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The Development of EliteVet: Veterinary Clinic Management System

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Abstract

In veterinary clinics, efficient management of customer's information and appointment booking are critical for delivering high-quality care. However, many clinics still rely on traditional paper-based systems, leading to challenges such as incomplete or inaccurate customer records and inefficient appointment booking processes. As a result, EliteVet was developed for Elite Veterinary Clinic and Surgery Tampin.This is related to various problems that customers confront, such as thedifficulty of filling out information on printed paper cards and the difficulty of making appointments for pets. This project implemented a prototyping model and object-oriented approach in developing and designing the proposed system. Hypertext Pre-Processor (PHP) language was selected for the development code, Visual Studio Code asa code editor, and MySQL to access the database. In addition, this system provides customers, pets, doctor's information, appointments, treatment, and pet hotel bookings, online payments, and report management. Overall, the proposed system demonstrates significant improvements in handling customer information and appointment booking, ultimately enhancing the service quality and operational efficiency of Elite Veterinary & Surgery Clinic.

1. Introduction

The veterinary industry is evolving beyond traditional medical care to encompass a wide range of services such as pet hotels, responding to a growing trend of diverse care options in the industry [1]. Elite Veterinary and Surgery Clinic, located in Bandar Tampin, Negeri Sembilan, has embraced this shift. Historically, the clinic has relied on manual, paper-based systems for recording customer data and booking appointments. Clients were required to visit or call the clinic to secure appointments, leading to challenges such as inefficient data storage, potential errors, and inconvenience for pet owners. The current paper-based system is plagued by issues including the absence of data verification, resulting in data loss and duplicate entries [2]. Additionally, the cumbersome cabinet system makes it difficult to access records during subsequent visits, while the appointment scheduling process is constrained by limited working hours. This also impedes customers from easily checking pet hotel availability, especially during peak times like holidays and weekends.

To modernize operations and address these challenges, a web-based veterinary clinic management system is proposed. The objectives of this system are to design a veterinary clinic management system using object-oriented approach, develop a veterinary clinic management system using web-based application, and test the functionality

and usability of the developed system using user acceptance testing. The proposed system is designed to cater to two main user categories: direct users (veterinary clinic owner and doctors) and indirect users (customers or pet owners). The clinic owner will manage comprehensive doctor and customer details, preferred payment methods, reporting, appointments, pet hotel bookings, and profiles for multiple pets.

This innovative system will streamline operations by enabling online appointment bookings, eliminating the need for physical visits or phone calls. It will centralize client records, allowing pet owners to conveniently view their pet's scheduled appointments and make online amendments and updates to their data. The system aims to enhance the clinic's efficiency and overall service quality by leveraging an object-oriented programming approach. Table 1 illustrates the modules and descriptions for the proposed system.

Table 1: Modules and Functions

No	Module	Description
1	Register	Users sign up for the system.
2	Login	Users log in securely.
3	Customer profile	Customers view/update profiles; admins manage user profiles.
4	Appointment	Customers book pet appointments; admins manage/approve them.
5	Pet hotel booking	Customers book pet hotels; admins approve/manage bookings.
6	Treatment	Customers select treatment packages and book appointments; admins create/update/delete treatments.
7	Pet information	Customers manage pet details; admins view, add, update, and delete pets per owner.
8	Doctor information	Admins manage doctor profiles; customers view them.
9	Report	Admins generate appointment, registration, and treatment reports.
10	Payment	Customers make payments via a gateway; admins approve payment statuses.

The project's goal is to create a developed system for Elite Veterinary & Surgery Clinic that would optimize operations and improve user experiences. It will efficiently handle appointment scheduling, provide real-time updates on pet hotel availability, manage pet treatment, provide complete control over doctor information, improve customer profile management, and simplify managing information for many pets. This solution is designed to increase the clinic's operating efficiency, reduce errors, and deliver a more convenient and smooth experience for both admins and customers.

2. Related Work

2.1 Background of Elite Veterinary and Surgery Tampin

Elite Veterinary and Surgery Clinic stands as a beacon of excellence in pet healthcare, serving as a haven for animal companions and their owners. The clinic, nestled in the vibrant locales of Seremban and Tampin, Malaysia, embraces a holistic approach to veterinary care, encompassing a diverse range of specialized services designed to address the myriad needs of pets. Dr. Benny Gabriel founded Elite Veterinary and Surgery Clinic Among in March 2013. The company is in No 488 & 489, Lorong Haruan 4/4, Oakland Commercial Centre, Seremban, Malaysia, and PT 853, Taman Seri Berlian, Tampin, Malaysia. Elite Veterinary and Surgery Clinic emerges as an esteemed institution dedicated to fulfilling the responsibility, offering a comprehensive suite of services tailored to meet the diverse needs of pets and their owners. One of the services offered is animal healthcare. At the core of Elite Veterinary and Surgery Clinic's offerings is comprehensive animal healthcare. Seasoned veterinarians conduct thorough examinations, devise tailored wellness plans, and administer treatments to address diverse health concerns in pets. Other than that, a pet hotel is also one of the services provided. Elite Veterinary and Surgery Clinic goes beyond healthcare provisions, extending a specialized Pet Hotel service, ensuring a safe, secure, and nurturing environment for pets when their owners are away. The Pet Hotel facilities are meticulously designed to replicate a home-like ambiance, fostering a stress-free and comfortable stay for furry guests.

2.2 Web-based Application

A web-based application is any program that can be accessed over a network connection via HTTP, rather than being stored on a device's memory. Web-based applications are frequently run within a web browser. However, web-based applications can also be client-based, in which just a small part of the program is downloaded to the user's desktop, but processing is done on an external server via the Internet [3]. Web-based applications have several advantages over traditional desktop software, the most notable of which being portability. Users do

not need to install additional software to utilize web-based apps, and developers do not need to create numerous versions of the same program for different operating systems [4]. The system can be created in various programming languages and employs various technologies and frameworks. No matter what operating system is installed on the client computer, a web-based program will execute in the browser. As a result, web-based apps are among the most flexible cross-platform solutions available today [5]. Thus, this approach is suitable to use for completing this project.

2.3 Study of Existing System

Veterinary Essential Services, VCA Animal Hospital, and LeeVet are three existing relevant systems that will be compared to the proposed system of this project in this section. The comparison will be made in a table based on the classification of certain features from the systems including the use of the term 'Yes' or 'No' to indicate the systems have or support such features. Table 2 demonstrates the comparison between the existing systems with the proposed system.

Table 2: Comparison of Three Existing Systems with Proposed System

Features/System	Veterinary Essential Services	VCA Animal Hospital	LeeVet	EliteVet
Login and sign up	No	Yes	No	Yes
Customer profiles	No	Yes	No	Yes
Appointment booking	Yes	Yes	Yes	Yes
Pet hotel booking	No	No	Yes	Yes
Treatment package and record	No	No	No	Yes
Pet management	No	No	No	Yes
Doctor information	Yes	Yes	Yes	Yes
Report	No	No	No	Yes
Online payment	No	No	No	Yes

According to Table 2, it can be seen there were significant inequalities in existing systems when compared to the proposed EliteVet system. Veterinary Essential Services and LeeVet lack key features including login and sign-up, client profiles, treatment records, pet management, reports, and online payment options. VCA Animal Hospital provides more complete services, however, it falls short in features like pet hotel bookings, treatment records, pet management, reports, and online payments. EliteVet system addresses all these gaps, providing a comprehensive solution that includes login and sign-up, customer profiles, appointment, and pet hotel booking, detailed treatment packages and records, pet management, doctor information, reporting, and online payment. This makes EliteVet a more robust and efficient system, capable of significantly improving the operational efficiency and service quality of veterinary clinics.

