

Mini-Project Report On

**PetConnect (A web application serving as a platform
for stray, injured, rabid dog adoption and caregiving)**

*Submitted in partial fulfillment of the requirements for the
award of the degree of*

Bachelor of Technology

in

Computer Science & Engineering

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CERTIFICATE

*This is to certify that the mini-project report entitled "**PetConnect (A web application serving as a platform for stray, injured, rabid dog adoption and care-giving)**" is a bonafide work done by **Mr. Henick Thadevous Peter (U2003094)**, **Mr. Justin Joshy (U2003114)**, **Mr. Jerin Joji (U2003101)**, **Mr. George Thomas Maruthathu(U2003086)**, submitted to the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology (B. Tech.) in Computer Science and Engineering during the academic year 2022-2023.*

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ABSTRACT

PetConnect is a dedicated online platform designed to cater to the needs of current pet owners and individuals seeking to bring in a furry companion to their lives. It is committed to promoting ethical practices in the dog adoption and selling process. Our website provides a secure and user-friendly environment with utmost priority given to the well-being of dogs. Proper measures are taken to find them loving forever homes.

It helps in facilitating easier and more efficient tracking of dogs in need of help. Our platform features a medium to report stray/rabid/injured dogs spotted in a locality, track them and initiate rescue via concerned authorities. We have included a map interface for the general public to be aware of the red zones indicating rabid dogs. It also features a comprehensive database of dog listings. Each listing provides detailed profiles, complete with photographs, breed information, medical history, behavioral traits, and any other relevant details to help potential adopters make informed decisions.

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Chapter 1

Introduction

1.1 Background

PetConnect serves as a crucial tool to connect homeless dogs with potential adopters, increase adoption rates, promote rescue organizations, and facilitate networking within the animal welfare community.

1.1.1 Facilitating Dog Adoptions

The primary goal of PetConnect is to connect homeless or stray dogs with potential adopters. It serves as a platform where shelters, rescues, and individuals can showcase dogs that are in need of loving homes. The website provides information about each dog, including their breed, age and any special needs they may have, to help potential adopters make informed decisions.

1.1.2 Increasing Adoption Rates

By having an online presence, adoption organizations can reach a wider audience and increase the chances of finding suitable homes for the dogs in their care. A website allows potential adopters to browse available dogs at their convenience, learn about the adoption process, and submit adoption applications online. This convenience and accessibility can help streamline the adoption process and encourage more people to consider adopting a dog.

1.1.3 Educating the Public

Dog adoption websites often serve as educational platforms, providing valuable information about responsible pet ownership, dog care, training tips, and other resources.

They aim to raise awareness about the importance of adopting rather than buying dogs and the benefits of rescuing animals in need. These websites may also offer guidance on topics such as selecting the right dog for a person's lifestyle, introducing a new pet into a household, and providing ongoing care.

1.1.4 Promoting Rescue Organizations

Dog adoption websites play a crucial role in promoting and supporting animal shelters, rescue groups, and other organizations dedicated to rescuing and rehoming dogs. These websites provide a platform for these organizations to showcase their work, highlight their missions, and share success stories of dogs who have found forever homes. They may also provide opportunities for visitors to donate, volunteer, or contribute in other ways to support these organizations' efforts.

1.1.5 Networking and Collaboration

Adoption websites can facilitate networking and collaboration among different animal welfare organizations. They may include features that allow shelters and rescues to connect, share information, and coordinate efforts to rescue and rehome dogs more effectively. By fostering partnerships and cooperation, these websites can help address the larger issue of animal homelessness and improve the overall welfare of dogs in need.

1.2 Existing System

Social media platforms, especially Facebook and Instagram, plays a significant role in dog adoption efforts. Many shelters and rescues utilized these platforms to share photos and stories of adoptable dogs, reaching a broader audience and increasing adoption chances. Word of mouth too plays a key role in spreading information about pets for adoption. On the other hand, offline animal shelters are often found to have inadequate data on castaways and their history.

1.3 Problem Statement

The challenge is to create a web application which will be able to offer a centralized and user-friendly platform to showcase adoptable dogs effectively.

There is a critical need for a comprehensive and user-friendly dog adoption website that serves as a centralized hub for shelters, rescues, and potential adopters. By providing a seamless and supportive adoption experience, this platform will contribute to reducing the number of homeless dogs and promoting responsible pet ownership.

1.4 Objectives

- **User-Friendly GUI-** To develop a web application that enables streamlined dog adoption
- **Dog adoption portal-** To develop a web application that enables streamlined dog adoption, with comprehensive dog profiles.
- **Streamlined functionality-**
- **Dog detection** - Rabid, injured and stray dog detection, via concerned and socially responsible citizens.
- **Rabid zone detection** - Civilian notification indicating rabid zones, mapping them out on the website for access by all.

1.5 Scope

The scope of this project is to develop a user-friendly HTML/CSS based web application for an online centralized dog adoption platform. The application will feature an intuitive interface, allowing users to upload images of adoptable dogs and of dogs needing care.

The website will have an adoption application process that allows potential adopters to submit their information and be considered for adoption. Each adoptable dog will have a profile page that includes a photo, a description of the dog's personality and needs, and contact information for the individual that is caring for the dog. The website will have a search function that allows users to search for adoptable dogs by breed, age, location, and other criteria.

Thorough documentation and user guides will support users and stakeholders in deploying and utilizing the application efficiently. Continuous improvement strategies based on user feedback and future requirements will be implemented to keep the system up-to-date and effective. Successful completion of this project aims to deliver a powerful, user-friendly solution that enhances public safety by efficiently detecting violence in videos across various settings.

Chapter 2

Literature Review

Explain the existing methods and their drawbacks. Draw a comparison table to compare the existing methods.

2.0.1 Leen: Web-based Platform for Pet Adoption

The project focuses on the development of a web-based platform called "Leen," aimed at revolutionizing the pet adoption process in Saudi Arabia, with a specific emphasis on the Eastern Province. The prevailing challenge of facilitating pet adoptions and finding suitable homes for pets is a significant societal concern that "Leen" aims to address by harnessing the potential of technology. The core idea behind the platform is to offer convenient and efficient services, making the pet adoption process accessible to all interested individuals.

The "Leen" platform offers a comprehensive range of services, including adoption, pet care, and donation, among others. Notably, all these services are provided free of charge, eliminating any financial barriers that might hinder the adoption process. With the user-friendly interface of the "Leen" platform, users can easily offer their pets for adoption, connecting them with potential adopters within the "Leen" community. Additionally, users can conveniently locate nearby pet care clinics in the Eastern Province region, ensuring the well-being of their beloved animals.

One of the distinctive features of the "Leen" platform is the direct donation option to trusted adoption associations in Saudi Arabia. By facilitating direct contributions, the platform encourages support for animal welfare causes and strengthens the adoption ecosystem in the region.

"Leen" has been meticulously designed to offer an array of essential services and streamline the entire process, enabling swift and hassle-free access to its functionalities.

The platform's user-centric approach ensures that all services are readily available and significantly expedites the adoption and pet care processes compared to conventional methods.

In conclusion, the introduction of the "Leen" platform represents a significant step forward in leveraging technology to address the challenges of pet adoption in Saudi Arabia, particularly in the Eastern Province. By providing an easily accessible and cost-free platform, "Leen" endeavors to create a positive impact on the pet adoption landscape and foster a compassionate and responsible pet ownership culture in the region.

2.1 Dog-mapping technique

2.1.1 Geocoding

Geocoding is the process of converting a physical address into a set of latitude and longitude coordinates. This can be used to map the locations of adoptable dogs.

2.1.2 Places API

The Places API provides information about businesses, points of interest, and other locations around the world.

2.1.3 Directions API

The Directions API provides directions between two points. This can be used to map the routes that potential adopters would take to visit shelters and rescue organizations.

2.1.4 Distance Matrix API

The Distance Matrix API provides the distance and travel time between two points. This can be used to estimate the travel time for potential adopters to visit shelters and rescue organizations.

2.1.5 Marker clustering

Marker clustering is a technique for grouping markers together on a map. This can be used to reduce the clutter on a map and make it easier to see the locations of adoptable dogs.

Reference

- **Santy, S., Karuna, R. and Budiman, A., 2018. E-dopt: A Mobile Application for Pet Adoption in Indonesia. TELKOMNIKA (Telecommunication Computing Electronics and Control), 16(5), pp.2137-2143.** The paper "E-dopt: A Mobile Application for Pet Adoption in Indonesia" by Santy, Karuna, and Budiman (2018) discusses the development of a mobile application for pet adoption in Indonesia. The application, called E-dopt, was developed to help connect potential adopters with adoptable pets.

The paper begins by discussing the problem of pet overpopulation in Indonesia. There are an estimated 15 million stray dogs and cats in Indonesia, and many of these animals are euthanized each year. The authors argue that E-dopt can help to reduce the number of stray animals by making it easier for potential adopters to find adoptable pets.

The paper then describes the development of E-dopt. The application was developed using the Android platform, and it includes a number of features to help connect potential adopters with adoptable pets.

- **Aggarwal, N., Sharma, C. and Garg, K., 2021. Plan a pet. International Journal of Research Engineering and Science, 9(6), pp.65-68.** Considering the following research papers, we are shown a lot of variables regarding the dog adoption landscape. Authors argue that pet ownership is a big responsibility, and that potential adopters should carefully consider their lifestyle and needs before bringing a pet into their home. The paper begins by discussing the benefits of pet ownership. Pets can provide companionship, love, and support. They can also help to reduce stress and anxiety. However, the authors also point out that pet ownership can be expensive and time-consuming. Pets need to be fed, walked, and taken to the vet regularly. They also need to be trained and socialized.

2.2 Conclusion

The literature review highlights how the process of dog adoption must be approached, from two different perspectives. Future research may focus on improving dog identification accuracy, expanding dog information, and conducting user studies to evaluate efficacy and usability. With the continued development of technology and the interest in dog adoption growing at a profound rate, a dog adoption and tracking website on the web hold great promise in promoting evidence-based welfare, facilitating the dissemination of adoption knowledge and maintain transparency in all such processes.

Chapter 3

System Analysis

3.1 Expected System Requirements

The system of user which is a smart phone is expected to have the following features:

- Requirement of Internet connection for web application.
- Multi-core CPU, minimum 4GB RAM, and sufficient disk space for hosting the application code and assets.
- Powerful CPU and RAM, with enough disk space to store dog data, and other relevant data.
- Suitable backend programming language and framework for robust web application development.
- APIs and External Services to ensure the server can handle API requests and smoothly integrate external plant data and medicine recommendations services.
- User Authentication and Authorization to implement a system to control access to sensitive features and data.
- Plan for scalability to handle increased user traffic.

3.2 Feasibility Analysis

3.2.1 Technical Feasibility

The project is technically feasible since a large majority of the population own smart devices, which meet the minimum requirements to run the web application.

3.2.2 Operational Feasibility

The operations are built in a simple and easy to use manner for civilians, pet owners and municipal authorities alike.

3.2.3 User Acceptance and Market Analysis

The project is likely to have significant user acceptance, as it caters to individuals interested in dog adoption and community welfare.

3.2.4 Development Time and Resources

The development time for the web application should be manageable, given the availability of skilled developers and readily accessible technologies. The minimum hardware requirements for smart Devices ensure that the web application can be efficiently implemented without significant resource constraints.

3.2.5 Scalability

The project's architecture should be designed with scalability in mind to accommodate potential growth in user traffic and data load. Cloud-based services and scalable databases can be employed to handle increased demand.

3.2.6 Integration with External Services

The availability of APIs for location determination makes integration feasible and straightforward. Proper documentation and support from external providers will aid in the seamless integration process.

3.2.7 Economic Feasibility

The app can reduce the overhead of expense incurred by people in resources spent on scouting adoptable dogs from shelter to shelter. The development of the web application is also zero budget as it was built using free resources.

3.3 Hardware Requirements

The following are the system requirements to develop the PetConnect web application.

- Processor: Intel Core i5
- Hard Disk: Minimum 100GB
- RAM: Minimum 8GB or higher

3.4 Software Requirements

The following are the softwares used in the development of the app.

Operating System: Windows or Linux

3.4.1 Development Tools and Languages

- Backend: Choose a programming language and framework suitable for building the backend of the web application.
- Frontend: Use HTML, CSS, and JavaScript for the frontend development.
- Database: Select a database management system like MySQL, or SQLite, depending on the data requirements and scalability needs.

3.4.2 APIs and External Services

- Identify and integrate with external APIs or services that provide accurate location determination. Ensure compatibility and smooth integration with your chosen backend and frontend technologies. The API used in PetConnect is Google Maps Platform API.

3.4.3 Google Maps Platform API

Google Maps API is a powerful and versatile tool that has transformed the world of location-based services. Introduced by Google in 2005, the API allows developers to integrate Google Maps' functionality into their own applications, websites, and services. This has opened up a world of possibilities, making it easier for businesses and individuals to leverage location data and provide users with interactive and personalized mapping experiences.

To use the Google Maps API, developers need to obtain an API key from the Google Cloud Console. Once developers have the API key, they can use it to embed Google Maps into their application's web pages or mobile apps. With the API integrated, developers can access various map data, such as geographic locations, street views, satellite imagery, and real-time traffic information.

3.4.4 Development Environment

- Set up a development environment with code editors, version control systems (e.g., Git, Visual Studio Code), and local servers for testing and debugging

3.4.5 Visual Studio Code

Visual Studio Code (VS Code) is a popular, free, and open-source code editor developed by Microsoft. It is designed to be lightweight, highly customizable, and versatile, making it a preferred choice for many developers across various programming languages and platforms. Here are some key features of Visual Studio Code:

- SCode Editing: VS Code offers a rich set of code editing features, including syntax highlighting, auto-completion, bracket matching, and code formatting for various programming languages.
- Extensibility: One of the standout features of VS Code is its vast extension ecosystem. Developers can install a wide range of extensions from the Visual Studio Code Marketplace to enhance functionality, add language support, integrate with version control systems, and more.
- Live Share: The "Live Share" feature allows developers to collaborate in real-time with others, enabling them to edit and debug code together in shared sessions.
- IntelliSense: VS Code offers intelligent code completion and suggestions (IntelliSense) based on the context of the code, enhancing productivity and reducing typing errors.
- Integrated Terminal: VS Code comes with an integrated terminal, allowing developers to run shell commands and scripts directly within the editor, eliminating the need to switch to a separate terminal window.

Chapter 4

Methodology

Block diagram + Explain each block.

4.1 Proposed Method

- Develop a web application that serves as an online platform for dog adoption and stray/injured/rabid dog detection.
- Build the platform by web development using HTML, CSS and Javascript that gives a better interface to our application and with the aid of the existing Google Maps Platform API, implemented dog location determination.
- The civilian user of the web application, on spotting a stray/injured/rabid dog, uploads the information onto the online database via the website.

4.2 Dog tracking using Google Maps Platform API

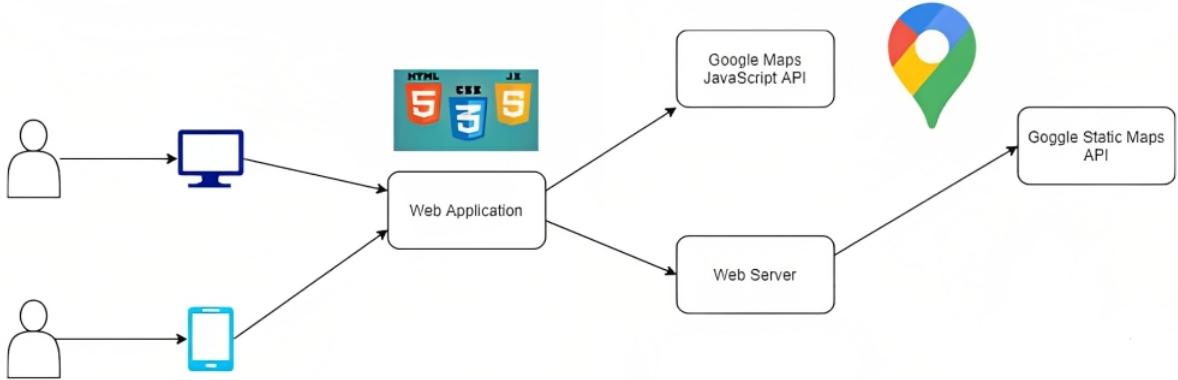
Introduction

Google Maps API is a powerful and versatile tool that has transformed the world of location-based services. Introduced by Google in 2005, the API allows developers to integrate Google Maps' functionality into their own applications, websites, and services. This has opened up a world of possibilities, making it easier for businesses and individuals to leverage location data and provide users with interactive and personalized mapping experiences.

We use this API to aid us in stray/rabid/injured dog tracking via the web application. The responsible citizen, on spotting a dog, needing for care, will take a pic of the dog in its current state, and will upload it to the website via the dog reporting form built in.

The form asks for the details of the dog and on uploading the image and details, it will ask to access the current location of the dog via the Google Maps Platform API.

Basic Architecture



This location will aid in mapping out zones for different end users, based on their levels of involvement in the process. Considering the case of the municipality authorities, they will be able to access the municipality portal, where the details of dogs needing injury related care is displayed. Considering the case of the ordinary citizen, the website maps out all zones containing dogs that are found to be rabid. These zones are called Rabid Zones, and will help citizens in being aware of areas where there is activity of such dogs.

