pet group by b.id_book";
        $result = $con->query($sql);
        if(!$result){
          die("Invalid query: " . $con->error); }
        while($row = $result->fetch_assoc()){
          echo "
          <tr>
          <td>$row[Treatment]</td>
        </tr>";
```

Figure 12: List Treatment History

4.2 System functionality testing

The system functionality testing will be doing to see if the system that has been develop will be functional and each of the application feature work according to their task or software requirement [9]. With each of the function that has been build will corresponding with the requirement to make sure that the output is the same with the end-user's expectation. This testing will begin when the user enters the input, catch the output and see if the output is the same as the expected output.

the testing will be conduct as similar with a black-box testing. The black-box testing when the user tests the system without the knowledge of how the internal system work [10]. With the user/tester enter an input and monitor the output that the system generated. With the test that has been conduct it possible to make sure how the system responds to an expected and unexpected user action.

Table 2: System Functionality System

Bil	Functionality	Expected Result	Testing Result
		Registration Module	
1.	User Register their account	User successfully register their account	Pass
2.	User Staff register supplier account	User Staff successfully register supplier account	Pass
		Login Module	
3.	User Owner login using their username and password	Owner successfully login using their account username and password	Pass
4.	User Staff login using their username and password	Staff successfully login using their account username and password	Pass
5.	User Vet login using their username and password	Vet successfully login using their account username and password	Pass
6.	User Supplier login using their username and password	Supplier successfully login using their account username and password	Pass

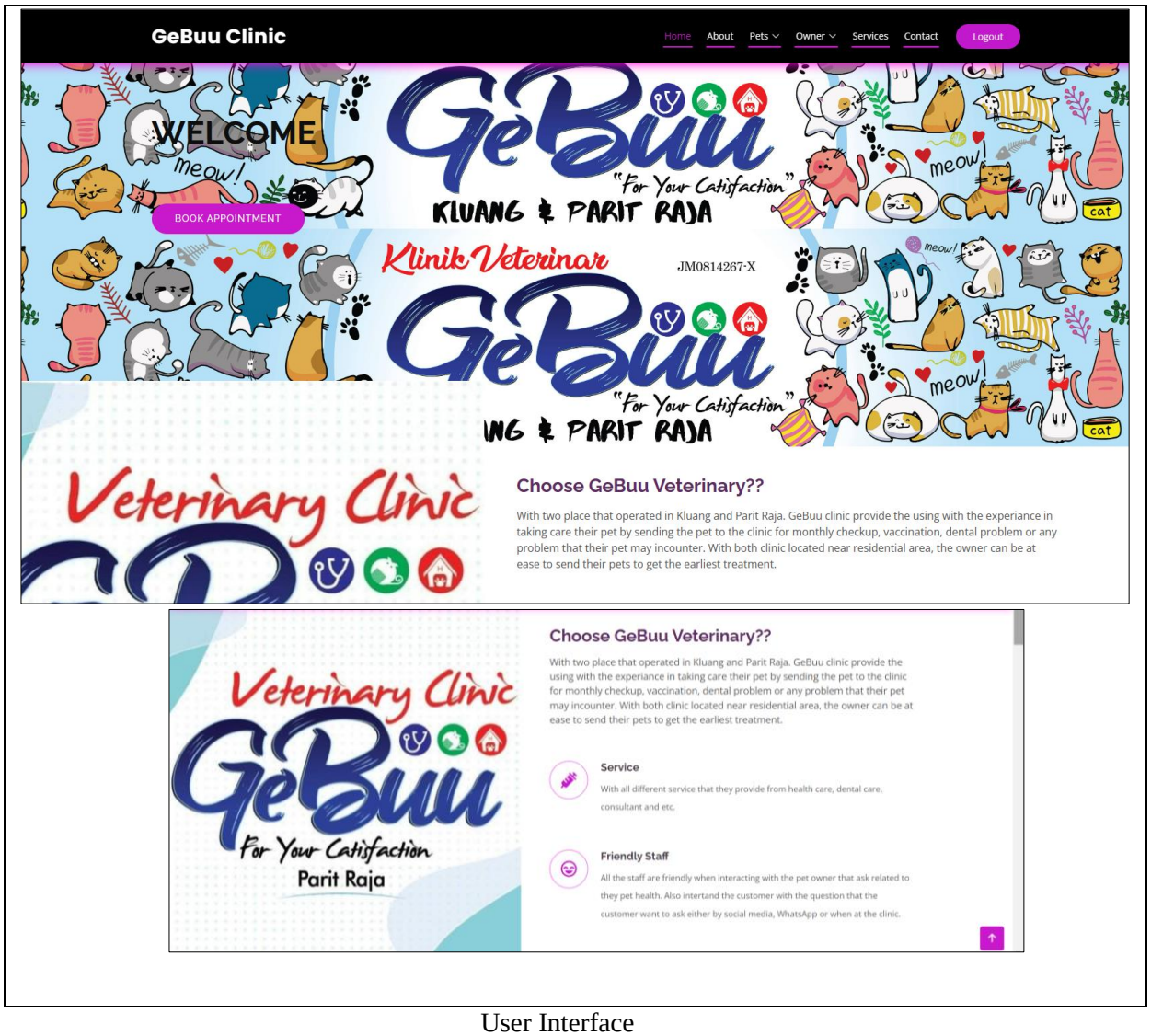
Bil	Functionality	Expected Result	Testing Result
		Pet Module	
7.	Owner when to the pet page	Owner successfully moved to the pet page	Pass
