Palestine Technical University – Kadoorie

College of Engineering and Technology

Department of Computer Systems Engineering

Course name:

Software Engineering

Project Title:

Paws & Care: A Pet Adoption and Products Marketplace

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Abstract

This project aims to develop a multi-functional electronic platform in Palestine, dedicated to facilitating pet adoption and the sale of related pet products. The platform will serve as a centralized space for individuals seeking to adopt pets, providing detailed information such as photos, health records, and breed details for each available animal. Users will be able to search and filter pets by various criteria including species, age, and health status, thus simplifying the adoption process.

In addition to pet adoption, the platform will feature an e-commerce section where users can purchase essential pet products such as food, toys, and accessories. By integrating these two functions—pet adoption and pet product sales—this platform will enhance the overall pet care experience by offering pet owners a one-stop solution for both adoption and necessary supplies.

The goal of this project is to promote responsible pet adoption practices, reduce the stray animal population, and support the local market for pet-related products in Palestine. By offering a comprehensive solution for pet adoption and pet products, the platform will facilitate the adoption process for potential pet owners and improve the well-being of pets in the region.

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Chapter 1: Introduction

1.1 Objective

The objective of this project is to develop a multi-functional electronic platform in Palestine, aimed at facilitating pet adoption and providing a marketplace for pet-related products. The platform will allow users to:

- Browse and search for pets available for adoption, with detailed information including photos, breed, health status, and location.

- Submit adoption applications through a simplified process that makes it easier for potential adopters to apply for pets.

- Purchase pet products such as food, toys, accessories, and other pet essentials through an integrated e-commerce section.

The platform aims to encourage responsible pet adoption and contribute to the welfare of animals in Palestine by reducing the number of stray animals and making pet care products easily accessible to pet owners.

1.2 Document Conventions

This document uses the following conventions.

NFR	Non-Functional Requirements
HTTP	Hyper Text Transfer Protocol
DDB	Distributed Data Base
ERD	Entity Relationships Diagram
HTML	Hyper Text Markup Language
CSS	Cascading Style Sheets
SQL	Structured Query Language

1.3 Intended Audience and Reading Suggestions

This document is intended for a diverse audience that includes stakeholders involved in the "Pet Adoption Platform" project.
The intended audience includes:

1. **End Users**: Individuals who will use the platform to search for pets available for adoption and communicate with adoption centers. These users may be prospective pet adopters.
2. **Administrators/Supervisors**: Individuals who will manage the platform and the participating adoption centers. They will add data on pets available for adoption, manage adoption requests, and supervise interactions between users and centers.
3. **Developers**: Engineers and programmers responsible for the design, development, and maintenance of the platform, ensuring all required features are implemented correctly.
4. **Testers**: Quality assurance personnel who will verify that the platform functions as expected and meets all the defined requirements.
5. **Project Stakeholders**: Individuals, such as project managers, investors, or donors, who are interested in the successful development of the platform and its ability to provide the necessary services to the community.

1.4 Project Scope

The "Pet Adoption and Pet Products Marketplace Platform" project aims to develop a multifunctional electronic platform that facilitates the process of adopting pets in Palestine and provides a marketplace for selling various products needed by pet owners, such as food, accessories, and toys. The project includes the development of essential features to meet the needs of users, administrators, and developers.
Key components of the project include:

1.Pet Adoption:

- Creating a comprehensive database containing detailed information about pets available for adoption, including images, health records, location, and other details.
- Providing a user interface to allow users to browse available pets using specific criteria such as breed, age, and health condition.
- Enabling users to submit adoption requests and communicate directly with owners or shelters via WhatsApp or email for more details and coordination.

2. E-commerce for Pet Products:

- Developing a section for selling pet-related products such as food, toys, accessories, and medicines.
- Providing an interface to allow users to search for products, displaying details like prices and descriptions for each product.
- Developing an electronic payment system to facilitate purchasing and provide shipping services to various addresses.

3. Account and Profile Management:

- Enabling administrators to manage platform content, such as adding new information about available pets and reviewing adoption requests.

4. User Interaction with Breeders:

- Allowing users to communicate with breeders via WhatsApp or email for more details about available pets for adoption.

5. Future Expansion:

- Designing the platform in a flexible way to accommodate future features, such as adding veterinary services or pet training programs.

Constraints:

- The project is limited to the Palestinian market for the current phase, with plans to expand into other markets in the future.
- The project will only deal with pets available for adoption through local breeders.
- Initially, the platform will be available in Arabic and English, with plans to support additional languages in the future.

Chapter 2: Overall Description

2.1 Product Perspective

This product is a standalone web-based platform developed specifically for the Palestinian market. It does not rely on or extend an existing system. It combines functionalities of online pet adoption and e-commerce in one unified system. The system is modular and allows for future enhancements like adding veterinary services or pet care tips.

2.2 Product Features

- Search and filter pets by species, breed, age, and health condition.
- View detailed pet profiles including photos and health records.
- Submit adoption requests.
- Contact shelters or breeders via WhatsApp or email.
- Browse and purchase pet products.
- Use online payment and track delivery.
- Admin dashboard for managing listings and adoption requests.
- Supports both Arabic and English languages.

2.3 User Classes and Characteristics

- **End Users (Adopters)**: General users who want to adopt pets or buy pet products. They may have average digital skills.
- **Administrators**: Manage platform content, handle adoption requests, and add or remove listings.
- **Breeders/Shelters**: Upload information about animals available for adoption and respond to user inquiries.
- **Developers**: Maintain and improve the platform.
- **Testers**: Ensure the quality and proper functionality of the system.

2.4 Operating Environment

- **Platform type**: Web-based (responsive for desktop and mobile)
- **Browsers**: Chrome, Firefox, Safari, Edge
- **Devices**: Desktop, laptop, smartphone, tablet
- **Backend**: Cloud-hosted server
- **Technologies**: HTML, CSS, JavaScript, PHP/Node.js, MySQL

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2.5 Design and Implementation Constraints

- The platform is limited to the Palestinian market in its initial phase.
- Only pets available through local shelters/breeders are supported.
- Communication is external (WhatsApp and email), not built-in chat.
- Platform must support both Arabic and English.
- Must follow data privacy regulations and be mobile responsive.

2.6 Assumptions and Dependencies

- Users have access to the internet and smart devices.
- Shelters and breeders will provide accurate pet data.
- Payment gateway and delivery services are available and functional.
- The platform will use open-source technologies where possible.
- External APIs like WhatsApp and payment gateways will remain accessible.

Chapter 3: Functional Requirements

3.1 FR-001: User Registration

- **Description:** The system shall allow a user to register by providing their name, email, password, and phone number.
- **Rationale:** To enable unique identification and secure access to personalized features.
- **Priority:** High
- **Precondition:** The user must not be already registered.
- **Postcondition:** A new user account is created, and the user is redirected to the login page.

3.2 FR-002: User Login

- **Description:** The system shall authenticate users using their email and password.
- **Rationale:** To provide secure access to the platform.
- **Priority:** High
- **Precondition:** The user has successfully registered.
- **Postcondition:** User is granted access to their dashboard.

3.3 FR-003: Browse Pets for Adoption

- **Description:** The system shall allow users to view a list of available pets with filters for species, breed, age, and health status.
- **Rationale:** To help users find pets that match their preferences.
- **Priority:** Medium
- **Postcondition:** Matching pet profiles are displayed with images and details.

3.4 FR-004: Submit Adoption Request

- **Description:** The system shall allow logged-in users to submit a request to adopt a pet.
- **Rationale:** To connect potential adopters with shelters/breeders for further processing.
- **Priority:** High
- **Precondition:** The user must be logged in.
- **Postcondition:** The request is sent to the respective shelter or breeder, and the user is notified of submission.

3.5 FR-005: Contact Breeder/Shelter

- **Description:** The system shall allow users to contact the breeder/shelter via WhatsApp or email from the pet's profile page.
- **Rationale:** To facilitate direct communication for more detailed inquiries.
- **Priority:** Medium

3.6 FR-006: Browse Pet Products

- **Description:** The system shall provide a catalog of pet-related products including descriptions, images, and prices.
- **Rationale:** To support pet owners in finding necessary supplies.
- **Priority:** Medium

3.7 FR-007: Add Products to Cart

- **Description:** The system shall allow users to add selected products to a shopping cart.
- **Rationale:** To allow batch purchasing before checkout.
- **Priority:** Medium

3.8 FR-008: Online Payment

- **Description:** The system shall provide an online payment gateway for users to complete purchases securely.
- **Rationale:** To enable seamless transactions.
- **Priority:** High
- **Precondition:** Items must be in the user's cart.
- **Postcondition:** Payment is processed and confirmed; the order is generated.

3.9 FR-009: Admin Management Panel

- Description: The system shall provide an administrative interface for managing pet listings, product inventories, and adoption requests.
- Rationale: To allow platform administrators to maintain and monitor system content and user activity.
- **Priority:** High.

Chapter 4: Non-Functional Requirements

4.1 Performance Requirements

- **R1:** The system response time should be less than 3 seconds when executing any search or browsing operation.
- **R2:** The system should be able to handle 1000 requests per hour without affecting its performance.
- **R3:** The system should support the upload of 5000 pet products at once.

4.2 Usability Requirements

- **R1:** The system should be easy to use for users with no technical experience.
- **R2:** The system should have an intuitive and easy-to-navigate user interface, both on computers and mobile devices.
- **R3:** The system should provide a user guide that explains how to use the platform and browse available pets for adoption.

4.3 Security Requirements

- **R1:** All user data (such as email and password) should be encrypted using strong security protocols like SSL.
- **R2:** The system should include multiple security layers (such as two-factor authentication) to secure accounts.
- **R3:** User personal data should be protected from unauthorized access, and should be stored securely.