Integration in our Application: The proposed model is integrated into our web application to make it easily accessible to users. The application will allow users to upload images of plants through a user-friendly interface and promptly receive identification results. Integration with other gardening or plant-related apps could also be explored to expand the model's potential use cases.

Testing and Validation: The API's performance will be thoroughly tested and validated using various test cases and user feedback. This validation process will ensure that the API consistently produces accurate loactions for a wide range of loaclities.

User feedback will be continuously gathered and analyzed to improve the model's accuracy and responsiveness.

User Interface (UI): To enhance user experience, a user-friendly interface will be designed, allowing users to easily input plant names and view the generated home remedies. The UI will be intuitive, responsive, and visually appealing, making it accessible to users of all levels of technological proficiency. By implementing these components in the proposed model, we aim to create a comprehensive and trustworthy home remedies system from the identified plant.

Conclusion: The proposed methodology will efficiently help construct a platform that acts as the destination for dog adopters and owners who want to put up their dogs for adoption. It will also harness the abilities of the Google Maps API to keep track of stray/rabid/injured dogs. The platform will be able to warn citizens of dangerous areas, and will thus be able to reduce attacks from dogs towards humans. It will also enable local authorities to jump into action in a timely manner on dog attacks or reports of related incidents, helping bring down or completely avoid such cases.

Chapter 5

System Design

Draw usecase diagrams, activity diagrams, sequence diagrams etc. Add a brief explanation for each UML diagram.

5.1 Architecture Diagram

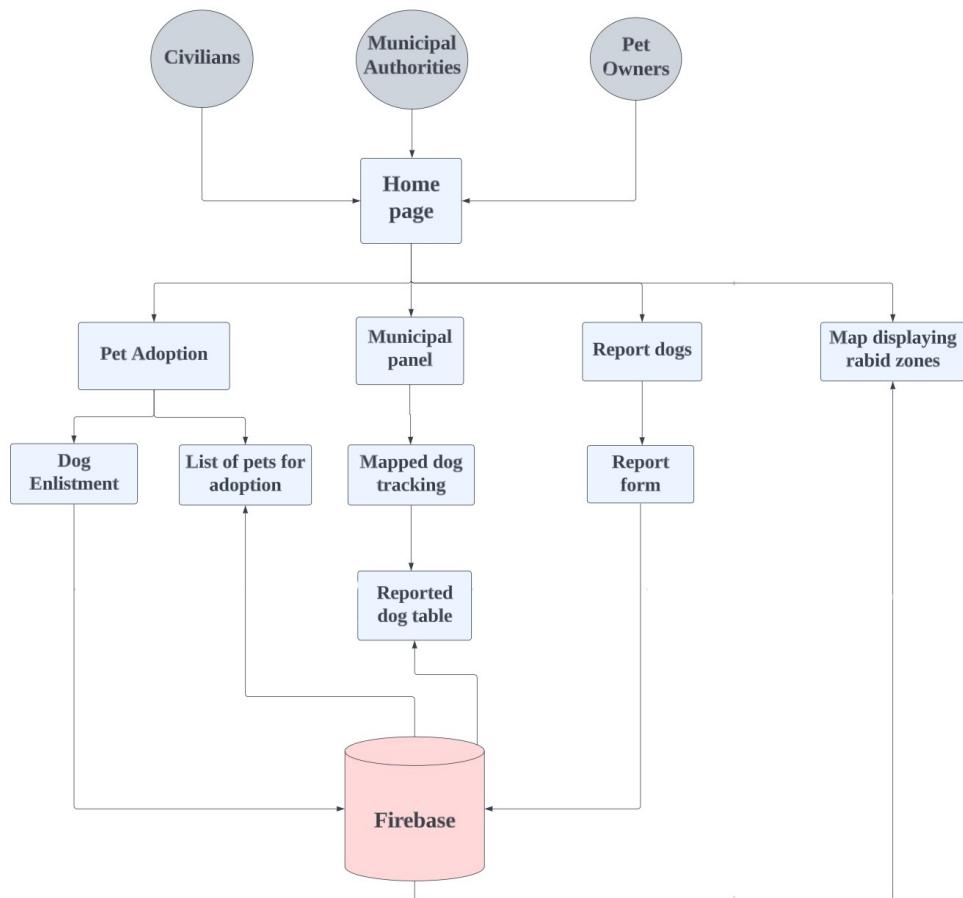


Figure 5.1: Architecture Diagram

5.2 System Overview

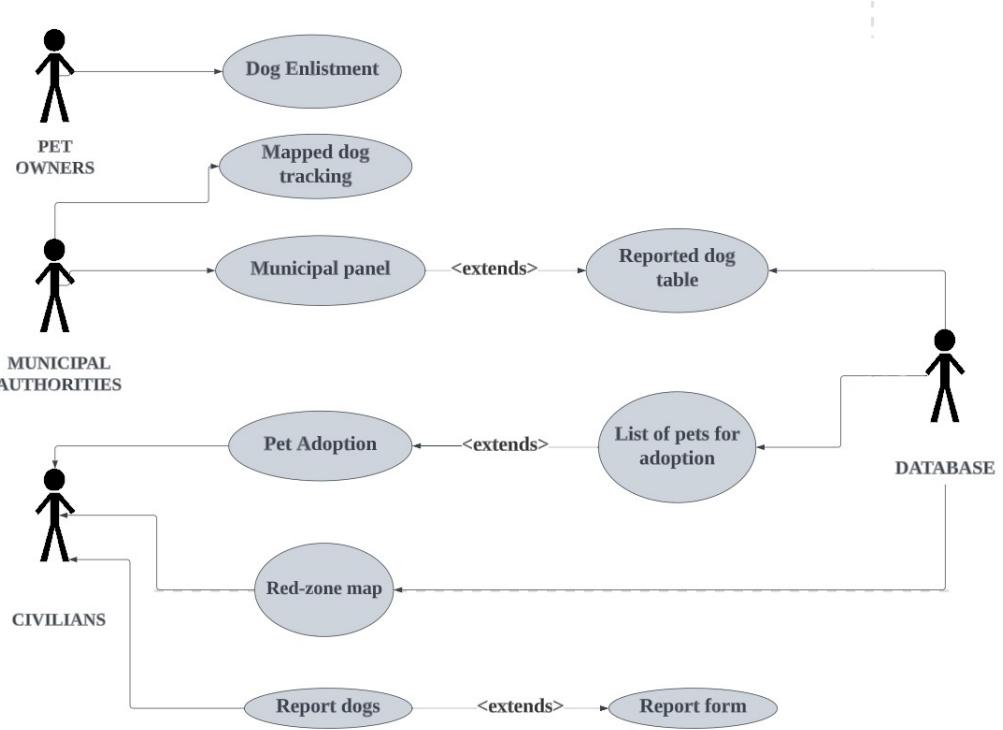


Figure 5.2: System Overview

Chapter 6

System Implementation

Explain the various modules in the system in detail + Code.

6.1 User Authentication

The website contains a sign-up/sign-in page that registers a new user. The sign-up page includes input fields for the user to enter their email, password, name, and other details during the registration process. When the user submits the sign-up form, the provided email and password are used to create a new user account using Firebase Authentication. The user's email is then verified by sending a verification link to their email address. If the verification is successful, the user can proceed to sign in. The sign-in form allows users to enter their email and password. Upon submitting the sign-in form, Firebase Authentication verifies the credentials, and if they are correct, the user is granted access to the application. If the credentials are invalid or the email is not verified, appropriate error messages are displayed to the user. This implementation ensures secure user authentication and email verification for access to the application.

6.2 Municipality Panel

The Municipality Admin Page is designed to provide the municipal panel with a comprehensive view of reported rabid dogs within the city. The page starts with a fixed navigation bar at the top, allowing easy access to other sections of the website. The main section consists of a parallax background image with a heading and description explaining the purpose of the page. The information about reported dogs is displayed in a well-organized table with columns for breed, condition, date of report, location, an option to view the dog's image, an action taken checkbox, and a date of action taken. This table is generated dynamically using JavaScript to fetch data from a Firebase database.

When the necessary steps are taken for the reported dog, the concerned official can check the "Action Taken" column that indicates that a particular report is attended to. A date of the action taken is also added to the database.

Below the table, there is a heading "Pick-Up Zones," followed by a Google Map displaying markers at locations where rabid dogs have been reported. The map is also dynamically populated with data from the Firebase database.

Overall, the Municipality Admin Page provides an effective platform for the municipal panel to review and manage reported incidents of rabid dogs, aiding in swift action and public safety.

6.3 Report Form

The report form is implemented using HTML, CSS, and JavaScript along with Firebase for data storage and image uploads. When a civilian encounters a stray dog he wishes to report he/she can fill up the form that allows them to report details about a dog, such as its breed, condition, and images. When the form is submitted, the geolocation of the user is obtained to fetch the address using the Google Maps Geocoding API. The dog data, including breed, condition, latitude, longitude, and address, is then prepared and stored in the Firebase Realtime Database under a unique key generated using push(). The selected images are uploaded to Firebase Storage, and their download URLs are retrieved and included in the dog data object. Finally, the complete dog data is stored in the Realtime Database, and an alert confirms successful submission. The form is cleared for the next report using the clearForm() function. This implementation allows users to report dogs and includes their geographical information and images for accurate record keeping.

6.3.1 Google Maps API

The developer has successfully integrated the Google Maps JavaScript library into the application and obtained the necessary API key from the Google Cloud Console. Through the implementation of the Geolocation API's getCurrentPosition() method and appropriate callback functions, the application now efficiently retrieves the stray dog's latitude and longitude.

With these location data readily available, the developer has seamlessly incorporated features that display the position on a map and enable location-based functionalities within the application. User permissions and privacy considerations have been carefully handled to ensure a professional and respectful user experience throughout the process..

6.3.2 Rabid Dog Hotspot

The rabid dog hotspots map feature is designed to visually display areas where rabid dogs have been reported. The map is integrated with a red zone overlay, indicating the regions where rabid dog incidents have been documented. Users can access the map through the website, and upon loading, they will see the map with various markers representing reported rabid dog incidents. Each marker on the map corresponds to a specific location where a rabid dog has been reported. The red zone overlay highlights regions with a higher concentration of reported rabid dogs, making it easier for users to identify areas with potential health risks related to rabies.

6.4 Dog Enlistment

The dog enlistment module allows pet owners who want to give away their pets for adoption to fill in the details of their pet and themselves in a dog enlistment form. The form includes fields for the pet's name, breed, age, gender, medical history and any other relevant information. The pet owner also provides their contact details, name, and location. Once the form is submitted, the information is stored in a database, and the pet's details are featured on the website for civilians looking to adopt. The featured pets are displayed along with their images and descriptions to attract potential adopters. Civilians interested in adopting a pet can browse through the enlisted dogs and find one that matches their preferences. They can then contact the pet owner through the provided contact details for further discussions and adoption arrangements. This module facilitates the process of finding suitable homes for pets in need of adoption and connects pet owners with potential adopters through the website platform.

6.5 Dog Adoption

The dog adoption module provides a user-friendly interface for people looking to adopt a dog. The module displays a full list of available dogs for adoption, showcasing their images, names, breeds, and other relevant details. Users have the option to filter the list based on their preferred location and breed. This feature ensures that potential adopters can easily find dogs that match their preferences and are available for adoption in their vicinity.

Once the user finds a suitable dog for adoption, they can click on the dog's listing to view more information about the pet. The detailed information includes the dog's age, name, medical history, and contact details of the pet owner. The contact details enable users to get in touch with the pet owner for further adoption procedures.

By providing a comprehensive list of dogs available for adoption and implementing filtering options, the module makes the adoption process more efficient and convenient for users. It encourages potential adopters to find their perfect furry companion while connecting them with pet owners willing to give their dogs a loving home

Chapter 7

Testing

Different types of testing have been done(Unit Testing, Integration Testing, System Testing, Acceptance Testing, Security Testing, User Interface Testing).
The results have been summarized.

7.1 Functional Testing

Ensured that each function of the web application is working as expected. It involves testing features like plant identification, medicine recommendation, user registration, login, and other functionalities.

7.2 Usability Testing

Evaluated the user interface (UI) and user experience (UX) of the application. Checked that the interface is intuitive, easy to navigate, and visually appealing.

7.3 Compatibility Testing

Tested the application on different web browsers (e.g., Chrome, Firefox) to ensure it functions correctly across various platforms.

7.4 Performance Testing

Evaluated the performance of the application to determine its responsiveness and loading speed. Tested the application under different traffic conditions to check for any performance bottlenecks.

7.5 Security Testing

Assessed the application's security measures to protect user data and prevent unauthorized access.

7.6 Database Testing

Checked the integrity of the database, including data insertion, retrieval, and updating.
Ensured that the data is stored correctly and consistently.

7.7 Error Handling

Tested the application to see how it handles various types of errors and exceptions.
Made sure users receive meaningful error messages when something goes wrong.

7.8 Stress Testing

Subjected the application to a high load to assess its performance under stress.

7.9 Regression Testing

After fixing bugs or making updates, performed regression testing to ensure that the changes have not adversely affected existing functionalities.

7.10 User Acceptance Testing (UAT)

Involved real users to perform UAT. Gathered feedback from them to understand their overall satisfaction with the application and identify any additional improvements.

