

[PETCARE PROJECT]

INFO 6007 Report



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1. Project Charter

Project Name	PetCare application
Project Objectives	Develop a multi-functional platform to help users better care for their pets and provide online support as well as offline solutions for pet emergencies.
Estimated Cost	\$ 164,750
Estimated Time	10 months

1.1 Project Details

1.1.1 Project Background

With the acceleration of urbanization, pets have become important members of many families. This trend is particularly evident among younger generations, who are increasingly focused on pet health, interaction, and quality of life. Consequently, there is a growing demand for pet care services, including vaccinations, daily care, and first aid knowledge. The rise of exotic pets (such as snakes and lizards) has further heightened the need for specialized pet care knowledge.

The PetCare application aims to provide comprehensive services for pet owners through features like daily records, community interaction, a medical assistant, and a nearby mall. By integrating AI technology with medical services and precise community segmentation, PetCare seeks to deliver a professional, convenient, and personalized pet care experience, while fostering further growth in the pet market.

1.1.2 Project Objectives

The objectives of this project are to develop a multi-functional platform that assists users in better caring for their pets and provides online support for pet emergencies, as well as offline solutions. Specific goals include:

- Complete the project development within 10 months.
- Release a test version within 8 months, targeting 5,000 active users and a 30% utilization rate of AI inquiries.
- Introduce human consultation features within 10 months and partner with at least 30 pet hospitals.
- Achieve 10,000 daily active users and 50,000 AUD in monthly sales.

1.2 Project Deliverables

1. Product Delivery

- Daily Record Module: A complete pet notepad and to-do reminder.
- Community management module: The community platform and the video sharing function.

- Medical assistant module: AI-driven pet health Q&A function and 24-hour online doctor consultation system.
- Online malls module: Supports online browsing, purchase and delivery services for pet food, toys and other products.

2. Document delivery

- Technical Documentation: Code comments, development documentation and test report.
- User Manual: Provides end users with an operating guide for the system.
- Project Management Documentation: Include Project Charter, Project Plan, Communication Plan, Risk Management Plan, Project Reports and Final Report.
- Training materials: Training documentation for internal teams, customers, or partners, including training courses and tutorials on system use and management.

3. High-Level Requirements

- Users can set important dates (e.g., vaccination times) and receive push notifications. The system must track weight changes and display user-shared experiences effectively.
- The system must allow for AI-generated pet images as representatives. Intelligent recommendation algorithms must analyze user behavior. AI must identify pet species from photos and provide relevant health advice.
- The navigation feature should guide users to recommended hospitals based on their location.
- The system must recommend related products based on purchase history.
- Users should be able to write and view product reviews.

1.3 Project Cost

Functional Modules	Estimated Cost (AUD)	Cost Structure
Daily Records	27,900	Includes health record features, reminder systems, and user interface design.
Community Management	32,000	Covers social platform construction, user classification functionality, and intelligent recommendation development.
Medical Assistant	30,000	Includes AI inquiry system and integration of 24/7 human consultation services.
Online Malls	27,900	Encompasses online shopping platform development and personalized recommendation algorithm creation.
Marketing and Promotion	14,000	Allocated for online advertising, social media promotions, and publicity in partner hospitals.
Reserves	32,950	Provides a buffer for financial risk management.
Total Project cost estimate	164,750	

1.4 Project Time

Phase	Time (estimated)	Phase Goal
Project Initiation	2024-08-01	Complete all initiation activities, including budget analysis and project scheduling.
Development Phase	2025-04-01	Develop a comprehensive PetCare Management Platform.
Marketing Phase	2025-06-01	Promote in the market and optimize based on user feedback.
Project Closure	2025-07-01	Complete all closure activities, including lessons learned and performance review.

1.5 Stakeholders & Roles

Name	Stakeholder	Role	Description
Wanying Yu	Project Sponsor	Chief Executive Officer (CEO)	Provides strategic direction and leadership for the project; coordinates relationships with investors and stakeholders; oversees project progress.
Yuchen Li	Technical Leader	Chief Technology Officer (CTO)	Leads technical implementation and strategic planning; ensures technology aligns with business goals and maintains quality.
Shiqi Peng	Project Manager	Project Manager	Manages daily operations and coordinates team activities; ensures timely and budget-compliant project delivery.
Yang Yang	Marketing Director	Marketing Director	Develops and executes marketing strategies to attract users and boost engagement after launch.
Huan Cao	Community Manager	Community Manager	Engages users and manages initiatives to foster interaction and community growth.

1.6 Constraints

Software Requirements : PostgreSQL is used to store pet records; React (front-end) + Node.js.

Hardware Requirement : 4-core CPU, 16GB RAM, 500GB SSD, which supports 10,000 daily active users.

Technical Parameters: Request processing time < 200ms and push notification latency < 2 seconds.

2. Scope

2.1 Project Scope Statement

The PetCare Management Platform project aims to develop a comprehensive digital solution for pet owners and service providers, facilitating pet care management, appointment scheduling, and resource access. The project will include the design, development, testing, and integration of the platform with the content management system, excluding the development of additional features and third-party system integration. The platform must be compatible with mainstream mobile devices.

2.1.1 Product Characteristics and Requirements

1. Core Functions :

- **Daily Records:** Users can record their pets' health information such as vaccinations, weight changes, and daily activities. Provide to-do reminders to ensure that important health matters (such as vaccine expiration and weight monitoring) are managed in a timely manner.
- **Community management:** Divide user communities by pet type and geographic location to support information sharing and communication between users. Professional pet experts and pet doctors are stationed to provide pet care knowledge and first aid video teaching. Based on user interests and interactive behaviors, intelligently recommend relevant content.
- **Medical Assistant:** Provides AI-driven pet health Q&A, covering daily care and emergency treatment advice. Supports 24-hour online consultation, users can communicate directly with veterinarians and get professional advice. Recommend and navigate to the nearest pet hospital based on user location.
- **Online Malls:** Provides online purchase of pet food, toys and other products, supports personalized recommendations and logistics tracking. Users can rate and review products to help other users choose suitable products.

2. Performance Standards :

- **Data processing:** Data storage and synchronization time should be less than 100 milliseconds to ensure smooth user operations.
- **Response speed:** The push notification delay should be less than 2 seconds to ensure that users receive reminders in time.
- **Scalability:** The system needs to support at least 10,000 users' daily active use and meet the high concurrency requirements of the community and mall.

3. Compliance Requirements :

- **Data Privacy:** Comply with the relevant requirements of the Personal Data Protection Law to ensure that users' personal data (pet health records, addresses, etc.) are properly protected and not abused or leaked.
- **Payment security:** The mall module must comply with payment industry standards to ensure the security of user payment information.

