Software Requirements Specification

for

Web Cattery Management System

Version 1.0 approved

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1. Introduction

1.1 Purpose

This Software Requirements Specification (SRS) is a comprehensive document which specifies the functional and non-functional requirements for version 1.0 Web Cattery Management System. The target audience of this system is cattery breeders whose purpose is to systematically manage their own catteries, and potential parents who want to seek for kittens and gather information on certain catteries. This document is written by the members of our project team to address and develop the specified requirements of the designed web system.

1.2 Document Conventions

The main body of this document is written in bold 12 Times New Roman, and all titles and subtitles are bold. In addition, functions will be presented as diagrams. The high-priority requirements or functions will be in italics. For example, registering cats is a function with high priority because it is the main function that the system must have.

1.3 Reading Suggestions

This document includes six sections: Introduction, Overall Description, External Interface Requirements, System Features, Other Nonfunctional Requirements, and Appendices. The recommended reading flow is reading each section one by one. The intended audience of this document is the project team, Professor Xiao and Teaching Assistants, and potential users.

For the project team, this document is intended to keep track of progress of the whole project including functions development, website design, requirements specification etc. In addition, this document serves as an integration of necessary requirements and information about the project, and a reminder for the teammates with high-priority requirements during the development process.

For Professor Xiao and Teaching Assistants, this document is intended to help evaluate the feasibility, complexity, and completeness of the web system we intend to develop.

For potential users, including breeders and potential parents, this document serves as a reference for the functionality of the designed web system.

1.4 Product Scope

The aim of this section is to address the needs and purpose of the designed web cattery management system.

Cat ownership nationwide increased dramatically since 2000. About 30%, or 42.7 million of households own cats with an average of two cats per household, in which about 6-8%, or 2.5 million of households obtain their cats from a cattery. About 41,120 pedigree catteries registered at The International Cat Association (TICA), and 75,041 registered at Fédération Internationale Féline (FIFe). For breeders, managing a standard cattery includes but not limited to scientific breeding, monitoring health of cats etc. However, there does not exist a comprehensive management system. Breeders always rely on themselves to sketch a plan for their catteries.

For potential parents, finding a reputable and trustful cattery is the primary source to bring a pedigree kitten home. The only way they could approach is searching by index in reputable organizations which issue certificates to catteries, such as TICA, FIFe, The Cat Fanciers' Association (CFA). Yet there does not exist a comprehensive database where potential parents can search for the certification of a cattery. Also, during the process of choosing a kitten from a cattery, potential parents always want to know what the family tree of the kitten is like, how well the kitten is going, the basic information of the cattery etc. But such information is not transparent enough to the potential parents because almost all the catteries will only update selected information on their websites, instagram, facebook, or through messaging. In such cases, potential parents are put in a disadvantageous position with risks of being deceived.

Hence, we feel it is important to provide an organized and transparent platform which could assist both breeders and potential parents in the above discussed situations. Specifically, breeders are able to manage mating, monitor health conditions of pregnant queens (female cats who are planned to deliver kittens) and newborns, and be informed of scientific breeding; potential parents are able to search and obtain information about certified breeders, and other necessary information related to the kittens who they intend to purchase. The system contains a database to store breeders, and cats information.

We hope users of this web cattery management system could benefit from systematic management and transparent information to breed or have healthy, socialized, and genetically guaranteed pedigree cat family members.

1.5 References

Pedigree Family Tree Database:
https://www.pawpeds.com/index.html
Search Engine for Registered Cattery under CFA:
https://cfa.org/breeder-search/
Search Engine for Registered Cattery under TICA:
https://tica.org/owners-breeders/catteries/registered-catteries
Search Engine for Registered Cattery under FIFe:
http://fifeweb.org/wp/catnames/cattery.asp

2. Overall Description

2.1 Product Perspective

The Web Cattery Management System collects information about cats and kittens in catteries and is able to search for catteries that are registered under CFA, TICA, and FIFe. Details about matings and the condition of pregnancy can be found on the website. Family trees and a gene calculator are also available. The Web Cattery Management System aims to evolve as the information about cats and kittens gets updated.

