CSSE 374 – Software Architecture and Design I

Homework 4

Objective

To apply what you have learned about UML Logical Architecture by:

1. Creating a preliminary Logical Architecture for the Dog-eDoctor System (DeDS), and
2. Detailing selected portions of DeDS with Interaction Diagrams and Design Class Diagrams.

Due Date

5 p.m., Tuesday, Week 4, January 5th, 2010.

Tasks

1. Review the attached Domain Model, SSDs, Use Cases, and partial package diagram for DeDS. While these are not complete, they should supply the necessary information to complete the assignment.
2. Develop a preliminary Logical Architecture that allocates the packages to appropriate layers and partitions. Be sure to indicate dependencies between packages.
3. Choose three system operations from the provided SSDs. For each, draw an interaction diagram showing the detailed messages and objects involved in implementing the operation. One of your interaction diagrams must be a sequence diagram, one must be a communication diagram, and the third is your choice.
4. Draw a design class diagram for the domain layer of DeDS following the guidelines in the book (Chapter 16) and discussed in class.

Per the suggestion in section 16.21 of the book, you should work on tasks 3 and 4 simultaneously. Also, recall that scans of neatly drawn pen and paper sketches are adequate for homework (though not for projects). There is a scanner in F217.

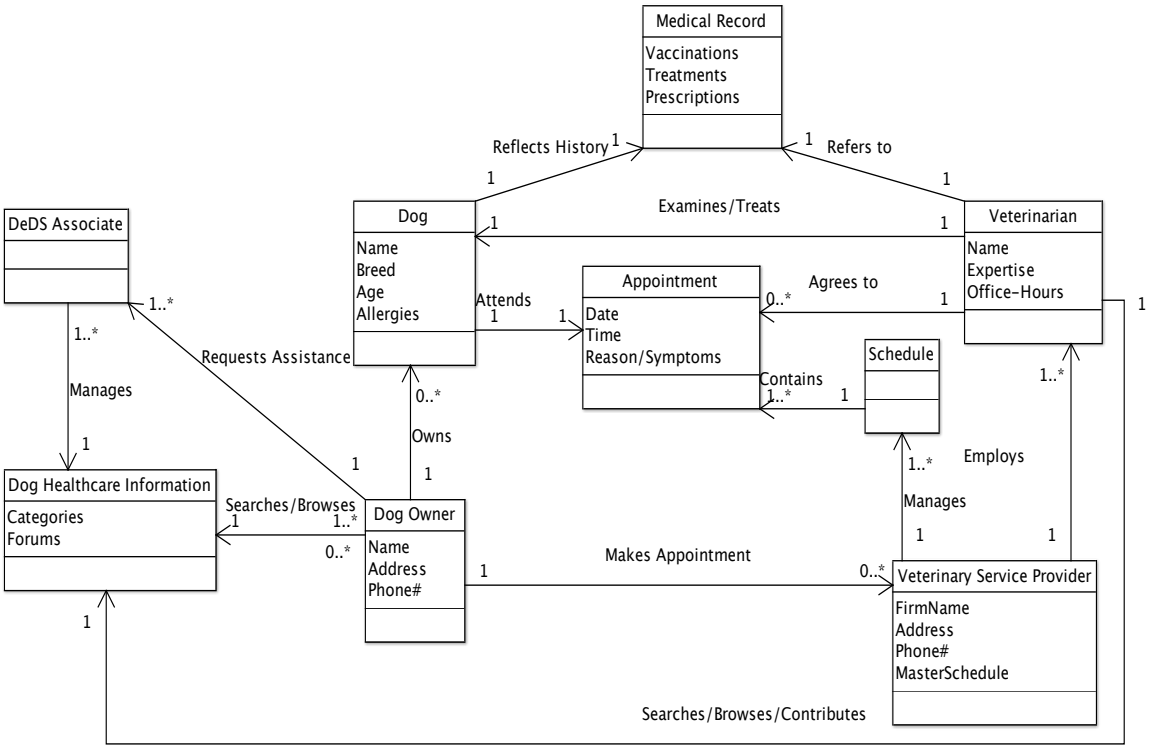
Submitting Your Work

Please submit your DeDS Logical Architecture as a single document to your individual SVN repository for this course.
Shawn's section: You can submit either a **pdf** file **or** a **Word** document. Name your document *HW4-LogicalArch*, with the appropriate extension (*pdf*, *doc*, or *docx*).
Curt's section: You must submit a **pdf** file. Name your document *HW4-*

LogicalArch.pdf. (This restriction is to allow me to test a grading program developed by a senior project team last year.)

