PetPal
System Requirement Specifications (SRS)

1 Table of Contents

1 Table of Contents....2
2 Problem Statement.... 4
3 Overview.... 4
3.1 Background.... 4
3.2 Overall Description....4
4 Investigation & Analysis Methodology....5
5 Constraints....5
5.1 Scalability.... 5
5.2 Integration with External APIs.... 5
5.3 Proprietary software.... 5
5.4 Project Schedule.... 6
6 Operational Requirements....6
7 Functional Requirements....6
8 Input Requirements.... 11
9 Process Requirements....11
10 Output Requirements....13
11 Hardware Requirements.... 13
12 Software Requirements.... 13
13 Deployment Requirements....14
14 Appendix - User Interface Mockup....15

12.2 Client Application 8
12.3 Network system 8
12.4 Mainframe system 9
12.5 Licenses 9
13 Deployment Requirements 9

2 Problem Statement

As of 2022, 33% of people in Singapore are pet owners. A CNA article from 2023 describes how pets are seen as "part of the family." Pet lovers are increasingly open to spending their time and money to be involved with pets. However, finding agencies for pet adoption, ad hoc pet sitting support, and pet-centered community events requires research and is not convenient. People have to sift through fragmented websites for individual agencies or social media groups to access this information. There is no unified platform to address several pet-related needs.

A breakdown of the problem this presents:

a) Those looking to adopt pets must reach out to several agencies separately, gather information about the available pets, and put in effort to compare their options.

b) Pet owners may need to subscribe to a regular service of pet helpers or exert significant effort if they need ad hoc support for a few hours or days.

c) Pet lovers who are qualified to be pet sitters as a side income, but are not part of a dedicated organization, find it difficult to secure pet sitting jobs.

d) Pet lovers may find it challenging to meet like-minded pet owners.

e) There are many pet lovers in Singapore, but pet-related events are few and far between because organizers must put in considerable effort to reach the right audience, and vice versa.

In conclusion, the lack of a one-stop platform leads to not only inconveniences for common pet-related tasks but also misses untapped potential to make the lives of both pets and pet owners more enriching.

3 Overview

3.1 Background

With the lack of a centralized forum for pets-related activities, pet owners and enthusiasts find it difficult to perform their pet activities. Potential pet owners find it tedious to search through available pets for adoption from each website, and then to collate it later to find which pet suits the capability and desirability of the adopter, often giving up on the prospect of adopting in favor of buying a pet. The need to find help to take care of a pet for holidays and vacations[1] make pet lovers hesitate on adopting a pet, not to mention the difficulty to find someone who can be trusted to take care of the pet. Pet events are often hosted on different pet forums, or private social forums like Discord, making it difficult for newcomers to have a welcoming experience to pet adoptions and socialization events. Convenience and accessibility in pet-related services is therefore paramount to the growth of pet adoption culture and practices.

[1] https://www.channelnewsasia.com/singapore/pets-part-family-rising-status-big-read-3569031

3.2 Overall Description

PetPals serve a role in providing a platform for onboarding potential pet owners with finding their ideal pets for participating pet adoption facilities, curating the provision and utilization of pet sitting services, and also social features for pet owners to join in events — self hosted or by organizers — to engage in fun activities like games and socializing opportunities.

4 Investigation & Analysis Methodology

[Not applicable for this project]

5 Constraints

5.1 Scalability

The PetPal application is designed for small to medium-scale usage and may face challenges scaling to handle a significantly larger user base or high volumes of simultaneous transactions. As the system is built on cloud infrastructure, limitations may arise from cost-related constraints of the cloud services (e.g., AWS), impacting performance during peak loads without additional resources or upgraded service plans.

5.2 Integration with External APIs

The PetPal platform depends on third-party APIs for functionalities such as user authentication (via Firebase) and location services (via Google Maps API). Any changes or interruptions in these external services may result in disruptions or limitations in functionality, requiring code updates or alternative solutions.

5.3 Proprietary software

The system relies on certain proprietary technologies, such as AWS services and GitHub for version control. Any shifts in licensing, costs, or support for these platforms could affect the system’s operations and require migration to alternative tools or platforms, which may introduce delays or additional costs.

5.4 Project Schedule

The PetPal project is constrained by a tight development timeline, with a 3-month window to plan, develop, and implement the full system. This compressed timeframe may limit the ability to fully test all edge cases, ensure scalability, or integrate additional non-essential features in the initial release.

6 Operational Requirements

[Not applicable for this project]

7 Functional Requirements

The PetPal system allows the User/Agency to do 3 main tasks as well as account registration and management tasks.

7.1 Personal Profile

7.1.1 View Profile

- User can view their profile to verify the following details:
  - Full Name
  - Email
  - Contact Number
  - Profile Picture
  - Pet(s)
    - Name
    - Type
    - Age
    - Picture
  - Description

- Agency can view their profile to verify the following details:
  - Full Name
  - Email
  - Contact Number
  - Profile Picture
  - License Number
  - Address
  - Pet(s)
    - Name
    - Type
    - Age
    - Picture
  - Description

7.1.2 Edit Profile

- User can edit the following details:
  - Full Name
  - Email
  - Contact Number
  - Profile Picture
  - Pet(s)
    - Name
    - Type
    - Age
    - Picture
  - Description
- Agency can edit the following details:
  - Name
  - Email
  - Contact Number
  - Profile Picture
  - Address
  - Pet(s)
    - Name
    - Type
    - Age
    - Picture
  - Description

- User/Agency can save the changes made to the profile.

