University of Asia Pacific

Department of Computer Science & Engineering

Course Name: Software Engineering Lab

Course Code: CSE 322

Project Name: MewWoofBd

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Motivation and Similar Systems Already in Place:

The proposed digital pet care platform is motivated by the growing demand for convenient, tech-driven solutions in the pet industry. Pet owners increasingly seek seamless ways to manage their pets' health, access veterinary expertise remotely, and purchase medicines online. Below are two existing similar systems that validate the market need and provide insights into the feasibility of our solution:

1. Chewy (USA) – Online Pet Pharmacy & Vet Consultation

Overview:
Chewy is a leading e-commerce platform specializing in pet food, medicines, and supplies. It offers automatic refills, doorstep delivery, and a 24/7 vet telehealth service called "Chewy Health."

Key Features:

- **Online Pet Pharmacy:** Easy ordering of prescription and non-prescription medicines.
- **Telehealth for Pets:** Connects pet owners with licensed veterinarians via chat or video.
- **Automatic Refills & Reminders:** Ensures timely delivery of essential medications.
- **Pet Health Records:** Digital storage for prescriptions and vet notes.

How It Validates Our Idea:
Chewy's success demonstrates the demand for online pet medicine delivery and remote vet consultations, reinforcing the viability of our proposed solution. However, our platform goes further by integrating AI symptom checks, AR-based training, and a community forum, offering a more comprehensive pet care ecosystem.

2. PawSquad (UK/EU) – Digital Vet Consultations & Pet Care

Overview:
PawSquad is a telemedicine platform that provides instant video or chat consultations with certified veterinarians. It also offers prescription services and preventive care advice.

Key Features:

- **Instant Vet Consultations:** Connects pet owners with vets via app-based calls.
- **Prescription Services:** Vets can issue digital prescriptions for pharmacy pickup/delivery.
- **Personalized Pet Health Tips:** AI-driven reminders for vaccinations and checkups.
- **Subscription Model:** Monthly plans for unlimited vet access.

How It Validates Our Idea:
PawSquad proves that pet owners are willing to pay for on-demand veterinary care, supporting our instant consultation feature. However, our solution differentiates by integrating e-commerce (medicine delivery), digital health records, and pet training resources, making it a one-stop pet care hub.

Problem Statement: There is a pressing need for a comprehensive, digital-first solution that enables pet owners to:

- Easily purchase and receive pet medicines with doorstep delivery.
- Consult certified veterinary doctors through instant messaging, voice, and video calls.
- Access structured pet training guides to ensure proper care and behaviour management.
- Maintain digital pet health records for seamless tracking of vaccinations, prescriptions, and medical history.

Proposed Solutions:
To address these challenges, we propose the development of a comprehensive digital platform that integrates pet medicine purchasing and pet training resources. This platform will include the following key features:

1. Online Pet Medicine Store
A user-friendly e-commerce system where pet owners can browse, order, and receive pet medicines at their doorstep. Automated refill reminders for essential medications. Detailed descriptions, dosage guidelines, and vet recommendations for each product.

2. Instant Customer Consultation
24/7 access to us via chat. Emergency hotline for critical situations. AI-powered symptom checker to provide initial assessments and recommend appropriate actions.

3. Digital Pet Health Records

- A personalized pet profile where users can store and manage:
- Vaccination records
- Past medical history
- Prescriptions & treatment plans
- Growth & weight tracking
- Reminders for vaccinations and medical checkups.

4. Pet Training & Wellness Guide
Expert-curated training guides & video tutorials on pet behaviour, diet, and health care. AR-based interactive training sessions to help owners train their pets more effectively.

5. Community & Support
A community forum where pet owners can discuss issues, share experiences, and get expert advice. Lost & Found Pet Alert System to help reunite lost pets with their owners.

By integrating these features, the platform will serve as a one-stop solution for pet owners, ensuring convenient access to medicine, expert veterinary care, and proper training resources, ultimately improving the overall well-being of pets.

Target Client:

The primary target clients for this digital pet care platform include:

1. **Pet Owners** – Individuals who own pets and require convenient access to medicines, veterinary consultations, and training resources.
2. **Veterinary Professionals** – Certified vets looking for an online platform to offer remote consultations and expand their reach.
3. **Pet Stores & Pharmacies** – Businesses that sell pet medicines and supplies and want to increase their customer base through online sales.
4. **Pet Trainers & Behavioral Experts** – Professionals who offer pet training and wellness guidance and can contribute expert content or interactive sessions.

5. **Animal Shelters & Rescue Organizations** – Groups that need a structured system to manage pet health records and access affordable veterinary services.

By catering to these client segments, the platform will create a robust ecosystem that benefits both pet owners and professionals in the pet care industry.

Feasibility Analysis

1. **Market Demand & Potential**

- The pet care industry is rapidly growing, with an increasing number of pet owners seeking digital solutions for convenience.
- The demand for online vet consultations and pet medicine delivery has surged, especially post-pandemic, making this platform highly relevant.

2. **Technological Feasibility**

- The platform can be built using existing technologies such as AI-powered chatbots for symptom checking, secure payment gateways for medicine purchases, and video conferencing APIs for vet consultations.
- Cloud-based digital pet records will ensure secure and easy access to medical history.

3. **Financial Feasibility**

- Revenue streams include consultation fees, commission from medicine sales, subscription-based premium features, and advertising partnerships with pet-related brands.
- Initial investment would be required for platform development, vet onboarding, and marketing efforts, but long-term profitability is achievable through recurring revenue models.

4. **Operational Feasibility**

- Partnering with veterinary professionals and pet pharmacies will ensure a steady supply of expertise and products.
- A dedicated support team will handle customer queries, vet coordination, and logistics for medicine delivery.

5. **Scalability**

- The platform can start in a specific region and expand based on demand.
- Additional features, such as pet insurance integration and IoT-based health tracking devices, can be introduced in future updates.

By analyzing the market, technology, financial viability, and operations, this platform presents a high feasibility potential, ensuring a sustainable and impactful solution for pet care management.

Objectives & Project Output

Objectives

The primary objectives of this project are:

1. **Develop a Digital-First Pet Care Platform** – Create a seamless, user-friendly solution that integrates pet medicine delivery, veterinary consultations, training resources, and health record management.

2. **Enhance Accessibility to Veterinary Care** – Provide 24/7 remote consultations via chat with us.

3. **Simplify Pet Medicine Purchases** – Offer an e-commerce system for easy ordering, doorstep delivery, and automated refill reminders.
4. **Improve Pet Health Tracking** – Enable pet owners to maintain digital health records for vaccinations, prescriptions, and medical history.
5. **Support Pet Training & Wellness** – Provide structured training guides, AR-based interactive sessions, and expert-curated content.
6. **Build a Pet Owner Community** – Facilitate discussions, expert Q&A, and lost & found pet alerts.