3. Methodology

The Prototyping Model is implemented to assist in the development of the EliteVet Management System. The prototyping Model consists of planning phase, analysis phase, design phase, implementation phase, and testing phase. The prototype will be used to collect input from users and management, as well as user suggestions for enhancing or repairing the system that has been prototyped, possible discoveries, and evaluation plans that specify which components of the system should be finished first or which parts of an entity should be prototyped next [6]. This process continues until every stakeholder involved agrees that the prototype is sufficiently functional to be implemented and used [7]. The process of prototyping model with its phases is illustrated in Figure 1. Table 3 shows the description of software development activities and tasks.

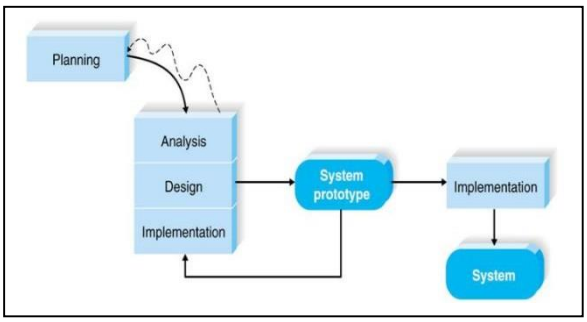

Figure 1: System Prototyping [7]

Table 3: Software Development Activities and Task

Phase	Task	Output
Planning	- Determine the project schedule, activities, and output - Identify problems, objectives, and scope	- Project proposal - Develop Gantt Chart
Analysis	- User requirement - System development requirement - System requirement	- Problem identification and data collection through an interview - Software and hardware requirements for the developer and user
Design	- Design database - Design interface - System architecture	- Wireframes of user interface - Database design (class diagram and data dictionaries) - System Architecture Design
Implementation	- Develop the system modules that connect with the database	- Proposed System
Testing	- User acceptance testing	- Error found and fixed, ensure that users are satisfied with the system

4. Analysis and Design

This section delves into a detailed analysis and design of the proposed EliteVet system. Following the requirement analysis, the design phase will cover the use case and class diagram, database schema, user interface design, and overall integration of the modules to create a seamless and efficient veterinary management system.

4.1 Functional Requirements

As shown in Table 4, Functional requirement analysis is a process that shows the developer the functionalities of the modules for the proposed system.

Table 4: Functional requirements for the proposed system

No	Function	Functionalities
1.	Register	- Allow users to register new account before continuing access to the system.
2.	Login	- Allow users to log in to the system using email and password.
3.	Customer profile	- Allow customers to view and update their profile. - Allow the administrator to view, add, update, and delete customer profiles.
4.	Appointment booking	- Allow customers to view and update their profile. - Allow the administrator to view, add, update, and delete customer profiles.
5.	Pet hotel booking	- Allow customers to book a pet hotel by giving pet details and choosing the type of cages (medium or large).

		- Allow the administrator to view and delete pet hotel bookings.
6.	Treatment	- Allow customers to view the treatment details and records of their pet and select the treatment packages for each pet. - Allow the administrator to create a treatment package and track the treatment history of each pet.
7.	Pet	Allow customers to add, update, or delete their pet's details. - Allow the administrator to add, update, or delete a customer's pet details
8.	Doctor information	- Allow the customer to view the doctor's information including their name, specialization, working day, and off day. - Allow the administrator to add, update, and delete the doctor's information.
9.	Report	- Allow the administrator to view and generate reports (appointment details report and customer registration report).
10.	Payment	- Allow customers to make a payment after subscribing to the pet hotel and the treatment packages. - Allow the administrator to check the status of payment and track the status of payment made by the customer.

4.2 Non-Functional Requirements

A system's quality attribute is defined by non-functional requirements. A non-functional ensures the whole software system's performance, usability, and security. The non-functional requirements of the proposed system are stated in Table 5.

Table 5: Non-Functional requirements for the proposed system

No	Requirement	Functionalities
1.	Performance	• Response time: The system shall respond within a reasonable time frame for all user interactions.
2.	Usability	• User interface: The interface shall be intuitive, user-friendly, and accessible to both customers and admins.
3.	Security	• Authentication and authorization: Implement secure login mechanisms and restrict access based on user roles.

4.3 User Requirements

User requirements are a crucial aspect of system design, defining the necessary functionalities and features that the system must have to meet the needs and expectations of its users. These requirements are essential for ensuring the system's success, as they provide a clear understanding of the end-users, including customers, admins, and doctors. The specific user requirements for each group are described in Table 6.

Table 6: User requirements for the proposed system

No	Role	Requirements
1.	Customer	• User shall be able to register an account in the system. • User shall be able to log in to the system via email and password. • User shall be able to change new password if forgot password. • Customer shall be able to view and update their profile. • Customer shall be able to book an appointment by entering owner name, pet name, pet type, reason, treatment type, date, time slot, and desired doctor. • Customer shall be able to print out appointment receipt for evidence of booking. • Customer shall be able to book a pet hotel slot by giving pet details, check-in and checkout date, and selecting size of the cage. • Customer shall be able to view and select the treatment packages with pricing for their pet.

		• Customer shall be able to add, update, and delete pet profiles. • Customer shall be able to view doctor information. • Customer shall be able to make a payment for treatment and pet hotel services.
2.	Admin	• Admin shall be able to view, add, update, and delete customer profiles if necessary. • Admin shall be able to view and update the status of appointments whether it is approved or rejected. • Admin shall be able to view and update the status of pet hotel booking. • Admin shall be able to create new treatment, update existing treatment, and delete the treatment. • Admin shall be able to add, update, and delete pet profiles. • Admin shall be able to add, update, and delete doctor information. • Admin shall be able to generate reports in the system. • Admin shall be able to update the status of payment.
3.	Doctor	• Doctor shall be able to view the appointment and update the status of appointments whether it is approved or rejected. • Doctor shall be able to comment on the pet's treatment session.

4.4 System Analysis

Figure 2 shows the use case diagram that represents the overall activity of the new system. All the users will perform the registration and login process to enter the system. Domain class diagrams are used to illustrate the proposed system based on the classes in their relationships. Figure 3 illustrates the domain class diagram for the proposed system.