2.1.2 In Scope

- Development of core features and functionalities.
- Creation of user guides and training materials.
- Conducting system testing and gathering user feedback.

2.1.3 Out of Scope

- Development of augmented reality (AR) functionalities.
- Post-launch marketing activities.
- Additional content development beyond initial scope.

2.1.4 Project Success Criteria

Criteria	Measurement
Timeliness	On-time project launch.
Budget Compliance	Adherence to the established budget.
Functionality	Full operational functionality of the platform.
User Satisfaction	Rating of 4.5/5 or higher from users.
Stakeholder Approval	Approval of all deliverables by stakeholders.

2.2 Key Milestones

Milestone	Start Date	End Date	Description
Project Initiation	2024-07-01	2024-07-21	Define scope, budget, and schedule. Identify target audience and analyze competitors.
Stakeholder Engagement	2024-08-12	2024-09-24	Communicate with stakeholders to gather insights and feedback for a user-centered approach.
Development Phase	2024-09-25	2024-11-19	Design UI/UX and develop key features, including the daily record and community modules.
Testing Phase	2024-11-19	2025-01-22	Perform comprehensive testing to ensure quality and fix any issues before launch.
Marketing Phase	2025-01-23	2025-02-27	Implement marketing strategies and prepare promotional materials for the app launch.
Platform Launch	2025-02-28		Official launch of the PetCare platform for users.
Maintenance and Training	2025-02-29	2025-04-10	Provide user support, create documentation, and train staff for ongoing improvements.
Project Closure	2025-04-10	2025-05-21	Review project outcomes, document lessons learned, and prepare a summary for stakeholders.

2.3 Deliverables

2.3.1 Project Management-related Deliverables

Deliverables	Description
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Project Charter	Overview of goals and stakeholders.
Project Plan	Timeline and budget details.
Communication Plan	Defined communication channels.
Risk Management Plan	Risk identification and mitigation.
Project Reports	Regular status updates.
Final Report	Summary of outcomes and lessons learned.

2.3.2 Product-related Deliverables

- Functional module delivery: The core deliverable of the project includes the complete implementation of all functional modules and ensures the normal operation of the system and the smoothness of the user experience.
- Technical Documentation: Code comments, development documentation and test report, which detailed comments covering key features and development process description.
- User Manual: Provides end users with an operating guide for the system, including how to use the recording function, medical assistant, participate in community interaction and shopping in the mall.
- Training materials: Training documentation for internal teams, customers, or partners, including training courses and tutorials on system use and management.

3. Literature Review/Technology Review, Market Research

3.1 Literature Review/Technology Review

3.1.1 Introduction

The growing number of pets and increasing focus on pet health have escalated the demand for pet management platforms (Hohenhaus, 2023). The PetCare project aims to deliver comprehensive solutions encompassing daily records, online medical assistance, community interaction, and an e-commerce marketplace, facilitating efficient pet health and life management for owners. This literature review summarizes current research, highlights knowledge gaps, and provides foundational support for the PetCare project.

3.1.2 Present situation of pet management platform

Functional integration is key to improving user experience. Wang et al. (2022) highlight that modern platforms should integrate health records, community interaction, and online consultations to meet pet owners' needs. Although integration simplifies the user experience, it adds complexity to system development, particularly in data integration and security. The **PetCare project** must balance these benefits with the challenges of system management.

3.1.3 Online pet medical inquiry

Online medical inquiry services have gained popularity among pet owners. Sun et al. (2018) demonstrate how remote services provide timely assistance in emergencies. However, AlZubi et al. (2023) note that while AI can enhance efficiency in simple inquiries, complex

diagnoses still require human veterinary intervention to ensure accuracy and foster user trust.

3.1.4 Influence of community operation on user stickiness

Community module has a significant impact on improving user stickiness. The research of Luo et al. (2021) shows that the platform with community function can better promote user participation and interaction compared with the platform without this function. Community interaction not only provides a space for pet owners to share their experiences, but also increases the perceived value of the platform. However, Benlian & Hess(2011) pointed out that due to personality preference and privacy issues, the participation rate of some users is low. Therefore, the community design of PetCare should consider the needs of different users, provide personalized interaction, and maximize user participation and platform stickiness.

3.1.5 Criticism of methodology

Most existing studies on pet management platforms rely on questionnaires and case studies, which may introduce bias and lack representative samples (Bauhoff, 2014). Additionally, research on system performance often lacks quantitative metrics, such as response times and server loads. The PetCare project will incorporate system performance monitoring and user behavior analysis to objectively assess usability and identify areas for improvement.

3.1.6 Identification of knowledge gaps

Despite extensive research on pet management and online medical care, notable gaps remain. Specifically, how to seamlessly integrate diverse functional modules (e.g., daily management and medical assistance) and enhance accuracy and user trust through community interaction are areas lacking in exploration. Addressing these gaps presents opportunities for the PetCare project to innovate personalized services by leveraging user data and community feedback.

3.1.7 Critical evaluation

Research consensus indicates that integration and intelligence are key development trends for pet management platforms. However, balancing functional richness with user experience simplicity poses ongoing challenges (Hartson & Pyla, 2012). Furthermore, while AI applications can enhance medical efficiency, human veterinarians remain essential for managing complex cases (Lee & Yoon, 2021). These challenges underscore existing technology's limitations and the advancement opportunities for the PetCare project.

3.1.8 New Ideas and project innovation

The PetCare project focuses on modular development, integrating essential functions while maintaining flexibility. The Integrated Dashboard consolidates pet-related information into a single interface, simplifying task management and health monitoring. Targeted Community Interaction personalized content based on pet type and location, fostering connections and community engagement. The Marketplace Functionality links users with local businesses, and the Medical Assistant offers support for health inquiries, continuously improving through community feedback.

3.1.9 Literature summary

In summary, existing research offers valuable insights into pet management platforms, yet gaps remain in functional integration, personalized services, and user trust enhancement. The PetCare project aims to address these gaps through innovative methods, ultimately providing comprehensive services for pet owners.

3.2 Market Research

3.2.1 Market Overview

The global pet care market has experienced substantial growth, valued at over USD 300 billion in 2023, and projected to expand at a CAGR of 6.8% from 2024 to 2032 (Mariam & Gauri, 2024). Key growth drivers include increased pet ownership, heightened health awareness, and the humanization of pets, leading to greater spending on premium products. The market also encompasses a diverse range of pets beyond cats and dogs, revealing untapped potential.

3.2.2 Target Audience Analysis (Market Demand)

Australia ranks among the top countries for pet ownership, with nearly 63% of households owning a pet (Baguley, 2011). Rapid growth in demand for high-quality pet food, veterinary care, and personalized services is evident, alongside a rise in pet insurance and advanced medical treatments (Zhang, Cao & Lin, 2022). However, the market is predominantly offline, focusing on in-person services, which limits convenience. The PetCare app aims to address this gap by offering health record tracking, experience sharing, AI-driven consultations, and an integrated shopping platform.

