# CSSE 374 – Software Architecture and Design I

## Homework 3

### Objective

To apply what you have learned about UML domain modeling by producing a set of system sequence diagrams and requisite operations contracts, and by beginning a preliminary Logical Architecture for the Dog-eDoctor System (DeDS).

### Due Date

5 p.m., Tuesday, Week 3

### Tasks

1. Read through the attached Domain Model, scope statement, requirements, and use cases. Develop the system sequence diagrams (SSD) for the relevant elements in the Domain Model. While there are no detailed Use Cases, use your creative imagination to come up with reasonable sequences for your SSDs. The objective of this exercise is to give you exposure to the process of reasoning about behavior at the analysis level.

2. From the SSDs you produce, identify *at least three* operations (methods) that need some level of detail to ensure constraints are met or rules are followed. For each operation that you identify, give a sentence or two describing why it warrants additional detail. Write the operations contracts for each of these.

3. In preparation for creating a Logical Architecture in Homework 4, begin choosing application domain classes.  From the Domain Model, SSDs, and Operations contracts, identify key classes from the application domain layer and organize them into packages. Give a UML Package Diagram showing the organization and a paragraph or two justifying it.  You do not need to show dependencies between packages at this time.

### Submitting Your Work

Please submit your SSDs, Operations Contracts, and Package Diagram 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 *HW3-Analysis*, with the appropriate extension (*pdf*, *doc*, or *docx*).
**Curt's section**: You must submit a **pdf** file.  Name your document *HW3-Analysis.pdf*.  (This restriction is to allow me to test a grading program developed by a sr. proj. team last year.)

**Scope**:

The Dog-eDoctor System (DeDS) will provide health information services for dog health care. Many dog owners are seeking basic advice for their dog's health problems as well as a directory for veterinary care providers. Like WebMD for humans, the DeDS will enable dog owners to inquire about their dog's symptoms and read related healthcare information. Using DeDS, dog owners can schedule appointments with local veterinarians.

Veterinarians will use the DeDS as a scheduling service and as a means to communicate with clients (dog owners) regarding appointments and follow-up treatments.

The DeDS will accept information from clients and potential clients that support presenting advice on dog healthcare, veterinary services, scheduling veterinary appointments, and collecting relevant dog information. DeDS will interact with clients (people) through a web interface with the assumption that the system will be able to keep information about the veterinarian, dog, and dog owner private. Information must be maintained on the dogs, clients, and veterinarians (entered, updated, and removed). The DeDS will accept dog and client information, accept inquiries for dog healthcare advice, list registered veterinary service providers, and schedule veterinary services.

## USERS

There will be 3 primary types of users interacting with the DeDS:

*Dog Owners* – The dog owner is a key user of the DeDS. The dog owner needs to register him/herself with the DeDS prior to accessing the website (beyond just browsing). Once the dog owner registers, then the dog owner must create his/her profile and their dog(s)' profile. The dog owner then has the ability to search the directory of veterinary service providers, and then the dog owner has the option to make appointments with the service.

*Veterinary Service Providers (VSP)* – The role of the VSP is to provide veterinary service to the dog for the dog owner. Each VSP has to register with DeDS and provide the information about the practice and specialties. Once all the profiles are completed, the vendor can update the schedule availability for dog owners to make appointments.

*DeDS Associates* – The primary role of the DeDS Associates is to communicate with prospective customers (dog owners and vendors) and assist customers with website inquiries. The DeDS associates have the ability to update and delete all the customers' records through the user interface (e.g., update passwords). The DeDS associates will also maintain a knowledge bulletin board with up-to-date health care information.