Project Output

The proposed solution will be a cross-platform application (web + mobile) to ensure maximum accessibility.

1. Web Application

- **Frontend:** React.js (responsive UI for desktop & tablet users)
- **Backend:** Django (for API handling, database management)
- **Database:** DBeaver (secure cloud storage for pet & customer records)
- **Authentication:** OAuth 2.0 (secure login for users & vets)

Key Features:

- Online pet medicine store (with payment gateway integration)
- Veterinary consultation booking
- Digital pet health dashboard (prescription history)
- AI symptom checker (NLP-based chatbot for initial diagnosis)
- Community forum (discussion boards)

2. Mobile Application (iOS & Android – Cross-Platform)

- **Framework:** Flutter (for unified iOS & Android development)
- **Key Features:**
    - **Instant vet items** (API integration)
    - **AR-based pet training guides** (Description for interactive sessions)
    - **Push notifications** (for order updates)

3. Additional Components

- **IoT Integration (Future Scope)** – Wearable pet health monitors syncing data with the app.
- **Admin Dashboard** – For veterinarians, pet trainers, and store managers to manage appointments, prescriptions, and orders.

Societal Impact:

The proposed all-in-one pet care platform (combining telemedicine, e-pharmacy, training, and digital health records) will have a far-reaching positive impact on society, benefiting pet owners, veterinarians, animal welfare organizations, and the broader pet care industry.

- Improved Access to Veterinary Care
- Convenient & Affordable Pet Medicine Delivery
- Better Pet Health Management Through Digital Records
- Enhanced Pet Training & Behavioral Support

- Supporting Animal Welfare & Rescue Efforts
- Economic Benefits for Vets & Pet Businesses
- Promoting Responsible Pet Ownership

1. Basic Requirements

These are the core needs the platform must fulfill:

- **Online Pet Medicine Store** – Purchase & delivery of pet medications.
- **Pet Training & Wellness Resources** – Guides, AR training, expert advice.
- **Community & Support Forum** – Discussions, lost & found alerts.

2. Functional Requirements

These define what the system should do for users:

A. For Pet Owners

- **User Registration & Profile Management**
    - Sign-up/login (username, password).
    - Create & manage pet profiles (breed, age, medical conditions).
- **E-Commerce Features**
    - Browse, search, and filter pet medicines.
    - Order medicines with secure payment (Bkash/Nagad).
    - Auto-refill reminders & order tracking.

B. For Veterinarians

- **Vet Onboarding & Verification**
    - Submit credentials for admin approval.

C. For Admin

- **User & Vet Management**
    - Approve/reject vet registrations.
    - Handle user complaints & disputes.
- **E-Commerce & Inventory**
    - Manage product listings & stock.
    - Process refunds & cancellations.
- **Analytics & Reports**
    - Monitor sales, consultations, user engagement.

3. Technical Requirements

A. Design Process Model: Agile (Scrum) + DevOps

Why Agile?

- **Iterative Development** – Frequent releases (MVP → feature additions).
- **User Feedback Integration** – Continuous improvements based on real usage.
- **Flexibility** – Adapt to changing market needs (e.g., adding pet insurance later).

Why DevOps?

- **Faster Deployments** – CI/CD pipelines for seamless updates.
- **Automated Testing** – Ensures stability before release.
- **Scalability** – Cloud-based deployment (AWS/Azure) handles growing users.

B. Software Architecture: MVC (Model-View-Controller)

Why MVC?

- **Separation of Concerns**
  - **Model** (Database logic – PostgreSQL).
  - **View** (UI – React.js).
  - **Controller** (Business logic –Django).

    Easier Maintenance – Teams can work on different layers independently.
    Scalability – New features (e.g., AR training) can be added without disrupting core functions.

Alternatives Considered:

- **MVVM (for Mobile Apps)** – Useful for reactive UIs (Flutter uses it internally).
- **MVT (Django's Model-View-Template)** – Simpler but less flexible than MVC.

4. Additional Technical Considerations

- **APIs & Integrations**
  - **Payment Gateway** (Bkash/Nagad).
- **Security**
  - **Data Encryption**.
  - **Role-Based Access Control** (Owners, vets, admins have different permissions).

Methodologies:

