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Software Design Document Final

Team Anubis
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Introduction

We are Team Anubis. Our members include Frankie Berry, Steven Gruenewald, Marjorie Hahn, Riley Shelton, and Matthew Siewierski. Our project is to create a pet adoption website for the NAZ Animal Welfare Task Force. The task force together helps over 4800 pets each year. The website will allow potential adopters to input data about themselves and be matched to a pet that fits their lifestyle.

The project sponsor, Cindy Brown, is the former development director of the Second Chance Center for Animals in Flagstaff. The cosponsor, Ken Lamm, is a member of the Animal Welfare Task Force. The NAZ Animal Welfare Task Force consists of all the major pet adoption agencies in northern Arizona including the Coconino Humane Society, Paw Placement, Ark Cat Sanctuary and Second Chance Center for Animals. Other members of the task force include Diane Jarvis (Board of Directors at Paw Placement), Sean Hawkins (Executive Director at Second Chance Center for Animals) and Carolyn Burrell (Board of Directors at Second Chance Center for Animals). This task force came together less than a year ago to help animal welfare in northern Arizona and this project is its first culmination. Furthermore, the CIO of NAU, Dr. Steven Burrell, has offered to fund and host the development environment for the project.

This document is used to explain how the project will be implemented in detail. We will begin by introducing the technologies that will be used, then we will go over the architecture of how the system will actually be built. This will then be followed by descriptions of each of the modules that will make up the system, and a plan for when each part of this project will be worked on. Finally, we will end the document with a conclusion and references.

Current Adoption Process

The Figure 1 (see below) outlines the current adoption process for the shelters involved with the Northern Arizona Animal Welfare Task Force. A key element for the task force is to reduce the number of animals that are abandoned and returned to shelters. They feel that a new system will allow users to be better informed on the responsibilities involved in adopting an animal as well as increase the chance that the animal will remain in their new home.
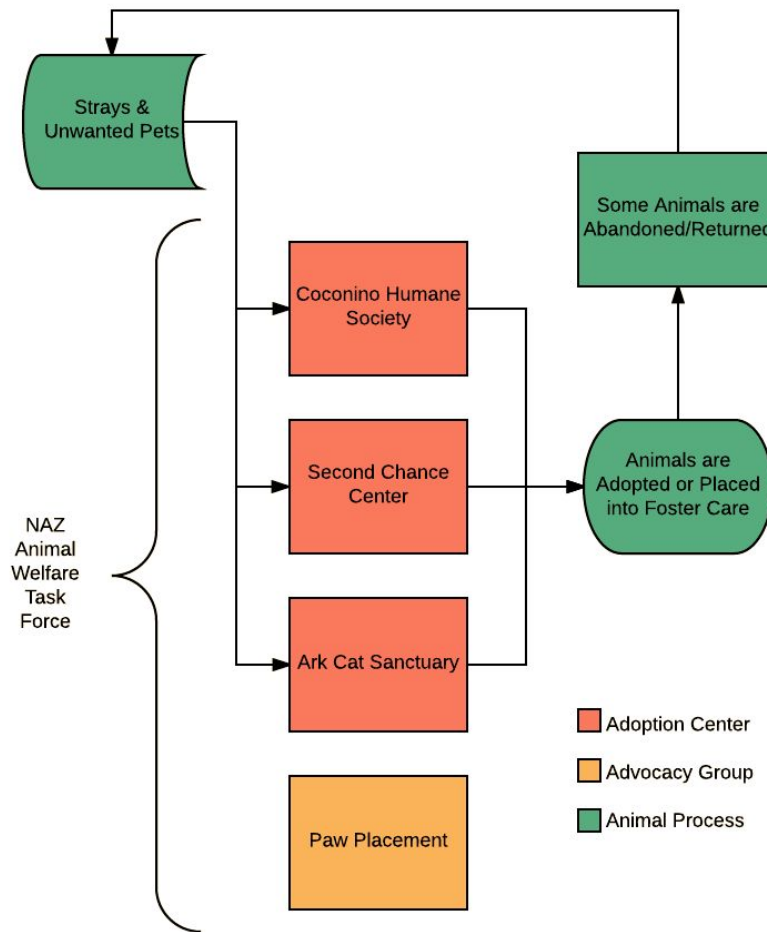
Figure 1 Current Adoption Process