3.2.3 Competitive Analysis

The pet care industry is highly competitive, with established players like MadPaws and Pawshake offering services such as pet-sitting and adoption. However, there remains a gap in digital solutions for health monitoring, emergency services, and integrated shopping. Our app emphasizes AI-based consultations and a holistic ecosystem that unites health recording, telemedicine, and e-commerce, providing a comprehensive experience surpassing existing competitors.

3.2.4 Marketing Strategy

Our marketing strategy focuses on three ways:

1. **Partnerships:** Collaborating with pet hospitals and veterinarians to establish the app as a trusted resource for health advice and emergency services, enhancing credibility and visibility.
2. **Influencer Marketing:** Engaging pet influencers to share their experiences using the app, attracting new customers through their established audiences. Targeted social media ads will highlight unique features such as personalized health tracking and AI consultations.

3. Targeted Offline Campaigns: Organizing themed activities, such as stray animal rescue and pet adoption promotions, to engage pet owners directly. These initiatives will showcase the app's convenience and community support.

Additionally, the app will offer exclusive online order promotions and subscription-based services for premium users, incentivizing long-term engagement and maximizing the use of premium features.

4. Work Breakdown Structure

4.1. WBS Diagram



Figure 4.1 WBS diagram

4.2. WBS Table

Level 1	Level 2	Level 3
Project start-up phase		
Project Initiation	Market Research	Identify target audience
		Analyze competitors
		Conduct surveys on pet ownership
	Project Charter	Define project goals
		Establish project scope
		Create initial budget
		Identify key milestones
	Stakeholder Engagement	Identify stakeholders
		Conduct stakeholder meetings
		Collect feedback and insights
Development	Design	Create UI/UX wireframes

	Core Features Development	Develop prototypes
		Daily Record Module
		Community Module
		Medical Assistant Module
		Marketplace Module
Testing	Quality Assurance	Develop comprehensive test cases
		Conduct usability testing
		Perform system integration testing
	Bug Fixing	Identify Bugs
		Implement Fixes
Launch	Marketing Strategy	Define marketing channels
		Develop promotional materials
		Create social media content plan
	App Launch	Prepare app store listings
		Monitor app performance post-launch
Maintenance	Ongoing Support	Create user support documentation
		Implement feedback channels
		Train support staff
	Community Engagement	Feedback Loops
		Continuous Content Generation
Project Closure	Final Report	Document lessons learned
		Review project performance
		Prepare case study for stakeholders
	Transition Plan	Plan for ongoing support
		Handover to maintenance team
		Conduct post-launch review

4.3. WBS Activies

1.1.1 Identify target audience	Research the demographics of pet owners to tailor app features and marketing strategies, focusing on age groups, ownership trends, and specific needs.
1.1.2 Analyze competitors	Review similar apps (e.g., Madpaws, Alan Shi Guan Diary) to identify

	strengths and weaknesses, informing our unique value proposition and features.
1.1.3 Conduct surveys on pet ownership	Gather feedback from potential users to ensure the app meets their needs and preferences.
1.2.1 Define project goals	Set clear objectives for enhancing pet care, community engagement, and user satisfaction.
1.2.2 Establish project scope	Outline specific features and functionalities to clarify what will be included in the app.
1.2.3 Create initial budget	Estimate development, marketing, and operational costs to ensure financial viability.
1.2.4 Identify key milestones	Set important deadlines for tracking progress and ensuring timely app delivery.
1.3.1 Identify stakeholders	Determine key participants (developers, marketing teams, pet professionals) for effective communication and collaboration.
1.3.2 Conduct stakeholder meetings	Engage stakeholders for insights and feedback throughout the project, ensuring all voices are heard.
1.3.3 Collect feedback and insights	Document stakeholder feedback for adjustments to meet user expectations.
2.1.1 Create UI/UX wireframes	Design intuitive wireframes to enhance user experience and accessibility.
2.1.2 Develop prototypes	Create clickable prototypes for user testing to validate design choices and gather feedback.
2.2.1 Daily Record Module	Implement a feature for users to log daily activities related to their pets, such as vaccinations, feeding schedules, and health observations. Include a reminder system for important dates (e.g., vaccination due dates) to enhance user engagement.
2.2.2 Community Module	Build a platform for pet owners to share experiences and support, segmented by pet type (cats, dogs, exotic pets) and location. Invite pet care experts to share emergency tips and experiences, primarily through video content.
2.2.3 Medical Assistant Module	Provide an AI-driven Q&A feature for basic health inquiries. Include 24-hour veterinary consultations for complex issues, emergency instructions, and GPS-based recommendations for nearby clinics. Enable users to upload photos for smart recognition of pet types and health statuses.
2.2.4 Marketplace Module	Create a marketplace for a variety of pet products (food, toys) with home delivery options. Users will be able to browse products, read reviews, and receive personalized recommendations based on their purchase history and behavior.
3.1.1 Develop comprehensive test cases	Create thorough test cases covering all app features to ensure quality
3.1.2 Conduct usability testing	Test the app's ease of use with real users to identify areas for improvement.
3.1.3 Perform system integration testing	Ensure that all app components function together seamlessly and as intended.

3.2.1 Identify Bugs	Document and categorize identified bugs for efficient resolution, prioritizing based on user impact.
3.2.2 Implement Fixes	Apply necessary fixes to ensure reliability and user-friendliness before launch.
4.1.1 Define marketing channels	Identify effective promotional channels (social media, online ads, partnerships) to reach target audiences.
4.1.2 Develop promotional materials	Create engaging marketing content to effectively communicate the app's value.
4.1.3 Create social media content plan	Plan and schedule posts to build brand presence and engage with pet owners.
4.2.1 Prepare app store listings	Optimize listings for visibility and downloads with compelling descriptions and visuals.
4.2.2 Monitor app performance post-launch	Track user engagement and app performance metrics to inform future updates.
5.1.1 Create user support documentation	Develop guides and FAQs to assist users in navigating the app.
5.1.2 Implement feedback channels	Establish systems for users to provide ongoing feedback on app features.
5.1.3 Train support staff	Equip support teams with knowledge about the app to enhance user assistance.
5.2.1 Feedback Loops	Create processes for collecting and implementing user feedback for continuous improvement.
5.2.2 Continuous Content Generation	Regularly produce new content to keep users engaged and informed about pet care.
6.1.1 Document lessons learned	Compile insights and lessons from project execution to improve future projects.
6.1.2 Review project performance	Analyze project outcomes against initial goals to assess success.
6.1.3 Prepare case study for stakeholders	Summarize project results for stakeholder review, highlighting successes and challenges.
6.2.1 Plan for ongoing support	Develop a strategy for ongoing maintenance and updates post-launch.
6.2.2 Handover to maintenance team	Transition project responsibilities to the maintenance team for ongoing support.
6.2.3 Conduct post-launch review	Review project execution and user feedback after launch to identify areas for future improvement.