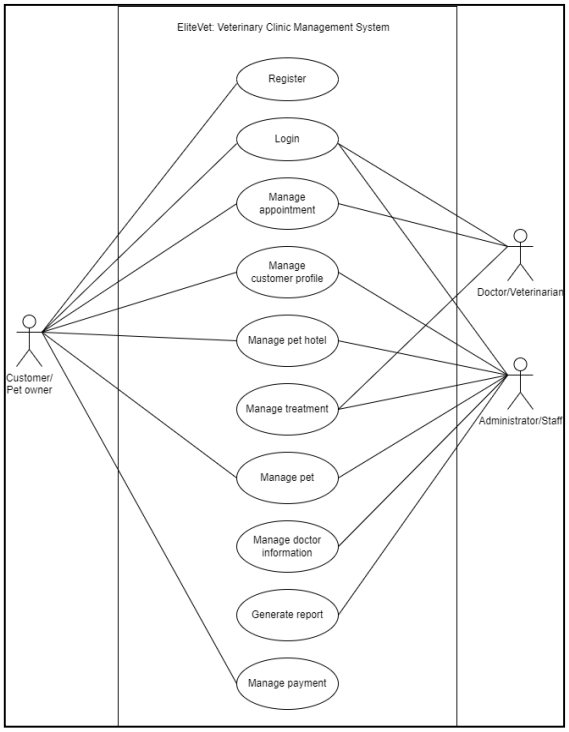

Figure 2: Use-case diagram for EliteVet

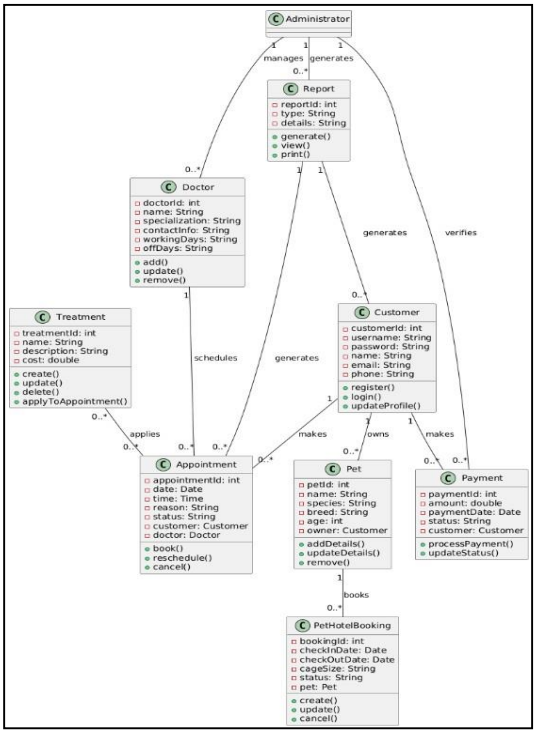

Figure 3: Domain Class Diagram

Several class diagrams are generated and shown in Figure 3. These diagrams outline the system's structure by illustrating the relationships between different classes. The domain class diagram, specifically, is derived after completing the sequence diagram, which details the interactions between objects over time. Additionally, the sequence diagrams and activity diagrams, which depict the flow of control and data, are included in Appendix A for further reference and clarity.

4.5 Database Schema

The database schema is a database design that contains entities and attributes. The database used for the proposed system is MySQL. The data schedule structure in the database is shown as:

(a) **User** (userid, email, password).
(b) **Customer** (customerId, firstName, lastName, icNum, phoneNum, email, username, password).
(c) **Admin** (adminId, firstName, lastName, icNum, phoneNum, email, username, password).
(d) **Doctor** (docId, docName, docIcNum, specialization, workingDay, offDay).
(e) **Pet** (petId, status, petName, petType, petGender, dob, age, species, breed, petWeight, petHeight, petLength, petOwner).
(f) **Appointment** (appointmentId, petName, petType, phoneNum, email, reason, treatmentType, date, timeSlot, docName, status).
(g) **Appointment Receipt**(receiptId, petOwner, phoneNum, petName, timeslot, status).
(h) **Treatment** (treatmentId, treatmentName, treatmentType, description, cost).
(i) **Payment** (paymentId, treatmentHistory, treatmentPricing, paymentReceipt).
(j) **Payment Receipt** (receiptId, receiptDetails, paymentDate).
(k) **Report** (appointmentDetailsReport, customerRegistrationReport, highestTreatmentReport).

4.6 Interface Design

The veterinary clinic management system interface is organized into several modules, each designed to cater to the specific needs of different user roles. Upon accessing the system, users are greeted by the **Dashboard Homepage** (see Appendix B), which serves as the central hub for navigation.

4.6.1 User Registration and Login

Before accessing the system, users must **register an account** (see Appendix B), providing their details to create a unique user profile. Once registered, users can access the **Login Page** by entering their registered email and password. This secure process ensures that only authorized users can access the system's features.

4.6.2 Appointment Management

For scheduling pet visits, the **Appointment Page** (see Appendix B) allows customers to book appointments by selecting the date, time, and reason for the visit. This module optimizes the appointment process, making it convenient for customers to manage their pet care. Admins can use the Manage Appointment Page to facilitate physical appointment bookings, ensuring that all in-person visits are efficiently organized.

4.6.3 Pet Accommodation

The system also offers a **Pet Hotel Page** (see Appendix B), where customers can reserve accommodations for their pets. Customers can choose from various packages, enter necessary details, and submit their booking requests. Administrators can manage these bookings through the **Manage Pet Hotel Page**, which provides tools to oversee and adjust reservations as needed.

4.6.4 Doctor Information

To help customers make informed decisions, the **Doctor Page** (see Appendix B) provides comprehensive information about the clinic's doctors. This includes their qualifications, specialties, and availability. Administrators can maintain this information using the **Manage Doctor Page**, where they can add, modify, or remove doctor profiles.

4.6.5 Treatment Options

The **Treatment Page** (see Appendix B) offers customers detailed information about available treatment packages, including a 'Learn More' button for additional details. This enables customers to choose the best care for their pets. The **Manage Treatment Page** allows administrators to manage these packages, including adding new treatments or updating existing ones.

4.6.6 User and Pet Profiles

The **My Profile Page** (see Appendix B) enables customers to view and edit their personal information, ensuring that their profiles are up to date. Additionally, the **My Pet Page** (see Appendix B) allows customers to manage information about their registered pets. For administrative purposes, the **Manage Pet Page** provides a comprehensive overview of all registered pets, with functionalities for updating or modifying pet information.

5. Result and Discussion

5.1 Test Case

Two types of testing will be used to test the functionality of the system which are functional testing and user acceptance testing. Test cases are used to make the testing process organized and well-structured. It will assist in tracing and finding any possible bugs or errors in the system, and making sure all the requirements are tested. Table 7 shows the test cases according to the modules. As a result, there are 69 test cases tested. Table 8 shows the overall test case result.

Table 7: List of test cases for each module

Test Cases ID	Requirement ID	Description	Actual Result
TC_100	**REQ_100**	**REGISTER**	
TC_100_01	REQ_101	The system shall be able to display the registration page.	Pass
TC_100_02	REQ_102	The system shall allow users to enter registration details including name, IC number, phone number, email, username, and password.	Pass
TC_100_03	REQ_103	The system shall be able to display an error message if there is a field that has no input.	Pass
TC_100_04	REQ_104	The system shall be able to display an error message if the account is already registered.	Pass
TC_200	**REQ_200**	**LOGIN**	
TC_200_01	REQ_201	The system shall be able to display the login page.	Pass
TC_200_02	REQ_202	The system shall allow the user to enter an email and password.	Pass
TC_200_03	REQ_203	The system shall be able to display an error message if there is a field that has no input.	Pass
TC_200_04	REQ_204	The system shall be able to display an error message if the user enters the wrong email format.	Pass
TC_200_05	REQ_205	The system shall be able to display an error message if the account does not exist or if the password is wrong.	Pass
TC_200_06	REQ_206	The system shall be able to display forgot password page if the user clicks forgot password link.	Pass
TC_200_07	REQ_207	The system shall allow the user to enter email.	Pass
TC_200_08	REQ_208	The system shall be able to display an error message if the account does not exist or is not registered yet.	Pass
TC_200_09	REQ_209	The system shall be able to display the reset token link if the user enters the right email.	Pass
TC_200_10	REQ_210	The system shall allow the user to enter a new password and confirm a new password.	Pass
TC_200_11	REQ_211	The system shall be able to display an error message if the confirmed new password is not the same as first entering a new password.	Pass