Implementation Overview

The solution that we have proposed to fit the sponsor's needs is a website application that will match people to shelter animals based on compatibility traits regarding lifestyle and personality. This will help ensure that people do not return pets to the shelter as often since they will be more likely to keep an animal that they are matched with.

The system will match people to animals using a questionnaire that a person fills out upon creating an account in the system. Furthermore, this website will also serve as an educational tool by informing the user about the responsibilities and costs of becoming a pet owner. This will

help dissuade people who should not adopt an animal from becoming pet owners, and thus decrease the number of pets returned or abandoned. Table 1 describes the different technologies that will be used to complete the project.

Software	Description
Microsoft SQL Server	Backend Database
ASP.NET	Responsive Web Framework
Bootstrap	Aesthetic Web Framework
Azure (Potentially porting to this in the future)	Cloud Based Server
.org Webspace	Web Hosting
DNN	Content Management System

Table 1: Implementation Software

Architectural Overview

Home
- login/ create profile
- About
- forgot password

Login — **Admin**
- add/remove shelters
- ability to change questionaire

Login — **Shelter**
- add/remove pets

Create Profile — **Questionnaire**
- user fills out form about themselves
- Educational Information about adopting animal is displayed

Login

Our Database
- user info
- matches to animals stored
- All animal information

External Database
- hourly updates of which pets have been adopted

User profile page
- ability to match
- see previous matches
- change form info

Matches
- Users matched from highest % to lowest
- matches are displayed
- User can select animals and accept their coupon
- A form is sent to the shelter with info about pet and user

Form sent to shelter
- Form allows shelters to have pre filled out info on adopter

