Cuddle Care Management System: Smart Solutions for Pet Care

BY

Muhaimin al Shihab
ID: 211-16-554

This Report was Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Computing and Information System (Major AI in IoT)

Supervised By
Md. Mehedi Hassan
Lecturer (Senior Scale)
Department of Computing & Information Systems
Faculty of Science & Information Technology
Daffodil International University

DEPARTMENT OF COMPUTING AND INFORMATION SYSTEM
DAFFODIL INTERNATIONAL UNIVERSITY
DHAKA, BANGLADESH
12 JANUARY 2025

Approval

This Project titled **"Cuddle Care Management System: Smart Solutions for Pet Care"**, Submitted by Muhaimin Al Shihab, ID No: 211-16-554 to the Department of Computing and Information Systems, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computing & Information Systems and approved as to its style and contents. The presentation has been held on 12-01-2025.

BOARD OF EXAMINERS

12.01.25

Md Sarwar Hossain Mollah — **Chairman**
Associate Professor and Head
Department of Computing & Information Systems
Faculty of Science & Information Technology
Daffodil International University

12.01.25

Md. Nasimul Kader — **Internal Examiner**
Assistant Professor
Department of Computing & Information Systems
Faculty of Science & Information Technology
Daffodil International University

12.01.25

Md. Mehedi Hassan — **Internal Examiner**
Lecturer (Senior Scale)
Department of Computing & Information Systems
Faculty of Science & Information Technology
Daffodil International University

Anowar Hossain — **External Examiner**
Founder & CEO at DocTime

Declaration

I hereby declare that; this project has been done by me under supervision of **Md. Mehedi Hassan, Lecturer (Senior Scale)**, department of Computing and Information System (CIS) of Daffodil International University. I am also declaring that this project or any part of there has never been submitted anywhere else for the award of any educational degree like, B.Sc., M.Sc., Diploma or other qualifications.

Supervised By

12.07.25

Md. Mehedi Hassan
Lecturer (senior Scale)
Department of CIS
Daffodil International University

Submitted By

Shihab

Name: Muhaimin Al Shihab
ID: 211-16-554
Department of CIS
Daffodil International University

Acknowledgement

First and foremost, I would like to express my gratitude to Almighty Allah for providing me with this incredible opportunity to learn and grow. Without His guidance and support, I would not have been able to complete this project and all the associated tasks.

I am immensely thankful to EGO Digital Ltd. for giving me the chance to work as an intern trainee, as it has been a valuable learning experience for me. Throughout this internship program, I have gained a wealth of knowledge and skills, especially in regards to new technologies and industry practices.

I am deeply indebted to my senior developer team and Project manager who served as my intern trainer, and Md. Mehedi Hassan, My academic supervisor. Their unwavering support, guidance, and encouragement have been instrumental in my professional development. They have always been there to provide the right advice, help me make informed decisions, and inspire me to overcome challenges.

I am sincerely grateful to them for their kindness, assistance, and belief in my abilities. Their mentorship has not only helped me navigate through difficult tasks but has also taught me how to excel in demanding situations and handle large-scale projects in the future.

Abstract

Cuddle Care is a totally novel and innovative online business of pet consultation and adoption of various diseases that will be run from artificial intelligence. It has the disease diagnosis of pets from the signs, breed, age, and many other health factors with the proper aid of artificial intelligence as well as complex machine learning. In simple terms, using the vast data of the histories of their pets, the AI model is prepared to diagnose not only ordinary diseases but also exotic ones. External attributes of Cuddle Care are: For the website frontend, we have React for easy navigation, sign-in for users securely, and Firebase for handling the Cuddle Care data in real-time and arranging the user vets. Some of the components include Pet's health record, appointment calendar this allows users to schedule a Consultation with the Vet and Pet adoption services. By means of the admin panel, veterinarians and administrators can schedule meetings; evaluate the activity of users and the health state of the pets. How ever Cuddle Care also has mobile and web design for the firm to make it even more convenient for clients who have Internet only access. While tying up with AI which is the most visible today and incorporating it with the best back end solutions, Cuddle Care is in progress to build a large-scope solution for the new approach of pet care and the enhancement of the range and the quality of veterinary services. This platform is to improve how consultations or follow-ups of animal health are conducted to increase both number and the rate at which the pets are adopted and in general to offer pet care in a better, reliable and friendly manner.

Table of Contents

List of Figures:

List of Tables:

Chapter 1: Introduction

1.1 Introduction

Cuddle Care is on-trend idea in the market which increases the quality of pets and their owners' life by providing services in different field including pet caring, adopting and healthcare. For the users and the admins, Cuddle Care was created with the purpose of helping manage important tasks pertaining to the pet's care and also foster a positive community. It is easy to use to make appointment and check pet related activities through the icon and participation on adoption. The following are some of the metrics that are displayed on the application's home screen: Appointments, orders, saving and pets. Also, the visiting card contains the information about the possibility of changing the account data, availability of the appointments with the veterinarians and the accounts of the opportunities to select and adopt one of more animals from the specified set stated at the website. This is especially helpful for administrators who receive a much better admin panel that includes user management, payments, consultations, medicines restocking, and adoption applications. Firebase and MongoDB are used for secure and real time data handling whereas React and Tailwind CSS are used for highly scalable and clean interface. This is further supported by the fact that the home page of Cuddle Care, as shown below, contains testimonial, service offered, blog and some images of pets. It has solid ground to offer capacities for additional advancements, and favorable features like real-time updates, API integration, and variable interface segments improve the productivity. Utilizing the up-to-date technologies and focusing on utility, Cuddle Care cuts off the connection between buyers and supplies, becomes the unchangeable platform to find pets and ensure that those found pets will have better lives.

The key purpose for the creation of the platform is to provide an accurate diagnosis of various diseases in animals with the help of AI. Therefore, Cuddle Care is versatile and would make a perfect handy tool for any mid/end-20s pet owner and everyone else who would like to successfully provide their pets with the necessary care.

1.2 Purpose of Project

- In addition to that, the primary purpose of utilising Cuddle Care is to design a central platform where the user and administrators can access all the needed material for pet care, pet adoption and pet healthcare services.

- Besides that, the main purpose of utilizing Cuddle Care is to construct one united platform where the user and the administrators can obtain all the relevant information regarding the pets' care and treatment, pet adoption as well as veterinary services.

- Thus, Cuddle Care serves as an important platform to bring people with pets so that they can either adopt a pet or get some information concerning pet health and care.

- For this, it has the current technologies for update the information in real time, payment mode is secured and it is responsive for easy access.

- Animal rights are also endorsed in Cuddle Care while the clients receives clear information about adopting new pets.

- Last of all the project's aim is to become the sole supplier of pets and services related to pets for people blotting out the existing gap.

.

Chapter 2: Initial Study

2.1 Project Proposal

Indeed Cuddle Care is purposely designed mobile app that intends to offer support to people with related issue of pets, their adoption and health care. The need for a comprehensive program which will cater for the needs of the consumers, the practitioners and administrators has thus become inevitable hence the project. With the new technologies of typescript, react, firebase and mongodbd, Cuddle Care has the opportunity to exercise secure, efficient, and real time tasks concerning pets. This means that users can obtain appointment services, pet adoption services, profile services, consulting services among others from Cuddle Care. Employees benefit from what they are able to do under the admin dashboard; they get to create users, payment, consultations, medicines, and adoption applications. It is easy on the eye and user-friendly, friendly response to menu and friendly way of real time notification. In this regard, Cuddle Care avails itself in all the defined roles since it brings together the community and pet owners, as well as service providers for a range of solutions regarding pets.

2.2 Project Scope

The goal of Cuddle Care project is to create a comprehensive pet care application unlike any other with fangs of breed, gender, color, age, personality, health, etc of the pet, specifically the owners of the pet, veterinarians and administrators. It mainly envisages that the application will be a single portal to manage the health, adoption, consultations, and administrative work of pets through a user-friendly web application. The options for the users – pet's owners will be the options for registration of the profile, appointment booking session with the veterinarians, pet adopting, and artificial smart intelligence disease diagnosis for pets. ADOPT Pets will be displayed with the health score and status of the pet together with consultants presence and appointments for the pet owned by the customer will also be displayed. For veterinarians the app will enable the handling of consulting, booking, status and record on the health of the animals. The reported IV epidemiology suggests that the possibility of using artificial intelligence to address possible condition risks will improve the care of pets by veterinarians. From the administrator's PERSPECTIVE, they will be able to handle user management, payments acceptance, consultation booking, prescription management, and adoption requests all in one single panel here at Cuddle Care. The few functions that investigate administrators will be able to perform through the platform are to monitor the statistics of the platform, payment processing and account management, blocking or unblocking of accounts. This project shall incorporate new technologies such as TypeScript, React, Firebase, MongoDB leading to scalability, accessible real-time data and being device-adaptable. To the consumers Cuddle Care will position itself to be the ultimate point of call for all pet care service needs while also affording consumers the best technological method and professional service.

2.3 Background of the project

It was from this revelation that Cuddle Care was then devised seeing that the pet care industry really lacks sound and realistic efficiencies. As the number of people owning pets rises across the globe, there will be higher expectations placed on markets, which offer materials that help one to look after one's pets; find adoption services or obtain simple consultation services. Furthermore, as an interlocutor of digitally advanced healthcare devices and technologies, artificial intelligence appeared in the pet care market, with information technologies' application in daily care for pets being a vital requirement. Current, there are numerous application for pet care but mostly they are not fully functional or not compatible with other applications used in taking care of pets. There are applications that are specific to adoptions, like, for example, Petfinder or applications for consultation and health control, such as Pet Desk, Paw track. Nonetheless, there is no efficient provider of coordinated services akin to disease identification by Artificial Intelligence, its implementation, and advisory services and administrative work required in handling the users and their payments, and other relevant assets. Thus, we can see ourselves in fulfilling the above mentioned need by launching Cuddle Care – the application that will meet the needs of both the average pet owner and specialists. AI in health diagnostic, real time updates and complete administrative control make Cuddle Care different which sets Cuddle Care a preferred platform for pet care other than the existing ones.

2.4 Objective

- The main aim of Cuddle Care is to develop a site that will contain all known features beneficial in handling pets and services related to pets to the pet owners, veterinary services or administrators. The platform aims to achieve the following specific goals:

- Provide a Unified Pet Care Solution: Health monitoring of pets, adoption services, hire a vet, and administrative work in one application.

- Leverage AI for Disease Detection: Implement the use of AI to solve the illnesses probable in pets so that pet owners and vets can act adequately for overall pet well-being.

- Streamline Appointment and Consultation Management: Optimise consulting documentation and management targeting pet owners and veterinarians, enhance functionality, increase the efficiency, and nearly eliminate wait time during consultation.

- Enhance User Experience: While creating, architecture and designing the platform GUI, use the ultimate concepts of innovative technologies such as React, Bootstrap, and stimulate Daisy UI.

- Empower Administrators with Robust Tools: Create appropriate infrastructure system of information presentation and the control of users and their payments and consultations, and applications to adoption along with a section where administrators will be able to track the functioning of the platform.

Chapter 3: Review of Literature

3.1 Examining the problem domain in light of the available solution

Its applicability lies in the sphere of the problem area related to the creation of information support system for pet care and their health needs, adoption services, and consultations. There are existing conventional products in the market which exist to compliment pet needs but no company offers integrated system as what Cuddle Care wants to introduce. For instance, while Petfinder is chiefly an adoption site and Pet Desk is mainly concerned with scheduling and record keeping, Pawtrack comes with a tracking device in the form of a GPS cat collar but boasts no sections that have to do with the health of the pet or where one can adopt one. Further, Banfield Pet Hospital Pet Portal has Health Management & Appointments options, but there's no 'Pet finding' or 'Diagnosis' tab as well. In features unobserved in other current platforms for contemporary pet care, Cuddle Care has disease detection by AI, adoption services, consultation actions, and administration that the existing software does not offer. Integration of functions is also implies that real time update, responsiveness and usability are on the convenience of pet care and enhances its importance.

3.2 Discussion on problem solution based on available solution

Cuddle Care identifies several issues with the current pet care state and plans to provide all marked lacks in the form of the Cuddle Care platform. The currently existing solutions for pet management are somewhat connected, with some offering adoption (Petfinder), or health management (PetDesk), or tracking (Pawtrack) but the useful options do not come in the same application. Cuddle Care addresses this issue because with the use of disease detection, appointment setting, adoption features and more so because the database is constantly updated all of them exist in a single interface. AI-based disease identification in pets is far better than other channels in pet care that enhance the Health assessment approach to diagnose diseases at early stages and enhance the prevention process. This paper explains that Cuddle Care as filling in pet symptoms and health information with machine learning makes it easier for people and vets to make decisions who had none before. In addition, Cuddle Care has been using Firebase and MongoDB for real time database integration with all the active features which only allows the users to get updated with most recent data and provided full featured interfaces to Cuddle Care administrators for managing user, payment and consultation data. Features like React, Tailwind CSS, and Daisy UI are used to strengthen and refresh the capability of making a site compatible with any device in use. Therefore, Cuddle Care builds on the customer experiences on the fragmented pet care services and fills in the gaps created by existing marketplace.

3.3 Recommended Approach

AI Integration for Disease Detection: The first heading should be the development of the equipment for detecting diseases in patients using artificial intelligence. AI model should be trained through large database of symptoms related to pets health as well as diagnosis. This is could be done in collaboration with the veterinarians and other specialists in this field to assure that all the health issues are comprehensively identified by the system; which is rather essential for the goal of the proposed platform. One thing that never need to be stopped of the new AI model is feeding more data set in order to boost its efficiency each time it tries to analyze more complication problems.

Modular and Scalable Architecture: This is not surprising since Cuddle Care has to allow usage space for current users and admins, so the overall structure of the system has to also be also modular and scalable. Selecting Firebase for real-time managing of the database and MongoDB for managing large datasets that potentially can be added to the platform, will make the platform as extensible to new users as possible. It should also be quite easy to interface with third party features and services including payment and health record options.