Chapter 8

Results

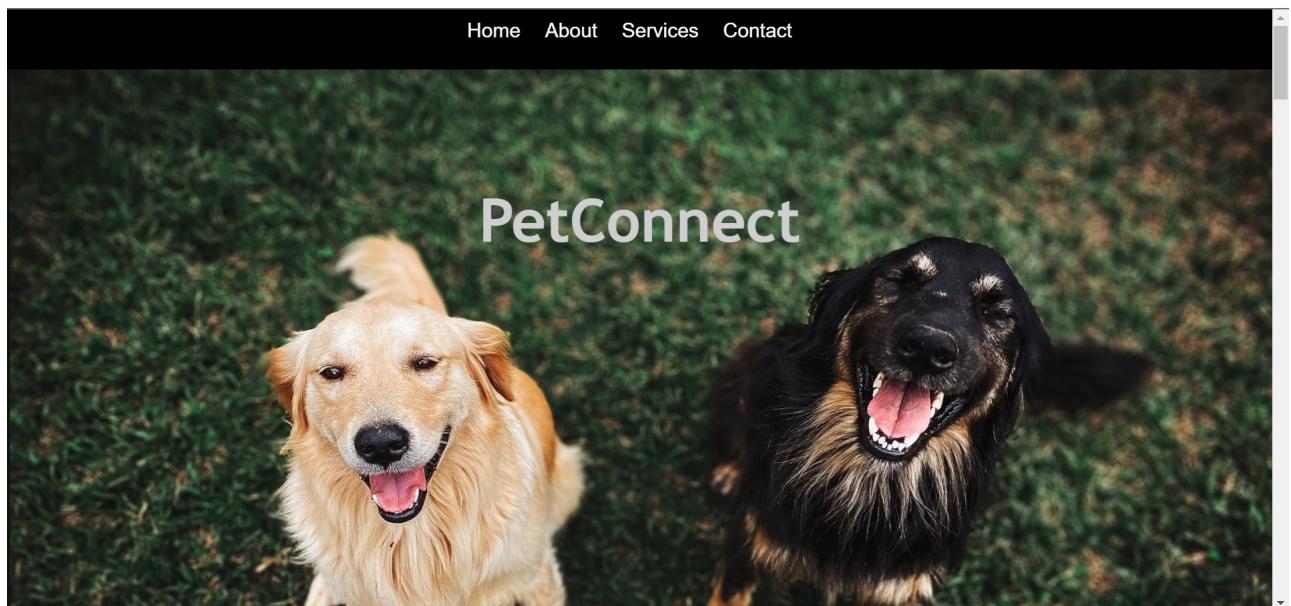


Figure 8.1: Home Page

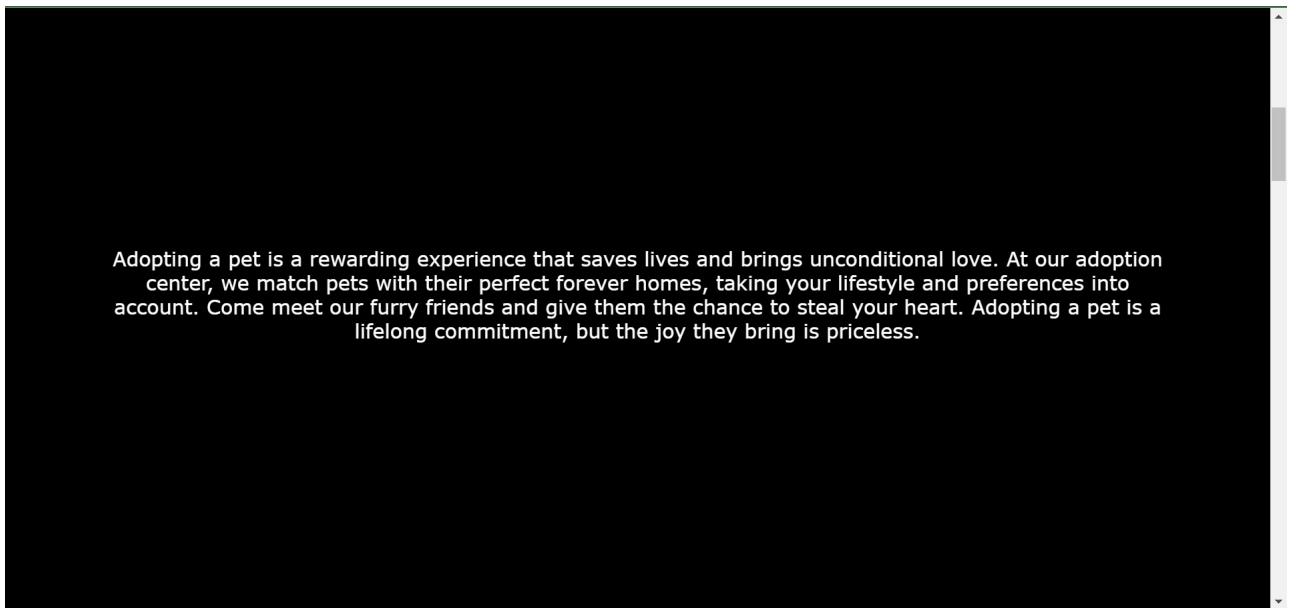


Figure 8.2: PetConnect Message

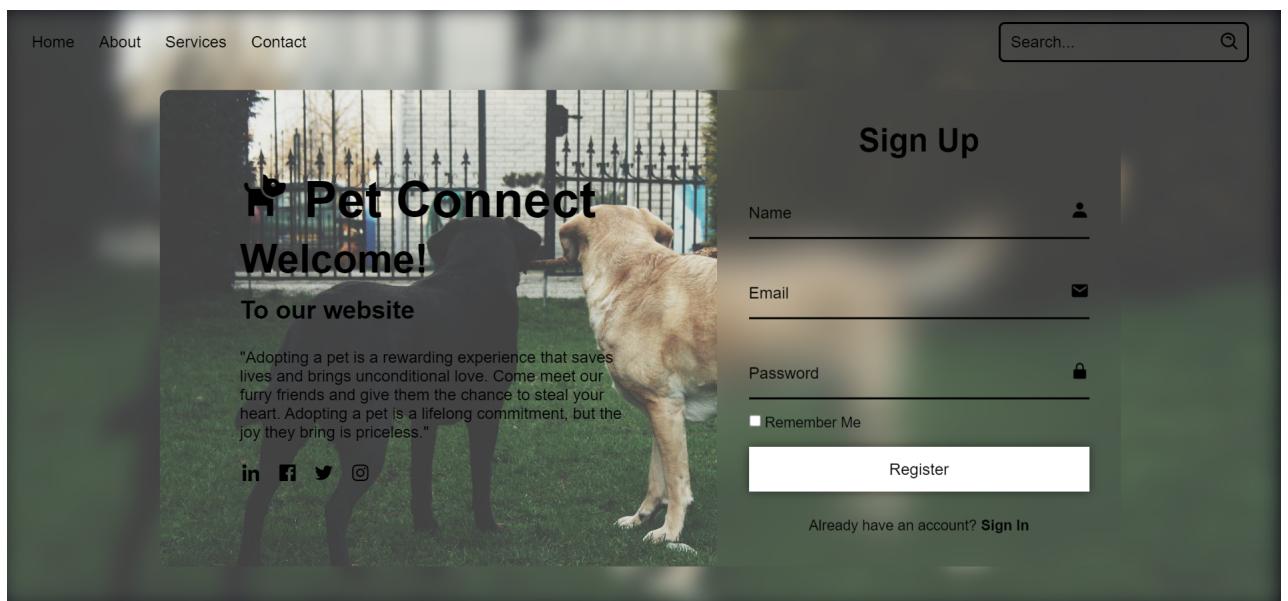


Figure 8.3: UI for Login

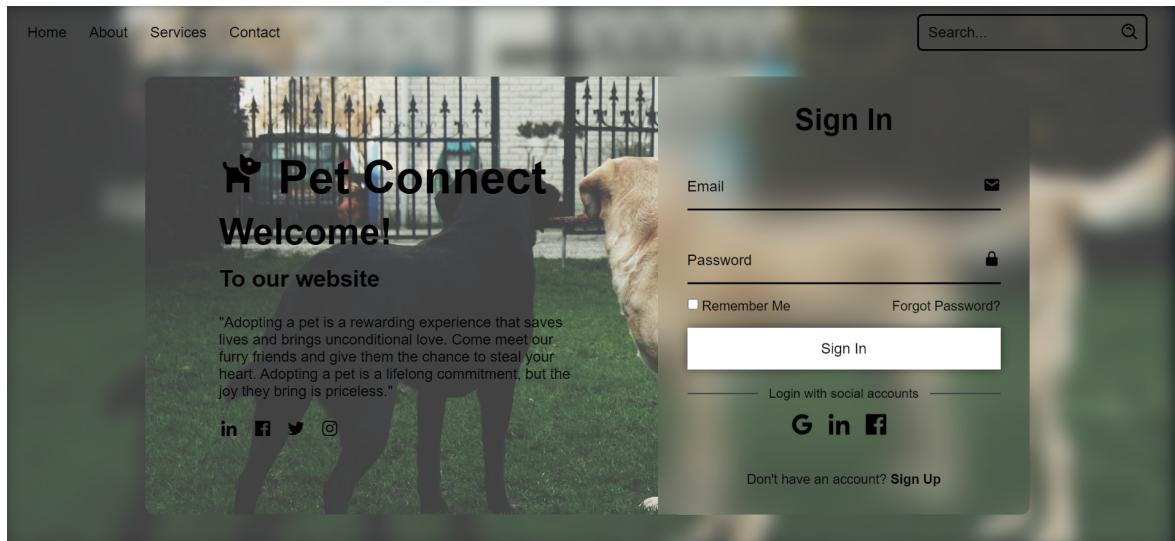


Figure 8.4: SignIn

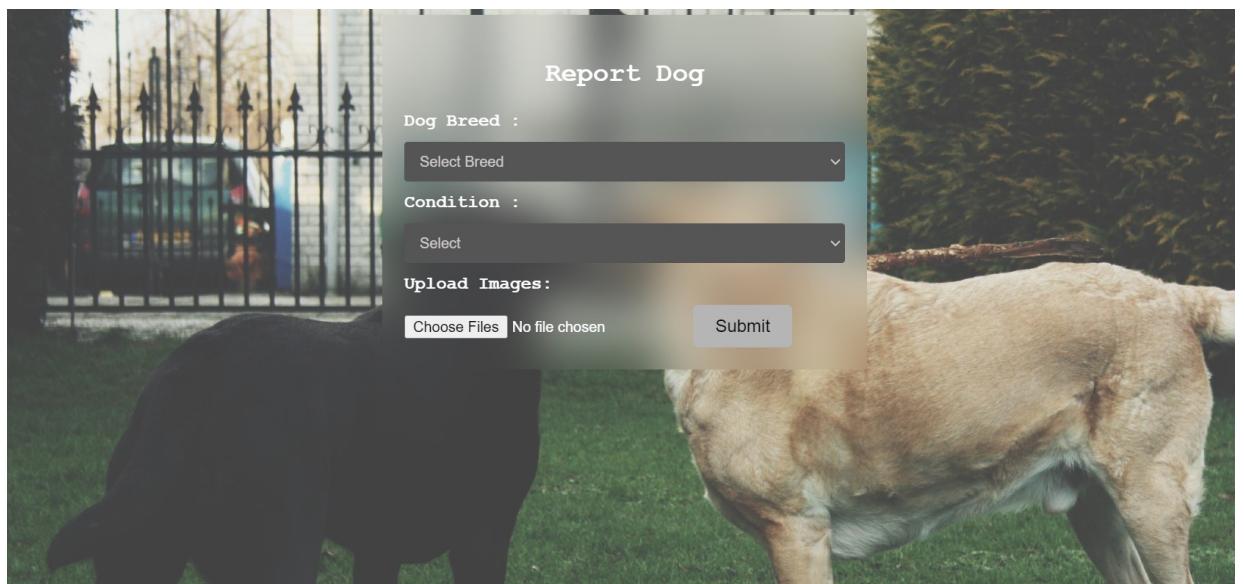


Figure 8.5: Report Dog

Reported Dogs

Below is a comprehensive list of reported rabid dogs within our city. The table provides essential information about each reported dog, including the breed, condition, date of the report, location, and an option to view the dog's image. You can track the actions taken for each reported case. Please review the table for up-to-date data on reported incidents, actions taken, and their status.

No.	Breed	Condition	Date (Reported)	Location	Image	Action Taken	Date Done
1	Bulldog	Rabid	19/7/2023	X9V5+8H8, Rajagiri Valley, Chalikkavattom, Vennala, Kochi, Kakkanad, Kerala 682030, India	View Image	<input type="checkbox"/>	
2	German Shepherd	Stray	7/18/2023	Traco Cable Company, Kakkanad, Kochi, Kerala 682030, India	View Image	<input checked="" type="checkbox"/>	18/7/2023
3	German Shepherd	Stray	18/7/2023	X9V5+8H8, Rajagiri Valley, Chalikkavattom, Vennala, Kochi, Kakkanad, Kerala 682030, India	View Image	<input type="checkbox"/>	
4	Golden Retriever	Injured	7/18/2023	69, Marathahalli, Kochi, Kerala 431809, India	View Image	<input checked="" type="checkbox"/>	18/07/2023
5	Poodle	Rabid	19/7/2023	X9V5+8H8, Rajagiri Valley, Chalikkavattom, Vennala, Kochi, Kakkanad, Kerala 682030, India	View Image	<input type="checkbox"/>	

