FurWell
Software Design Document
Version 01.00

Revision History

Date	Version	Description	Author
02/12/2025	01.00	Whole Document	Santillan, Mitch Lauren A. Mier, Angelina B. Sungahid, Rainelyn G. Arias, Elaisha Mae M. Camus, Adrianne John G.

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Software Design Document

1. INTRODUCTION

1.1 Purpose

The purpose of this Software Design Description (SDD) is to outline the architecture, system components, and design considerations of the FurWell veterinary care management platform. This document provides a structured and detailed representation of the system's functionality, including data flow, interface interactions, and component relationships. It serves as a guide for developers to ensure consistency, maintainability, and scalability throughout the software development lifecycle. Furthermore, this document aligns with the Software Requirements Specification (SRS) to guarantee that the design effectively meets stakeholder needs and system objectives.

1.2 Scope

The FurWell platform is a web-based veterinary management system aimed at enhancing clinic operations, appointment scheduling, and pet health record management. The system is designed to accommodate three key user groups:

- Administrators: Oversee system-wide operations, manage clinic records, and monitor appointments.
- Veterinarians: Handle clinic-specific appointments, maintain pet health records, and track patient history.
- Pet Owners: Access their pet's medical history, vaccination records, and upcoming appointments.

The system is built using React for a responsive and interactive frontend, Firebase Firestore for real-time database operations, and Vercel for scalable deployment. This architecture ensures a seamless, high-performance, and user-friendly experience across all roles.

1.3 Overview

This document provides a detailed breakdown of the FurWell platform's design, covering its architecture, data structures, and component interactions. It includes an in-depth analysis of the system's major modules, design decisions, and interface specifications. The SDD serves as a foundational reference for developers, stakeholders, and testers, ensuring a clear understanding of the system's internal workings and design principles. Through this structured approach, the document facilitates the efficient implementation, testing, and future enhancements of the platform.

1.4 Reference Material

[1] *System Architecture - Detailed explanation*. (2023, June 22). InterviewBit. https://www.interviewbit.com/blog/system-architecture/

[2] *class diafram - Bing*. (n.d.). Bing. https://www.bing.com/images/search?view=detailV2&ccid=qwZ0NSEM&id=2A3DD70FF309F29A550015117F8655AABB7ECFE2&thid=OIP.qwZ0NSEM2dVELlNzVj6MUgHaFS&mediaurl=https%3A%2F%2Fstatic.javatpoint.com%2Ftutorial%2Fuml%2Fimages%2Fuml-class-diagram9.png&exph=536&expw=750&q=class+diafram&simid=608005415496330417&FORM=IRPRST&ck=441B85ADEC5BCE5D06270255DAD04EB7&selectedIndex=11&itb=0&cw=855&ch=821&ajaxhist=0&ajaxserp=0

[3] Wikipedia contributors. (2024, December 9). *Systems architecture*. Wikipedia. https://en.wikipedia.org/wiki/Systems_architecture

1.5 Definitions and Acronyms

Term	Description
SDD (Software Design Document)	A document that provides a detailed blueprint of the system's architecture, design components, and data flow to guide developers in implementation.
SRS (Software Requirements Specification)	A document outlining the functional and non-functional requirements of the FurWell system, ensuring it meets user and business needs.
React	A JavaScript library used for building the frontend of the FurWell platform, providing an interactive and dynamic user experience.
Firebase	A backend-as-a-service (BaaS) platform used for authentication, real-time database operations, cloud storage, and security.
Firestore	A NoSQL database that stores and syncs data for mobile and web apps. It's a fully managed, serverless database that's part of Firebase and Google Cloud.
Vercel	A cloud platform used for deploying the FurWell system, ensuring fast performance and seamless version control.

2. SYSTEM OVERVIEW

2.1 General Description

FurWell is a web-based veterinary care management system designed to enhance interactions between pet owners, veterinarians, and clinic administrators. The platform integrates several essential features, including pet health record management, appointment scheduling, clinic management, and real-time customer updates, all within a responsive and secure interface. The system leverages Firebase as its backend for authentication, real-time database operations, and cloud storage, while React powers the frontend to provide a smooth and intuitive user experience. By combining these technologies, FurWell ensures that users can efficiently manage pet healthcare needs while maintaining security and reliability.

2.2 Context

As pet ownership continues to grow, the need for an efficient veterinary care management system has become increasingly evident. Pet owners often struggle with tracking medical records, scheduling appointments, and staying informed about their pets' healthcare needs. Veterinarians and clinic administrators, on the other hand, face challenges in managing clinic operations, maintaining patient records, and ensuring seamless communication with pet owners. FurWell was developed to address these issues by providing a centralized platform that allows users to easily manage pet health records, book and adjust appointments, and locate veterinary clinics. Through its cloud-based infrastructure, the system guarantees accessibility, scalability, and real-time updates, making pet healthcare management more efficient and user-friendly.

2.3 Design Overview

The FurWell system follows a modular architecture, which allows for scalability, maintainability, and flexibility. The User Management Module is responsible for handling user authentication and role-based access control, ensuring that only authorized individuals can access specific functionalities. The Clinic Management Module enables administrators and clinic owners to oversee clinic operations, manage subscriptions, and update relevant information. The Appointment Scheduling Module allows pet owners to conveniently book, reschedule, or cancel appointments while providing veterinarians with tools to manage their schedules efficiently. The Pet Health Records Module serves as a digital repository for pet medical histories, including vaccination records and treatment plans, ensuring that critical health information is easily accessible. The Notification Module facilitates timely communication by sending appointment reminders and updates to pet owners and veterinarians, helping to reduce missed appointments and improve customer engagement. Finally, the Security Module safeguards the system by implementing secure authentication mechanisms and ensuring data protection against unauthorized access. By integrating these modules, FurWell delivers a comprehensive and efficient solution for veterinary care management.