Legend:
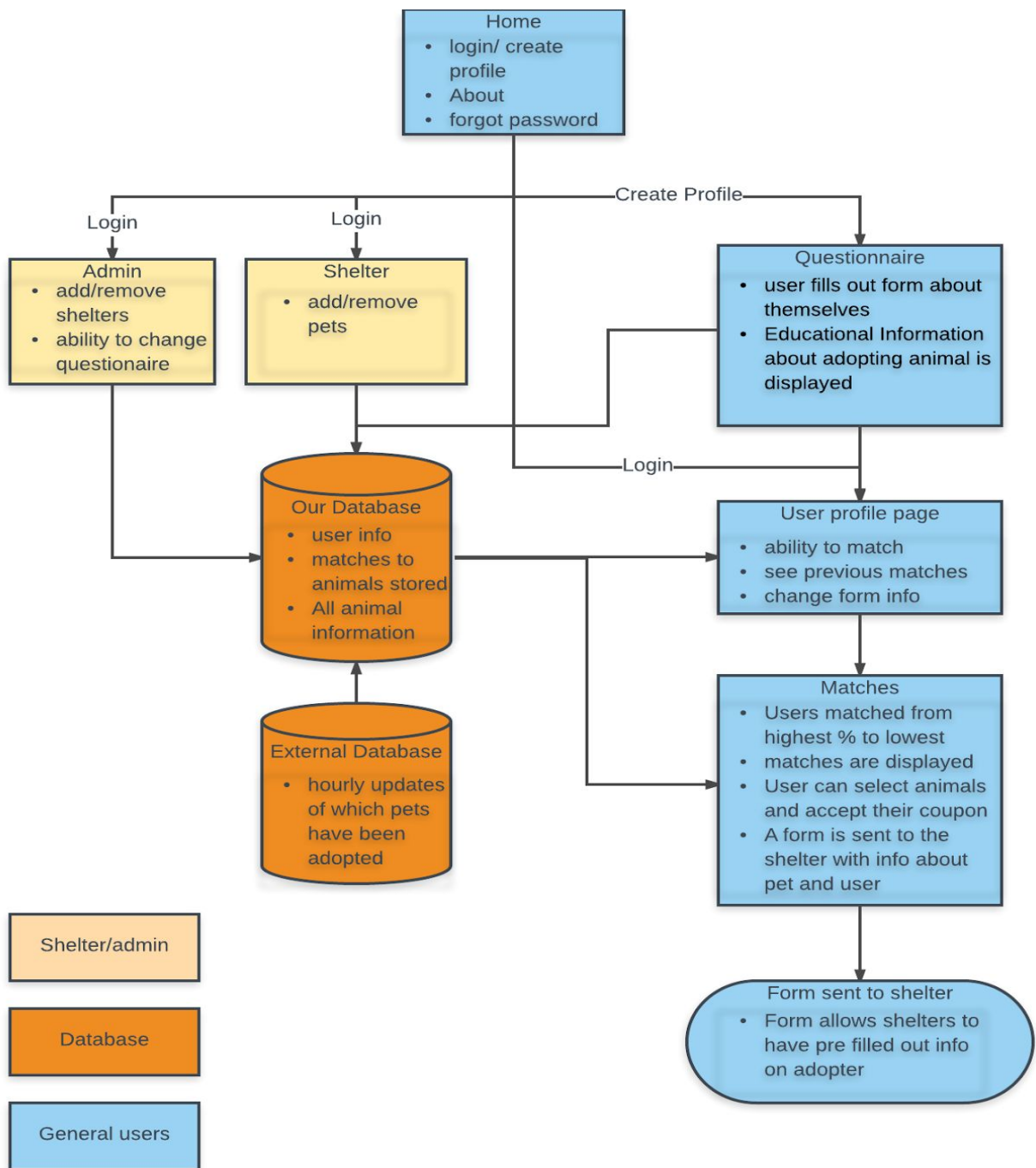- Shelter/admin
- Database
- General users

Figure 2: Architecture

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The key components which the architecture is comprised of are the home screen, administrator user, shelter user, questionnaire, user profile, our database, external database, matching and the corresponding info sent to the shelter (Fig 2).

From the home screen the user can login to the system, create a profile with a username and password, recover a password, and browse to a page with information about the website and organization (Fig 2 home). The main communication mechanism of this component will mainly be handled by the content management system. If the user is an administrator or shelter user, then they will be directed to their respective pages. If the user is just logging in, then they will be directed to the user profile page. If the user is creating a profile, then they will be directed to the questionnaire page.

The administrator pages will have the option to edit the questionnaire and add shelters to the website's listings. The main communication mechanism for this page will be the content management system (Fig 2. Admin).

The shelter pages will provide the ability to add/remove pets from the database and to update pets (Fig 2. Shelter). The main communication mechanism for this page is the content management system with our database.

The questionnaire is a form for the user to fill out with information for the matching algorithm, with educational information about adopting pets displayed to the user during the process (Fig 2 Questionnaire). The main communication mechanisms for this are the forms created by the CMS entering data into the database using SQL scripts. Upon completing the form the user will be directed to their profile page.

The user profile page is comprised of a frame of all their previously selected top matches, a button to go through the matching algorithm, and the ability to change form info (Fig 2. Profile page). The main communication mechanisms are going to be SQL script and the content management system talking with the database. At this point the user can go to the matching page or go back to the questionnaire.