Figure 8.6: Reported Dogs

Rabid Zones

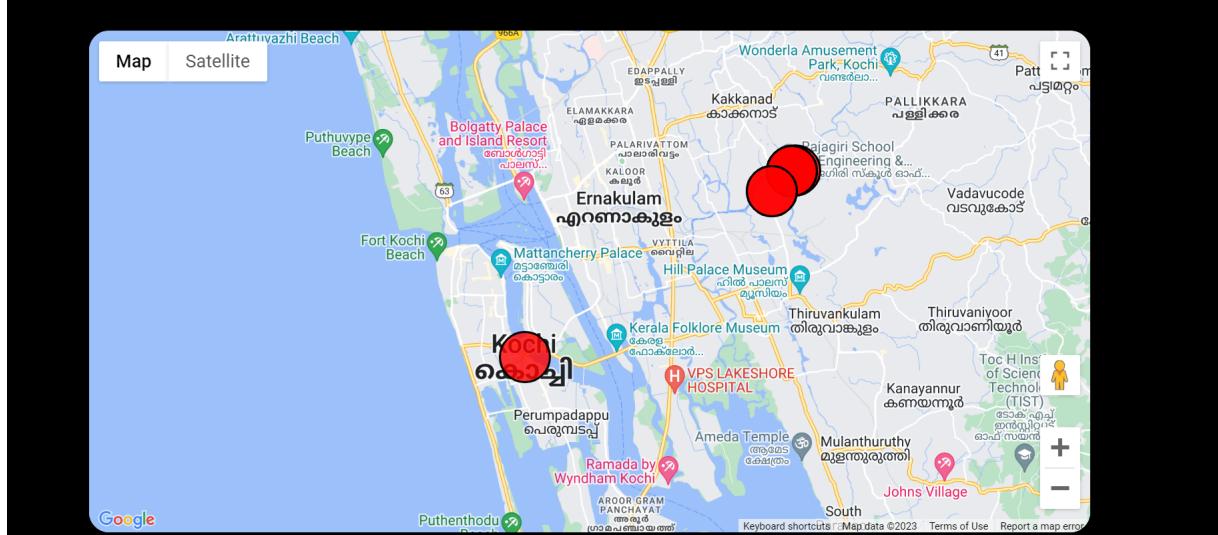


Figure 8.7: Rabid Zones visible for all

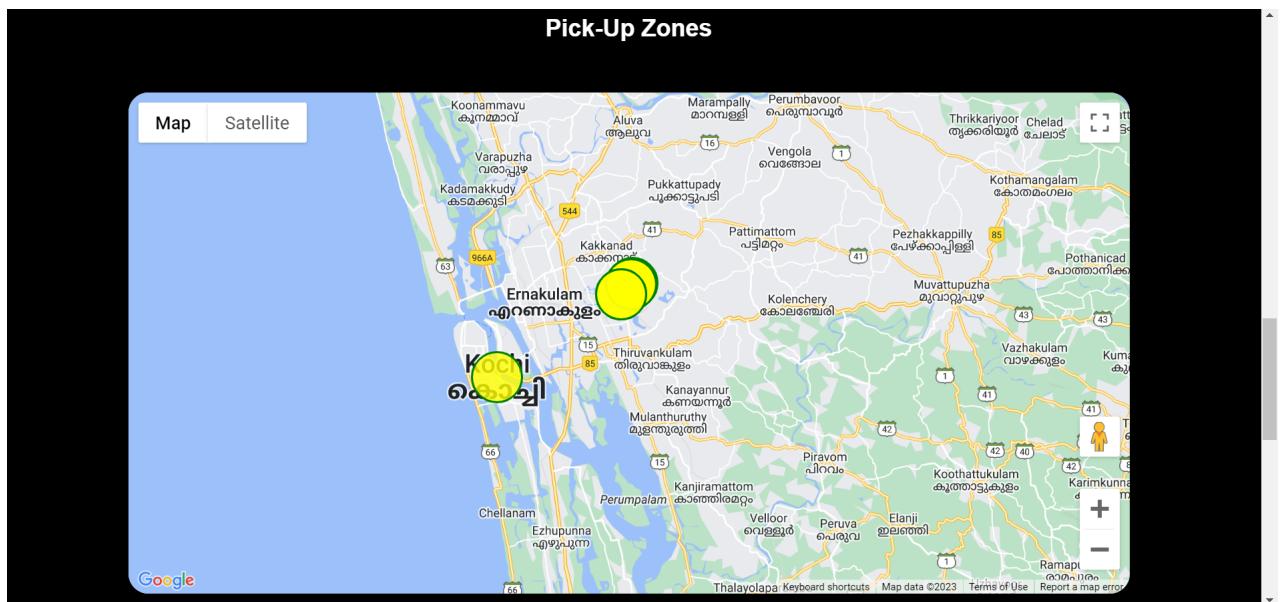


Figure 8.8: Pick-Up Zones visible to municipal users

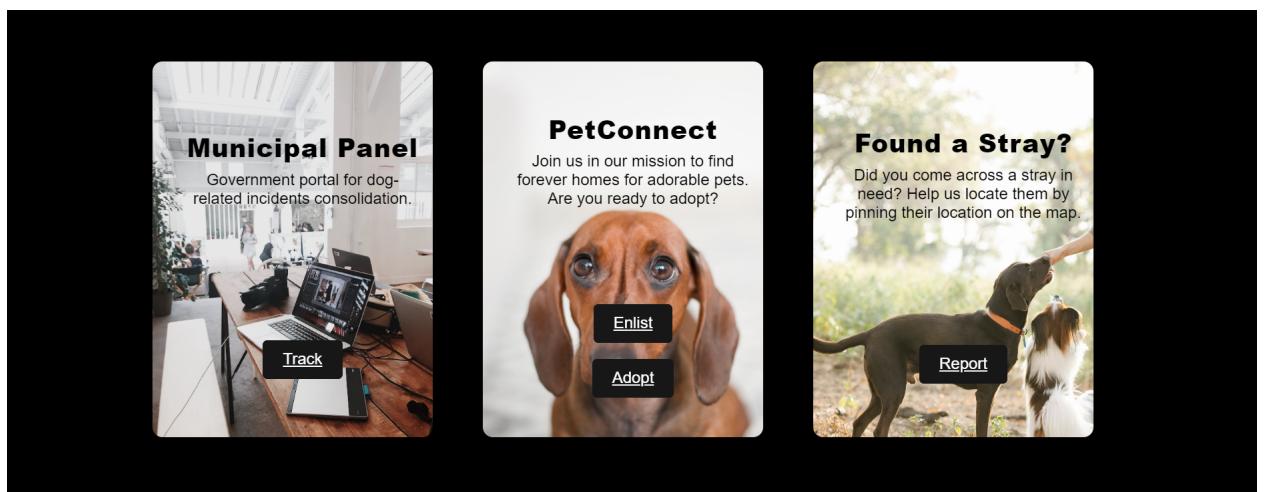


Figure 8.9: PetConnect Features

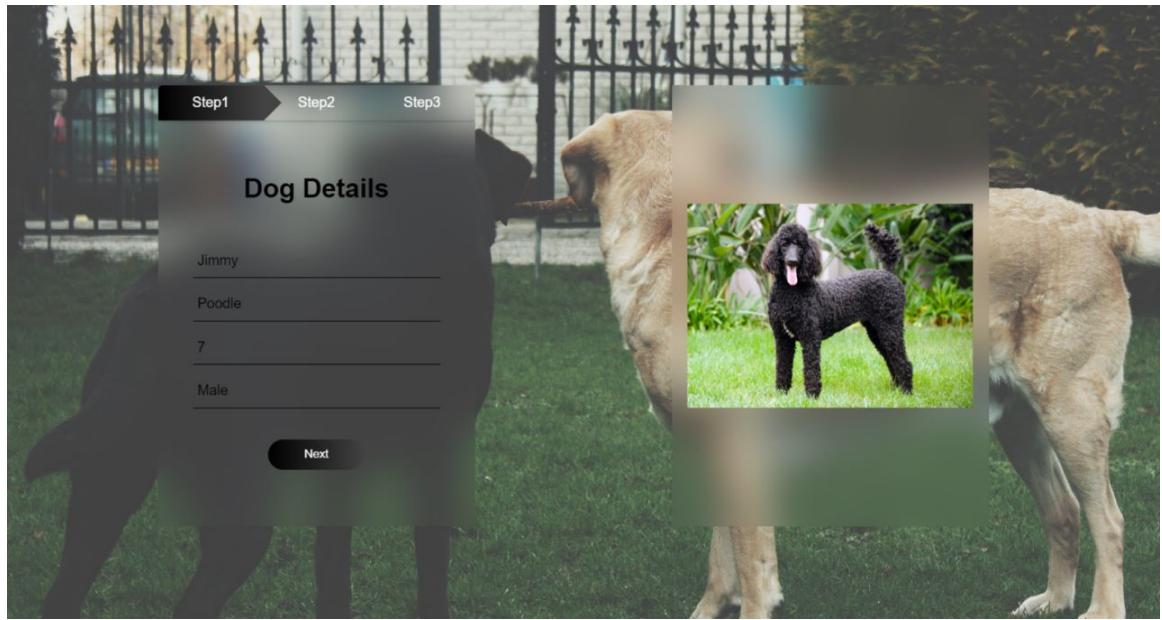


Figure 8.10: Dog Enlistment Step-1

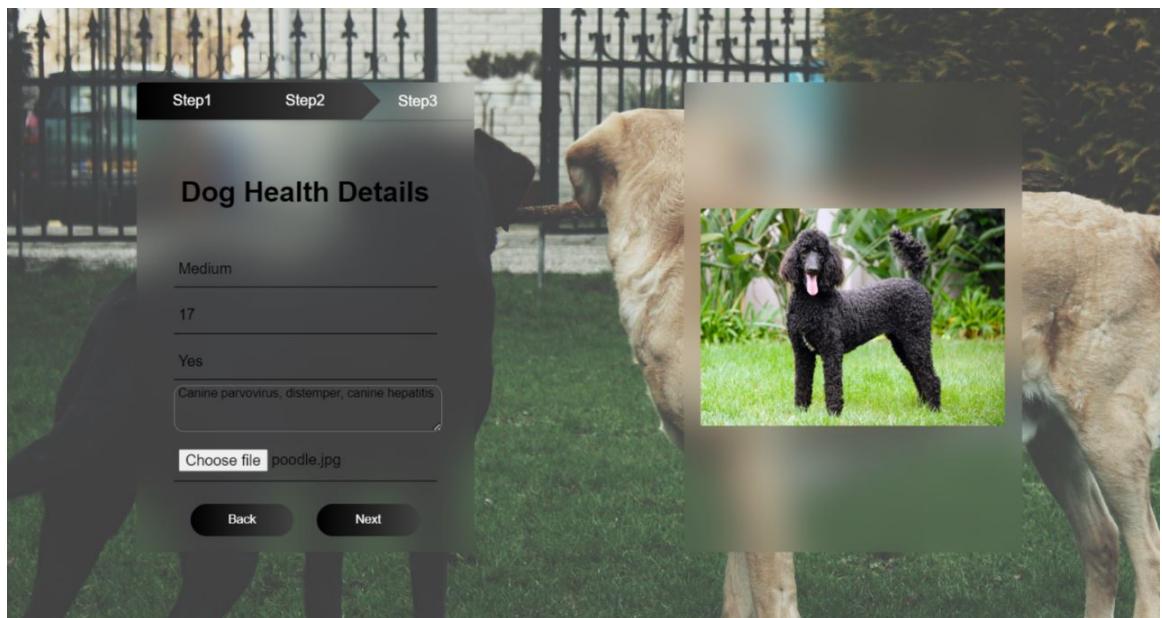


Figure 8.11: Dog Enlistment Step-2

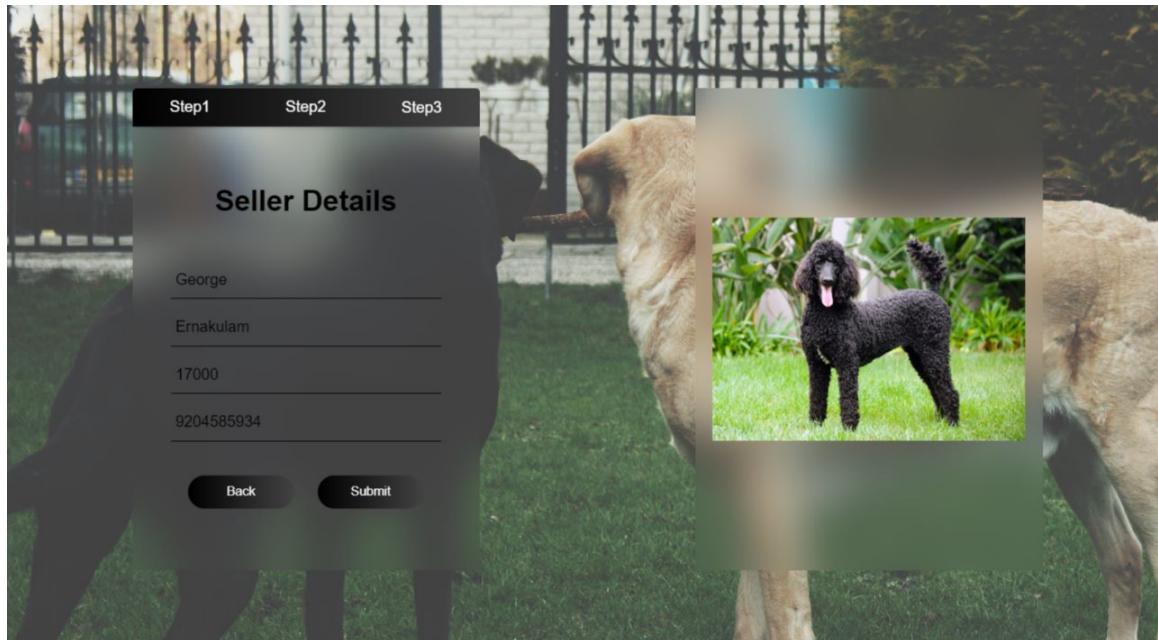


Figure 8.12: Dog Enlistment Step-3

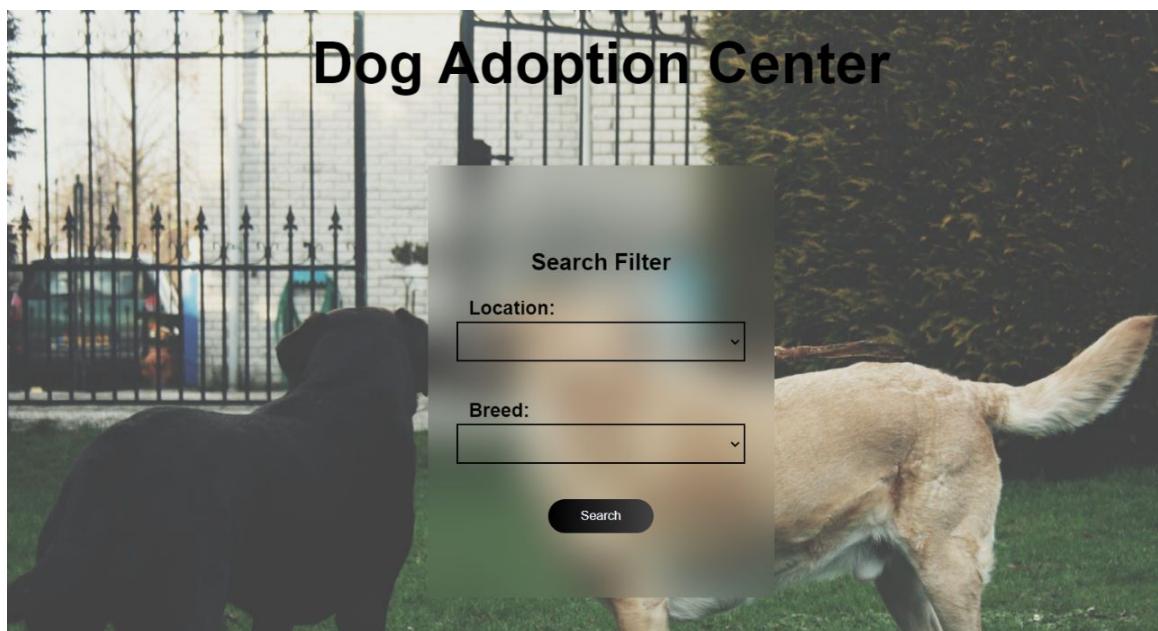


Figure 8.13: Dog Adoption Page

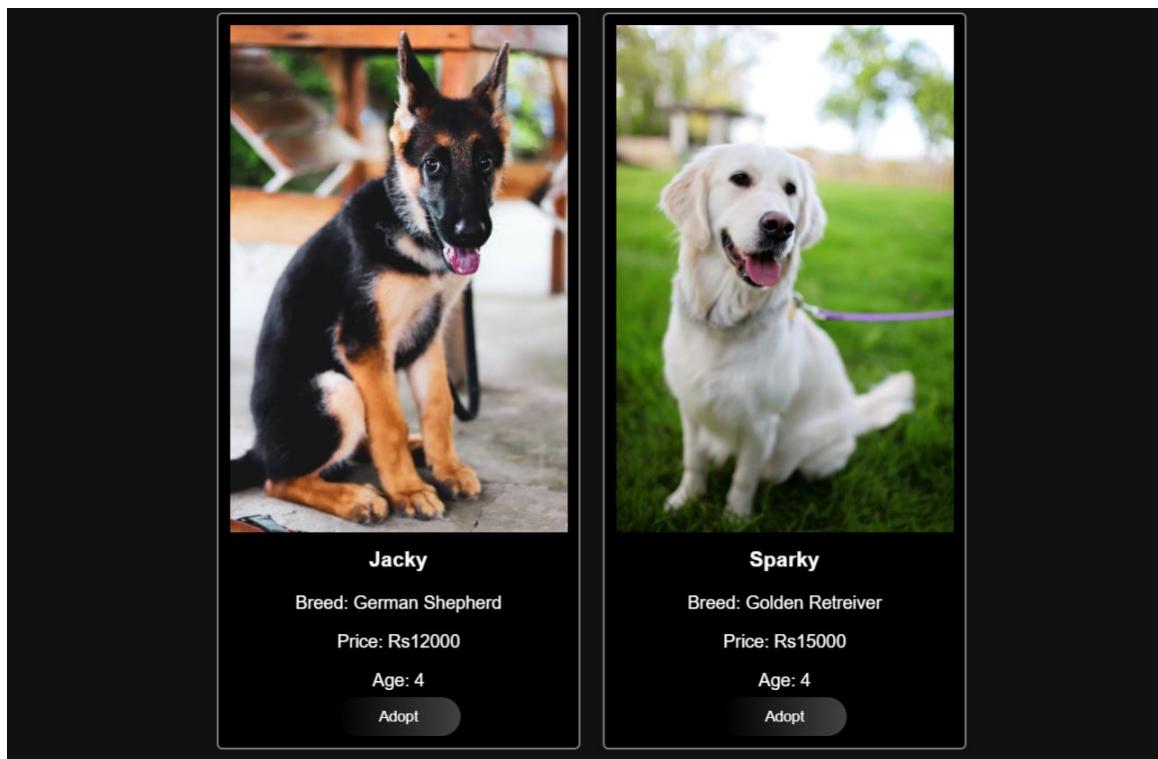


Figure 8.14: Dog Profile Page

Chapter 9

Risks and Challenges

Some key considerations are:

- Time constraint: The ability of the concerned authorities to take actions regarding received requests is of utmost importance, as on this not happening dogs might cause more trouble in an area or may succumb to their injuries. Also, a stray dog might wander off to a different area if timely response is not taken.
- Accuracy and Reliability: One of the most significant challenges is ensuring the accuracy and reliability of the dog location and pinpointing techniques. The application's success heavily depends on providing correct information to users. Inaccurate location determination could have adverse consequences on users' well-being, leading to potential legal and reputational risks for the application.
- Building a following: Community awareness and outreach to build up a following for the platform will be a tough hurdle to clear in the beginning days of the website.
- Building up a group of socially responsible civilians: Providing civilians the incentive to track down dogs in need of help will be a hurdle faced in the infancy of the platform. It will have to be assumed that there are enough like-minded citizens who will care enough to assist dogs in need, and likewise other citizens in their daily commute.
- Data Privacy and Security: Handling sensitive user data, such as personal information and location, requires robust data privacy and security measures. The application must comply with relevant data protection regulations to safeguard user information from unauthorized access, breaches, or misuse.

- Liability and Legal Concerns: Providing medical recommendations implies a level of responsibility and potential liability for any adverse outcomes experienced by users following the app's advice. The application's developers must carefully consider disclaimers, terms of use, and appropriate warnings to mitigate legal risks.
- Database Management: Building a comprehensive database of dog details and potential interactions can be a complex and time-consuming task. Keeping the database up to date and accurate is crucial for the application's success.
- Scaling and Performance: As the user base grows, the application should be able to handle increased traffic and usage. Ensuring scalability and optimal performance is vital to maintain a positive user experience.
- Updating Regulations: The regulations related to dog adoption might change over time. Developers must stay updated with relevant laws and adapt the application accordingly to remain compliant.
- Ethical Considerations: The web application must be designed ethically. Care must be taken to avoid promoting the misuse of the application to list dogs that have not been properly cared for etc.
- User Engagement: Getting users to regularly use the application and provide feedback can be challenging. Without active engagement, the app's database may not receive the necessary user-generated content and updates, impacting the application's overall effectiveness.

Chapter 10

Conclusion

Conclusion + Future scope

All in all, the PetConnect Web Application is a useful tool that acts as a hassle-free online platform for users to enlist and adopt dogs, as well as keep track of dogs needing care and of concern. The application offers a great experience for dog enthusiasts with its user-friendly interface and advanced dog-tracking capabilities.

Using a large database of dogs for adoption, the web application not only filters to the dogs the adopter wishes for, but also provides detailed information about each dog, including name, age, breed, and price. This knowledge sharing promotes environmental awareness and fosters a deeper connection between users.

In addition, the web application has the ability to foster community engagement, enhance learning, and enable users to exchange information, stories and skills through conventions, conferences and social media.

The PetConnect web application promises to be a reliable and up-to-date resource through continuous updates and improvements, keeping up with the ever-changing nature of dog adoption and enabling users to safely explore and enjoy the adoption experience.

In conclusion, this dog adoption site has become an indispensable companion for all dog lovers who contribute to the caregiving and understanding of the dogs in our surroundings. As we continue to shape the future, this tool is at the bleeding edge of engaging and encouraging a deeper understanding of the needs of all dogs around us, be it stray or home-kept.

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Appendix A: Base Paper

Pet Adoption App To Free Animal Shelters

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Abstract – Adopting a pet from a shelter helps to save more than one life. By adopting, people help free up space in the shelter, giving more space to rescue more animals. Adopting an animal means people are getting a pet that has received appropriate medical care. This study aimed to develop a web and mobile-based application that allows animal shelters and pet owners to post animals for adoption. Using the system will help them look for potential adopters who can pass the requirements for adoption. The study utilized the descriptive developmental type of research and administered two sets of the survey questionnaire. The respondents were the animal shelters, pet owners, and adopters in Cebu City, Philippines. Frequency, simple percentage, and weighted mean were used to treat the collected data. The study revealed that the system users are very satisfied with using the application. Also, they agreed that the system was very capable and very accessible to use in adopting pets. The researchers strongly recommend conducting the study on a larger scale to strengthen the preliminary findings.

Keywords – Technology, animal adoption, developmental method, Philippines.

I. Introduction

Dogs and cats have been popular household pets for thousands of years. Countless families have shared their homes with these animals and formed close emotional bonds. The essence of having these animals alongside people is to give comfort and accompany them. Pets are known to reduce stress levels, anxiety, and depression. Moreover, these animals can also share their loyalty to protect and obey their owners with the guidance of proper training and discipline.

One core media for adoption are shelters, pounds, neighbors, and friends that can be classified as pet owners [1]. According to the Humane Society of the United States Organization, adoption not only gives more animals a second chance, but its cost directly helps shelters better care for the animals they take in [2], [3], [4].

Adoption is taking full responsibility for an animal abandoned in a shelter by its previous owner or rescued by an animal organization. Adopting a living being is not a child-play but rather a duty and

obligation to provide the love, trust, and patience they deserve.

Dogs and cats purposely being left alone in the wild and abused are rampant nowadays. Due to the immense increase of abandoned animals and lost pets, they are hardly taken care of in animal shelters or animal pounds, making it a huge problem to cater to all the animals in one place. This also results in the number of animals being euthanized dramatically. Overpopulation, limited resources, inadequate staff, volunteer training, and high turnover are common in animal shelters [5], [6], [7]. In other instances, due to overcrowded shelters, different pets will be overlooked and may not be given the love and care it expects.

Moreover, twelve million stray cats and dogs roamed the nation in 2019, according to the Philippines Animal Welfare Society [8]. Thousands of animals are euthanized or die of disease, hunger, or wounds resulting from fighting each year. Domesticated animals, once family pets, are frequently thrown out onto the streets when their owners can no longer earn enough to support them or

as they become ill, and their pet owner does not want to deal with making them better because finding a potential adopter is difficult. However, just like any other animal shelter's problems, since this is only a temporary place for animals to stay, shelters are limited in resources. Prone to overpopulation of unwanted animals that leads to euthanasia, less acknowledged shelters, difficulties in managing animals, updating their vaccinations and deworming, donations, and adoption [9], [10], [11].