7.2 Personal Account

7.2.1 Registration

- User can register as a User or Agency
- User can register by providing the following details
  - Full Name
  - Email
  - Contact Number
  - Password
  - Profile Picture - *Optional*
  - Pet(s) - *Optional*
    - Name
    - Type
    - Age
    - Picture
    - Description
- Agency can register by providing the following details
  - Name
  - Email
  - Contact Number
  - Password

- License Number
- Address
- Profile Picture - *Optional*
- Pet(s) - *Optional*
    - Name
    - Type
    - Age
    - Picture

7.2.2 Login

- User/Agency can login by providing the following details:
    - Email
    - Password

7.3 Sitter Matching

Owners and Sitters are both Users.

7.3.1 Sitter Matching as Owner

- Owner can view their past sitting requests from a drop-down menu
- Owner can add a new sitting request with the following details:
    - Requesting User
    - Title
    - Hourly rate
    - Location
    - Description
- Owner can match with interested sitters using the following parameters:
    - Location
- Owner can view the following information about interested sitters:
    - Name
    - Location
    - Description
    - Contact Number
    - Email
- Owner can accept a particular sitter.
- Owner can cancel the sitting request
- Owner can view the location on an interactive Map

7.3.2 Sitter Matching as Sitter

- Sitters can view a list of active sitting requests with the following details
    - Title
    - Hourly rate
    - Location
    - Description
- Sitters can match with owners based on the following parameters
    - Location
    - Sitting Type
    - Animal Type

- Date
- Keyword Search

- Sitter can register interest for a particular request.
- Sitter can de-register interest for a particular request.
- Sitter can view the location on an interactive map.

7.4 Adoption

7.4.1 Adoption as Agency

- Agencies can add pets to their profile to be listed for adoption.
- Agencies can remove pets from their profile to de-list them for adoption.
- Agency can view a list of interested Users and the following details:
  - Name
  - Location
  - Description
  - Contact Number
  - Email

7.4.2 Adoption as User

- Users can view a list of adoption listings
- Users can register interest for any particular adoption listing.
- Users can de-register interest for any particular adoption listing.
- Users can filter the adoptions listings based on the following parameters:
  - Name
  - Type
  - Age
  - Picture
  - Description

7.5

Organizer can be a User or Agency.

7.5.1 Event as Organizer

Organizer can be an Agency/User.

- Organizer can add event listing with the following details

- Event Name
- Time
- Date
- Venue
- Entry Fee
- Description

- Organizer can view a list of interested Users and the following details:
  - Name
  - Location
  - Description
  - Contact Number
  - Email
- Organizers can cancel the event listing.

7.5.2 Event as User

- Users can view a list of Event listings
- Users can register interest for any particular Event.
- Users can de-register interest for any particular Event.
- Users can filter the Events listings based on the following parameters:
  - Animal Type
  - Location
  - Date
  - Keyword Search

8 Input Requirements

8.1 Profile Details

The details as specified in 7.2.1 are necessary to facilitate account creation within the system. Each user will be assigned a unique user_id which is used to map information internally. The necessary information such as name, email and contact, etc is used to prove the legitimacy of the individual registering. Optional fields include *pets* allowing users who are interested in animals but currently not owning any pets to partake in the system. The description allows the user to add more information about their love for pets, certification for pet grooming or any relevant experience to improve attractiveness to any owners.

8.2 Sitting Request

A User can register a sitting request with the details as mentioned in 7.3.1. The hourly

rate will allow potential sitters to filter through relevant sittings. The description can contain details of the job as well particulars about the pet's habits, personality, illness, etc.

8.3 Adoption Listing

Adoption Listing requires additional details about the pets as compared to a User registering a pet. The description provides space for the agency to give pointers on the pet's personality, grooming and caretaking requirements, etc. It is also utilized in keyword matching to assist the User in their search.

8.4 Event Listing

Events Listing requires details as mentioned in 7.5.1. The date, time and venue make it convenient for Users to match events with their schedule and the entrance fee will notify users of any cost. The description provides more details on the theme. motivation and schedule of the event. It is also utilized in keyword matching to assist the User in their search.

9 Process Requirements

The following are the key process requirements that the PetPal system must handle:

9.1 Database Transactions

The system must ensure that all operations, such as posting pet listings (adoption, sitting, events), updating user profiles, and registering interests, are handled as complete transactions. This ensures that each operation either fully succeeds or fails without leaving partial data.

9.2 Data Integrity

All operations must ensure that the data is valid and consistent. Transactions must be fully committed or rolled back in case of failure, guaranteeing that no incomplete or corrupt data is stored. Referential integrity between entities (e.g., users, pets, events) must always be maintained.

9.3 Atomicity and Durability

Each user action (e.g., adopting a pet or registering for an event) must be atomic, meaning the entire operation is treated as a single unit. If successful, the data changes must be durable and persist even in the event of system failures.

9.4 Isolation and Concurrency Handling

The system must manage concurrent transactions (e.g., multiple users trying to adopt the same pet) by ensuring proper isolation. No two transactions should interfere with each other, and conflicts must be resolved to ensure data consistency.

9.5 Data Validation

All user input, including pet details, event information, and profile updates, must be validated on both the client and server sides (including cache). Data validation must prevent invalid data from being stored in the system, and users should be provided with clear error messages when input is incorrect.

