SW Engineering CSC648/848

DoggyDex Web Application
Section 01, Team 02

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Milestone 1
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History Table:

Version	Date
V1	09/30/2021

1. Executive Summary

In society today, both online and out in the real world, dogs play an integral role as our best friends. Even if we don't have a dog, it's likely we see dogs all around at the park or on our social media timelines. Many people have fond memories of dogs growing up, and being a "dog-person" can be a personality statement. One of the great things about dogs is that there are so many different kinds of dogs out there, and each has their own traits, needs, and personality tendencies. Many dog lovers have favorite kinds of dogs, and it's always exciting to see a new type of dog when out in the world. However, when an individual is out at the park and sees a dog that they like, it can be really hard to figure out what type of breed the dog is without prior knowledge. This is where DoggyDex comes in.

DoggyDex is a fun way for users to learn more about the dogs they encounter in everyday life. DoggyDex is an application that will identify the breed of a dog in a photo provided by users, will provide information on that dog breed, and will store what breeds of dogs the user has come across. When users use DoggyDex, they will start with an empty DoggyDex, and the goal will be to fill up their DoggyDex with all of the different types of dog breeds there are in the world. When a user takes a picture of a certain kind of dog, it will identify the dog breed in the picture, it will log the dog breed in the user's DoggyDex as a discovered breed and then present an information page on that type of dog. Users will be able to go through their DoggyDex pull up information on all of the dogs they've found before. However, dog breeds they haven't taken a picture of won't be shown to the user. It acts like a game for the user, to find and unlock all of the different breeds of dogs. DoggyDex will also provide several other dog-centric auxiliary services for users, including maps of nearby dog parks and shelters, an ability to set playdates with other local dogs, and a community board for dogs that have been separated from their owners.

Our team has a strong affinity for dogs and a dream to help both owners and companions enhance their daily life together. Since day 1, we connected and banded together to constantly bounce ideas off of each other and help each other when taking on the challenge of unfamiliar topics and tools.

2. **Personas and User Stories**
   Listed in order of priority

Persona	User Story
Kyle (19M) - Kyle plays lots of video games in his free time and loves Pokémon Go. He signed up for DoggyDex because he wanted to try something in the same realm as Pokémon Go. He is looking to "beat" the game by completing the DoggyDex. Kyle will go to any length to fill the remaining empty slots in his DoggyDex.	As Kyle, I want to play DoggyDex as a game, much like I would play Pokémon. As such, I not only want DoggyDex to store all the photos of dogs I have taken in the past so I can remember them and have that sense of collecting them all, but I also want DoggyDex to show me features that will keep me engaged beyond this core functionality. Without these other features to keep me engaged, I may stop using DoggyDex in favor of a different game. **Constraints**: Be able to handle a large number of user accounts so each user can have a personalized experience with the app. Have continuous engaging content such as showing Kyle memories of dog photos he has taken in the past or giving clues about where certain dog breeds can be found to help him build out his personal DoggyDex.
Dexter (65M) - Dexter does not own any dogs himself but has a casual interest in learning more about his friends' dogs and the dogs he sees on his walks. He does not plan on going out of his way to snap photos of dogs just to fill in his DoggyDex.	As Dexter, I want to have DoggyDex identify a dog breed of a dog in front of me as quickly as possible. **Constraints**: App launch time + time to get to a screen where Dexter can take a photo of 2 seconds or less.

Gabriela (32F) - Gabriela lives in the north bay and does not personally own any dogs. She has been talking about wanting to get one for quite a while when she moves out of her current apartment. The idea of buying from a breeder is unappealing, and she would like to know what kind of options all the local shelters have available without having to visit each one individually. She wants to know what areas around her are dog friendly.	As Gabriela, I want to both find dogs of a specific breed and be able to browse a broad selection of dogs that are currently up for adoption in shelters within a certain radius of me. I also want to be able to find dog-friendly apartments in an area and find out what parks or other public spaces allow dogs so that I can research fun activities to do with the dog I end up adopting. **Constraints**: We will need to have a way either for local shelters to upload information about what dogs they have that are currently up for adoption or for us to scrape this information from some other resource. The dog-friendly apartment or public space search will definitely need to be scraped from some already existing source. We will need to allow the user to provide their current location or be able to input a zip code to narrow the range of these searching features.