2.2 Product Functions

The Web Cattery Management System will offer the following functions:

PF-1: Cat Information - includes cats' basic information, health data, certificates, bloodline, retire status, and sale status
PF-2: Kitten Information - contains kittens' basic information, vaccine information, and sale status, monitors health of kittens, and provides a feature of feeding reminder
PF-3: Pregnancy Management - includes records during pregnancy, records of health examination, and a weight curve of the pregnant queen
PF-4: Family Tree - is able to find the pedigree of a certain cat, including his predecessors, siblings and offspring if any
PF-5: Gene Calculator - obtains the genetic information of cats from the database and computes the probability of genetic diseases

2.3 User Classes and Characteristics

Breeder: A breeder refers to any full-time or part-time breeder in a cattery. Their jobs include updating information about cats, kittens, and pregnant queens, such as their profile, health data, vaccines record, and so forth. All Breeders will have access to update and view the Cat Information, Kitten Information, Pregnancy Management, and Family Tree sections of the Web Cattery Management System, and they can also use the Gene Calculator feature. Breeders need to log in in order to access different sections of the website. Login Access is provided to the Breeder by the Administrator, which is based on their email address and a password of their choice. Other potential stakeholders such as the cattery owners may access the website under the Breeder role.

Potential Parent: A Potential Parent refers to any potential customer that intends to purchase cats or kittens at a cattery. Potential Parents are expected to register an account before using this website. All Potential Parents will have read-access to the Cat Information and Family Tree sections of the Web Cattery Management System, and they will also be able to know the kings

and queens that are paired to mate. Potential Parents are expected to log in everytime they access these features.

Administrator: Administrators refers to the personnel that are responsible for monitoring and updating the information in the Web Cattery Management System when needed. The Administrator can provide and cancel login access to Breeders or any other Administrators. They are able to change the equation used in the Gene Calculator, the source of pedigrees, and the source of search engines. The Administrator cannot modify data in the Cat Information, Kitten Information, and Pregnancy Management sections of the website.

2.4 Operating Environment

OE-1: The Web Cattery Management System should operate on desktop computers, tablets, and mobile devices.
OE-2: It should operate on all common browsers including Microsoft Edge, Google Chrome, Mozilla Firefox, Safari, and Opera, from the latest version at the start of January, 2021 and forward.

2.5 Design and Implementation Constraints

CO-1: The system's design, code, and maintenance documentation shall conform to the standards dictated in the CSDS 393 Software Engineering course.

2.6 User Documentation

UD-1: The system shall provide instructions for use for Potential Parents on each section of the website that Potential Parents may access.
UD-2: The system shall provide a tutorial on the different features of the Web Cattery Management System which Breeders may use.

2.7 Assumptions and Dependencies

AS-1: Breeders will be discreet when filling out the information and data of the cats, kittens and pregnant queens so that the data obtained will be accurate.
AS-2: Breeders will update in time if any data in the Cat Information, Kitten Information, and Pregnancy Management sections is changed.
AS-3: People that are not Breeders will not edit information on the website.
AS-4: Potential Parents will not be provided with the access of logging in as Breeders or Administrators.
DE-1: Administrators will not misuse their power to give or repeal access or permissions.
DE-2: Administrators will not misuse their power to alter information on the website.

3. External interface Requirements

3.1 User Interface

UI-1: The system shall provide a help link from each section to explain how to use this section.
UI-2: The system shall provide a tutorial link for Breeder and Potential Parents after they log in.
UI-3: The system shall change the scale of the viewed area in order to see more detail or less.
UI-4: The system shall allow both breeders and parents to type in information.

3.2 Hardware Interface

No specific hardware interfaces have been identified.