9.6 Performance

The system must be optimized for high-concurrency scenarios, ensuring smooth performance when multiple users interact with the platform simultaneously. Real-time updates and notifications for critical events (e.g., adoption approvals or sitting requests) must be handled efficiently.

9.7 Data Repository

PostgreSQL will serve as the primary data repository, securely storing all user profiles, pet listings, sitting requests, event details, and reviews. The database must be optimized for quick reads and writes, ensuring high availability and consistency of data.

9.8 Session Management

User sessions must be securely managed using token-based authentication (via Firebase). The system should ensure that user sessions remain secure, preventing unauthorized access to sensitive data.

9.9 Error Handling

All system errors, including transaction failures and validation errors, must be logged and handled gracefully. The system should provide meaningful feedback to users, ensuring a seamless experience despite occasional errors.

10 Output Requirements

10.1 Sitter Listing

This output requirement is relevant to Users. Users can view a list of active sittings as well as any request registered by themselves. Users can view interested Users for any personal listing and a map showcasing their localities in a page describing their own activity that includes personal listings and interests.

10.2 Event Listing

This output requirement is relevant to Users and Agencies. Users/Agencies can view a list of active Event listings as well as any listing registered by themselves. Users/Agencies can view interested Users

for any personal listing in a page describing their own activity.

10.3 Adoption Listing

This output requirement is relevant to Users and Agencies. Users/Agencies can view a list of active Adoption listings. Only agencies can view interested Users for any personal listing.

11 Hardware Requirements

[Not applicable for this project]

12 Software Requirements

12.1 Client Operating Systems

- UNIX (any flavor)
- MAC
- Windows

12.2 Client Application

Any modern W3C compliant browser:

- Chrome
- Safari
- Firefox

12.3 Network system

Network software and protocols in order for systems to communicate:

- TCP/IP
- HTTP
- HTTPS

12.4 Frontend System

- Next.js
- Firebase Authentication

12.5 Backend System

- Python Environment with Flask Framework
- PostgreSQL Database

12.6 Licenses

Valid licenses are required to run software from third party vendors:

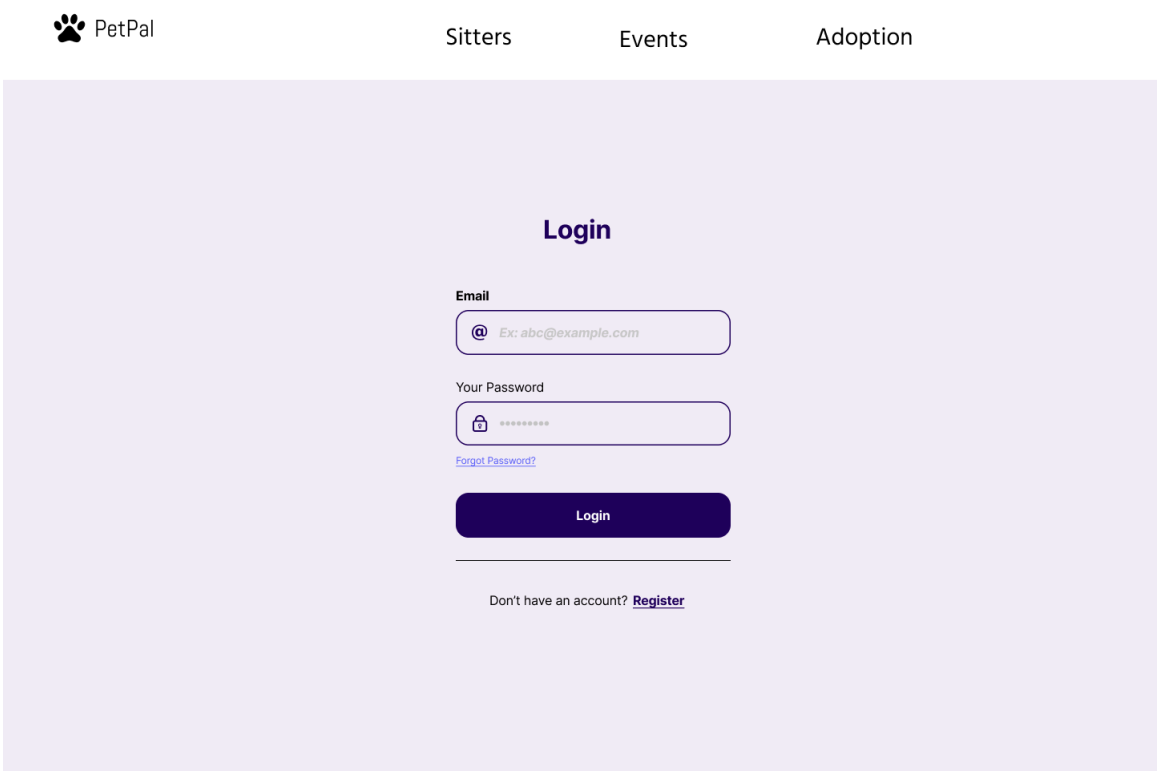
- To use development tools (VSCode, NeoVim)
- To use web server, application server and database software in development, test and production mode