3. SYSTEM ARCHITECTURE

3.1 Architectural Design

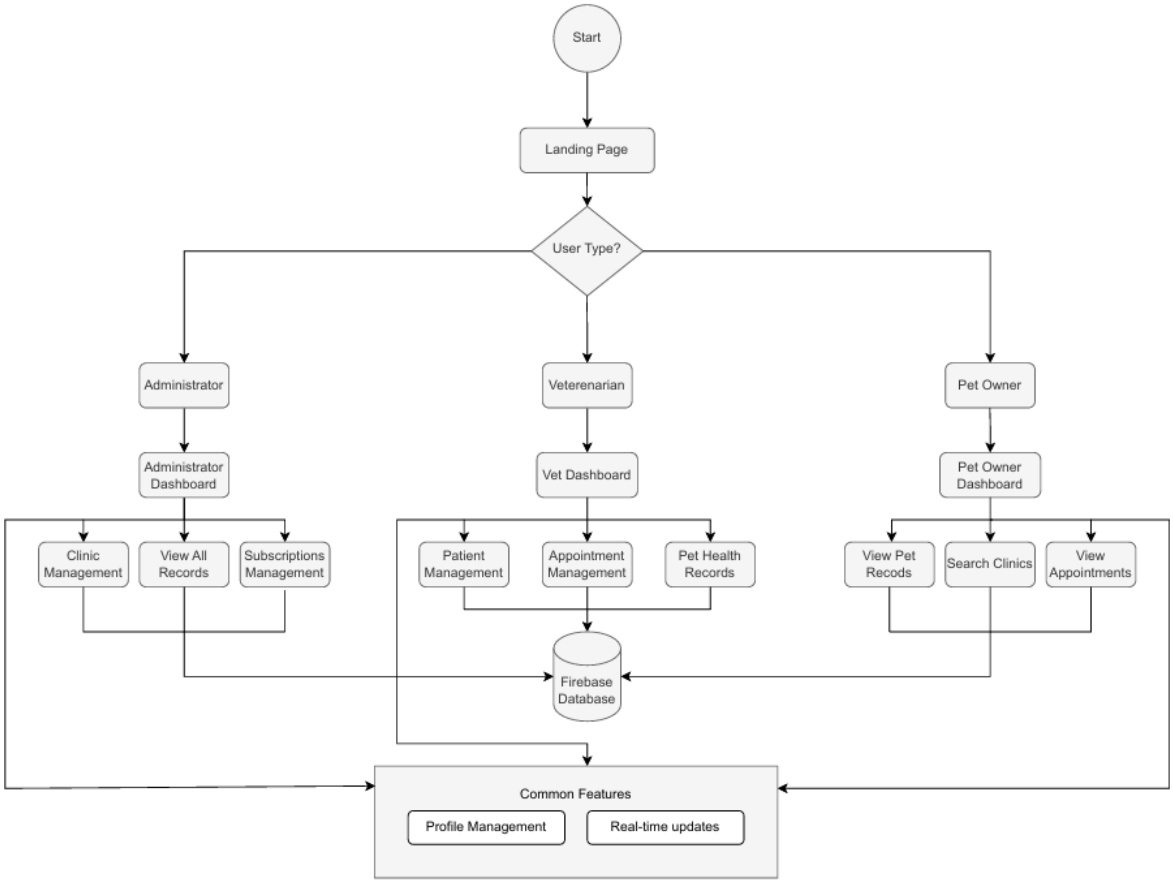


Figure 1.0: Flow Chart

3.2 Decomposition Description

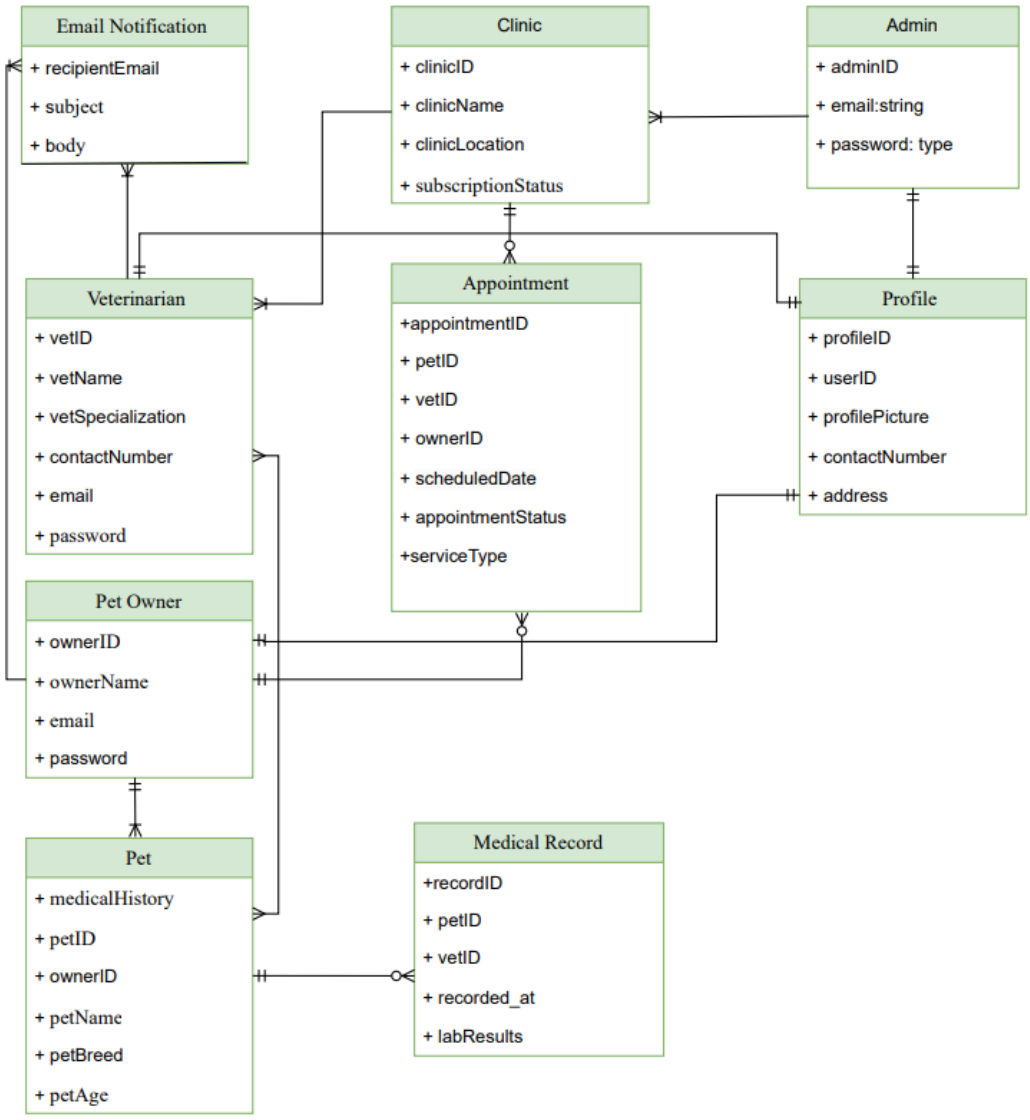


Figure 1.2: Decomposition Description

3.2.1 User Roles and Access

The FurWell System categorizes users into different roles, each with specific permissions and responsibilities:

- **Pet Owners**: Register and manage pet profiles, schedule appointments, and access medical records.
- **Veterinarians**: Handle patient records, manage appointments, and update medical histories.
- **Administrators**: Oversee clinic management, user profiles, and system configurations.
- Each role requires authentication and has designated access levels to protect sensitive data and enhance system security.

3.2.2 System Modules

The FurWell System is divided into **eight key modules**, each responsible for handling different functionalities:

Profile Management Module

- Stores **user information**, including profile pictures, contact details, and addresses.
- Used for user authentication and authorization.

Pet Management Module

- Stores **pet details**, including breed, age, and medical history.
- Links pets to their respective owners for easy record retrieval.

Appointment Management Module

- Facilitates **scheduling, rescheduling, and canceling appointments**.
- Tracks **appointment status** (e.g., Pending, Confirmed, Completed).

Medical Record Module

- Stores **pet health data**, including lab results and recorded visits.
- Maintains records of **veterinary consultations and treatments**.

Veterinarian Management Module

- Stores veterinarian details, including **specialization, contact information, and login credentials**.
- Links veterinarians to appointments and patient records.

Clinic Management Module

- Manages **clinic details, locations, and subscription status**.
- Connects clinics with veterinarians and pet owners.

Email Notification Module

- Sends **appointment reminders, medical updates, and system notifications**.
- Ensures communication between pet owners, veterinarians, and administrators.

Admin Module

- Allows administrators to oversee **user roles, clinic operations, and security settings**.
- Ensures smooth system operation and regulatory compliance

3.3 Design Rationale

FurWell is built using a modular, cloud-based architecture to maximize scalability, security, performance, and maintainability. Firebase, serving as the backend, enables real-time updates and effectively manages a growing number of users and clinics. The system's security is reinforced through Firebase Authentication, which ensures encrypted credentials and secure login mechanisms. React powers the frontend, providing an intuitive and interactive user experience, while Firebase Firestore allows for real-time synchronization, improving system efficiency. The modular approach further enhances maintainability by facilitating independent development and testing of subsystems.

Alternative architectural approaches were considered during the design phase. A traditional server-based architecture was ultimately dismissed due to the high maintenance costs and lack of real-time capabilities. Similarly, a monolithic application structure, which integrates all components into a single system, was ruled out as it would have hindered scalability and long-term maintainability. By leveraging Firebase for authentication, data storage, and real-time processing, FurWell delivers an efficient, scalable, and secure solution tailored to veterinary clinic management.

4. DATA DESIGN

4.1 Data Description

The FurWell Platform's data structure consists of multiple entities that represent users, clinics, appointments, medical records, and notifications. Each entity has defined attributes stored in database tables, facilitating data retrieval and management within the system. Below is an overview of the key entities and their roles:

The User entity manages authentication for three roles: Admin, Veterinarian, and Pet Owner. It includes attributes like User ID, Email, Password, and Role. Role-based access control determines which functionalities each user can access.

The Admin Login entity ensures secure authentication for system administrators. It includes Admin ID, Email, and Password for credential verification.

The Vet Clinic entity stores details about veterinary clinics. Attributes include Clinic ID, Clinic Name, and Location, which allow the system to manage multiple veterinary clinics. Administrators can update clinic information as needed.

The Appointment entity enables pet owners to book, reschedule, and cancel appointments with veterinarians. Attributes include Appointment ID, Pet ID, Vet ID, Date, and Status. Veterinarians can view and manage their scheduled appointments, while email notifications confirm bookings and remind users of upcoming visits.

The Pet Health Record entity maintains medical histories, including vaccination records and lab results. Attributes include Record ID, Pet ID, Vet ID, Diagnosis, Treatment, and Date. Veterinarians update these records, and pet owners can access them in real time.

The Notification entity manages alerts for appointment reminders and clinic subscription updates. Attributes include Notification ID, User ID, Message, and Timestamp. Email notifications ensure timely communication between pet owners, veterinarians, and administrators.

4.2 Data Dictionary

Objects	Fields	Type	Description
Admin	adminID	int	Unique identifier for admins.
	email	string	Admin email for login.
	password	string	Admin password for authentication.
Appointment	appointmentID	int	Unique identifier for each appointment.
	petID	int	Links appointment to a specific pet.
	vetID	int	Links appointment to a veterinarian.
	ownerID	int	Links appointment to a pet owner.
	scheduledDate	DateTime	Stores scheduled appointment date and time.
	appointmentStatus	string	Tracks appointment status (Scheduled, Rescheduled, Canceled, Completed).
	serviceType	string	Type of service needed (Wellness and Prevention, Pet Surgery, Urgent Care, etc.)
Clinic	ClinicID	int	Unique identifier for veterinary clinics. ail for login.
	clinicName	string	Name of the veterinary clinic.
	clinicLocation	string	Address of the clinic.
	subscriptionStatus	string	Indicates if the clinic has an active subscription.
Email Notification	recipientEmail	string	Email address of the recipient.
	subject	string	Subject of the email notification.
	body	string	Email message content.
Medical Record	recordID	int	Unique identifier for medical records.
	petID	int	Links the record to a pet.
	vetID	int	Links the record to the veterinarian.
	date	DateTime	Date of medical check-up.
	labResults	string	Stores test results.
Pet	petID	int	Unique identifier for each pet.
	ownerID	int	Links pet to the owner.
	petName	string	Pet's name.
	petBreed	string	Pet's breed.
	petAge	int	Pet's age.
	medicalHistory	List<string>	Stores past health records.
Pet Owner	ownerID	int	Unique identifier for pet owners.
	ownerName	string	Pet owner's full name.
	email	string	Pet owner's email.
	password	string	Pet owner's password for authentication.
Profile	profileID	int	Unique identifier for profiles.
	userID	int	Links the profile to a user (Admin, Pet Owner, Veterinarian).
	profilePicture	string	Stores the file path or URL of the profile

			picture.
	contactNumber	string	Stores the user’s contact number.
	address	string	Stores the user’s address.
Veterinarian	vetID	int	Unique identifier for veterinarians.
	vetName	string	Veterinarian's full name.
	vetSpecialization	string	Field of expertise.
	email	string	Veterinarian's email for login.
	password	string	Veterinarian's password for authentication.

5. Component Design

When a user visits the FurWell platform, they will first be directed to the welcome page where they can choose to log in as a pet owner, veterinary clinic staff, or administrator. For pet owners, they will be required to sign up using their email address and complete their profile information including contact details and pet information. After a successful login, pet owners will be able to access their dashboard where they can view their pets' health records, schedule appointments, and find nearby clinics. The platform will store all pet-related information and appointment history in Firebase for easy access and management.

For the veterinary clinic and administrator end, they are required to register for an account with valid credentials and complete their clinic profile. Once authenticated, clinic staff can manage appointments, update pet health records, and communicate with pet owners through the platform. Administrators will have additional access to oversee multiple clinics, manage subscriptions, and monitor system activities. All data transactions and file storage will be handled through Firebase, with real-time updates and notifications being sent to relevant users when changes occur.