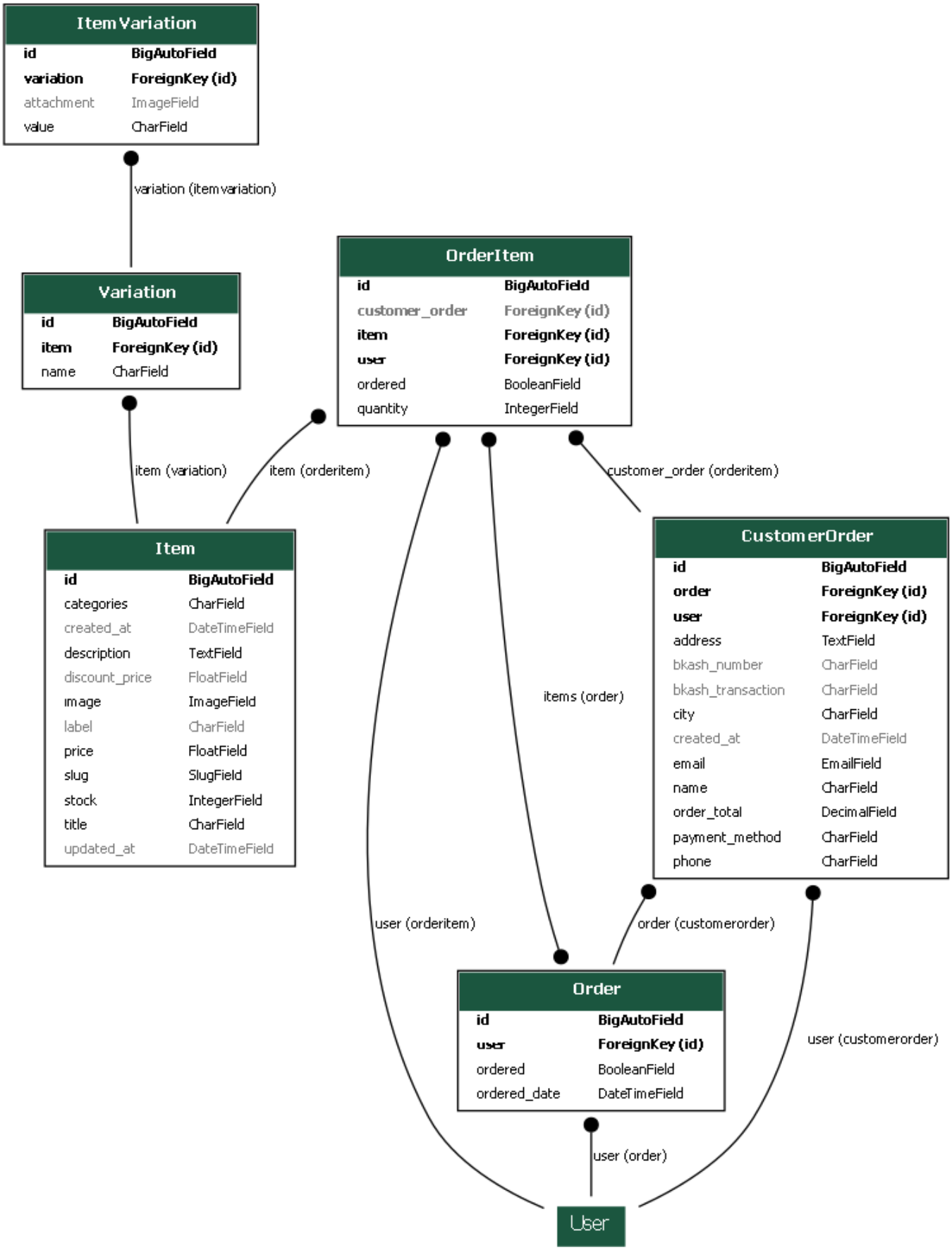


Fig: ER Diagram

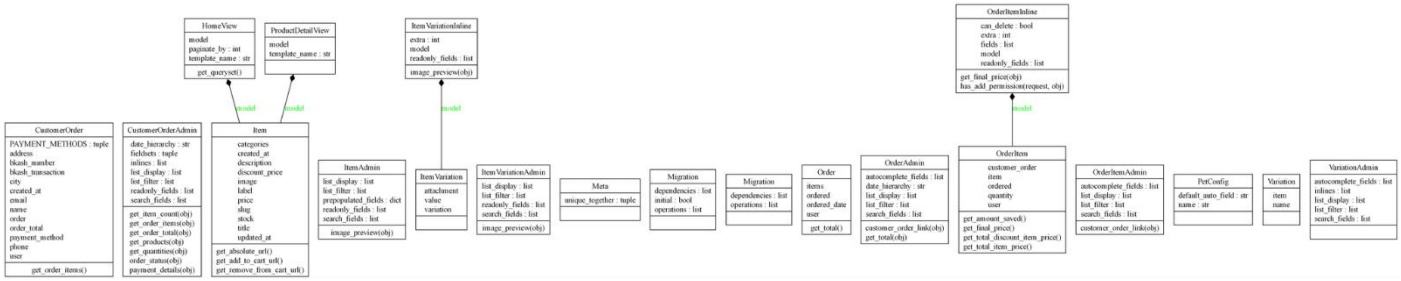


Fig: UML Diagram

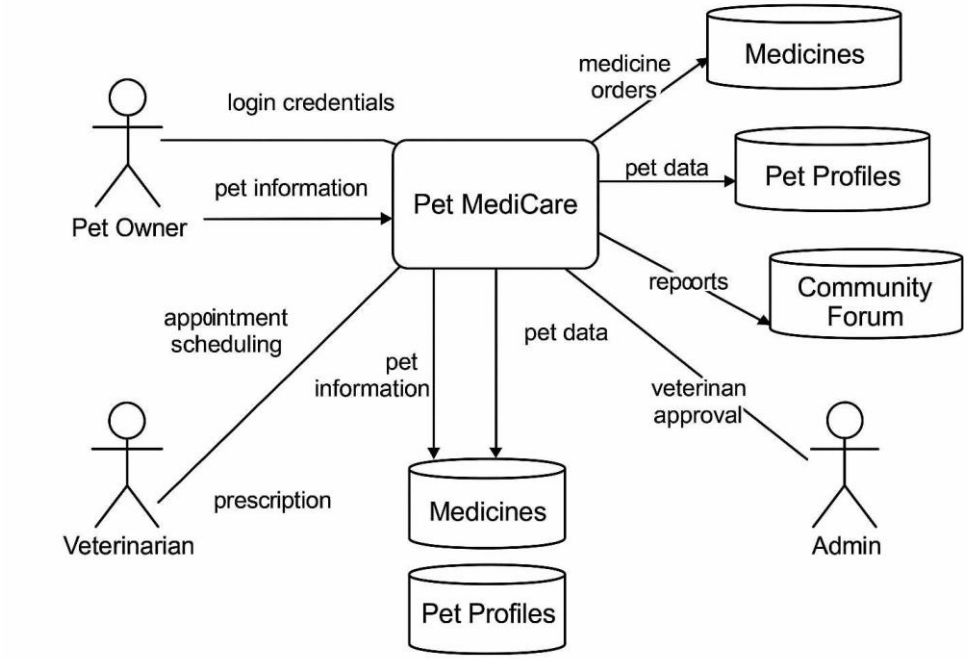


Fig: DFD Diagram

Software Process Model: Agile + DevOps

- **Agile Methodology (with Sprints):**

Your project is well-suited for Agile Development, particularly using Scrum. Agile allows for:

  - Quick adaptation to changes (e.g., new feature requests)
  - Incremental delivery (e.g., Order system first, then Cart, then Admin panel)
  - Frequent collaboration with stakeholders (e.g., veterinarians, pet shop owners)

- **Sprint Breakdown Example (2 Weeks Each):**

Sprint	**Deliverables**
Sprint 1	Setup Django project, user registration/login
Sprint 2	Develop Item & Variation models, Item display view
Sprint 3	Implement Cart & Order models with checkout logic
Sprint 4	Create Admin dashboard with model inclines
Sprint 5	Add customer order handling (address, payment, email)
Sprint 6	Testing, deployment, and API integration (e.g., payment gateway)

- **DevOps Integration (CI/CD Pipeline):**
  - **Version Control**: GitHub/GitLab
  - **CI/CD**: Selenium for automatic testing/deployment
  - **Deployment**: Render
  - **Monitoring**: Django logging + Sentry for error reporting

Sample Selenium Codes:

```
driver.save_screenshot("login_form.png")
time.sleep(2)

# Fill in the login form
username_input = driver.find_element(By.NAME, "username")
password_input = driver.find_element(By.NAME, "password")
username_input.send_keys("rifatt")  # Username: rifatt
password_input.send_keys("rifat112233")  # Password: rifat112233

# Screenshot 3: After filling the form
driver.save_screenshot("form_filled.png")
time.sleep(1)

# Submit the form
submit_button = driver.find_element(By.XPATH, "//button[@type='submit']")
submit_button.click()
time.sleep(3)

# Screenshot 4: After successful login, home page
driver.save_screenshot("home_page_after_login.png")

# Close the browser
driver.quit()