EXTRA CREDIT: If you turn this homework in by 5:00pm on Friday, December 18th, 2009, you can receive 2 points (20%) extra credit on this assignment.

A Domain Model for Dog-eDoctor System



The conceptual classes represented above in the Domain Model provide the basic actors and objects used in the Dog-eDoctor System from the partial requirements and use cases provided. The Dog is a key class that many of the other classes revolve around. The Dog Owner owns the Dog for which he/she makes an appointment with a Veterinary Service Provider (VSP). The appointment allows the Dog to be seen by a Veterinarian.

Prior to or after the Dog appointment is made, the Dog Owner may search or browse the Dog Healthcare Information to get advice or determine if the Dog requires medical attention. If he/she needs assistance in finding information or understanding how to engage a VSP, an inquiry or request for assistance can be made to the Dog-eDoctor System (DeDS) Associate.

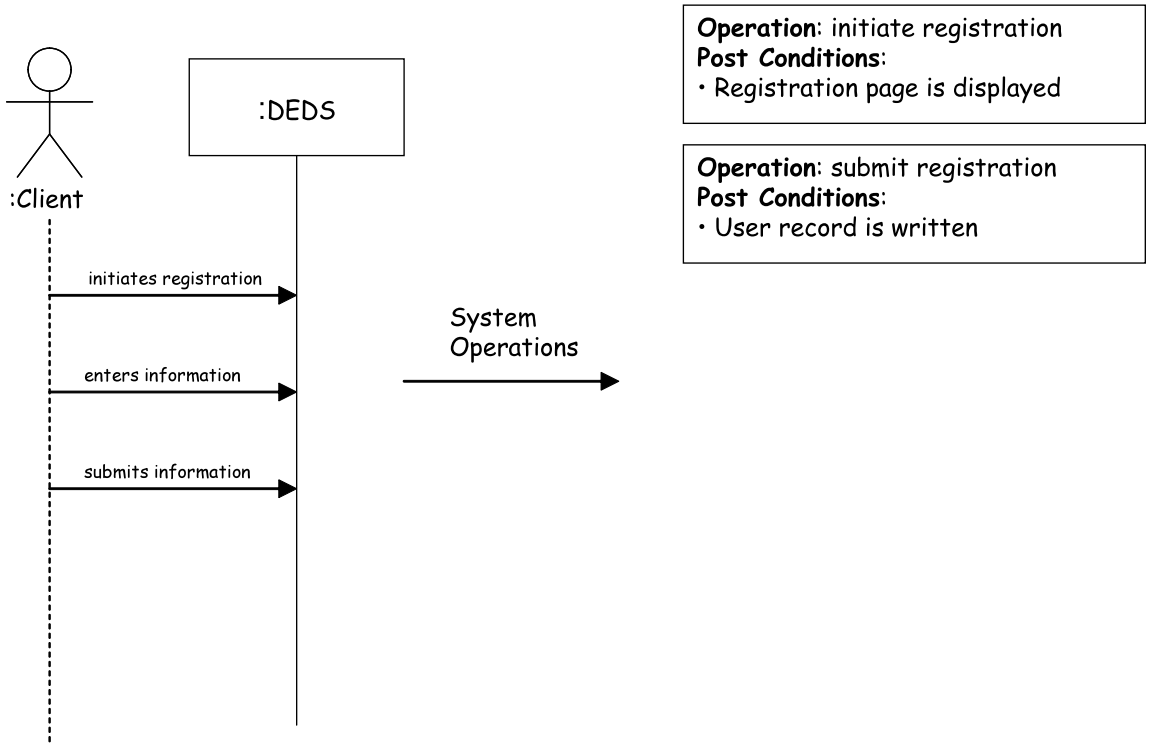
The VSP employs a number of Veterinarians to serve Dog Owners. The VSP identifies the appropriate Veterinarian and places an Appointment for the Dog with the Veterinarian on the Schedule. On the specified day and time, the Veterinarian will Examine and/or Treat the dog based the symptoms and the Medical Record for the Dog.