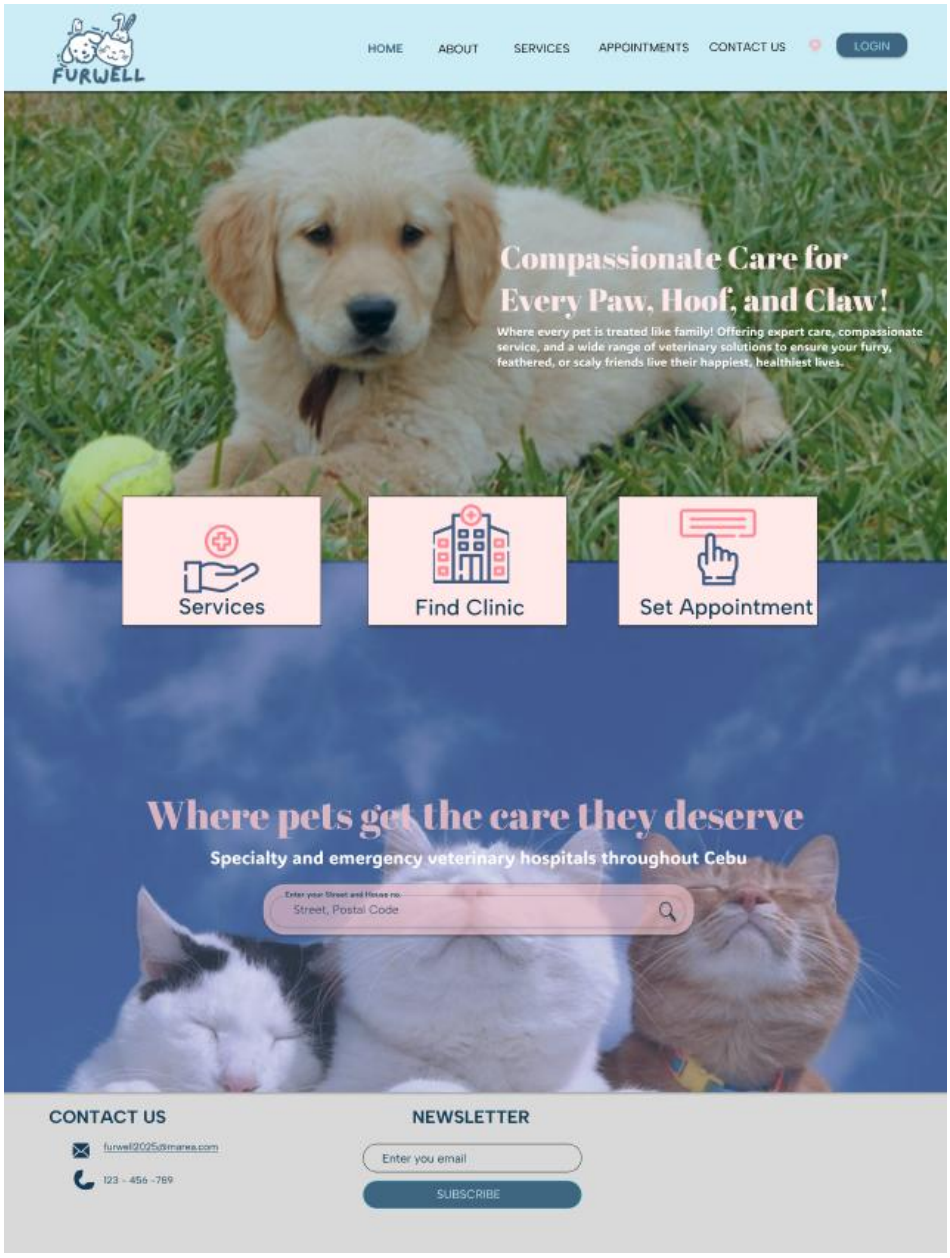
6. HUMAN INTERFACE DESIGN

6.1 Overview of User Interface

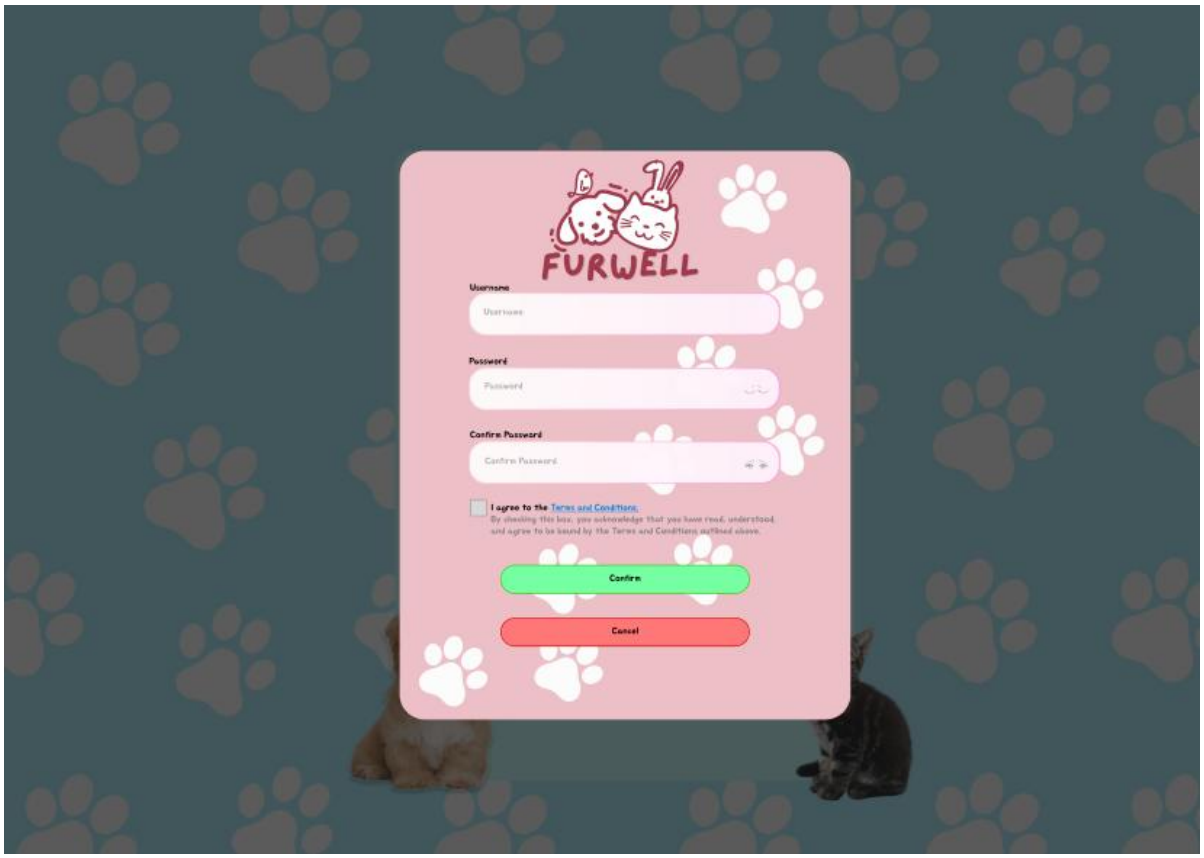
FurWell will be designed to provide convenience for pet owners and veterinary clinics when managing pet healthcare. The software will allow clinic staff to organize their practice through features like appointment scheduling, pet health record management, and client communications. The administrators will be given full accessibility in managing multiple clinics and overseeing system operations. Pet owners will need to verify their email address before accessing the platform's features. The features and functionalities of the website will be as follows:

1. Pet Owner
   - Sign up and login with email verification
   - Complete profile and pet information management
   - Schedule and manage appointments
   - View pet health records and history
   - Search for nearby veterinary clinics
   - Receive notifications and updates
2. Veterinary Clinic
   - Register clinic with valid credentials
   - Manage clinic profile and services
   - Handle appointment schedules
   - Update pet health records
   - Communicate with pet owners
3. Administrator
   - Manage multiple clinic registrations
   - Monitor system activities
   - Handle subscription management