```

test_login_selenium.py

```python
from selenium import webdriver
from selenium.webdriver.chrome.service import Service
from selenium.webdriver.common.by import By
from selenium.webdriver.common.keys import Keys
from selenium.webdriver.support.ui import WebDriverWait
from selenium.webdriver.support import expected_conditions as EC
import time

# ChromeDriver path
service = Service(r"E:\chromedriver-win64\chromedriver-win64\chromedriver.exe")
driver = webdriver.Chrome(service=service)
wait = WebDriverWait(driver, 15)

# 1. Login Page
driver.get("http://127.0.0.1:8000/userLogin/")
time.sleep(2)
driver.save_screenshot("1_login_page.png")

# 2. Fill Login Form
driver.find_element(By.NAME, "username").send_keys("rifatt")
driver.find_element(By.NAME, "password").send_keys("rifat112233")
driver.save_screenshot("2_login_filled.png")
driver.find_element(By.XPATH, "//button[@type='submit']").click()
time.sleep(3)
```

test_login_selenium.py

```python
from selenium import webdriver
from selenium.webdriver.chrome.service import Service
from selenium.webdriver.common.by import By
import time

# ChromeDriver path
service = Service(r"E:\chromedriver-win64\chromedriver-win64\
driver = webdriver.Chrome(service=service)

# Start the Django site
driver.get("http://127.0.0.1:8000/")

# Screenshot 1: Login page loading
driver.save_screenshot("login_page.png")
time.sleep(2)

# Click on the login link
login_link = driver.find_element(By.LINK_TEXT, "Login")
login_link.click()

# Screenshot 2: Login form loading
driver.save_screenshot("login_form.png")
time.sleep(2)

```

Final Results:

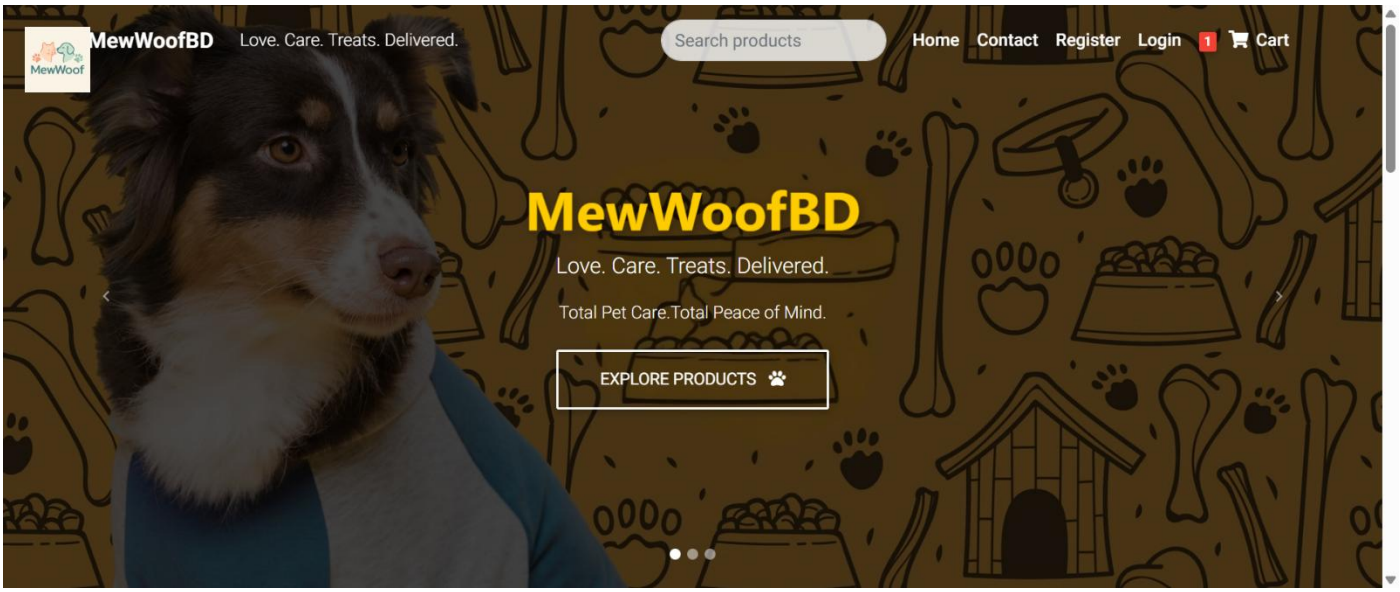


Fig: Home page

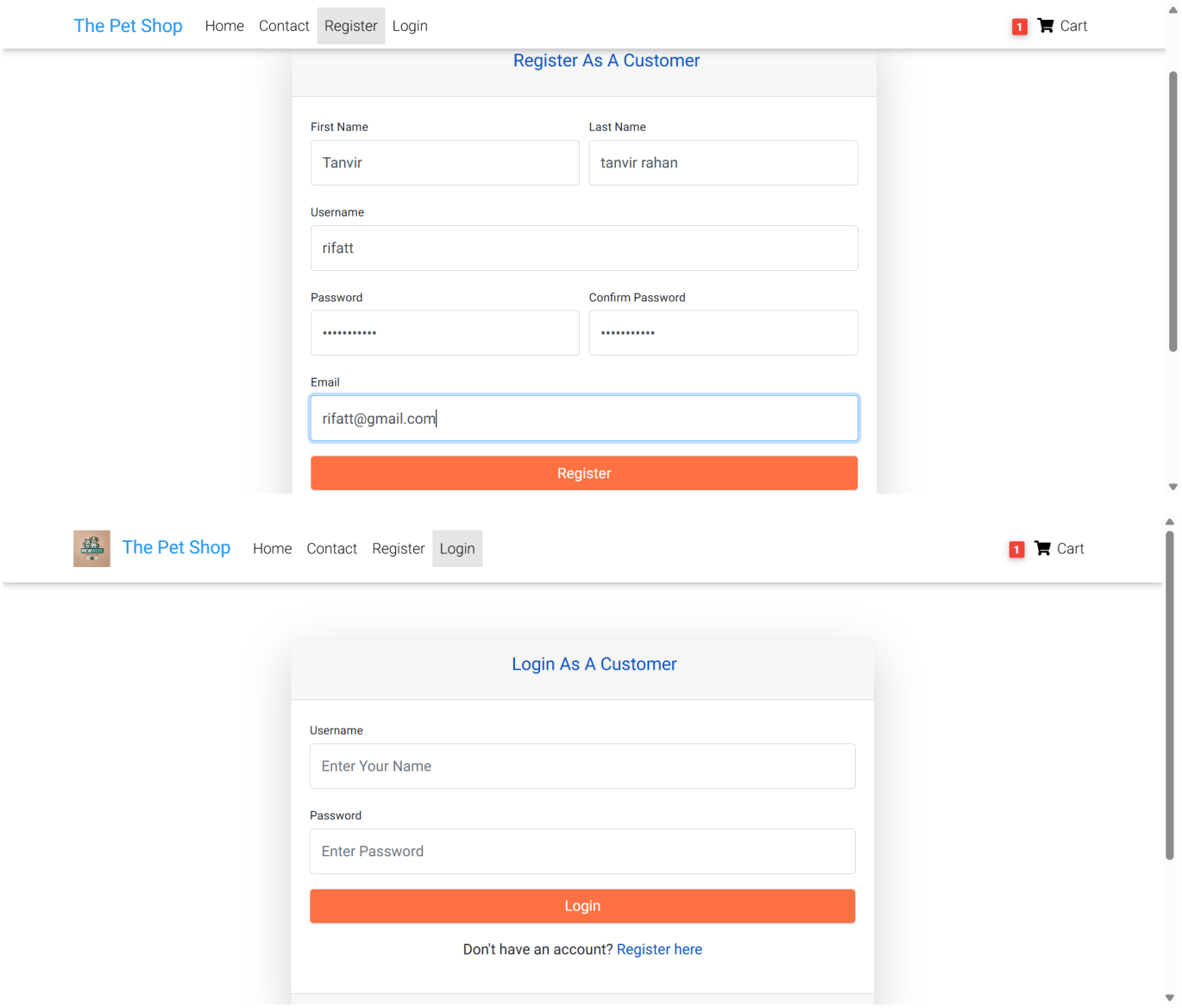


Fig: Login Section

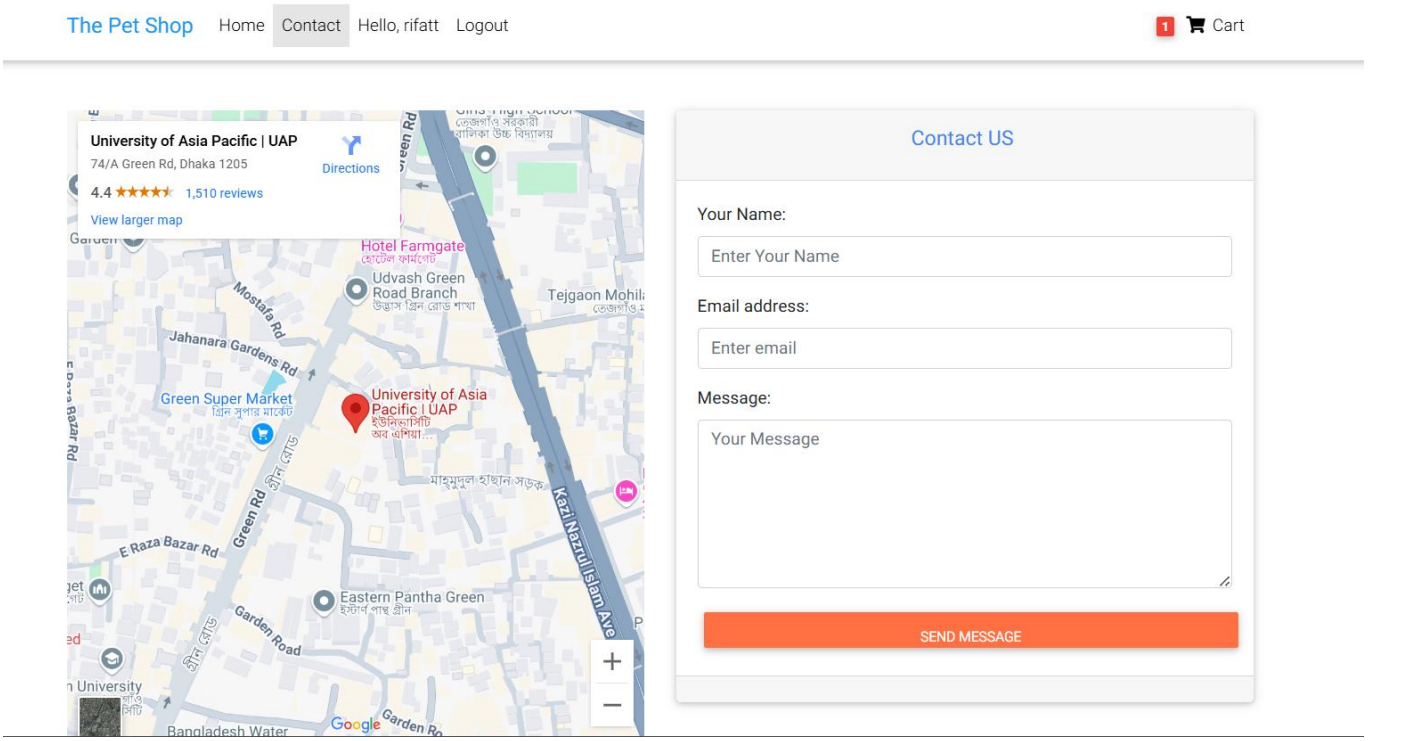