Name	Aliases	Where/How Used	Description
dog	pet, patient	used in scheduling appointments	Consists of a name, a breed, and a birth date.
DeDS associate	admin.	Maintains site content, responds to inquiries on DeDS	Consists of a name, address, phone, email address
veterinarian	vet	Publishes articles, approves/denies appointments	Consists of a name, address, phone, email address, and a clinic
dog owner	customer, client	Reads articles, requests appointments	Consists of a name, address, phone, email address, and a list of dogs
Dog Healthcare Information	Health Info.	Searched and browsed by dog owners, Vets. Maintained by DeDS Associates. Information provided by dog health bulletins.	Consists of dog healthcare information listed in an information-base under various categories.
Veterinary Service Provider	VSP, vet office	Searched for by clients	Consists of a name, an address, a phone number, and a region identifier
Veterinary Service Provider	VSP, vet office	Searched for by dog owners	Consists of a name, an address, a phone number, and a region identifier
appointment		Time requested by a dog owner for their dog to visit a veterinarian	Consists of a date, a duration, and a confirmation status
schedule	calendar	Used by veterinarians to see all appointments	Consists of a list of all appointments

System Sequence Diagrams

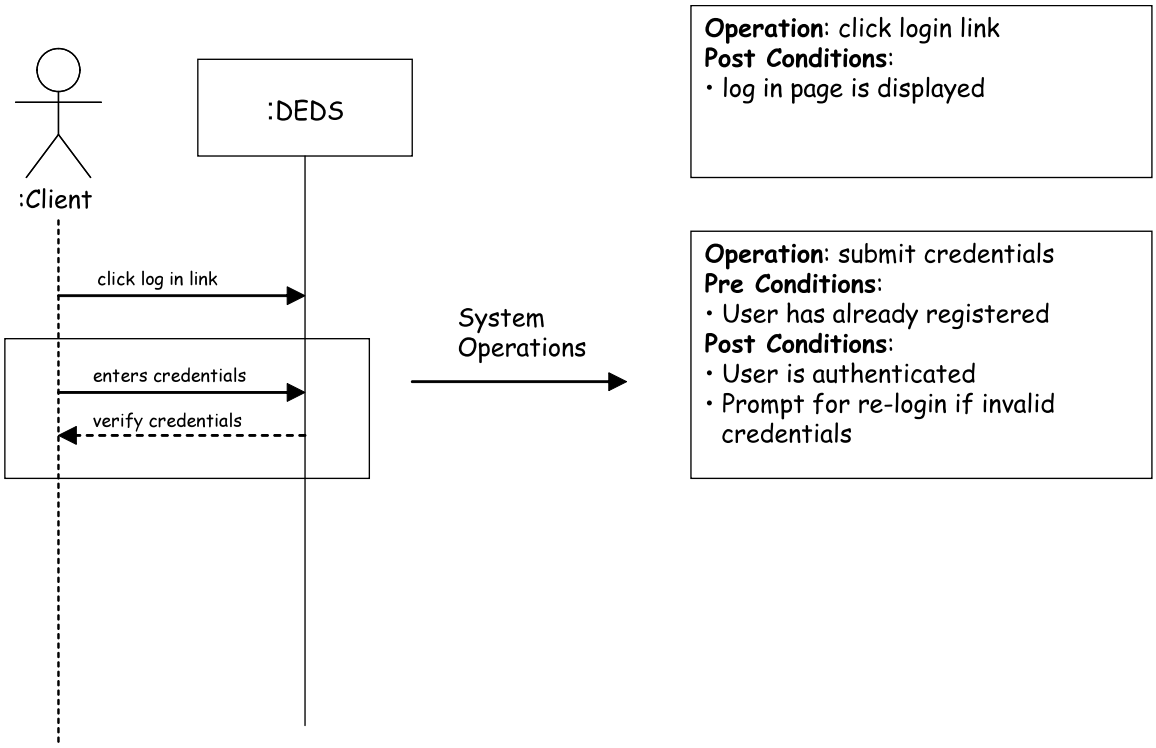
These SSDs and OCs are student work from a previous offering. While very well done overall, there are a few mistakes. In particular, the postconditions are in the present tense instead of the past tense. Nevertheless, we thought that a thorough set of examples would be useful.