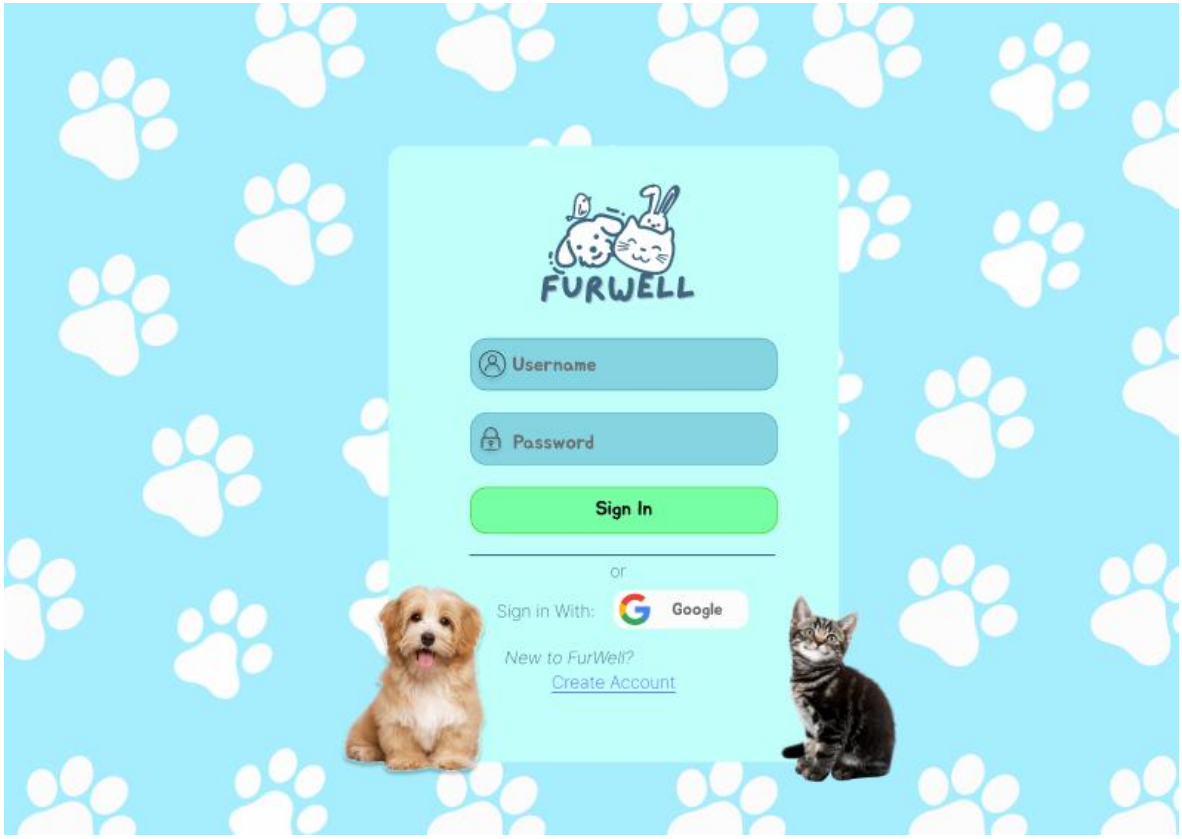
6.2 Screen Images



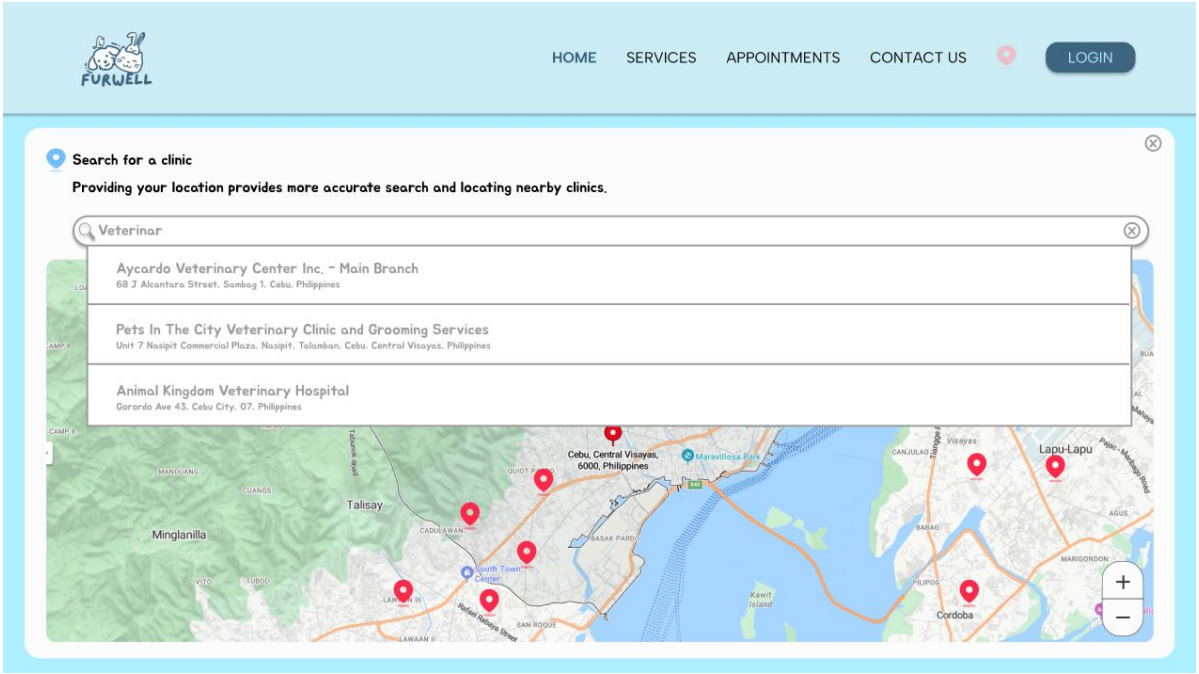
Picture 1.0: Landing Page



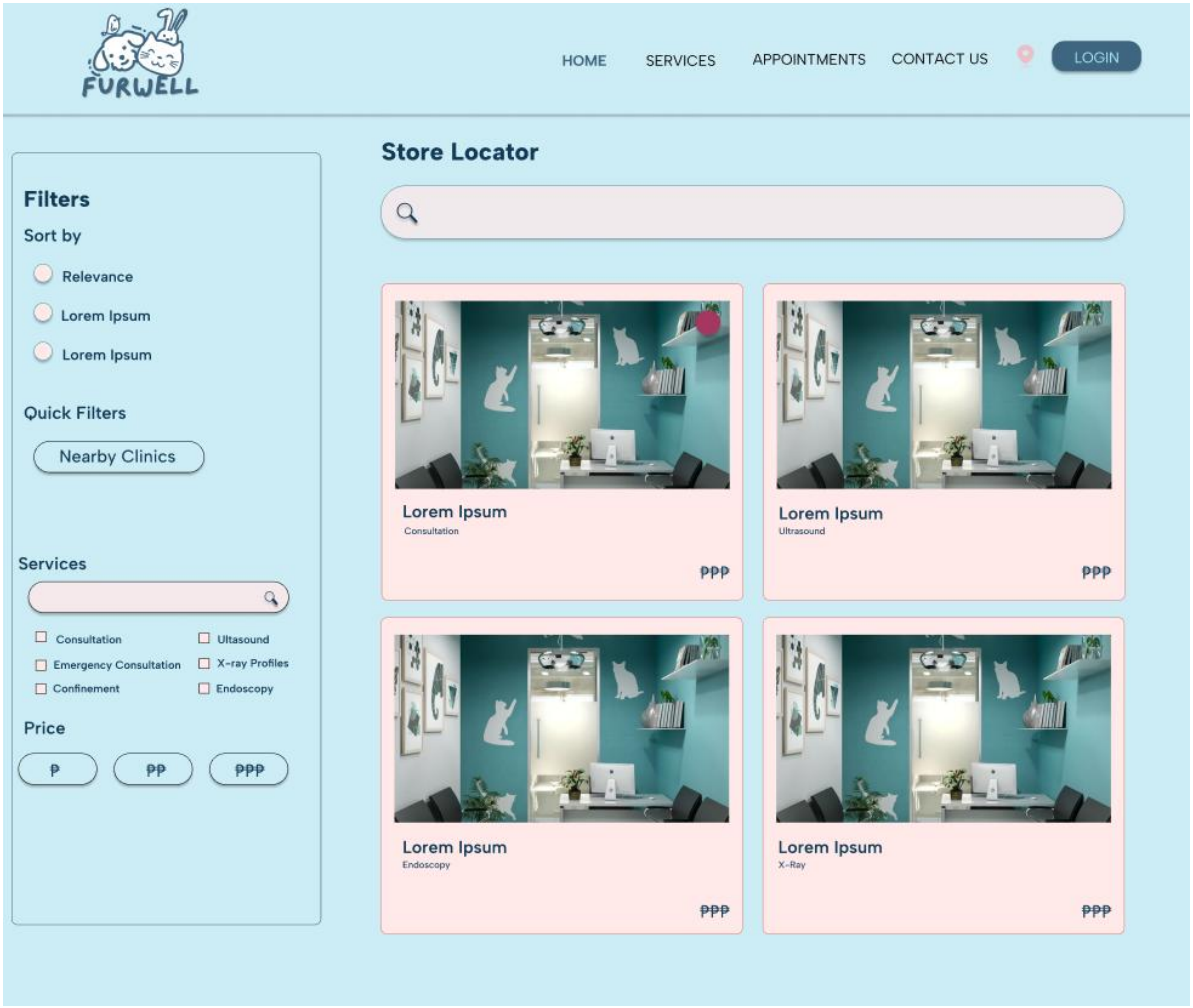
Picture 1.1: Sign Up Page



Picture 1.2: Sign In Page