TC_200_12	REQ_212	The system shall allow the user to logout.	Pass
TC_200_13	REQ_213	The system shall be able to display a confirmation message before logging out from the user account.	Pass
TC_300	**REQ_300**	**MANAGE CUSTOMER PROFILE**	
TC_300_01	REQ_301	The system shall be able to display a customer profile page.	Pass
TC_300_02	REQ_302	The system shall allow the customer to view and update their profile.	Pass
TC_300_03	REQ_303	The system shall be able to display a confirmation message before the user continues to update the profile.	Pass
TC_300_04	REQ_304	The system shall be able to display an error message if there is a field that has no input.	Pass
TC_300_05	REQ_305	The system shall allow the admin to add, update, and delete the user profile.	Pass
TC_300_06	REQ_306	The system shall be able to display a confirmation message before continuing to update and delete the customer profile.	Pass
TC_400	**REQ_400**	**MANAGE APPOINTMENT**	
TC_400_01	REQ_401	The system shall be able to display the appointment page.	Pass
TC_400_02	REQ_402	The system shall allow customers to enter appointment details including the customer's name, pet name, date, treatment type, time slot, and the desired doctor.	Pass
TC_400_03	REQ_403	The system shall be able to display an error message if there is a field that has no input.	Pass
TC_400_04	REQ_404	The system shall be able to display a successful message after the customer books an appointment.	Pass
TC_400_05	REQ_405	The system shall allow the customer to print the appointment receipt as evidence of the appointment.	Pass
TC_400_06	REQ_406	The system shall allow customers to make a payment.	Pass
TC_400_07	REQ_407	The system shall be able to redirect the customer to the payment page and payment gateway.	Pass
TC_400_08	REQ_408	The system shall allow customers to upload payment receipts as evidence of payment.	Pass
TC_400_09	REQ_409	The system shall allow the admin to view and give approval or rejection of the appointment.	Pass
TC_400_10	REQ_410	The system shall be able to display a confirmation message before continuing to approve or reject the appointment bookings.	Pass
TC_400_11	REQ_411	The system shall allow the doctor to view the appointment.	
TC_500	**REQ_500**	**MANAGE PET HOTEL**	
TC_500_01	REQ_501	The system shall be able to display the pet hotel page.	Pass
TC_500_02	REQ_502	The system shall be able to display a reminder message for customers to take a pet vaccination before booking a pet hotel.	Pass
TC_500_03	REQ_503	The system shall allow customers to enter pet hotel booking form details for their pet.	Pass
TC_500_04	REQ_504	The system shall be able to display an error message if there is a field that has no input.	Pass
TC_500_05	REQ_505	The system shall be able to display an error message if the booking slot is full.	Pass
TC_500_06	REQ_506	The system shall allow the admin to view or delete the pet hotel bookings.	Pass
TC_500_07	REQ_507	The system shall be able to display a confirmation message before continuing to delete the appointment.	Pass
TC_600	**REQ_600**	**MANAGE TREATMENT**	
TC_600_01	REQ_601	The system shall be able to display the treatment page.	Pass
TC_600_02	REQ_602	The system shall allow the customer to choose a treatment type for their pet.	Pass
TC_600_03	REQ_603	The system shall allow customers to view the pricing page for each treatment type for pets.	Pass
TC_600_04	REQ_604	The system shall be able to redirect to the appointment page to book an appointment for the selected treatment.	Pass

TC_600_05	REQ_605	The system shall allow the admin to view the appointment for the selected treatment, add a new treatment type, update existing information of treatment, and delete the treatment.	Pass
TC_600_06	REQ_606	The system shall be able to display a confirmation message before continuing to update or delete the treatment.	Pass
TC_600_07	REQ_607	The system shall allow the doctor to make comments for the pet treatment session.	Pass
TC_700	**REQ_700**	**MANAGE PET INFORMATION**	
TC_700_01	REQ_701	The system shall be able to display the pet information page.	Pass
TC_700_02	REQ_702	The system shall allow customers to view pets, add new pets, update existing pet profiles, and delete pets.	Pass
TC_700_03	REQ_703	The system shall be able to display a confirmation message before continuing to update and delete the pet profile.	Pass
TC_700_04	REQ_704	The system shall allow customers to enter all pet information.	Pass
TC_700_05	REQ_705	The system shall be able to display an error message if there is a field that has no input.	Pass
TC_700_06	REQ_706	The system shall allow the admin to view, add, update, and delete pet profiles.	Pass
TC_800	**REQ_800**	**MANAGE DOCTOR INFORMATION**	
TC_800_01	REQ_801	The system shall be able to display the doctor information page.	Pass
TC_800_02	REQ_802	The system shall allow customers to view doctors.	Pass
TC_800_03	REQ_803	The system shall allow the admin to enter all doctor information.	Pass
TC_800_04	REQ_804	The system shall be able to display an error message if there is a field that has no input.	Pass
TC_800_05	REQ_805	The system shall allow the admin to view, add, update, and delete doctor profiles.	Pass
TC_800_06	REQ_806	The system shall be able to display a confirmation message before continuing to update and delete doctor profiles.	Pass
TC_900	**REQ_900**	**MANAGE REPORT**	
TC_900_01	REQ_901	The system shall be able to display the manage report page.	Pass
TC_900_02	REQ_902	The system shall allow the admin to generate reports.	Pass
TC_900_03	REQ_903	The system shall be able to print the reports.	Pass
TC_900_04	REQ_904	The system shall be able to generate the report by searching the start and end date.	Pass
TC_1000	**REQ_1000**	**MANAGE PAYMENT**	
TC_1000_01	REQ_1001	The system shall be able to display the payment page.	Pass
TC_1000_02	REQ_1002	The system shall allow the customer to print the payment receipt.	Pass
TC_1000_03	REQ_1003	The system shall allow the customer to upload a payment receipt.	Pass
TC_1000_04	REQ_1004	The system shall allow the admin to receive the payment receipt from customers.	Pass
TC_1000_05	REQ_1005	The system shall allow the admin to update the status of payment from pending to paid.	Pass

Table 8: Overall Test Case Result

Test Case ID	Total Test Cases Tested	Total Test Cases Passed
TC_100	4	4
TC_200	13	13
TC_300	6	6
TC_400	11	11
TC_500	7	7
TC_600	7	7
TC_700	6	6
TC_800	6	6
TC_900	4	4
TC_1000	5	5
	69	**69**

5.2 User Acceptance Testing

For user acceptance testing, two sides will be assessed by the stakeholders which are user and admin side. The aspects being tested are the system functionality that encompasses modules and interface design. There are 20 respondents for user-side and 5 respondents for admin-side. The bar graph shows feedback on the system functionality and interface design. Figure 27 and Figure 28 show the feedback on the user side while Figure 29 and Figure 30 illustrate the feedback on the admin side.