Fig: Contact section

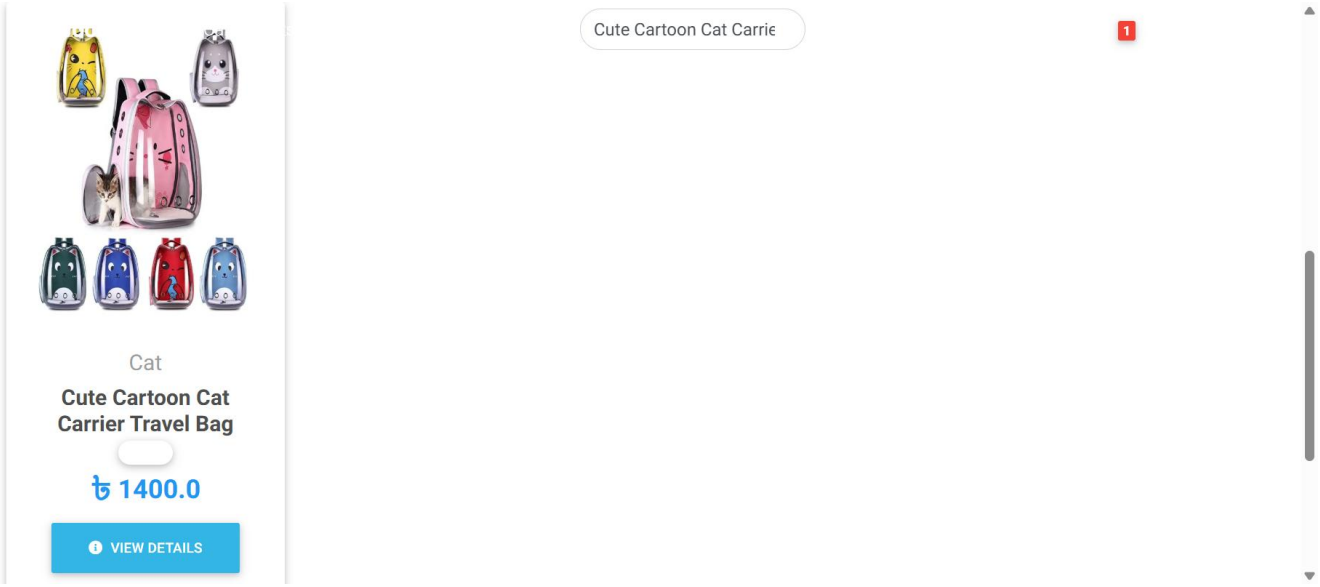


Fig: Search Operation

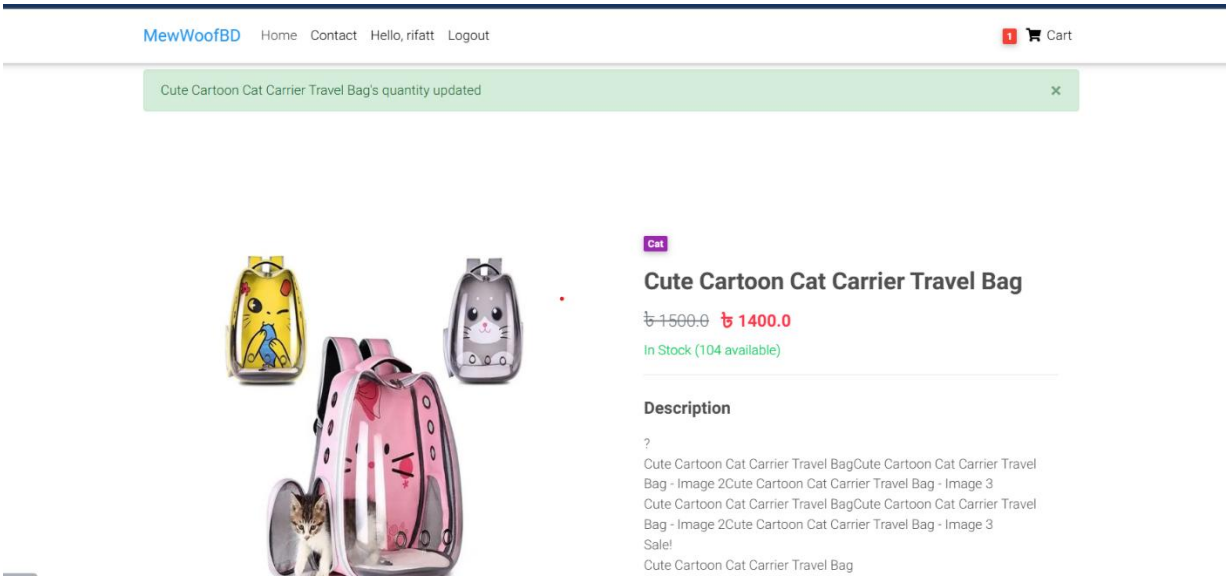
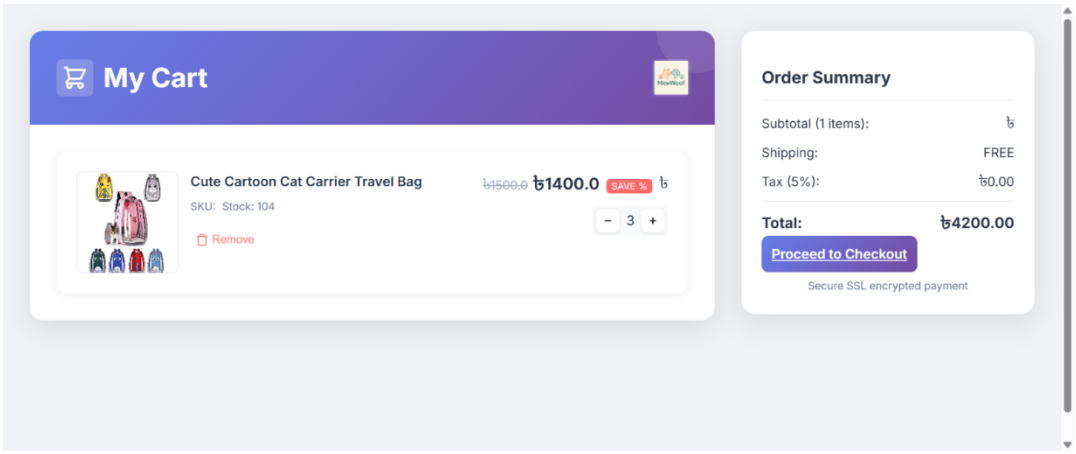