2. Related Literature

The pace of people's lives has accelerated in recent years, and the pressure has increased the number of abandoned pets. The increasing number of displaced animals has had an impact not only on the animals of nature but also on the lives of humans. Furthermore, stray animals have posed a significant hidden threat to the city's surrounding environment, public transportation, and public health security. Animal rescue by humans is still in its early stages. There are issues such as restrictions on rescue locations, the remoteness of rescue locations, high investment demand, updates of relevant news, and publishing difficulties. These circumstances, directly or indirectly, contribute to receiving more and fewer pets from animal rescue facilities. This situation forces the rescue team to deal with numerous serious issues, including the economy and the location. Second, you will realize that animal adoption has a more natural and profound meaning after having a pet. To begin with, adopting animals raises people's awareness of the need to care for animals, reducing the occurrence of the magical behavior of unscrupulous pets, not to mention the horrible human beings who enjoy animal meat. Adopting a pet can also help children develop an awareness of the importance of animal and environmental protection.

Children raised in today's world are surrounded by reinforced concrete and high-rise buildings. They can rediscover the love they have lost since childhood by adopting animals, and we can help them acknowledge the beauties of life and recapture the childlike innocence they should have at this age. People are becoming more fond of e-commerce as computer technology advances, from selling daily necessities to selling houses, which can be traded through e-commerce. People are becoming more accustomed to completing many personal tasks without leaving their homes. As a result, utilizing the benefits of the

Internet, animal adoption, as well as the development and design of a web-based pet adoption system, is imminent [12].

Pet overpopulation has been a significant issue for a long time. Hundreds of thousands of dogs in shelters all over the country desperately need homes. When looking up these dogs on shelters web sites, it is common to find a small blurb and a low-quality photograph in a poorly designed environment about a dog needing a home. Most of the time, these postings are insufficiently informative to assist potential owners in making an informed decision when selecting the right dog. Dogs in these shelters would have a much better chance of being adopted if they had a more prominent web presence than they do now. The purpose of the project is to create a digital shelter dog adoption center to make dogs up for adoption more appealing, interactive, and geared toward a more accurate fit for the potential owner. This method is best suited for dogs with a more challenging time finding a home, such as older dogs, dogs of a specific breed and size, physically or mentally handicapped dogs, or dogs with other special needs [13].

Cats and dogs are among the common domesticated animals for human companionship, and their bonds with humans generally provide mutual psychosocial health benefits. Following the global spread of COVID-19 pneumonia, social distancing measures such as working from the home policy have been reinforced worldwide. Abandonment of pet dogs and animal cruelty have also been reported amidst the pandemic, probably due to rumors of animals as potential reservoirs of COVID-19. Stray dogs were starved and subsequently euthanized of them. Animal cruelty is widespread and reported in developed and developing nations [14].

For some companion animal guardians, the animal-human bond is as strong as the bond with any other family member. It argues that the emotional attachment many humans have for their pets not only equals but transcends the emotional attachment they form with other humans. Upon the first glimpse, the number of people deeply attached to their pets may be significant. Studies report a high percentage of companion animal guardians who state that the pet is a family member. The pet is a family member [15].

The pet's personality, compatibility, and behavior are attributed to satisfaction and retention rather than demographic differences among adopters or adoption

settings. Health issues first plagued half of the adopted pets, but most were resolved within a year. Roughly one-fourth of adopters who no longer have their companion animal said their pet died. Characteristics of dead pets support the contention that spaying and neutering profoundly affect a companion animal's life span. Although retention is similar for dogs and cats, mortality is higher among cats in the first year after adoption [16].

Many animals are put up for adoption. Many available animals can overburden shelters if this number rises above a shelter's maximum capacity. Pet adoption websites need to identify which characteristics or general information about the animals are most salient to potential pet adopters to increase adoption speed and avoid overcrowding [17].

Across species and age groups, the top reasons for adoption were the animal's appearance, social behavior with adopters, and personality. Most adopters said information about the animal provided by an employee or volunteer was more crucial than data on cage cards, and health and habits information was critical. Adopters valued interaction with the animal more than viewing it in its kennel. Shelters can use the results of this study to create better adoption matches, prioritize shelter resources and staff training, and potentially increase adoptions. Simple training techniques are also suggested to facilitate adopter-friendly behaviors from sheltered dogs and cats [18].

[19] Explain the latest pet adoption trend in Indonesia and introduce e-dopt, a mobile application designed to encourage more pet adoption in Indonesia. The benefit of conducting this research is that pet adoption mobile applications are not yet widely available in Indonesia. A mobile application to aid in the pet adoption process was developed as part of this study. The mobile application is created using the Android platform, and the requirements are gathered from interviews, surveys, and research that have been conducted. The developed mobile application provides convenience for those who want to adopt or give out pets and allows businesses in the pet product industry to use the mobile application as a sales channel.

The process is broken down into four components: user handling module, pet handling module, pet adoption module, and pet statistics module. Eclipse and MySQL using SSM framework, bootstrap framework, various plug-ins, and related JSP

technology. Among them is the modal box in the bootstrap framework to reduce the number of JSP pages. When browsing pets, I chose a plug-in written in pure CSS to complete the waterfall stream layout for users to browse. In adopting the pet statistics module, the plug-in provided by Echarts is used to complete the production of the chart, making the data look more vivid and intuitive. It also can download the image to the local system for administrators to download and use. When a user logs in, the username is determined by the username logged in, and the user's identity is determined by whether the user is an ordinary member or an administrator. To identify the permission and navigate to the appropriate page. When you log in, you can remember your password; you can log in to two functions to make the design more user-friendly [20].

Privacy is an increasingly important issue for Internet users, especially in e-commerce, where they must disclose large amounts of personal information to make purchases. Various privacy-enhancing technologies (PETs) are currently available, including the platform for privacy preference projects, privacy seals, and human-readable privacy policies. In particular, P3P has been the subject of considerable interest; however, it's also highly dependent on the symbiotic deployment of P3P user agents and policies on vendors' Websites. Internet users and vendors must commit time and resources to deploy P3P agents or procedures, thus requiring evidence that the technology won't stagnate or become obsolete [21].

With the rise of online shopping, animal shelters can use websites to allow potential adopters to view adoptable animals, thereby increasing the number of adoptions. However, little research has been conducted to assess this user group's information needs. This study used a user needs analysis to determine what information potential adopters want when looking for a new pet, specifically a cat or dog. Twenty-six people ranked various behavioral and physical characteristics in order of importance and identified their top five overall factors. In general, cat adopters ranked the cat's personality and behavior as very important, and dog adopters found physical characteristics highly important. This study shows the importance of understanding potential adopters' needs to provide relevant and valued information on online pet adoption profiles. The recommendations and insights can be used to develop pet profiles that meet

adopters' needs and help adopters find the right pet [22].

[23] Investigated the relationship between dog-owner personality match and pet satisfaction. Previous research indicates that dog owners abandon their pets at a greater incidence. New guidelines for matching owners with future pets may help reduce the number of homeless pets. These were created after reviewing the literature to determine all possible dog traits and conducting structured interviews to test for various features. After doing this, 45 characteristics were determined and created in two surveys. One survey assessed the dog's personality traits, and the other evaluated the owners. Comparisons between dog overall satisfaction and dog-owner personality match revealed four characteristics significantly associated with happiness: the proclivity to share possessions, the desire to run outside, the tendency to be destructive, and the ability to get along with others. These findings suggest that prospective dog owners should consider adopting dogs that match their personality on these traits. A few characteristics shared by dogs and their owners may predict owner satisfaction. This is significant because it can reduce the number of dogs relinquished by owners and the number of dogs left homeless each year.

3. Objectives of the Study

The study aimed to develop an online web and mobile-based application for Animal Adoption. Specifically, it sought to 1] determine how the application be analyzed and designed as to their functionalities; and 2] assessment on the application as to its satisfaction, system capabilities, and accessibility.

4. Scope and Limitations

This study focuses on developing a web and mobile-based application that allows animal shelters and pet owners to post animals for adoption. This will help them look for potential adopters who can pass the requirements for adoption. This will be conducted first in Cebu City but can apply to the Philippines.

The limitations include 1] The system will only cater to registered users; 2] The animals to be adopted limited to cats and dogs; 3] In the mobile app, they can use third-party applications for money transactions such as PayPal and GCash and need to send the proof of transaction; 4] In the web platform, the money transactions are through PayPal only; 5] The mobile application does not support iOS; 6] The mobile

application is for adopters only; 7] The system does not support the delivery of pets to adopters; 8] The system will cover Cebu City area only for the meantime but will surely expand to other regions and the whole Philippines.

5. Methodology

The study utilized the descriptive developmental method to gather data about pet adoption in Cebu City, Philippines. The incremental developmental methodology was used to develop the system consisting of modules with specific functionality. They must go through a systematic process to successfully apply all the necessary features being planned by the researchers. With the help of the Incremental Model, it can quickly identify potential problems and risks during the testing period. In this manner, the researchers will address issues during the iteration of the system process. The researchers developed two sets of questionnaires administered to the respondents: a questionnaire on systems procedures and functionalities and a system user acceptance test. The study's respondents were the pet owner, adopters, and animal shelters. Statistical treatments used in the data analysis were frequency, simple percentage, and weighted mean.

6. Results and Discussions

System Analysis as to Web and Mobile Functionalities

As shown in Figure 1, animal shelters can log in and must first subscribe to the next subscription promos provided by the system. After subscribing, animal shelters can now manage their account, pet, and selections were in selection has category, breed, and adoption fee. They can also view manage petbook, where they can view and generate pet books and allocate vaccines and deworming to the animal. They can also have access to adoption where they add adoption policy, confirm payments for adoption, and accept or reject requests for adoption. They can also view donations and confirm whether they have received them. For some of these features, they can receive notifications.



Figure 1. Program Workflow – Animal Shelter (Web)

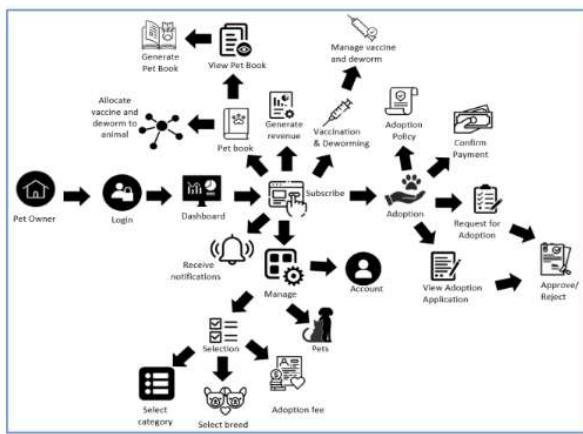


Figure 2. Program Workflow – Pet Owner (Web)

Figure 2 shows that the pet owners can log in and must first subscribe to the following subscription promos provided by the system. After subscribing, pet owners can now manage their account, pet, and selections were in selection has category, breed, and adoption fee. They can also view manage pet book, where they can view and generate pet books and allocate vaccines and deworming to the animal. They can also have access to adoption where they add adoption policy, confirm payments for adoption, and accept or reject requests for adoption. For some of these features, they can receive notifications. Lastly, they can generate revenue.

Figure 3 shows that the adopter can log in to the system. They must first subscribe to any subscription promos provided so that they can view animals, donate, apply for adoption and pay the adoption fee. They can also locate animal shelters and pet owners who provide the animals to be adopted. Additionally, they can manage their profile and receive notifications. They can view vaccines and deworm

products used for pets. They can also view adoption status, payment history, and receipts.



Figure 3. Program Workflow – Adopter (Mobile)

As shown in Figure 4, the admin can log in to the system using the default username and password. The admin can access the dashboard, manage subscriptions, approve or reject account application requests, generate revenue, view reports, and approve account reactivation requests from animal shelters, pet owners, and adopters. They can also see they receive notifications from user requests, and they can also approve subscriptions and adoption fees.

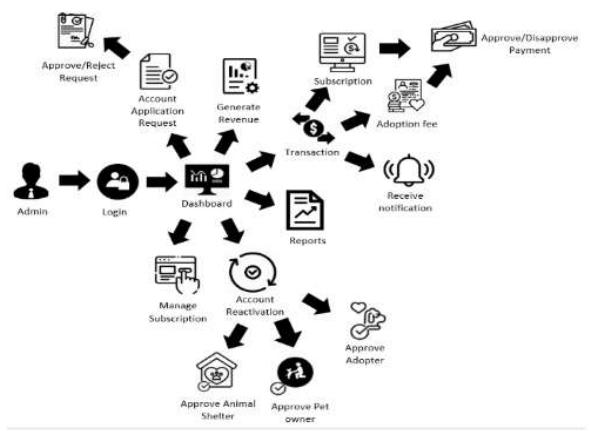


Figure 4. Program Workflow – Admin (Web)

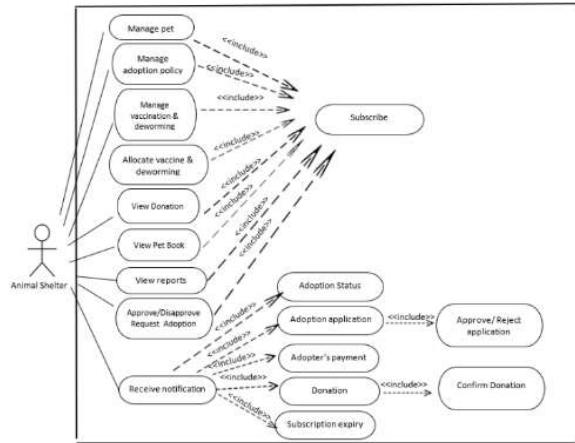


Figure 5. Use Case Diagram – Animal Shelter (Mobile)

Figure 5 illustrates that the shelter should have an adoption policy, required vaccination, and pet deworming to manage the animals. The shelter must first subscribe to any promos available in the system. After subscribing, the system allows them to use these privileges for a particular time, depending on the subscription. Additionally, they can view donations and receive notifications like adoption applications, adopter's payments, donations, and subscription expiry. Upon receiving, the shelter can approve or reject applications and confirm the adopter's payment.

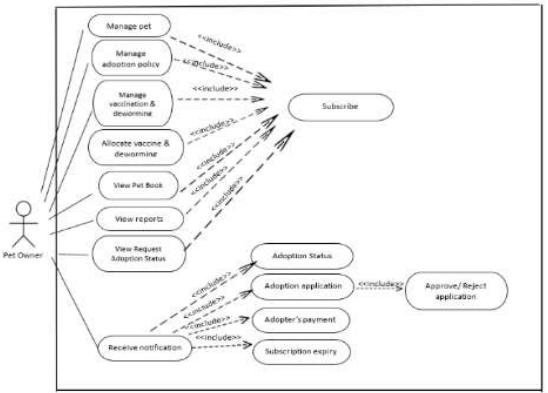


Figure 6. Use Case Diagram – Pet Owner

As shown in Figure 6, pet owners must subscribe to a promo available in the system. After subscribing, they can now manage animals, create adoption policies, vaccination, and deworming. They can also allocate vaccines and deworming to an animal being added. Additionally, they can receive notifications like adoption applications from adopters, adopters' payments to the pet being adopted, and subscription

expiry. Upon receiving, the pet owner can approve or reject applications and confirm the adopter's payment.

Figure 7 illustrates that the admin can view shelters, a list of pet owners, transactions, and income. They can also approve or reject shelters and pet owners by reviewing their application forms. They can also receive notifications like payments from pet owners and animal shelters and then go directly to the transaction section to confirm subscription payment and view payment history. The admin can also manage subscriptions providing affordable and reasonable prices for pet owners and shelters.

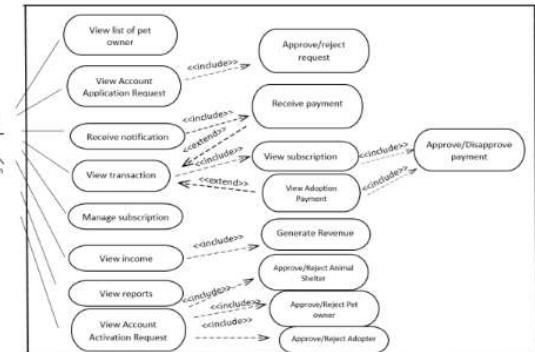


Figure 7. Use Case Diagram– Admin

Figure 8 illustrates that the adopter can manage an account and then select their animal preferences. Upon viewing animals, they can apply for adoption and must thoroughly follow the given adoption policy provided by shelters and pet owners. Once done, adopters can view the application status while waiting for approval. In addition, adopters can also apply for donations and then view the application status once it has been submitted to the shelter. Moreover, they can view transactions like payment history and receive notifications for payment confirmation.

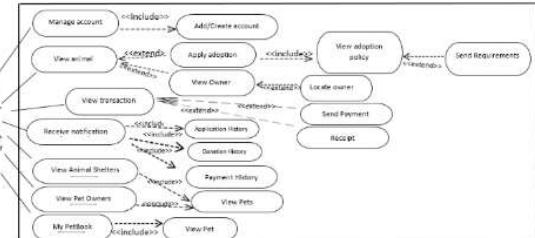


Figure 8. Use Case Diagram – Adopter

System Design as to Web and Mobile Functionalities

Database Design. It is the process of producing a detailed data model of a database. This data model includes all the logical and physical design options, and storage device criteria are taken to produce a design in a data dictionary which can then be used to create a database.