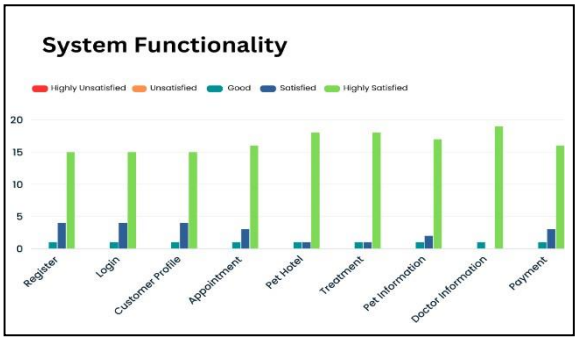

Figure 27: System functionality feedback (user-side)

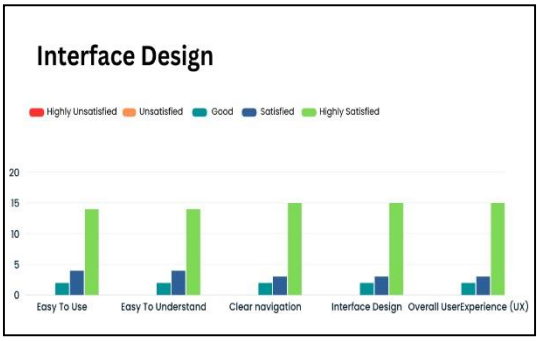

Figure 28: Interface design feedback (user-side)

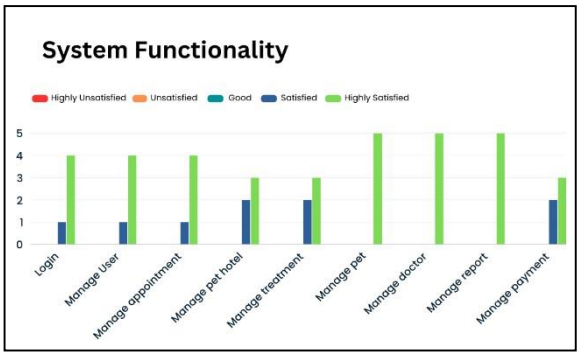

Figure 29: System functionality feedback (admin-side)

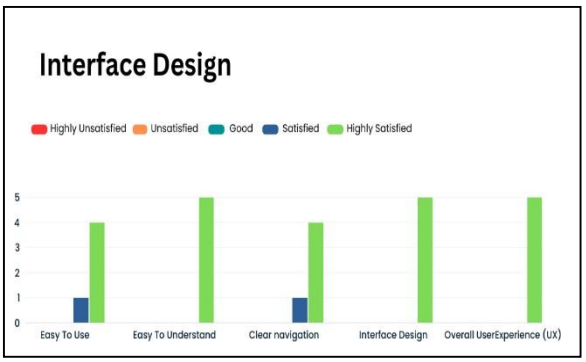

Figure 30: Interface design feedback (admin-side)

The feedback received from both user and admin respondents provides valuable insights into thesystem's performance. On the user side, the system functionality feedback indicates a high level of satisfaction, suggesting that users found the system intuitive and effective in fulfilling their needs, such as booking appointments and accessing pet-related information. Similarly, the interface design feedback reflects positive responses, highlighting that the design is user-friendly, aesthetically pleasing, and easy to navigate. This suggeststhat the design team successfully created an interface that caters to the varied user base, including those with limited technical expertise.

On the admin side, the feedback on system functionality also indicates high satisfaction levels, with administrators finding the system robust and capable of supporting their operational needs. This includes efficient management of appointments, pet hotel bookings, and overall system administration. The feedback on the interface design from the admin perspective further confirms that the system is not only functional but also designed to streamline administrative tasks. The high satisfaction levels from both user and admin respondents underscore the system's effectiveness and usability, affirming that the design and functionality are well-aligned with stakeholder expectations. This positive feedback serves as a strong endorsement of the system's quality and suggests that it is well-positioned to meet the operational and customer service needs of the clinic.

These results show that the development and design of the EliteVet Management System successfully met stakeholder requirements and expectations. The high satisfaction levels indicate that the system is both functional and well-received by its daily users. This positive feedback provides a strong basis for future improvements, ensuring that the system continues to offer great value to both customers and clinic staff.

6. Conclusion

The EliteVet Management System marks a significant leap in veterinary clinic operations by offering an integrated platform that enhances the experiences of both pet owners and clinic staff. By streamlining processes like appointment scheduling, pet hotel bookings, and the management of pet and customer information, the system

boosts efficiency and customer satisfaction. Secure payment processing and comprehensive data management further enhance operational efficiency and improve the quality of pet care provided.

For future improvements, focusing on refining the user interface to make it more intuitive and accessible for all users is crucial. Developing a mobile application would also provide greater accessibility, offering features like push notifications for appointments and real-time updates on pet care. Additionally, integrating advanced data analytics could provide deeper insights into customer behavior and operational performance, while telemedicine features could expand service offerings. Integrating the system with other clinic software, enhancing security measures, and providing personalized pet care recommendations are also recommended. These advancements will help the EliteVet Management System stay at the forefront of veterinary technology, setting new standards for pet care and customer convenience.

Acknowledgment

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References

[1] M. K. Koytcheva, L. K. Sauerwein, T. L. Webb, S. A. Baumgarn, S. A. Skeels, and C. G. Duncan, "A Systematic Review of Environmental Sustainability in Veterinary Practice," *Topics in Companion Animal Medicine*, vol. 44, p. 100550, Aug. 2021, doi: https://doi.org/10.1016/j.tcam.2021.100550.

[2] A. H. Seh et al., "Healthcare data breaches: Insights and implications," Healthcare, vol. 8, no. 2, p. 133, 2020, doi: https://doi.org/10.3390/healthcare8020133.

[3] techopedia, "What is a Web-Based Application? - Definition from Techopedia," Techopedia.com, 2019. https://www.techopedia.com/definition/26002/web-based-application

[4] Lvivity, "Web-Based Application: What It Is, and Why You Should Use It," Lvivity, Oct. 09, 2018. https://lvivity.com/web-based-applications

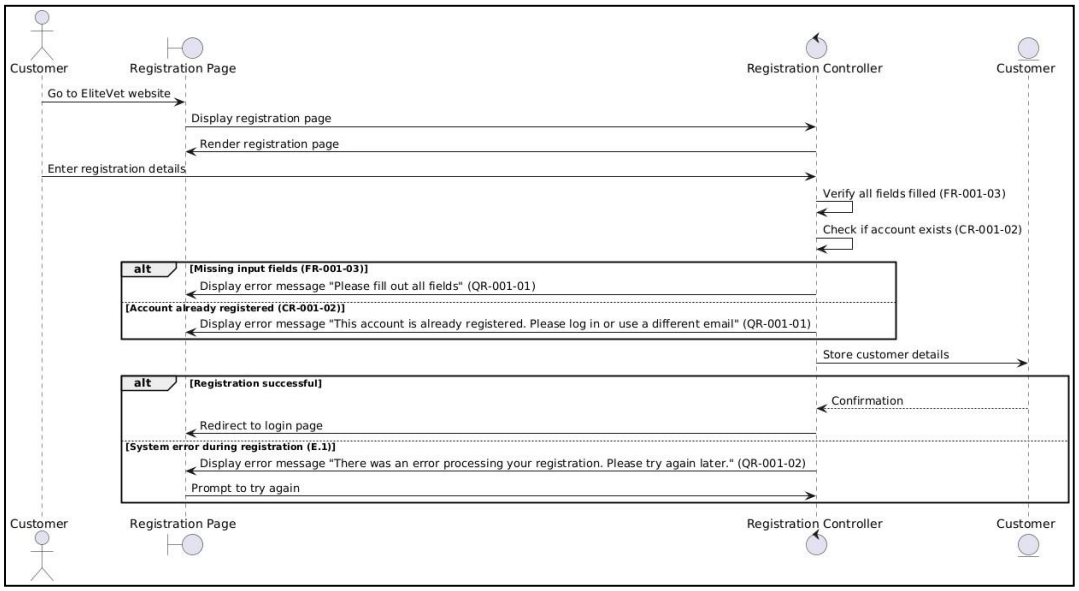
[5] Lvivity, "Web-Based Application: What It Is, and Why You Should Use It," Lvivity, Oct. 09, 2018. https://lvivity.com/web-based-applications