The functionality of our database includes pulling pet data from the external database, storing user profile data and matches, and updating the database hourly (Fig 2 Our Database). The

only communication mechanism will be SQL script. This database will use our ERD diagram (Fig 3) for its architecture.
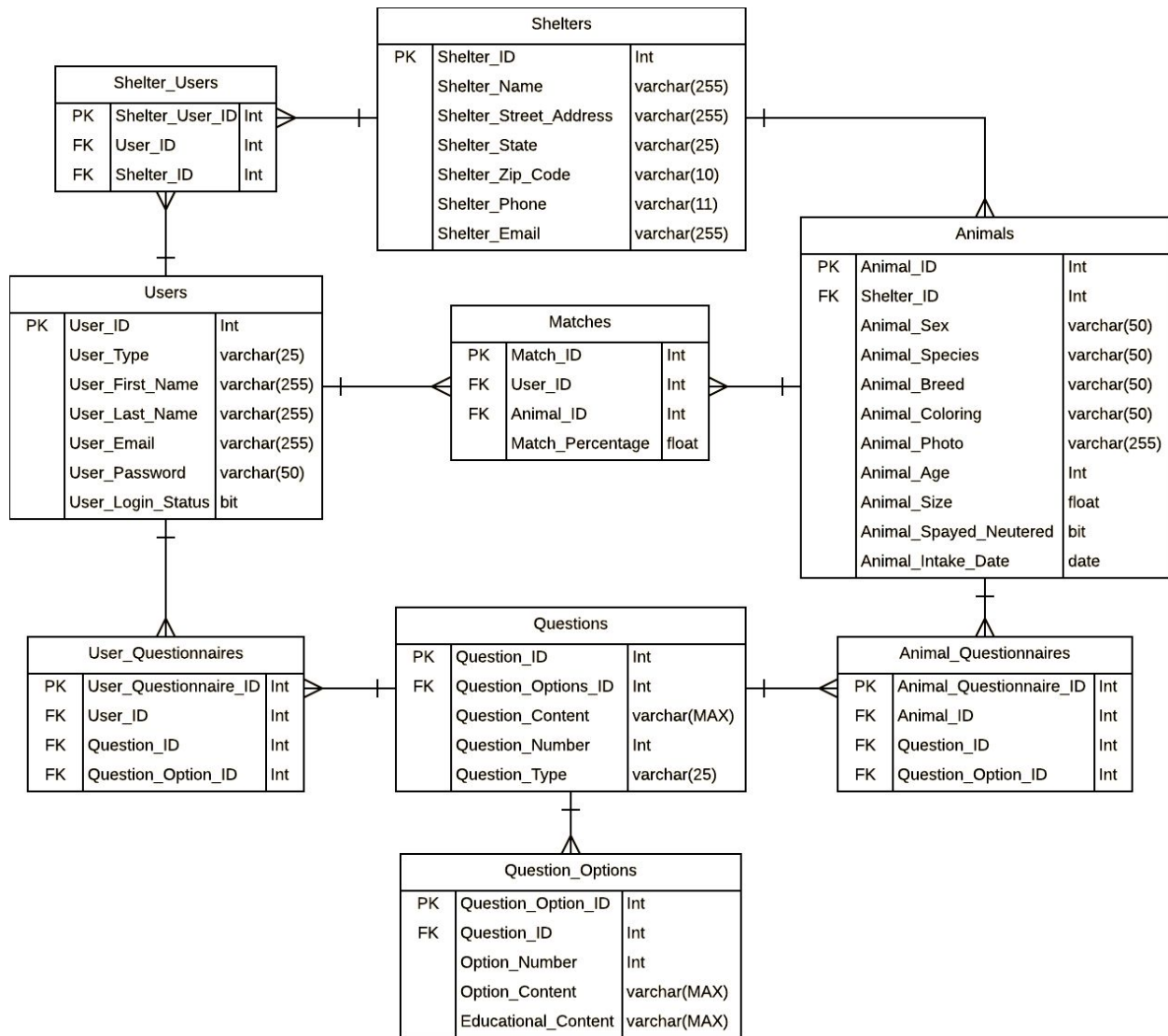

Figure 3: System ERD

The external database will be holding all previous data inputted to the existing shelter databases. The only communication will be our database pulling from the shelter database.