Responsive and Intuitive User Interface: During the development of the React combined with Tailwind CSS and Daisy UI for the UI of the platform, it will be very simple to make it responsive and accessible across devices. Such approach of simplifying is crucial to ensure that users will use the application, since the major customers will mostly be the owners of the pets, such a kind of service does not need to have sophisticated features. Web interface redesign should be based on user testing with the audience and feedback.

Real-Time Communication and Notifications: Pop-up and Notifications, the work to done through React Toastify the user/administrator alert on appointment reminders, change in adoption status, or any show Alert health emergent notices. User-Centric Features: And it should assist its users in easing their work concerning pet's health, seeking experts advice or finding an adoption center. It is thus possible to stage pets to be adopted and there is a button whereby all the pet profiles can be managed.

AI Implementation:

AI is to be integrated into Cuddle Care where the disease identification of animals will hence enhance the specific pet heath change through use of machine learning algorithm of disease identification. The system applies information like symptoms, medical history of the pets among other relevant information required to develop an AI model to predict the most common diseases the pets may be having. This system is going to be trained from the dataset of pet's health records, images, lab results as well as symptoms of the pets. regarding the interaction i – Pets: Through entering these symptoms or uploading the photo of pets, owners allow the AI to analyze their pets. And then the system will be able to identify those possible illnesses and what the owner has to do which is to consult the veterinarian. The efficiency of the prediction rises as more data is given to the AI system, this will help in making good decision on pet's care for the owners and to enhance veterinarian's diagnostics. They argue that enhanced artist identification will enhance health since serious diseases can be well diagnosed early an thus prevent

Chapter 4: Methodology

The Cuddle Care methodology to be adopted consists of user, centric essential elements which includes AI in disease detection, real time database and simplicity. Development is also established with an Agile proving ground since app iterations are tried and tested in later build releases having the feedback implemented. It 'learns' through machine learning together with compatibility and support of today's web technologies and scalability for the user.

4.1 What to use

Following this discourse is how Cuddle Care was developed, particularly in terms of using the Agile strategy. The solution employs different modern technologies and frameworks. React is used for HTML presentation; that is, it adds interactivity to the Web site. TypeScript enhanced how good the code is and how good the scale is. Out of the available options Vite is chosen as the build tool due to the faster development process and the efficiency of using the production mode build. Tailwind CSS is used to define the style of the components such that the UI looks good, streamlined and minimalist with an ultimate target of responsiveness. On the backend side, Firebase also provides good authentication, real-time database, MongoDB for the complex data structure. The AI disease detection is existent through Machine learning models, which are extracted from widely used interface software like TensorFlow or PyTorch from large training data set. Some other libraries which assist in form handling are React Hook Form used for form handling Navigation is done in React Router and API calls are efficiently made in React Axios. Together, all these technologies assist the platform to meet one of the core goals of offering an all-round and solutions focused care for pets.

4.2 Agile Model:

Agile is a system of software that is efficient by integrated and that occurs in incremental phases. This breaks the project up into a series of small, and somewhat easier to complete pieces called sprints; though these could range between 1 week to 4 weeks. Such feedback is used at the end of each sprint in order to do better in the next one because the primary focus lies in functional components delivery. Agile promotes a number of objectives and aims, such as alignment within a team and between the team and other stakeholders. Sprint Scrum and Daily Scrum best inform identification of progress as well as issues which are best solved within the process. This model is good for Cuddle Care because it provides a means by which the increasing needs of the users will be incorporated and also provides a mechanism through which the features of the website are changed frequently and the user needs are constantly updated progressively.

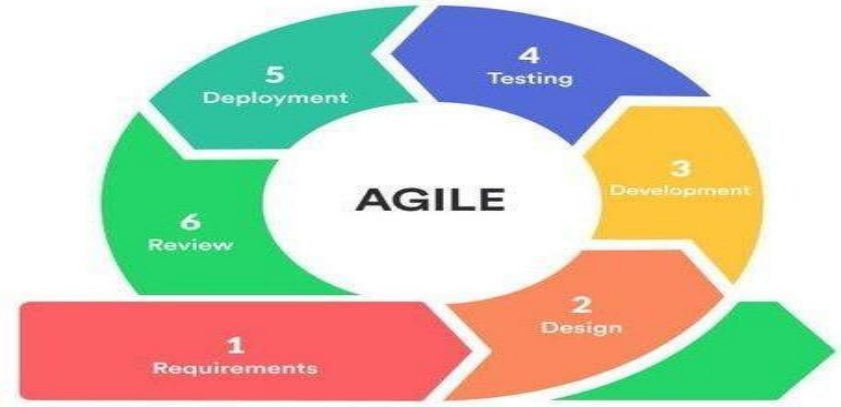

Figure 4-1: Agile Model

4.3 Scrum Model:

The Scrum is actually a small practice of the larger Agile structure that involves the use of incremental process and self organised teams. SSC divides work into time-bound cycles known as sprints that are typically 1-4 weeks long, and within which a list of tasks is completed. There is the Product Owner, who provides a vision of the product and priority to the work; then there is the Scrum Master who leads the process and removes the obstacles; and the Development Team which does the work. Just the daily Scrum meetings, the Sprint Planning, the Sprint Review and the most of all the Sprint Retrospective makes the system open, Agile and evolving constantly. They include: I'm sure that Scrum is suitable to implement at Cuddle Care because: Cuddle Care is a programme that will effectively manage the tasks to be done; The time needed to complete specific iterations is short; Implementing the users' feedback is not a problem with Scrum; As a result, Cuddle Care will be a responsive and high-quality site.

Figure 4-2: Scrum Methodology

4.4 Why to use

User-Centric Development: In the beginning, Agile pay attention to the feedbacks of the users, so this platform should include the requirement of each owner, vets, and admins. It helps in categorizing the broad categories of services like disease detection, consultation and adoption services based on feedback from the users.

Iterative Progress: Therefore, when using agility, the development team is able to work in micro cycles called sprints with in between product updates. This ensures that relevant such as artificial intelligence disease diagnosing and appointment scheduling options are considered and update where necessary.

Flexibility: Any new requirement emerging in a project, whether it entails enhancement of some features in the project, addition of new features or even improving on the display to meet the needs of the user can easily be implemented in a project without necessarily complicating the process of development. This is important especially for a platform such as Cuddle Care, which future development may warrant a complete overhaul depending on the forces at play.

Early Risk Mitigation: I believe one of the strong sides of Agile is Smith that in intervals testing can happen and with user feedback one could address potential issues before they happen mid development.

Enhanced Collaboration: In turn, agile fosters partnership between technical workers, notably developers and designers, as well as customers – in the most rudimentary sense, it is about the people creating a particular good and people who will in one way or another, use this good.

4.5 Sections of Methodology

Requirement Analysis: Collect and record the selected stakeholders, which include pet owners, veterinarians, and administrative staff, are expected to submit the functional and non-functional requirements. It also encompasses basic requirements necessary for the development of a satisfactory medical app; these are AI-based disease detection, user identity, consultation, and adoption services. Features to be incorporated should be ordered according to what is mostly required by the users and technical possibility.

System Design: Sketch the system architecture where the three areas previously discussed, frontend, backend and AI belong. Propose the implementation of user profiles and pet records, consultations, as well as adoption application database schema.

Technology Selection: Select the technology you want to use; this might include your front-end framework, React, your database, Firebase/MongoDB , your CSS framework, Tailwind CSS, and your AI frameworks which may include TensorFlow/Py Torch.

Development Process: Implement Agile where releases contain numerous incremental features with iterative cycles or sprints used during cycles. Build the AI model of the disease detection and

incorporate it for the backend system. Design and code the frontend components with react as you as you contribute focusing on responsiveness and usability.

Testing and Validation: Perform unit testing, integration testing and user acceptance test (UAT). Test the AI model's performance on an example dataset which needs to include a range of diversity. Check if it works well, whether the platform can handle increasing volumes more and to check on its security.

Deployment: Use the platform in the production environment for the final set up of the platform. Release the platform to production servers with monitoring instruments.

Maintenance and Updates: Both for new features, bug fixes and for adapting the application according to the needs of its users, offer updates quite frequently.

Implementation Plan

1. Define Project Vision Establish the primary goal: to develop a single application to cover almost all the aspects of pet care, including the detection of diseases using AI algorithms, appointment setting, adoption service, and they are developing administrative solutions. Identify key stakeholders: the pet owners, the veterinary doctors and the managers. Clear quantitative goals include enhancement of early disease detection accuracy by 90% as well as effective adoption and consultation.

2. The need to undertake the functional requirements gathering and analysis is hereby established. These embody surveys, interviews and workshops in the target population for functional and non-functional requirements.

3. Overview of Systems, Design, and Architecture At the end of the research, define a system architecture, which begins with the frontend application, the backend, the AI module and the database. Design out the tables of the database so that the data could be conveniently collected and stored.

4. Technology Setup Set up the development environment with the selected tech stack: React, TypeScript, Tailwind CSS, Firebase, MongoDB and TensorFlow/Py Torch as technologies of choice for AI.

5. Incremental Approach (Scrum Cycles) Break down development into sprints, each focusing on specific features:

- Sprint 1: User authentication and authorisation as well as management of the user's profile.
- Sprint 2: Integration of AI in disease detection.
- Sprint 3: They include appointment scheduling, as well as consultation management.
- Sprint 4: Adoption services and administrative work and control panel.

6. Testing and Quality Assurance Of the four testing levels, perform unit, integration and system testing during each sprint. Check the accuracy of AI using a new set of data and test the application on animal doctors. Make sure the platform is also responsive and also compatible with different devices.

Chapter 5: Plan for the Project

5.1 Structure for Work Breakdown

The Work Breakdown Structure (WBS) is the management and control of the task of the project in the form of a hierarchy. It offers a graphic display of the project's outline, its expected output as well as how different aspects of work depend on one another. Our project has been deconstructed and we have developed a schedule of which segment of the project will receive how much time. In some ways, it assists us to focus on the whole project on a specific time tabled for that particular project.

Task Name	Duration (days)	Start	End
Introduction	8	1 Jul-2024	8 Jul-2024
Initial Study	5	9 Jul-2024	13 Jul-2024
Literature Review	3	14 Jul-2024	16 Jul-2024
Methodology	5	17 Jul-2024	21 Jul-2024
Project Plan	8	22 Jul-2024	29 Jul-2024
Feasibility Study	7	30 Jul-2024	5 Aug-2024
Foundation	7	6 Aug-2024	12 Aug-2024
Exploration	9	13 Aug-2024	21 Aug-2024
Engineering	12	22 Aug-2024	2 Sep-2024
UI/UX Development	5	3 Sep-2024	7 Sep-2024
Development	37	8 Sep-2024	15 Oct-2024
Testing	7	16 Oct-2024	22 Oct-2024
Implementation	5	23 Oct-2024	28 Oct-2024
Critical Appraisal & E	2	29 Oct-2024	30 Oct-2024
Lesson Learned	4	31 Oct-2024	3 Nov-2024
Conclusion	4	4 Nov-2024	7 Nov-2024
	Total: 130 days		

Figure 5-1: Work Break down Structure

5.2 Resource Allocation

Project resources are all the materials, human and physical that are used in a project to execute project work and achieve its goals successfully. Based on the reality of project implementation it becomes crystal clear that skillful distribution of tasks between the team members is the way to go; besides, on utilization of all available resources. The list of resource allocations that have been highlighted is provided below. Every stakeholder, from users to project managers, has been identified for their involvement at every step of our project.

Task Name	Duration(days)	Resource
Introduction	8	Analyst, User
Initial Study	5	Analyst
Literature Review	3	Analyst, Team Leader
Methodology	5	Analyst, Developer, Project Manager
Project Plan	8	Analyst, Project Manager, Team Leader
Feasibility Study	7	Analyst, Project Manager, Team Leader, User
Foundation	7	Analyst, Team Leader
Exploration	9	Analyst, Developer, Team Leader, Designer
Engineering	12	Project Manager, Team Leader
UI/UX Development	5	Designer, Developer, Team Leader, User
Development	37	Developer, Analyst, Tester
Testing	7	Tester, Developer, Team Leader, User
Implementation	5	Project Manager, Developer, Tester
Critical Appraisal & Evaluation	2	Analyst, Developer, User
Lesson Learned	4	Developer , Analyst
Conclusion	4	Analyst
	Total: 130 days	

Figure 5-2: Resource Allocation

5.3 Time Boxing

Time boxing is a methodology used in the management of projects whereby time is partitioned in to a predetermined time slots called time boxes. It aids in setting direction, importance and constraint of meeting deadlines for the accomplishment of the tasks involved. In our project there are preceding time boxing which is shown below:

Time Boxes	Task Name	Duration(days)	Resource
TB1	Introduction	8	Analyst, User
	Initial Study	5	Analyst
TB 2	Literature Review	3	Analyst, Team Leader
	Methodology	5	Analyst, Developer, Project Manager
TB 3	Project Plan	8	Analyst, Project Manager, Team Leader
	Feasibility Study	7	Analyst, Project Manager, Team Leader, User
	Foundation	7	Analyst, Team Leader
TB 4	Exploration	9	Analyst, Developer, Team Leader, Designer
	Engineering	12	Project Manager, Team Leader
	UI/UX Development	5	Designer, Developer, Team Leader, User
TB 5	Development	37	Developer, Analyst, Tester
TB 6	Testing	7	Tester, Developer, Team Leader, User
	Implementation	5	Project Manager, Developer, Tester
TB 7	Critical Appraisal & Evaluation	2	Analyst, Developer, User
	Lesson Learned	4	Developer , Analyst
	Conclusion	4	Analyst
		Total: 130 days	

Figure 5-3: Time Boxing

5.4 Gantt diagram

Tasks, milestones, and project schedule data are shown in a timeline manner on a Gantt chart, a visual project management tool. Better planning, coordination, and tracking of project progress are made possible by its graphical representation of project activities, their durations, and their dependencies.

