COMP 3004 - Object-Oriented Software Engineering

“Requirement Analysis”

4our People

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Requirements Analysis Document:

1. Introduction

The objective of the program is to provide service assistance to people looking to adopt animals from homeless shelters. This also provides a crucial service to assist animals find a perfect home for their specific personality and description parameters.

This document will provide a detailed report on the application's purpose and functionality. It will also provide information on how the functions are structured and detailed instructions on how to use the system.

1.1. Purpose of System

1.1.1. Requirements Elicitation

Animal shelters are often plagued with the problem of giving away animals to the wrong types of people due to large amounts of animals and lack of resources. This results in adopters often having to give away their animals, regretting their choice, and sometimes even neglecting the animals. The system will solve this problem by creating a matching application with users and animals. Annually 7 million cats and dogs are put in shelters, of those 2.7 million cats and dogs die a year because they cant get adopted. This is very bad, with our proved matching system, virtually zero cats and dogs will die. 50% of animals die in shelters. Our proposed system can reduce this amount significantly.

A shelters animals and the human adopters can be mismatched in diversified ways, including labels in temperment, needs, and expectations. The algorithm that is used is Carleton University Animal Care System (cuACS). cuACS achieves this by giving a tool that automatically matches together, based on characteristics between shelter animals and the human clients who wish to adopt them. A match is an animal that is available for adoption and a human client who is appropriate to adopt it. Rather than generating a small subset of excellently fitting options and a large subset of not as fitting options, the algorithm will look at the best interests of all animals in the shelter.

1.2. Overview of Document

This document explores the proposed system for the cuacs software. This includes Functional Requirements, Non functional Requirements, Use Cases, High Level Use Case Diagram, Detailed Use Case Diagram, Use Case Flow of Events, Object Model, Data Dictionary and Class Diagram. These chapters will display detailed information on how the system works and its purpose. As the document is analyzed one will observe that it has deep level of technical specifications for engineers and software developers mainly. Going through the document one will learn how to use the system, how the system is used, who can use the system and why the system is used. This document will also display the construction of the application on a low level. Also providing insight on how the system was created.

2. Proposed System

2.1. Overview

This system will provide help to animals in shelters. It will allow animals to be given to appropriate adopters. Using an algorithm it will allow efficiency on a larger scale and increased compatibility.

2.2. Functional Requirements

Table 1 -- Functional Requirements

F-01 AnimalShelter users must be able to sign in as a client or staff
F-02 AnimalShelter staff will launch matching algorithm based on certain attribute
F-03 AnimalShelter staff can edit the animal information and add animals
F-04 AnimalShelter staff will edit the client information and add clients
F-05 AnimalShelter staff must be able to view list of animals
F-06 AnimalShelter staff must be able to remove animals
F-07 AnimalShelter staff must be able to add animals
F-08 AnimalShelter staff must be able to view animals basic profile information
F-09 AnimalShelter staff must be able to edit animals basic profile information

F-10 AnimalShelter staff must be able to view list of clients
F-11 AnimalShelter staff must be able to view clients basic identification profile information
F-12 AnimalShelter staff must be able to view clients basic matching preference profile information
F-13 AnimalShelter staff must be able to add/remove clients
F-14 AnimalShelter staff can launch the matching algorithm
F-15 AnimalShelter client must be able to view list of animals
F-16 AnimalShelter client must be able to view animals basic profile information
F-17 AnimalShelter client must be able to edit their basic identification profiles information
F-18 AnimalShelter client must be able to edit their matching preference profiles information
F-19 AnimalShelter user will receive a File Error when accessing search query that DNE
F-20 AnimalShelter user will receive Database Error when the entity is not found

2.3. Non-Functional Requirements

Table 2 -- Non Functional Requirements

NF-01 Useability: clear, detailed instructions on installation and usage of the system are provided
NF-02 Useability: short code commands are provided for ease of functionality
NF-03 Useability: add/remove operations should be confirmed to the user
NF-04 Useability: all error messages should be clear and descriptive suggesting appropriate solutions
NF-04 Useability: user expertise should be medium level to expert level. Competency in Linux Ubuntu is expected standard navigation and english language required.
NF-05 Reliability: if the system fails it should prompt for a backup restored version
NF-06 Reliability: the system can store as much as the staff can add
NF-06 Reliability: data of clients will be secured using levels of abstraction and login keys