13 Deployment Requirements

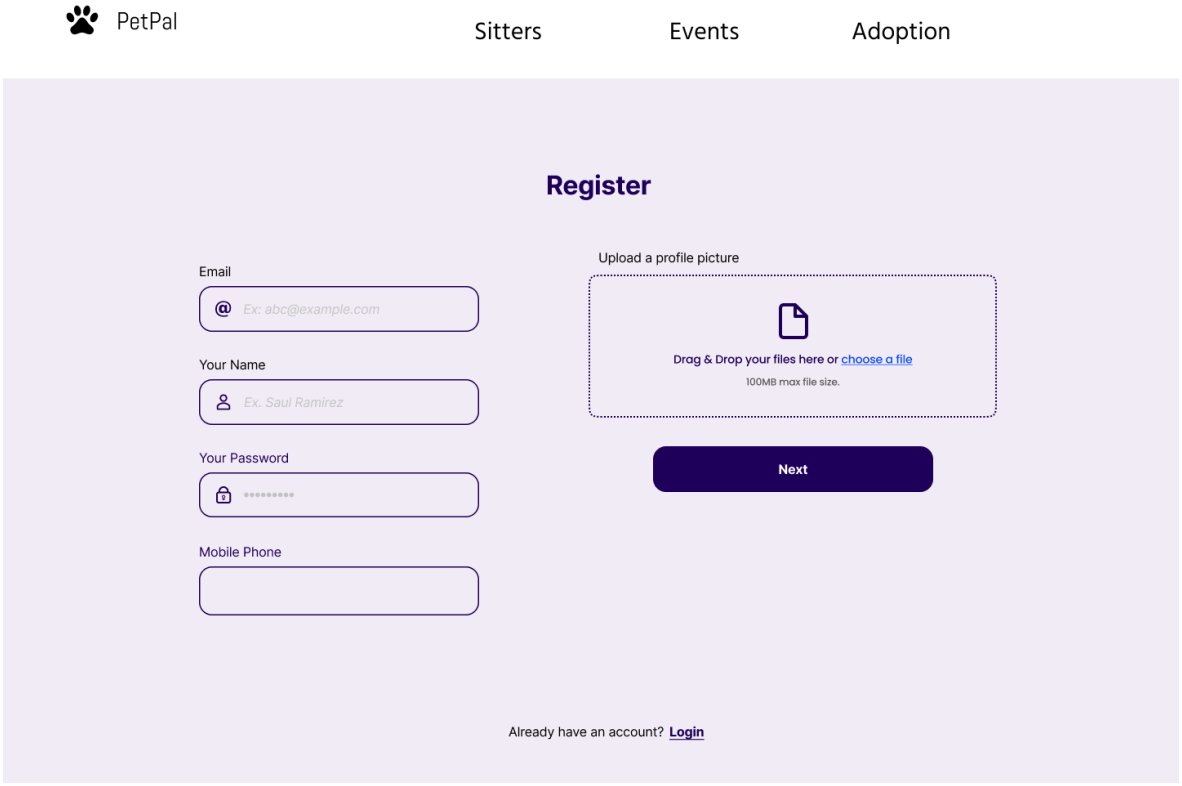
Component	**Technology**	**Hosting/Service**
User Machine	Browser (Chrome, Safari, Firefox)	Local User Device
Frontend	Next.js	Vercel
Authentication	Firebase Authentication	Firebase
Backend	Flask (Python)	Microsoft Azure
Database	PostgreSQL	Microsoft Azure