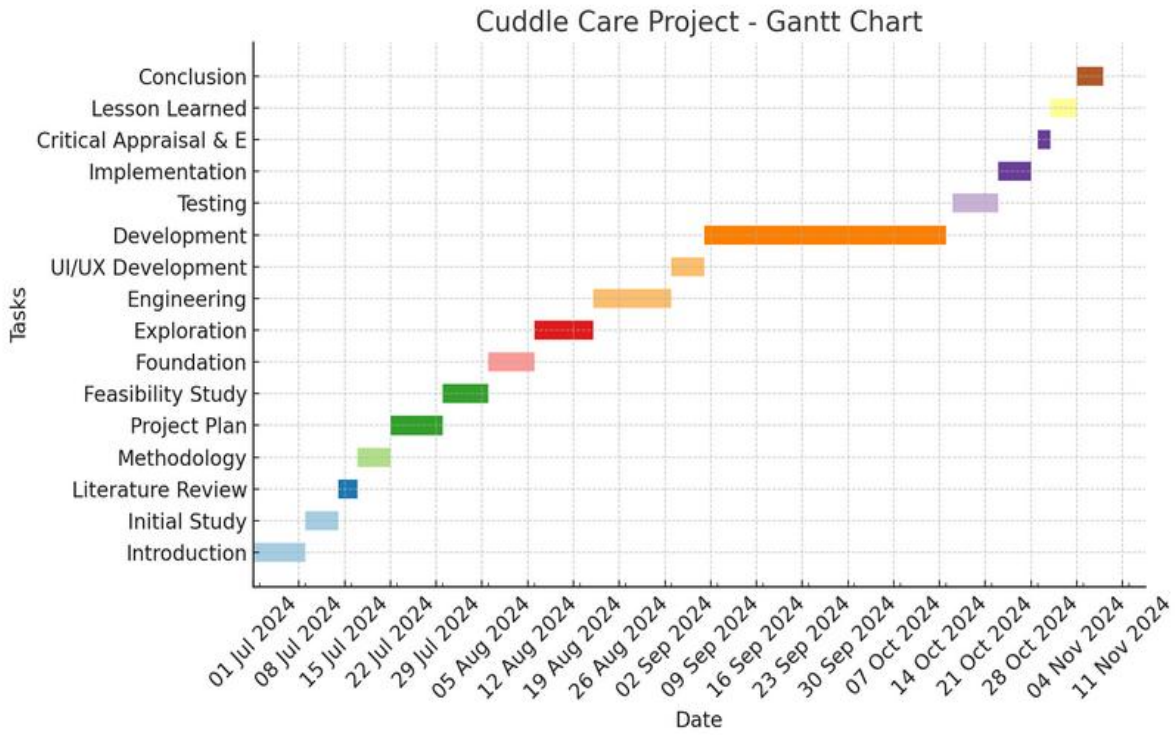

Figure 5-4: Gantt chart

Chapter 6: Study of Feasibility

6.1 All possible types of feasibility study:

This feasibility study will thus end eavour to show the possibilities and general success of this proposal. Thus for that identification there is a call to assess the technical viability, economical rationality, functionality, legal permissibility and timing of the project. Thus, the purpose of the current research is to give a comprehensible assessment of the project's viability and prepare acceptable suggestions for the stakeholders for its completion.

6.2 Technical Feasibility:

Next the technical feasibility will then be evaluated depending on obtainability of the technology and or sourcing technology, the suitable tools and infrastructure that will be needed in the project. This is in regard to the evaluation of the compatibility of the numerous software development platforms, AI frameworks to the presented project. Given that our goal was to design our project, it is crucial to assess the viability of the tools, framework, and platform we chose because, once a project is underway, it becomes extremely difficult to switch out the stack, tools, and software Since it's feasible, we ought to be able to try to find an existing solution and determine why they used these technologies. We have included a list of all the tools and technology utilised during the project in the following sections.

- Hardware: Laptop & Desktop, Wi-Fi-router
- Software: MS word, VS code, Mongo dB, Google sheets, Google chrome,
- Mozilla Firefox, windows 11
- Database: No SQL (mongo dB)
- Client-side technology: HTML, CSS, React, Vite, Tailwind CSS, JavaScript.
- Server-side technology: Node.js, OpenAI Api, express.js, dl.

6.3 Economic Feasibility:

Economic viability is a condition that checks that the economic lack of sustainability of a work or thought is going to be offset by the good that it will engage. In Cuddle Care, here the costs are made up of what would be spent on bringing, introducing and maintaining the solution and on the other hand, there are the revenues that are likely to be generated and the value that is likely to be received in the future.

Costs: The most significant expense belonging to this business structure is the cost of AI model training along with Fire-base, MongoDB clouds service charge, fee for frontend and backend coding, testing along with its marketing fees. Some of the overheads are realised during the process of

obtainment of the datasets used for training of the AI model as well as the bonuses to the activities like the payment processor.

Benefits: The main sources of revenue will be consultant's fees, membership subscription and advertising revenues because Cuddle Care is likely to turn out to be a bustling site. This leads to the ability to grow more users into the site while at the same time not having to address such high levels of cost. Besides, improved health management of pets will attract users and in the process, owners of the pets become to have a good attachment towards the pet to require continuable use.

ROI: For instance, using current tools such as Vite and designing through Tailwind CSS makes speed to advance faster, and first costs are low. Machine learning appeals to the equation for increasing the value meaning Cuddle Care can compete in the pet care.

Conclusion: While here there are few numbers mentioned as the costs of the project, Cuddle Care does not lack higher and multiple economic aspects such the potential revenues, more than enough to cater for the project and make it economically healthy and continuously running.

6.4 Operational Feasibility:

Operational feasibility therefore embraces an evaluation of how the project can actually be run and maintained within status quo establishment. But in the case of Cuddle Care it means assessing the ease with which the platform can be integrated into the owner's, veterinarian's, or administrator's daily workflow.

Usability: Thanks to such tools like React UI and Tailwind CSS developing a friendly interface for both user –owner and specialist is quite comfortable. Work of this section includes diseases detection, consultation booking and pets adoption and this doesn't need professional assistance to be done thus making the product easy to use.

System Integration: Cuddle Care's back end, which Firebase and MongoDB also helped create, is versatile and processes data in real time. It easily incorporates the AI generated disease identification model to the basic information about pets and updates them from time to time.

Maintenance and Support: Cloud scalability enables Cuddle Care to admit users and their data to handle in masses as needed. It is by design, mobile and that means adaptations such as these can be integrated with ease and new features plugged into the format without much of a problem.

Staffing: It is very low in terms of administration and organisation since its features like user administration or the tracking of a consultation is accomplished inherently. Nevertheless, occasional helpdesk support may be necessary for emergent issues such as problem solving , asking questions about the new system , and system update.

Conclusion: Cuddle Care is also operationally implementable in baseboard technology with a low TCB that is designed to be particularly approachable by the two target users, capable of efficiently eliminating redundancies, and well suited to the management of scale.

Chapter 7: Foundation

7.1 The problem area identification:

The need therefore for the formation of Cuddle Care is well founded on the increasing need for a company that offers a one stop solution to the emerging needs within the pet sector. In as much as families are adopting pets, the activities of searching for the pets, buying them quality healthcare, setting appointments for the vets, adopting and many more can be only be accomplished through a one or many solutions and platforms. Some other service which are currently available are Petfinder and Pet Desk which only solve a one or two of these in isolation. In doing this, Cuddle Care provides a complete, conducive, convenient and intelligent form of administering modern day pet care.

Essentially, disease detection by AI technologies in the Cuddle Care includes the elements such as disease identification and notifying the care unit and real-time database and scalable storage from Firebase and MongoDB. Determining health condition of pets is made through the help of AI, this translates to high preventive measures by the owners and efficient workplace of the vet. On the other hand real time data synchronization ensures that there is constantly and consistently a flow of data and changes between the users, the veterinarians and the administrators.

The platform is here for the users, using some of the relatively new frameworks like React and UI frameworks like Tailwind CSS and DaisyUI to provide a premium user experience. Moreover some functions are implemented into the platform: adoption services, consultation appointment scheduler and the admin panel to meet different customers' needs.

As all these components have been designed and must be run in a way that they can merge into single platform, Cuddle Care has thought the future of pet care where it can make pet care easier, efficient and effective, something that very few if not any pet care firm or service can envision. Some such foundation lends the vision, scalability, sustainably, flexibility and long term success.

7.2 Interview:

During the interview, knowledge and findings were gathered and got from the experiences of the pet owner, veterinarian or the administrator has faced challenges and or expectations. On that basis, key findings for AI-based health monitoring, integrative consultations, as well as adoption services created Cuddle Care features and interface.

7.3 Questionnaire:

- How often do you take your pet to a veterinarian for check up?
- Here are some characteristics, which matter most when selecting the preferred pet health management platform?
- To what extent are you satisfied with the current possibilities in regard to pets' disease

diagnosis and treatment?

- Would it interest you if your pet's health is managed and even diagnosed by an AI system?
- On a resemblant note, how likely are you to engage a platform that provides booking appointments, monitoring pets' health, and pet adoption?

7.4 Requirement Specification:

The Functional Requirement for Cuddle Care is as follows: AI for diagnosis of diseases; appointment setting; adoption; real time database. There are also other requirements that are usually deemed non-functional; they comprise of: easy user interface, safe user identification, legislations protecting user data, and then users require more space. Any chosen system must be user friendly and dependable and show ability to deal with many users Not Supported

7.4.1 Functional Requirements:

The functional requirements of the Requirement Specification of the Cuddle Care are disease detection through AI scheduling adoption and the synchronizing of the database. has to be friendly with regard to its reaction time, the client has to be able to authenticate itself in a secure manner, the system has to respect data acts as regards privacy and the system has to be scalable. Another requirement is that the system must be as user friendly, fast and scalable to accommodate a large number of users and/or transactions.

The system should implement an authentication process for its users to increase on data privacy and system security. These should allow users to make choices concerning colours, logos and prints that can be developed by an application of Artificial Intelligence. It should therefore have an easy to use friendly graphical user interface through which end users can make adjustments.

It is also important now for the system to be friendly in such a way that can facilitate changes on its functionality. This should enable users to select and style products by changing colours, including logos, and the addition of AI promoted prints. In regard to this, the input OpenAI API should be used for image generation. The beneficiary of the system should be adoptable in order that the user can always customise it to his/her tastes. From the point of view of customer experience, the system must enable a user to preview what he/her will order and make changes if desired.

7.4.2 Non-Functional Requirements:

On the other hand non-functional requirements refer to the characteristic or constraints required in a system or a product. These include availability, reliability, integrity and accessibility, extensibility and lastly, modifiability. While functional requirements explain aspects of activities in the environment occupied by the given system, non-functional requirements define the behaviour or performance of that very system. More often these specifications consist of some requirements, overloaded or linked references or indicators to assess system's efficiency in various aspects. In below we have listed out all Non-functional requirements:

- The It should be responsive that is it should be capable of freely responding tousers' commands and requests.
- They should be open at the same time by two or more users and they should not diminish very much as more people open the same information.
- The interfaces that are designed should be friendly, should look easy to use and, most important of all, should look good.
- Customization process should be easily understandable and integrated and hence basic should be easily understandable for layman.
- It should provide information and guidelines for informing the potential customers through the customization process up to ordering process.

Chapter 8: Exploration

8.1 Activity Diagram:

Activity diagrams are best suited for modeling of a system or a process, writing the processes that are needed, and identifying the relative weaknesses and strengths. They give a 'picture' of complex procedures and thus, afford the holders a basic perspective of the overall framework and hierarchy of the activities. In order to assimilate the work flow better, we have bifurcated our full activity into two part the first one is customization activity diagram and second is order process. Further we have developed the complete activity diagram

