



PawGo

Design Description

Version 1.2

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PawGo	Version: 1.2
Design description	Date: 19-04-2022

Revision History

Date	Version	Description	Author
28-02-2022	1.0	First version	Entire Team
03-03-2022	1.1	Adjustments to first version	Entire Team
19-04-2022	1.2	New mockups & Added Heroku	Panagiotis (Panos)

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1. Introduction

1.1 Purpose of this document

The purpose of this document is to illustrate the system design and architecture of the “PawGo” project. It may be updated during the project development process by delivering more details for each architectural unit and its desired functionalities.

1.2 Document organization

The document is organized as follows:

- Section 1, *Introduction*, describes the contents of this document and its scope, including the references used during the development process.
- Section 2, *Requirements*, defines all project requirements.
- Section 3, *High-level system description* describes the system and its components at a high-level.
- Section 4, *Software architecture and design, Assumptions & Dependencies, Development Methods* describes the lower level architecture and the development methods of the project.
- Section 5, *Graphical User Interface*, shows mockups of the initial project’s design.

1.3 Intended Audience

The intended audience is:

- **Team members**, the development team should have full access to this document, to develop the required solution using intended design approach and chosen technologies.
- **Supervisors**, Professor Paul Bourke should have full access to this document, to evaluate and grade the progress of the development as well as to advise the team where it is needed.
- **Customer**, Liz McKeever, to whom deliver the final product should have full access to this document, to revise the development progress.

1.4 Scope

This document covers the design and architecture of the project software, describing its components and interactions between them, as well as the software development tools and technologies that are going to be used to develop the desired application.

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1.5 Definitions and acronyms

1.5.1 Definitions and synonyms

Keyword	Definitions
Mockup	An high-level model to give an idea of the design the application will have
NoSQL	Non-Relational (database)
SQL	Standard Query Language (database)
App	(Mobile) Application
Hybrid App	Is a software application that combines elements of both native apps and web applications

1.5.2 Acronyms and abbreviations

Acronym or abbreviation	Definitions
UML	Unified Modeling Language
GUI	Graphical User Interface
API	Application Programming Interface
R #	Requirement
JSON	JavaScript Object Notation

1.6 References

Front-end:

- *Flutter*: <https://flutter.dev/>

Back-end:

- *Node.js*: <https://nodejs.org/en/>
- *Express*: <https://expressjs.com/>
- *Cloud application platform*: <https://www.heroku.com/>

Database:

- *MongoDB Database*: <https://www.mongodb.com/>
- *Firebase*: <https://firebase.google.com/>

Design:

- *Figma software*: <https://www.figma.com/>

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2. Requirements

2.1 Functional Requirements

ID	Description	Priority	Motivation
R1	The application must have authentication, allowing users to login	1st Stage	Users should be authenticated to track and share their progress
R2	The application must allow users to edit their username and their profile picture and information	1st Stage	Users want to keep their personal information up to date
R3	The application must allow users to edit their dog's picture and their profile information	1st Stage	Users want to keep their dog's information up to date
R4	The application should allow users to search for dog owners on the map	2nd Stage	Users want to search based on map range
R5	The application should be able to track user's location using device's GPS service	1st Stage	Users want to know their position and make a match based on map positions
R6	The application should provide the user security to their account	2nd Stage	Users want to have their account secure
R7	The application should allow the user to seek for support	1st Stage	Users want to have the ability to ask for support
R8	The app should provide the user a chat feature	2nd Stage	Users want to have the ability to use a chat feature as a communication service
R9	The app should provide the user a matchmaking system	2nd Stage	Users seek for a convenient way to matchmaking based on their preferences (Dog owner/dog)
R10	The application should allow users to search for events	Optional	Users will have the ability to search for dog meeting events nearby

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High-level system description

3.1 Project background

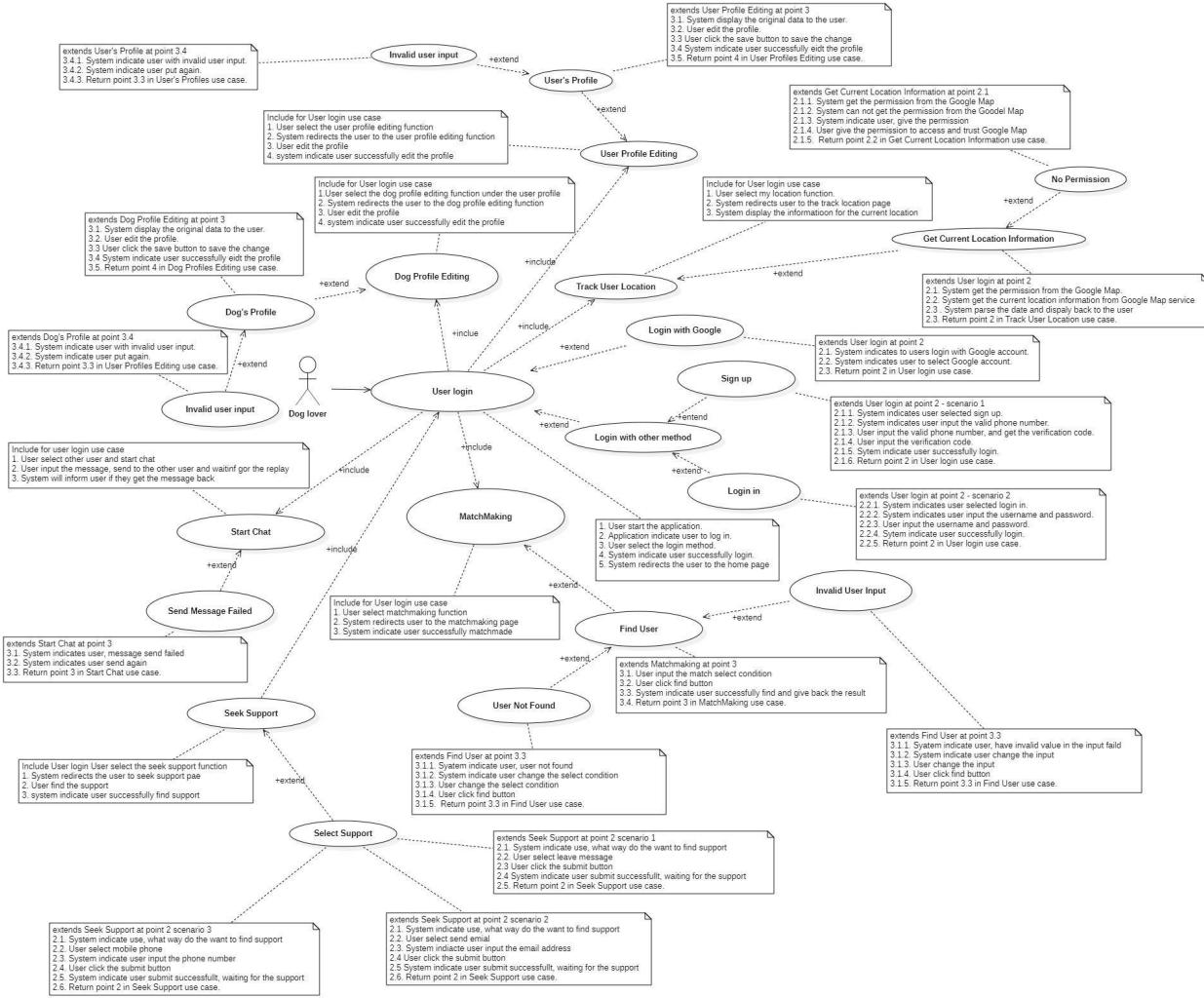
“Friend5” project team is responsible for the development of the “PawGo” application for matchmaking dog owners/lovers.