NF-07 Reliability: system can handle exceptions with approach to using timers, fault prevention, and fault tolerance.
NF-08 Performance: the database should update within 1 second of any changes
NF-09 Performance: Users should be able to use the system without internet connection
NF-10 Performance: System should support one concurrent user at a time
NF-11 Supportability: the GUI should work on any platform with little work in transfering code
NF-12 Supportability: the staff may maintain the system
NF-13 Supportability: mobile app can be developed
NF-14 Implementation: the system should work on Linux system
NF-15 Implementation: should be written in C++
NF-16 Implementation: testing team may need to be onsite to observe animals in person
NF-17 Operations: the staff knows how to use the system
NF-18 Operations: the client knows how to use the system
NF-19 Operations:system must be available on multiple operating systems
NF-20 Packaging: the system must be able to be launched from an executable
NF-21 Packaging: the system must be available as a TAR
NF-22 Packaging: the system can be installed by staff
NF-23 Interface: export/import Animal Shelter matches/client info and state as JSON
NF-24 Interface: fetch Data Base information from SQL Lite DB upon initialization
NF-25 Interface: system is not console based
NF-26 Legal: complies with Non for profit act
NF-27 Legal: complies with with canadian standards of care legal law
NF-28 Legal: complies with International animal welfare legal law