8.1.1 Full Activity Diagram:

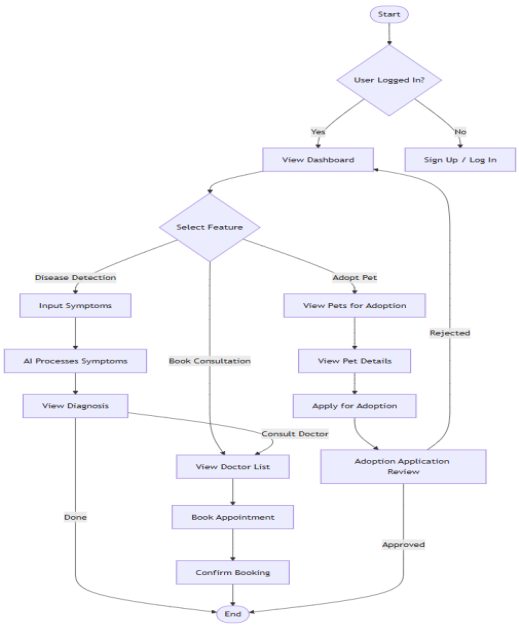

Figure 8-1: Activity Diagram of the full system

8.2 Full system use case:

Figure 8.2: Full system use case

8.3 Use case of Dashboard:

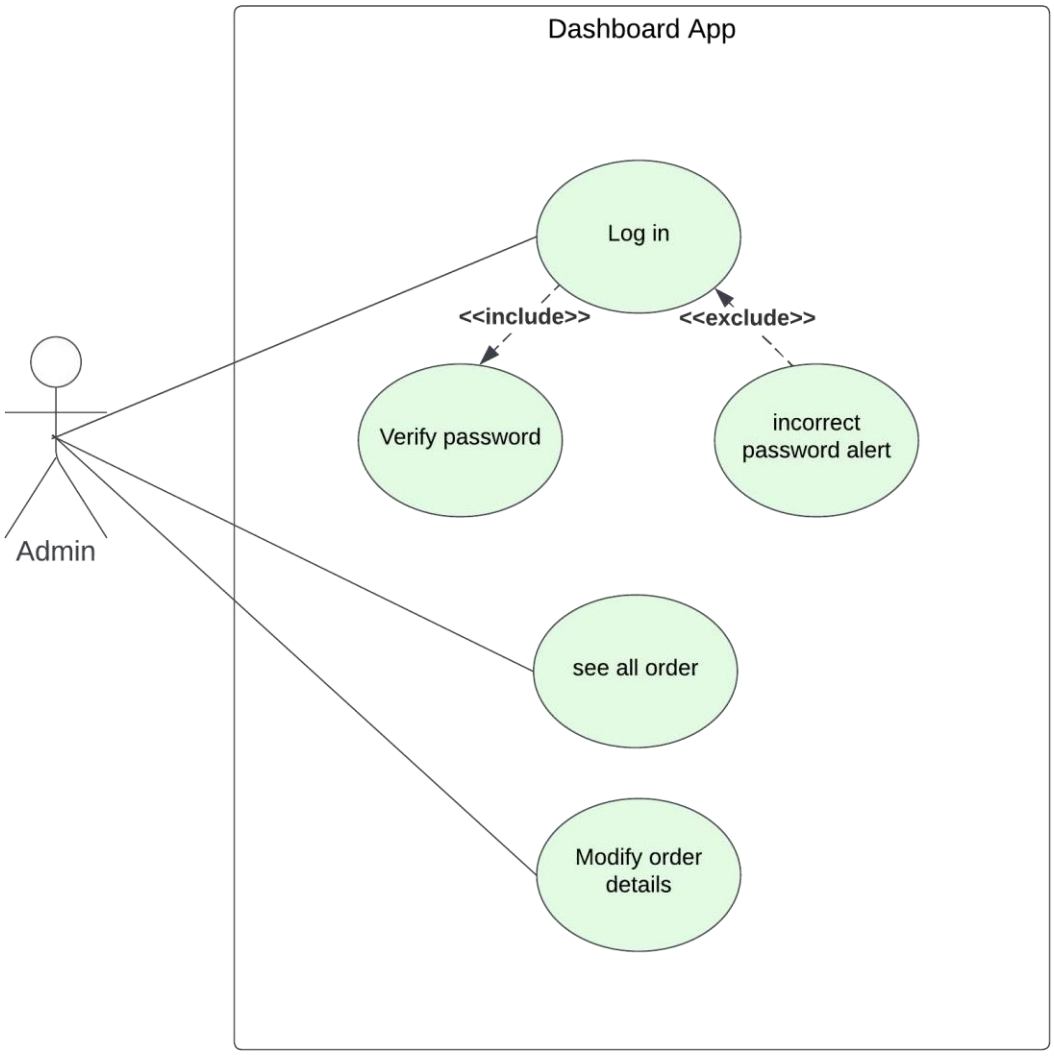

Figure 8-3: Use case of Dashboard

Chapter 9: Exploration

9.1 Module of the system:

Serial of Action	User Action	System Interaction
1	User logs in or signs up	System authenticates user via Firebase.
2	Selects a feature (e.g., disease detection)	System redirects to the selected feature page.
3	Inputs pet symptoms	AI model processes symptoms and provides a diagnosis.
4	Views diagnosis results	System displays disease details and consultation options.
5	Searches for veterinarians	System fetches a list of available doctors.
6	Books a consultation appointment	System schedules the appointment and sends confirmation.
7	Browses pets for adoption	System retrieves and displays pet profiles.
8	Applies for pet adoption	System records application and updates admin dashboard.

Table 9.1: Table of Module system

9.2 Class diagram of the system:

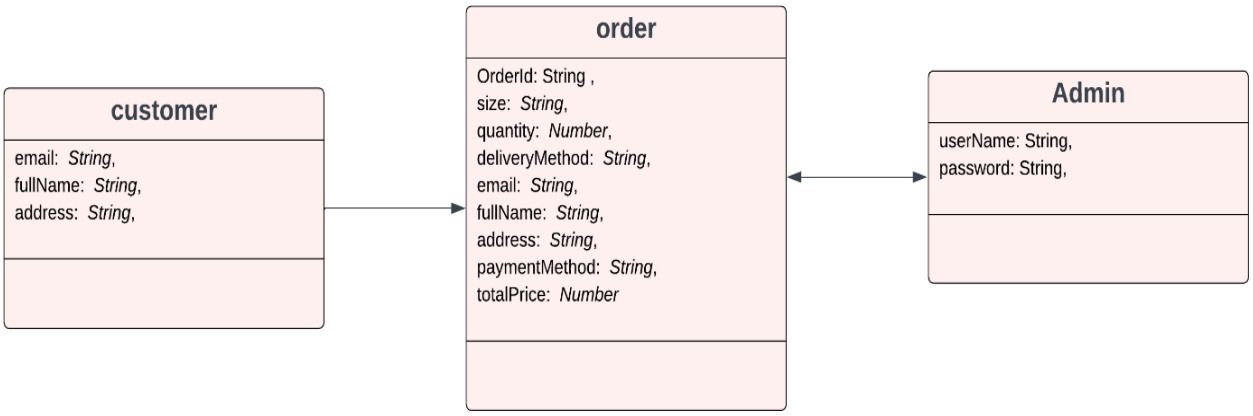

Figure 9-1: Class Diagram

9.3 Sequence diagram of the system:

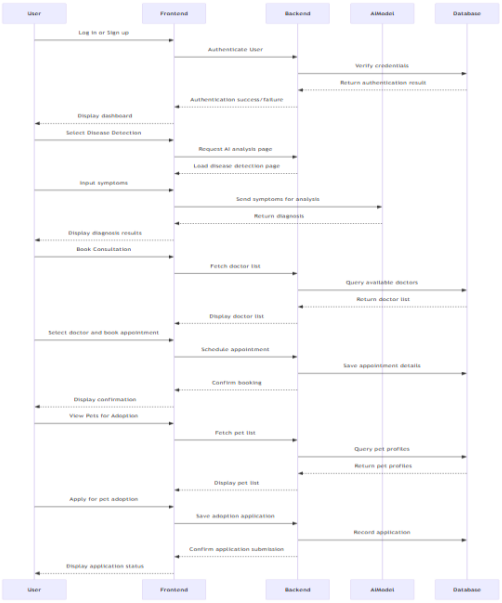

Figure 9-2: Sequence Diagrm

9.4 High-fidelity prototype of the system:

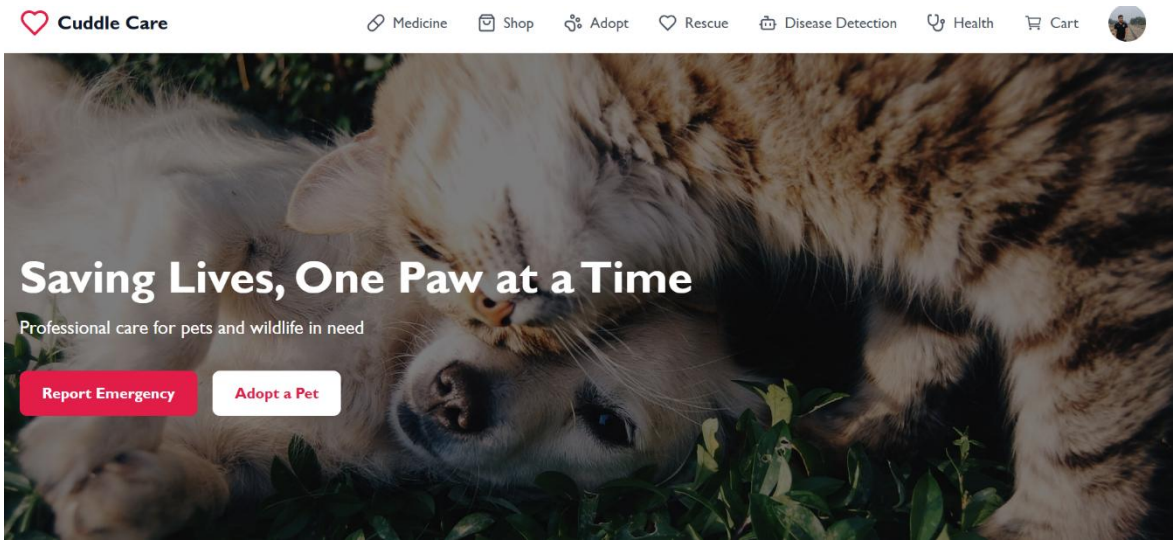

Figure 9-3: High Fidelity prototype (Home page)

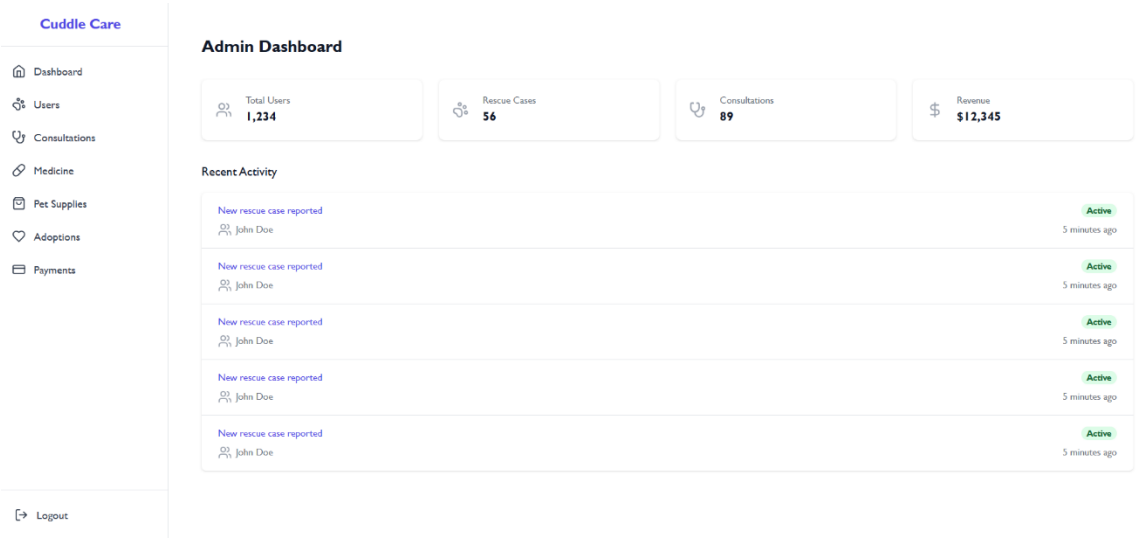

Figure 9-4: High Fidelity prototype (Admin Dashboard)

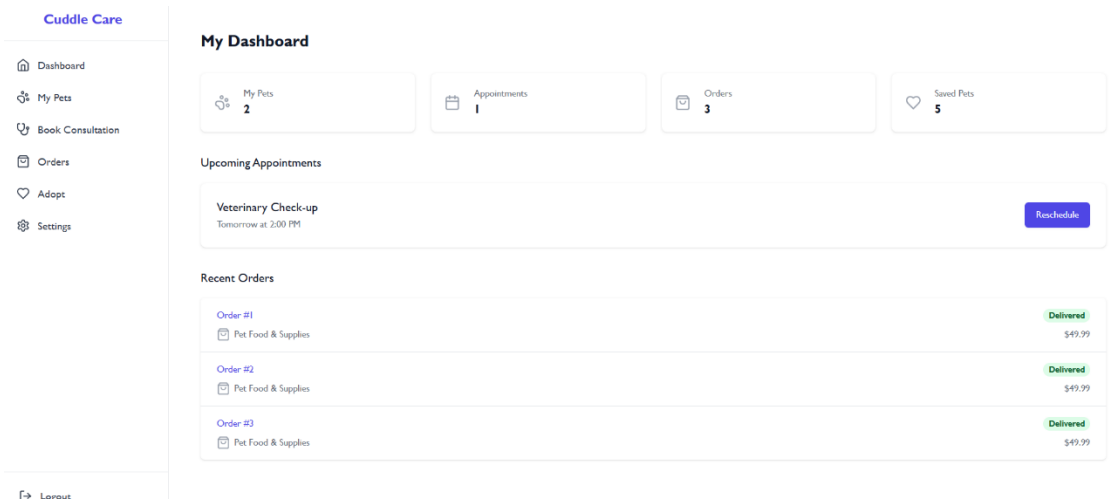

Figure 9-5: High Fidelity prototype (user Dashboard)