8.	Owner adds new pet	Owner successfully registered new pet	Pass
9.	Owner view pet treatment history	Owner successfully viewed pet treatment history	Pass
10.	Owner updates their pet details	Owner successfully updated their pet details	Pass

5.0 Conclusion

The conclusion from the development of the system is that the staff or veterinarian can quickly check the schedule of that date task or work because when the staff accept the booking made from the owner the booking information like name, age, gender and what treatment they want to book will be see when the veterinarian check their schedule. The owner can also add or deleted their pet record. So, when they visit the clinic the detail of their pet can be easily obtain by the staff and if save time in register each time they visit. The website can easily be access by anybody that want to register their pet at the GeBuu Veterinary Clinic because the website is web-based system that can be open via google browser or any browser. There are an advantage and also disadvantage of the system.

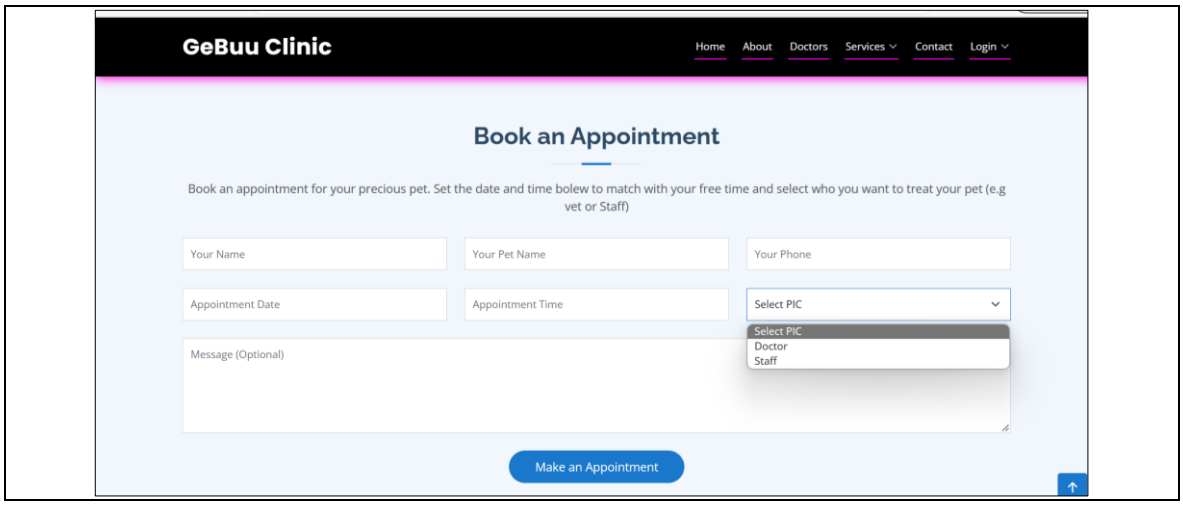
The advantage of the system is that it is easy to understand because the layout of the main interface is easy to know what button do what. It is also well organized for example, when the owner needs to see their pet detail, he/she can just click on the pet feature and it will display all the detail about your pet and has a button to add delete and update the pet detail. While for the staff, vet and supplier there can see order, appointment, medicine, schedule and etc. the veterinary party can save space in their database because of the delete button at the pet owner. The owner can just delete their pet detail that has pass away or when missing. The disadvantage of the system is there is not chat box that the staff and owner can communication between each other of there any question the owner wants to ask. Also, there no payment option in the system that the owner can pay the fee from the website. So, for the future work, the payment can be added so that the owner can pay using online bank in, PayPal or other payment method. Also add a space that the photo of the pet can be upload in the owner part and admin part.