3.3 Software Interface

SI-1: Account Management System
SI-1.1: The system shall allow the administrator to to search for the account entered into the database.
SI-1.2: The system shall allow the administrator to add and delete accounts in the database.
SI-2: Local Resource Information System
SI-2.1: The system shall allow Administrators to modify local resources information in the database.
SI-2.2: They system shall allow Administrators to add local resources information to the database.

3.4 Communication Interface

No specific communication interfaces have been identified.

4. System Features

4.1 Log in

4.1.1 Description and User Classes

The breeder and the parent can register an account and log in to the account. The system sends the account information to the database when an account is created.
User classes: breeder, potential parents

4.1.2 Stimulus/Response Sequences

Scenario 1:
Stimulus: The breeder requests to log in to the system.
Response: A selection of logging in with existing account or creating a new account

Stimulus: The user chooses logging in with an existing account.

Response: The system returns a query. The user needs to fill in identity (breeder or parent), user name, and password.

Stimulus: The user fills in and submits the query.

Response: The system confirms the information with the accounts in the database. If the received information matches an account in the database, then the users log in successfully. If the received information doesn't match any account in the database, then the system returns an error message.

Scenario 2:

Stimulus: The breeder requests to log in to the system.

Response: A selection of logging in with an existing account or creating a new account.

Stimulus: The user chooses creating a new account.

Response: The system returns a query. The user needs to fill in identity (breeder or parent), user name, and password.

Stimulus: The user fills in and submits the query.

Response: If the identity is parents, the system checks if the account has already existed in the system. If the account has already existed, the system returns a message that the account has already existed. If the account doesn't exist, the system saves the account into the database. If the identity is a breeder, the system will save the received query in a query box and wait for confirmation from the administrator.

4.1.3 Functional requirements

Feature ID	Feature name	Description
LI-F1	LogIn.Select	The system let the user select logging in with an existing account or creating a new account.
LI-F2	LogIn.Existing	The system gives a query for the user to fill in the information needed to log into an account.
LI-F3	LogIn.Create	The system gives a query for the user to fill in the information needed to create an account.
LI-F4	LogIn.Blank.Yes	If any of the information needed is blank, the system returns a message to ask the user to fill in the blank.
LI-F5	LogIn.Blank.No	If all the information is filled in, the system starts to log in or create a new account.

LI-F6	LogIn.Existing.Comfirm	The system confirms the account is in the database.
LI-F7	LogIn.Existing.Comfirm.Yes	If the information from the log-in query matches with an account in the database, the system logs the user in.
LI-F8	LogIn.Existing.Comfirm.No	If the information from the log-in query doesn't match with any account in the database, the system returns an error message.
LI-F9	LogIn.Create.Comfirm	The system confirms the account is in the database.
LI-F10	LogIn.Create.Comfirm.Yes	If the information from the log-in query matches with an account in the database, the system returns a message to the user telling the account has already existed.
LI-F11	LogIn.Create.Comfirm.No.Parent	If the information from the log-in query doesn't match with any account in the database, and it is a parent account, the system saves the account to the database.
LI-F12	LogIn.Create.Comfirm.No.Breeder	If the information from the log-in query doesn't match with any account in the database, and it is a breeder account, the system saves the account to a query box.
LI-F13	LogIn.Administrator.Comfirm	The administrator checks the query box and confirms the request of creating a breeder account. The system saves the account information to the database when the account is approved by the administrator.
LI-F14	LogIn.ForgotPassword	If the user forgets the password, it can be reset by sending a temporary password to the email box the user provided (which should be stored in the login database).

*: LI-F1 - LI-F10, LI-F14 are requirements for breeders, parents, and administrators. LI-F11 is for parents. LI-F12 is for breeders. LI-F13 is for administrators.

4.2 Register cattery

4.2.1 Description and User Classes

The breeder can register cats and kittens and put into the information for the cats and kittens. The system put the information of the cats and kittens into the database.

User classes: breeder

4.2.2 Stimulus/Response Sequences

Stimulus: The beeder requests to register a cat/kitten.