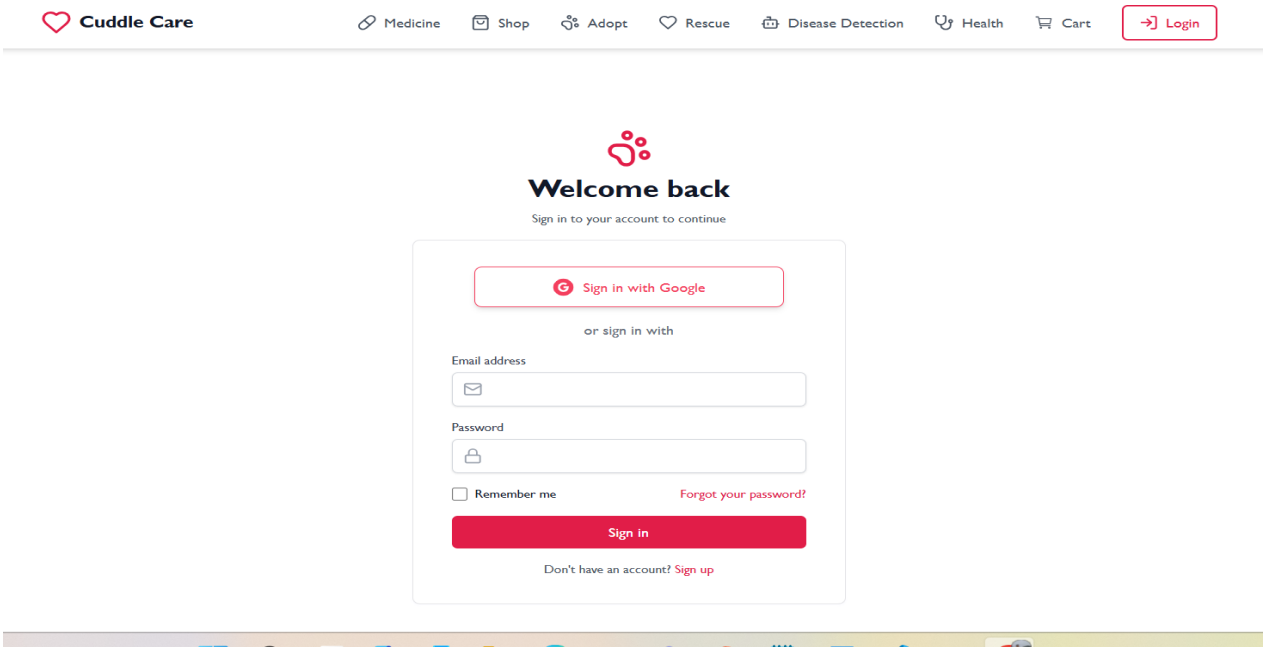

Figure 9-6: High fidelity prototype (Login page

Chapter 10: Development

10.1 Folder structure of the system:

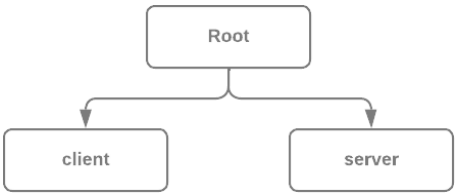

Figure 10-1: Root folder

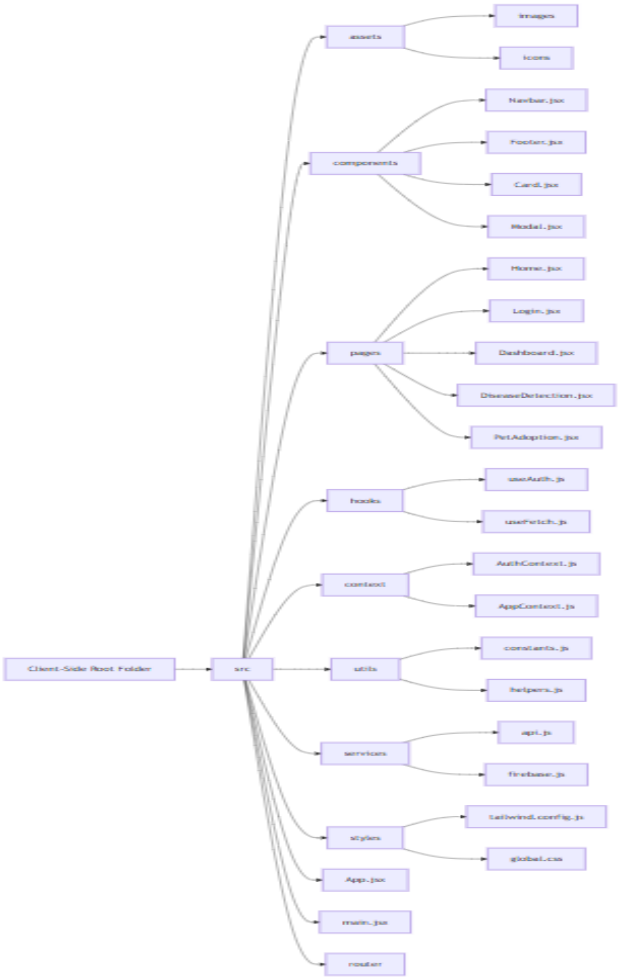

Figure 10-2: Client-side Folder structure

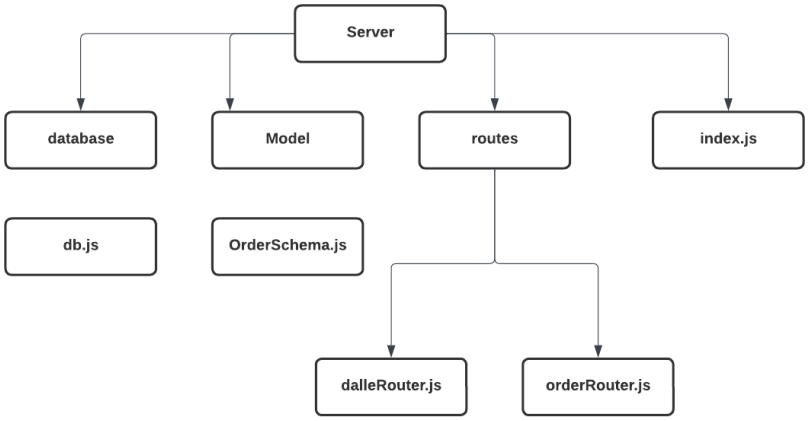

Figure 10-3: Server-side folder structure

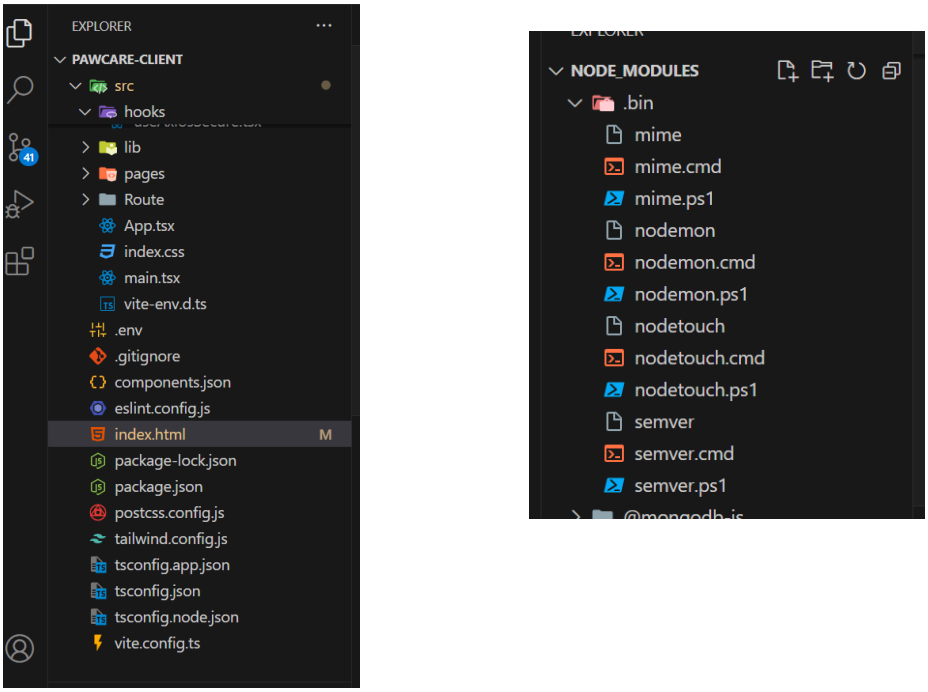

Figure 10-4: Actual folder Structure Sample

10.2 Core module output sample: change the pic with your project

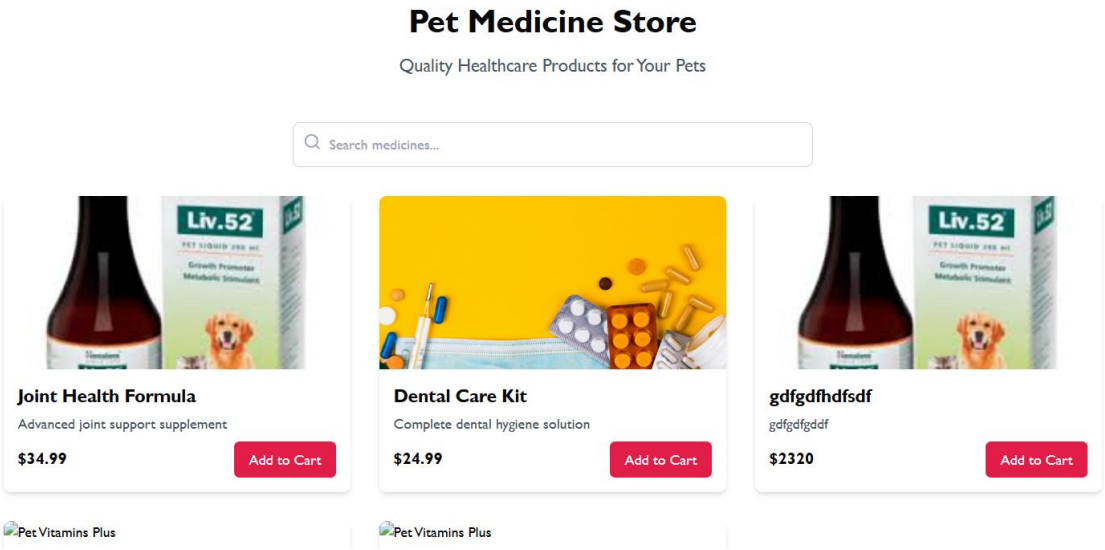

Figure 10-5: Output of pet medicine store

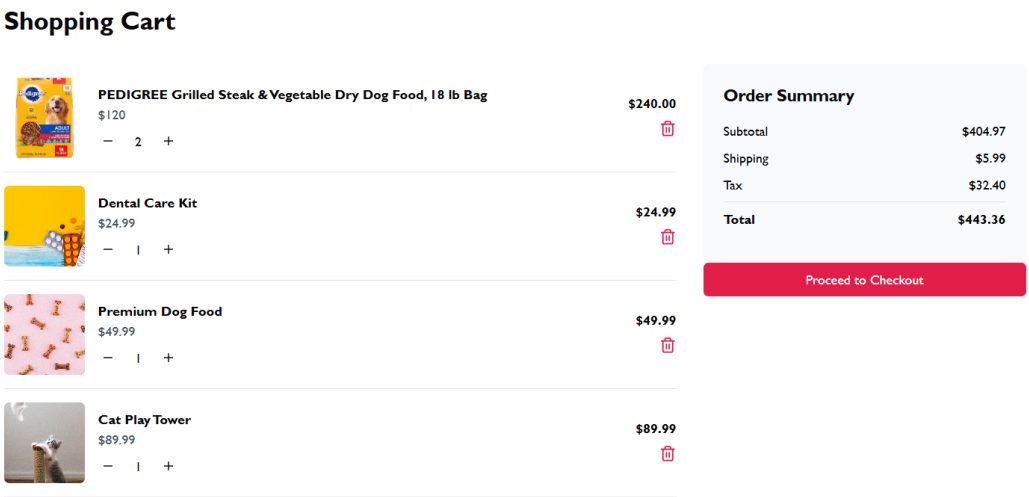

Figure 10-6: Output of pet medicine shopping cart

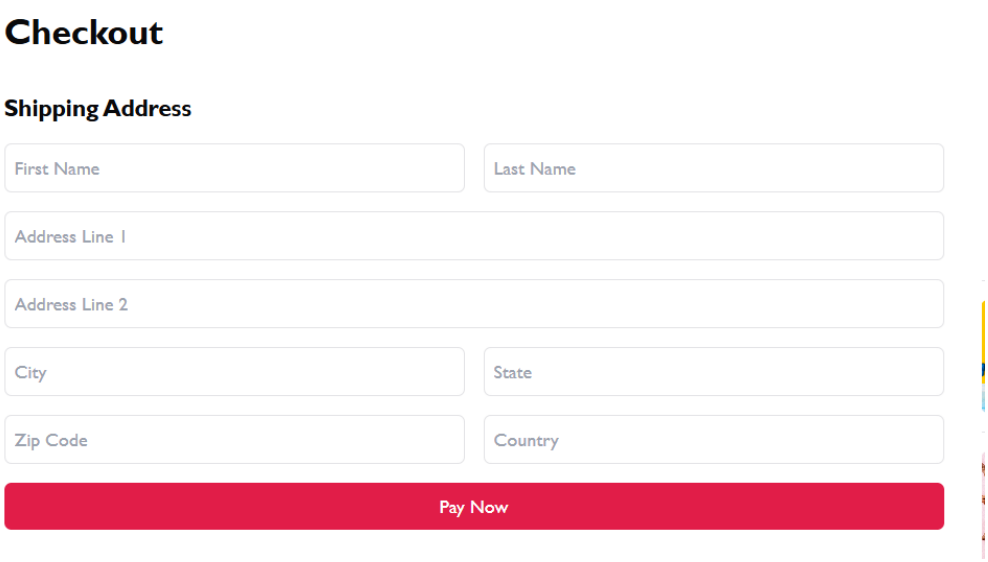

Figure 10-7: Output of pet medicine store address

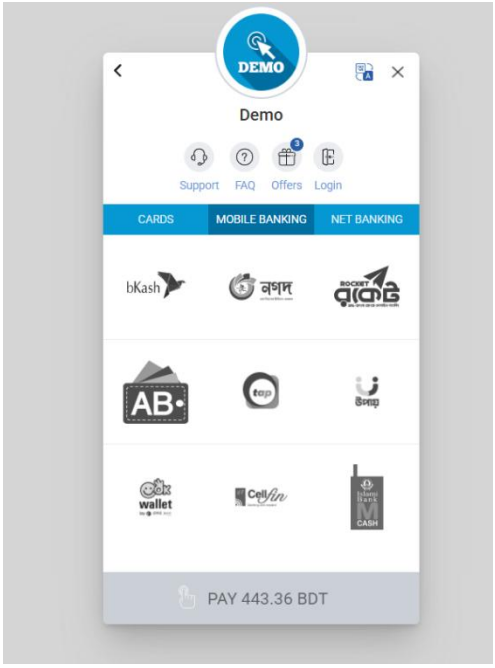

Figure 10-8: Output of payment method

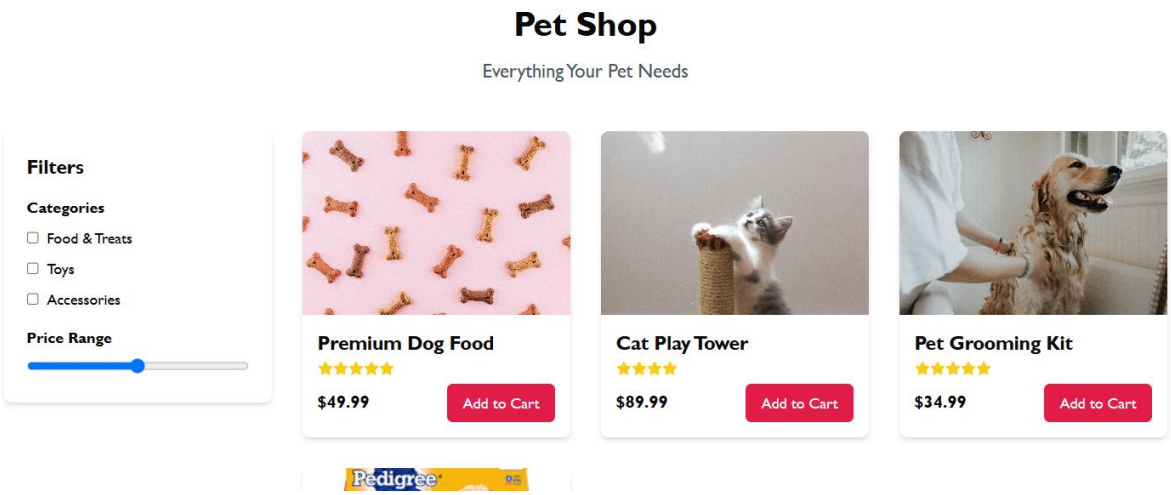

Figure 10-9: Output of pet shop

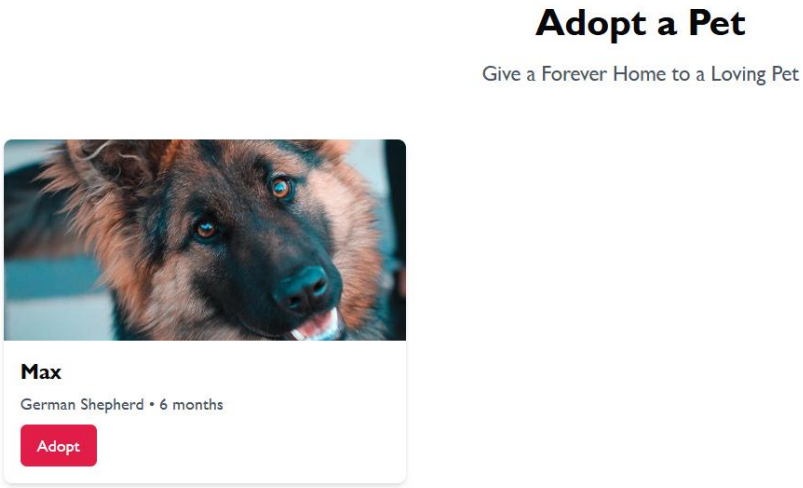

Figure 10-10: Output of adopt a pet

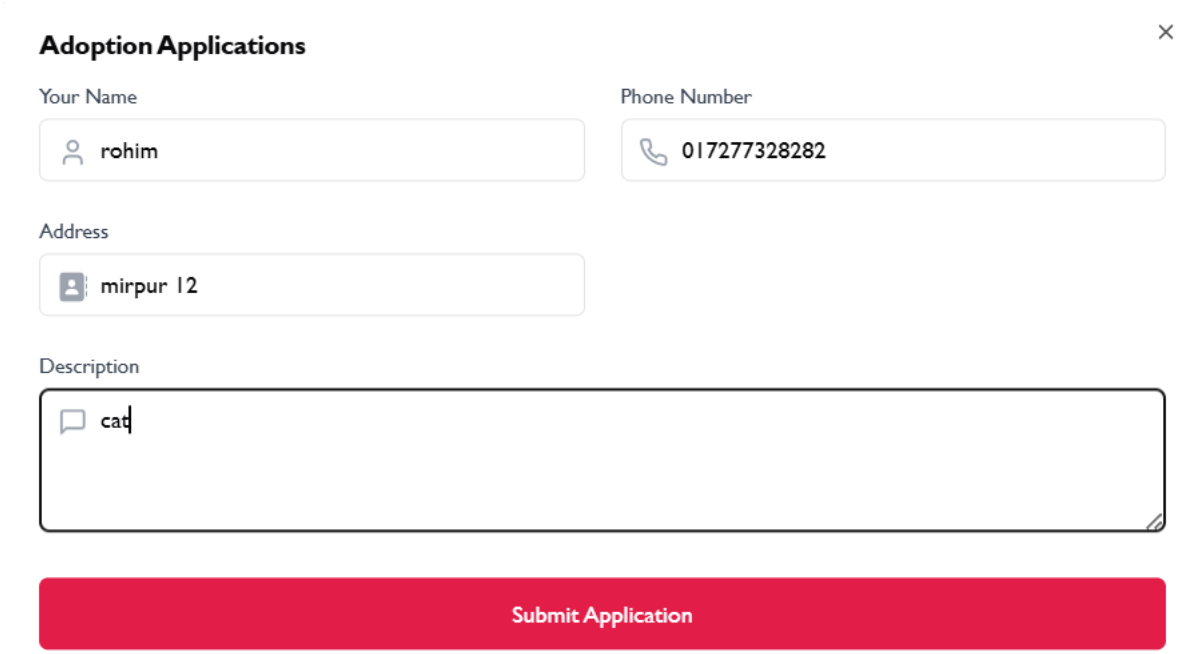

Figure 10-11: Output of adoption application

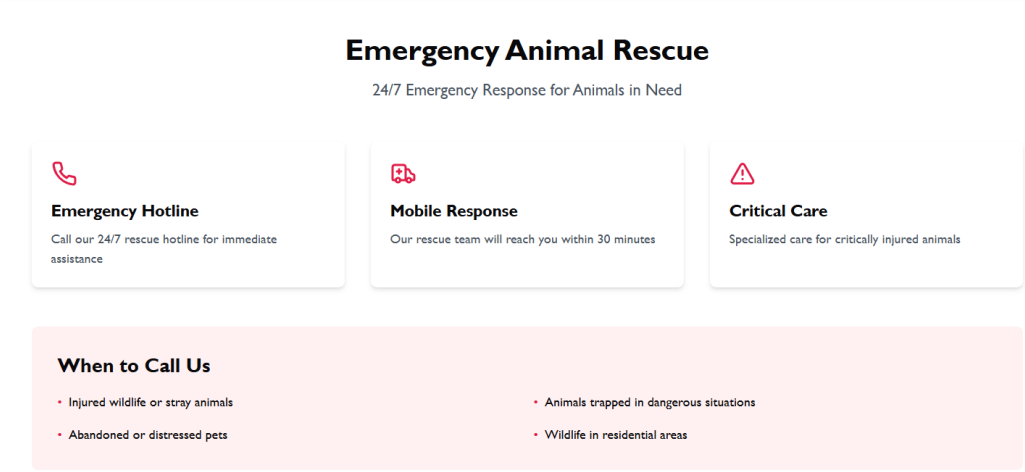

Figure 10-12: Output of animal rescue

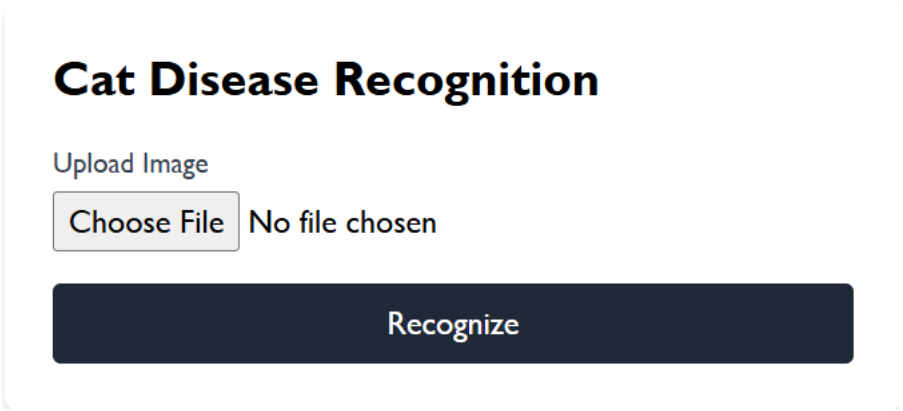

Figure 10-13: Output of disease recognition

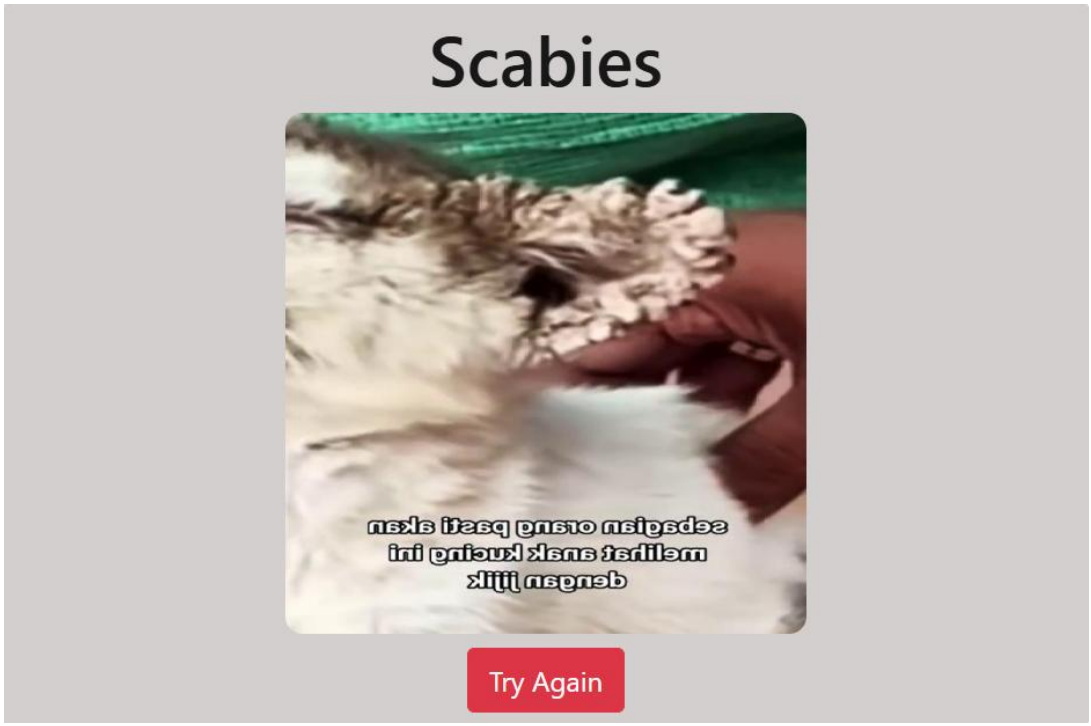