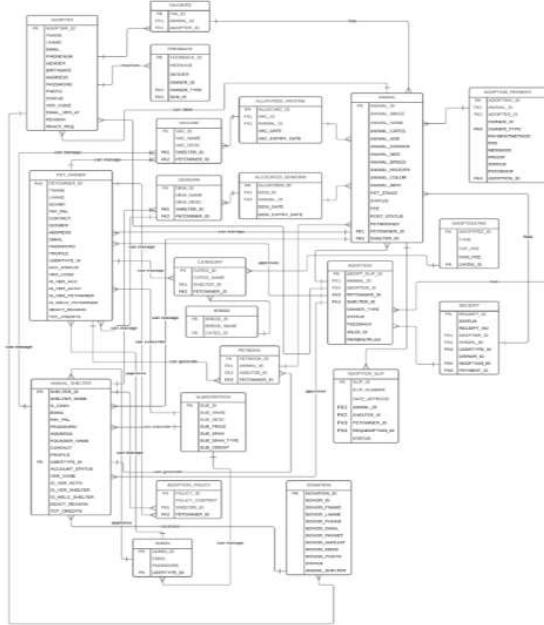


Figure 9. Entity-Relationship Diagram

Network Model. The developed system uses a Client-Server Architecture. A client-server network allows clients to access resources and services from a central computer via an area network or a wide-area network, such as the Internet. Figure 9 shows how clients' wireless devices are connected through a wireless LAN and will send HTTP requests, which will then pass through the wireless router to the router and finally be received and accepted by the Web or Database server. As soon as the server accepts the HTTP request, the server will perform the requested task and reply to the client.

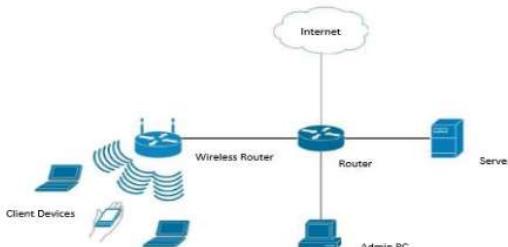


Figure 10. Network Model

Graphical User Interface (GUI) Design. This allows the users to directly interact with their devices, which are characterized by icons, windows, menus, and other objects on the screen. Figures 11 to 18 show the sample screenshots of the web application for pet adoption. Also, Figures 19 to 26 display the sample screenshots of the mobile application.



Figure 11. Front Page Interface

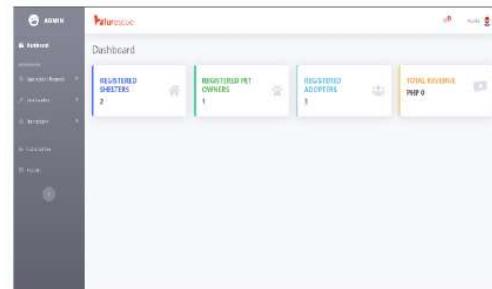


Figure 12. Admin Dashboard Page Interface

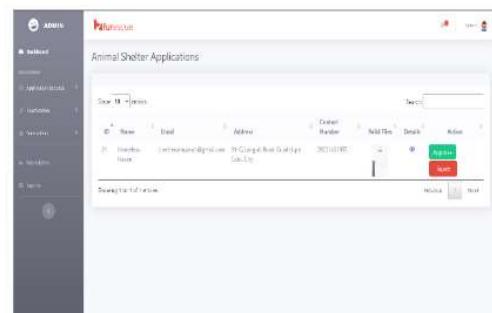


Figure 13. Admin View Shelter Application

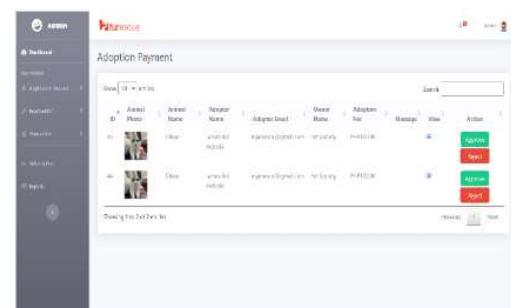


Figure 14. Admin Adoption Payment

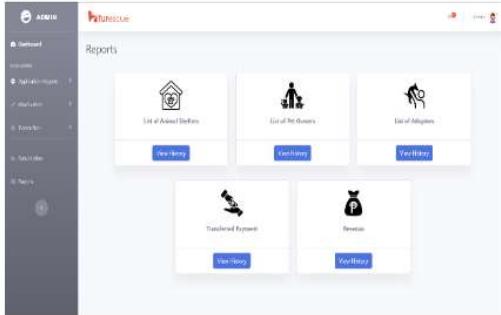


Figure 15. Admin Report Interface

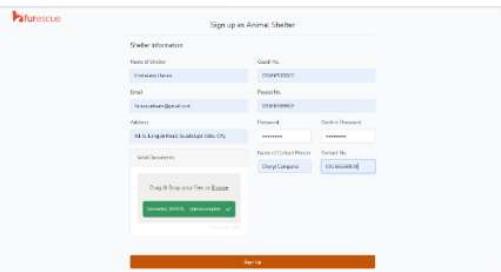


Figure 16. Animal Shelter Registration



Figure 17. Animal Shelter Select Pet

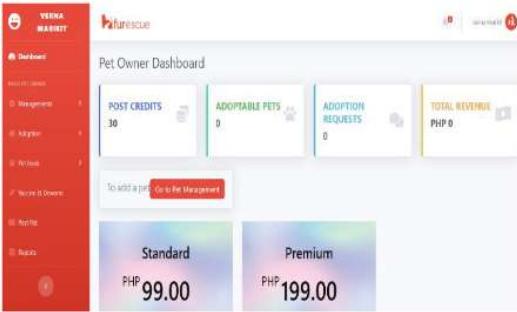


Figure 18. Pet Owner Dashboard

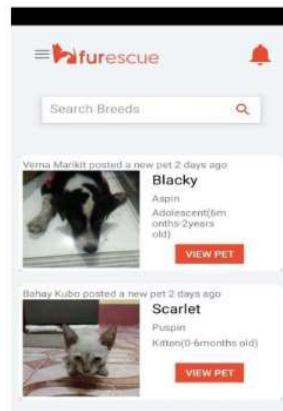


Figure 19. User Dashboard

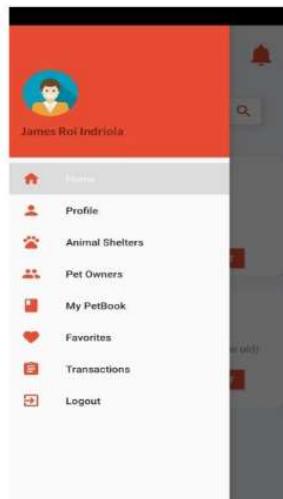


Figure 20. User Sidebar



Figure 21. Animal Shelter

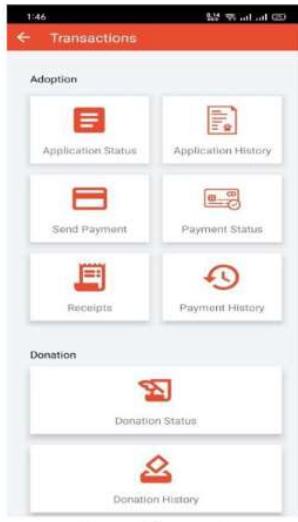


Figure 23. User Transactions

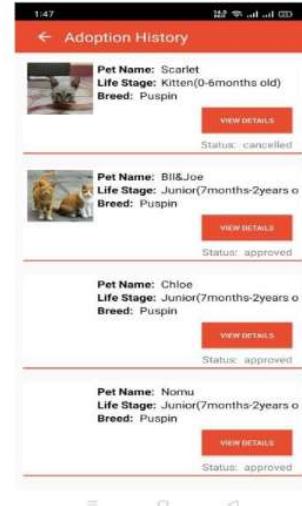


Figure 24. User Adoption History Details



Figure 25. User Donate Interface



Figure 26. Pet Details Interface

Table 2. Stakeholders' Responses on System Capabilities of the Application

Indicators	Animal Shelters [n = 3]		Pet Owners [n = 35]		Adopters [n = 40]		Consolidated [N = 78]	
	Mean	Inter	Mean	Inter	Mean	Inter	Mean	Inter
	1.	Speed	3.43	VC	3.55	VC	3.65	VC
2.	Reliability	3.76	VC	3.47	VC	3.89	VC	3.71
3.	Functionalities	3.37	VC	3.06	MC	3.55	VC	3.33
4.	Corrective	3.22	MC	3.19	MC	3.09	MC	3.17
5.	Design	3.84	VC	3.74	VC	3.43	VC	3.67
Aggregate Mean		3.52	VC	3.40	VC	3.52	VC	3.48

Range:

1.00-1.74 Not Capable [NC]; 1.75-2.49 Less Capable [LC];
2.50-3.24 Moderately Capable [MC]; 3.25-4.00 Very Capable [VC]

Stakeholders Assessment on the Application

Table 1 presents the results of the stakeholders' responses on their satisfaction with the use of the application.

When data are combined, the study shows that the application's Features got the highest mean of 3.61 [Very Satisfied]. At the same time, the Overall product got the lowest mean of 3.49 [Very Satisfied].

The data imply that the system users were delighted

Table 1. Stakeholders' Responses on Satisfaction of the Application

Indicators	Animal Shelters [n = 3]		Pet Owners [n = 35]		Adopters [n = 40]		Consolidated [N = 78]	
	Mean	Inter	Mean	Inter	Mean	Inter	Mean	Inter
1.	Quality of the application	3.70	VS	3.27	VS	3.61	VS	3.53
2.	Responsiveness	3.33	VS	3.35	VS	3.99	VS	3.56
3.	Features of the application	3.87	VS	3.41	VS	3.56	VS	3.61
4.	User-friendliness	3.48	VS	3.09	MS	3.95	VS	3.51
5.	Overall product	3.57	VS	3.44	VS	3.47	VS	3.49
Aggregate Mean		3.59	VS	3.31	VS	3.72	VS	3.54

Range:

1.00-1.74 Not Satisfied [NS]; 1.75-2.49 Less Satisfied [LS];
2.50-3.24 Moderately Satisfied [MS]; 3.25-4.00 Very Satisfied [VS]

The table shows that most respondents from animal shelters were very satisfied with the application's features [Mean = 3.87]. While the indicator, Responsiveness, got the lowest mean of 3.33 [Very Satisfied].

Also, the table reveals that most pet owners were very satisfied with the overall product [Mean = 3.44]. While the indicator, User-friendliness, got the lowest mean of 3.09 [Moderately Satisfied].

Moreover, Table 1 shows that most adopters were very satisfied with the application's responsiveness [Mean = 3.99]. While the indicator, Overall product, got the lowest mean of 3.47 [Moderately Satisfied].

with the Web and mobile-based applications for adopting pets because adopting them from shelters saves more than just one life. The pet adopters help free up spaces inside the shelter, giving the shelter more space for rescued animals.

Housing design affects staff, pets, and adopters. Regarding cages, double-compartment housing is perhaps the most significant factor affecting staff safety and efficiency. The most significant risk to staff in daily care comes with moving and crating pets to clean and service the enclosure [24].

The study of [25] concluded that those who adopted the pets lived in different parts of town than those who

adopted from a shelter. Although the pets have a more extended stay from intake to adoption, they spend less time in the shelter and free up more kennel space for other pets in the shelter.

Table 2 presents the results of the stakeholders' responses to the system capabilities of the application. The table shows that most respondents from animal shelters agreed that the application design is very capable of adopting pets, with a mean of 3.84. While the indicator, Corrective, got the lowest mean of 3.22 [Moderately Capable].

Also, the table reveals that most pet owners agreed that the application design could capture data on pet adoption [Mean = 3.74]. While the indicator, Functionalities, got the lowest mean of 3.06 [Moderately Capable].

Further, the table shows that most adopters agreed that the reliability of the application was very capable [Mean = 3.89]. While the indicator, Corrective, got the lowest mean of 3.09 [Moderately Capable].

When data are combined, the study shows that the application's Reliability got the highest mean of 3.71 [Very Capable]. While the indicator Corrective got the lowest mean of 3.17 [Moderately Capable].

The data imply that the system is capable of adopting pets utilizing the Web or by a mobile device. The users acknowledge the speed, reliability, functionalities, and design of the system for adopting pets.

An increasing number of information technology systems and services are being created to influence

systems and the types of content and software functionality that may be found in the final product. The following seven underlying postulates, methods for analyzing the user and the user context, and persuasive design strategies and guidelines are highlighted.

[27] Investigates the use of UX and UI design theory to improve the pet adoption process and determines whether a more efficient user experience would result in a higher adoption rate and increased awareness. Users are likely to continue using and sharing an app that is simple, efficient, and usable. Users will not analyze every detail but will intuitively recognize features and indirect meanings, so nothing on their screen should be redundant.

Table 3 presents the results of the stakeholders' responses on the usefulness of the application.

The table shows that most respondents from animal shelters agreed that the application helps them be more productive, with a mean of 3.91.

While the indicator, Helps to be more effective, got the lowest mean of 3.22 [Moderately Useful].

Further, the table reveals that most pet owners agreed that the application helps them be more productive and got the highest mean of 3.76 [Very Useful], while the indicator, Helps meet my needs, got the lowest mean of 3.18 [Moderately Useful].

Moreover, the table shows that most adopters agreed that the application helps them be more productive and got the highest mean of 3.95 [Very Useful]. Also, it reveals that the application helps pet

Table 3. Stakeholders' Responses on Usefulness of the Application

Indicators	Animal Shelters [n = 3]		Pet Owners [n = 35]		Adopters [n = 40]		Consolidated [N = 78]	
	Mean	Inter	Mean	Inter	Mean	Inter	Mean	Inter
1. Helps to be more effective	3.22	MU	3.48	VU	3.95	VU	3.55	VU
2. Helps to be productive	3.91	VU	3.76	VU	3.15	MU	3.61	VU
3. Helps to save time and effort	3.81	VU	3.56	VU	3.53	VU	3.63	VU
4. Helps meet my needs	3.63	VU	3.18	MU	3.91	VU	3.57	VU
5. Helps them to find their shelter for pets	3.55	VU	3.65	VU	3.13	MU	3.44	VU
Aggregate Mean	3.62	VU	3.53	VU	3.53	VU	3.56	VU

Range:

1.00-1.74 Not Useful [NU]; 1.75-2.49 Less Useful [LU];
2.50-3.24 Moderately Useful [MU]; 3.25-4.00 Very Useful [VU]

users' attitudes, behavior, or both. The study by [26] discusses designing and evaluating persuasive

owners helps find shelter for pets got the lowest mean of 3.13 [Moderately Useful].

When data are combined, it reveals that the users agreed that the application helps them save time and effort [Mean = 3.63, Very Useful]. While the indicator, Helps them to find shelter for pets got the lowest of 3.44 [Very Useful].

The data imply that the Web and mobile applications for pet adoption benefit users of the system. Animal shelters have vital roles in the community to reunite pet owners and adopters to lessen the number of pets in the shelter.

The study of [28] aimed to reduce the number of stray animals by introducing an app that is convenient for the public. The mobile applications provide a function and information about pets only. These apps do not give the necessary information to users in handling stray animals. Even though the evaluation results were satisfactory, the app still lacked some features.

Many web and mobile application platforms use a decentralized control strategy, relying on explicit user consent to grant the apps' requested permissions. Users must rely on community ratings as the primary signal for identifying potentially harmful and inappropriate apps, even though community ratings typically reflect opinions about perceived functionality or performance rather than risks. [29] attempt to deceive or entice users into granting permissions by requesting more permissions than is typical; 'look-alike' applications with names similar to popular applications also request more permissions than is typical.

7. Conclusions

Domestic pets are seen every day on the streets with nothing but themselves. Those strays may look untamed and aggressive, but they are much more than that. Those pets, with proper training, are harmless and only looking for the love and care they need. Pets offer unmatched loyalty, and with animal adoption, people cannot only lessen the number of strays but also stop the abuse that most animals are getting from people who do not deserve to have pets. To adopt a pet is undeniably a big responsibility. However, people have to start adopting rather than buying. Thousands of animals are being euthanized each day, and with adoption, people can put an end to it. Decisions to adopt give them a second chance in life and helps reduce overcrowding in animal shelters. Animal adoption must be normalized and introduced to other

people to help those animals that are struggling because those animals deserve to live a happy life just like humans, and with the world's current situation, humans are the most capable of helping those animals.

8. Recommendations

The researchers recommend conducting another study to support the preliminary findings.

9. Acknowledgements

This work has been made possible with the assistance and help of the FOURGRAMMERS.