2.4. Use Cases

2.4.1. High Level Use Case Diagram

Figure 1.1 -- High Level Use Case Diagram

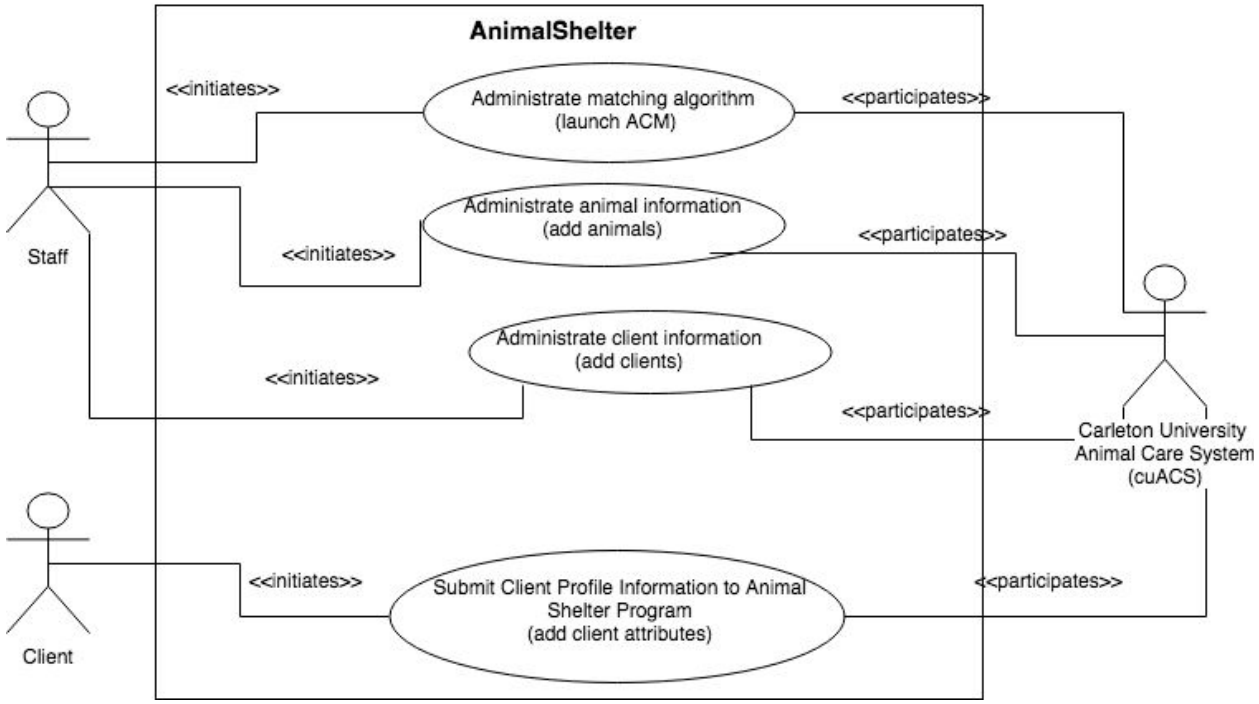

Table 3 -- High Level Use Case Descriptions

UC-01 **Administrate Matching Algorithm**	Staff will launch matching algorithm based on certain attribute
UC-02 **Administrate Animal Information**	Staff can edit the animal information and add animals
UC-03 **Administrate Client Information**	Staff will edit the client information and add clients
UC-04 **Submit Information to Animal Shelter System**	Client submits personal information to Animal Shelter system