Figure 10-14: Output of disease recognition

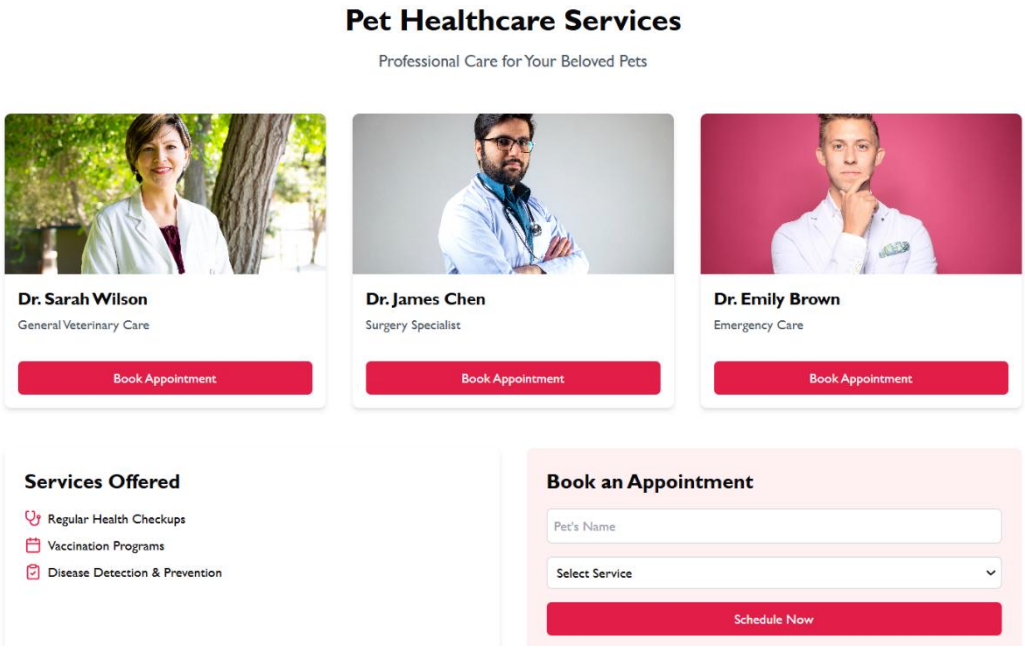

Figure 10-15: Output of disease health care service

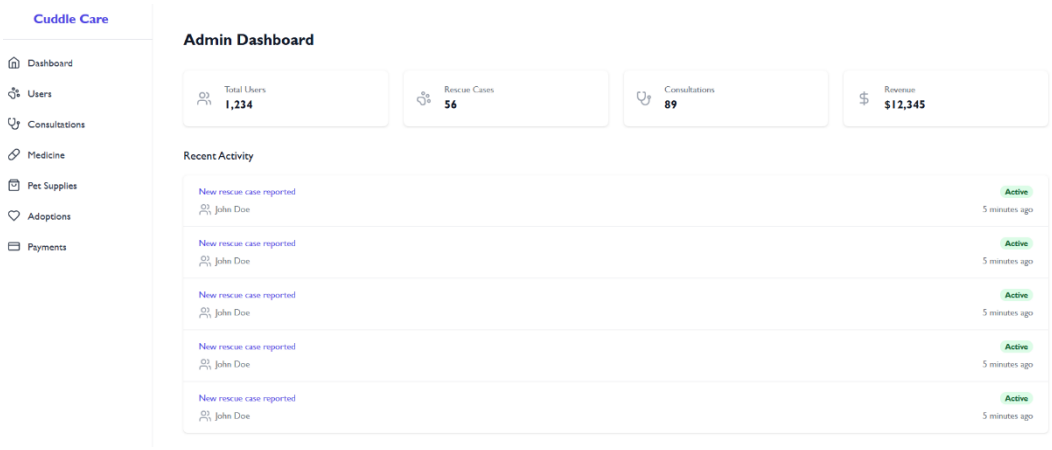

Figure 10-16: Output of admin dashboard

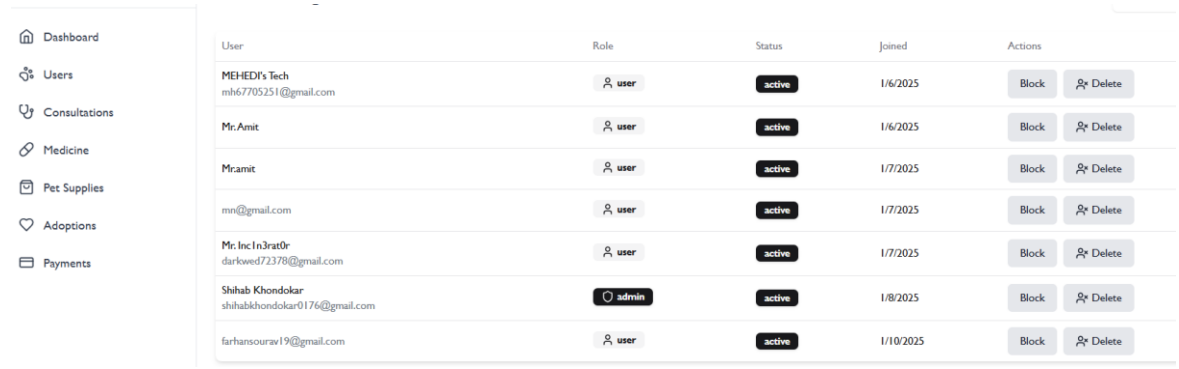

Figure 10-17: Output of admin dashboard

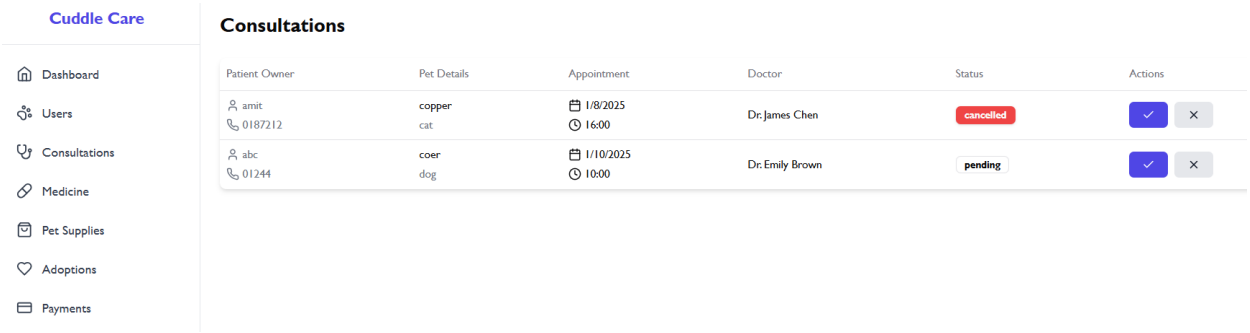

Figure 10-18: Output of consultations

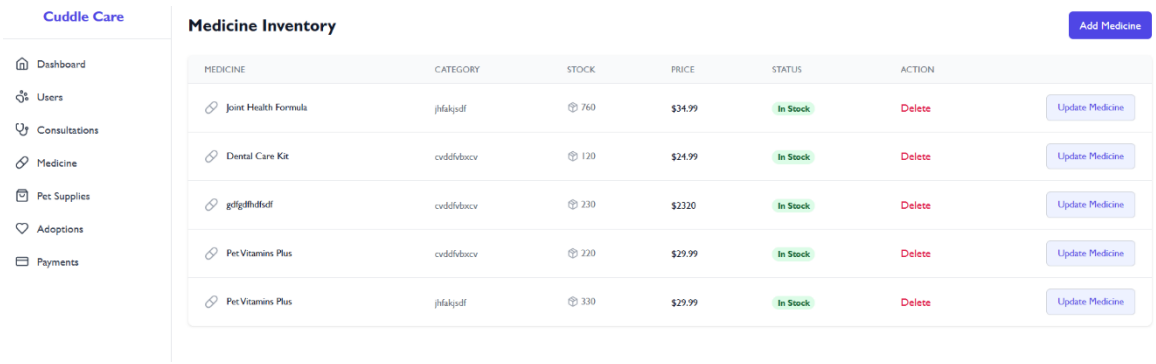

Figure 10-19: Output of medicine inventory

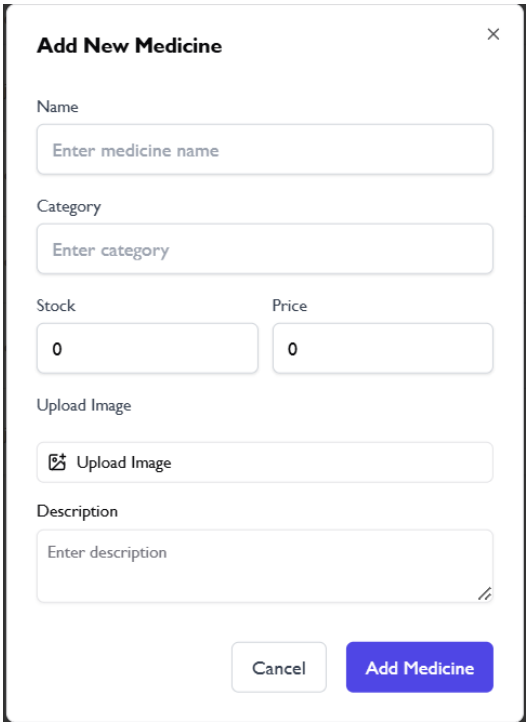

Figure 10-20: Output of add medicine

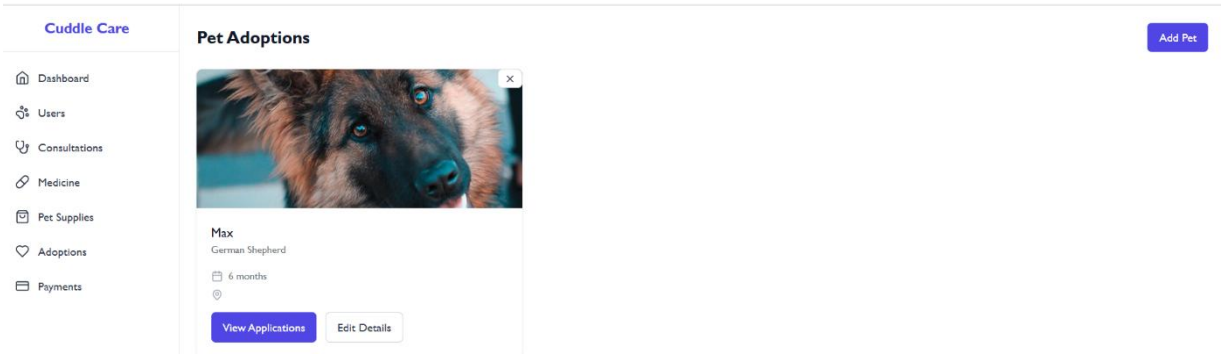

Figure 10-21: Output of pet adoption

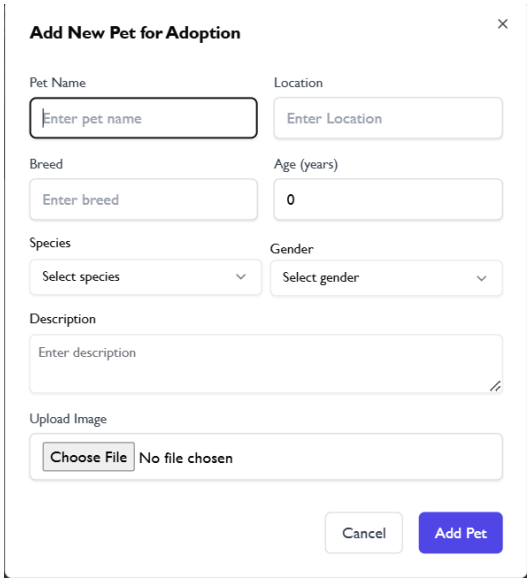

Figure 10-22: Output of add pet adoption

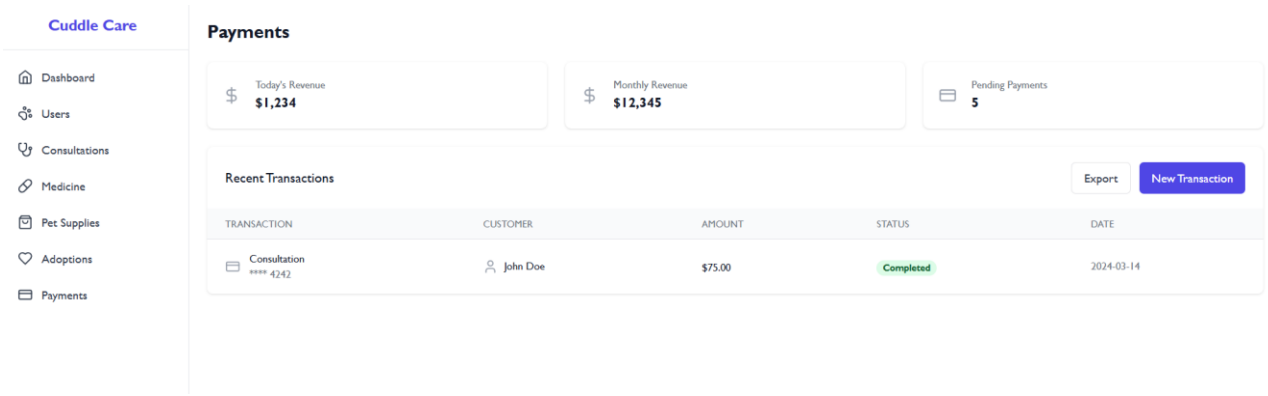

Figure 10-23: Output of payment method

10.3 Prioritization while developing:

Serial	Requirements
1	User Authentication and Authorization: Secure login and signup functionality.
2	AI-Driven Disease Detection: Core feature to analyze pet health data.
3	Consultation Booking: Enable users to schedule appointments with veterinarians.
4	Pet Adoption Management: View and apply for pet adoptions.
5	User Dashboard: Centralized area to track appointments, orders, and saved pets.
6	Responsive Design: Ensure compatibility across devices using TailwindCSS.

Table 10-3: Table of Module system

Chapter 11: Testing

11.1 Test Case:

With regard to our project testing will play a great role in order to check for functionality of the various components including; color option, logo inclusion, AI print and order placing among others. It will also include testing the coupling between the frontend, the backend and other external APIs if any.

A test case is generally made up of different parts, which create a perfect testing strategy. These components include:

Description: The brief description of the test case with reference to the test's goals and aims.

Precondition: The particular preparations needed that must be made before the first of the test steps is performed.

Steps: Tasks or operations in a strict order as have to be done on a specific test run.

Expected Result: The expected performance or the type of behavior that should be expected from the system in case it runs as it is supposed to.

Actual Result: The actual result that was obtained during the conduct of the test case.

Pass/Fail Criteria: The specifications used in the test case to reason whether the actual result suggests that the test has been passed or failed.

Test Environment: Some of the features which may vary are the kind of browser in which the test is conducted, the operating system among others.

Test Data: Information that is specific to the test case and which are used in the execution of the test case.