# A Domain Model for Dog-eDoctor System
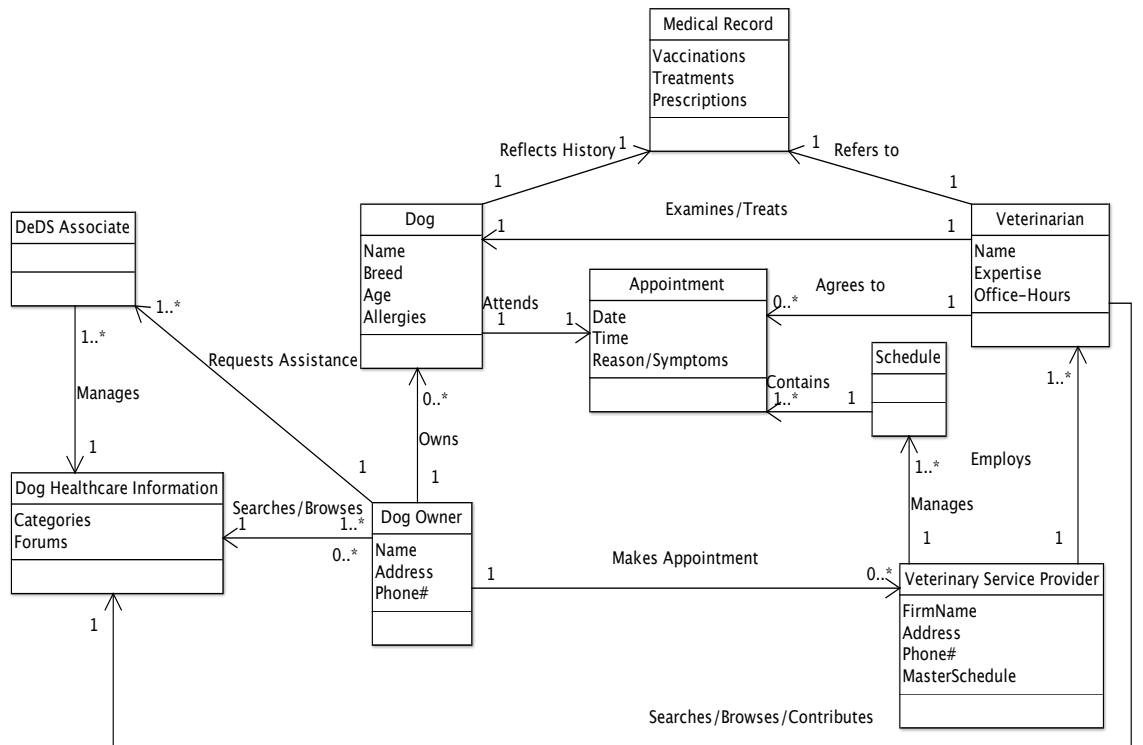


The conceptual classes represented above in the Domain Model provide the basic actors and objects used in the Dog-eDoctor System from the partial requirements and use cases provided. The Dog is a key class that many of the other classes revolve around. The Dog Owner owns the Dog for which he/she makes 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.

**General Requirements/Features:**

1. Dog owner shall be able to register to be a user of the DeDS.
2. Dog owner shall be able to Login / Logoff the DeDS.
3. Dog owner shall be able to change password for accessing the DeDS.
4. Dog owner shall be able to search for a veterinary service provider using DeDS.
5. Dog owner shall be able to schedule an appointment with a veterinary service provider using DeDS.
6. Dog owner shall be able to view an appointment with a veterinary service provider using DeDS.
7. Dog owner shall be able to cancel an appointment with a veterinary service provider using DeDS.
8. Dog owner shall be able to browse the dog healthcare information using DeDS.
9. Dog owner shall be able to inquire about dog healthcare situation via symptoms, breed, and age of dog using DeDS.
10. Dog owner shall be able to create a profile with both client and dog information using DeDS.
11. Dog owner shall be able to update a profile using DeDS.
12. Dog owner shall be able to delete a profile using DeDS.
13. Veterinary service provider shall be able to register to be a user of the DeDS.
14. Veterinary service provider shall be able to Login / Logoff the DeDS.
15. Veterinary service provider shall be able to change password for accessing the DeDS.
16. Veterinary service provider shall be able to confirm scheduled appointments with dog owners using DeDS.
17. Veterinary service provider shall be able to view an appointment with dog owners using DeDS.
18. Veterinary service provider shall be able to cancel an appointment with a dog owner using DeDS.

19. Veterinary service provider shall be able to browse the dog healthcare information using DeDS.

20. Veterinary service provider shall be able to inquire about dog healthcare situation via symptoms, breed, and age of dog using DeDS.

21. Veterinary service provider shall be able to create a profile with relevant service information using DeDS.

22. Veterinary service provider shall be able to update a profile using DeDS.

23. Veterinary service provider shall be able to delete a profile using DeDS.


**Example USE CASES (informal)**


**Use Case:**   CUSTOMER REGISTRATION AND UPDATE/DELETE PROFILE

*Primary Actor:*

- Dog Owner

*Stakeholder (Interests):*

- Dog Owner: Register new account with DeDS; then create profile for dog owner and dog.

- DeDS Associates:  Respond to customer inquiry about DeDS and assist customer to register and update profiles successfully in the DeDS.

*Preconditions:*

- Dog Owner has access to a computer with the Internet access.

*Post Condition:*

- Dog Owner successfully registers and updates account with the DeDS.

*Main Success Scenario:*

- Dog Owner successfully registers with DeDS and validation completed.

- Dog Owner successfully creates and updates profiles for him/herself and dog.

- Dog Owner granted access to all functionalities provided by DeDS.

**Use case**: SEARCH, SERVICE INQUIRY, AND SCHEDULE APPOINTMENT

*Primary Actor*:

- Dog Owner

*Stakeholder (Interests)*:

- Dog Owner: Research for veterinary service provider
- Dog Owner: Inquire about service
- Dog Owner: Schedule and confirm appointment with service provider.
- Veterinary Service Provider: Response to inquiry and confirm appointment with dog owner.

*Preconditions:*

- Dog owner will need to have already registered and created profiles with the DeDS.
- Prospective VSP will need to register with the DeDS before any service.

*Post Condition:*

- Dog owner schedules appointment with selected service provider.

*Main Success Scenario:*

- Dog owner successfully researches the service provider by preference.
- Dog owner successfully inquires about service provider and receives response.
- Dog owner successfully schedules appointment and receives confirmation.