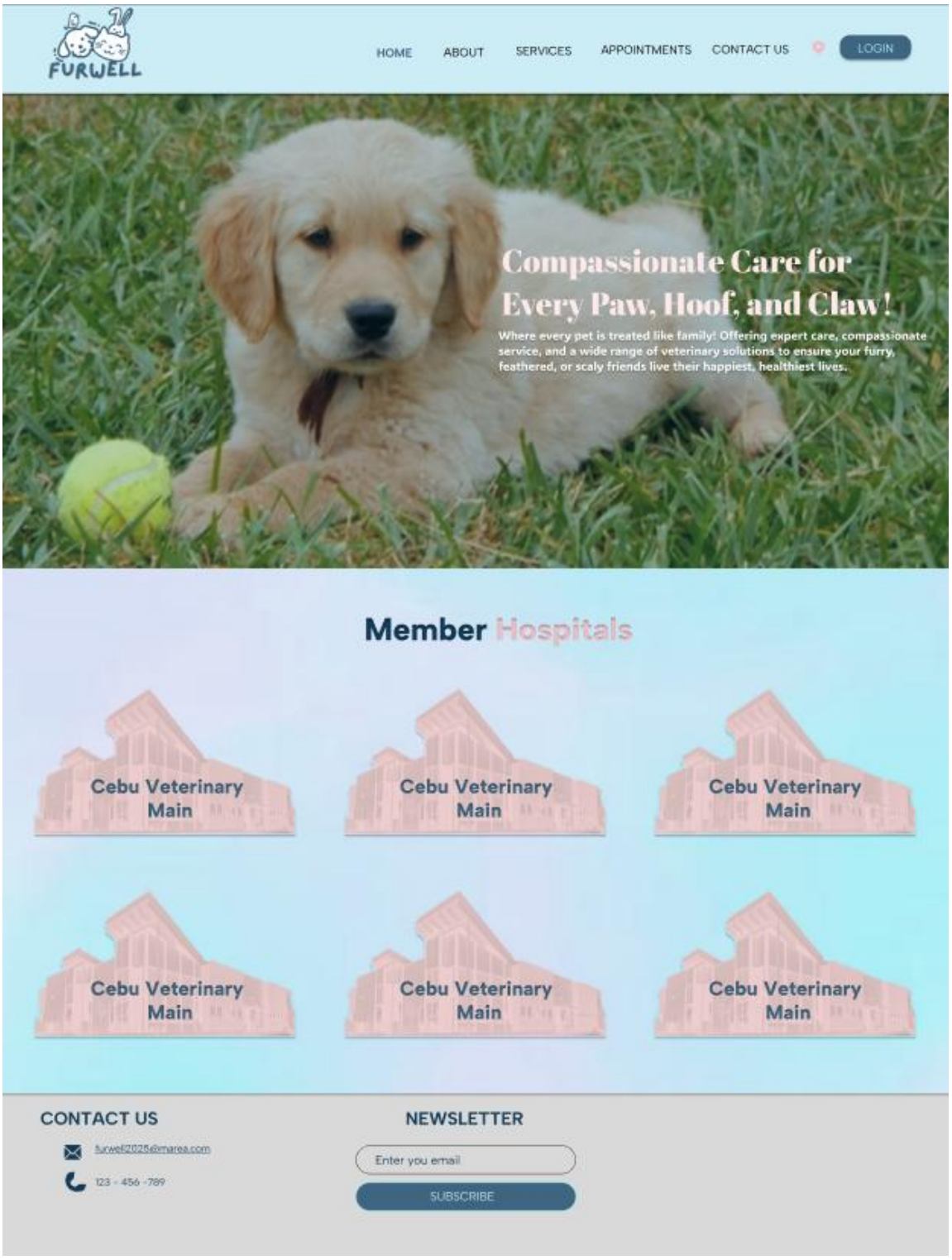


Picture 1.3: Clinic Locator Page

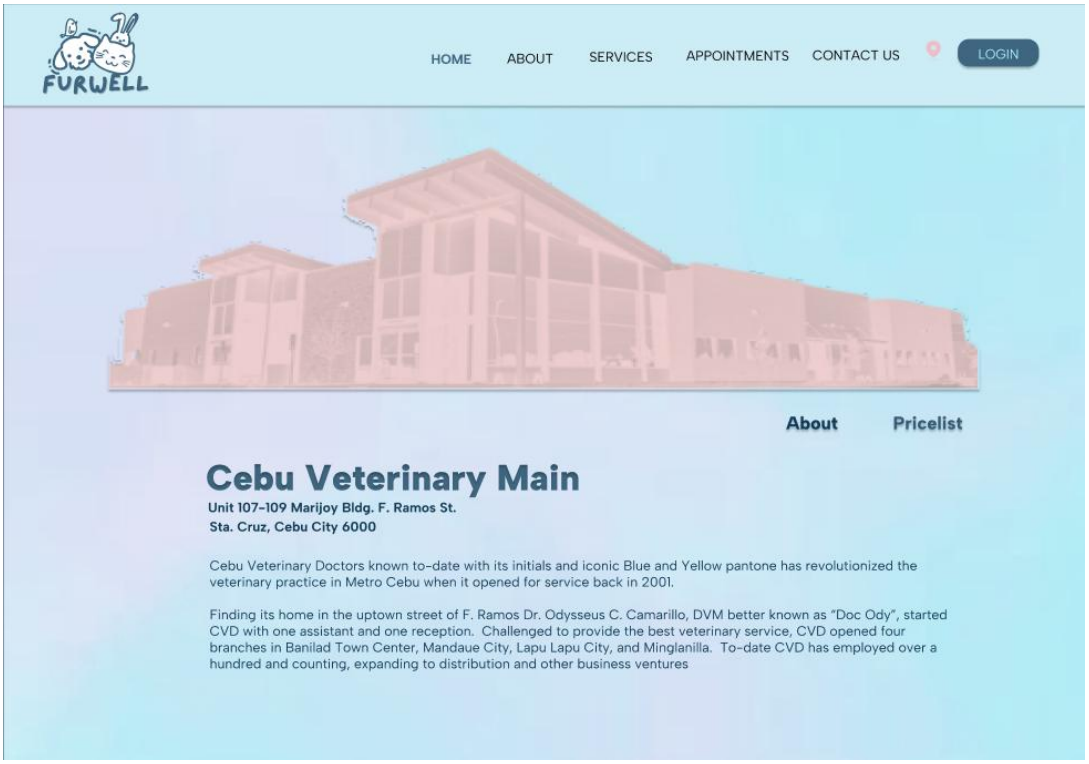


Picture 1.4: Store Locator Page

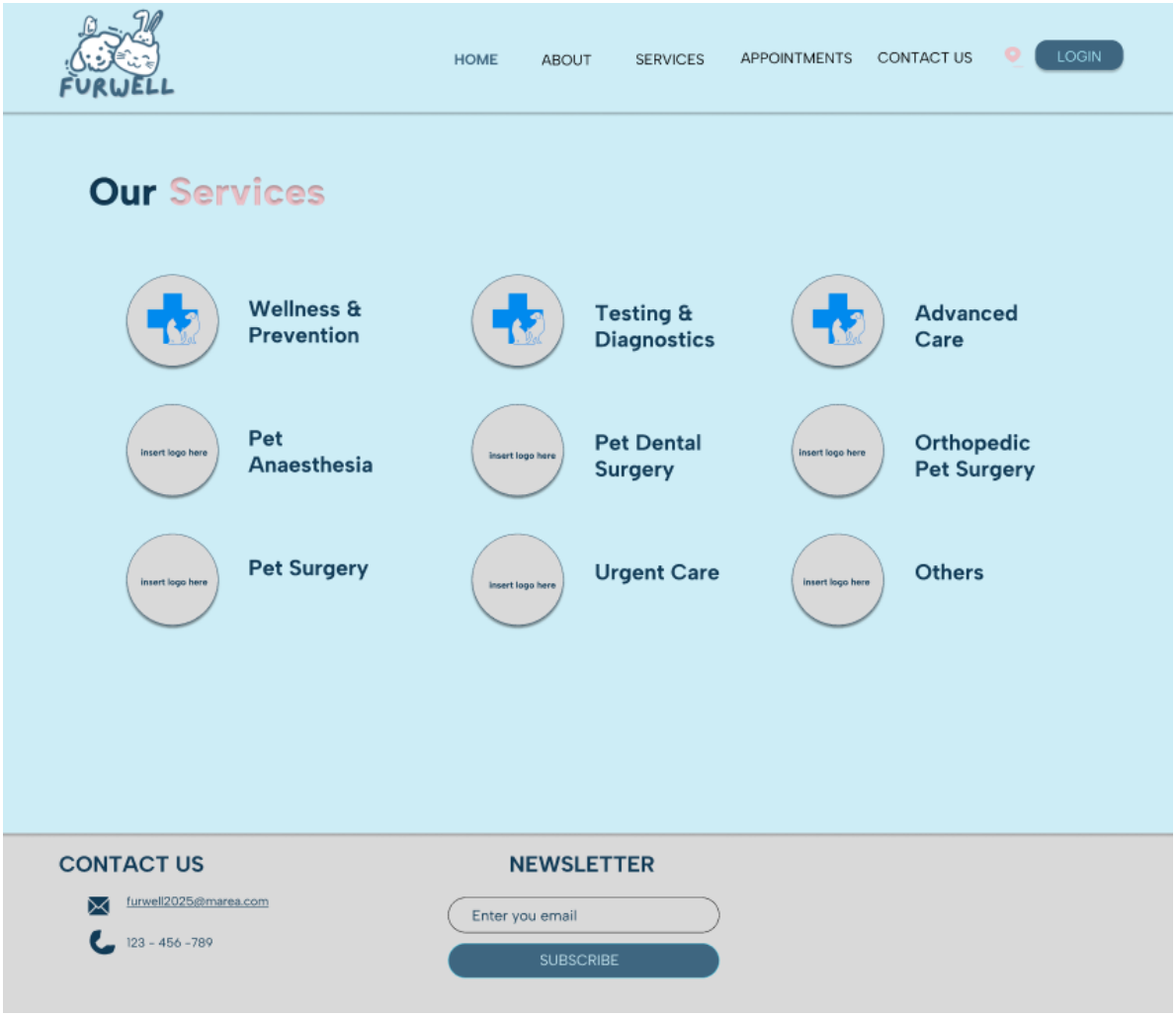
Book Appointment, Store Locator, Admin Analytics