Dog Owner Registration



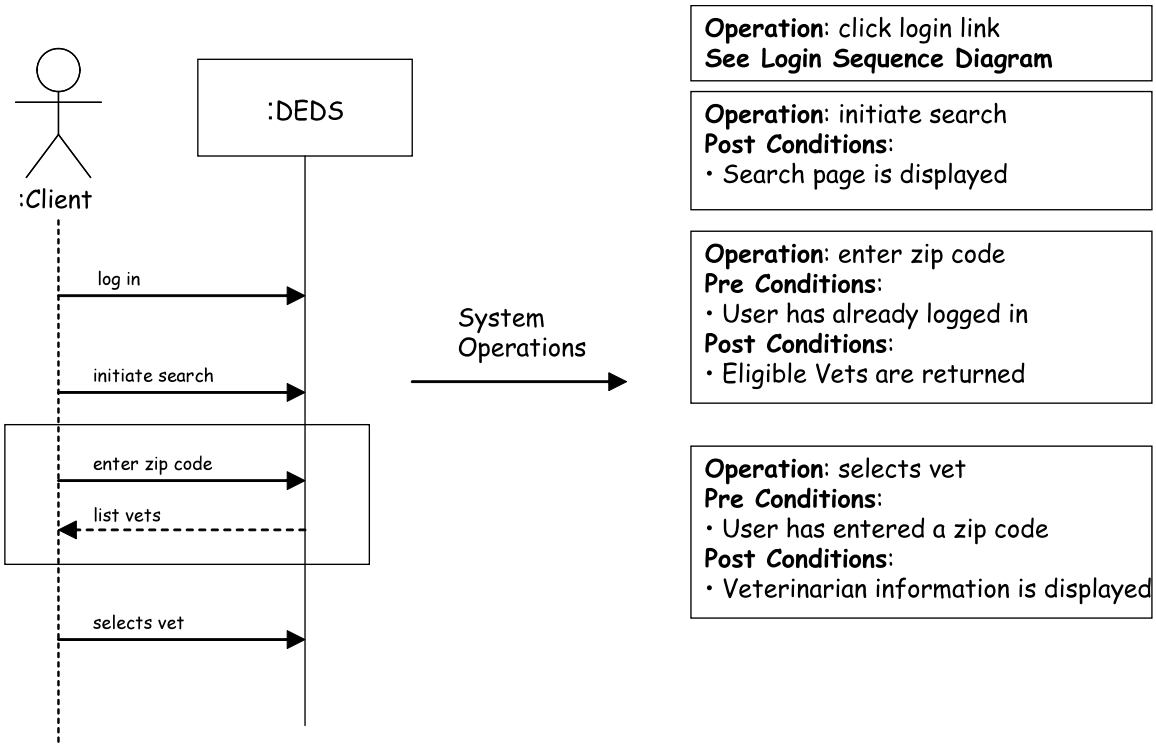
A client (dog owner) initiates registration by visiting the DEDS system and initiating Registration. Once the registration page has been displayed, the client enters all relevant information (name, address, email, etc), as well as dog information (each dogs name, date of birth, and breed). While there are no response arrows shown, it is assumed the DeDS confirms initiation, information entry, and final submission.