4.4 Reliability Requirements

- **R1:** The system should be available 99.9% of the time.
- **R2:** The system should perform a daily backup of data every 24 hours.
- **R3:** The system should be able to restore data within two hours in case of a technical failure.

4.5 Maintainability Requirements

- **R1:** The system should be easy to update in terms of adding new products or updating pet adoption data.
- **R2:** The system's administration interface should be flexible and allow for easy modifications.
- **R3:** Maintenance operations should be performed regularly without affecting the user experience.

4.6 Compatibility Requirements

- **R1:** The system should be compatible with modern browsers such as Chrome, Firefox, Safari, and Edge.
- **R2:** The system should be compatible with mobile devices running iOS and Android.
- **R3:** The system should be compatible with popular operating systems like Windows and macOS.

Chapter 5: System Architecture

5.1 Overview

The "Paws & Care" platform is designed based on a standard Client/Server architecture. It separates concerns across multiple layers to enhance maintainability and scalability. The frontend communicates with the backend through HTTP requests, while the backend interacts with the database to handle data operations.

5.2 Architectural Components

- Frontend (Client-side): Built using HTML, CSS, and JavaScript. It handles user interactions, navigation, and UI rendering.
- Backend (Server-side): Developed using Node.js or PHP to process requests, apply business rules, and manage database operations.
- Database: MySQL is used to store all system data, including user information, pet details, products, and orders.
- Hosting Environment: The platform is intended to be hosted on a cloud-based server for availability and scalability.
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5.3 System Layers

- Presentation Layer: Responsible for user interaction via browser interfaces such as Home, Cart, Login, and Admin Dashboard.
- Business Logic Layer: Processes user requests, manages validations, handles adoption and order logic.
- Data Access Layer: Interfaces with the MySQL database to retrieve, insert, update, and delete records.

5.4 Communication Model

- All client-server communications occur via standard HTTP/HTTPS protocols.
- External APIs such as WhatsApp and payment gateways are used to handle contact and financial transactions.

5.5 Deployment Environment

- The system runs on a web server such as Apache or Nginx.
- It supports all modern web browsers (Chrome, Firefox, Safari, Edge).
- The design is responsive, enabling access from desktops, laptops, tablets, and smartphones.

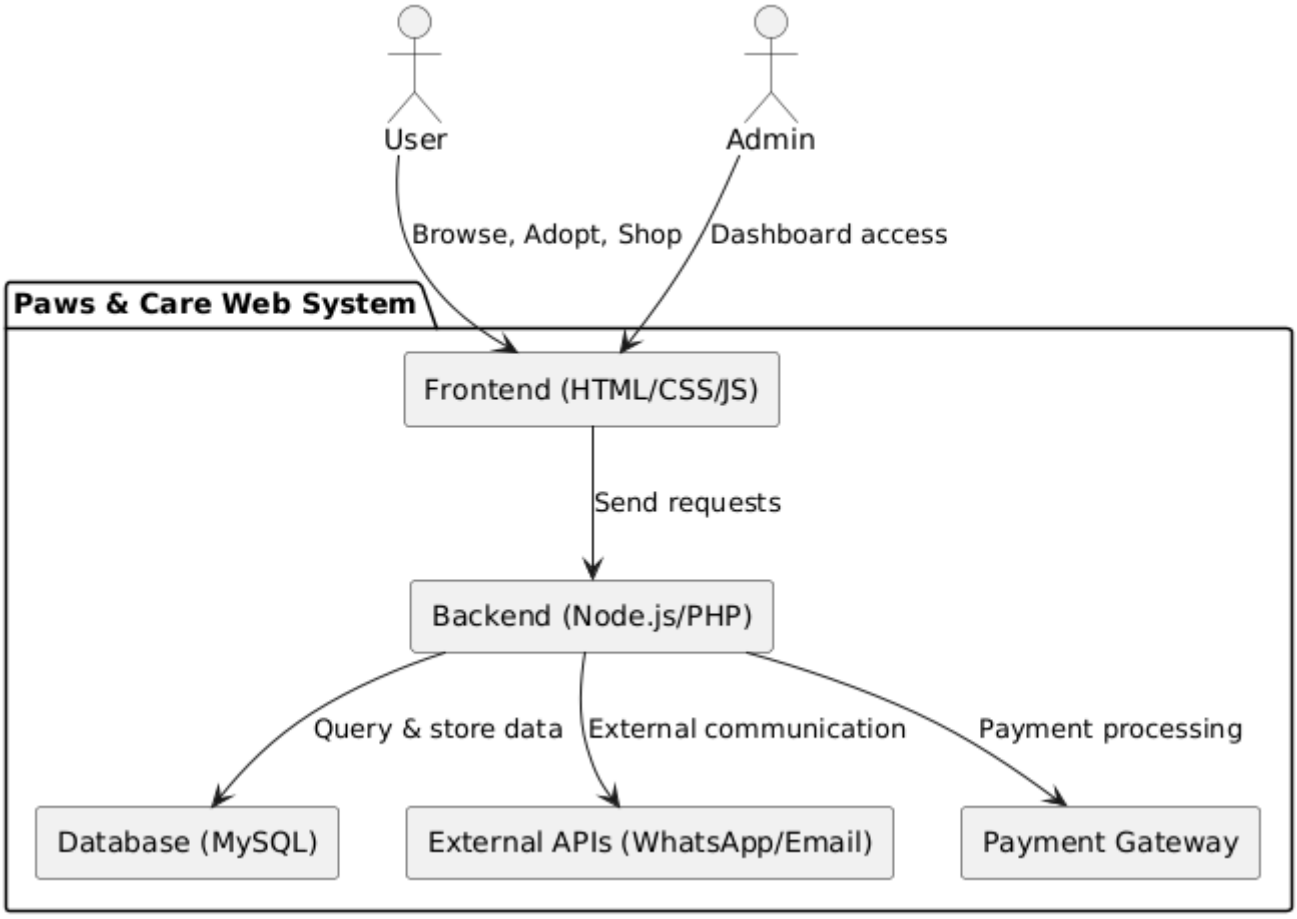

Figure 5.1: System Architecture of the Paws & Care Platform

Chapter 6: System Models

This chapter presents the visual models that describe the functional structure and dynamic behavior of the Paws & Care system. These models help stakeholders better understand system architecture, interactions, and logic. The diagrams are developed using the Unified Modeling Language (UML).

6.1 Use Case Diagram

- **Description:**

The Use Case Diagram represents the interactions between external actors and the core functionalities of the Paws & Care system. This diagram helps stakeholders visualize how users interact with the system to perform essential tasks such as registration, login, browsing pets, submitting adoption requests, and administrative management.

The two main actors involved are:

- Regular User – Can register, log in, browse pets, view pet profiles, submit adoption requests, contact via WhatsApp/email, and purchase pet products.
- Admin – Manages users, pets, adoption requests, and products through an admin dashboard.

Diagram:

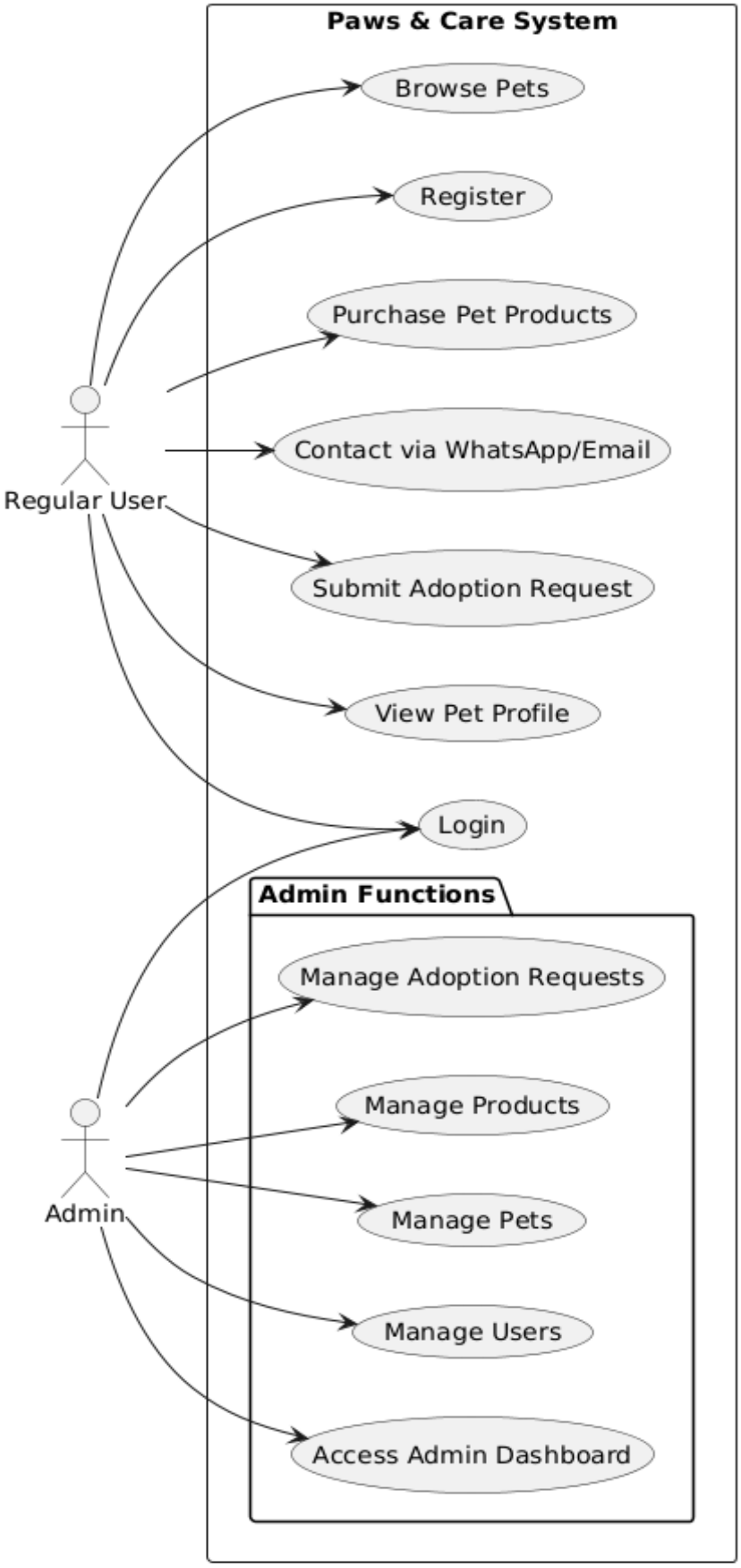

Figure 6.1: Use Case Diagram for Paws & Care System

6.2 Class Diagram

- **Description:**

This section presents the class diagram of the Paws & Care system.
The diagram illustrates the system's static structure, showing the main classes, their attributes, methods, and the relationships between them. It is used to model the system's core entities such as users, pets, adoption requests, and products.