The matching component involves using the matching algorithm to find the best possible matches, displaying/selecting matches, and receiving a coupon from the task force. The

communication mechanisms will be through SQL queries to our database and managed by our content management system.

The info sent to the shelters is only the form of selected pet matches. This form will either be on our website or sent via some other method, such as email.

Module and Interface Descriptions

Profile Creation (CMS)

The profile creation (content management system) module is for the creation of the profiles of the users. This module is handled by the content management system. The information created from the profile is used in the matching module as well as the shelter contact modules within the system. When creating a profile, it is by default for the basic or normal user. An existing administrator must authorize adding new shelter users or administrators to the system.

Profile Management (CMS)

The profile management (content management system) module is for the management of the different security roles within the system. This module is managed by the content management system. It is used to add and remove the different security roles within the system such as: basic, shelter, and administrator. It offers the ability to restrict the access of pages to select rolls for added security.

User Login (CMS)

The user login (content management system) module is for users to login to the system in order to access the full functionality of the system. This module is managed by the content management system. This allows administrators to edit the content on the different pages, shelter users to add and remove animals from the system, and basic users to complete the assessment to get matched to the animals within the system.

In the event that we are unable to use a CMS to handle user login, profile creation, and profile management, then this data will be stored in the "Users" table of the database instead. See Fig. 2 for the database design overview.

User Assessment

The user assessment module is for the questionnaire that a basic user fills out upon creating an account in the system. The user will complete this assessment along with the registration process for the system. Depending on the number of "red flags" or concerns that are raised during the assessment, the user may be denied as a potential adopter, and instead be recommended for fostering, on-campus rent-a-puppy events, or similar activities. If the user is found to be "PetReady," then they will be prompted to complete the behavioral questionnaire. This questionnaire contains multiple behavior-based questions that will be used to match the user with animals that are stored within the system. The user's answers to these questions will be stored in the "User_Questionnaires" table in the database (Fig 3). Once the user has been deemed "PetReady" and has completed the behavioral questionnaire, then they can view their potential matches.

Animal Assessment

The animal assessment module is for the behavioral information that corresponds to the animals within the system. This is the main information that is used for the matching of animals and users. This information is inputted by shelter users. The information that is to be collected is including but not limited to the following: good with dogs, good with children, good with cats, active, inactive etc. The data from this assessment will be stored in the "Animal_Questionnaire" table in the database (Fig 3). Not every shelter keeps track of detailed animal behavioral information, and that is okay. Our system will be designed to work with any amount of information that the shelter can provide on the animal, no matter how minimal the data is.

Matching

The matching module is for the matching of users and animals within the system. It takes information from the User Assessment and the Animal Assessment, finds the commonalities between the two, and assigns a numeric value to each matching answer. The total number of

matching answers are then summed together to get the match percentage. A higher match percentage indicates a higher behavioral correlation between the adopter and the animal. These percentages will be stored in the "Matches" table of the database (Fig 3).

Shelter Notification

The shelter notification module is for the users to contact a respective shelter and express interest in an animal that is within the system. The user will be able to click on an animal and express interest. The shelter will then receive an email notification that the user is interested in that particular animal. After that, it will be up to the shelter and the user to continue the adoption process, but the matching process will help ensure that the animal is a good fit for the user.

Animal Management

The animal management module is for the maintenance of the animals within the system that are available for adoption. The Shelter User will add the relevant information for the animal that is to be used in the matching algorithm. This information is including but not limited to the following: species, breed, size, coloring, etc. This information will be stored in the "Animals" table in the database (Fig 3).

Assessment Management

The assessment management module is for the updating and maintenance of the assessment questionnaire that users complete to see if they are ready for pet adoption. It will allow administrative users to update the table containing the questions and the corresponding answers. The data pertaining to the questions and the question options will be stored in the "Questions" and "Question_Options" tables within the database.