Login System Sequence Diagram



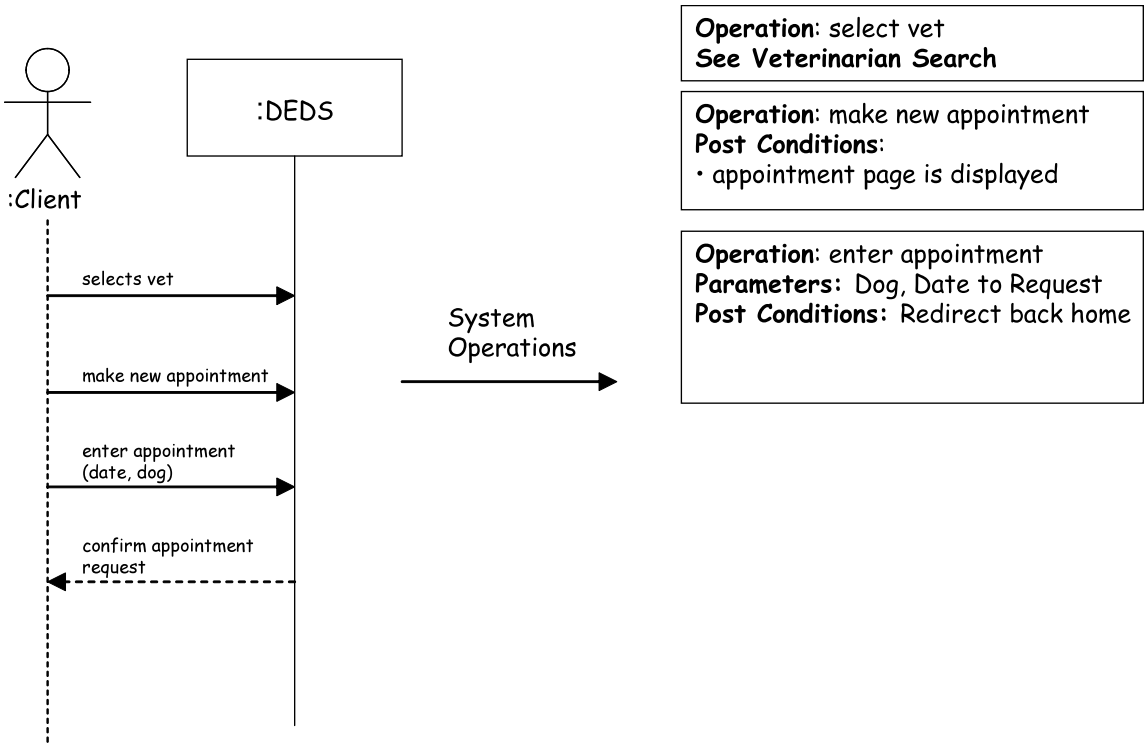
Logging in to the DeDS will allow the user to access the veterinarian search, as well as appointment scheduling. Failure to login with the correct credentials should result in a system lockout after a specified number of attempts.

Veterinarian Selection System Sequence Diagram



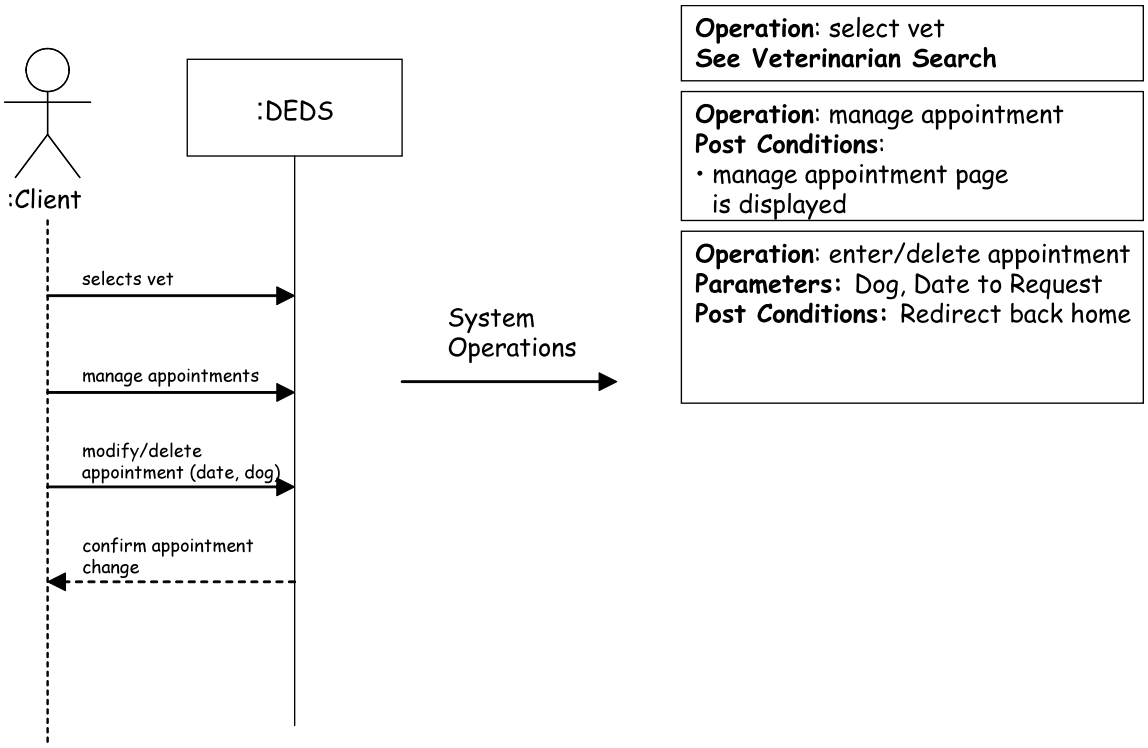
The user may search for a veterinarian clinic by clicking on the Vet Search page once he or she has successfully logged in. Searches are performed by criteria such as zip code. The user may select a vet from the list, which in turn will display veterinarian information (doctors at that clinic, address of the clinic, etc).