14 Appendix - User Interface Mockup

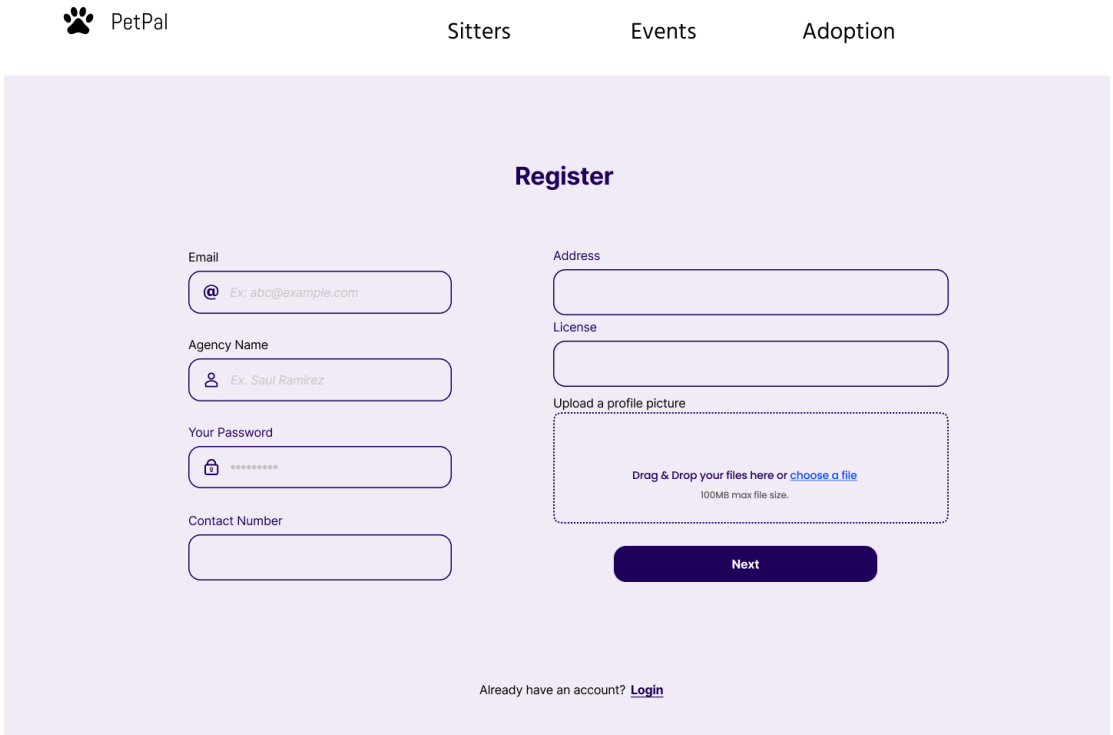
Login Page



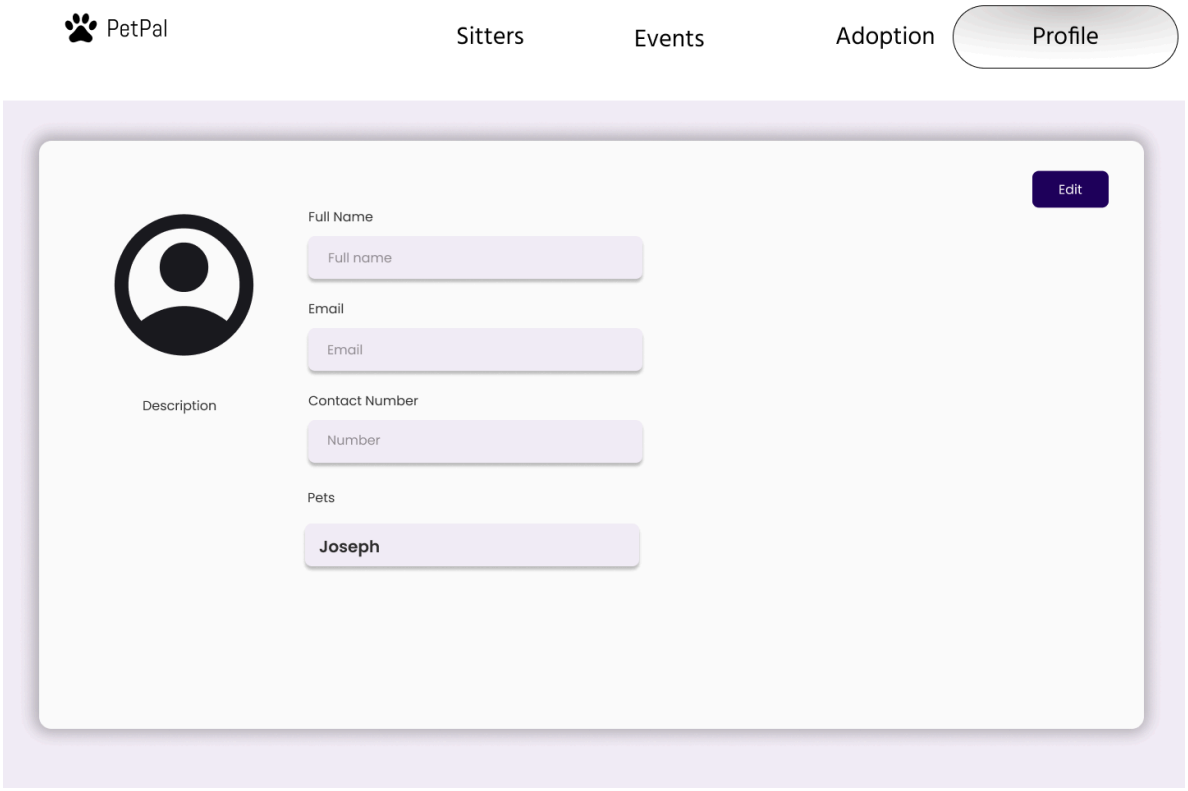
Register as User



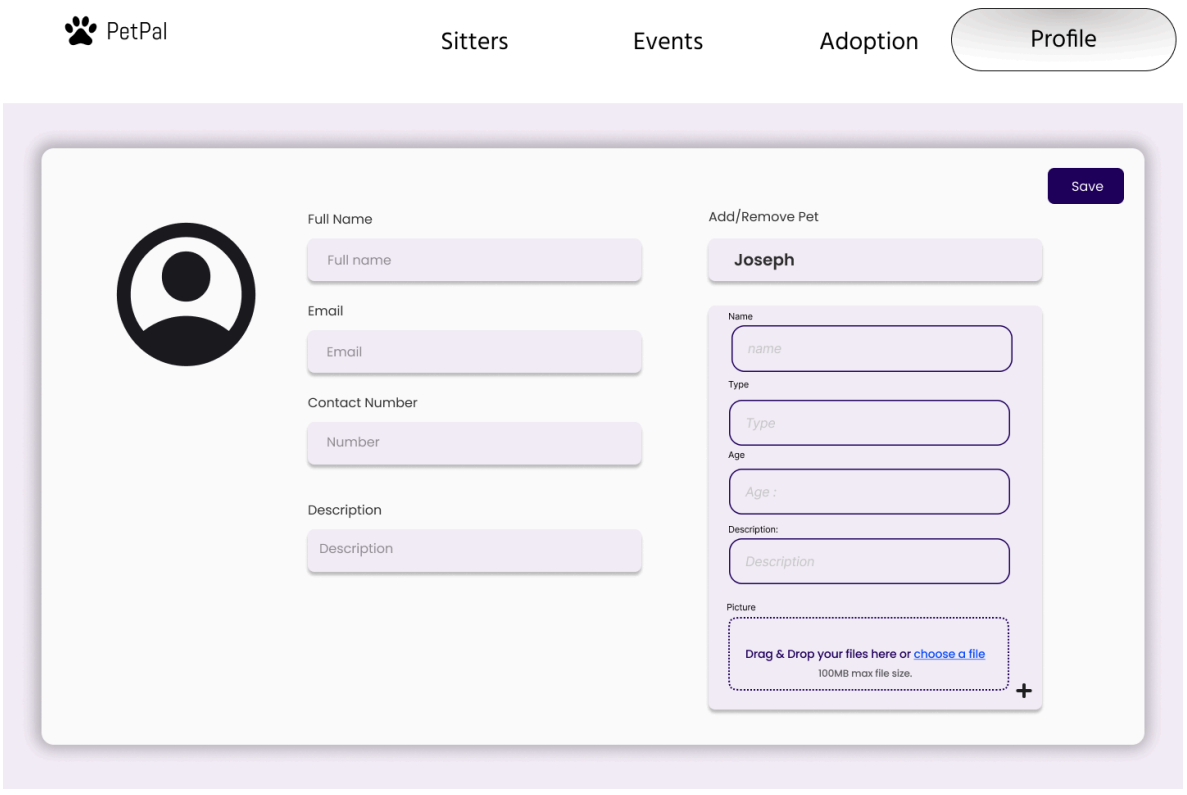
Register as Agency