Educational Tooltip for Questions

The educational tooltips for questions module is a portion of the assessment management module. It allows you to add, edit or remove educational tooltips to questions depending on the response that the user selected while filling out the questionnaire. This is used to create the educational component of the system that allows the users to think before they adopt an animal.

The content of these tooltips will be stored in the "Educational_Content" portion of the "Question_Options" table (Fig 3). Note that not all questions will have educational tooltips corresponding to every option for the question.

Report Generation

The report generation module is designed to generate reports for the shelter and admin users. The exact content of the reports has not been determined as of yet, but will be in the next sponsor meeting. The system will query the database for the information that the sponsors have deemed relevant to the given reports. It will display the results to the report to the shelter or admin user and allow them to export the results for safekeeping.

Pulling Data from Other Areas

The pulling data from other areas module is designed for the pulling of data from a third-party service. The system is intended to connect to the PetPoint database. Currently, this is not possible due to the way the information is pulled from the database. We will discuss options with the sponsors at the next meeting concerning this. Once a connection is possible, we will pull the adoption and behavioral information contained in the shelter to our site in order to import large amounts of animal data.

Implementation Plan

Implementation will start with a basic user interface that will allow you to create a new account, login, and navigate to the other parts of the site. After this, the questionnaire for the user assessment and the database used to store it will be created and integrated into the system. At the same time, someone will be working on pulling data from the existing database from PetPoint. When that is complete, we will implement the matching algorithm that matches the users to the animals pulled from PetPoint. Testing will be started as each module is completed, and will continue until the project is delivered.

#	Name	Start	Finish
1	Team Standards	09/20/2016	09/29/2016
2	Team Inventory	09/20/2016	09/29/2016
3	First meeting with sponsors	09/29/2016	09/29/2016
4	Technology Feasibility	10/10/2016	10/27/2016
5	Requirements Document First Draft	11/01/2016	11/24/2016
6	Design Review I	11/08/2016	11/22/2016
7	November Meeting with Sponsors	11/10/2016	11/10/2016
8	Mini Team Update	11/15/2016	11/15/2016
9	Requirements Document Final Draft	11/24/2016	12/06/2016
10	Technology Feasibility Prototyping	11/29/2016	12/06/2016
11	December Meeting with Sponsors	12/01/2016	12/01/2016
12	Technology Prototyping / Team Training	12/06/2016	01/17/2017
13	January Meeting with Sponsors	01/24/2017	01/24/2017
14	User Interface Design	12/12/2016	03/10/2017
15	Software Design Review Draft	02/09/2017	02/09/2017
16	Application Development	02/10/2017	03/17/2017
17	Build Profile Creation	02/10/2017	02/17/2017
18	Build Profile Management	02/10/2017	02/17/2017
19	Software Design Review Final	02/16/2017	02/16/2017
20	Peer Eval #1	02/17/2017	02/17/2017
21	Build User / Animal Assessment	02/20/2017	02/27/2017
22	February Sponsor Meeting	02/21/2017	02/21/2017
23	Build Animal / User / Assessment Management	02/22/2017	03/01/2017
24	Build Educational Tooltips	02/27/2017	03/01/2017
25	Implement Matching	03/02/2017	03/09/2017
26	Database Intergration	02/22/2017	03/10/2017
27	Implement Pulling Data from Other Areas	02/22/2017	03/08/2017
28	Build Shelter Contact	02/22/2017	03/08/2017
29	Implement Report Generation	03/01/2017	03/08/2017
30	Peer Eval #2	03/10/2017	03/10/2017
31	UGRADS Registration	03/30/2017	03/30/2017
32	Peer Eval #3	04/07/2017	04/07/2017
33	Testing	02/17/2017	04/17/2017
34	Profile Testing	02/17/2017	04/17/2017
35	User / Animal Assessment Testing	02/27/2017	04/17/2017
36	User / Animal Management Testing	03/01/2017	04/17/2017
37	Matching Testing	03/09/2017	04/17/2017
38	Database Testing	03/09/2017	04/17/2017
39	Report Generation Testing	03/09/2017	04/17/2017
40	User Interface Revision	03/06/2017	04/17/2017
41	Product Delivery / Sponsor Training	03/06/2017	04/17/2017
42	Design Review II	03/09/2017	03/09/2017
43	March Sponsor Meeting	03/21/2017	03/21/2017
44	Software Testing Plan	03/28/2017	03/28/2017
45	Design Review III	04/06/2017	04/06/2017
46	April Sponsor Meeting	04/18/2017	04/18/2017
47	UGRADS Prep	04/17/2017	04/28/2017
48	UGRADS	04/28/2017	04/28/2017
49	Peer Eval #4	04/30/2017	04/30/2017
50	Final Report / Signed Checkoff Sheet	05/11/2017	05/11/2017
51	Product Delivery	05/11/2017	05/11/2017
52	Peer Eval #5	05/12/2017	05/12/2017