This objective is pursued by providing the users with an interactive system that encourages dog owners to find others and match based on dog breed, hobbies and other preferences. This will give users the opportunity to meet up at a pet allowed restaurant or outdoors and have the chance to know each other.

3.2 Class Diagrams

Overview:

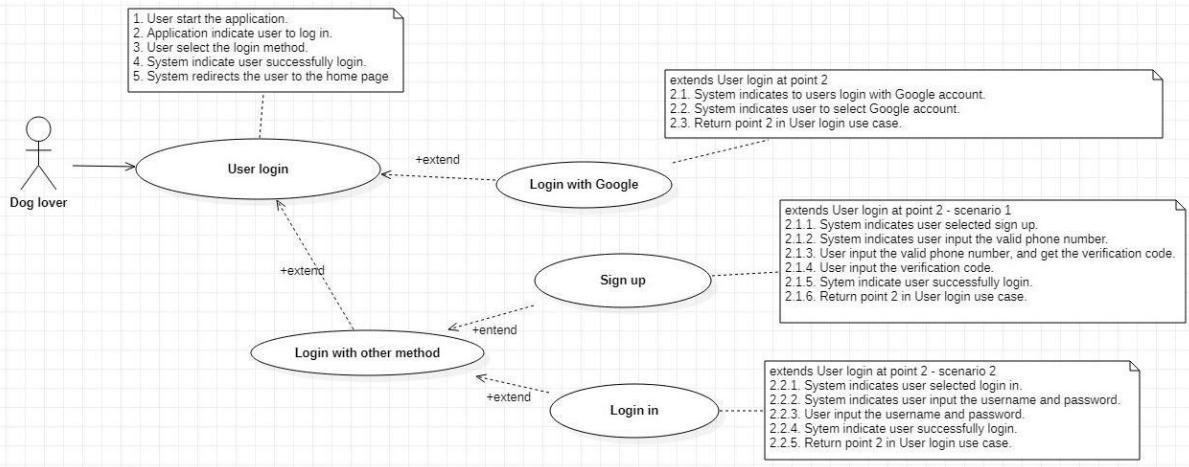
Link to UseCase overview: [click here](#)



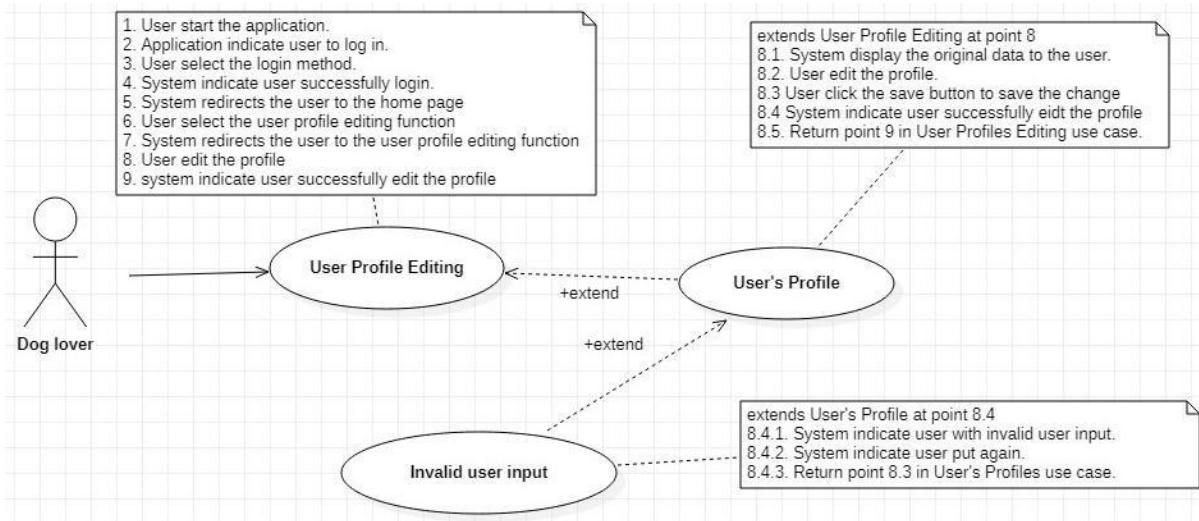
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Stage 1:

Login:

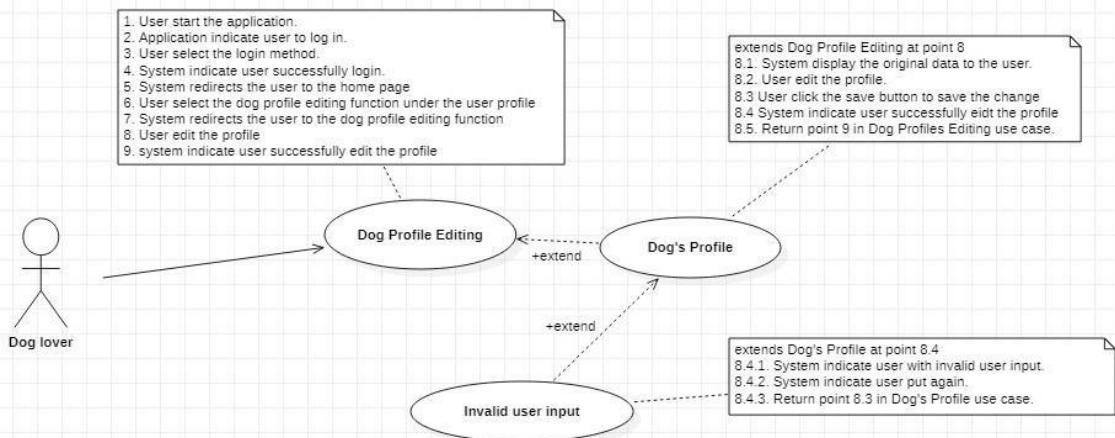


Edit user information:

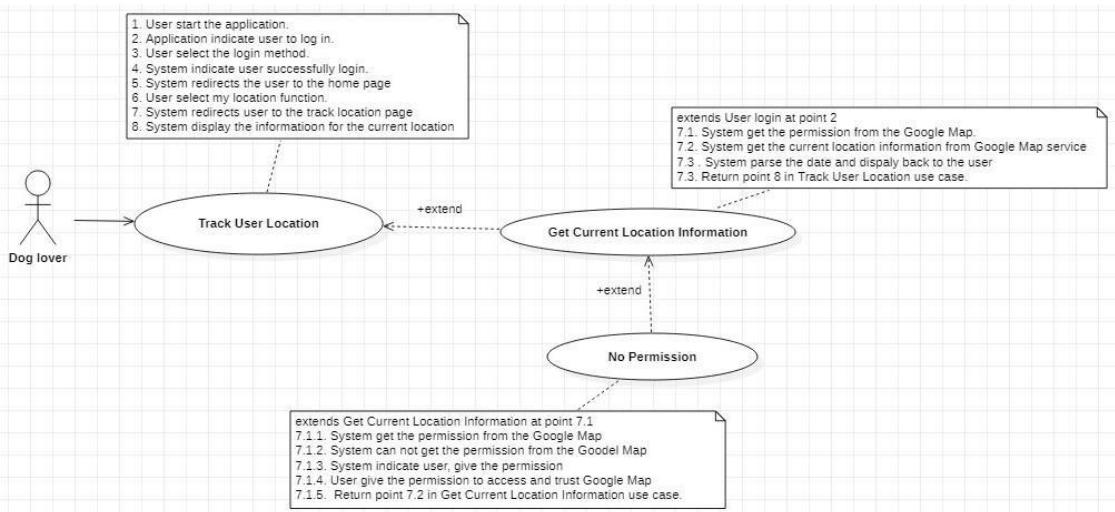


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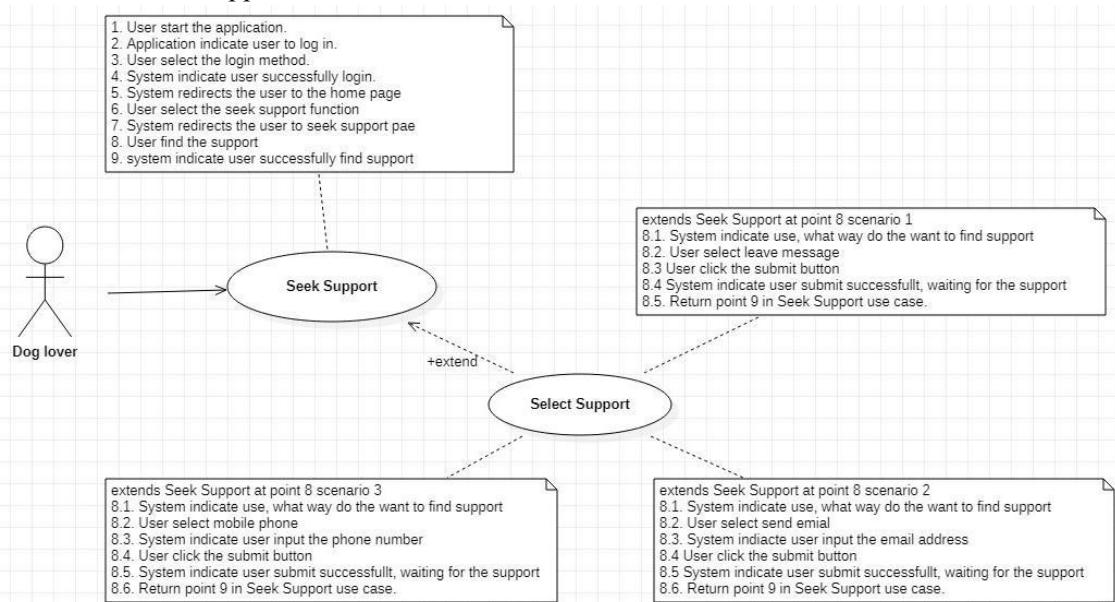
Edit dog information:



Track user location:



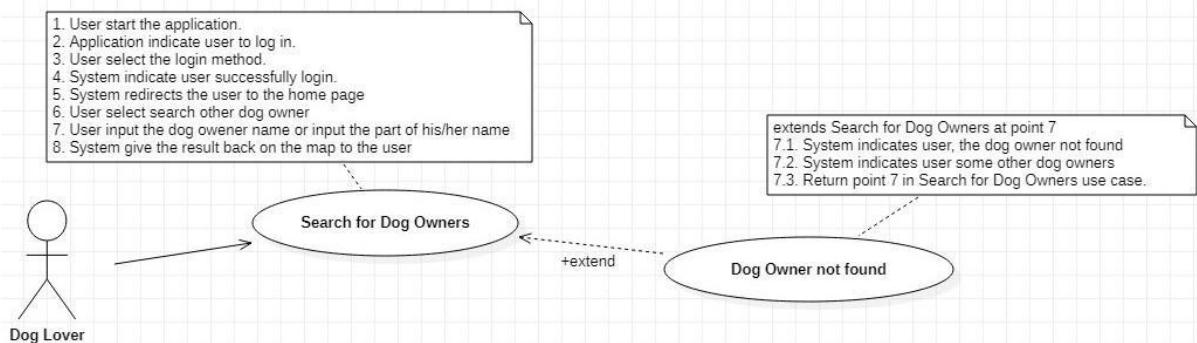
User seek for the support:



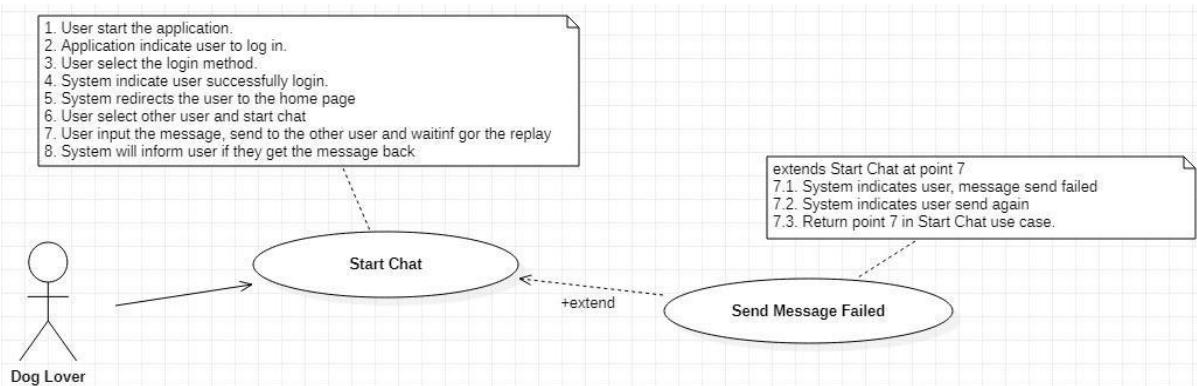
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Stage 2:

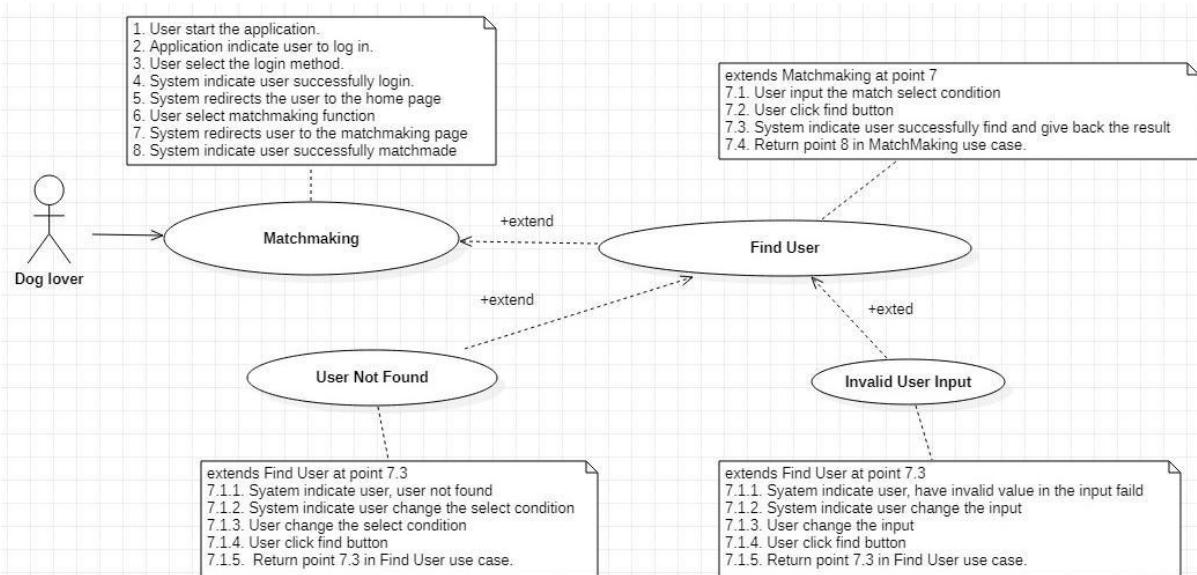
Search dog owner on map:



Chat feature:



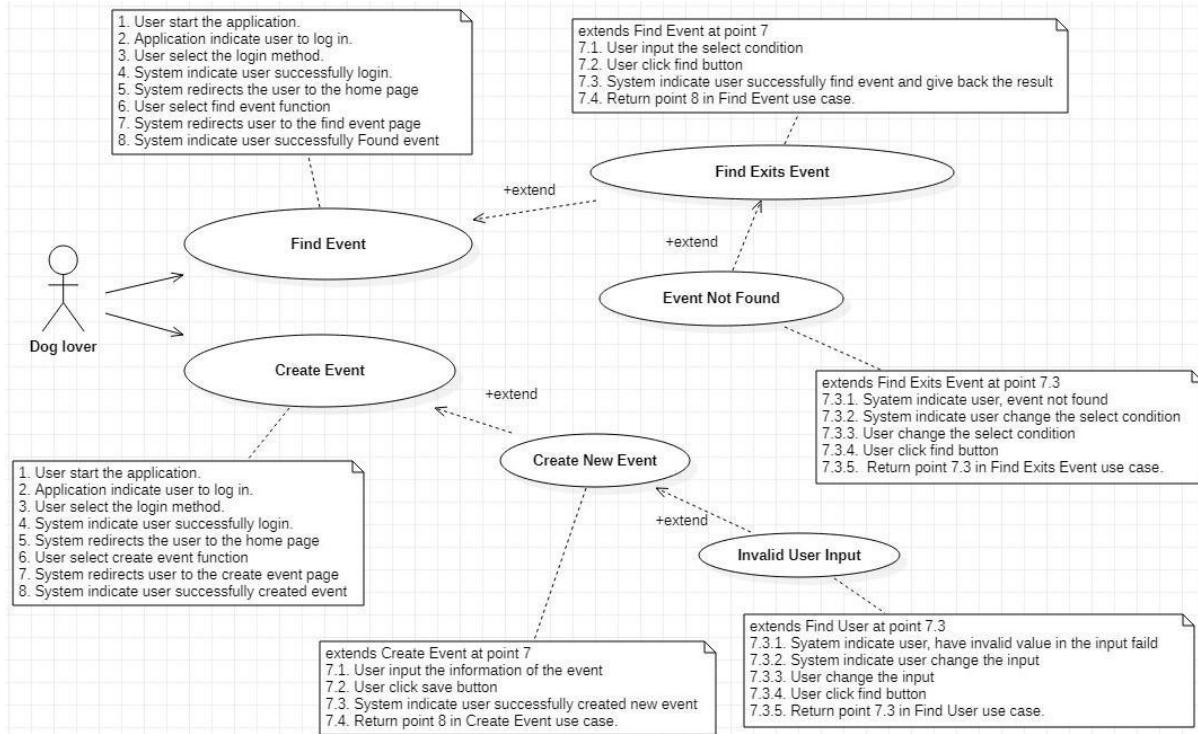
Matchmaking:



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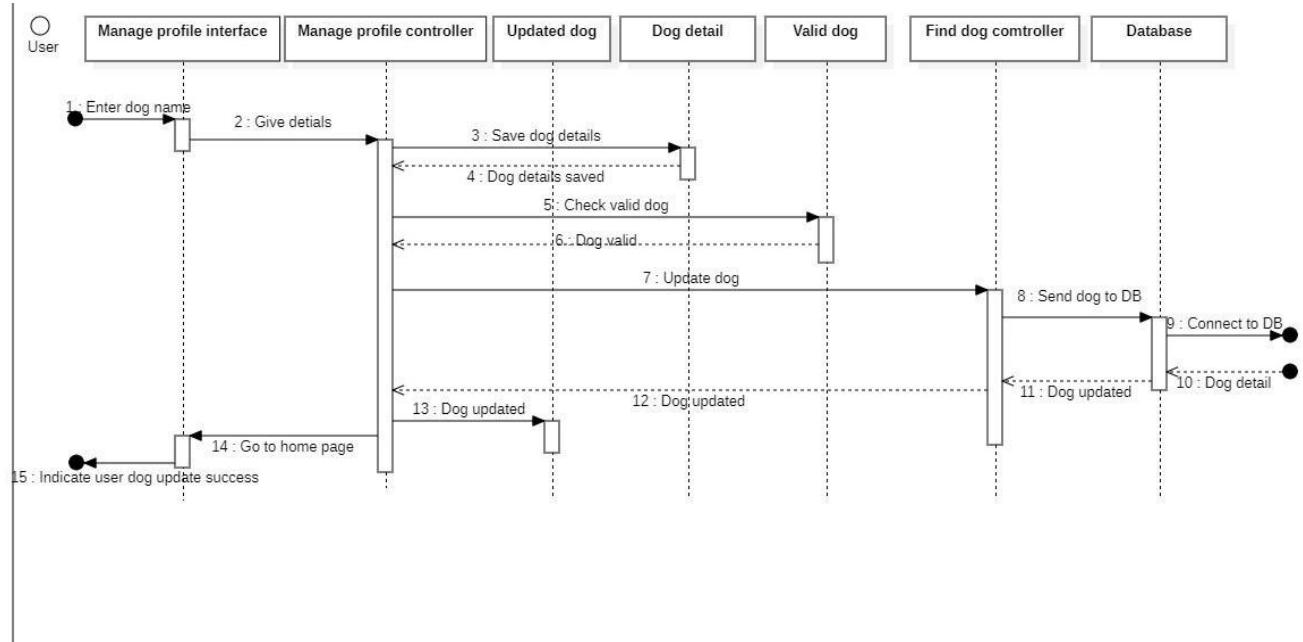
Stage 3:

Search event:



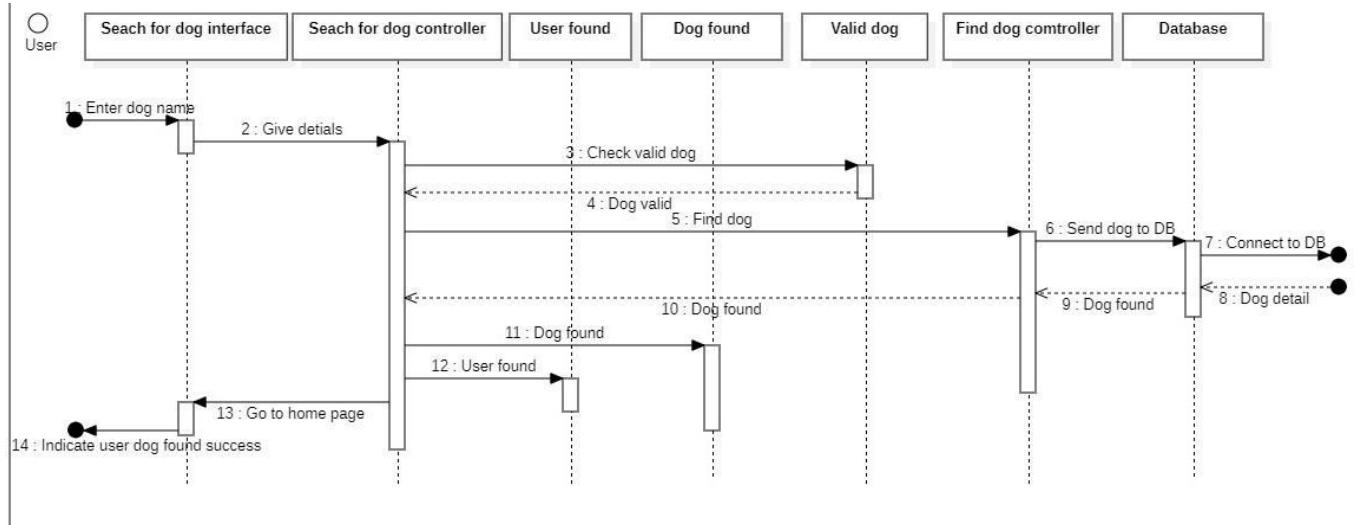
3.3 Sequence Diagrams

Manage dog:

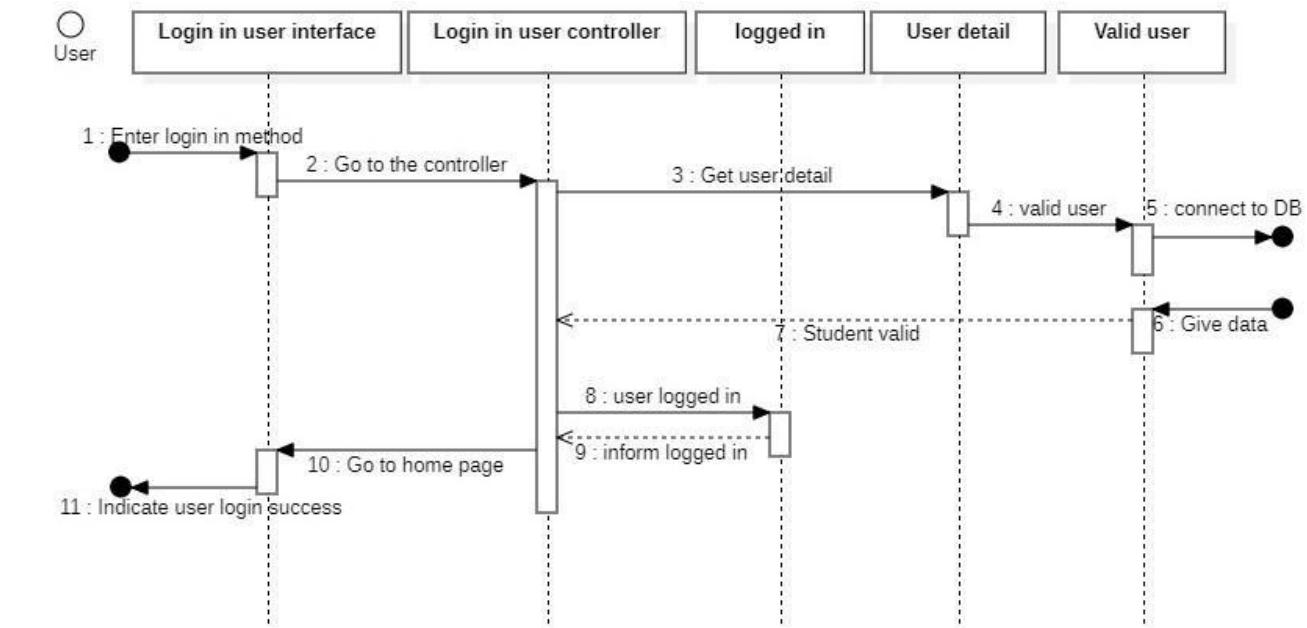


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Search dog:

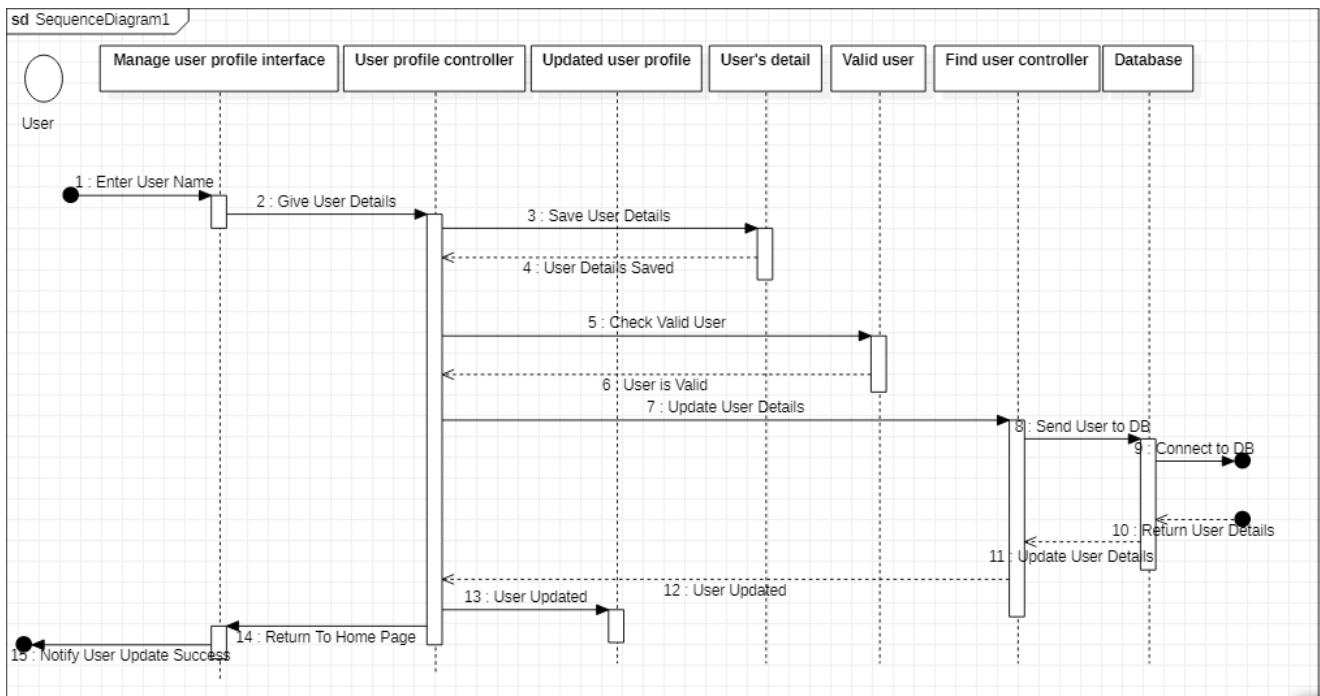


Login:



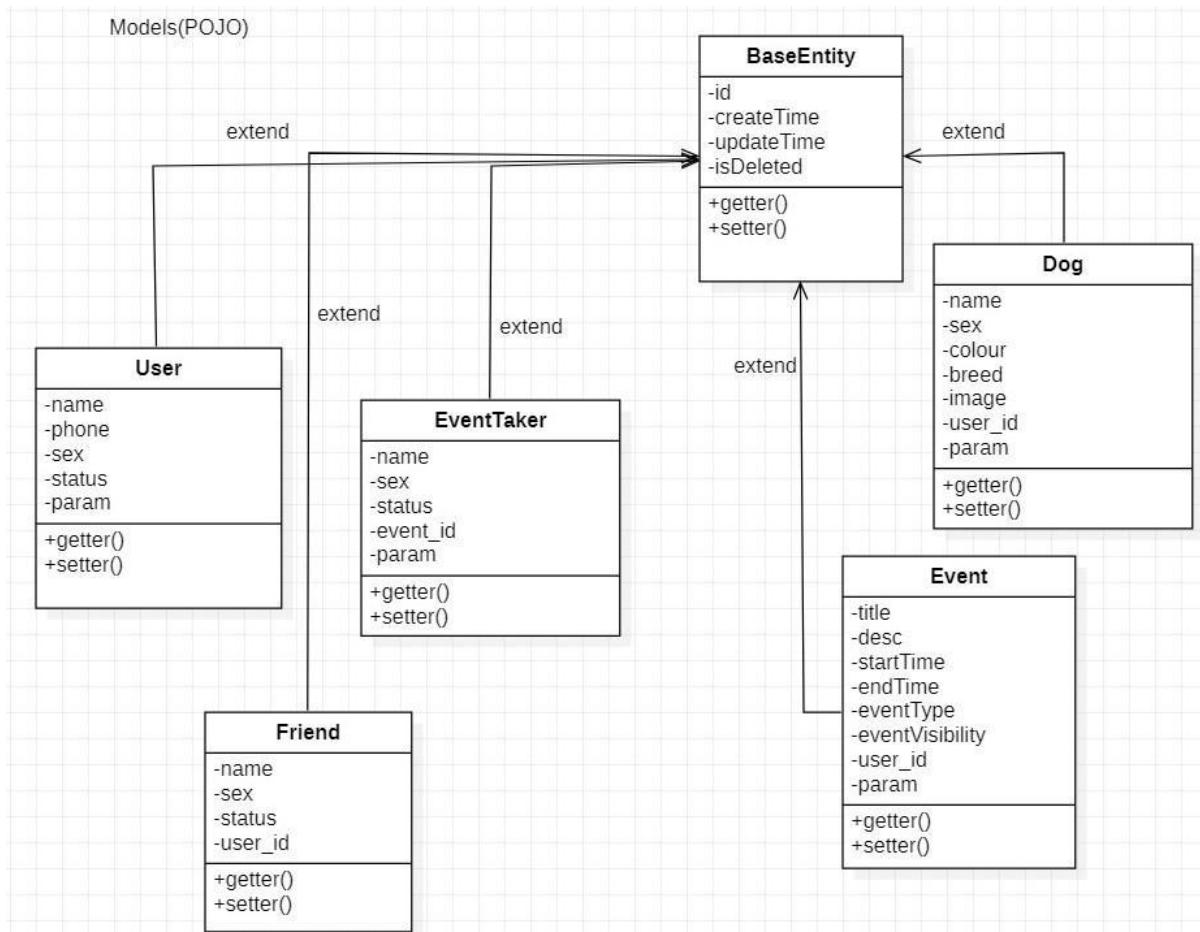
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User Profile:



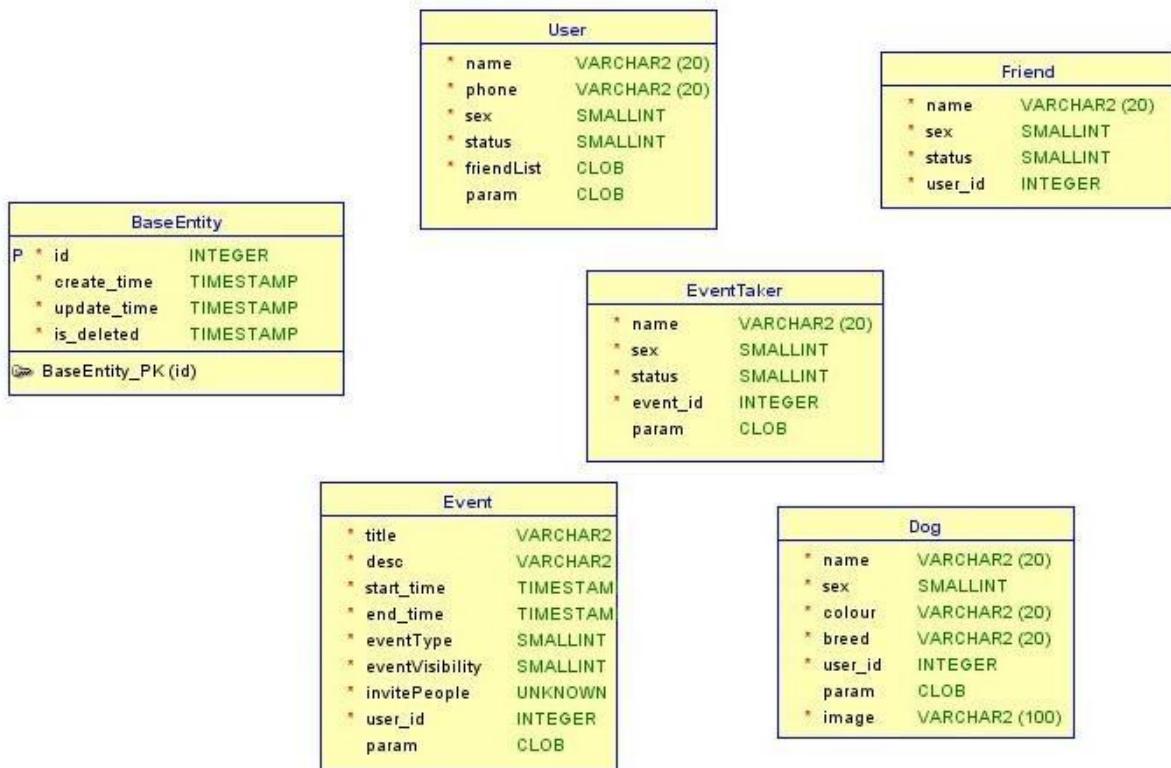
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3.4 Class Diagrams



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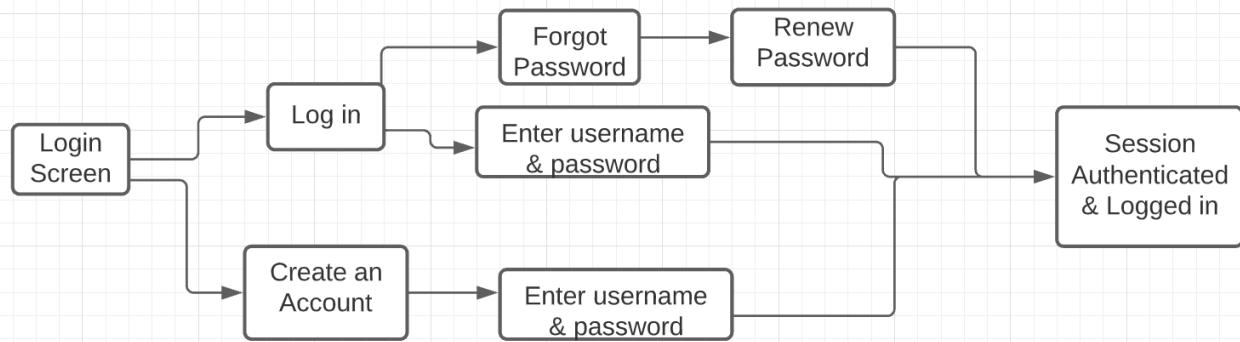
3.5 Database Design (MongoDB)