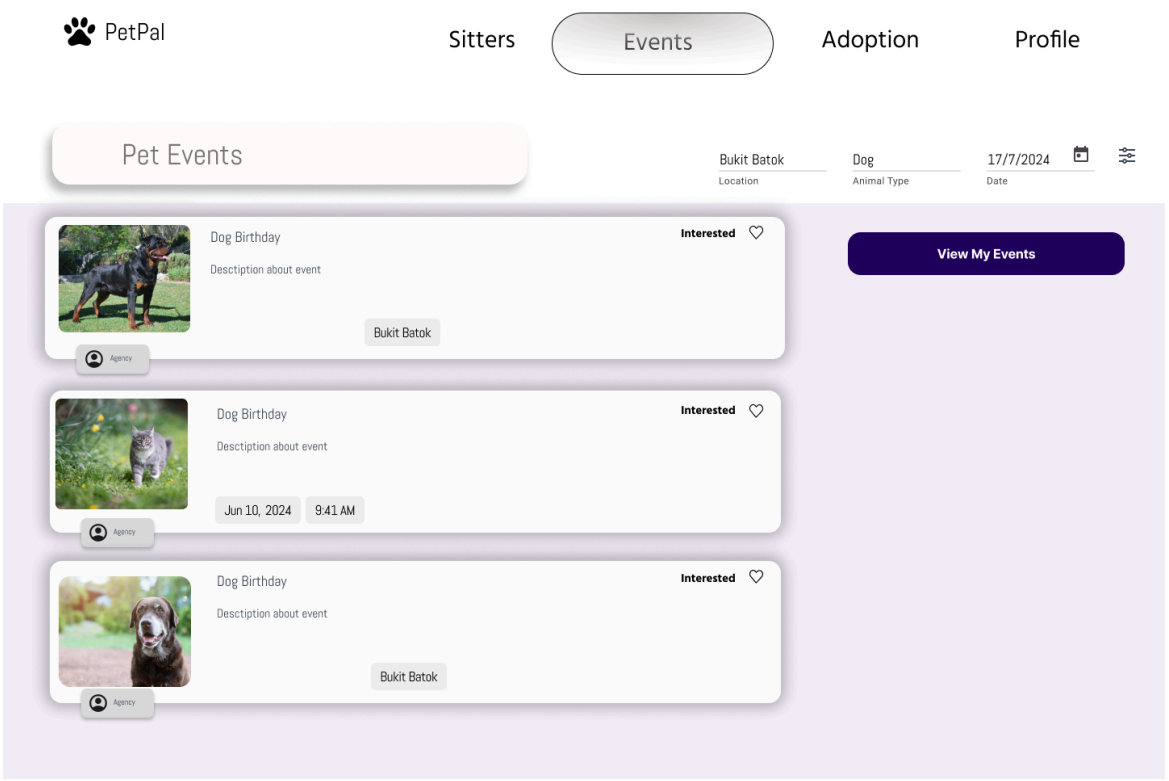
View Profile



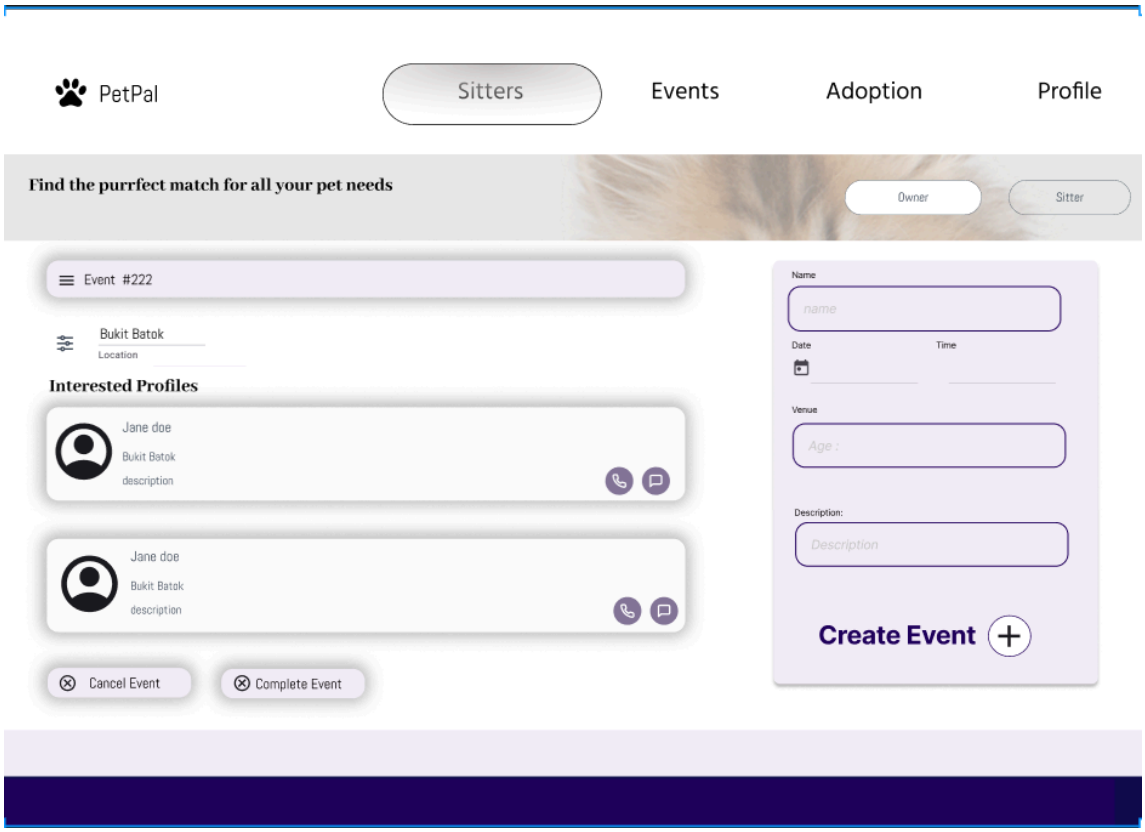
Edit Profile



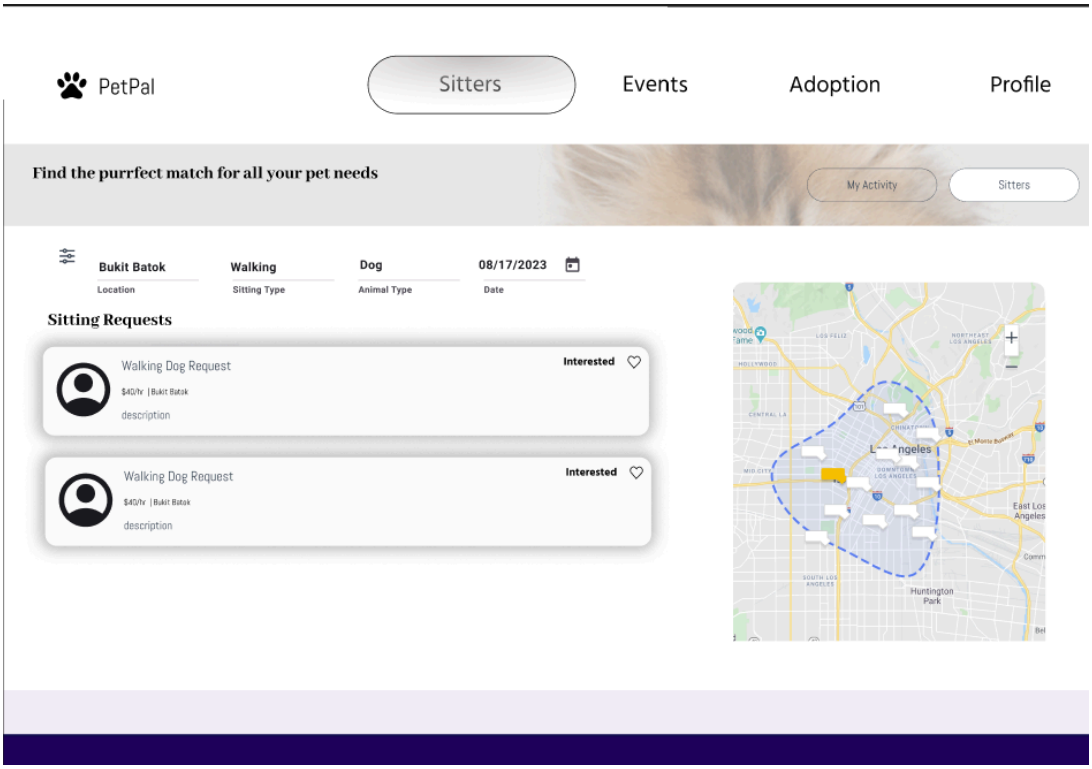
Events Page

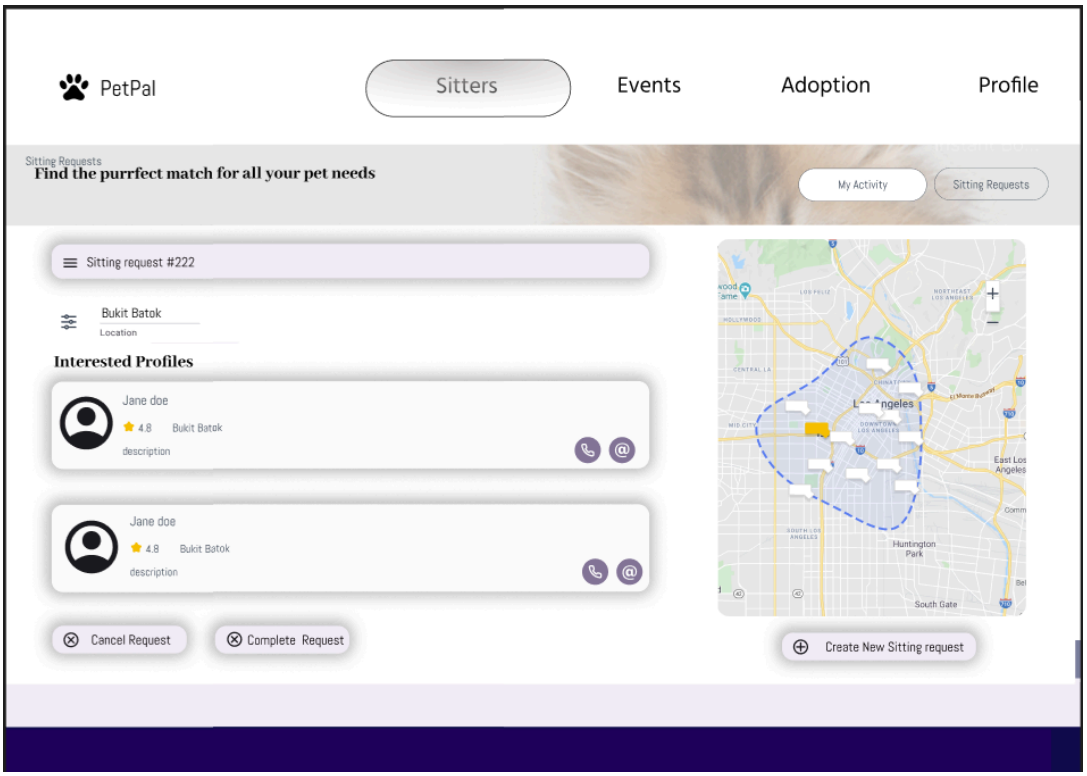


My Events Page