2.4.2. Detailed Use Case Diagram

Figure 1.2 -- Detailed Staff Use Case Diagram

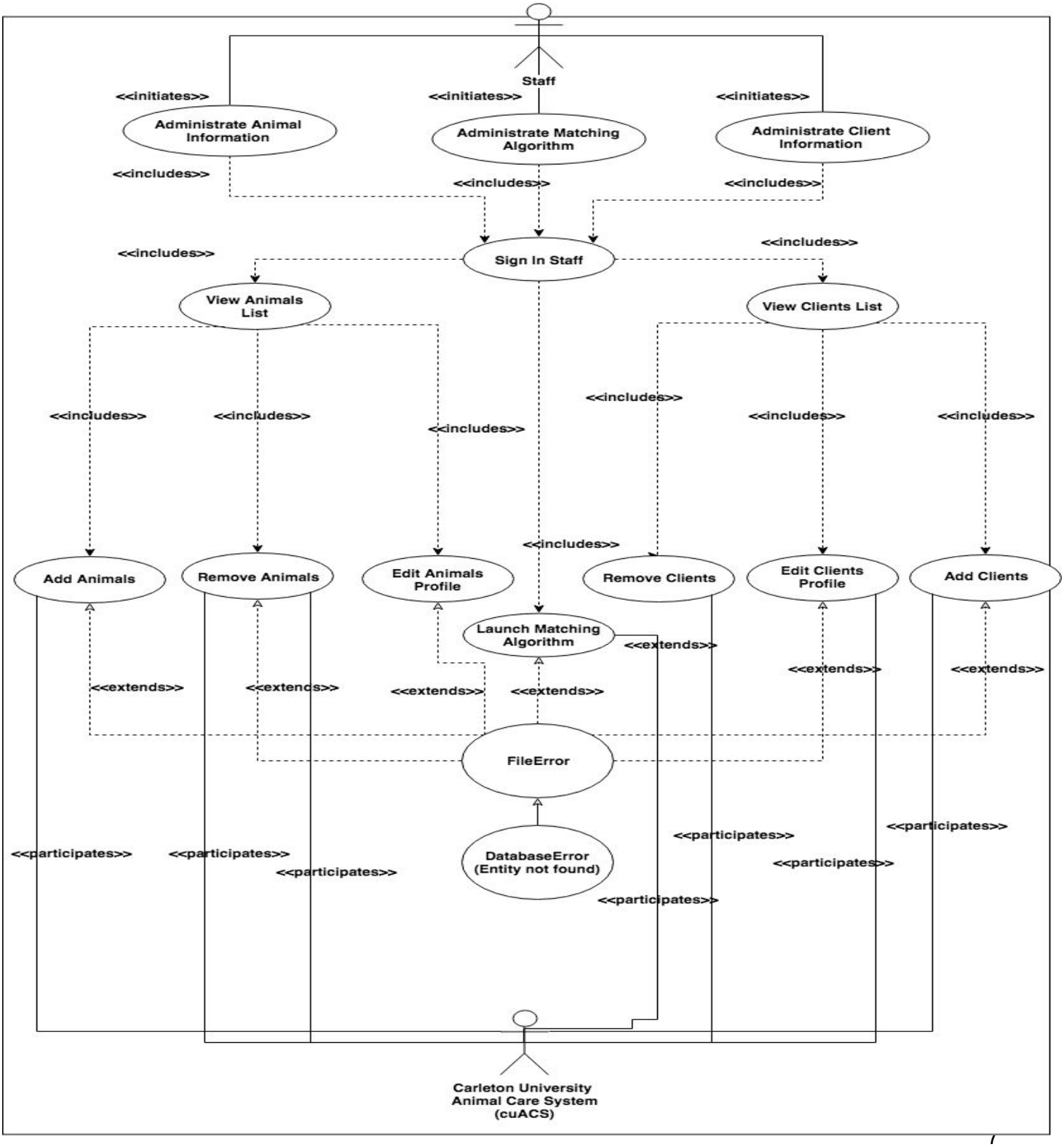

Table 4 -- Detailed Staff Use Case Descriptions

UC-05 **Sign In Staff**	Staff can sign in and manages attributes of the Shelter system
UC-06 **View Animal List**	Staff views list of animals in the shelter
UC-07 **View Clients List**	Staff views list of clients in the shelter
UC-08 **Add Animals**	Staff adds animals to the shelter Application database(db)
UC-09 **Remove Animals**	Staff can remove animals from the Shelter Application db
UC-10 **Edit Animals Profile**	Edit animal profiles, removing attributes or adding attributes
UC-11 **Remove Clients**	Remove clients, can take out clients from database that exist
UC-12 **Add Clients**	New client profile is added to database,
UC-13 **FileError**	There was an error processing the selected function. The specific Error is reported to the user
UC-14 **Database Error**	The entity is not found with the search query given.

Figure 1.3 -- Detailed Client Use Case Diagram

Table 5 -- Detailed Client Use Case Descriptions

UC-15 **View Animal Profiles**	View a list of all the animal profiles available to adopt
UC-16 **View Animals**	View a list of all the animals available to adopt
UC-17 **Edit Basic Profile Identification Information**	Edit personal profile information for identification
UC-18 **Edit Basic Matching Preferences Information**	Edit basic matching preferences information to get paired with animals

2.4.3. Use Case Flow of Events

Use Case Identifier	UC-01
Name	**AdministrateMatchingAlgorithm**
Participating Actors	Initiated by Staff
Flow of Events	1. The Staff Administrates the Algorithm by launching it 2. If the Staff chooses to launch the algorithm, the system creates and initializes a new algorithm result
Entry Conditions	
Exit Conditions	
Quality requirements	
Traceability	F-03

Use Case Identifier	UC-02
Name	**AdministrateAnimalInformation**
Participating Actors	Initiated by Staff
Flow of Events	1. The Staff can manage details on Animal profiles, details of their attributes

	can be edited 2. The system can change the database information
Entry Conditions	
Exit Conditions	
Quality requirements	
Traceability	F-04

Use Case Identifier	UC-03
Name	**AdministrateClientInformation**
Participating Actors	Initiated by Staff
Flow of Events	1. The staff can edit details on the client information attributes 2. Staff can add and remove clients
Entry Conditions	
Exit Conditions	
Quality requirements	
Traceability	F-05

Use Case Identifier	UC-04
Name	**Submit Information to Animal Shelter System**
Participating Actors	Initiated by Client

Flow of Events Entry Conditions Exit Conditions Quality requirements Traceability	1. Client can submit personal profile information to Animal Shelter Program 2. Client can edit personal profile identification attributes 3. Client can edit personal profile matching attributes

Use Case Identifier	UC-05
Name	**Sign in Staff**
Participating Actors	Initiated by Staff
Flow of Events	1. Staff has ability to sign in to specific account 2. Allows access to manage functions of Animal Shelter System
Entry Conditions	Must have started program
Exit Conditions	
Quality requirements	

Traceability	F-01

Use Case Identifier	UC-06
Name	**View Animal List**
Participating Actors	Initiated by User
Flow of Events	1. User has ability to view animals list
Entry Conditions	Must have started program
Exit Conditions	
Quality requirements	
Traceability	F-02