[6] "SYSTEMS ANALYSIS & DESIGN." Accessed: Mar. 09, 2022. [Online]. Available: https://www.pearsonhighered.com/assets/preface/0/1/3/4/013478555X.pdf

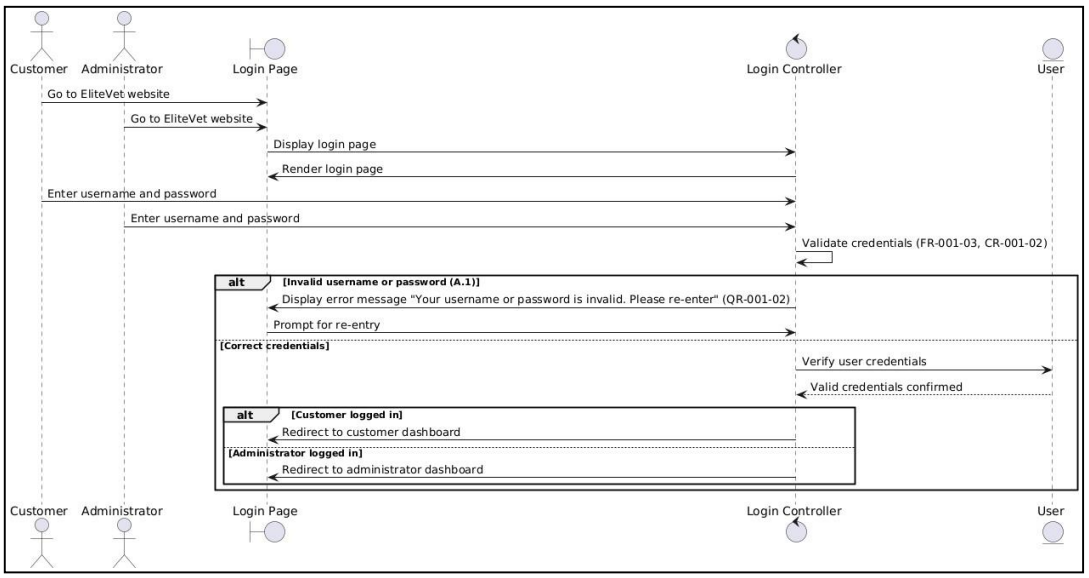
[7] A. Dennis, B. Wixom, and R. Roth, *Systems Analysis and Design, 5*, illustrated. UNITED STATES OF AMERICA: Wiley, 2012, pp. 592 pages. Accessed: Dec. 27, 2023. [Online]. Available: https://www.uoitc.edu.iq/images/documents/informaticsinstitute/Competitive_exam/Systemanalysisanddesign.pdf

Appendix A:

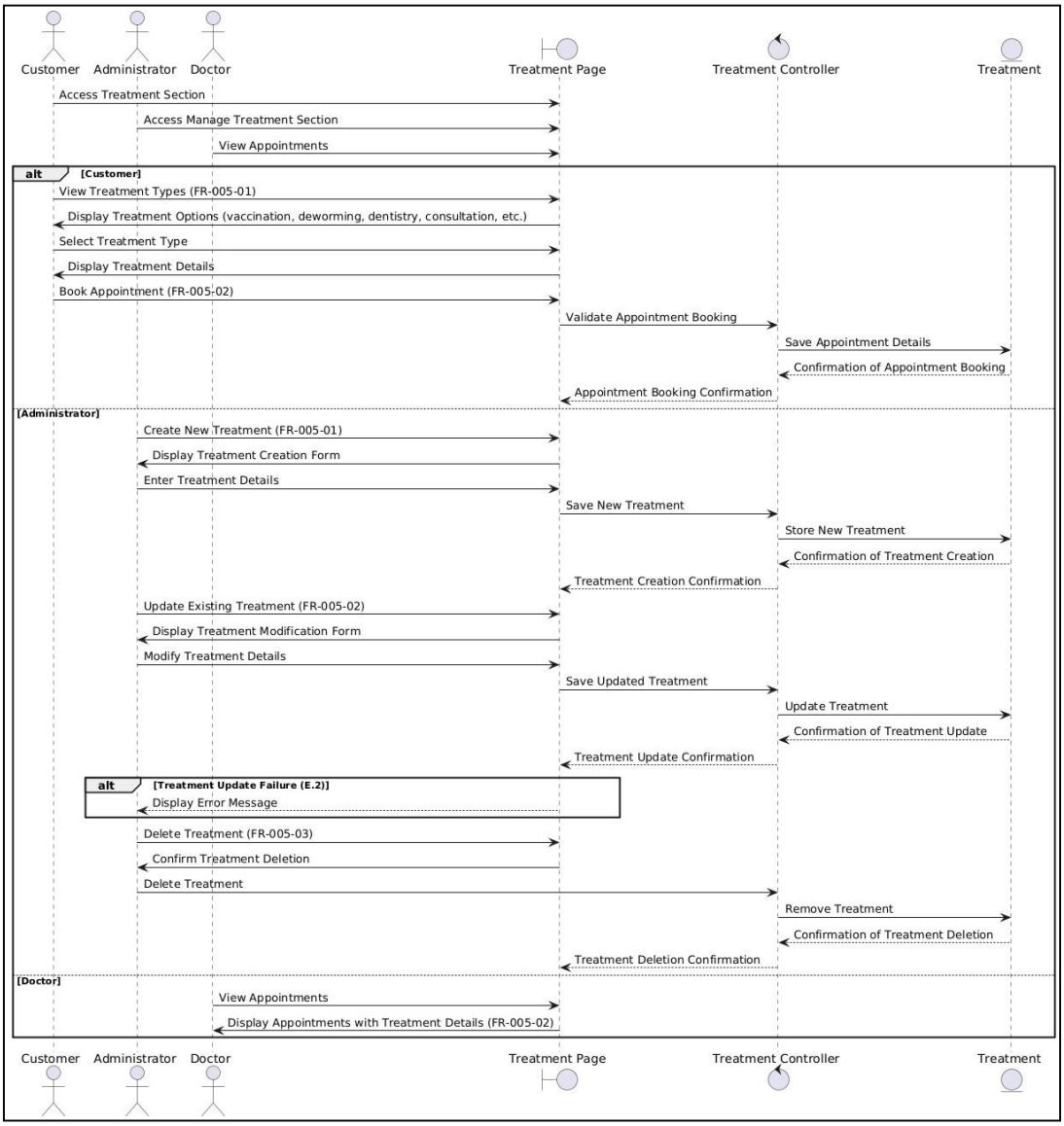
The sequence diagrams and activity diagrams for the use cases are shown.