Appointment Scheduling System Sequence Diagram



Once the client has selected a clinic, he or she may make a new appointment. Once the appointment has been created, the veterinary clinic should be notified of a new appointment in order to approve or deny the appointment request (not illustrated in the diagram). At the time the appointment is created, however, the customer will receive notification that the appointment has been "penciled in," and that they will receive confirmation at some point in the near future.

Manage Appointments System Sequence Diagram



After the appointment has been created, the client may wish to delete or modify the appointment. Modification of an appointment will result in the same behavior as a create. Deletion of an appointment will send a notification to the veterinary clinic informing them that an appointment has been removed.

Use Cases

UC1: Register

Primary Actor	Client (Dog Owner)
Preconditions	The Dog e-Doctor system is up and running. The client is using a supported web browser.
Post Conditions	The client is registered with the site and the client's information is saved in the database.

Basic Flow:

1. The client arrives at the DEDS and initiates Registration.
2. The client is presented with a data entry form. Required fields are marked with a red asterisk.
3. The client enters information about themselves and their dog(s), and completes all required fields.
4. When finished, the client saves the information.

Alternate Flow:

*a. At any time, the client can terminate the entry and information entered that has not been saved will be lost.

UC2: Login

Primary Actor	Client (Dog Owner) Vet
Preconditions	The Dog e-Doctor system is up and running. The client has previously registered with the site.
Post Conditions	The client/Vet is logged into the site.

Basic Flow:

1. The client/Vet arrives at the DeDS and initiates a login.
2. The client/Vet is presented with a login form.
3. The client/Vet enters their user identification and credential.
4. When finished, the client/Vet confirms the okay to proceed with the login.
5. The system ensures the information entered by the user matches the registration information that is stored.
6. The client/Vet is authorized to use the system.

Alternate Flow:

*a. At any time, the client can terminate the session and the use case ends.

5a. The login and /or credential supplied by the client/Vet do not match what is saved for this client, the system displays a message to try again or contact system administrator. The use case will resume at step 2 in the Basic Flow.

UC3: Change Credential

Primary Actor	Client (Dog Owner) Vet
Preconditions	The Dog e-Doctor system is up and running. The client has previously registered with the site.
Post Conditions	The client's/Vet's credential is changed and saved.

Basic Flow:

1. The client/Vet arrives at the DEDS and initiates a change credential action.
2. The client/Vet enters their current userID and credential for authorization to make the change.
3. The system ensures the information entered by the client/Vet matches the information that is stored.
4. The system requests new credential twice to ensure that it is entered properly.
5. The system compares each new credential entries and verifies that they are the same.
6. The system stores the client's/Vet's new credential.

Alternate Flow:

*a. At any time, the client/Vet can terminate the session and the use case ends.

4a. The userID and /or credential supplied by the client/Vet do not match what is saved for this client/Vet, the system displays a message and clears all the entry boxes on the form. The use case will resume at step 2 in the Basic Flow.

5a. New credential entries do not match: The system will display a message and prompt the client/Vet to enter the new credential again twice. The use case will resume at step 6 in the Basic Flow.