Josh (13M) - Josh is in middle school and enjoys discovering new applications he can use on his phone. He likes sharing fun applications he finds with his friends at school, and he wants to use DoggyDex to play pranks on his friends by taking photos of them to classify them as specific dog breeds.	As Josh, I want to be able to both take new photos and upload previous photos I have taken of my friends and have the algorithm provide the dog breed that most closely matches them. I want to be able to then save or export a new composite photo that has the picture I uploaded and a stock photo of the identified dog breed side-by-side that I can share to social media in order to show my friends. **Constraints**: Have integration with major social media platforms to promote usage. The ML model should still provide an output (however low the guessed accuracy) for photos that our model clearly categorizes as "non-dogs".
Kimmy (27F) - Kimmy lives with her boyfriend, and their two dogs in Santa Rosa. Whenever she sees a dog on the street, she easily becomes distracted and asks to pet it. She often takes pictures of various dogs and shows them to her friends. Kimmy wants to socialize her dogs more, but none of her friends have any, and she is afraid to overwhelm them by taking them to a dog park.	As Kimmy, I want my dogs to interact with other dogs, but I am nervous about some of the dogs at my local dog park because my dogs are rather skittish. I want to be able to arrange playdates with other dog owners where I can see information about the dogs that would potentially be interacting with my dogs. **Constraints**: We will need to allow users to create a profile that has information about any dogs that they personally own and opt-in to the DoggyDates service so that they may be matched with other interested users.

Cassandra (22F) - Cassandra is interested in machine learning and wants to experiment with DoggyDex to see how accurate it is. She will push the ML model to its limits by capturing photos that would be considered edge cases which will be difficult for the model to interpret.	As Cassandra, I am primarily interested in the technology behind DoggyDex. I want to push DoggyDex by taking photos of dogs in uncommon situations (i.e. wearing costumes, in low light, far away) to see what the output will be. I have a hobby of trying to trick DoggyDex into categorizing a single dog as multiple different breeds by providing multiple photos of the same dog in different conditions. **Constraints**: The app should include instructions on photo-taking for the user if the user is providing photos of poor quality that the ML model has a difficult time categorizing with high confidence.

3. Data Definitions

Name	Definition	Usage
Basic_User	This will be the basic user that most users will be. This is a user who has signed up for DoggyDex with an email and password.	This will start with an empty DoggyDex (empty Found Dog Breeds) and will be able to fill the
Admin_User	Admin users will have control over contents of the Dog Breed Table as well as have all Dog Breeds unlocked.	This will give admin users a full view of DoggyDex's Dog Breeds as well as the ability to add more Dog Breeds to the findable dogs.
Dog_Breed	This will be the structure that stores information on a specific dog breed type.	There will be a collection of these, and there should be one of these for every dog breed that there is.
Dog_Breed_Table	This will be a table of different Dog_Breeds.	This will be used to store all of the different types of Dog Breeds.
Found_Dog_Breeds	This is a table of dog breeds.	This will store which Dog Breeds a User has found.
Registered_User	This will be the overall user structure. A user registers with an email and password.	Registered Users will either be assigned Basic or Admin privileges, and this will define their experience with DoggyDex.
User_Dog_Statistics	This will store all of the statistics of a particular user in regards to different types of dogs.	This will show how many times a user has come across a specific type of dog, the dates discovered of breeds, as well as other things.