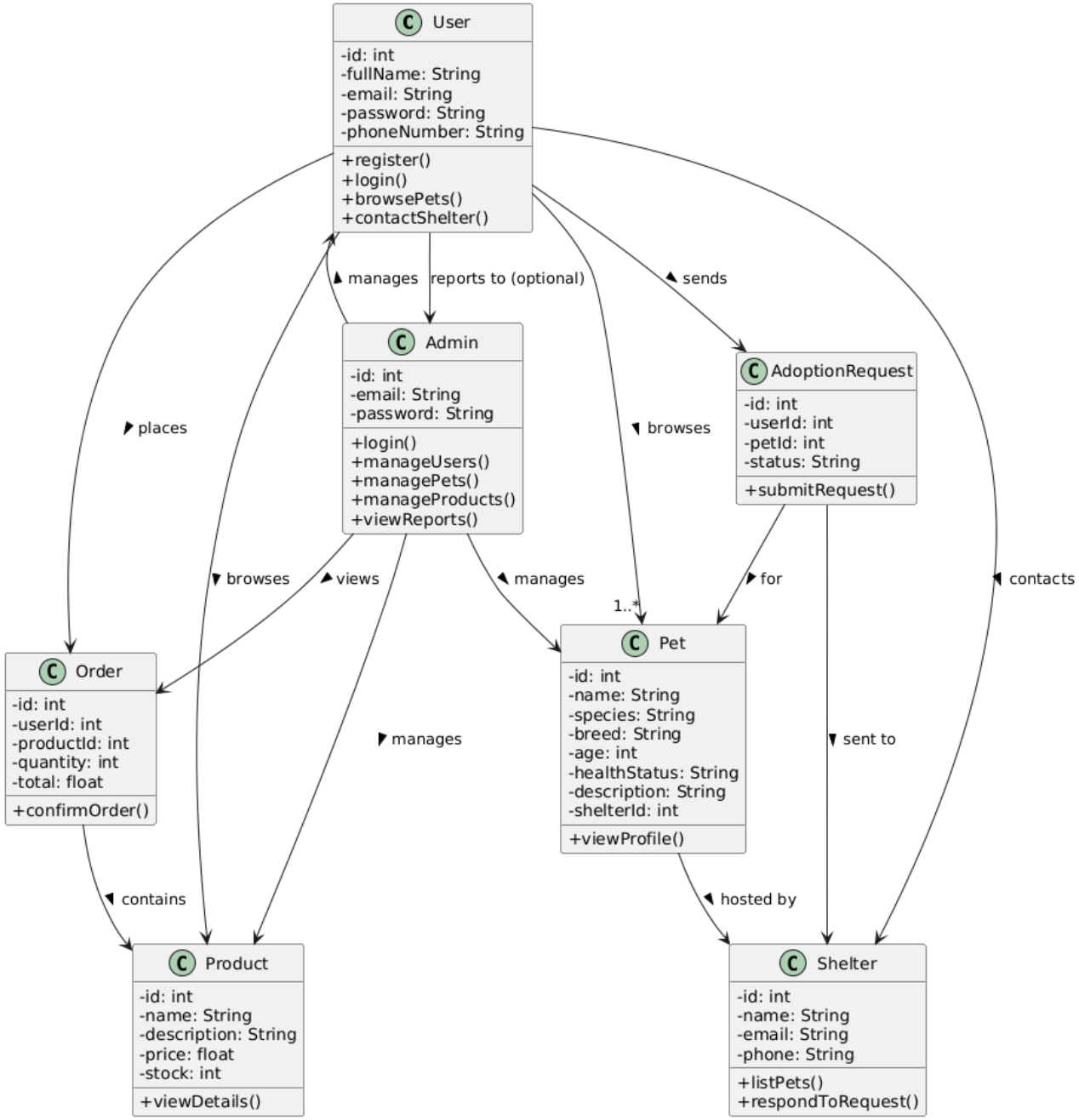

Figure 6.2: Class Diagram for Paws & Care System

6.3 Sequence Diagram

- ### 6.3.1 Description:

The sequence diagram illustrates the dynamic behavior of the Paws & Care system by modeling the interactions between different objects over time. The following diagram represents the "**Submit Adoption Request**" feature, showing how a user sends an adoption request, and how the system processes and forwards it to the shelter or breeder.

Diagram:

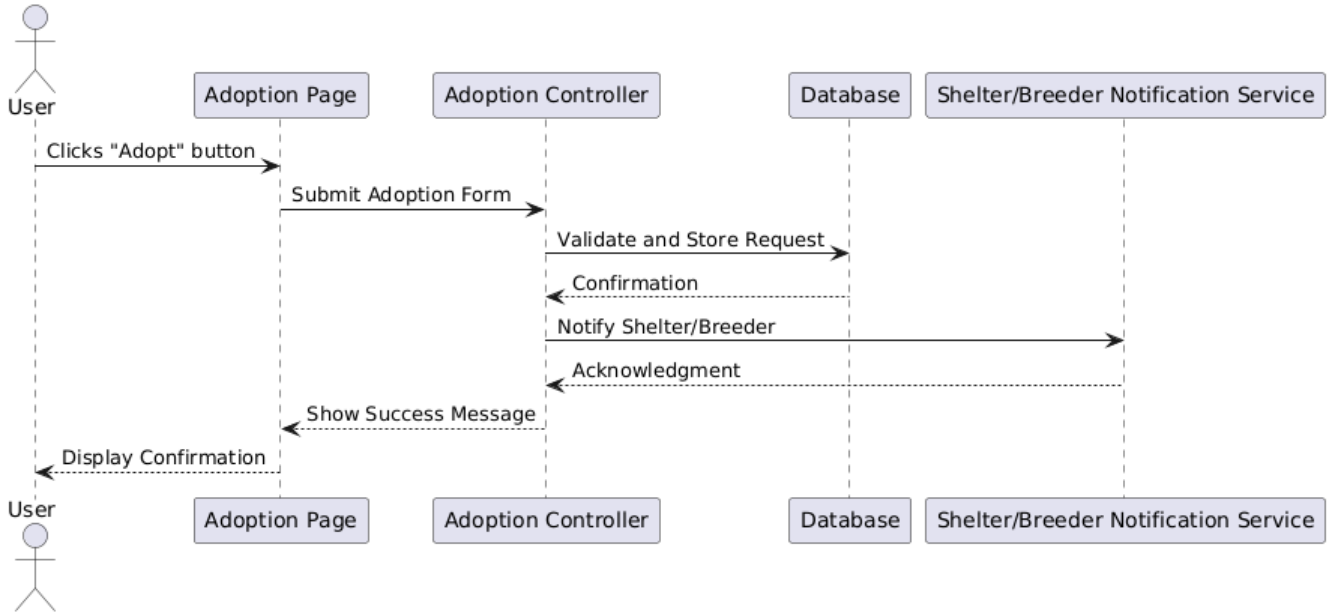

Figure 6.3.1: Sequence Diagram for Submit Adoption Request

- ## 6.3.2 Description:

The sequence diagram illustrates the dynamic behavior of the Paws & Care system by modeling the interactions between different objects over time.
The following diagram represents the "**Purchase Pet Product**" feature, showing how a user selects a product, proceeds to checkout, enters payment details, and how the system processes the order and confirms the transaction.

Diagram:

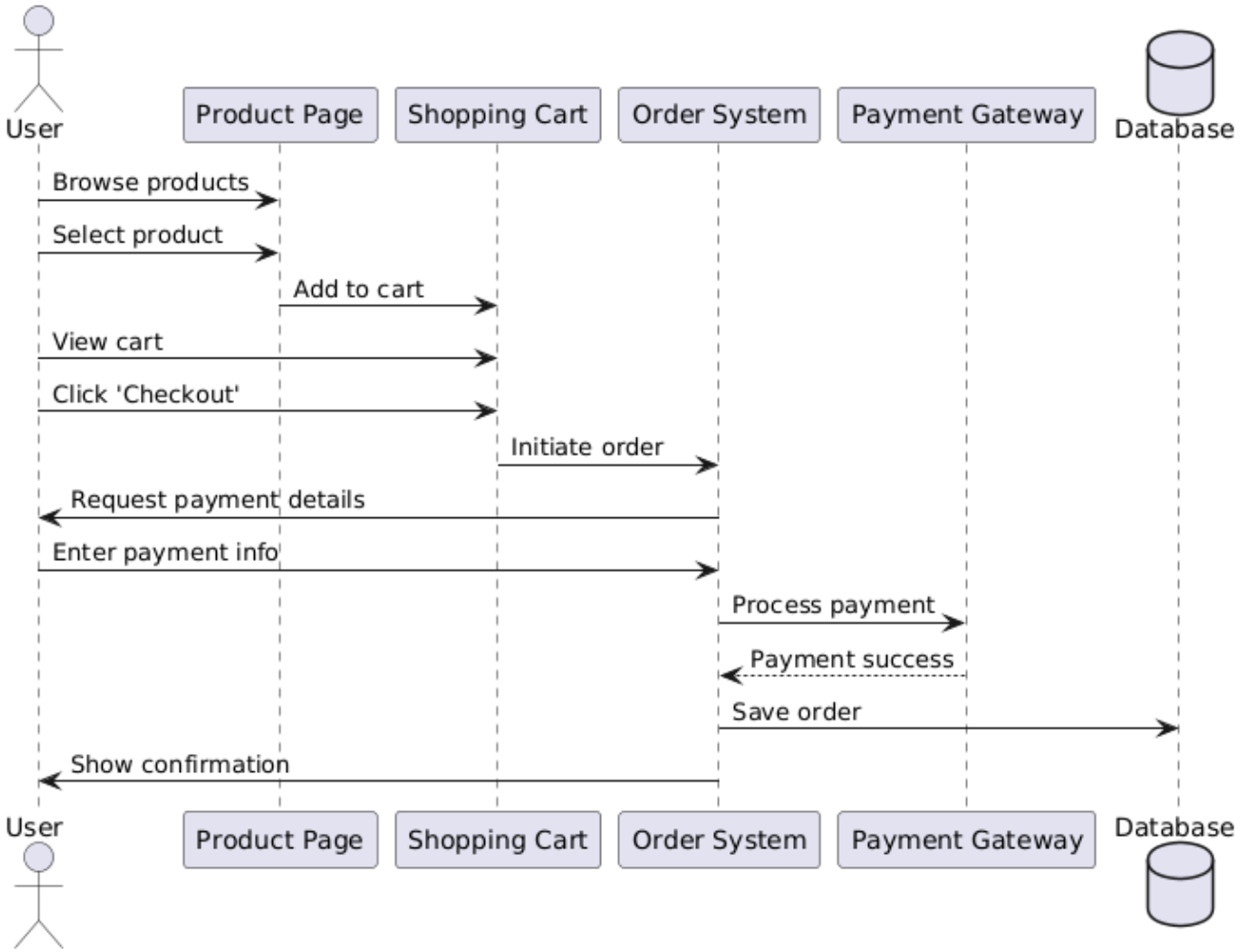

Figure 6.3.2: Sequence Diagram for Purchase Pet Product

- ## 6.3.3 Description:

  The following sequence diagram describes the process of "**User Login in**" the Paws & Care system. It represents the interactions between the user and the system components as the user provides their credentials, the system verifies them, and grants access accordingly.

  ## Diagram:

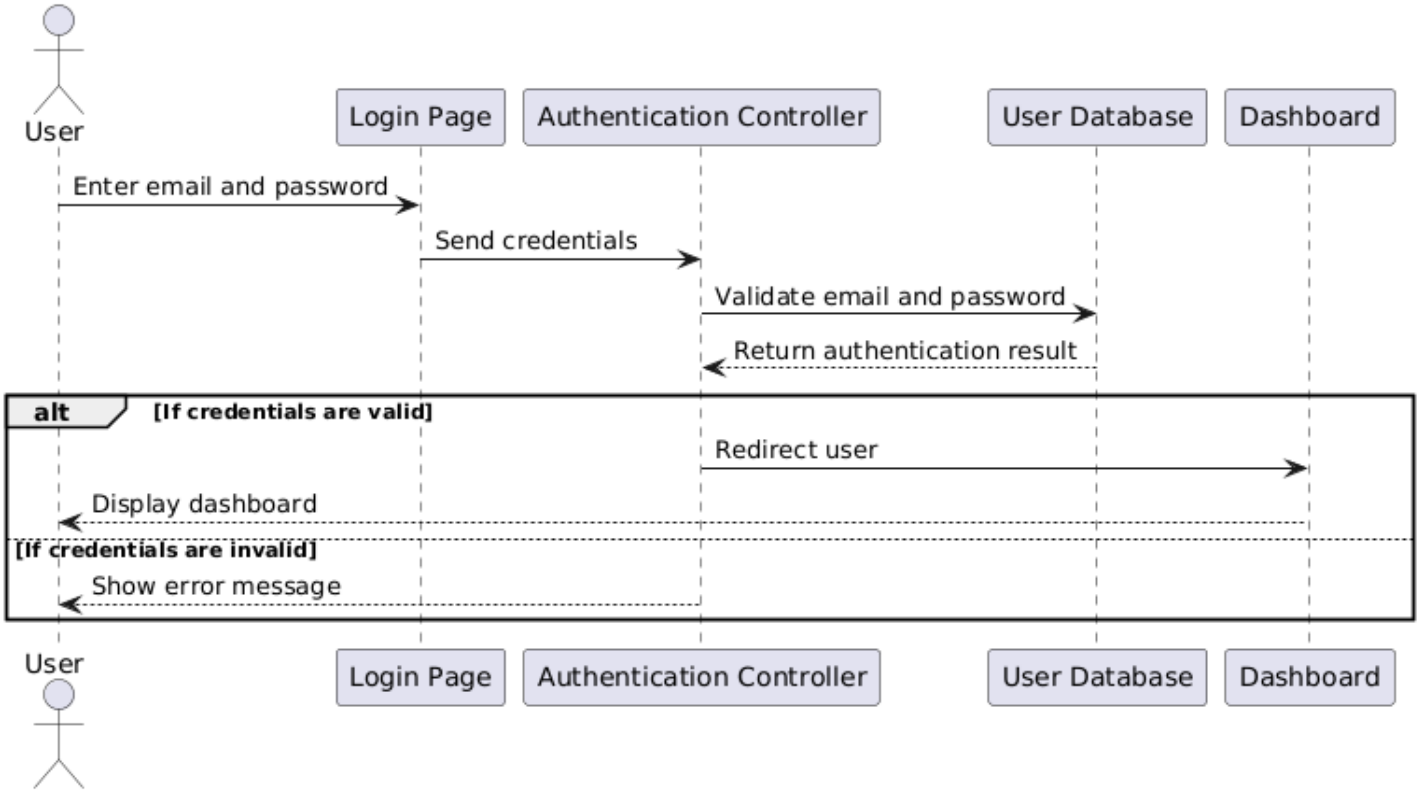

Figure 6.3.3: Sequence Diagram for User Login

6.4 Activity Diagram

- **Description:**

  The following Activity Diagram provides a high-level representation of the main workflows within the **Paws & Care** system. It is structured using **swimlanes** to distinguish between major functional partitions: **User Operations**, **Pet Adoption**, and **E-Commerce**.

- **User Operations:** This section captures the initial interaction of the user with the system, where they either register or log in. If the user is authenticated, they are granted access to system features. Otherwise, they are redirected to the login or registration interface.
- **Pet Adoption:** After logging in, users can browse pets available for adoption. Upon selecting a pet, they are prompted to fill out an adoption request form. The system validates the input and either confirms the submission or prompts the user to correct the information if incomplete.
- **E-Commerce:** Users can also browse pet-related products, add items to their shopping cart, and proceed to checkout. The system checks whether the cart is empty before allowing payment. Successful transactions result in order placement and confirmation, while failed payments trigger error messages.

  This diagram aids in visualizing the dynamic flow of actions and decisions within the system, and serves as a foundational reference for designing and implementing the system's functional behavior.

Diagram:

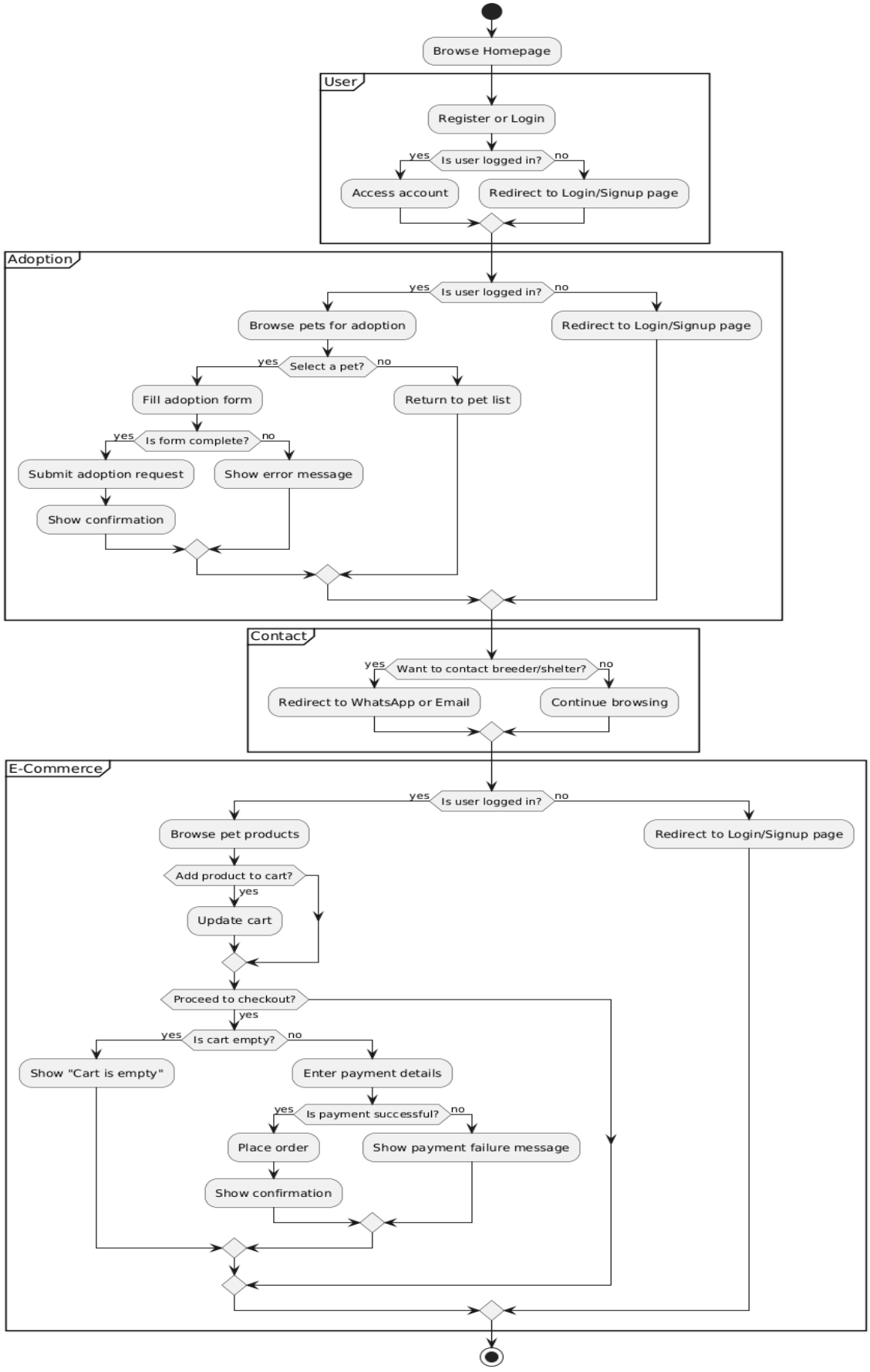

Figure 6.4: Activity Diagram for Paws & Care System

6.5 Entity Relationship Diagram (ERD)

- **Description:**

The Entity Relationship Diagram (ERD) represents the logical structure of the Paws & Care system's database. It identifies the core entities—such as Users, Pets, Products, and Adoption Requests—and illustrates the relationships between them. This model serves as a blueprint for designing the database schema and maintaining data integrity across the system.

Diagram:

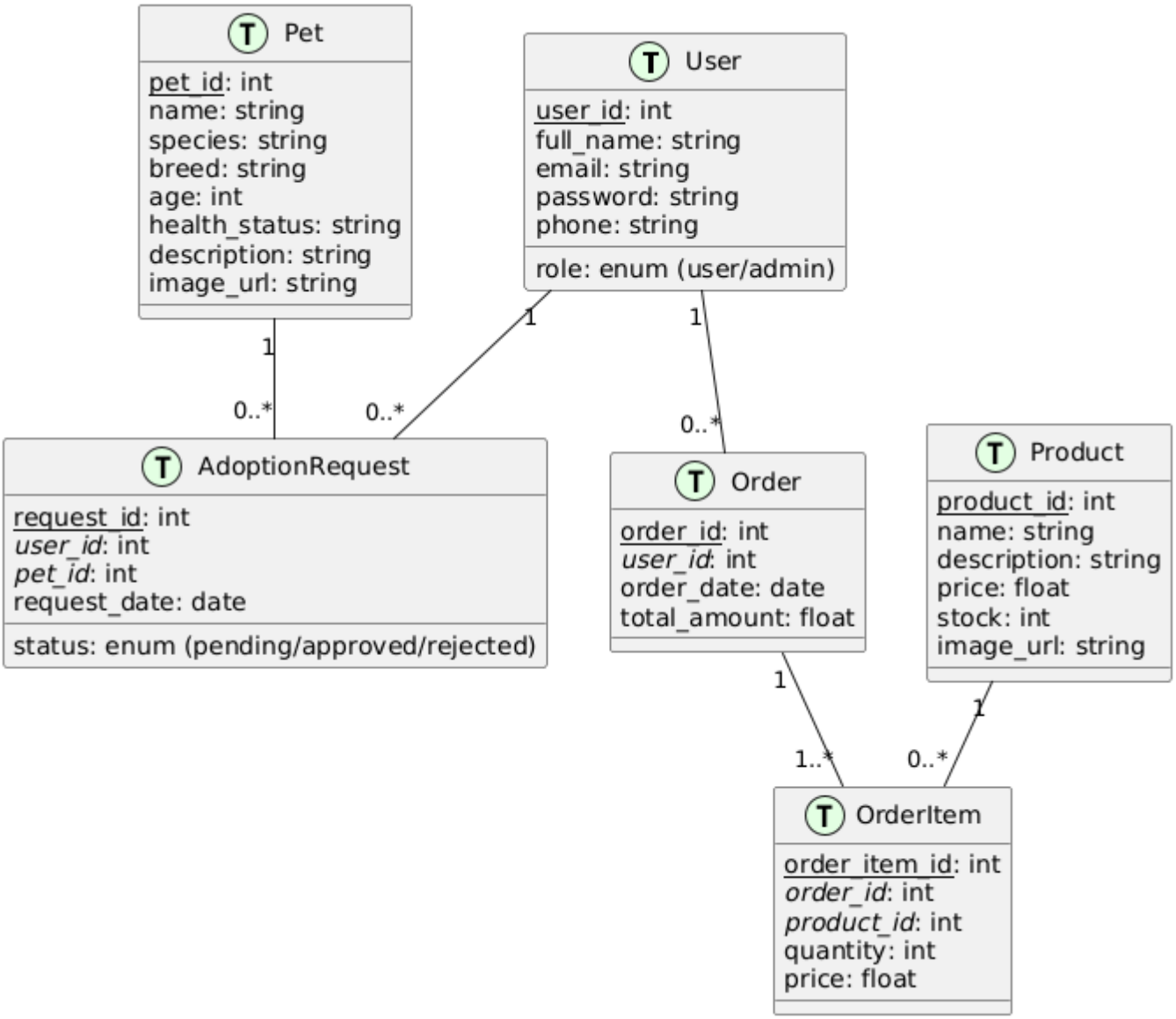

Figure 6.5: Entity Relationship Diagram for Paws & Care System

Chapter 7: Design Model (Interface)

7.1 User Interface Overview

The "Paws & Care" platform is designed to provide an intuitive and user-friendly experience for both regular users and administrators. The interface is responsive, clear, and aligned with the system's goals of pet adoption and pet product sales. The design ensures accessibility across devices and follows a clean layout for easy navigation.

Users interact with the platform through key pages like the Home Page, Pet Adoption, Marketplace, Cart, and Admin Dashboard. The layout uses a consistent navigation bar, card-based item views, and clear call-to-action buttons for interaction.

In addition to the main functional pages, the platform also includes a secure and accessible Login / Sign Up page that allows new users to create accounts and existing users to sign in seamlessly. The form includes validation, user-friendly messages, and error handling to ensure a smooth experience.

7.2 Screenshots of User Interface

Below are screenshots representing the key interfaces of the “Paws & Care” platform. Each screenshot highlights a core page of the system as implemented.