UC4: Vet Search

Primary Actor	Client (dog owner)
Preconditions	The Dog e-Doctor system is up and running.
Post Conditions	Summary information about vets that meet the search criteria are displayed to the client.

Basic Flow:

1. The client arrives at the DEDS and initiates Search for a Vet action.
2. The search form is displayed to the client.
3. The client enters their search criteria.
4. The system uses the search criteria to return information on any vets who match the search criteria.

5. The system displays summary information for each vet that was returned in the search. Detailed information for each vet can then be displayed as the user indicates.

Alternate Flow:

*a. At any time, the client/Vet can terminate the session and the use case ends.

4a. No match found: The system will display a message that no vet matched the client's criteria and suggest they broaden their search criteria. The use case will resume at step 2 in the Basic Flow.

UC5: Select Vet from Search

Primary Actor	Client (Dog Owner)
Preconditions	The Dog e-Doctor site is up and running. UC4 was successfully executed by the client.
Post Conditions	Details about a specific vet are displayed to the client.

Basic Flow:

1. The client clicks the vet returned from the previous search.
2. The system presents detailed information about the selected vet.

Alternate Flow:

*a. At any time, the client/Vet can terminate the session and the use case ends.

2a. The client can opt to Schedule an Appointment. The use case continues to UC6.

UC6: Schedule an Appointment

Primary Actor	Client (Dog Owner)
Preconditions	The Dog e-Doctor system is up and running. UC5 was successfully executed by the client. The client is logged in. (See alternate flow 6a)
Post Conditions	An appointment is schedule for this client with the selected vet.

Basic Flow:

1. The client arrives at this page by executing UC5 or UC7.
2. The vet schedule information is presented (from UC5). This includes the available appointments for this vet.
3. The client selects an appointment from the available appointment dates.
4. The client enters information about the type of services they desire and/or the symptoms of their dog.

5. The client confirms the request and the DeDS makes and confirms the appointment with the VSP or Vet.

Alternate Flow:

*a. At any time, the client/Vet can terminate the session and the use case ends.

UC7: Manage Appointments

Primary Actor	Veterinarian (or VSP)
Preconditions	The Dog e-Doctor site is up and running. The Vet is logged in.
Post Conditions	Changes to the appointment, if any are confirmed and saved.

Basic Flow:

1. The Vet initiates the manage appointments action.
2. The system retrieves and presents any pending appointments for this Vet.
3. The Vet selects an appointment from the list of appointments.
4. The Vet is presented the appointment detail with the options to: Delete, Modify, and Return to Search Results.
5. The client clicks the Return to Search Results link.
6. The client is redirected back to the previous page.
7. The use case ends.

Alternate Flow:

*a. At any time, the client/Vet can terminate the session and the use case ends.

2a. Client has no appointments: The search results are empty.

4a. The client selects the Modify link: The use case resumes at step 2 of UC6, Schedule an Appointment.

4b. The client selects the Delete link: The appointment is deleted from the schedule.

UC8: Manage Profile

Primary Actor	Client (Dog Owner)
Preconditions	The Dog e-Doctor system is up and running. The client is logged in.
Post Conditions	Changes to the client's profile are saved in the database.

Basic Flow:

1. The client initiates Manage Profile action.

2. The system retrieves the clients current profile information including all current pet information.
3. The client selects information to update and makes changes accordingly.
4. The client saves the updated profile.

Alternate Flow:

*a. At any time, the client/Vet can terminate the session and the use case ends.

UC9: View Appointments

Primary Actor	Vet
Preconditions	The Dog e-Doctor site is up and running. The Vet is logged in. (See UC2 Login)
Post Conditions	All appointments for the Vet are displayed.

Basic Flow:

1. The Vet initiates action View Appointments. This is a secure area of the site that is only accessible to authorized users.
2. The system sets the From date and the To date for the query.
3. The system queries the schedule for any appointments scheduled for this Vet that fall with the specified From and To dates.
4. The Vet's appointments for the specified date range are presented.

Alternate Flow:

*a. At any time, the client/Vet can terminate the session and the use case ends.

Partial Package Diagram (Logical Architecture)