4. Initial List of Functional Requirements

Req #1 Splash Screen / Login Screen:

Username - must be unique
Password - must password validation requirements
Forgot Password
New User Sign Up
Log in with (facebook, Google, etc)
Skip, skips log in
Terms of Service
Privacy Policy

Req #2 New User Sign Up:

Name
Last Name
Email
Verify Email
Password
Existing member
Log in with (Facebook, Google, etc)
Terms of Service
Privacy Policy

Req #3 Forgot Password:

Email input
Back button to login
Submit

Req #4 Home Screen:

All users, whether or not they are logged in, can access the application's main feature which allows users to photograph dogs and be shown facts about the dogs' breed. To use other features, users must make an account and log in.

Req #8 Dog of the day banner at top
Buttons for all of our major features:

Upload or Take a Photo
DoggyDex
DoggyDates
Lost Dog Community Board
DoggyMap
Dog food, toys, or accessories ads

Req #5 Upload or Take a Photo:

This screen will prompt the user to either upload or take a photo. This will then classify the dog, provide an estimate of how accurate the model predicts its answer is, then present an info page of the most-predicted dog breed. In the background, this dog breed entry will be added (if not already) to the user's personal DoggyDex for them to view later.

DoggyDex:

Req #6 Desktop View:

Vertical Rolodex-style view of a list of dogs on the left. On the right, the dog that is currently selected will have a view that shows their picture and a description of the breed.

Req #7 Mobile View:

Vertical rolodex-style view of a list of dogs. User will tap into a specific dog breed that interests them to see the dog breed profile with photo and description on a different page.

*The DoggyDex will initially be completely empty, but will fill in as the user takes photos of different dog breeds. There will be a setting for the user to not store the photo they took and simply use stock photos, but the default will be for the DoggyDex photos to be the user-generated photos. This will disable features that show the user a history of their dog photos.

Req #9 DoggyDates:

Find local dogs and start a play date by enabling the doggy-date feature. Plan the perfect play date by using the filters to find the ideal friend!

Req #10 Lost Dog Community Board:

User is shown pictures of lost dogs within a certain radius of their location. The user can comment on posts to notify the owner of any relevant information.

DoggyMap:

Req #11 Dog Park Finder:

User is presented with a map that will ask to use their location. If the user denies, they will be prompted to enter a zip code. The search will be limited to nearest dog parks within 10 miles, sorted nearest to farthest, but the user can increase this radius. The user will have a sorting feature.

Req #12 Pet Shelter Finder:

App locates the nearest pet shelter and shows availability of users' favorite dogs through gps location and manual zip code search. Users can also

choose the radius of their search. App will provide a facility address and phone number.
-Option for Pet Shelter to post listings of dogs at the shelter with pictures

Req #13 Dog-Friendly Areas:

User can discover areas that are dog-friendly, be they apartments, hikes, restaurants, etc.

Priority List of Initial List of Functional Requirements:

	Requirement	User Stories
1	Splash / Login	All
2	New User Sign Up	Kyle, Gabriela, Kimmy
3	Forgot Password	Kyle, Gabriela, Kimmy
4	Home Screen	All
5	Upload or Take Photo	Kyle, Dexter, Josh, Kimmy, Cassandra
6	DoggyDex Desktop View	Kyle, Cassandra
7	DoggyDex Mobile View	Kyle, Dexter, Gabriela, Josh, Kimmy
8	Dog of the Day	Kyle, Kimmy
9	DoggyDates	Kimmy
10	Lost Dog Community Board	Kimmy
11	Dog Park Finder	Gabriela
12	Pet Shelter Finder	Gabriela
13	Dog-Friendly Areas	Gabriela

5. List of Non-Functional Requirements

1. Application will initialize within 3 seconds after showing title screen.
2. Password requirements with at least one of: Upper Case, Lower Case, Number
3. Application should be able to have a user capacity of at least 1000 before failure.
4. Dog breed identification should take less than 3 seconds.
5. The Home screen (first screen the users will see) will have an attractive layout with buttons for features. Navigation will be natural and easy for users to understand.
6. Transition between features should be 0.1 seconds or less.
7. Data will all be hosted on Amazon Web Services.
8. All code will be maintained through the collaborative use of GitHub.