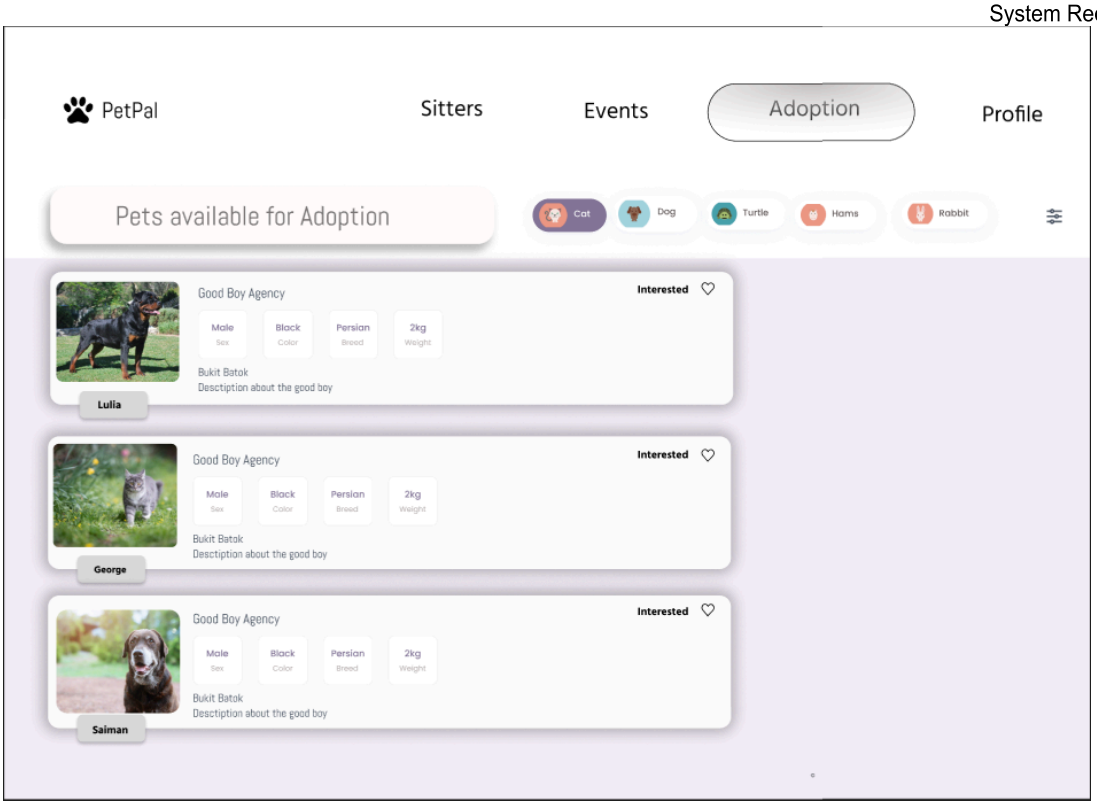


Sitters Pages





Adoption


PetPal
Sitters
Events
Adoption
Profile
Pets available for Adoption
Cat
Dog
Turtle
Hams
Rabbit
Good Boy Agency
Interested
Male
Black
Persian
2kg
Bukit Batok
Desctiption about the good boy
Lulia
Good Boy Agency
Interested
Male
Black
Persian
2kg
Bukit Batok
Desctiption about the good boy
George
Good Boy Agency
Interested
Male
Black
Persian
2kg
Bukit Batok
Desctiption about the good boy
Saiman