Response: An query for entering the information of the cat/kitten. If it's the information for a cat, the query gathers the certification, bloodline, basic information (hair color, characteristic, variety, etc.), health information, pregnancy status, sale status, and retirement status. If it's the information of a kitten, the query gathers the vaccine information, basic information (hair color, characteristic, variety, etc.), health information, feeding remainder, and sale status.

Stimulus: The breeder fills in the query and submits the query.

Response: The system saves the information to the database.

4.2.3 Functional requirements

Feature ID	Feature name	Description
RC-F1	RegisterCat.Breeder. Identity	The system should confirm that the beeder has the permission to register for a cat/kitten.
RC-F2	RegisterCat.Breeder. Comfirm	The system should confirm that the breeder fills in all the information for the cat/kitten.
RC-F3	RegisterCat.Breeder. Blank.Yes	If there is information that is left blank in the query, the system notifies the breeder to fill in the information.
RC-F4	RegisterCat.Breeder. Blank.No	If all the information needed is filled in, the system registers for the cat/kitten and saves the information to the database.

*: RC-F1 - RC-F4 are for breeders.

4.3 Check Cat/Kitten Information

4.3.1 Description and User Classes

The beeder or potential parents request to check the information of a cat/kitten. The system returns the cat/kitten information required.

User Classes: breeder, potential parents

4.3.2 Stimulus/Response Sequences

Stimulus: The beeder or potential parents request to check the information of a cat/kitten.

Response: An entry for entering the name or certification number of the cat/kitten.

Stimulus: The name or certification number of a cat/kitten.

Response: If the cat/kitten is in the database, the system returns the information of the cat/kitten. If the cat/kitten is not in the database, the system returns a message of the cat/kitten not existing in the systeem.

4.3.3 Functional requirements

Feature ID	Feature name	Description
CI-F1	Cat.Breeder.Search	The system should let the breeder see the cat/kitten information in the database.
CI-F2	Cat.Parent.Blank.Yes	If the information for name or certification number is blank, the system should give the parent a message to fill in the information.
CI-F3	Cat.Parent.Blank.No. Found	If the information for name or certification number is not blank, the system should search and return the corresponding cat/kitten information in the database.
CI-F4	Cat.Parent.Blank.No. NotFound	If the information for name or certification number is not blank, and the system did not find the corresponding cat/kitten information in the database, a message of the cat not existing in the system should be returned.

*: CI-F1 is for breeders, CI-F2 - CI-F4 are for parents.

4.4 Update cattery information

4.4.1 Description and User Classes

The breeder can request to update the information in the database. The system will save the update information in the system and delete the obsolete information.

User Classes: breeder

4.4.2 Stimulus/Response Sequences

Stimulus: The beeder requests to update the cat/kitten information.

Response: The system returns a query that gathers the information of the name or certification number of the cat/kitten.

Stimulus: The breeder enters the name or certification number of the cat/kitten.

Response: The system returns the information of the cat/kitten and a query that gathers the information needed to be updated.

Stimulus: The breeder enters the information needed to be updated.

Response: The system updates the information in the database according to the information in the query.

4.4.3 Functional requirements

Feature ID	Feature name	Description
UC-F1	Update.Breeder.Search	The system should let the breeder search for a cat/kitten.
UC-F2	Update.Breeder.Save	The system saves the updated information to the database and deletes the obsolete information.

*: UC-F1 - UC-F2 are for breeders.

4.5 Pregnancy Management

4.5.1 Description and User Classes

The breeder can request to search pregnant cats, to record the information during the pregnancy, to add the health examination records, and view the weight curve of the pregnant cats. The system returns the information of the pregnant cats, saves the information during the pregnancy and health examination records to the database, and forms weight curves for the pregnant cats.

User Classes: breeder

4.5.2 Stimulus/Response Sequences

Stimulus: The beeder requests to check the information of a pregnant cat.