5.Project schedule and Time Modeling

5.1. Gantt

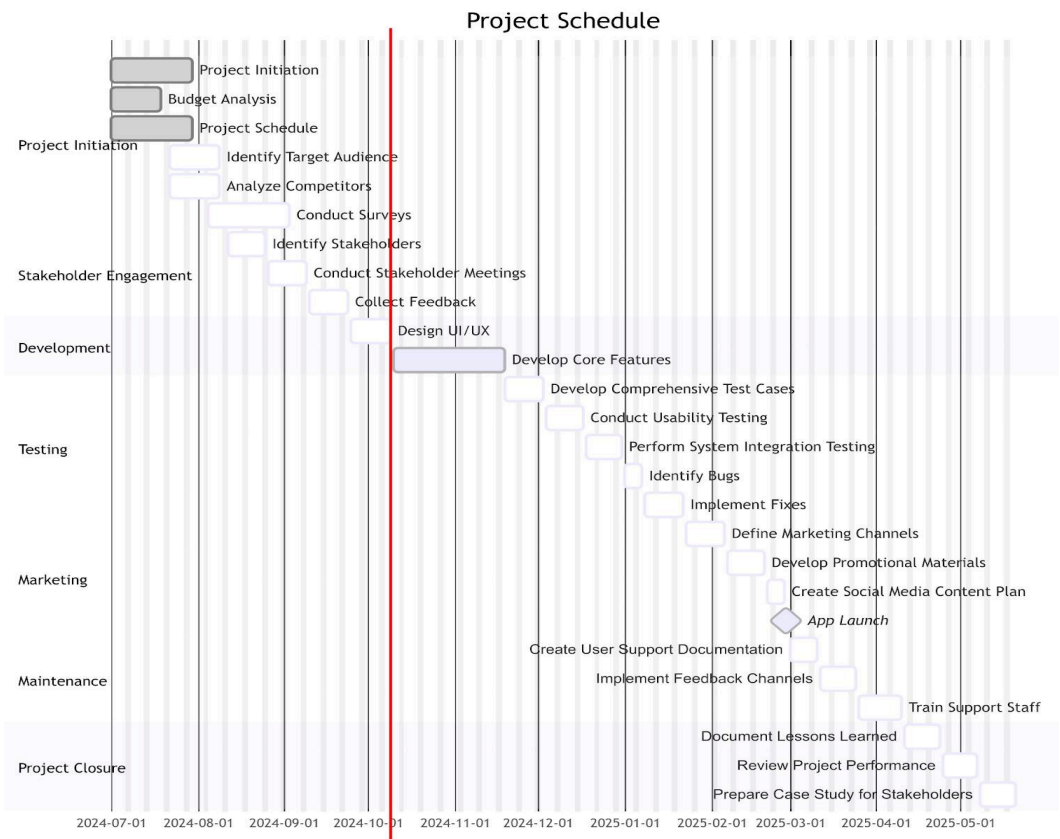


Figure 5.1 Gnatt graph 1

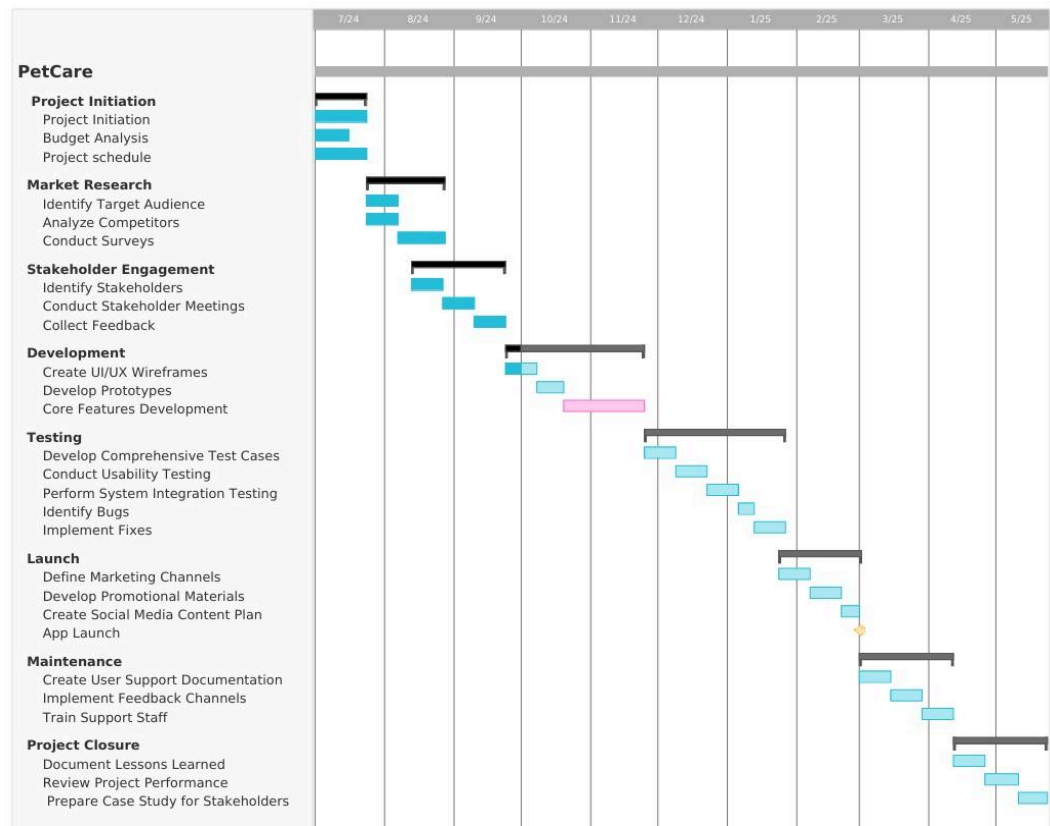


Figure 5.1 Gnatt graph 2

Project Phases:

1. Initiation Phase:
 - Duration: July 1 - July 28, 2024
 - Goal: Establish project foundation, including budget and scheduling.
2. Development Phase:
 - Duration: October 10 - November 19, 2024
 - Focus: Develop core features: Daily Record, Community, Medical Assistant, and Marketplace modules.
3. Testing Phase:
 - Duration: November 19, 2024 - January 22, 2025
 - Activities: Conduct quality assurance, usability testing, and system integration.
4. Marketing Phase:
 - Duration: January 23 - February 28, 2025
 - Activities: Execute marketing strategies and prepare for app launch.
5. Maintenance Phase:
 - Duration: March 1 - ongoing
 - Activities: Implement user support and feedback mechanisms.
6. Closure Phase:
 - Duration: April 1 - April 24, 2025
 - Activities: Final documentation and project review.