Fig: Item Details



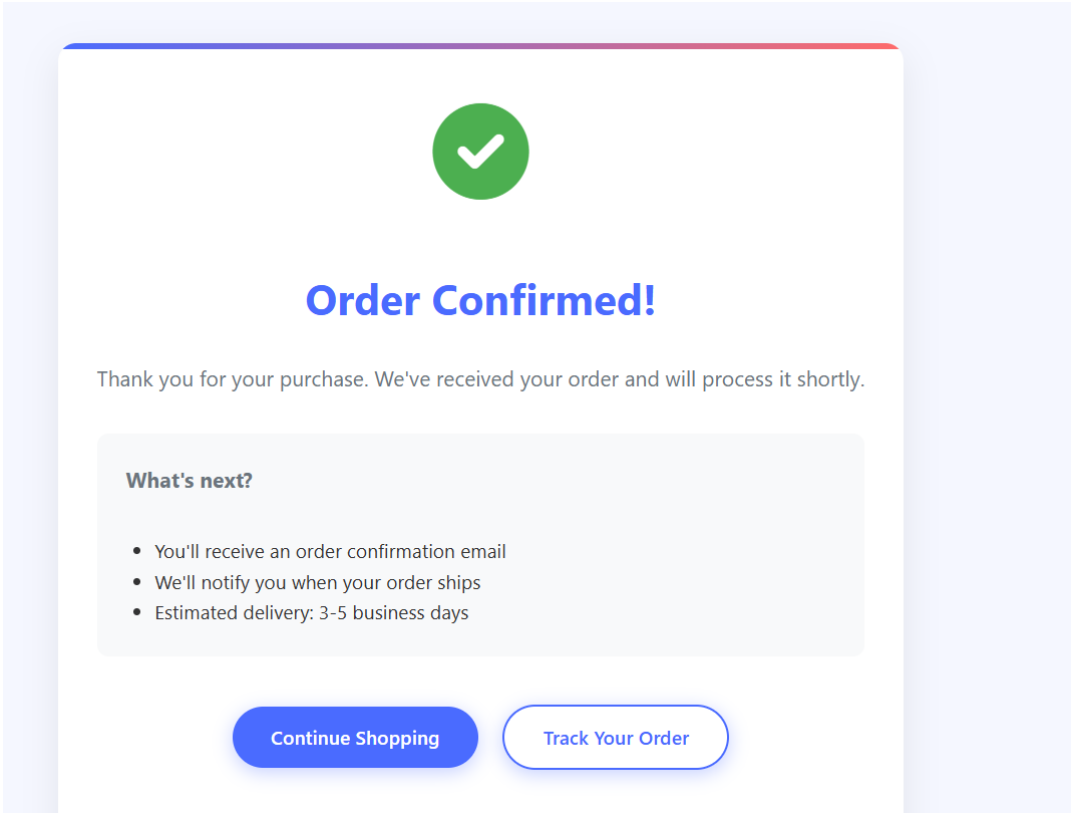


Fig: Order Confirmation page

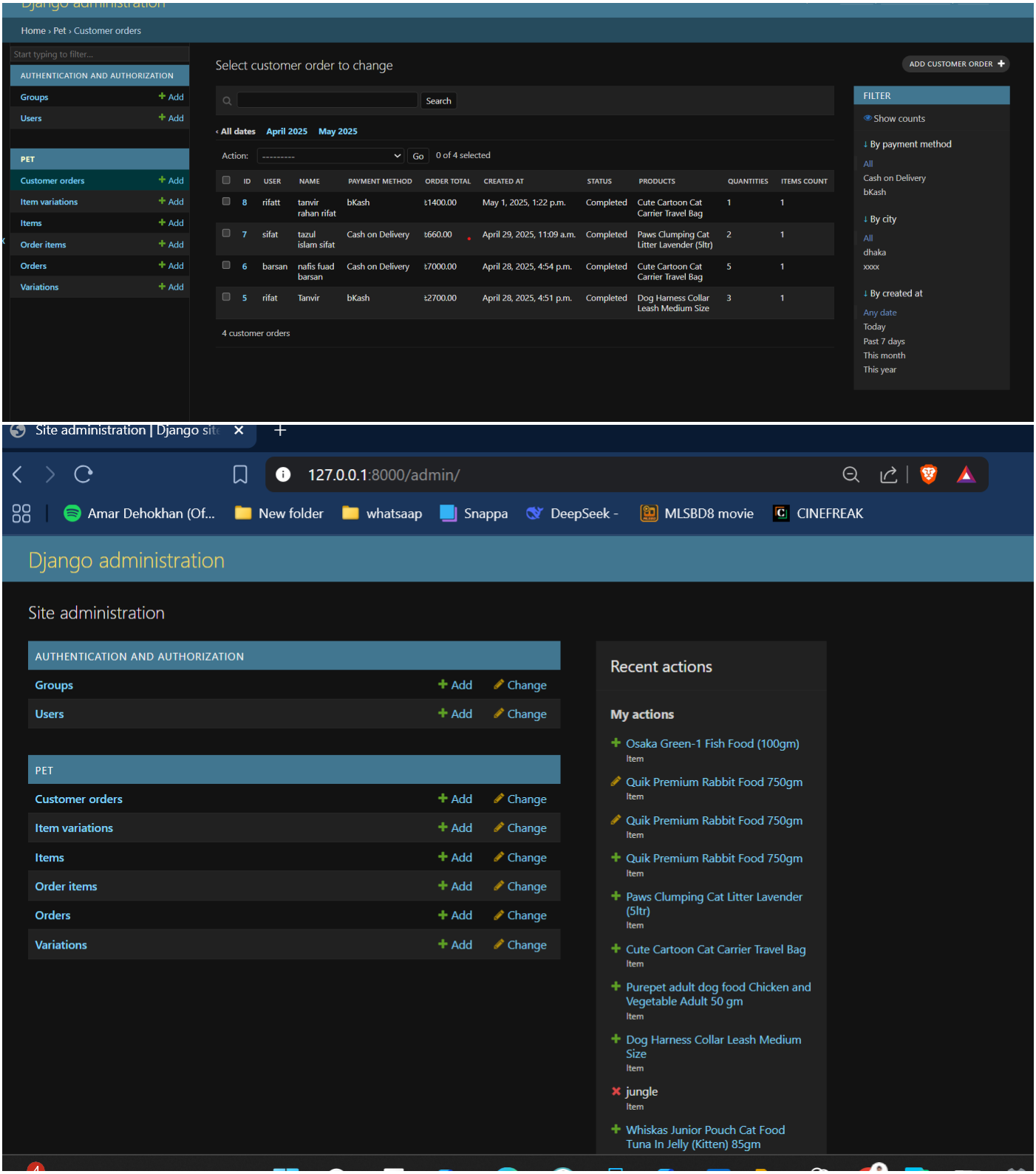


Fig: Django-admin panel

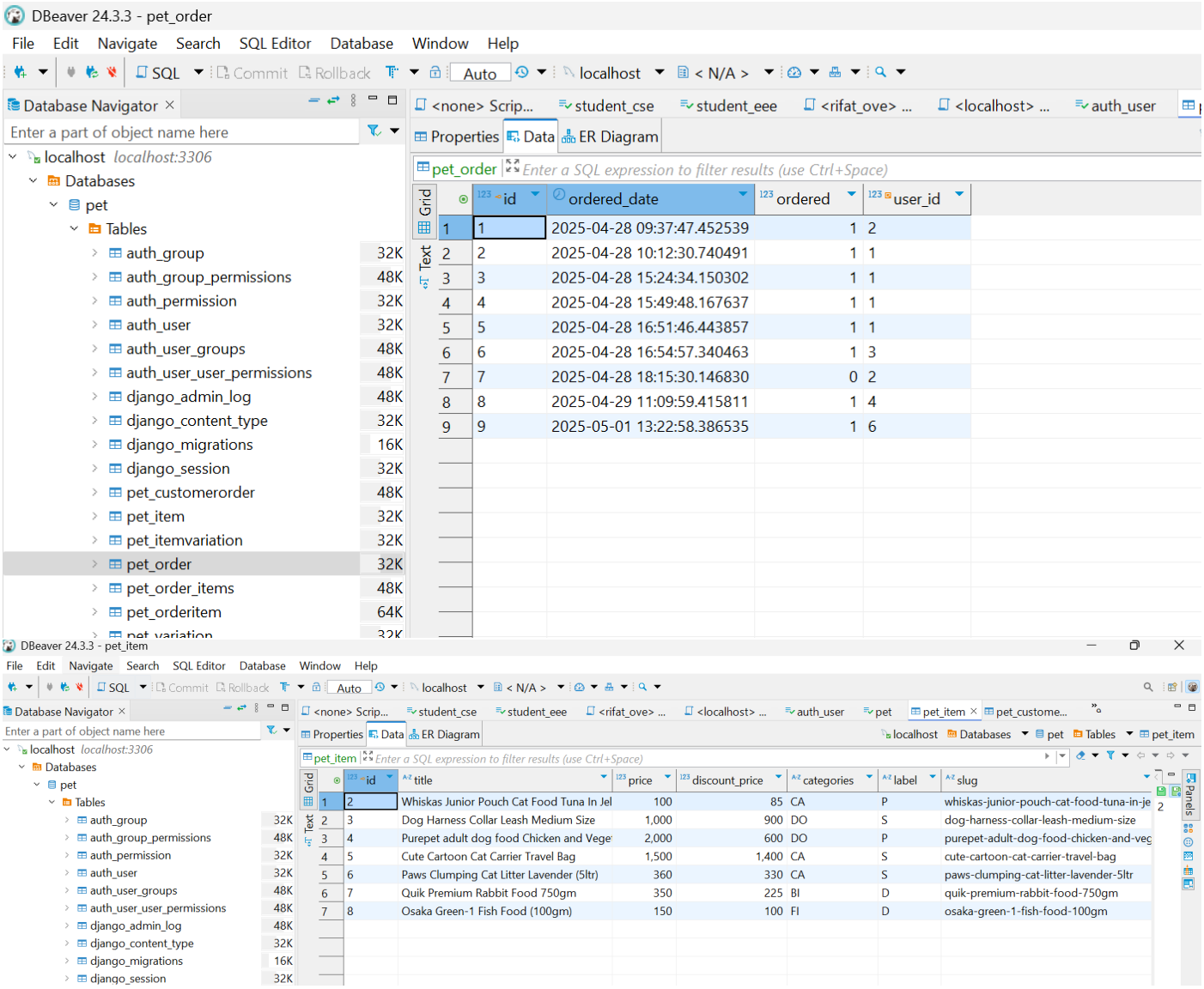
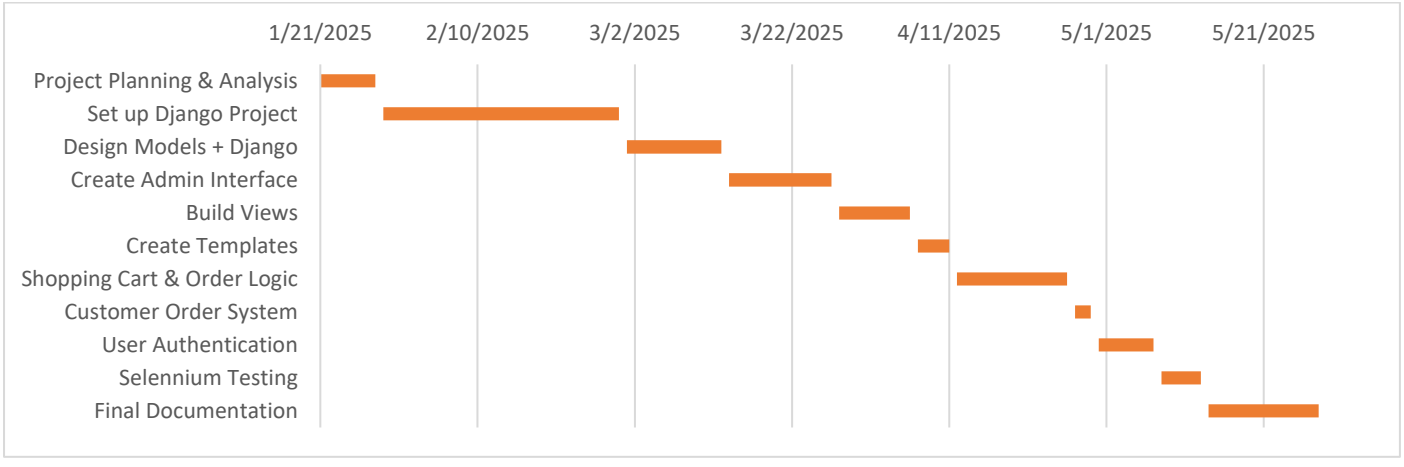


Fig: Dbeaver database linked to our project site

Project Management:



Gantt Chart of our project execution timeline.

Project Timeline Table

Tasks	Start Date	End Date
Project Planning & Analysis	1/21/2025	1/28/2025
Set up Django Project	1/29/2025	2/28/2025
Design Models + Django	3/1/2025	3/13/2025
Create Admin Interface	3/14/2025	3/27/2025
Build Views	3/28/2025	4/6/2025
Create Templates	4/7/2025	4/11/2025
Shopping Cart & Order Logic	4/12/2025	4/26/2025
Customer Order System	4/27/2025	4/29/2025
User Authentication	4/30/2025	5/7/2025
Selenium Testing	5/8/2025	5/13/2025
Final Documentation	5/14/2025	5/28/2025

K-Mapping:

Course Outcome	**Knowledge Level (K)**	**Mapped Knowledge Description**
CO1	K3 (Apply)	Apply Django framework to build modular apps
CO2	K4 (Analyze)	Analyze user roles, product models, and order workflows
CO3	K5 (Evaluate)	Evaluate different Django ORM and admin customizations
CO4	K6 (Create)	Design and create end-to-end pet e-commerce platforms

P-Mapping:

Performance Indicator (P)	**Mapped Activity**	**Project Integration**
P1	Write reusable, testable Django views and models	Core backend logic in Order, Item modules
P3	Deploy and maintain software using Git versioning & sprint tasks	Git commits, sprint-based Agile workflow
P7	Demonstrate UI/UX consistency and API response integration	Frontend + Django REST Framework for APIs

A-Mapping:

Attitude Indicator (A)	**Mapped Attitude**	**How it's Reflected in Project**