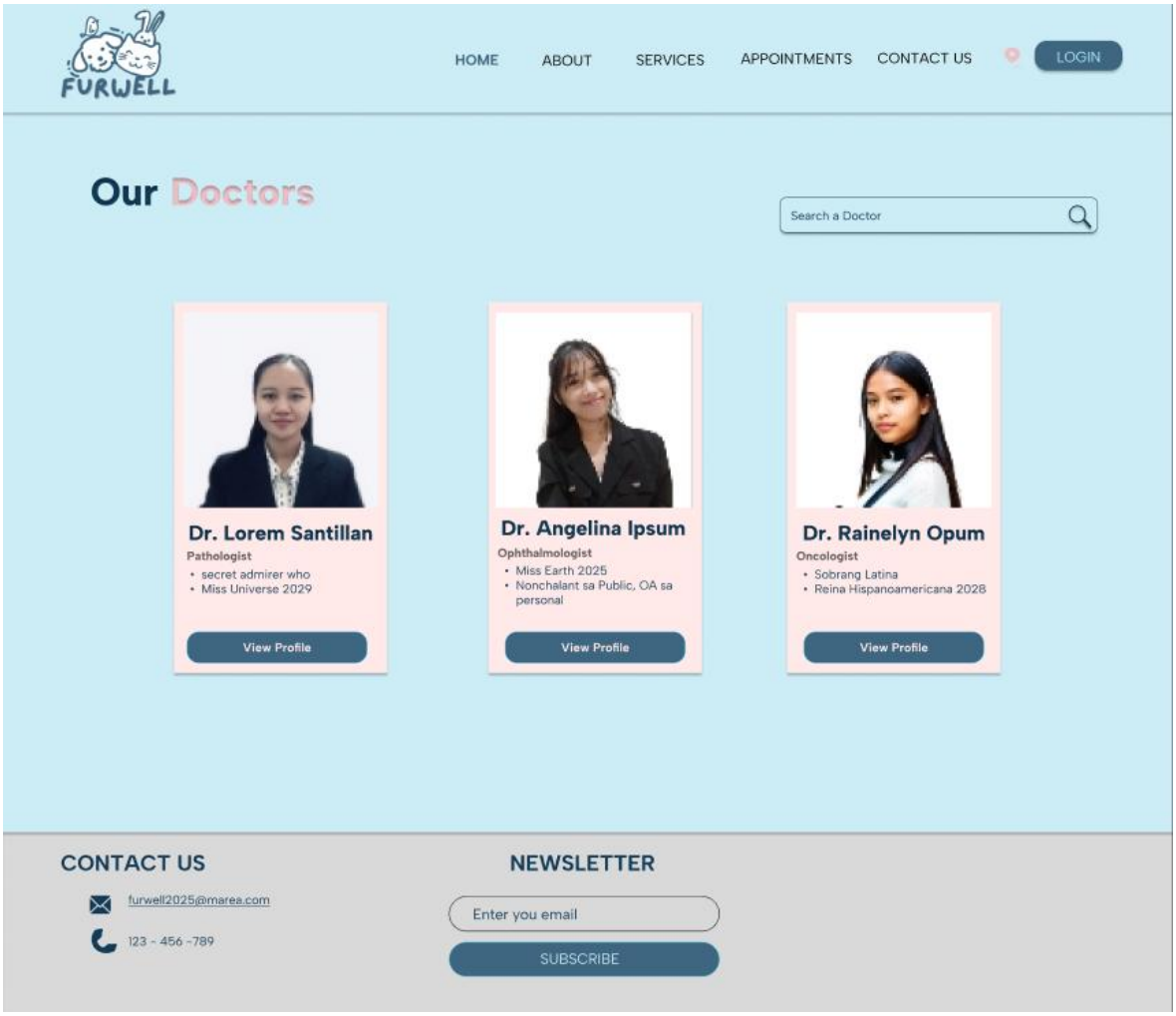
Picture 1.5: List of Clinics Page



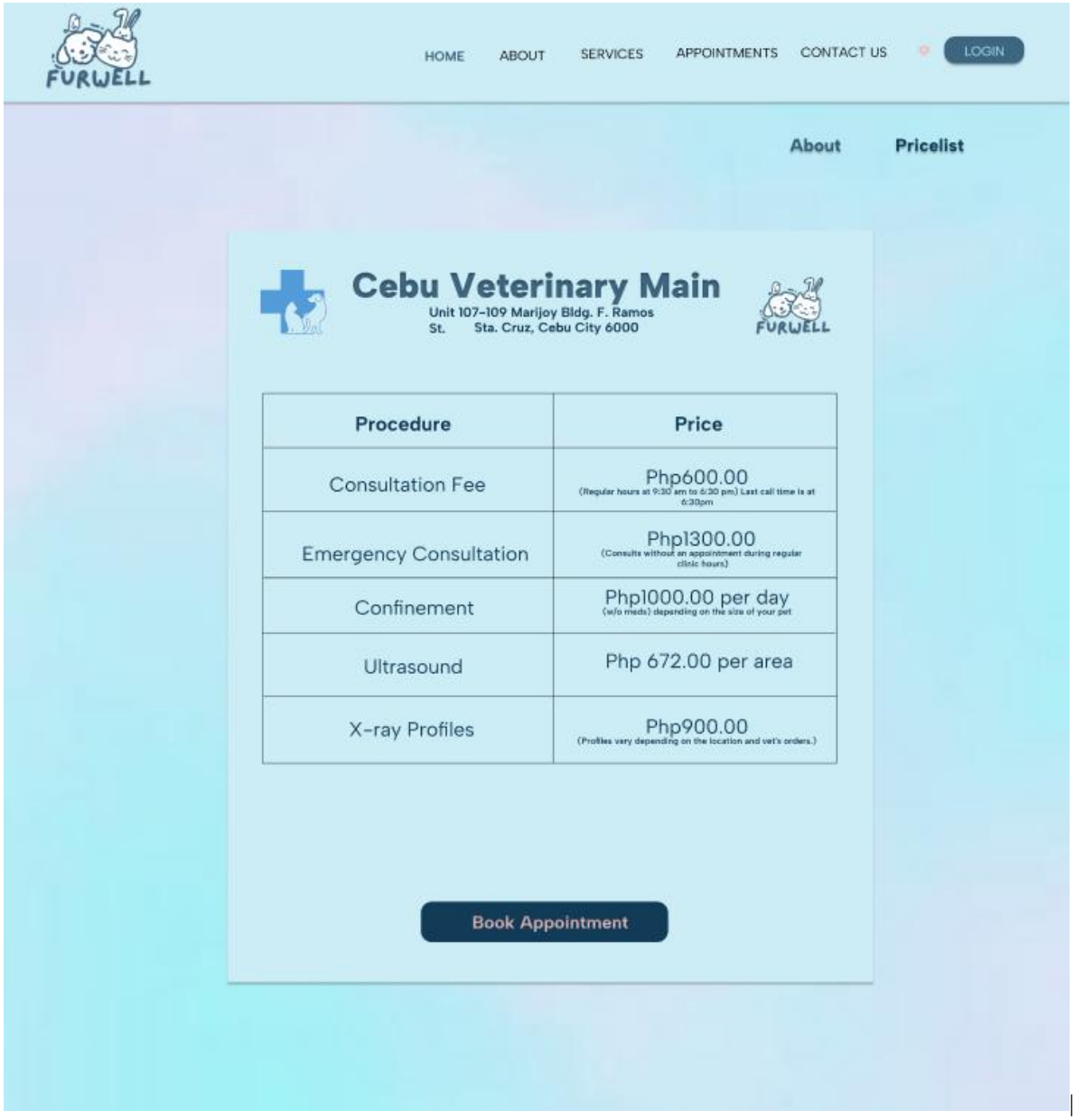
Picture 1.6: Clinic Details Page



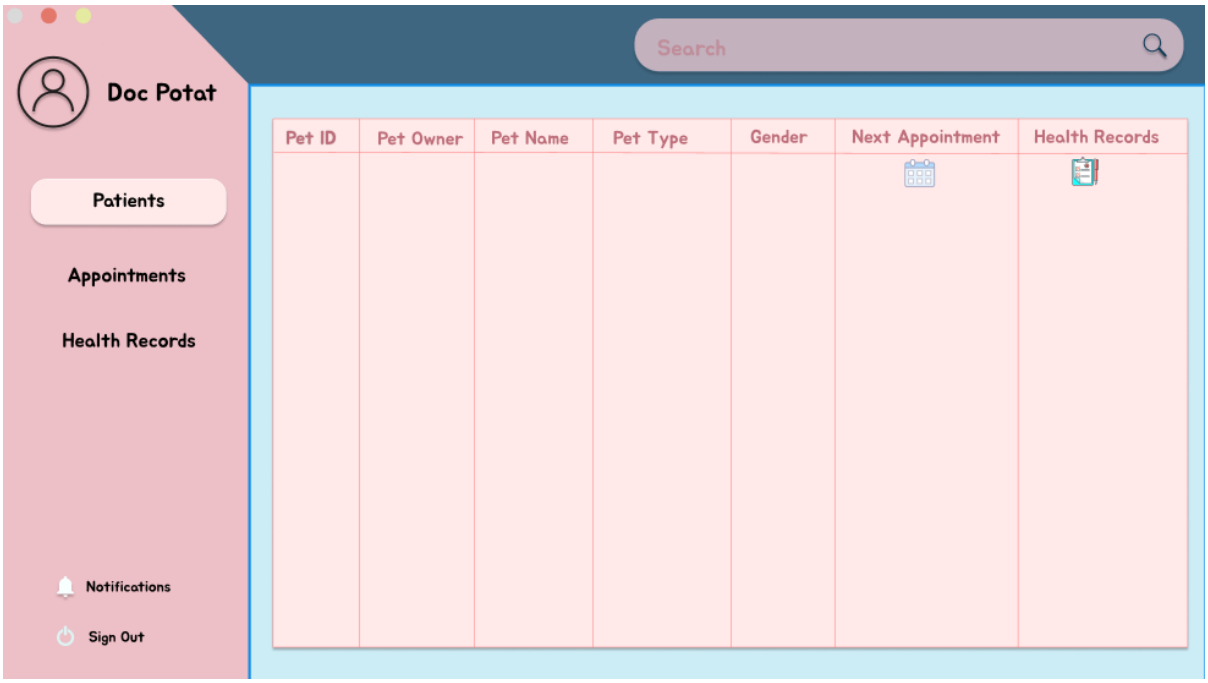
Picture 1.7: Services Page



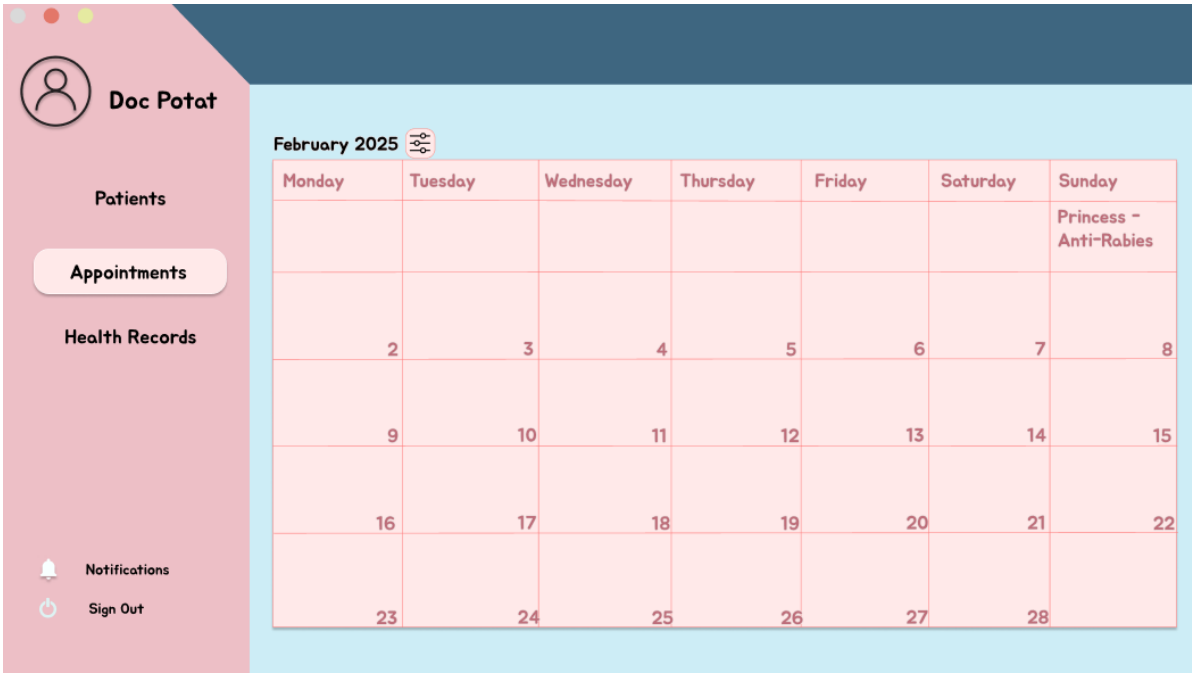
Picture 1.8: Doctors Page



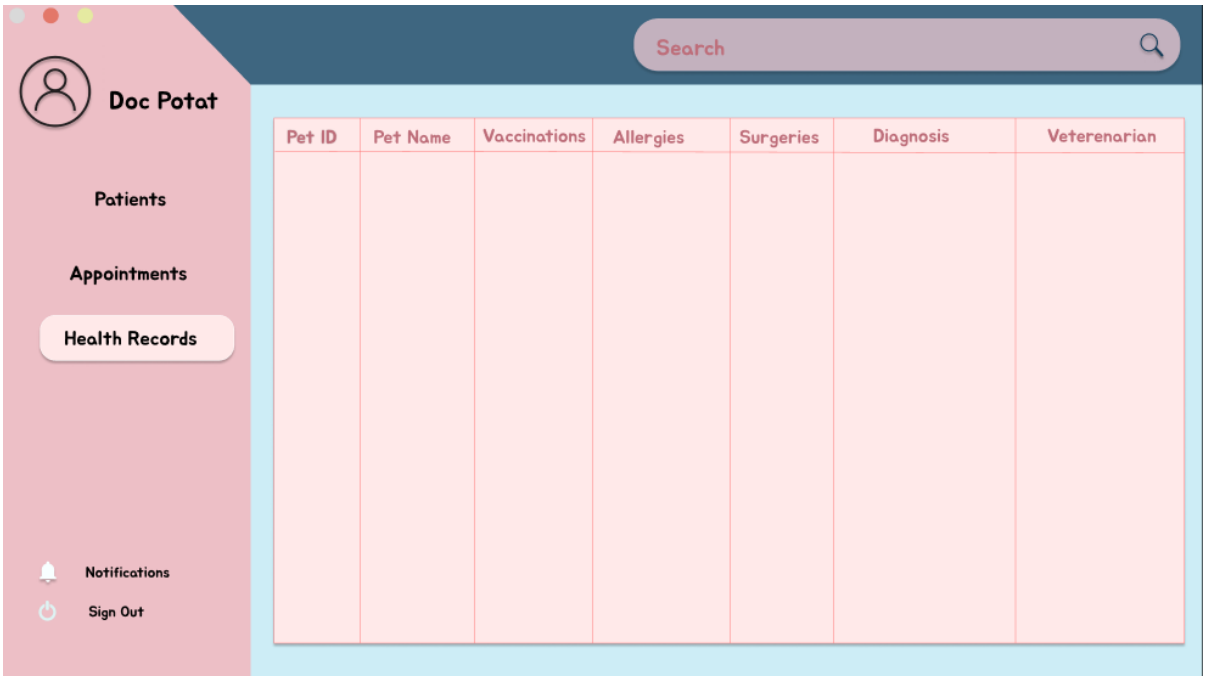
Picture 1.9: Clinic Pricelist Page



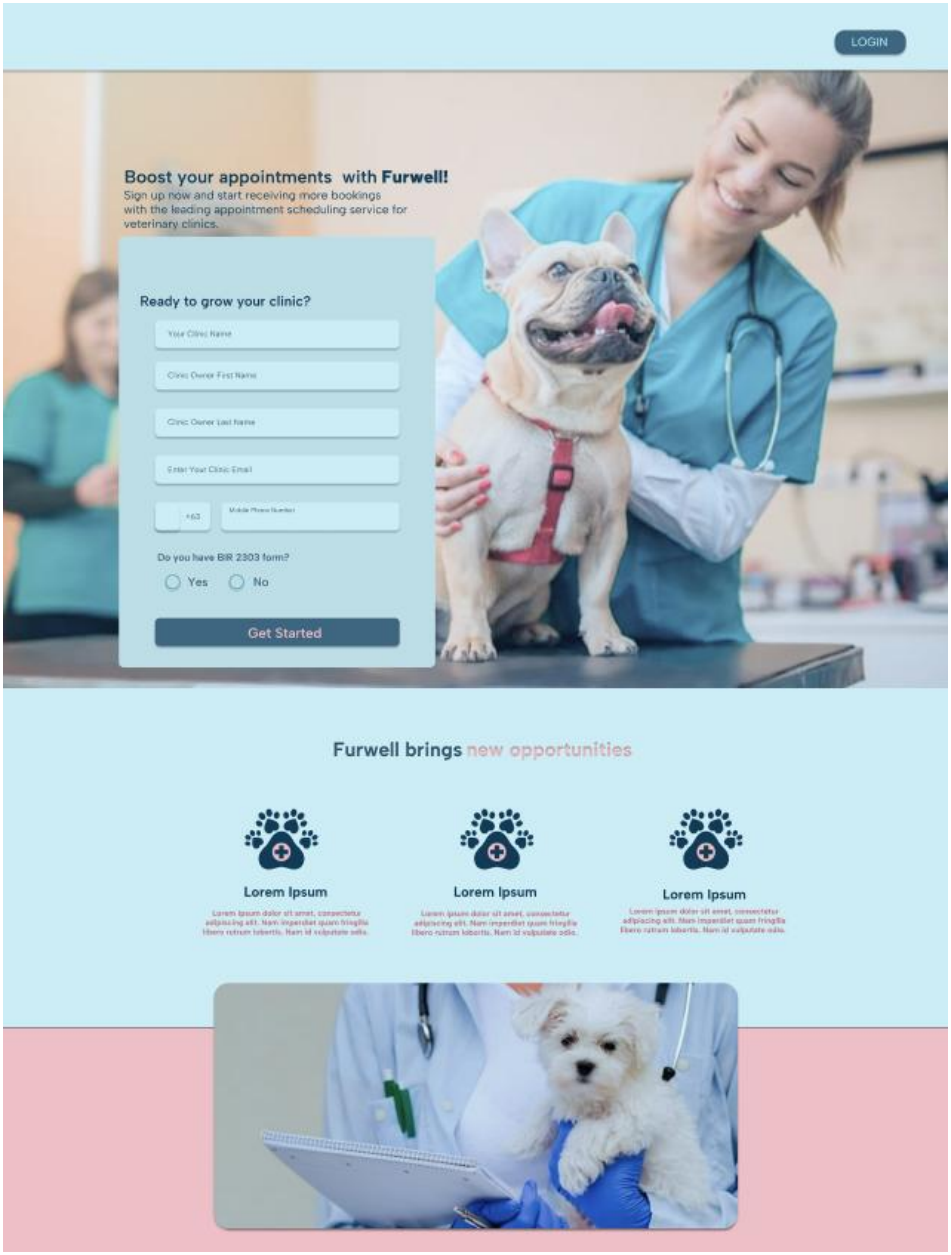
Picture 1.10: Veterinary Clinic Patients Page

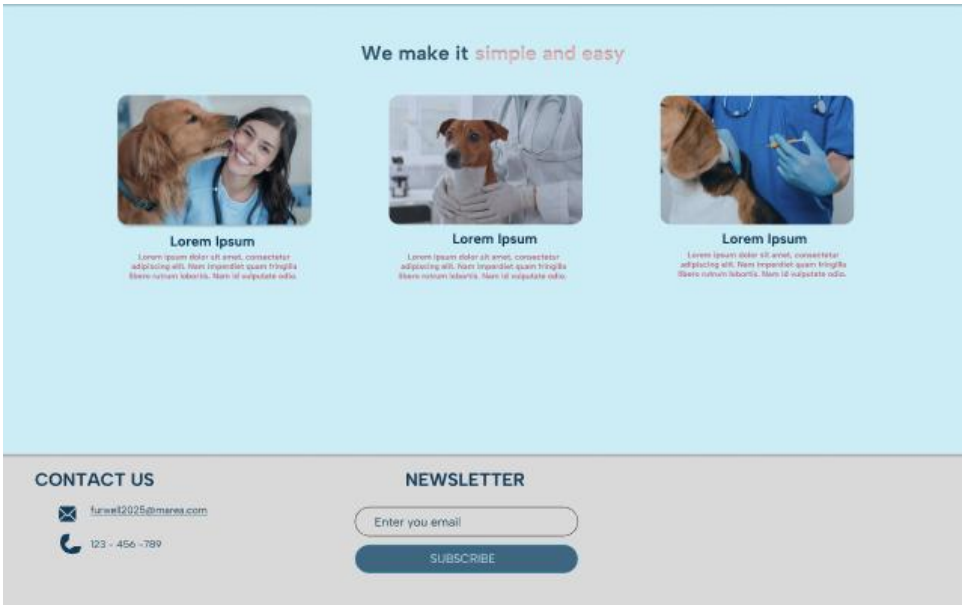


Picture 1.11: Veterinary Clinic Appointments Page