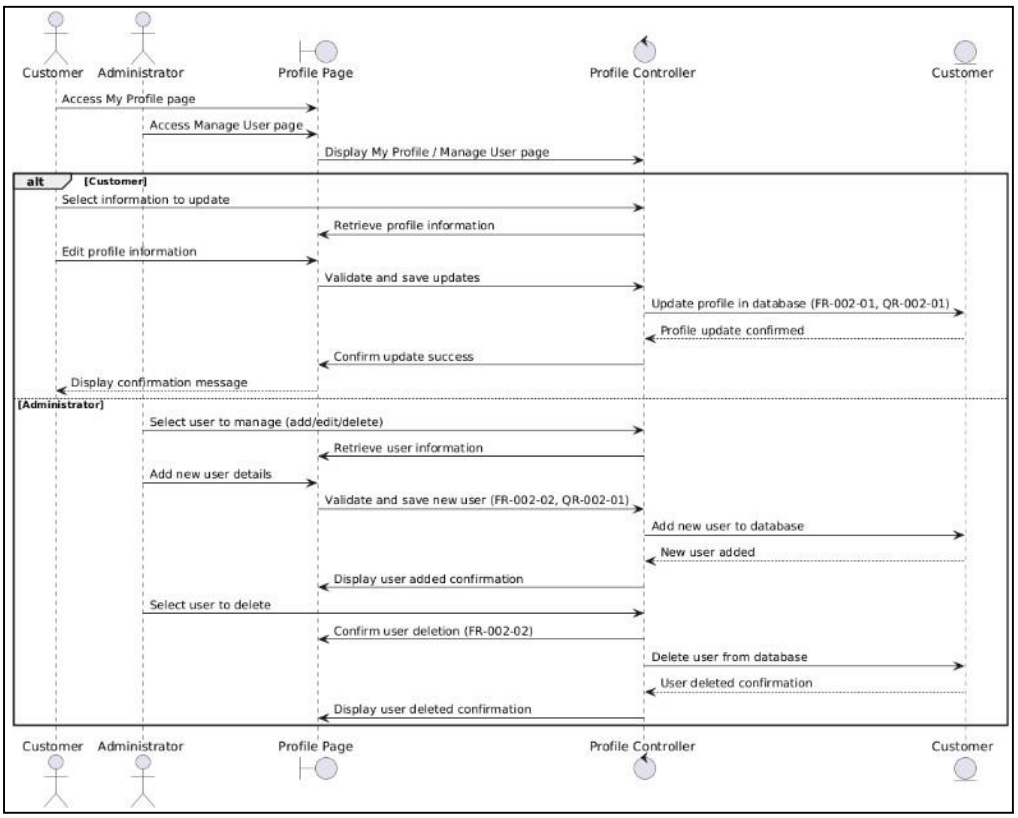
Sequence diagram for register



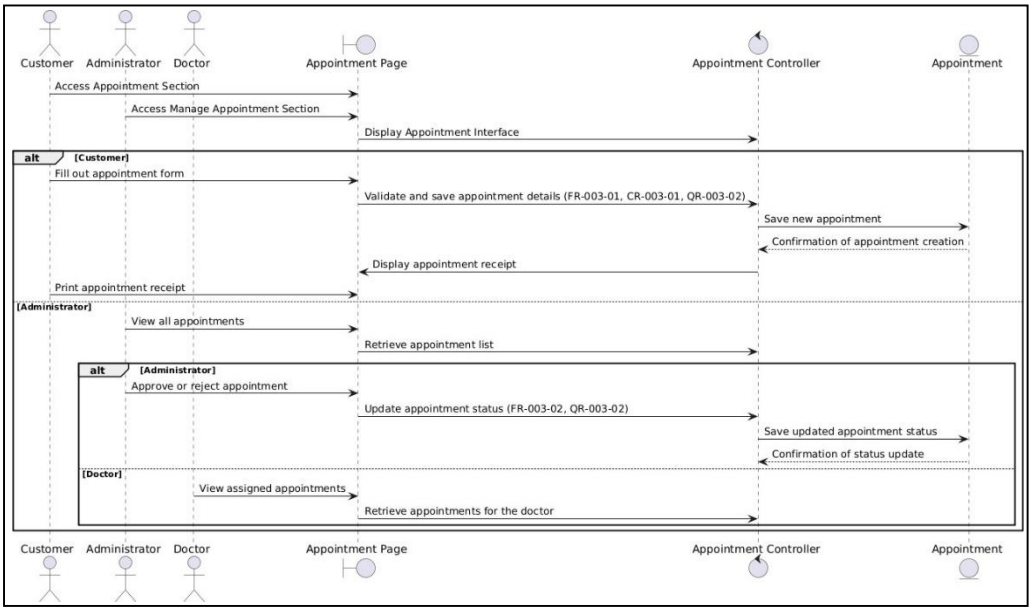
Sequence diagram for login



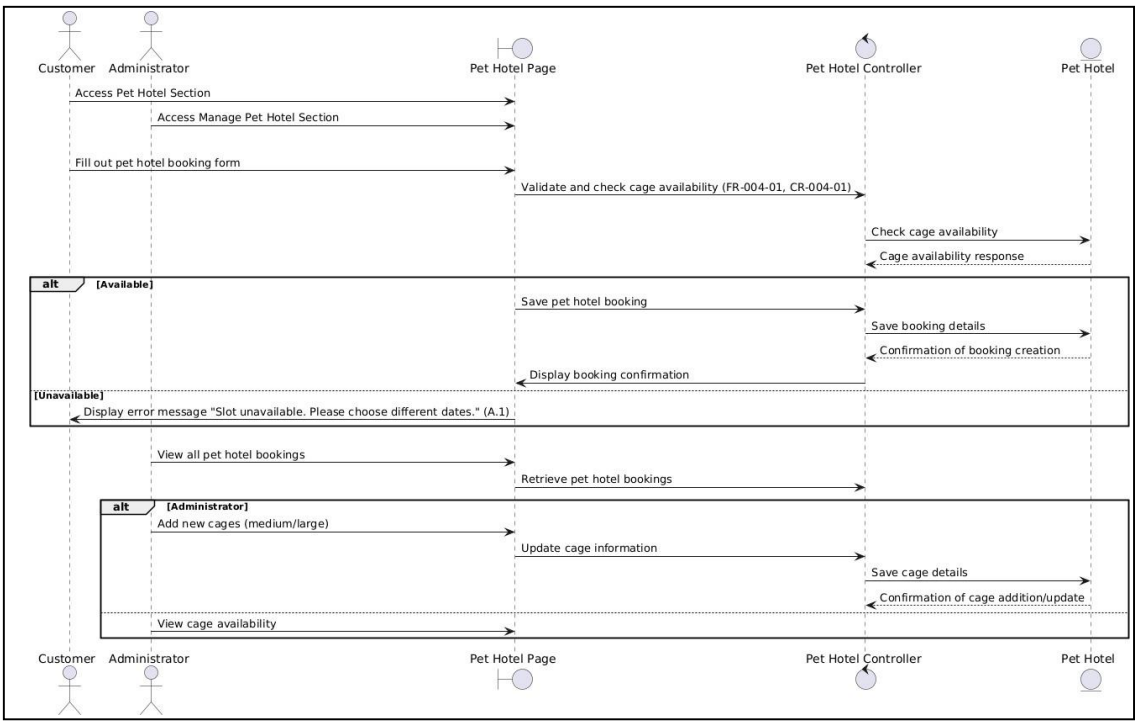
Sequence diagram for manage treatment



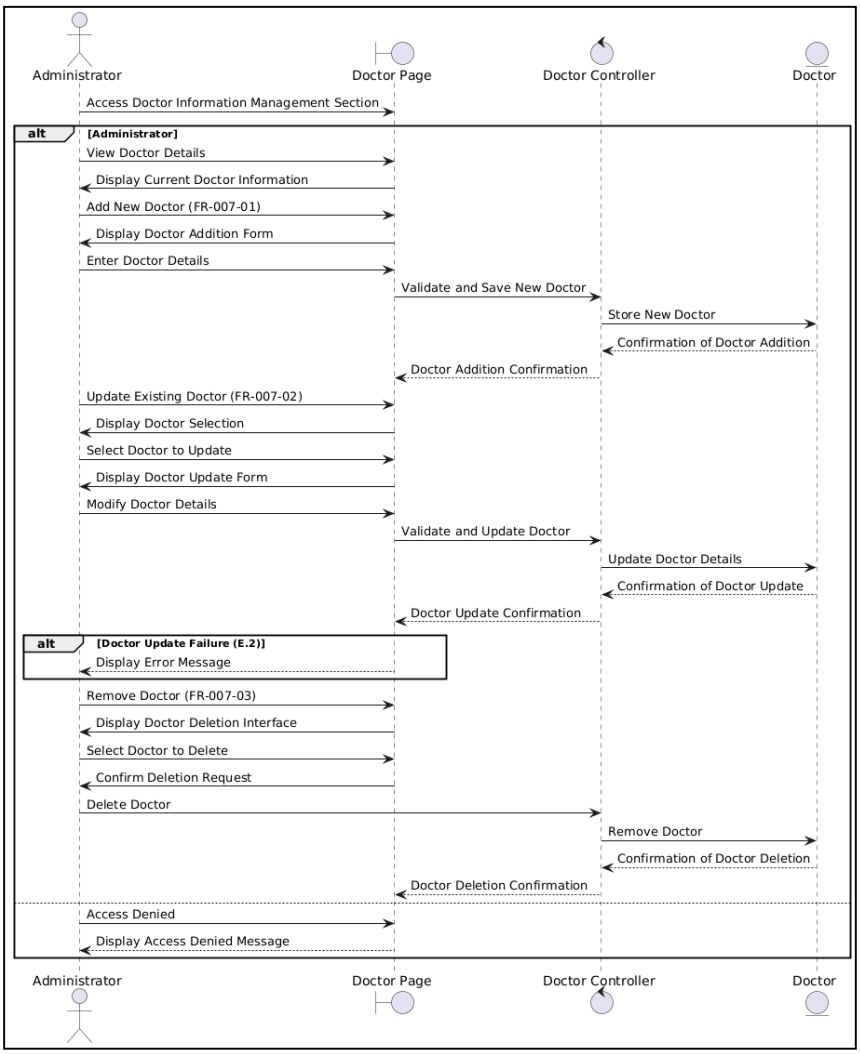