5.2. AON graph

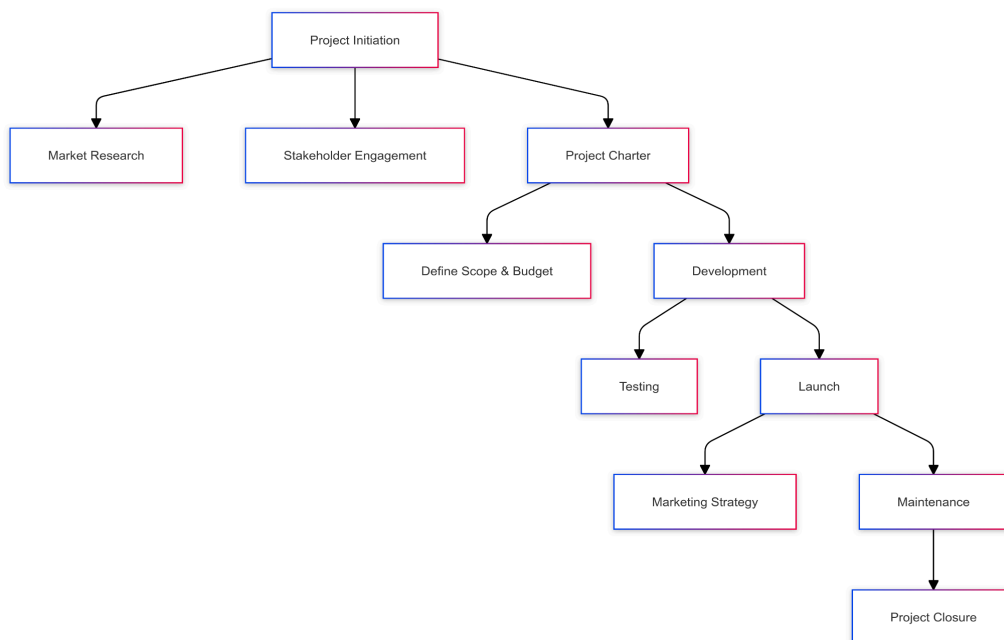


Figure 5.2 AON graph

6 Time management

6.1 Overview

This plan outlines how our app development team will estimate activity durations and handle potential schedule delays effectively. Our goal is to ensure a smooth process and timely delivery of the PetCare app.

6.2 Estimation Methods

To create accurate timelines, we use the following methods:

1. **Expert Judgment:** We consult experienced team members to gather insights based on their past projects.
2. **Analogous Estimating:** We look at timelines from similar apps to set realistic expectations.
3. **Parametric Estimating:** We analyze data from previous projects to inform our estimates based on specific metrics.
4. **Three-Point Estimating:** We consider optimistic, pessimistic, and most likely durations for key tasks to account for uncertainties.

6.3 Mitigation Actions for Schedule Delays

If we encounter delays, we will take the following actions:

1. **Reassess Scope:** We'll simplify features if necessary to get back on track without compromising quality.
2. **Increase Resources:** We may bring in additional team members or external help to speed up progress.
3. **Adjust Timeline:** We'll revise milestones and clearly communicate any changes to the team and stakeholders.
4. **Daily Stand-Ups:** We'll hold brief daily meetings to check progress, address issues, and keep everyone aligned.
5. **Critical Path Analysis:** We'll identify essential tasks and prioritize them to meet deadlines.

6.4 Time Management Overview

A clear overview of project phases and milestones aids in understanding the timeline and ensures accountability at each stage.

Project Phases and Milestones

1. **Initiation:** Complete by August 1, 2024.
2. **Development:** October 10 - November 19, 2024. Focus on UI/UX design and core features.
3. **Testing:** November 19, 2024 - January 22, 2025. Comprehensive quality assurance process.
4. **Marketing and Launch:** Conclude by February 28, 2025. Prepare for app launch.
5. **Maintenance and Closure:** February 29 - July 1, 2025. Ongoing support and project closure.

Progress Monitoring

1. Bi-Weekly Reviews: Regular check-ins to track progress and adjust plans as necessary.
2. Project Management Tools: Utilize Gantt charts for visual progress tracking and quick identification of delays.

7. Cost Modeling

7.1 Cost Estimation

In the process of project cost estimation mainly adopted bottom-up estimation. Bottom-up estimation is an accurate cost estimation method. This method works by breaking the project down into the smallest task units, estimating the cost individually for each unit, and then adding the costs of all tasks together to get the total cost of the entire project.

The PetCare Master application can be divided into the following main modules: Project Initiation, Development, Testing, Software Development and Project Closure. Each module is further broken down into smaller tasks. For example, the Project Initiation module can be broken down into: Market Research, Project Charter and Feasibility Study.

Then, separate unit estimated costs for each task. This process requires determining the resources required for each task and estimate the cost of a single task.

- Human resources: developers, designers, project managers, etc.
- Material resources: such as servers, third-party services, etc.
- Time resources: such as the completion time of the task, the length of the construction period affects the labor cost.

In addition I also need to consider the additional cost, such as communication and coordination costs and risk reserve.

The next step is to summarize the cost of each task. After estimating the cost for each task unit, the cost of all tasks is added up according to the work breakdown structure to form the cost of each module. The cost of all modules is further summed up to obtain the total cost of the whole project.

Finally, all the cost estimation data will form the cost baseline of the project, which will be used for cost control and tracking of subsequent projects. The budget for each module becomes a baseline for actual execution, helping the project team to control costs and prevent overruns.