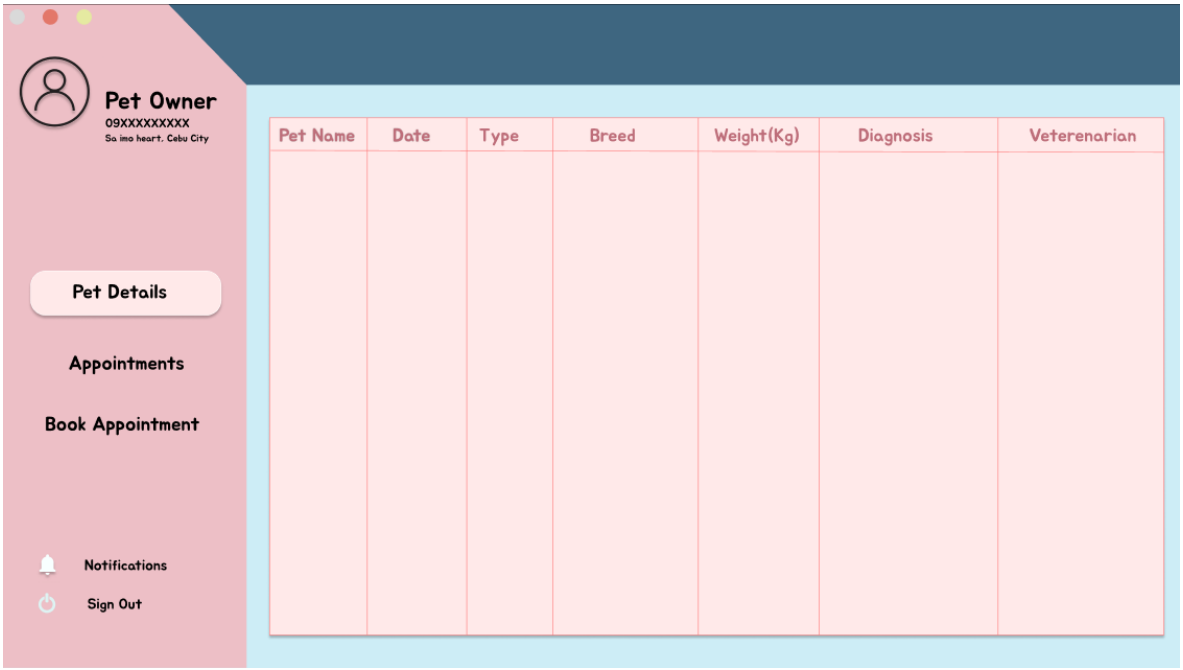


Page 1.12: Veterinary Clinic Health Records Page

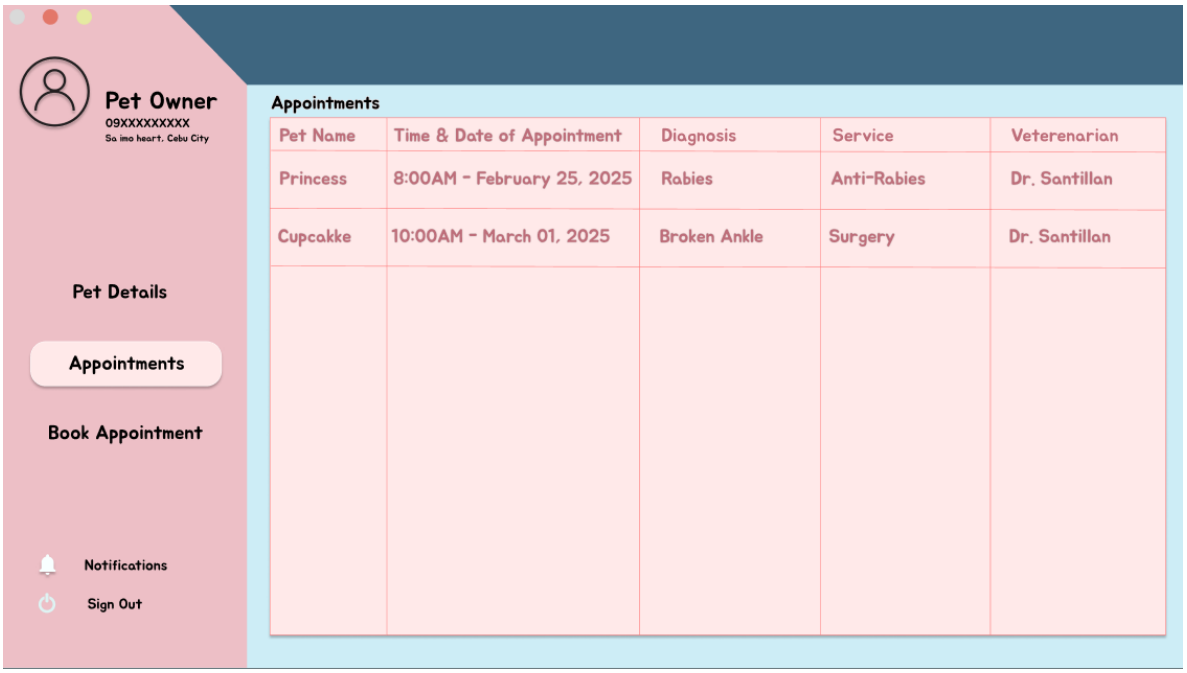

LOGIN
Boost your appointments with Furwell!
Sign up now and start receiving more bookings with the leading appointment scheduling service for veterinary clinics.
Ready to grow your clinic?
Your Clinic Name
Clinic Owner First Name
Clinic Owner Last Name
Enter Your Clinic Email
+63
Mobile Phone Number
Do you have BIR 2303 form?
Yes
No
Get Started
Furwell brings new opportunities
Lorem Ipsum
Lorem Ipsum
Lorem Ipsum