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Appendix B: Sample Code

```
<!DOCTYPE html>
<html>
<head>
<title>Report Dog</title>
<style>
  body {
    background-color: #151515;
    color: #ffffff;
    background-image: url("C:/Users/jerin/Downloads/b8.jpg");
    background-repeat: no-repeat;
    background-size: cover;
    align-items: center;
    font-family: 'Courier New', monospace;
  }

  .form-container {
    max-width: 400px;
    margin: 0 auto;
    padding: 20px;
    background-color: #232222;
    border-radius: 5px;
  }

  .form-container h2 {
    text-align: center;
  }

  .form-container label {
    font-weight: bold;
    display: block;
    margin-bottom: 10px;
  }

  .form-container input[type="text"],
  .form-container textarea,
  .form-container select {
    width: 100%;
```

```
padding: 10px;
margin-bottom: 10px;
background-color: #555;
box-sizing: border-box;
border-radius: 3px;
border: none;
color: #cfcfcf;
}

.form-container textarea {
  resize: vertical;
}

.form-container input[type="submit"] {
  background-color: #b5b5b5;
  color: #rgb(8, 8, 8);
  padding: 10px 20px;
  border: none;
  cursor: pointer;
  border-radius: 5px;
  font-size: 16px;
}

.form-container input[type="submit"]:hover {
  background-color: #17612b;
}

</style>
</head>
<body>
  <div class="form-container">
    <h2>Report Dog</h2>
    <form id="dogForm" enctype="multipart/form-data">
      <label for="breed">Dog Breed :</label>
      <select id="breed" name="breed" required>
        <option value="">Select Breed</option>
        <option value="Labrador">Labrador</option>
```

```

        </select>
        <label for="condition">Condition :</label>
        <select id="condition" name="condition" required>
            <option value="">Select</option>
            <option value="Stray">Stray</option>
            <option value="Injured">Injured</option>
            <option value="Rabid">Rabid</option>
        </select>
        <label for="images">Upload Images:</label>
        <input type="file" id="images" name="images" multiple required>

        <input type="submit" value="Submit">
    </form>
</div>

<script type="module">
import { initializeApp } from "https://www.gstatic.com/firebasejs/9.23.0.firebaseio.js";
import { getDatabase, ref, push, set } from "https://www.gstatic.com/firebasejs/9.23.0.firebaseio-database.js";
import { getStorage, ref as storageRef, uploadBytes, getDownloadURL } from "https://www.gstatic.com/firebasejs/9.23.0.firebaseio-storage.js";

const firebaseConfig = {
    apiKey: "AIzaSyCkweWbw5avf9JeUY6iP8dFkDwDD7QMy3M",
    authDomain: "petconnect-191dd.firebaseio.com",
    projectId: "petconnect-191dd",
    storageBucket: "petconnect-191dd.appspot.com",
    messagingSenderId: "82959695721",
    appId: "1:82959695721:web:39ae89be0bab19f42247f8"
};

const app = initializeApp(firebaseConfig);
const db = getDatabase(app);
const storage = getStorage(app);

document.getElementById('dogForm').addEventListener('submit', function(e) {
    e.preventDefault();
}

```

```

const breed = document.getElementById('breed').value;
const condition = document.getElementById('condition').value;
const image = document.getElementById('images').files[0];
const currentDate = new Date().toLocaleDateString();
const currentTime = new Date().toLocaleTimeString();

if (navigator.geolocation) {

    const options = {
        enableHighAccuracy: true, // Enable high-accuracy positioning
        timeout: 5000, // Set a timeout value (in milliseconds)
        maximumAge: 0 // Disable caching of the position
    };

    navigator.geolocation.getCurrentPosition(
        position => {
            const latitude = position.coords.latitude;
            const longitude = position.coords.longitude;

            const apKey = "AIzaSyAEg8Psxk_gXK1jipYdWv9pDgZP4iTnnvA";
            const geocodingUrl = `https://maps.googleapis.com/maps/api/geocode/json?latlng=${latitude},${longitude}&key=${apKey}`;

            fetch(geocodingUrl)
                .then(response => response.json())
                .then(data => {
                    const address = data.results[0].formatted_address;

                    const dogData = {
                        Breed: breed,
                        Condition: condition,
                        Latitude: latitude,
                        Longitude: longitude,
                        Address: address,
                        Date: currentDate,

```

```

    Time: currentTime
};

const dogKey = push(ref(db, 'Dog')).key;

const imageRef = storageRef(storage, `images/${dogKey}/${image.name}`);
uploadBytes(imageRef, image)
.then(() => {
  // Get the download URL for the uploaded image
  return getDownloadURL(imageRef);
})
.then(downloadUrl => {
  dogData.Image=downloadUrl; // Store the download URL in the dogData object

  return set(ref(db, `Dog/${breed}_${Date.now()}`), dogData);
})
.then(() => {
  alert("Reported Successfully!!!");
  clearForm();
})
.catch(error => {
  console.log(error);
});
}

  .catch(error => {
    console.log(error);
  });
},
error => {
  console.log(error);
}
);
} else {
  console.log("Geolocation is not supported by this browser.");
}
});

function clearForm() {
  const form = document.getElementById('dogForm');
  form.reset();
}

</script>
</body>
</html>

```

```

        if (redZones.hasOwnProperty(key)) {
            var zone = redZones[key];
            var marker = new google.maps.Marker({
                position: { lat: zone.Latitude, lng: zone.Longitude },
                map: map,
                icon: {
                    path: google.maps.SymbolPath.CIRCLE,
                    scale: 25,
                    fillColor: 'yellow',
                    fillOpacity: 0.8,
                    strokeColor: 'green',
                    strokeWeight: 2
                }
            });
        }
    });
}

```

```

</script>

<script src="https://www.gstatic.com/firebasejs/8.10.0.firebaseio.js"></script>
<script src="https://www.gstatic.com/firebasejs/8.10.0.firebaseio-database.js"></script>

<script>
    var firebaseConfig = {
        apiKey: "AIzaSyCkwLbw5avf9JeUY6iP8dFkDwDD7QMy3M",
        authDomain: "petconnect-191dd.firebaseio.com",
        projectId: "petconnect-191dd",
        storageBucket: "petconnect-191dd.appspot.com",
        messagingSenderId: "82959695721",
        appId: "1:82959695721:web:39ae89be0bab19f42247f8"
    };

    firebase.initializeApp(firebaseConfig);
</script>

<script src="https://maps.googleapis.com/maps/api/js?key=AIzaSyAEg8Psxk_gXK1jipYdWv9pDgZP4iTnnvA&callback=initMap" async defer></script>
</body>
</html>

```

```

<!DOCTYPE html>
<html>
<head>
    <title>Stray/injured/Rabid</title>
    <style>
body
{
    background-color: #242424;
    color: #ffffff;
    background-repeat: no-repeat;
    background-size: cover;
    display: flex;
    flex-direction: column;
    align-items: center;
    justify-content: center;
    font-family: 'Courier New', monospace;
    height: 80vh;
}
#map {
    height: 500px;
    width: 50%;
    border-radius: 20px;
}
</style>
</head>
<body>
    <h1>Pick-Up Zones</h1>
    <div id="map"></div>

    <script>
        function initMap() {
            var center = { lat: 16.02198, lng: 78.95434 };

            var map = new google.maps.Map(document.getElementById('map'), {
                zoom: 4,
                center: center
            });

            var redZonesRef = firebase.database().ref('Dog');

            redZonesRef.on('value', function(snapshot) {
                var redZones = snapshot.val();

                for (var key in redZones) {
                    if (redZones.hasOwnProperty(key)) {

```

```

<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <link rel="icon" href="/image/care-for-pets_96935.ico">
    <title>Municipality Admin Page</title>
    <link rel="stylesheet" href="style_petfood.css">
    <link href='https://unpkg.com/boxicons@2.1.4/css/boxicons.min.css' rel='stylesheet'>
<style>
    body {
        margin: 0;
        background: □#111111;
        font-family: cursive, "Euclid Circular A", "Poppins";
    }
    main {
        height: 100vh;
        overflow-x: hidden;
        overflow-y: auto;
        perspective: 2px;
    }
    .admin-page-heading {
        text-align: center;
        margin: 100px 0 50px;
        font-size: 30px;
        color: ■white;
    }
    .admin-table {
        margin: 0 auto;
        width: 80%;
        background-color: ■#ffffff;
        border-collapse: collapse;
        text-align: center;
        color: □#000000;
        margin-top: 50px;
        margin-bottom: 50px;
    }
    .admin-table th,
    .admin-table td {
        padding: 10px;
        border: 1px solid ■#dddddd;
        font-family: "Arial", sans-serif;
        font-size: 14px;
    }

```

```
        font-weight: normal;
        color: #333333;
    }
.admin-table th {
    background-color: #f9f9f9;
    font-family: "Arial", sans-serif;
    font-size: 14px;
    font-weight: normal;
    color: #333333;
}
.admin-table td.image {
    width: 200px;
}
.admin-table td.image img {
    max-width: 100%;
    height: auto;
}

.parallax.bg1::after {
    content: "";
    position: absolute;
    top: 0;
    right: 0;
    bottom: 0;
    left: 0;
    background-image: url("imgs/pexels-goochie-poochie-grooming-3361739.jpg");
    background-repeat: no-repeat;
    background-size: cover;
    z-index: -1;
}

.navbar {
    position: fixed;
    width: 100%;
    top: 27px;
    left: 0;
    text-align: center;
    transform: translateY(-50%);
    z-index: 999;
}
.navbar a {
    position: relative;
```

```

        </style>
</head>
<body>
<main>
    <div class="no-parallax-head">
        <nav class="navbar">
            <a href="/index.html">Home</a>
            <a href="#">About</a>
            <a href="#">Services</a>
            <a href="#">Contact</a>
        </nav>
    </div>
    <section class="parallax bg1">
        <div style="font-family: 'Trebuchet MS', 'Lucida Sans Unicode', 'Lucida Grande', 'Lucida Sans', Arial, sans-serif; text-align: center;>
            <h1 style="margin-top: 150px;">Reported Dogs</h1>
            <p style="font-size: 18px; margin-top: 30px; color: #rgb(214, 211, 211);">Below is a comprehensive list of reported rabid dogs</p>
        </div>
    </section>
    <section class="no-parallax">
        <div>

            <table class="admin-table">
                <thead>
                    <tr>
                        <th>No.</th>
                        <th>Breed</th>
                        <th>Condition</th>
                        <th>Date (Reported)</th>
                        <th>Location</th>
                        <th>Image</th>
                        <th>Action Taken</th>
                        <th>Date Done</th>
                    </tr>
                </thead>
                <tbody id="dog-table-body">
                </tbody>
            </table>
        <h1 class="pickup-zones-heading">Pick-Up Zones</h1>
        <div id="map"></div>
        <div class="button-container">

```

```

        <div class="button-container">
        </div>
    </div>
</section>
<section class="parallax bg1">

</section>
</main>
<div class="no-parallax-end">

</div>
<script src="https://www.gstatic.com/firebasejs/8.9.1.firebaseio.js"></script>
<script src="https://www.gstatic.com/firebasejs/8.9.1.firebaseio-database.js"></script>
<script>
    // Initialize Firebase
    var firebaseConfig = {
        apiKey: "AIzaSyCkweWbw5avf9JeUY6iP8dFkDwDD7QMy3M",
        authDomain: "petconnect-191dd.firebaseio.com",
        projectId: "petconnect-191dd",
        storageBucket: "petconnect-191dd.appspot.com",
        messagingSenderId: "82959695721",
        appId: "1:82959695721:web:39ae89be0bab19f42247f8"
    };
    firebase.initializeApp(firebaseConfig);

    // Get a reference to the database
    var database = firebase.database();

    var dogsRef = database.ref("Dog");
    dogsRef.on("value", function(snapshot) {
        var dogs = snapshot.val();
        var tableBody = document.getElementById("dog-table-body");
        tableBody.innerHTML = "";

        Object.keys(dogs).forEach(function(key, index) {
            var dog = dogs[key];
            var row = document.createElement("tr");

            var slNoCell = document.createElement("td");
            slNoCell.textContent = index + 1;
            row.appendChild(slNoCell);
        });
    });
</script>

```

```

var breedCell = document.createElement("td");
breedCell.textContent = dog.Breed;
row.appendChild(breedCell);

var conditionCell = document.createElement("td");
conditionCell.textContent = dog.Condition;
row.appendChild(conditionCell);

var dateReportedCell = document.createElement("td");
dateReportedCell.textContent = dog.Date;
row.appendChild(dateReportedCell);

var locationCell = document.createElement("td");
locationCell.textContent = dog.Address;
row.appendChild(locationCell);

var imageCell = document.createElement("td");
var imageLink = document.createElement("a");
imageLink.href = dog.Image; // Set the link URL to the image URL
imageLink.textContent = "View Image"; // Set the link text
imageLink.target = "_blank"; // Open the link in a new tab
imageLink.style.textDecoration = "none"; // Remove underline by default
imageLink.style.color = "#007BFF"; // Link color for unvisited and visited states

// Add an event listener to handle hover style
imageLink.addEventListener("mouseover", function() {
    imageLink.style.textDecoration = "underline"; // Add underline on hover
});
imageLink.addEventListener("mouseout", function() {
    imageLink.style.textDecoration = "none"; // Remove underline on hover-out
});
imageCell.appendChild(imageLink);
row.appendChild(imageCell);

var actionTakenCell = document.createElement("td");
var checkbox = document.createElement("input");
checkbox.type = "checkbox";
checkbox.dataset.dogKey = key; // Store the dog key as a data attribute
checkbox.checked = !!dog["Date Done"];
actionTakenCell.appendChild(checkbox);
row.appendChild(actionTakenCell);

var dateDoneCell = document.createElement("td");
dateDoneCell.textContent = dog["Date Done"] || "";

```

```
        position: relative;
        font-size: 20px;
        color: ■#ffffff;
        text-decoration: none;
        font-weight: 500;
        margin-right: 20px;
    }
.navbar a::after {
    content: " ";
    position: absolute;
    left: 0;
    bottom: 0px;
    width: 100%;
    height: 2px;
    background: transparent;
    border-radius: 5px;
    transform: translateY(10px);
    transition: 0.5s;
    opacity: 1;
}
.navbar a:hover::after {
    transform: translateY(0);
    background: ■#ffffff;
}

.no-parallax-end {
    background-color: □#000000;
    z-index: 999;
    height: 50vh;
}

#map {
    height: 500px;
    width: 80%;
    max-width: 1000px;
    margin: 0 auto;
    border-radius: 20px;
    margin-top: 50px;
}

.pickup-zones-heading {
    text-align: center;
    font-size: 24px;
    color: ■white;
```

```

checkbox.addEventListener("change", function() {
    var isChecked = checkbox.checked;
    var dogKey = checkbox.dataset.dogKey;

    if (isChecked) {
        // If checkbox is checked, add the current date as "Date Done" in the Dog database
        var currentDate = new Date().toLocaleDateString();
        database.ref("Dog").child(dogKey).update({
            "Date Done": currentDate
        });
    } else {
        // If checkbox is unchecked, remove "Date Done" from the Dog database
        database.ref("Dog").child(dogKey).update({
            "Date Done": null
        });
    }
});

    tableBody.appendChild(row);
});
});

```

</script>

```

Function initMap() {
    var center = { lat: 16.02198, lng: 78.95434 };

    var map = new google.maps.Map(document.getElementById('map'), {
        zoom: 4,
        center: center
    });

    var redZonesRef = firebase.database().ref('Dog');

    redZonesRef.on('value', function(snapshot) {
        var redZones = snapshot.val();

        for (var key in redZones) {
            if (redZones.hasOwnProperty(key)) {
                var zone = redZones[key];
                var marker = new google.maps.Marker({
                    position: { lat: zone.Latitude, lng: zone.Longitude },
                    map: map,
                    icon: {
                        path: google.maps.SymbolPath.CIRCLE,

```

```

for (var key in redZones) {
    if (redZones.hasOwnProperty(key)) {
        var zone = redZones[key];
        var marker = new google.maps.Marker({
            position: { lat: zone.Latitude, lng: zone.Longitude },
            map: map,
            icon: {
                path: google.maps.SymbolPath.CIRCLE,
                scale: 25,
                fillColor: 'yellow',
                fillOpacity: 0.8,
                strokeColor: 'green',
                strokeWeight: 2
            }
        });
    }
}
};

<script src="https://maps.googleapis.com/maps/api/js?key=AIzaSyAeg8Psxk_gXK1jipYdWv9pDgZP4iTnnvA&callback=initMap" async defer></script>
</body>
</html>

```

```

var firebaseConfig = {
  apiKey: "AIzaSyBWEi9gYo0eRJtxRI4-5T-aBk_DZ89tyaY",
  authDomain: "test-75362.firebaseio.com",
  databaseURL: "https://test-75362-default-rtdb.firebaseio.com",
  projectId: "test-75362",
  storageBucket: "test-75362.appspot.com",
  messagingSenderId: "565901038176",
  appId: "1:565901038176:web:343fe9ca2e82be738b6905",
  measurementId: "G-4XPF7F2NGJ"
};

firebase.initializeApp(firebaseConfig);
var storage = firebase.storage();
var database = firebase.database();

// Get the form elements
var form1 = document.getElementById("form1");
var form2 = document.getElementById("form2");
var form3 = document.getElementById("form3");
var submitButton = document.getElementById("submit");
var imageInput = document.getElementById("image");
var imagePreview = document.getElementById("preview");

// Handle file input change event
imageInput.addEventListener("change", function (event) {
  var file = event.target.files[0];
  var reader = new FileReader();

  reader.onload = function (e) {
    imagePreview.src = e.target.result;
  };

  reader.readAsDataURL(file);
});

// Handle form submission
submitButton.onclick = function () {
  // Get dog details from form fields
  var dogName = document.getElementById("dogName").value;
  var dogBreed = document.getElementById("dogBreed").value;
  var dogAge = document.getElementById("dogAge").value;
  var gender = document.getElementById("gender").value;
  var dogSize = document.getElementById("dogSize").value;
  var dogWeight = document.getElementById("dogWeight").value;
  var dogTraining = document.getElementById("dogTraining").value;
}