7.2 Budget Table

	Units	Cost /Unit	Cost type	Subtotals	WBS level 2 Totals	% of Total	Cost Description
WBS Items							
1. Project Initiation					\$4800	2.9%	
Market Research	14	\$230/day	Direct costs; Tangible costs	\$2300			Cost of researching competitor pet owner preferences and salary of assessors
Project Charter			Direct costs; Tangible costs	\$1500			Costs of preliminary data collection and personnel organization
Stakeholder Communication			Direct costs; Tangible costs	\$1000			Cost of holding meetings and collecting feedback
2. Development					\$59200	35.9%	
App Design	14	\$800/day	Direct costs; Tangible costs	\$11200			Salaries for UI design and wireframe creation staff
Core Features Development	48	\$1000/day	Direct costs; Tangible costs	\$48000			Salaries for specific functions achieving staff
3. Testing					\$18200	11.0%	
Quality Assurance	14	\$500/day	Direct costs; Tangible costs	\$7000			Costs of verifying the feasibility of the function and collecting user feedback
Bug Fixing	14	\$800/day	Direct costs; Tangible costs	\$11200			Cost of fixing bugs and salaries for work member
4. Launch					\$14000	8.5%	
Marketing Strategy			Indirect costs; Intangible costs	\$10000			Costs of developing promotional plans and marketing
App Launch			Indirect costs; Intangible costs	\$4000			Costs of developing documentation to help users navigate and providing tutorials for new users

	Units	Cost /Unit	Cost type	Subtotals	WBS level 2 Totals	% of Total	Cost Description
5. Maintenance					\$25000	15.2%	
Ongoing Support	30	\$500/day	Indirect costs; Tangible costs	\$15000			Cost of collecting feedback and training support staff
Community Engagement			Indirect costs; Intangible costs	\$20000			Cost of incentivizing community content generation
6. Project Closure					\$10600	6.5%	
Final Report			Indirect costs; Tangible costs	\$3600			Costs for collecting user usage information and analyzing the results; cost of compiling documents and organizing project information
Transition Plan	14	\$500/day	Indirect costs; Tangible costs	\$7000			Salaries for the maintenance team
7. Reserves					\$32950	20.0%	Providing a buffer for financial risk management
Total Project cost estimate					\$164750	100.0%	

7.3 Cost Baseline

	Month										
WBS Items	1	2	3	4	5	6	7	8	9	10	Totals
1. Project Initiation											
Market Research	766.7	766.7	766.7								2300
Project Charter	500	500	500								1500
Stakeholder Communication		500	500								1000
2. Development											
App Design			2800	2800	2800	2800					11200
Core Features Development			4800	9600	9600	9600	9600	4800			48000

	Month										
3. Testing											
Quality Assurance					3500	3500					7000
Bug Fixing					2800	2800	2800	2800			11200
4. Launch											
Marketing Strategy							2500	2500	2500	2500	10000
App Launch							2000	2000			4000
5. Maintenance											
Ongoing Support								5000	5000	5000	15000
Community Engagement									10000	10000	20000
6. Project Closure											
Final Report										3600	3600
Transition Plan										7000	7000
7. Reserves	3295	3295	3295	3295	3295	3295	3295	3295	3295	3295	32950
Totals	4561.7	5061.7	12661.7	15695	21995	21995	20195	20395	20795	31395	164750

8. Communications management plan and marketing plan

8.1 Stakeholder Analysis

There are multiple stakeholders involved in our project with distinct roles, interests, and expectations. Our communication plan includes sponsors, marketing director, pet owners, veterinarians, pet product retailers, project manager, technical leader, and community manager.

8.2 Communications management plan

Type of stakeholders	Sponsors	Marketing Director	Pet Owners	Veterinarians
Level of interest in project	Very high	High	Low	Low
Description of interest or concern	Return on their investment through increased app usage, subscription services, and partnerships	Driving user acquisition and retention through targeted campaigns, promotions, and collaborations	Accessing accurate, reliable information on pet health, daily care and recording pet data.	Expanding their business by being listed in the app's local services section.
Document Name	Monthly status report	Monthly status report		
Communication medium	Hard copy/Meeting	Hard copy/Meeting	Questionnaire	E-mail/Telephone

Frequency of communication	Once a month	Once a month	Once a month	Once a month
Contact Person	Wanying Yu	Yang Yang		Sarah
Communication owner		Project Manager	Community Manager	Marketing Director
Communication constraints	Limited time, Information overload	Limited time	Language differences, Urgency of response, Geographical distance	Language differences

Type of stakeholders	Pet Product Retailers	Project Manager	Technical Leader	Community Manager
Level of interest in project	Low	High	High	High
Description of interest or concern	Promoting and selling pet care products such as food, grooming supplies, toys, and accessories.	Ensuring that the final product aligns with user needs, market trends, and business goals.	Technical details of the project and Improving user engagement and experience	Managing community easily and promoting the app to a wider users
Document name		Monthly status report		
Communication medium	E-mail/Telephone	Hard copy/Meeting	E-mail/Telephone	E-mail/Telephone
Frequency of communication	Once a month	Once a month	Once a week	Once a day
Contact Person	David	Shiqi Peng	Yuchen Li	Huan Cao
Communication owner	Marketing Director		Project Manager	Project Manager
Communication constraints	Language differences, Urgency of response, Geographical distance	Limited time, Urgency of response, Information overload	Urgency of response	Urgency of response

9. Quality Management Plan

9.1. Purpose of The Project Quality Management Plan

The objective of this Quality Management Plan is to ensure that our pet care platform—which includes daily records, community engagement, medical assistance, and a marketplace—meets industry standards and user expectations. The plan focuses on the following goals:

1. **Compliance with Standards:** Ensure that all platform components adhere to ISO 9001 (Quality Management) and ISO 27001 (Information Security) standards to deliver a high-quality user experience.
2. **Process Efficiency:** Implement standardized processes to reduce errors and rework, enhancing overall project efficiency. For example, utilizing automated testing tools will streamline development.
3. **Stakeholder Expectations:** Address the needs of pet owners, veterinary partners, and community members by providing timely services and a user-friendly interface.
4. **Quality Reference Standards:** Establish clear quality benchmarks for each project phase, ensuring consistent adherence to high standards throughout development and launch.

9.2 Quality Planning

9.2.1 Define Project Quality

1. **Quality Standards:** Adhere to ISO 9001 and ISO 27001 to fulfill international quality and safety requirements.
2. **Performance Metrics:**
 - Uptime: Maintain 99.9% operational uptime.
 - Response Time: AI responses within 2 seconds; veterinary consultations within 5 minutes.
 - User Satisfaction: Target a satisfaction score of at least 4.5 out of 5.
3. **Stakeholder Expectations:**
 - Pet Owners: User-friendly features for tracking vaccinations and health.
 - Veterinary Partners: Efficient patient transfer and comprehensive medical records.
 - Community Users: Authoritative content from professionals to enhance engagement.

9.2.2 Measure Project Quality

Measurement indicators:

1. System Performance: Monitor response times and uptime.
2. User Feedback: Collect user satisfaction ratings for all platform modules.
3. Bugs and Faults: Track and reduce the number of issues during development.

Measuring tools and methods:

1. User Testing: Collect feedback through beta testing.
2. Monitoring Tools: Utilize tools like New Relic for performance tracking.
3. Surveys: Implement questionnaires to assess user satisfaction quantitatively.