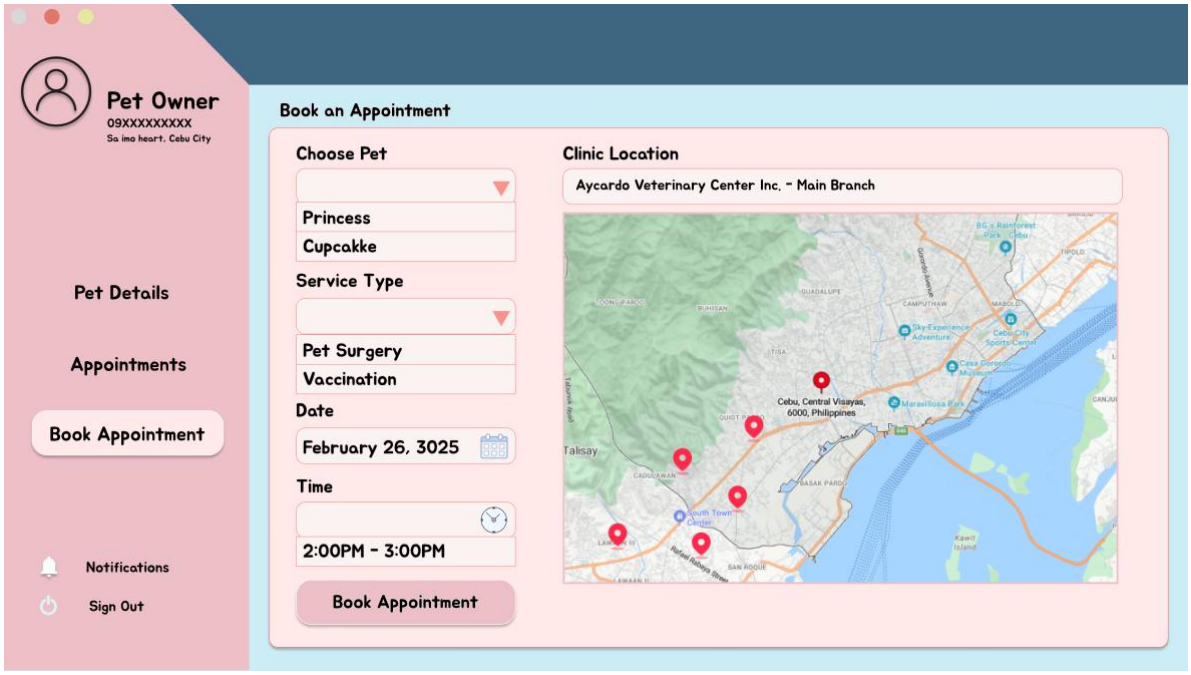
Picture: 1.13: Clinic Subscription Page



Picture 1.14: Pet Owner Pet Details Page



Picture 1.15: Pet Owner Appointments Page

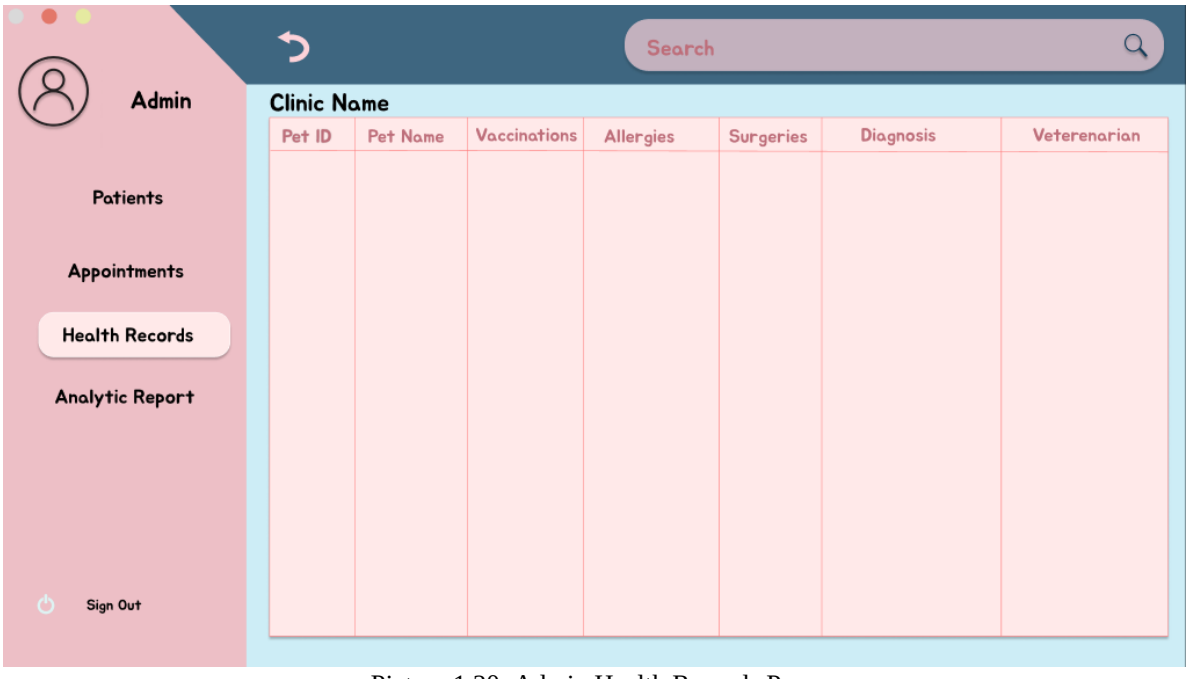


Picture 1.16: Pet Owner Appointments Page

Picture 1.17: Pet Owner Profile Section

Picture 1.18: Admin Patients Page

Picture 1.19: Admin Appointments Page



Picture 1.20: Admin Health Records Page

Picture 1.21: Admin Analytic Report

6.3 Screen Objects and Actions

This section outlines the key screen objects and their associated actions within the FurWell veterinary management platform.

Picture 1.0: Landing Page
Objects: Welcome Message, Login/Signup Buttons, Home, About, Services, Appointments, Contact Buttons, System Overview
Actions: Users can navigate to the login/signup, about, services, appointments, contact buttons using their respective buttons

Picture 1.1: Sign Up Page
Objects: Input fields (name, email, password).
Actions: Users enter details and submit the form to create an account.

Picture 1.2: Sign In Page
Objects: Username/Email and password fields, “Create Account” link, login button
Actions: Users input credentials and log in, if they’re new to the site, they can login via Create Account and redirected to the Sign Up Page (Picture 1.1).

Picture 1.3: Clinic Locator Page
Objects: Search Bar, Clinic Lists
Actions: Users can search for nearby veterinary clinics and view detailed information.

Picture 1.16: Pet Owner Appointments Page
Objects: Dropdown box, Calendar Pop Up
Actions: Users can choose a pet, choose a service type, and schedule the appointment.

Picture 1.12: Veterinary Clinic Health Records Page
Objects: List of Past Medical Check-Ups, Vaccination Records, Treatment History
Actions: Veterinarians can update records, and pet owners can review their pet’s medical history.

Picture 1.13: Clinic Subscription Page
Objects: Input fields (Clinic Name, Clinic Owner Name, Email, Phone Number)
Actions: Clinic Administrator manage clinic subscriptions and track payment status.

7. REQUIREMENTS MATRIX

Requirement Code	Requirement Description	System Component
3.1.1.1	The system shall allow users to create and manage personal profiles with contact information and role-specific details.	UserModel, ProfileModelProvider, FirebaseAuthService
3.1.1.2	The system shall enable pet owners to register and manage multiple pets under their profile.	PetModel, UserModelProvider, FirebaseAuthService
3.1.1.3	The system shall provide clinic registration and profile management capabilities for veterinary staff.	ClinicModel, ClinicModelProvider, FirebaseAuthService
3.1.1.4	The system shall facilitate appointment scheduling and management between pet owners and clinics.	AppointmentModel, AppointmentModelProvider
3.1.1.5	The system shall maintain comprehensive pet health records with medical history and vaccination records.	PetHealthModel, HealthRecordProvider
3.1.1.6	The system shall provide real-time notifications for appointments and updates to all users.	NotificationModel, NotificationProvider
3.1.2.1	The system shall enable clinic search functionality with location-based filtering.	LocationModel, LocationServiceProvider
3.1.2.2	The system shall manage clinic subscriptions and payment processing.	SubscriptionModel, PaymentModelProvider
3.1.2.3	The system shall provide administrative controls for managing multiple clinics and users.	AdminModel, AdminModelProvider
3.1.3.1	The system shall implement role-based access control for different user types.	SecurityModel, AuthorizationProvider
3.1.3.2	The system shall provide secure storage and transmission of medical records.	EncryptionModel, SecurityProvider
3.2.1.1	The system shall support image upload and storage for pet profiles and clinic information.	StorageModel, FirebaseStorageProvider
3.2.1.2	he system shall provide a responsive interface adaptable to different screen sizes.	UIModel, ResponsiveLayoutProvider
3.2.2.1	The system shall validate email addresses and send verification codes for user authentication.	ValidationModel, EmailProvider
3.2.2.2	The system shall manage user sessions and secure logout functionality.	SessionModel, AuthenticationProvider
3.3.1.1	The system shall backup and maintain data integrity for all user information.	BackupModel, DataIntegrityProvider
3.3.1.2	The system shall provide error handling and system status notifications.	ErrorModel, StatusNotificationProvider
3.4.1.1	The system shall support multiple languages and localization features.	LocalizationModel, LanguageProvider
3.4.1.2	The system shall provide accessibility features for users with disabilities.	AccessibilityModel, A11yProvider