```

```

var uploadTask = imageRef.put(imageFile);

// Listen for the upload completion
uploadTask.on(
  "state_changed",
  null,
  function (error) {
    // Handle upload errors
    alert("Image upload failed:", error);
  },
  function () {
    // Image upload successful, get the download URL
    uploadTask.snapshot.ref.getDownloadURL().then(function (downloadURL) {
      // Create an object with all dog details
      var dogDetails = {
        name: dogName,
        breed: dogBreed,
        age: dogAge,
        gender: gender,
        size: dogSize,
        weight: dogWeight,
        training: dogTraining,
        vaccinations: vaccinations,
        seller: seller,
        location: dogLocation,
        price: dogPrice,
        contact: contact,
        image: downloadURL, // Store the download URL of the image
      };

      // Store the dog details in the Realtime Database
      database.ref("dogsforAdoption").push(dogDetails).then(function () {
        // Dog details successfully stored
        alert("Dog details saved in the database!");
        // Reset the form for the next submission
        form1.reset();
        form2.reset();
        form3.reset();
        // Reset the image preview
        imagePreview.src = "";
      });
    });
  });
}

```

```

        <button type="button" id="back1">Back</button>
        <button type="button" id="next2">Next</button>
    </div>
</form>

<form id="form3">
    <h3>Seller Details</h3>
    <input type="text" placeholder="Seller Name" id="seller" required>
    <input type="text" placeholder="Location" id="dogLocation" required>
    <input type="text" placeholder="Price" id="dogPrice" required>
    <input type="text" placeholder="Contact" id="contact" required>
    <div class="btn-box">
        <button type="button" id="back2">Back</button>
        <button type="button" id="submit">Submit</button>
    </div>
</form>

<div class="step-row">
    <div id="progress"></div>
    <div class="step-col"><small>Step1</small></div>
    <div class="step-col"><small>Step2</small></div>
    <div class="step-col"><small>Step3</small></div>
</div>
</div>

<div class="logreg-box">
    <div class="form-box">
        <div id="imagePreview" class="image-preview">
            
        </div>
    </div>
</div>
</div>
</div>
<section class="no-parallax-end">
    <div class="row">
        <div class="h2">
            Copyright ©2023 PetConnect. All rights reserved.
        </div>
        <div class="social-icons">
            <a href="#"></a>
            <a href="#"></a>
            <a href="#"></a>
            <a href="#"></a>
        </div>
    </div>
</section>

```

```

        </div>
    </div>
</section>
<script src="https://www.gstatic.com/firebasejs/8.10.0.firebaseio.js"></script>
<script src="https://www.gstatic.com/firebasejs/8.10.0/firebase-storage.js"></script>
<script src="https://www.gstatic.com/firebasejs/8.10.0.firebaseio-database.js"></script>
<script src="form.js"></script>
<script>
    var Form1 = document.getElementById("form1");
    var Form2 = document.getElementById("form2");
    var Form3 = document.getElementById("form3");

    var Next1 = document.getElementById("next1");
    var Next2 = document.getElementById("next2");
    var Back1 = document.getElementById("back1");
    var Back2 = document.getElementById("back2");

    var progress = document.getElementById("progress");

    next1.onclick = function(){
        Form1.style.left = "-450px";
        Form2.style.left = "40px";
        progress.style.width = "240px";
    }
    back1.onclick = function(){
        Form1.style.left = "40px";
        Form2.style.left = "-450px";
        progress.style.width = "120px";
    }
    next2.onclick = function(){
        Form2.style.left = "-450px";
        Form3.style.left = "40px";
        progress.style.width = "360px";
    }
    back2.onclick = function(){
        Form2.style.left = "40px";
        Form3.style.left = "-450px";
        progress.style.width = "240px";
    }
</script>
</body>
</html>
```

```

<!DOCTYPE html>
<html lang="en">
    <head>
        <meta charset="UTF-8" />
        <meta name="viewport" content="width=device-width, initial-scale=1.0" />
        <link rel="icon" href="/image/care-for-pets_96935.ico">
        <title>PetConnect-DogAdoption</title>
        <link rel="stylesheet" href="search.css" />
        <link href='https://unpkg.com/boxicons@2.1.4/css/boxicons.min.css' rel='stylesheet'>
    </head>
    <body>
        <main>
            <section class="no-parallax-head">
                <nav class="navbar">
                    <a href="/index.html">Home</a>
                    <a href="#">About</a>
                    <a href="#">Services</a>
                    <a href="#">Contact</a>
                </nav>
            </section>
            <div class="parallax bg1">
                <h1>Dog Adoption Center</h1>
                <div class="search-container">
                    <h2>Search Filter</h2>
                    <label for="place">Location:</label>
                    <select id="searchInput1" required>
                        <option value="none"></option>
                        <option value="Alappuzha">Alappuzha</option>
                        <option value="Ernakulam">Ernakulam</option>
                        <option value="Idukki">Idukki</option>
                        <option value="Kannur">Kannur</option>
                        <option value="Kasaragod">Kasaragod</option>
                        <option value="Kollam">Kollam</option>
                        <option value="Kottayam">Kottayam</option>
                        <option value="Kozhikode">Kozhikode</option>
                        <option value="Malappuram">Malappuram</option>
                        <option value="Palakkad">Palakkad</option>
                        <option value="Pathanamthitta">Pathanamthitta</option>
                        <option value="Thiruvananthapuram">Thiruvananthapuram</option>
                        <option value="Thrissur">Thrissur</option>
                        <option value="Wayanad">Wayanad</option>
                    </select><br><br>
                    <label for="Breed">Breed:</label>
                    <select id="searchInput2" required>
                </div>
            </div>
        </main>
    </body>
</html>

```

```

        <label for="Breed">Breed:</label>
        <select id="searchInput2" required>
            <option value="none"></option>
            <option value="Labrador Retriever">Labrador Retriever</option>
            <option value="German Shepherd">German Shepherd</option>
            <option value="Golden Retriever">Golden Retriever</option>
            <option value="Bulldog">Bulldog </option>
            <option value="Poodle">Poodle</option>
            <option value="Beagle">Beagle</option>
            <option value="Rottweiler">Rottweiler</option>
            <option value="Boxer">Boxer</option>
            <option value="Dachshund">Dachshund</option>
            <option value="Siberian Husky">Siberian Husky</option>
        </select><br><br>
        <button onclick="searchDogs()">Search</button>
    </div>
</div>
<div id="dogsContainer" class="dogs-container"></div>

<section class="no-parallax-end">
    <div class="row">
        <div class="h2">
            Copyright ©2023 PetConnect. All rights reserved.
        </div>
        <div class="social-icons">
            <a href="#"><i class='bx bxl-linkedin'></i></a>
            <a href="#"><i class='bx bxl-facebook-square'></i></a>
            <a href="#"><i class='bx bxl-twitter'></i></a>
            <a href="#"><i class='bx bxl-instagram'></i></a>
        </div>
    </div>
</section>
</main>
<script src="https://www.gstatic.com/firebasejs/8.10.0.firebaseio.js"></script>
<script src="https://www.gstatic.com/firebasejs/8.10.0.firebaseio-database.js"></script>
<script src="search.js"></script>
<script src="details.js"></script>
</body>
</html>

```

Appendix C: CO-PO And CO-PSO Mapping

COURSE OUTCOMES:

After completion of the course the student will be able to

SL. NO	DESCRIPTION	Blooms' Taxonomy Level
CO1	Identify technically and economically feasible problems (Cognitive Knowledge Level: Apply)	Level 3: Apply
CO2	Identify and survey the relevant literature for getting exposed to related solutions and get familiarized with software development processes (Cognitive Knowledge Level: Apply)	Level 3: Apply
CO3	Perform requirement analysis, identify design methodologies and develop adaptable & reusable solutions of minimal complexity by using modern tools & advanced programming techniques (Cognitive Knowledge Level: Apply)	Level 3: Apply
CO4	Prepare technical report and deliver presentation (Cognitive Knowledge Level: Apply)	Level 3: Apply
CO5	Apply engineering and management principles to achieve the goal of the project (Cognitive Knowledge Level: Apply)	Level 3: Apply

CO-PO AND CO-PSO MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PS O3
C O1	3	3	3	3		2	2	3	2	2	2	3	2	2	2
C O2	3	3	3	3	3	2		3	2	3	2	3	2	2	2
C O3	3	3	3	3	3	2	2	3	2	2	2	3			2
C O4	2	3	2	2	2			3	3	3	2	3	2	2	2
C O5	3	3	3	2	2	2	2	3	2		2	3	2	2	2

3/2/1: high/medium/low

JUSTIFICATIONS FOR CO-PO MAPPING

MAPPING	LOW/ MEDIUM/ HIGH	JUSTIFICATION
100003/CS6 22T.1-PO1	HIGH	Identify technically and economically feasible problems by applying the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
100003/CS6 22T.1-PO2	HIGH	Identify technically and economically feasible problems by analysing complex engineering problems reaching substantiated conclusions using first principles of mathematics.
100003/CS6 22T.1-PO3	HIGH	Design solutions for complex engineering problems by identifying technically and economically feasible problems.
100003/CS6 22T.1-PO4	HIGH	Identify technically and economically feasible problems by analysis and interpretation of data.
100003/CS6 22T.1-PO6	MEDIUM	Responsibilities relevant to the professional engineering practice by identifying the problem.
100003/CS6 22T.1-PO7	MEDIUM	Identify technically and economically feasible problems by understanding the impact of the professional engineering solutions.
100003/CS6 22T.1-PO8	HIGH	Apply ethical principles and commit to professional ethics to identify technically and economically feasible problems.
100003/CS6 22T.1-PO9	MEDIUM	Identify technically and economically feasible problems by working as a team.
100003/CS6 22T.1-PO10	MEDIUM	Communicate effectively with the engineering community by identifying technically and economically feasible problems.
100003/CS6 22T.1-P011	MEDIUM	Demonstrate knowledge and understanding of engineering and management principles by selecting the technically and economically feasible problems.
100003/CS6 22T.1-PO12	HIGH	Identify technically and economically feasible problems for long term learning.
100003/CS6 22T.1-PSO1	MEDIUM	Ability to identify, analyze and design solutions to identify technically and economically feasible problems.
100003/CS6 22T.1-PSO2	MEDIUM	By designing algorithms and applying standard practices in software project development and Identifying technically and economically feasible problems.
100003/CS6 22T.1-PSO3	MEDIUM	Fundamentals of computer science in competitive research can be applied to Identify technically and economically feasible problems.
100003/CS6 22T.2-PO1	HIGH	Identify and survey the relevant by applying the knowledge of mathematics, science, engineering fundamentals.

100003/CS6 22T.2-PO2	HIGH	Identify, formulate, review research literature, and analyze complex engineering problems get familiarized with software development processes.
100003/CS6 22T.2-PO3	HIGH	Design solutions for complex engineering problems and design based on the relevant literature.
100003/CS6 22T.2-PO4	HIGH	Use research-based knowledge including design of experiments based on relevant literature.
100003/CS6 22T.2-PO5	HIGH	Identify and survey the relevant literature for getting exposed to related solutions and get familiarized with software development processes by using modern tools.
100003/CS6 22T.2-PO6	MEDIUM	Create, select, and apply appropriate techniques, resources, by identifying and surveying the relevant literature.
100003/CS6 22T.2-PO8	HIGH	Apply ethical principles and commit to professional ethics based on the relevant literature.
100003/CS6 22T.2-PO9	MEDIUM	Identify and survey the relevant literature as a team.
100003/CS6 22T.2-PO10	HIGH	Identify and survey the relevant literature for a good communication to the engineering fraternity.
100003/CS6 22T.2-PO11	MEDIUM	Identify and survey the relevant literature to demonstrate knowledge and understanding of engineering and management principles.
100003/CS6 22T.2-PO12	HIGH	Identify and survey the relevant literature for independent and lifelong learning.
100003/CS6 22T.2-PSO1	MEDIUM	Design solutions for complex engineering problems by Identifying and survey the relevant literature.
100003/CS6 22T.2-PSO2	MEDIUM	Identify and survey the relevant literature for acquiring programming efficiency by designing algorithms and applying standard practices.
100003/CS6 22T.2-PSO3	MEDIUM	Identify and survey the relevant literature to apply the fundamentals of computer science in competitive research.
100003/CS6 22T.3-PO1	HIGH	Perform requirement analysis, identify design methodologies by using modern tools & advanced programming techniques and by applying the knowledge of mathematics, science, engineering fundamentals.
100003/CS6 22T.3-PO2	HIGH	Identify, formulate, review research literature for requirement analysis, identify design methodologies and develop adaptable & reusable solutions.

100003/CS6 22T.3-PO3	HIGH	Design solutions for complex engineering problems and perform requirement analysis, identify design methodologies.
100003/CS6 22T.3-PO4	HIGH	Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
100003/CS6 22T.3-PO5	HIGH	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools.
100003/CS6 22T.3-PO6	MEDIUM	Perform requirement analysis, identify design methodologies and assess societal, health, safety, legal, and cultural issues.
100003/CS6 22T.3-PO7	MEDIUM	Understand the impact of the professional engineering solutions in societal and environmental contexts and Perform requirement analysis, identify design methodologies and develop adaptable & reusable solutions.
100003/CS6 22T.3-PO8	HIGH	Perform requirement analysis, identify design methodologies and develop adaptable & reusable solutions by applying ethical principles and commit to professional ethics.
100003/CS6 22T.3-PO9	MEDIUM	Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.
100003/CS6 22T.3-PO10	MEDIUM	Communicate effectively with the engineering community and with society at large to perform requirement analysis, identify design methodologies.
100003/CS6 22T.3-PO11	MEDIUM	Demonstrate knowledge and understanding of engineering requirement analysis by identifying design methodologies.
100003/CS6 22T.3-PO12	HIGH	Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change by analysis, identify design methodologies and develop adaptable & reusable solutions.
100003/CS6 22T.3-PSO3	MEDIUM	The ability to apply the fundamentals of computer science in competitive research and prior to that perform requirement analysis, identify design methodologies.
100003/CS6 22T.4-PO1	MEDIUM	Prepare technical report and deliver presentation by applying the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
100003/CS6 22T.4-PO2	HIGH	Identify, formulate, review research literature, and analyze complex engineering problems by preparing technical report and deliver presentation.

100003/CS6 22T.4-PO3	MEDIUM	Prepare Design solutions for complex engineering problems and create technical report and deliver presentation.
100003/CS6 22T.4-PO4	MEDIUM	Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions and prepare technical report and deliver presentation.
100003/CS6 22T.4-PO5	MEDIUM	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools and Prepare technical report and deliver presentation.
100003/CS6 22T.4-PO8	HIGH	Prepare technical report and deliver presentation by applying ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
100003/CS6 22T.4-PO9	HIGH	Prepare technical report and deliver presentation effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.
100003/CS6 22T.4-PO10	HIGH	Communicate effectively with the engineering community and with society at large by prepare technical report and deliver presentation.
100003/CS6 22T.4-PO11	MEDIUM	Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work by prepare technical report and deliver presentation.
100003/CS6 22T.4-PO12	HIGH	Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change by prepare technical report and deliver presentation.
100003/CS6 22T.4-PSO1	MEDIUM	Prepare a technical report and deliver presentation to identify, analyze and design solutions for complex engineering problems in multidisciplinary areas.
100003/CS6 22T.4-PSO2	MEDIUM	To acquire programming efficiency by designing algorithms and applying standard practices in software project development and to prepare technical report and deliver presentation.
100003/CS6 22T.4-PSO3	MEDIUM	To apply the fundamentals of computer science in competitive research and to develop innovative products to meet the societal needs by preparing technical report and deliver presentation.
100003/CS6 22T.5-PO1	HIGH	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
100003/CS6 22T.5-PO2	HIGH	Identify, formulate, review research literature, and analyze complex engineering problems by applying engineering and management principles to achieve the goal of the project.

100003/CS6 22T.5-PO3	HIGH	Apply engineering and management principles to achieve the goal of the project and to design solutions for complex engineering problems and design system components or processes that meet the specified needs.
100003/CS6 22T.5-PO4	MEDIUM	Apply engineering and management principles to achieve the goal of the project and use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
100003/CS6 22T.5-PO5	MEDIUM	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools and to apply engineering and management principles to achieve the goal of the project.
100003/CS6 22T.5-PO6	MEDIUM	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities by applying engineering and management principles to achieve the goal of the project.
100003/CS6 22T.5-PO7	MEDIUM	Understand the impact of the professional engineering solutions in societal and environmental contexts, and apply engineering and management principles to achieve the goal of the project.
100003/CS6 22T.5-PO8	HIGH	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice and to use the engineering and management principles to achieve the goal of the project.
100003/CS6 22T.5-PO9	MEDIUM	Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings and to apply engineering and management principles to achieve the goal of the project.
100003/CS6 22T.5-PO11	MEDIUM	Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments and to apply engineering and management principles to achieve the goal of the project.
100003/CS6 22T.5-PO12	HIGH	Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change and to apply engineering and management principles to achieve the goal of the project.
100003/CS6 22T.5-PSO1	MEDIUM	The ability to identify, analyze and design solutions for complex engineering problems in multidisciplinary areas. Apply engineering and management principles to achieve the goal of the project.

100003/CS6 22T.5-PSO2	MEDIUM	The ability to acquire programming efficiency by designing algorithms and applying standard practices in software project development to deliver quality software products meeting the demands of the industry and to apply engineering and management principles to achieve the goal of the project.
100003/CS6 22T.5-PSO3	MEDIUM	The ability to apply the fundamentals of computer science in competitive research and to develop innovative products to meet the societal needs thereby evolving as an eminent researcher and entrepreneur and apply engineering and management principles to achieve the goal of the project.