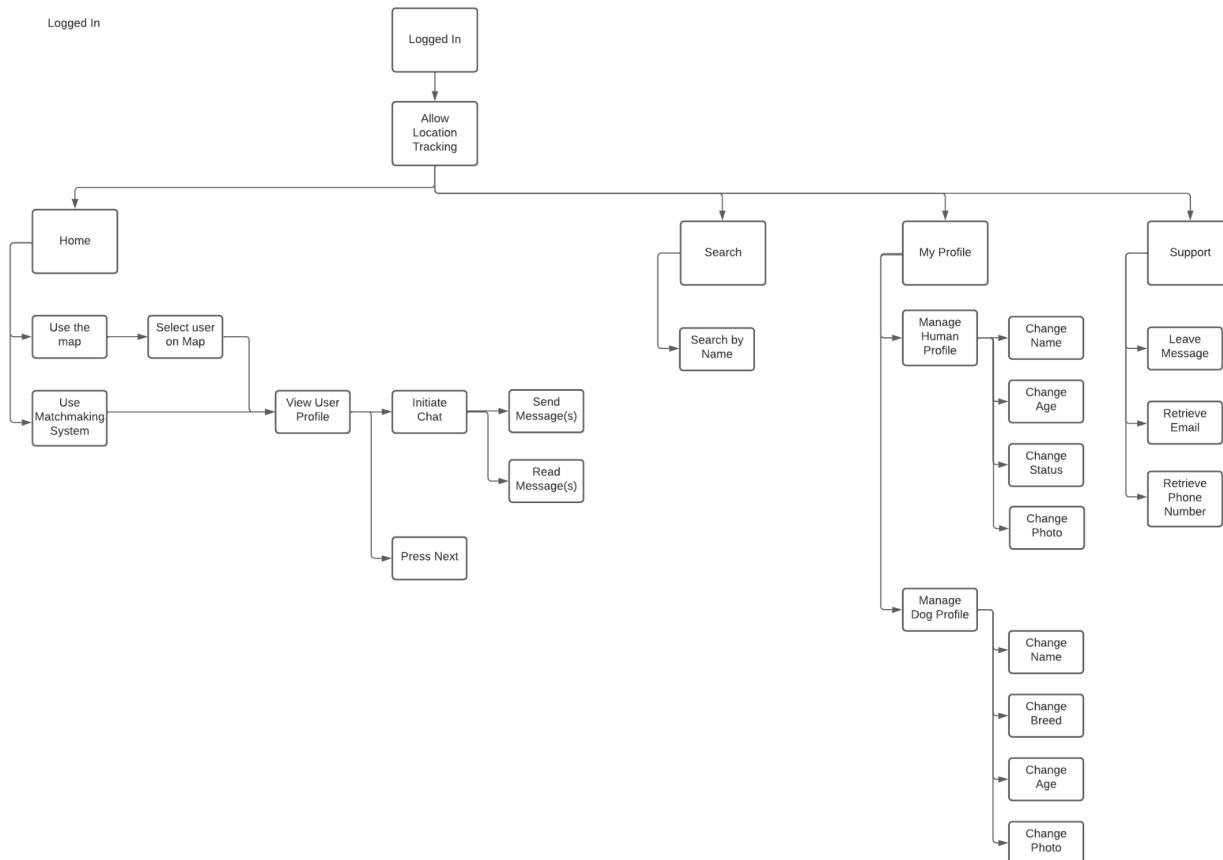
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3.5 Information Architecture (Web sitemap)

Logged out



Logged in



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3.6 High-level overview of the system

The software back-end will be implemented using NodeJs, while the data storage will be used as non-relational document-based databases, MongoDB.

The Flutter framework will be used to develop a hybrid mobile application and a web page that visualizes dog owner's profile page as well as a search/matchmaking system. This is because Flutter gives the opportunity to have a single code for hybrid development. Moreover, it gives efficient and effortless maintenance to all platforms simultaneously.

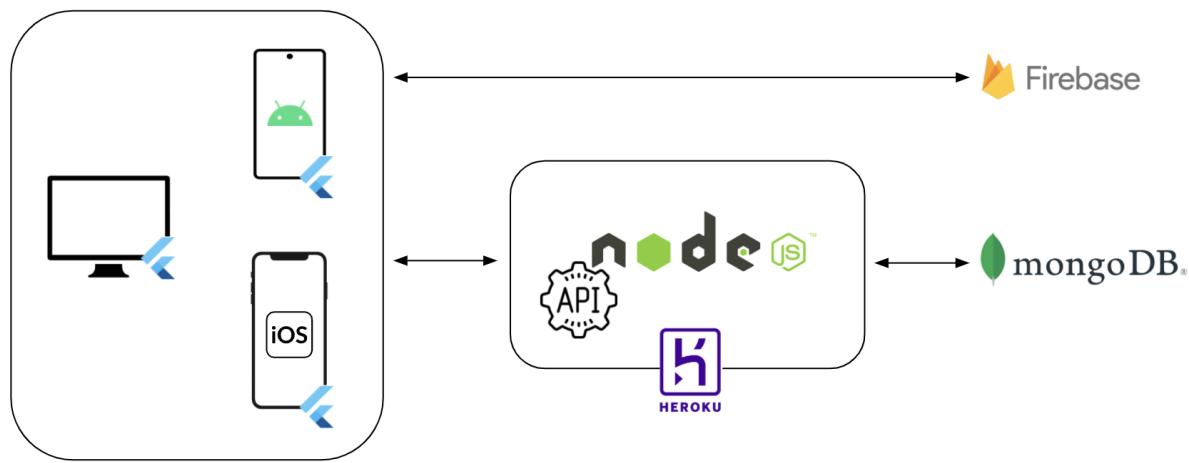


Figure: High-level overview of the entire system

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3. Assumptions & Dependencies

Here are the assumptions and dependencies:

- The related hardware or software that we chose to focus on is an Android smartphone with a version higher than 9.0 and an iOS phone with a version higher than 9.4.1. Android and iOS will be the operating systems on which this software/hardware will run.
- End-User Characteristics: Initially, we are assuming that the user is familiar with smartphones and apps that are related to maps. Furthermore, we expect that they are at least somewhat familiar with the concepts of dating/meeting apps
- Possible and/or probable changes in functionality: This will be developed through the initial requirements list that is mentioned above for any adjustments in functionality. Following that, we will make real-time adjustments based on the needs of the consumer. Functions can be adjusted according to individual needs during the development process, and there are many exciting additions that can be considered and implemented in later development.

4. Development Methods

5.1 Agile Software Development

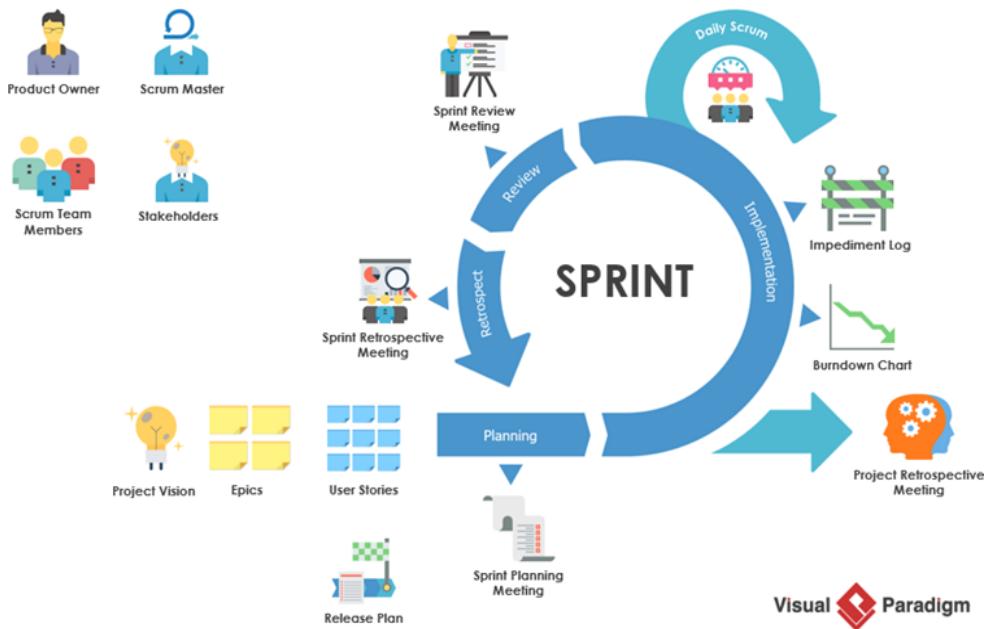
The development method that we have chosen is Agile Software Development. Agile methodology is an iterative development which breaks down a major application's software development into smaller parts. This is done through a rapid iteration. Agile methodology is conceived, created, and tested through iterative development cycles. Agile software development methodologies aim to create small, functional software quickly in order to increase customer satisfaction. We'll break down the function into little modules, design it to fit the intended functions, we will create a development plan, test it, and review it as part of our development process. The Scrum Framework is the Agile development framework that we intend to adopt. The main objective of using this is to make it easier to develop small modules by utilizing the Sprint idea.