Use Case Identifier	UC-07
Name	**View Clients List**
Participating Actors	Initiated by Staff
Flow of Events	1. Staff has ability to view a list of all the clients
Entry Conditions	Must have started program
Exit Conditions	
Quality requirements	
Traceability	F-10

Use Case Identifier	UC-08
Name	**Add Animals**

Participating Actors	Initiated by Staff
Flow of Events	1. Staff has ability to add animals to the database
Entry Conditions	Must have started program
Exit Conditions	
Quality requirements	
Traceability	F-07

Use Case Identifier	UC-09
Name	**Remove Animals**
Participating Actors	Initiated by Staff
Flow of Events	2. Staff has ability to add remove from the database
Entry Conditions	Must have started program
Exit Conditions	
Quality requirements	
Traceability	F-06

Use Case Identifier	UC-10
Name	**Edit Animal Profile**
Participating Actors	Initiated by Staff

Flow of Events	1. Staff has ability to edit animals attributes in the database
Entry Conditions	Must have started program
Exit Conditions	
Quality requirements	
Traceability	F-09

Use Case Identifier	UC-11
Name	**Remove Clients**
Participating Actors	Initiated by Staff
Flow of Events	1. Staff has ability to remove clients from Animal Shelter System
Entry Conditions	Must have started program
Exit Conditions	
Quality requirements	
Traceability	F-13

Use Case Identifier	UC-12
Name	**Add Clients**
Participating Actors	Initiated by Staff
Flow of Events	1. Staff has ability to add clients from Animal Shelter

	System
Entry Conditions	Must have started program
Exit Conditions	
Quality requirements	
Traceability	F-13

Use Case Identifier	UC-13
Name	**File Error**
Participating Actors	Initiated by User
Flow of Events	1. The system notifies the User an error has occurred trying to access specific memory referenced
Entry Conditions	Must have started program
Exit Conditions	
Quality requirements	
Traceability	F-19

Use Case Identifier	UC-14
Name	**Database Error**
Participating Actors	Initiated by User
Flow of Events	1. The system notifies the

	User an error has occurred trying to access specific memory referenced 2. The entity is not found with the search query given
Entry Conditions	Must have started program
Exit Conditions	
Quality requirements	
Traceability	F-20

Use Case Identifier	UC-15
Name	**View Animal Profiles**
Participating Actors	Initiated by Client
Flow of Events	1. Client has ability to view profiles of all the animals
Entry Conditions	Must have started program
Exit Conditions	
Quality requirements	
Traceability	F-16

Use Case Identifier	UC-16
Name	**View Animals List**
Participating Actors	Initiated by Client

Flow of Events	1. Client can view a list of all the animals
Entry Conditions	Must have started program
Exit Conditions	
Quality requirements	
Traceability	F-15

Use Case Identifier	UC-17
Name	**Edit Basic Profile Identification Information**
Participating Actors	Initiated by Client
Flow of Events	1. Client can edit personal profile information used for identification
Entry Conditions	
Exit Conditions	Must have started program
Quality requirements	
Traceability	F-17

Use Case Identifier	UC-18
Name	**Edit Basic Matching Preferences Information**
Participating Actors	Initiated by Client

Flow of Events	1. Client can edit personal profile information used for matching algorithm
Entry Conditions	
Exit Conditions	Must have started program
Quality requirements	
Traceability	F-18

2.5. Object Model

2.5.1. Data Dictionary

Entity Object **Attributes & Associations** **Definition**

Shelter	● List of Animals ● Storing Function	A **`Shelter`** containing an **`animalList`**. Storing more **`Animals`**.
Staff	● Employee Id ● Name	
Acm	● Matching Algorithm	Matching certain **`Animals`** to **`Clients`**.
Client	● Client Id	
Animal	● Shelter Id ● Age ● Name ● Type ● Sex ● Height ● Colour ● Breed ● Neutered ● Condition	

Login	• Open Database • Close Database • Launching	Server side connection for the application's database
MainWindow	• Push Buttons	Various **buttons** for system navigation
View	• Printing Shelter	View entire collection of **`Animals`**
Control	• Initial Database Values	Initialises minimum set of **`Shelter`** **Animals**.

2.5.2. Class Diagram