Conclusion

Adopting a pet while at school without realizing the commitment needed to properly take care of the animal is a commonly seen and growing issue with students. This project aims to specifically target NAU students--a group especially guilty of adopting then returning/abandoning pets, and help reduce the number of pets adopted by irresponsible students, thereby reducing the number of pets that end up back in a shelter.

Through the use of a responsive web app, potential adopters will be screened via a questionnaire in order to make sure they are in a position to properly care for an animal as well as to educate them about the responsibilities involved so as to avoid any misinformation which may lead to returning or abandoning their potential future pet.

This document is focused on outlining the software design behind our planned implementation for the web app inspired by our project goal. Specifically, the document covers an implementation and architectural overview in order to provide a big picture description and high-level details respectively regarding our software design plans. The document also includes a description for each of the modules which constitute the interfaces involved in the software architecture of the web app. An implementation plan is included to give a timeline for the project.

We are confident that by following the implementation outlined in this document, we will be able to create a system that our sponsor can use to educate students on the responsibilities of adopting an animal, as well as contribute in helping more animals find their forever homes in Northern Arizona.

Glossary

- Admin User

  - A user that oversees the system by updating and maintaining the website.

- Content Management System

  - A Content Management System (CMS) is a computer application or program that supports the creation and modification of digital content using a simple interface to abstract away low level details unless required. A CMS usually supports multiple users working in a collaborative environment.

- Default User

  - A typical/normal/generic user (pet adopter) that interacts with the system.

- Digital Content

  - Digital content refers to the website and backend database for the system.

- Framework

- ○ The underlying structure of the system. More specifically, the framework is the software that the system is designed in and around.

● Lifestyle questionnaire

- ○ A questionnaire given to the potential pet adopter to assess their lifestyle habits and determine if they are suitable for adopting a pet.

● Personality questionnaire

- ○ A questionnaire given to the user to assess their personality in order to determine what kind of pet would be best suited for the user.

● PetPoint

- ○ A shelter management service used by the larger shelters in northern Arizona. E.g. Coconino Humane Society, Second Chance Animal Shelter.

● Pet Ready?

- ○ Current working name for the pet adoption website tool.

● Responsive Web Application

- ○ A web application that has an interface that changes according to the screen of the user. e.g. runs on a desktop, laptop, tablet, or smartphone.

● Shelter

- ○ An animal shelter or shelter is a place consisting of stray, lost, abandoned, or surrendered animals which are mostly dogs and cats.

● System

- ○ The Northern Arizona Animal Welfare Task Force pet adoption tool.

- Shelter User

    - An employee representing a certain shelter who would upload larger amounts of animal data to the website and ensure that their data is current and as up-to-date as possible.

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