Appendix A



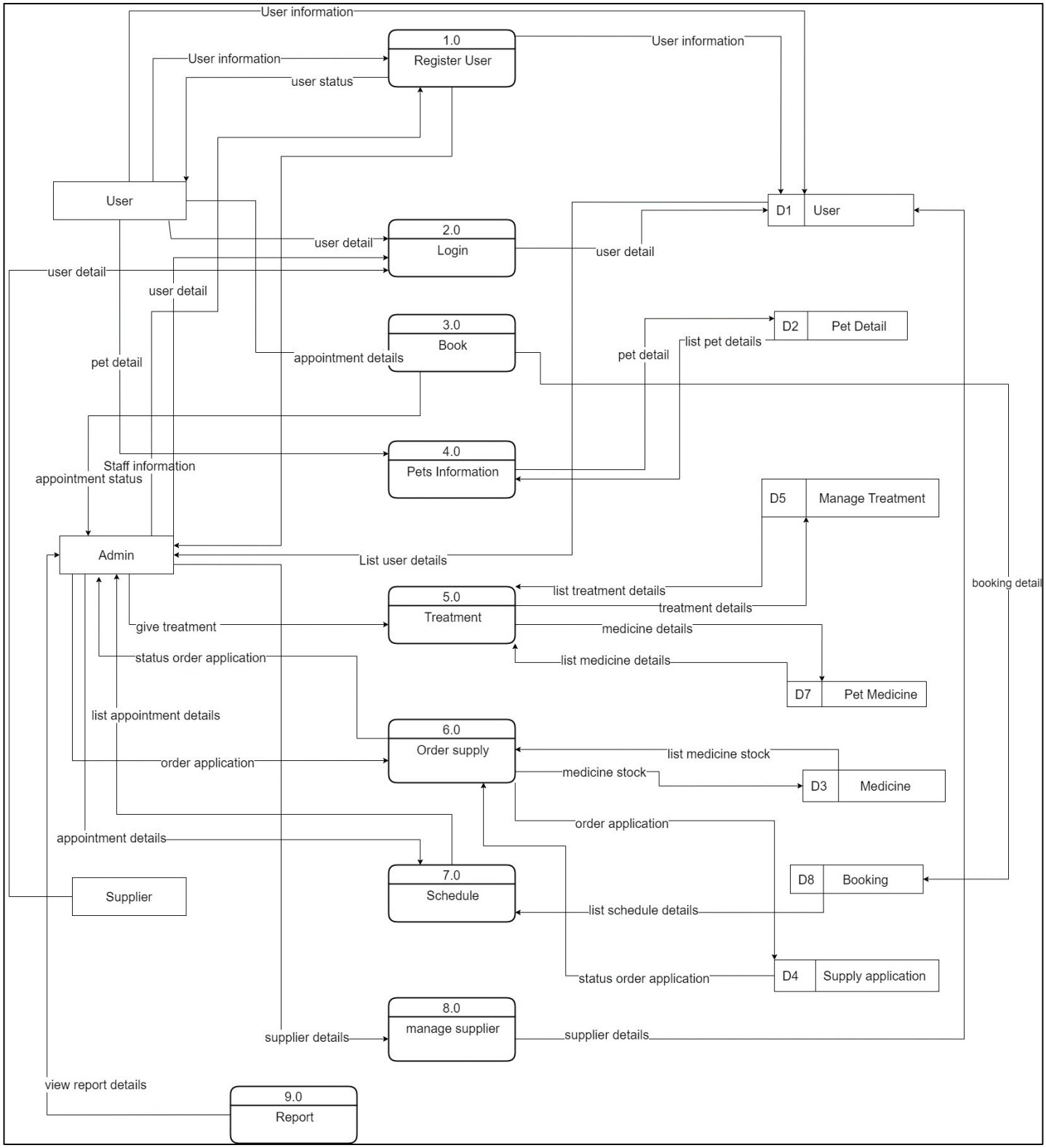
User Interface

Appendix B



Book Appointment Interface

Appendix C



Data Flow Diagram Level 1

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