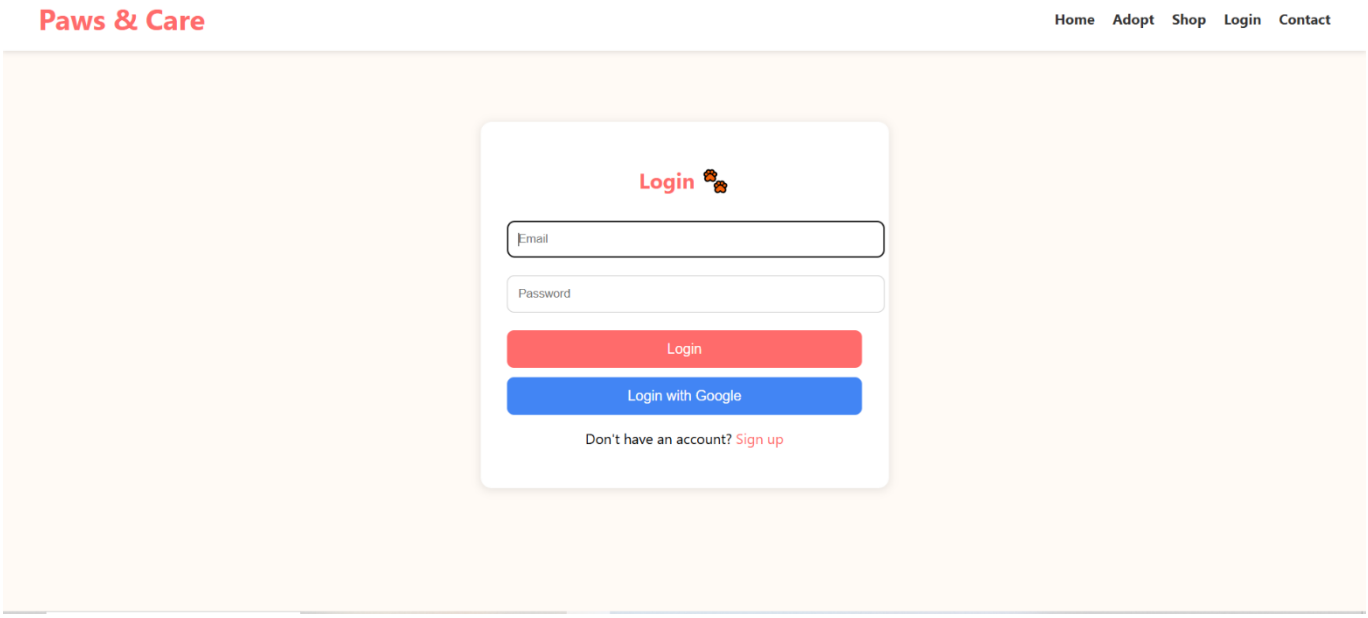

Figure 7.2.0: Login Page

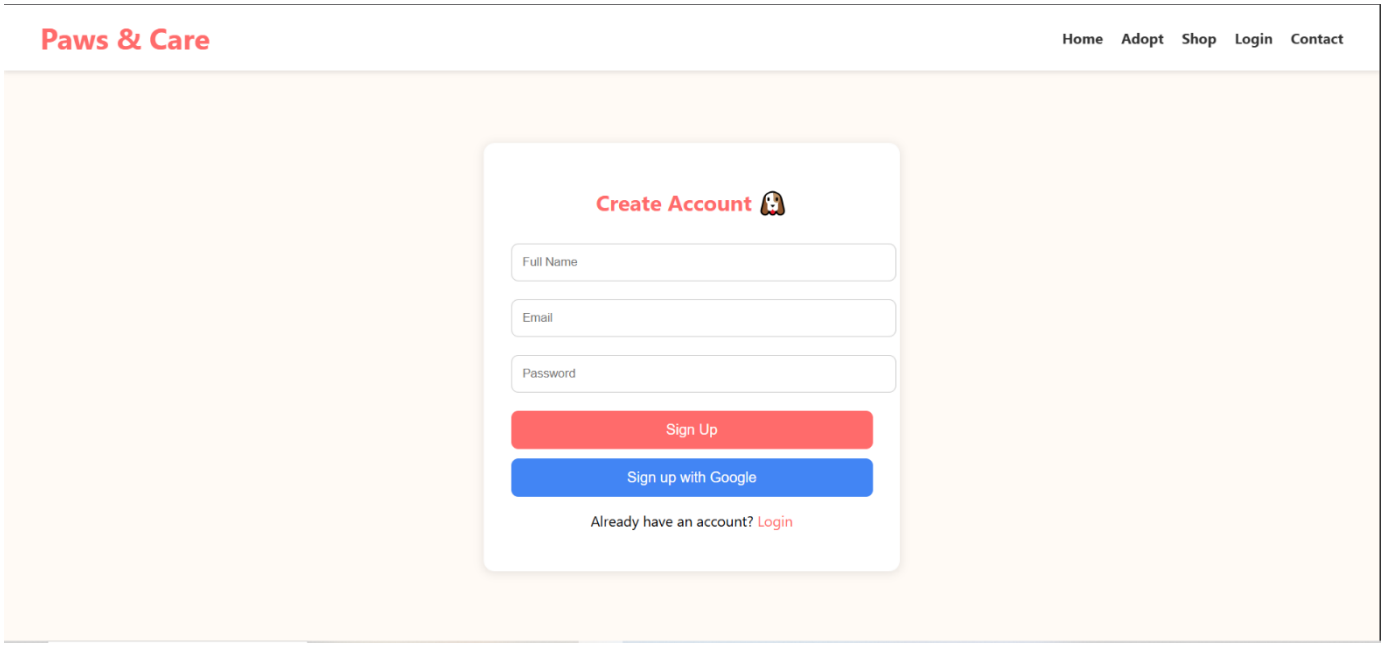

Figure 7.2.1: Sign Up Page

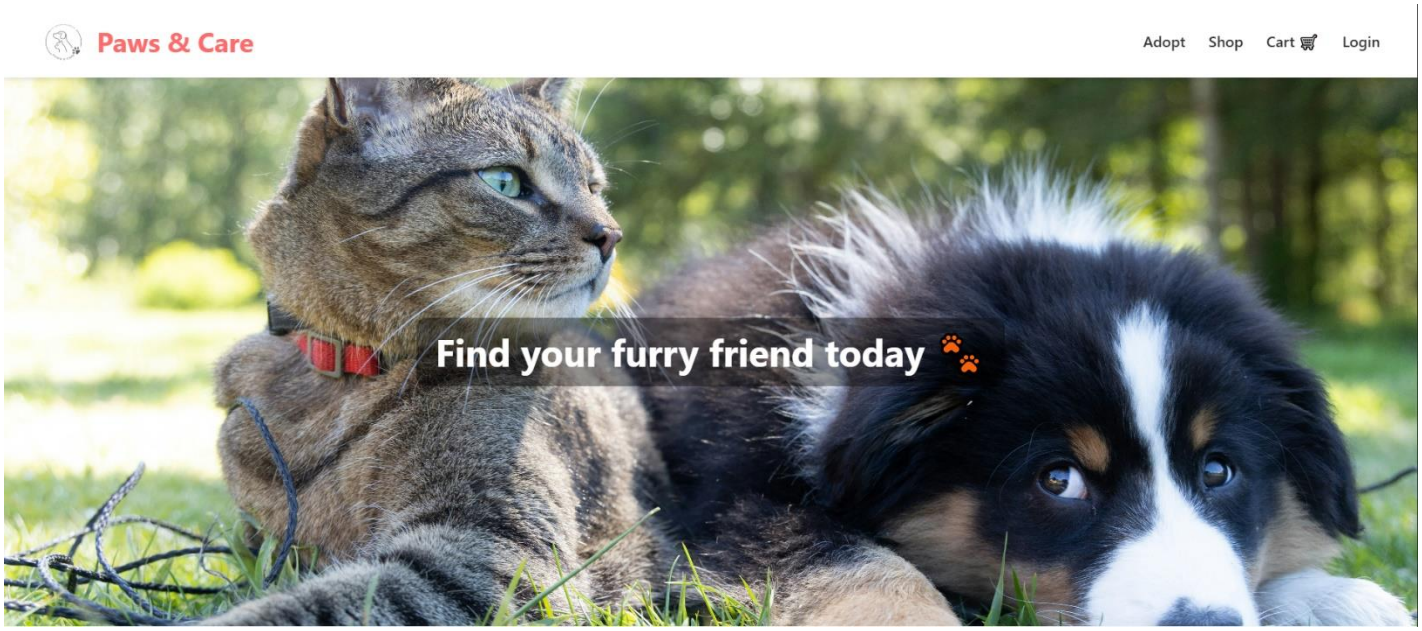

Figure 7.2.2: Home Page

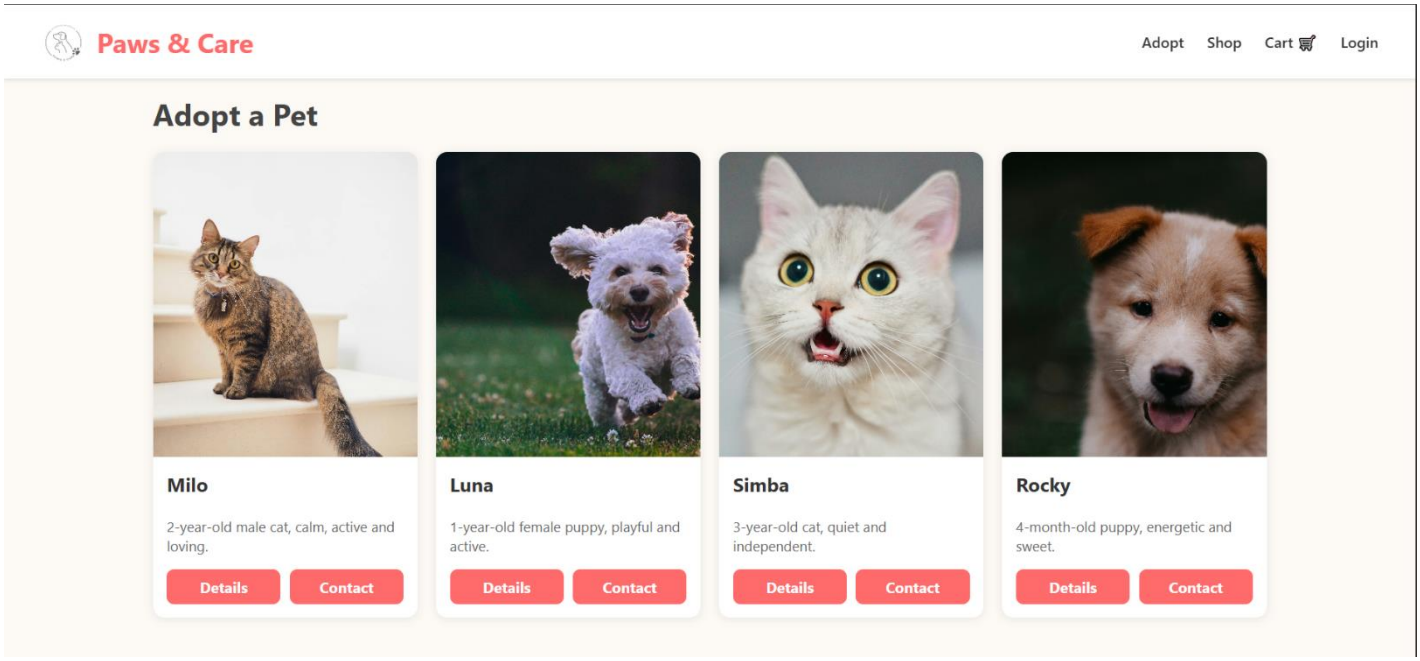

Figure 7.2.3: Pet Adoption Page

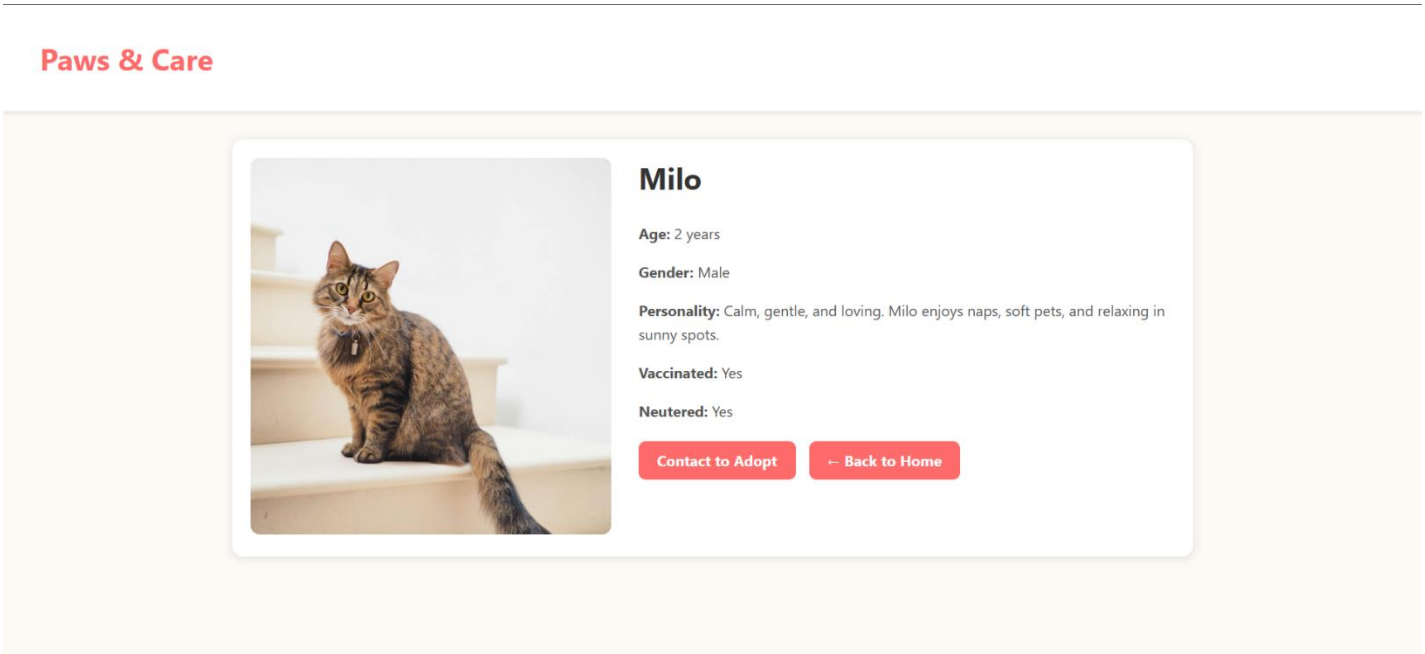

Figure 7.2.4 Pet Details Page

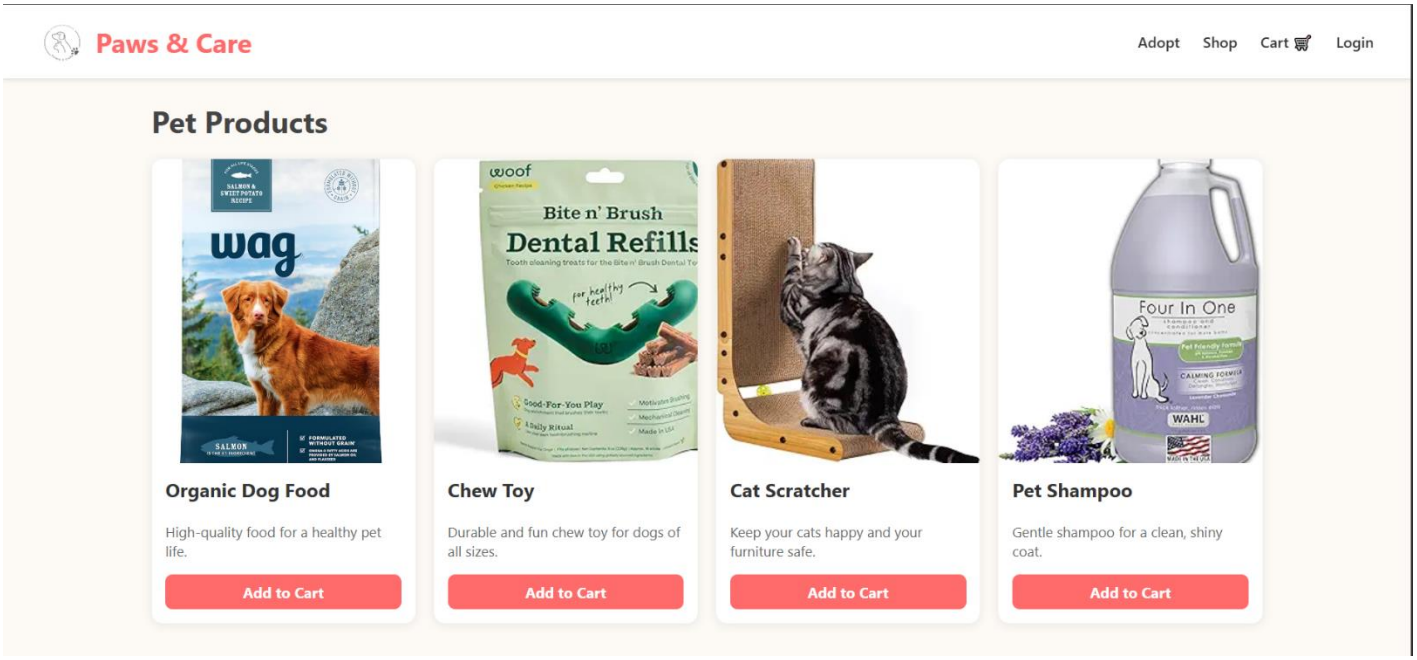

Figure 7.2.5: Product Marketplace

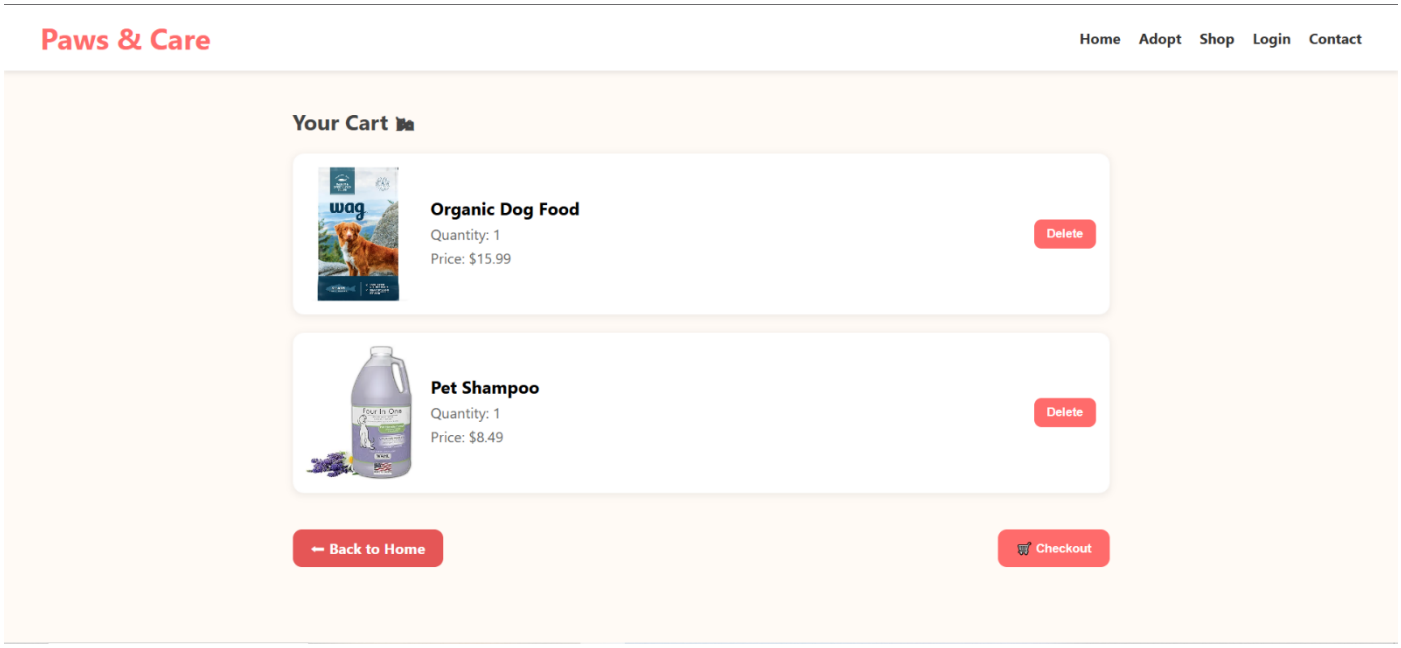

Figure 7.2.6: Cart Page

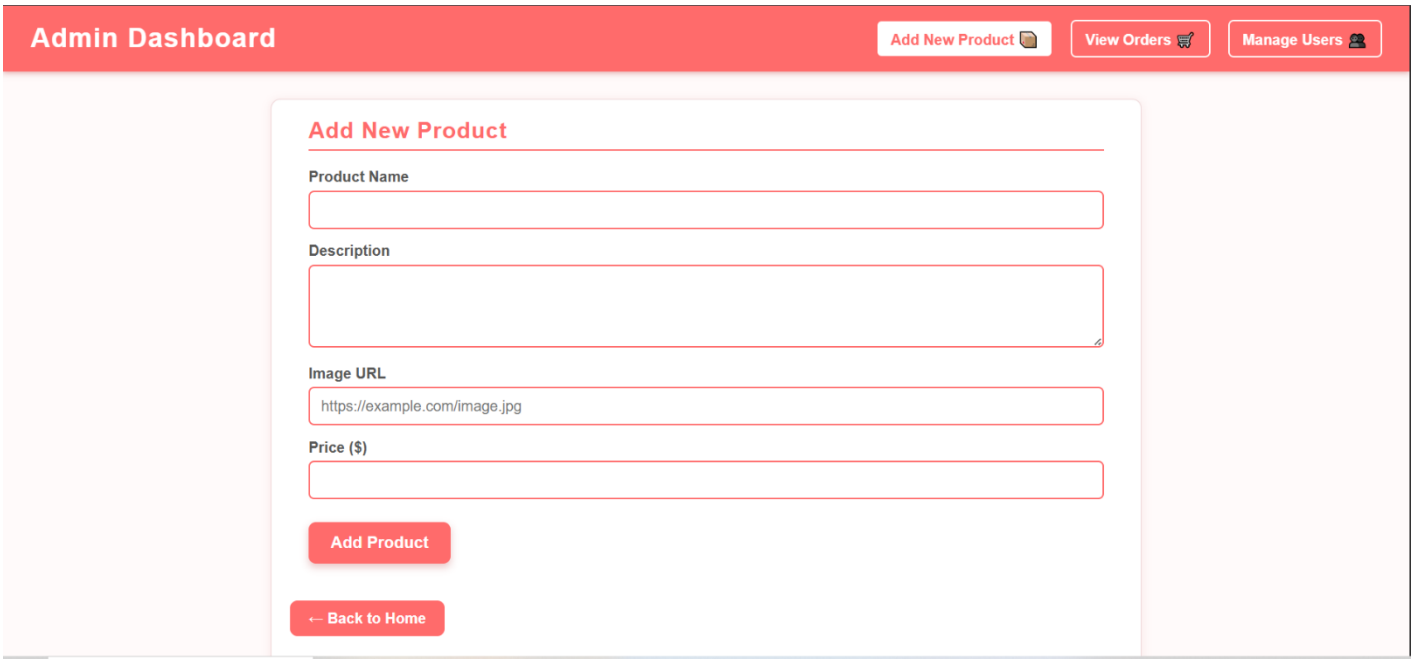

Figure 7.2.7: Admin – Add New Product

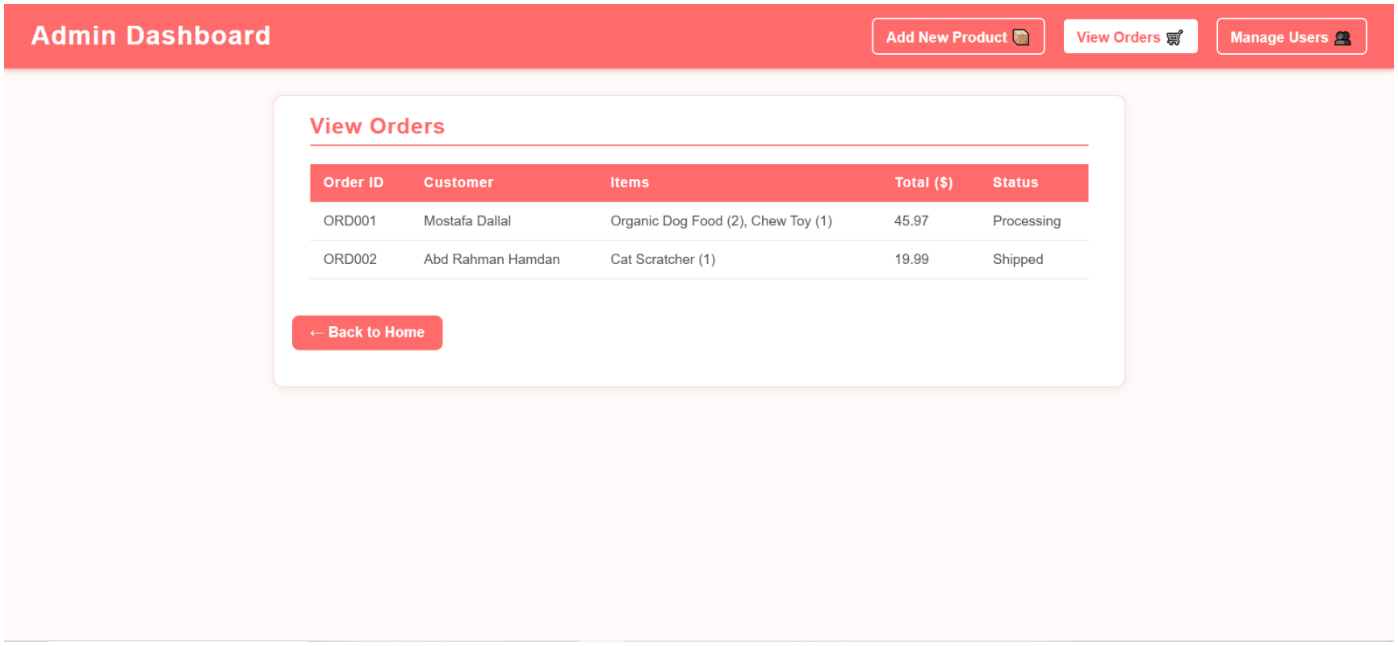

Figure 7.2.8: Admin – View Orders

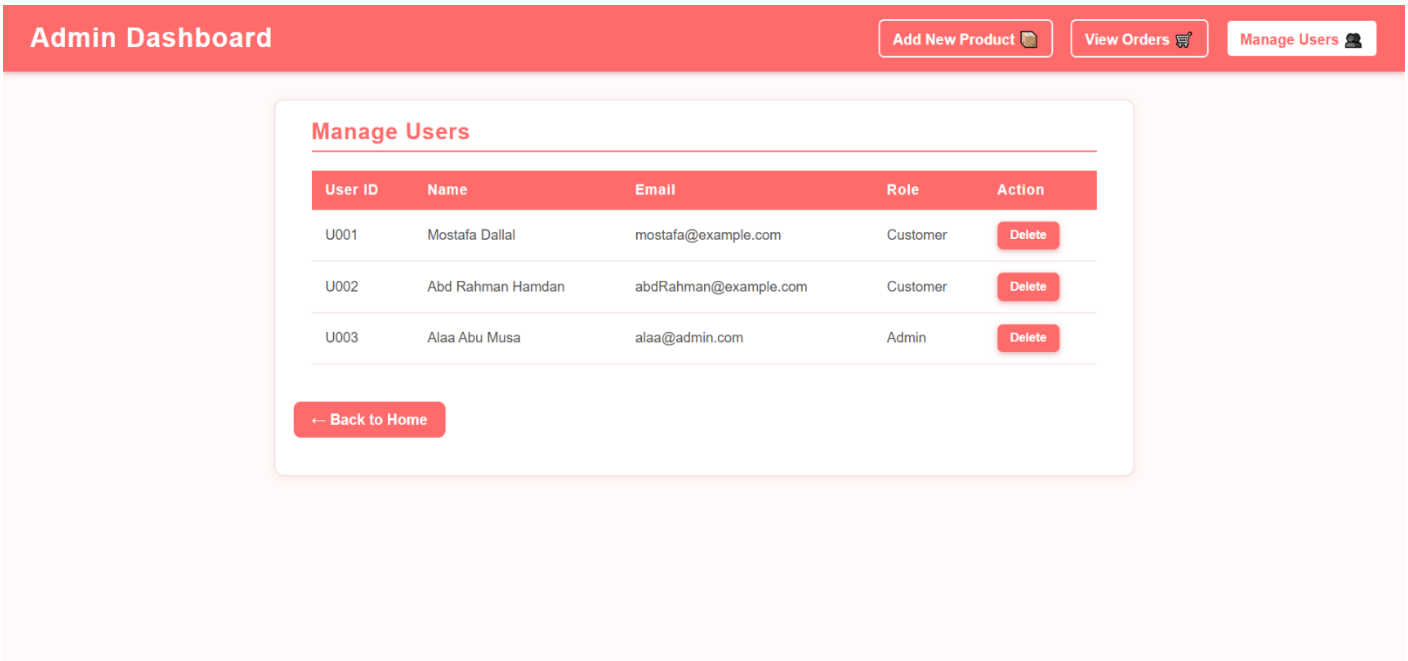

Figure 7.2.9: Admin – Manage Users

Chapter 8: Conclusion

The *Paws & Care* platform developed throughout this project constitutes a significant contribution to animal welfare and responsible pet ownership in Palestine. By combining pet adoption services with pet-related e-commerce in a single, user-friendly web-based system, the platform meets both practical and ethical needs of its intended users.