Goals and thresholds:

1. Maintain user satisfaction above 4.5.
2. Ensure response times are under 3 seconds and uptime exceeds 99.9%.

9.3. Quality Assurance

9.3.1 Analyze Project Quality

Analysis Focus: Evaluate user experience and system performance, especially under high load.

Analysis method:

1. Log Monitoring: Track user interactions and system responses to identify problems.
2. User Feedback: Use regression testing to resolve potential performance issues based on user input.

Application of Insights:

Optimize modules based on user feedback to improve overall usability.

9.3.2 Improve Project Quality

Improvement measures:

1. Automated Testing: Introduce automated testing tools to improve reliability and reduce manual testing efforts.
2. Feedback Optimization: Streamline channels for faster collection of user feedback.

Efficiency Gains:

Target a 25% reduction in manual testing time and a 15% decrease in development costs.

Addressing Low Scores:

Promptly address feedback for any module scoring below 4.0 to ensure ongoing quality improvement.

9.4. Quality Control

9.4.1 Monitoring measures

Performance monitoring: Implement continuous monitoring using tools like New Relic, focusing on key performance indicators such as memory usage and response times.

Code Reviews: Conduct biweekly reviews by development and quality assurance teams to ensure code quality meets internal standards.

User Feedback Tracking: Collect and analyze user feedback to address identified issues promptly.

9.4.2 Control measures

Regression Testing: In-depth regression testing after every development iteration to ensure that the introduction of new features did not affect the working of existing ones.

Pre-launch Reviews: Detailed pre-launch testing of each module regarding functionality, user experience, and security.

Corrective Action: Whatever corrective measures necessary without any delay the very moment system performance or user satisfaction falls below the set benchmark

9.4.3 Quality Threshold

Response Time: Alerts will be triggered when response times are above 5 seconds. These types of triggers call for priority attention on the part of the technical team.

User Feedback Scores: Causes for anything under a 4.0 score in a module should be investigated and fixed before the next release cycle.

10. Risks Management

According to our product design, critical risks mainly arise from six aspects: data breach, regulatory risk, low user adoption, high competition, hospital dependency, and product liability. These risks can be categorized into three areas: product risks, market risks and expansion risks. At the same time, we also meet several lower likelihood risks. We will propose precise mitigation strategies and contingency plans for each risk to help us address issues promptly and effectively.

10.1 Product Risks

Risk No.	1	2
Risk Name	Data Breach	Regulatory Risk
Risk Description	Customer data, including pet medical and personal information, could be exposed if our application is hacked, which would cause users to lose trust and initiate legal action.	If AI uses incomplete or outdated information or if pet influencers share pet first aid knowledge and experiences that do not meet professional veterinary standards, users may initiate legal action against the software and argue that the product provides incorrect medical advice.
Risk Owner	CTO	Legal Department/COO
Category	Technology Risk	Financial Risk
Mitigation Plan	Implement strong encryption, conduct regular security audits, and enforce strict access controls. Remind users keep safe access.	Work closely with legal advisors to ensure that AI responses and influencer content meet professional standards. Conduct content reviews and apply disclaimers.
Impact level	High	High
Likelihood	Medium	Medium
Impact Score (1-5)	5	5

Description of impact	Loss of user trust, financial penalties, and potential legal cases due to privacy breaches.	Legal penalties, damage to brand reputation, and user attrition.
Contingency Plan	In case of a breach, notify affected users immediately, work with authorities, and provide compensation to minimize damage.	If any legal issues arise, release an official statement, remove non-compliant content, and improve content review procedures.

10.2 Market Risks

Risk No.	3	4
Risk Name	Low User Adoption	High Competition
Risk Description	Users may not be aware of our product or may choose not to use the app due to lack of familiarity or perceived complexity, leading to insufficient revenue from memberships and product sales, restricting business growth.	Similar competing products may reduce the market share of our application which in turn limits our ability to secure partnerships with pet hospitals, influencers, and pet product vendors.
Risk Owner	Chief Marketing Officer (CMO)	Chief Marketing Officer (CMO)
Category	Market Risk	Market Risk
Mitigation Plan	Conduct targeted marketing campaigns, engage in partnerships with pet influencers and offer promotions or incentives for new users. Provide user-friendly tutorials to guide first-time users through the app's features.	Enhance our services with unique features such as pet health monitoring and AI-driven consultations. Develop a robust brand presence by collaborating with well-known pet hospitals and prominent influencers. Regularly refine and expand the app's features based on user feedback.
Impact level	High	High
Likelihood	Medium	Medium
Impact Score (1-5)	5	5
Description of impact	Restricted revenue growth, inability to expand operations or reach new users.	Reduced market share, loss of competitive advantage, and limited ability to form new partnerships, potentially hindering future growth and revenue streams.

Contingency Plan	If adoption rates remain low, revisit and adjust marketing strategy, improve app accessibility and offer time-limited discounts to encourage user onboarding.	If competition intensifies, we need to enhance product differentiation, adjust pricing models and explore new market segments or international expansion opportunities.
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10.3 Expansion Risks

Risk No.	5	6
Risk Name	Hospital Dependency	Product Liability
Risk Description	The app's success is closely tied to specific partnerships with pet hospitals. If there is a sudden increase in users or a hospital partner unexpectedly stops cooperating, the app's operations may stall.	Pet food or products sold through the app may have quality issues which will lead to pet health problems, user complaints, or legal actions against the company. It will harm the company's reputation and result in financial penalties or loss of users.
Risk Owner	Chief Operations Officer (COO)	Chief Operations Officer (COO)
Category	Structure/Process Risk	Financial Risk
Mitigation Plan	Diversify partnerships with multiple hospitals to reduce dependency on any single partner. Establish contracts that include notice periods for withdrawal.	Implement a strict vetting process for all product suppliers, ensuring they meet regulatory standards. Require suppliers to provide liability insurance and proof of product safety certifications. Establish a robust quality control system for products sold through the platform. Conduct regular supplier audits and implement a recall system if issues arise.
Impact level	High	High
Likelihood	Medium	Medium
Impact Score (1-5)	5	5
Description of impact	Operations may be severely disrupted, leading to customer dissatisfaction and potential loss of trust if users are unable to access hospital services.	Legal risks, substantial financial repercussions from user claims or legal disputes, and possible harm to the company's reputation, which may lead to diminished confidence among users and partners.
Contingency Plan	If a hospital withdraws, immediately onboard new partners and offer users temporary alternative solutions such as	If a product issue occurs, immediately recall the product and notify affected users. Offer compensation and work closely with legal teams to handle any claims. Hold suppliers accountable for

	telemedicine or partnerships with emergency clinics.	their products and publicly address the issue and highlight the steps taken to prevent future incidents.
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10.4 Lower Likelihood Risks