Response: The system returns the information of the cat during the pregnancy, the health examination records, and the weight curve.

Stimulus: The beeder requests to add/update information for a pregnant cat.

Response: The system returns a query to gather the information needed to add/update.

Stimulus: The beeder fills in the update information to the query and submits the query.

Response: The system adds/updates the information in the database.

4.5.3 Functional requirements

Feature ID	Feature name	Description
PM-F1	Pregnancy.Breeder.Search	The system returns the information of the pregnant cat when the breeder searches the cat.
PM-F2	Pregnancy.Breeder.Info	The system lets the breeder view the information during the pregnancy, the health examination records, and the weight curve for every pregnant

		cat.
PM-F3	Pregnancy.Breeder.Update	The system lets the breeder input new information of the pregnant cats and update the information in the database.
PM-F4	Pregnancy.Breeder.Curve	The system forms a weight curve for each pregnant cat according to the information in the database.

*: PM-F1 - PM-F4 are for breeders.

4.6 Genetic Calculator

4.6.1 Description and User Classes

The breeder can request to calculate the potential genetic disease that the newborn kitten may suffer according to the genetic disease history of its sire and dam. After the breeder inputs the name of its sire and dam, the calculator will extract the genetic disease history of the sire and the dam. Then the calculator will return the potential genetic disease that the kitten may suffer.

User Classes: breeder

4.6.2 Stimulus/Response Sequences

Stimulus: The breeder requests to input the name of the sire and the dam.

Response: The system returns two blanks spaces for the breeder to provide the name of the sire and the dam.

Stimulus: The breeder requests the calculator to calculate the potential genetic diseases that the newborn kitten may suffer.

Response: The system will return the potential genetic diseases that the newborn kitten may suffer.

Stimulus: The breeder requests to input two new names of the sire and the dam.

Response: The system refreshes the page and provides two blank spaces for the breeder to provide the name of the sire and the dam.

4.6.3 Functional requirements

Feature ID	Feature name	Description
GC-F1	Calculator.Breeder.Input	The system allows the breeder to input the name of two cats, the sire and the dam.
GC-F2	Calculator.Breeder.Info	The system returns the potential diseases that the new kitten may suffer according to the genetic

		disease history of the sire and the dam.
GC-F3	Pregnancy.Breeder.Update	The system lets the breeder input a new name of the sire and a new name of the dam.

*: GC-F1 - GC-F3 are for breeders.

4.7 Family Tree Management

4.7.1 Description and User Classes

The breeder can input the information of a cat into the system and gradually build up a family tree. The family tree is initially empty and the breeder needs to input the information of a cat. If the cat has a spouse, add the spouse into the system and pair the cat and its spouse. If the two cats have a newborn kitten, the breeder needs to input the information of the newborn kitten into the system and pair it with its sire and dam.

User Classes: breeder

4.7.2 Stimulus/Response Sequences

Stimulus: The breeder requests to input the information of a new cat

Response: The system returns a questionnaire to the breeder to allow the breeder to input the information of the new cat.

Stimulus: The breeder requests to pair one cat with another cat.

Response: The system will return two blank spaces and allow the breeder to input the name of two cats.

4.7.3 Functional requirements

Feature ID	Feature name	Description
FT-F1	Tree.Breeder.Input	The system allows the breeder to input the information of a cat.
FT-F2	Tree.Breeder.Pair	The system allows the breeder to pair a cat with another cat to form a family tree.

*: FT-F1 - FT-F2 are for breeders.

5. Other Non-functional Requirements

5.1 Performance Requirements

- A confirmation page should be displayed within 5 seconds after a new user signs up for a new account.

- The system should accommodate 500 users during the peak time usage window.
- The query results of cattery information should be displayed within 3 seconds of the query.
- The display of the family tree should be within 5 seconds after the user submits the query request.