A1	Discipline and responsibility in project collaboration	Task allocation, version control, sprint deadlines
A4	Open-mindedness and adaptability to feedback and change	Iterative feature updates based on peer reviews & testing

Conclusion:

The Pet Medicare project successfully demonstrates a full-stack e-commerce solution tailored for pet health and product management. Built using Django and Django REST Framework, this system includes robust modules for product variation management, customer orders, cart and checkout operations, and dynamic admin functionalities. The project also integrates modern development practices like Model-View-Template (MVT), Admin customizations, API development, and responsive frontend rendering.

By leveraging an Agile software process with sprint-based development, each module was designed, tested, and deployed incrementally, ensuring flexibility, continuous integration, and better collaboration among team members. Key features like order tracking, payment processing, and inventory handling provide a real-world simulation of a scalable and functional pet e-commerce platform.

Moreover, version control and task automation via GitHub enhanced development transparency and deployment efficiency, while the modular approach made the codebase easy to extend. The use of ER diagrams and class structures helped maintain clean database normalization and efficient data relations across components.

In conclusion, this project not only meets the technical and functional requirements of a modern pet product management system but also showcases the practical implementation of real-world software engineering concepts, setting a strong foundation for future enhancements such as mobile app integration, real-time notifications, or AI-powered product suggestions.