Sequence diagram for customer profile



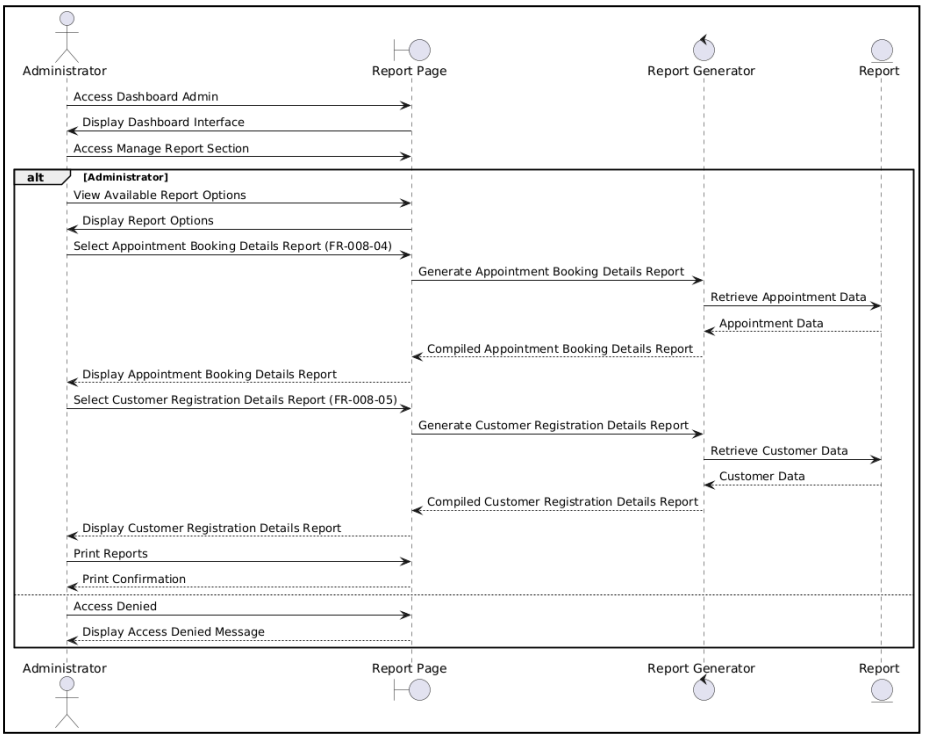
Sequence diagram for appointment



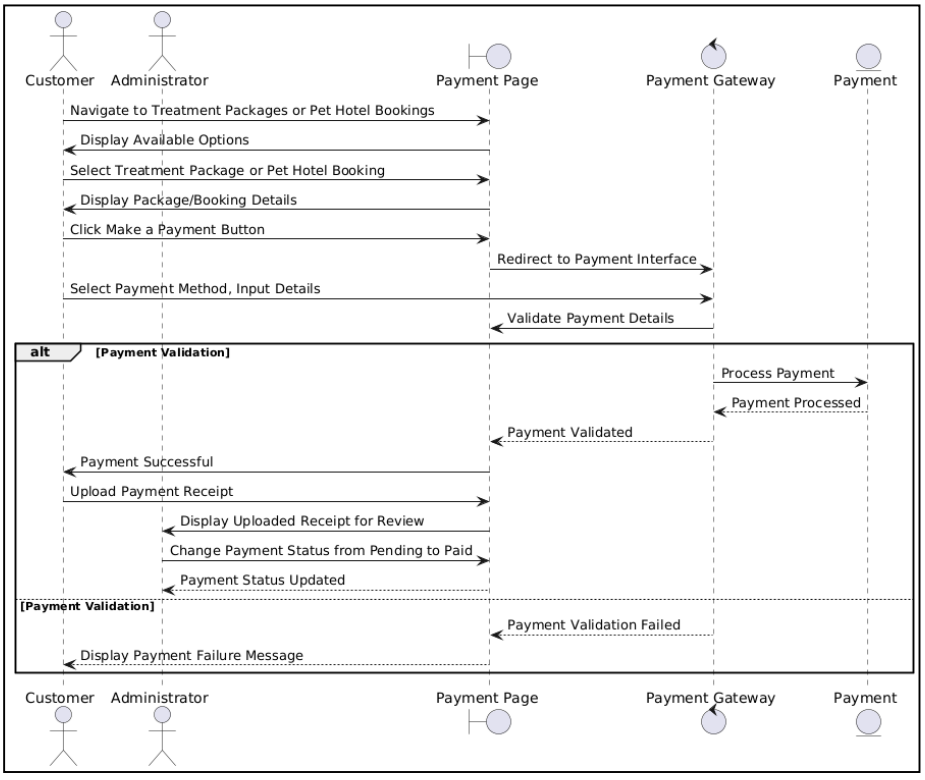
Sequence diagram for pet hotel



Sequence diagram for doctor information



Sequence diagram for manage report



Sequence diagram for manage payment