One of the key accomplishments of the platform is the streamlining of the adoption process. Users are empowered to browse pet profiles, filter results based on relevant criteria (e.g., species, age, health condition), and directly communicate with shelters or breeders. This not only enhances adoption efficiency but also increases the likelihood of animals being matched with suitable, caring homes.

In parallel, the integrated online marketplace provides access to essential pet supplies, making the platform a one-stop solution. Users can browse and purchase food, accessories, and other products, ensuring continuity in pet care after adoption.

The system's modular design and use of modern web technologies allow for future scalability and adaptability. Potential enhancements may include multilingual support, integration of veterinary services, and training program management, making the system future-proof and suitable for broader geographic deployment.

In summary, *Paws & Care* is a secure, scalable, and impactful system that meets the objectives of simplifying the adoption process, supporting pet product providers, and promoting a culture of responsible pet care. The project demonstrates how thoughtful software design can address real-world needs while remaining adaptable for future growth.

Chapter 9: Team Work and Responsibilities

9.1 Timeline Overview

Month	Week	Key Tasks Completed
March	Week 4	Initial planning, completing Chapter 1, holding 2 Zoom planning meetings.
April	All weeks	Finished Chapters 2, 3, and 4. Implemented Login, Signup, Cart, and Home UI pages.
May	All weeks	Completed Chapters 5, 6, 7, and 8. Finalized diagrams, admin panel, and all frontend logic.

The team held regular meetings to assign tasks and review progress. Collaboration and code- sharing were maintained via GitHub/Google Drive.

9.2 Individual Responsibilities

Team Member	Responsibilities
Abd Rahman Hamdan	Use Case Diagram, Activity & Sequence Diagrams, Functional Requirements, UI pages (Adoption/Cart).
Alaa Abu Musa	System Architecture, ERD, Admin Dashboard Code, Non-Functional Requirements, Documentation Layout.
Mostafa Dallal	Class Diagram, UI Design and Wireframes, Login/Signup Pages, Frontend Logic, Design Chapter 6.

All members jointly worked on final testing, formatting the SRS document, and building the final prototype. Shared contributions included bug testing, code review, and refining the visual interface.

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