5.2 Safety and Security Requirements

- The breeders and (potential) parents shall be required to log into the system for all operations. The breeders and the (potential) parents have different views to information, naming breeders should have more accessibility to the functions of this system.
- Information which is necessary for the process of authentication and essential data should be encrypted to prevent the disclosure of personal information.
- The system should prevent any changes made by parties without the privilege to modify it to protect data integrity. The database system should also be robust against injection attacks.

5.3 Software Quality Attributes

- **Debuggability**: The system should have a log system to store the information when errors occur. It will be helpful for the developers to retrieve and resolve the problems in time.
- **Learnability**: The system should be visualized in an understandable way to instruct users to perform the functions they'd like to use without causing too much confusion. The functions of each module should be presented clearly.
- **Robustness**: The system should backup information for the purpose of recovering important data from accidentally deleting.
- **Maintenance**: Each time when the system has been updated, an email should be sent to all of the users to notify them of the changes.

6. Appendix

6.1 Appendix I: Analysis Models

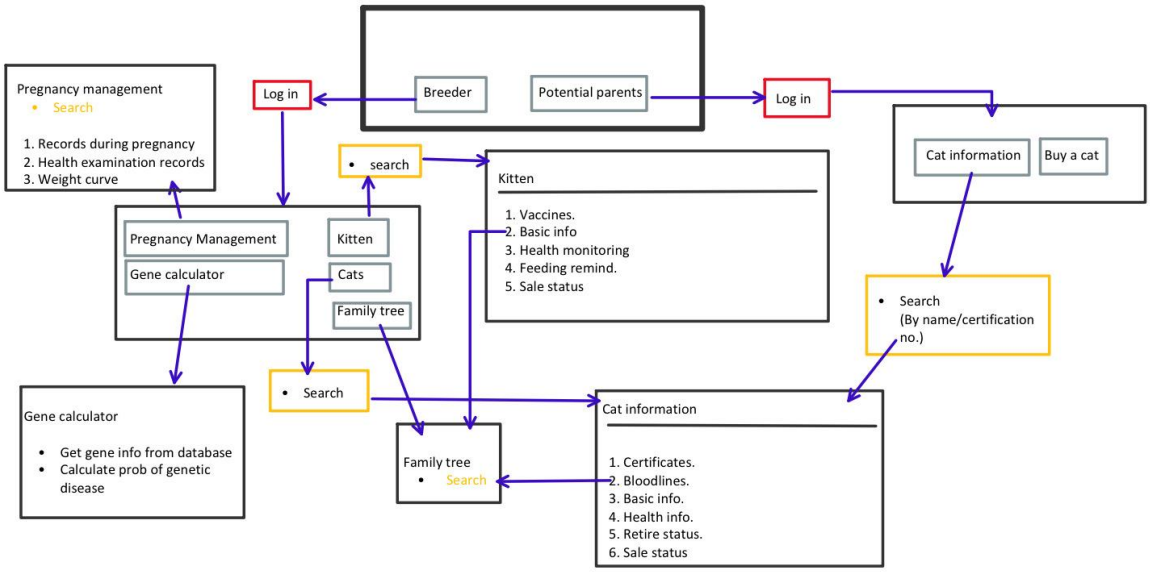

Figure 1: Detailed context diagram for Web Cattery Management System

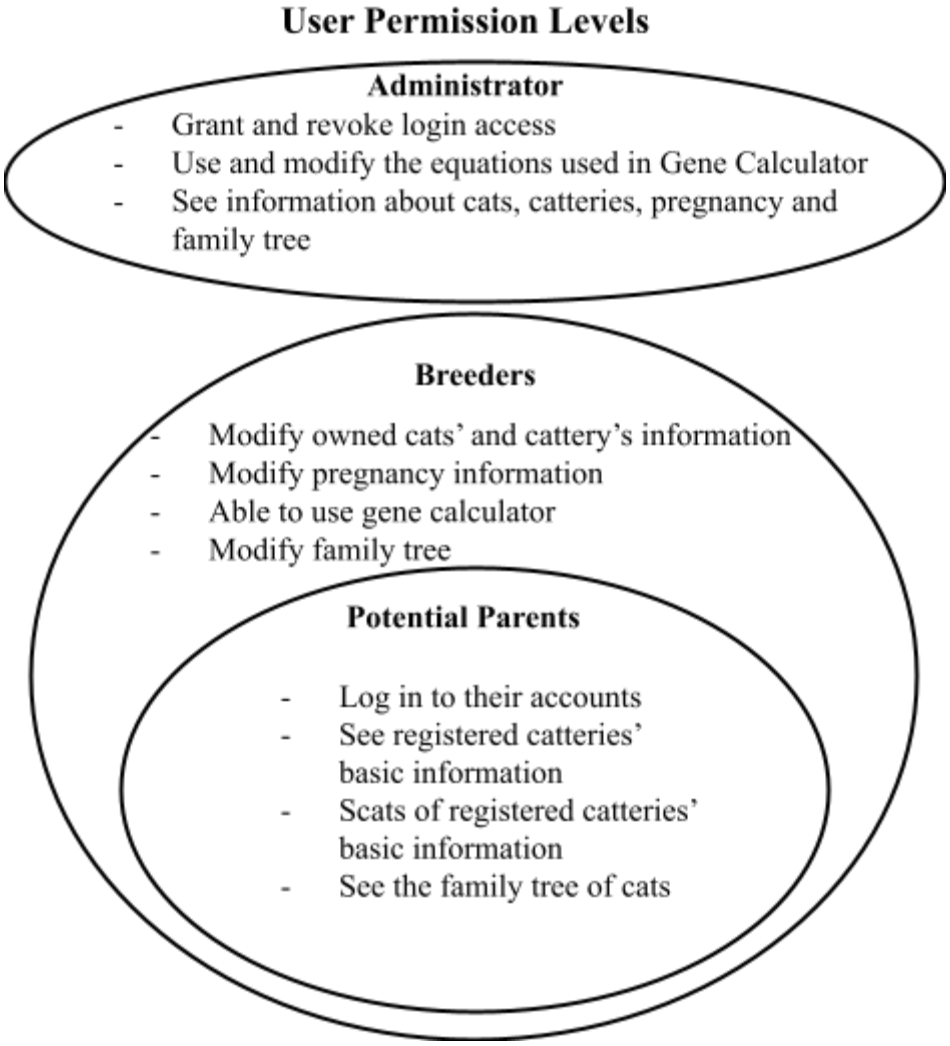

Figure 2: User permission levels diagram for Web Cattery Management System

6.2 Appendix II: Workload Distribution

We decided to use PERN Stack (PostgreSQL, Express, React, and Node.js) for the development of the web cattery management system. We divided our workload into three main parts: server, database, and frontend.

- Sherry Zhao: Sherry will be responsible for implementing the front-end website. The associated features are CI-F1 - F4, UC-F1 - F2, PM-F1 - F4, GC-F1 - F3, FT-F1 - F2

- Zora Li: Zora will be responsible for the implementation of the user interface. The associated features are LI-F1 - F5, F7 - F8, F10 - F14, RC-F1 - F4
- Ningjia Huang, Zhaokuan Chen: Ningjia and Zhaokuan will be in charge of the development of the web server. The main responsibility is to connect the server with the database and respond to the requests from the frontend. The associated features for Ningjia are LI-F1 - LI-F13, CI-F1, CI-F3, UC-F1 - UC-F2. The associated features for Zhaokuan are PM-F1 - PM - F3, GC-F1 - GC-F3, FT-F1 - FT-F2.
- Nora Tang: Nora Tang will be responsible for the database management system. The associated features are LI-F2, LI-F3, LI-F6, LI-F7, LI-F8, LI-F9, LI-F10, LI-F11, LI-F12, RC-F4, CI-F3, CI-F4, UC-F2, PM-F1, PM-F3.