Contrary to be able to make a short and readable test cases documentation. For all of our test cases we will just demonstrate the following test components; Test scenario, Test steps, Actual result, Expected result, Pass/Fail criteria. After implementation, we did unit testing, module testing, integration after the execution of one test scenario to check all the system functionality and all outstanding features

Test Scenario	Expected Result	Actual Result	Remarks
Add a logo in supported format	The logo is successfully uploaded and displayed.	The logo was uploaded and displayed correctly.	Passed
Add a logo in unsupported format	The system shows an error message for invalid format.	The system displayed the appropriate error message.	Passed
Remove an existing logo	The logo is successfully removed from the display.	The logo was removed correctly.	Passed
Replace an existing logo	The new logo replaces the old one on the display.	The logo was replaced correctly.	Passed
Upload a large-sized logo	The system resizes or optimizes the logo as needed.	The logo was resized and displayed properly.	Passed

Table 11.1: Unit Test-2

11.2 Unit Test -3

Test Case Name	Unit Test -3
Test Case	Test the AI-generated print functionality

Test Scenario	Expected Result	Actual Result	Remarks
Generate print preview for AI results	The system displays a correctly formatted print preview.	The print preview was formatted accurately.	Passed
Print AI-generated diagnosis results	The diagnosis results are printed without formatting issues.	The results were printed as expected.	Passed
Handle large AI-generated content	The system paginates or scales content for printing.	Large content was paginated correctly for printing.	Passed
Print results in different formats (PDF)	The system generates a printable PDF of the results.	The PDF was generated and printed successfully.	Passed
Handle print cancellation gracefully	The system cancels the print job without errors.	The print job was canceled without issues.	Passed

Table 11.2: Unit test-3

11.3 Module Testing:

11.3.1 Module Test-1:

Test Case Name	Module Test -1
Test Case	Frontend and Backend Module Testing

Test Scenario	Expected Result	Actual Result	Remarks
Frontend: User login functionality	User is able to log in with valid credentials.	User successfully logged in with valid credentials.	Passed
Frontend: Form validation (required fields)	All required fields are validated correctly.	All required fields were validated correctly.	Passed
Frontend: UI responsiveness on mobile	UI adapts to mobile screen sizes properly.	UI displayed correctly on mobile devices.	Passed
Backend: User authentication API	User is authenticated via API call with valid data.	Authentication API returned a successful response.	Passed
Backend: AI diagnosis API	AI diagnosis API processes and returns results correctly.	AI API processed symptoms and returned accurate results.	Passed
Backend: Database connection	Database connection is established and data is fetched.	Database connection was successful and data retrieved.	Passed
Frontend: Displaying data from backend	Data from the backend is displayed correctly in UI.	Data fetched from backend displayed correctly.	Passed
Backend: Pet adoption API	Pet adoption data is correctly processed and stored.	Adoption data was correctly processed and stored.	Passed

Table 11.3.2: Module test-3

11.4 Integration Testing:

Test Case Name	Integration Test
Test Case	Integration Testing

Test Scenario	Expected Result	Actual Result	Remarks
Frontend and Backend communication for user login	User can log in and the frontend communicates with backend for authentication.	Login was successful and backend responded correctly.	Passed
Frontend and Backend integration for AI diagnosis	Frontend sends pet symptoms to backend, AI processes, and returns diagnosis.	AI diagnosis was returned and displayed correctly.	Passed
Frontend integration with database for pet adoption	User applies for pet adoption, frontend communicates with backend and stores data in the database.	Adoption application was stored and displayed properly.	Passed
Frontend and Backend integration for appointment booking	User books an appointment, frontend sends data to backend, and appointment is stored.	Appointment was booked and saved in the backend.	Passed

Table 11.4.1: Integration test

Model Training:

Randomize the data set – and allocate 70 percent for the training of the algorithm, 15 percent for the algorithm's validation and the remaining 15 percent for testing.

Model Evaluation: For the model, evaluate in terms of accuracy or precision, or Recall, F1 score obtained in the test set. In our case, they are misclassifications, and thus we will be required to undertake error analysis just to learn what went wrong.

Deployment:

The model should meet performance that can be associated with the requirements of Cuddle Care after which should be integrated into the Cuddle Care software platform. The model can be hosted on tensorflow.js or pytorch.js for the real-time detection of disease in the frontend or even build as an API REST for the backend implementation.

11.5 Scaling:

Cuddle Care will expand by having cloud services that may include Firebase, MongoDB among others in order to handle data that flows from the users, constant update on AI models, constant check on system load to facilitate a kind of growth known as horizontal scaling.

11.6 Load Balancing:

Traffic distribution in the Cuddle Care's application systems will be made easier through load balancing so that to ensure availability and reliability. They make work easier, reduce the burden on the server, and improve end users' experience as the website will not close during high traffic. od balancing, maintaining horizontal capability and constant performance evaluation that does not require a vertical capability.

Chapter 12: Implementation

12.1 Training:

- Pet Disease Detection
- AI Model Training
- Objective: Know how the AI model of diseases that affect pets through typing of inputs of the diseases, breed, age, and other features of the pets.

Steps for AI Model Training:

Data Collection:

Gather a large amount of data containing health status, signs, breeds, ages and diagnosis, if any was given.

Data Preprocessing:

Data pre-processing where after raw data is collected before it is input in the data mining program is cleaned and the unnecessary data is either left out. If qualitative and quantitative data are to be used they should be normalized when seen necessary (age groups, symptoms etc.) Monitor the learning process and annotate the data placing symptoms where they belong, to the type of disease.

Model Selection:

Choose the correct supervised machine learning algorithm such as Random forest, Neural networks or Support Vector machines or deep learning algorithms such as Tensor Flow or Py Torch etc. Make sure that the model which is to be built is capable of handling the multiclass classification that is more than one disease transmission is diagnosable with the input parameters.

Model Training:

Randomize the data set – and allocate 70 percent for the training of the algorithm, 15 percent for the algorithm's validation and the remaining 15 percent for testing.

Model Evaluation:

For the model, evaluate in terms of accuracy or precision, or Recall, F1 score obtained in the test set. In our case, they are misclassifications, and thus we will be required to undertake error analysis just to learn what went wrong.

Deployment:

The model should meet performance that can be associated with the requirements of Cuddle Care after which should be integrated into the Cuddle Care software platform. The model can be hosted on tensorflow.js or pytorch.js for the real-time detection of disease in the frontend or even build as an API REST for the backend implementation.

12.2 Scaling:

Cuddle Care will expand by having cloud services that may include Firebase, MongoDB among others in order to handle data that flows from the users, constant update on AI models, constant check on system load to facilitate a kind of growth known as horizontal scaling.

12.3 Load Balancing:

Traffic distribution in the Cuddle Care's application systems will be made easier through load balancing so that to ensure availability and reliability. They make work easier, reduce the burden on the server, and improve end users' experience as the website will not close during high traffic. od balancing, maintaining horizontal capability and constant performance evaluation that does not require a vertical capability.

Chapter 13: Critical Appraisal and Evaluation

13.1 Objective that could be met:

Thus, the purpose of Cuddle Care is implementing an AI-created pet health check-up, consultation, and pet-findings services. By using cloud infrastructure, real time database and machine learning technologies, it is expected that Cuddle Care will enhance the quality of pet care, enhance tasks associated with veterinarians, and provide users with a better experience more efficiently thus promoting the development of the hángling, sidecar and constant supervising of the developing pet care market.

13.2 How much better could have been done:

To develop Cuddle Care further we need to apply more sophisticated AI approaches in disease prediction; more frequent machine learning for individualization; incorporation of teleconsultation **services;** and we must create a more practical and diverse application for the Smartphone.

13.3 Which features could not be touched:

Firebase is a critical attribute of Cuddle Care as it offers database and users' authentication, in real-time, whereas disease detection by the use of artificial intelligence, is an important feature that defines the quality of the PAW system, as it identifies its main function

Chapter 14: Lesson Learned

14.1 Pre Project – Review – Closing:

Pre-Project

When Cuddle Care was initiated, the initial user and context analysis, including technical, economic, managerial, and legal feasibility for the intended project was conducted. Some of the main research which has been conducted is; research on the pet care market, the user needs analysis, and lastly research on the available technologies in the market. Therefore, according to the outcomes presented above, it was decided to develop an AI-based program to perform check-ups and consults of pets' health as well as to adopt them.

Review

During the course of the project at the samples, there were ultimate feedbacks done to determine whether the going was in congruity with or without the set standards. These were meant to be significant on disease detection model using artificial intelligence, user interface and data management. These areas comprised real-time update of the admin dashboard as well as site's ability to adapt to the mobile use through feedback given by other stakeholders during the testing phase. Issues solving was done on a collaborative basis; for instance, they needed to focus on how the arrival of AI into real time data would be handled.

Closing

The project is nearly complete because most essential features are designed and verified. The last interaction with the platform, the refinement of behaviors, and the preparation of training manuals are still in the process of construction. Further assessment of results and changes will be made after the launch in order to continue improving the situation.

14.2 The Problem I Have Faced:

The following challenges were realized while developing Cuddle Care. Gola one of them was to incorporate the AI model application for pet disease detection and the real-time database application. The requirement to sort through the health data and to keep track of the users & pets profiles lead to some changes on the backend architecture.

One more challenge in narrowing the processes was perfecting the system utility regarding its features for managing the enormous volume of pet health information. Since response time optimization of incoming AI queries and avoiding a bottleneck situation for heavy loads were inevitable, the load balancing and query optimizations had to be made at the database level.

Another challenge was the aspects of the user interface; not only because it was necessary to optimize the application and keep the number of buttons and menus as low as possible, while integrating a number of complicated functions, such as, for example, consulting booking, health control, adoption services and so forth, but also owing to the necessity to design the interfaces for different clients – the veterinarians and administrators on the one hand and the owners of the pets on the other hand.

Finally, client information insurance or the extension of data protection to pet health information posed especially sensitive questions of security and authentication for implementation of encryption.

14.3 What Solutions Occurred:

The following challenges were realized while developing Cuddle Care. Gola one of them was to incorporate the AI model application for pet disease detection and the real-time database application. The requirement to sort through the health data and to keep track of the users & pets profiles lead to some changes on the backend architecture.

One more challenge in narrowing the processes was perfecting the system utility regarding its features for managing the enormous volume of pet health information. Since response time optimization of incoming AI queries and avoiding a bottleneck situation for heavy loads were inevitable, the load balancing and query optimizations had to be made at the database level.

Another challenge was the aspects of the user interface; not only because it was necessary to optimize the application and keep the number of buttons and menus as low as possible, while integrating a number of complicated functions, such as, for example, consulting booking, health control, adoption services and so forth, but also owing to the necessity to design the interfaces for different clients – the veterinarians and administrators on the one hand and the owners of the pets on the

Finally, client information insurance or the extension of data protection to pet health information posed especially sensitive questions of security and authentication for implementation of encryption.

Chapter 15: Lesson Learned

15.1 Summary of the project:

Cuddle Care is an AI application that creates possibilities to enhance the quality of pet health, consulting, and pet adoption services. Thus, it provides a beautiful image of pet care to its customers, vets, and administrators through technology friends like Firebase, MongoDB, and AI. Some of integration highlights are as follows: Advanced health watches, reliable user identification and completeness in dashboards. Thus, the principal objective of the project is to improve the quality of pet care and further facilitate its provision to all the stakeholders based on the aforesaid concept as the model of the modern pet management.

15.2 Goal of the project:

That is why the main goal of the Cuddle Care project is to create an AI system that contributes to increasing pet's welfare and provides access to doctors and medications, consultations, and pet adoption. Its purpose is to improve the organization of spay/neuter, expand and improve accessibility and delivery of veterinary services, and to be user friendly to the animal, the owner, the veterinarian and the manager. Such advancement such as real time data synchronise the branch aims at offering a comprehensive package in regard to the pro active pet and general management for every one in chain.

15.3 What I have done in Documentation:

Project Overview: Speaking about the platform, it exists with the mission to help diagnose diseases using artificial intelligence, make a consultation appointment, and provide adoption services.

Technologies Used: Listed the technologies, which are integrated into the platform: React, Firebase, MongoDB, TypeScript, Tailwind CSS, and AI frameworks.

Functional and Non-Functional Requirements: Explained what this actual functional specification entails including the log in, Vital pet records, Admin panel, security, efficiency, and flexibility of the application.

Methodology: The paper identified what development approach was right for the type of development that was required – the Agile model and the phases within the Agile model.

AI Implementation: Piped on how the integration of the AI model for disease detection was done inclusive of the training and the evaluation work.

Testing and Evaluation: It is important to note that all the test cases listed belong to various features

and all of them serve the purpose of proving the platform functionality, platform performance and platform security:

Challenges and Solutions: Discussed on the problem that was experienced during the development and how they were solved.

Project Conclusion: In conclusion, the results achieved, inventions that have been implemented and activities for the subsequent improving of the next project are pointed out

My Experience:

Stages: Perhaps, organizational development experience at Cuddle Care has most probably been a more or less challenging as well as structural alterative in nature during the process of work experience. From initial research and requirement gathering to the actual implementation and testing, you have gained hands-on experience in:

AI Integration: Here you were to learn about adding machine learning models for diagnosis of diseases through data introduction and preparation, model learning, and application, to enhance your understanding of practical aspects of AI and its use.

Frontend Development: Comfortable with React TypeScript and having gothic Tailwind CSS you have provided an impeccable & user-friendly UI/UX interface. Always been advancing the modern WebDev-frameworks.

Backend Development: Engaging Firebase authentication for the user's information and MongoDB for information storage you acquire hands-on experience of how to deal with database and ensure the consumer's data security.

Collaboration: In this environment as an agile development environment, you have given and received development feedback through iterative development feedback and you and your team have mainly worked together to make progress and reach every single relevant milestone in the project.
Problem-Solving: They are based on the problems you had concerning the performance of the model, the job that was done by the AI, and the issues that were experienced in the design of the user interface during the project that enables one to develop some important problem solving skills.

Works Cited

- *Petfinder. Pet Adoption Platform. https://www.petfinder.com*
- *PetDesk. Pet Health Management App. https://www.petdesk.com*
- *Pawtrack. Pet Tracking Device for Cats. https://www.pawtrack.com*
- *Banfield Pet Hospital. Pet Portal: Health Management for Pets.*
- *https://www.banfield.com*
- *Openai. (n.d.). OpenAI API. Retrieved from https://openai.com/api/*
- *PetWellness Co. AI for Disease Detection in Animals*
- *. https://www.petwellnessco.com*
- *Pet Adoption Network. Pet Adoption Services and Listings.*
- *https://www.petadoptionnetwork.org*

Plagiarism Report

211-16-554

ORIGINALITY REPORT

6%	6%	1%	1%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	dspace.daffodilvarsity.edu.bd:8080 Internet Source	5%
2	Submitted to University of Greenwich Student Paper	<1%
3	Submitted to Daffodil International University Student Paper	<1%
4	publikationen.uni-tuebingen.de Internet Source	<1%
5	Willie van Peer, Frank Hakemulder, Sonia Zyngier. "Assignments", John Benjamins Publishing Company, 2012 Publication	<1%
6	jet2careers.com Internet Source	<1%
7	James Schiel. "The ScrumMaster Study Guide", Auerbach Publications, 2019 Publication	<1%
8	doi.org Internet Source	<1%