5.2 Scrum

Scrum is an agile framework for managing a software product's development process in an iterative and incremental manner. It's built on continuous learning and adapting to changing circumstances.

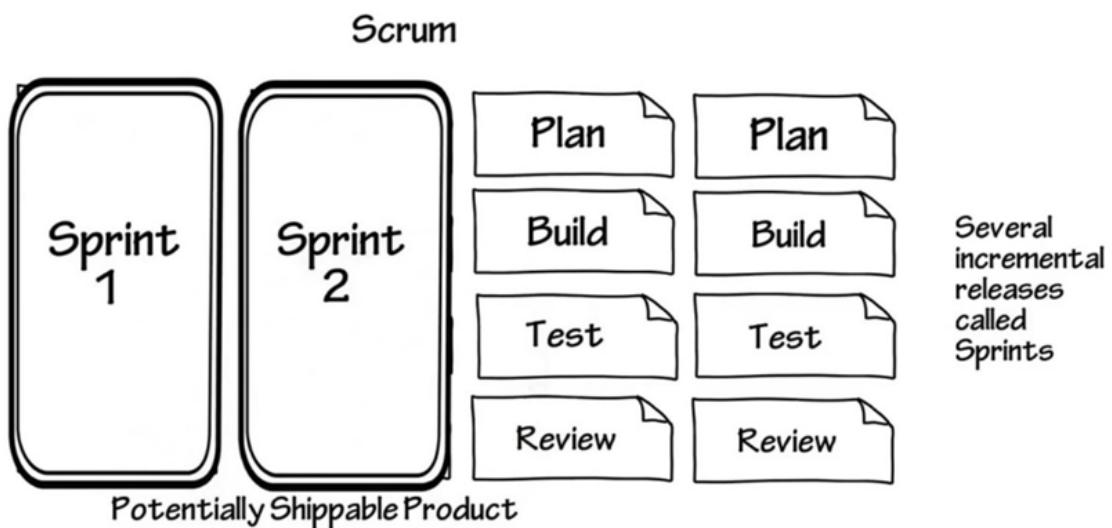
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The Agile – Scrum Framework



Sprint

The Scrum framework is based on sprints, which are fixed-time work cycles. They're usually less than a month long and are stacked one on top of the other. This will make our project more manageable and enable us to work faster and more frequently while maintaining good quality. This also allows us to be more adaptable to changes.



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5. Software architecture and design

The system has 2 main components:

- the Hybrid mobile application
- MongoDB Databases

5.1 Front-End

The main components of the front-end part are the hybrid mobile application and the webapp. The main objective of the **hybrid application** is to store user's data and to provide a system that allows users to search and matchmaking with others.

5.2 Back-End

The back-end is based on Node.js, an open-source, cross-platform runtime environment and is hosted on Heroku, a container-based cloud Platform as a Service (PaaS).

It is composed of a central server logically organized into different components, each with a different purpose.

The back-end task is to manage and respond to requests sent by the application and the web app and it contains the application logic. In particular, it includes the algorithms which deal with the computation of statistics and with the assignment of points based on the statistics of the user. To do this, it communicates with the MongoDB non-relational database.

5.3 Databases

Regarding the management of system data and users' personal information, it was decided to use two distinct databases: MongoDB and Firebase, the first to store all the information necessary for the functioning of the system; the latter is instead used for easier management of authentication and for the storage of relevant personal information about users.

Firebase is a platform developed by Google for managing applications. In our system, Firebase is used only to effectively and securely manage authentication and to manage the personal account information of user profiles.

MongoDB is a document-based non-relational (NoSQL) database program. In PawGo, it is used as the main database for saving user information, dog information and some other relative data. The database is hosted on the Cloud through the MongoDB Atlas platform, in line with the design choice referring to the use of Heroku to host the Node.js server.

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6. Graphical User Interface

7.1 Mockups

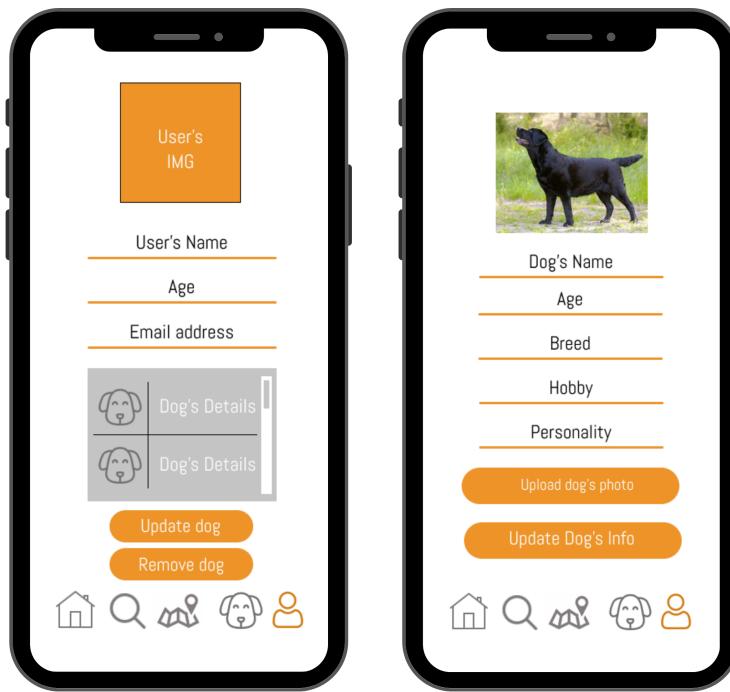
All the mockups for the mobile application are created using a software called Figma. The general structure and layout of the application is based on similar activity recording applications on the market and follows the most basic user interaction flow.

6.1.1 Application - Login page & Homepage

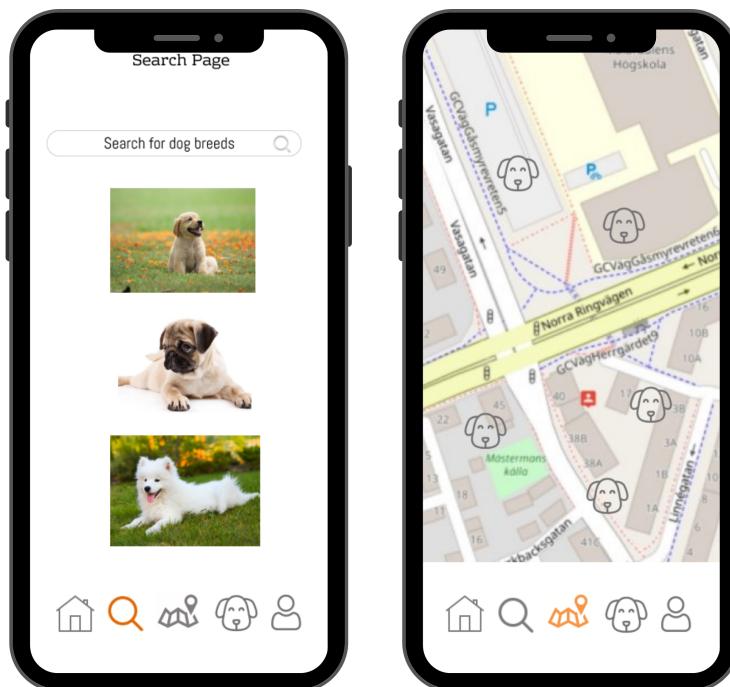


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6.1.2 Application - Profile



6.1.3 Application - Search & Map page



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6.1.4 Application - Matchmaking System