6. Competitive Analysis

Below are some of the notable features that other apps possess. Each one has something that it excels in, but lacks other features.

Competitor App	DoggyDex
<u>Dog Breed Identity</u>: ● Offline mode. ● Can upload pictures of people to see what dog breed they resemble most. ● “73%” accuracy.	● Accuracy is one of the key aspects we want for our app. An accuracy rate of over 90% is what we aim for.
<u>Dog Book</u> ● Dog of the day. Highlights dog pictures from other users. ● Has limited information about specific breeds. ● Has a “Nearby Dogs” feature that allows the user to select a breed, and see nearby users with that breed of dog. ● Can Favorite dogs.	● Our dog feed will include pictures from friends, as well as those from local users. ● Nearby features will also include shelters, parks, and other useful dog related tools. ● The information we will provide will be more expansive, and help the user to understand more about various dogs.

<u>Dog Scanner</u> ● Also has links to Cat Scanner and Horse Scanner ● Has history tab where you can view previous scans ● Section for friends ● 371 Supported breeds, can log which ones you've seen.	● Include a user profile that can also be used to view friends. ● Our history will not only display previously saved/scanned pictures, but will also let you select them as main breed photos for your collection. ● We will have friends, as well as circles in order to make it easy for users to connect for DoggyDates.
<u>Identify Dog Breeds</u> ● Simple design and extremely easy to use. ● 121 supported breeds. Shows an example picture for each breed. ● Active breed identification. Can identify dog breeds without taking or uploading a picture.	● Our app would like to remain simple and clean, but with more features than its competitors. ● At the very least, we will include all Federation Cynologique International recognized breeds.

One large advantage our app has over others is the amalgamation of all the best features from each app rolled into one. It will be easier for users to share and view dogs and their owners nearby. Not only that, but this app will be able to guide users to the best locations around them for dog friendly activities, which is a service other applications do not provide. For anyone who already has or plans on having a furry friend, this app will be the ultimate go to for just about anything dog related, making their daily life easier when incorporating their companion. Even if you simply enjoy dogs, the wealth of information provided will overshadow our competitors.

7. High-Level System Requirements

Server Host	: AWS CLI 2.0
Database	: MongoDB 5.0
Programming Language	: HTML, CSS, JavaScript
IDE	: Visual Studio Code 1.60
Front-End Technology	: React 17.0.2
Back-End Framework	: Express 4.17.1
Machine Learning	: TensorFlow 2.5.0
Datasets	: kaggle.com, Google Datasets
UI/UX Design	: Figma, Sketch

8. Team

Grayson Dew	: Team Lead
Orion Culbertson	: Front-end Lead
Miguel Galvan	: Git Master
Rigo Perez	: Back-end Lead
Kristopher Phillips	: Scrum Master

9. Checklist

- Team found a time slot to meet outside of the class. **DONE**
- Scrum Master shares meeting minutes with everyone after each meeting. **DONE**
- GitHub master chosen. **DONE**
- Everyone sets up their local dev environment from the team's git repo. **DONE**
- Team decided and agreed together on using the listed SW tools and deployment server. **DONE**
- Team ready and able to use the chosen back and front end frameworks.
    - For each technology (front-end/back-end/DB/cloud), team decides who will lead the study of each technology, and what will be output of the (feasibility) study by end of this month.
        1. Front-end (React)
            a. Kristopher, Orion
            b. DoggyDex Frontend Demo
        2. Back-end (Express)
            a. Rigo, Miguel
            b. Demo w/ MongoDB
        3. DB (MongoDB)
            a. Rigo
        4. Cloud (AWS EC2)
            a. Grayson
    - If you list a detailed explanation (other than Yes/No/Issues), earn extra points!
- Team lead ensured that all team members read the final M1 and agree/understand it before submission. **DONE**