Risk No.	7	8	9	10
Risk Name	Market Demand Decline	Compliance Failures	Supply Chain Disruptions	Staff Turnover
Risk Description	Decreased market demand could lead to reduced users and sales.	Non-compliance with new regulations could lead to fines.	Disruptions could affect product availability.	High turnover could impact project continuity and knowledge loss.
Risk Owner	CMO	COO	COO	HR
Category	Market Risk	Financial Risk	Operational Risk	HR Risk
Mitigation Plan	Open international markets and diversify product offerings.	Regular legal reviews, compliance audits.	Diversify suppliers, maintain inventory buffers.	Implement retention strategies, continuous training programs.
Impact level	Medium	Medium	Medium	Medium
Likelihood	Medium	Low	Low	Medium
Impact Score	3	3	2	3
Description of impact	Reduced revenue and potential cutbacks in operations.	Fines and penalties, damage to brand trust.	Product shortages, delayed deliveries.	Loss of expertise, delays in project delivery.
Contingency Plan	Adjust marketing strategy, explore new markets and customer segments.	Update compliance measures, legal consultations.	Activate alternative supply chains, adjust inventory.	Develop a talent pipeline, quick onboarding processes.

11. Procurement Management and Human Resources Management

11.1 Human Resources Management Plan

11.1.1 Project Roles and Responsibilities

Responsibility Assignment Matrix (RAM): This matrix defines key roles and responsibilities for the PetCare project, aligning team members with work packages from the Work Breakdown Structure (WBS).

Work Package	Project Manager	Technical Lead	Develops	Testers	Marketing Lead
Requirements	A	C	R	R	I
Development	A	R	R	R	C
Testing	A	I	C	C	R
Marketing Strategy	A	I	I	I	I

Role Codes: R: Responsible; A: Accountable; C: Consulted; I: Informed

11.1.2 Project team structure and reporting lines

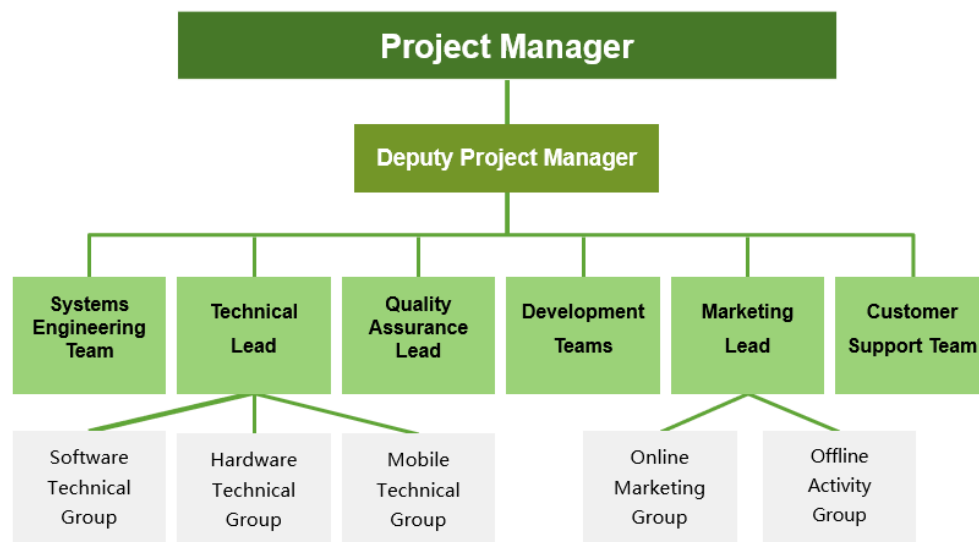


Figure 11.1 Team Structure

11.1.3 Required Skills and Competencies

Technical Skills: Pet care software development (e.g., mobile apps).

Domain Knowledge: Insights into pet care trends.

Project Management Skills: Agile methodologies.

Marketing Skills: Digital marketing expertise

11.1.4 Staff Acquisition Plan

Role	Hiring Strategy	Recruitment Process	Selection Criteria	Onboarding Plan
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Project Manager	Internal promotion/external	Job posting, interviews	5+ years experience in project management, leadership skills	2-week onboarding covering project scope and tools
Software Developers	External hire	Job posting, coding challenges	2+ years experience in relevant programming languages (e.g., Java, Swift)	1-week onboarding covering codebase and development processes
Quality Assurance Tester	External hire	Job posting, coding challenges	2+ years in software testing, familiarity with testing tools	1-week onboarding covering testing methodologies
Marketing Lead	External hire	Job posting, coding challenges	3+ years in digital marketing, experience in pet industry	2-week onboarding covering marketing strategies and tools

11.1.5 Training and Development

For Project Manager:

1. Pet Care Industry Knowledge Training: Understanding the latest trends and regulatory requirements in the pet care market.
2. Advanced Project Management and Communication Skills: Strengthening high-efficiency communication capabilities when dealing with app developers and diverse stakeholders.

For Developers:

1. Mobile Application Development: Advanced development skills for Android and iOS platforms to ensure platform compatibility and performance optimization.
2. AI and Machine Learning Applications: Specialized training in developing AI-driven pet health Q&A systems.

For QA Testers:

1. Automation and Performance Testing Tools: Using automated testing frameworks for performance testing.
2. Compliance and Security Testing: Ensuring the platform adheres to data privacy laws and payment security standards.

11.1.6 Performance Management

Quarterly Performance Reviews:

Regularly assess team performance through quantitative and qualitative metrics including quality of code, test coverage, customer feedback, and project milestones achieved. Use the output as feedback to enable clear and frank communication

among the team members, helping them understand how their work contributes to the success of other team members and the project in general.

Recognition for Outstanding Contributions:

Establish a monthly and annual excellence award on innovation, customer service, and teamwork. Provide opportunities for professional growth in the form of bonus incentives to help foster personal career development plans, which will encourage team members to pursue higher education in the fields of technology and project management.

11.1.7 Conflict Management

Effective conflict management is crucial to maintaining a cohesive team environment and ensuring the successful delivery of the project. Especially in the processes of AI implementation to mobile app development and protecting data privacy will be diverse conflicts like technical disagreements, resource allocation, and pressure points in project timelines. Here's how we plan to address and resolve conflicts within the project team:

1. **Resolution and Problem Solving:** When conflicts arise, particularly those related to technical issues or project direction, we are encouraging team members to openly discuss differing viewpoints in the collaborative environment. This way can enable us to reach solutions that support our project objectives.
2. **Negotiation and Resource Adjustment:** In cases where resources are stretched or deadlines are challenging, negotiation and adjustment tactics will ensure team members feel acknowledged and valued. We may consider reallocating resources temporarily or adjusting timelines to maintain project momentum and quality.
3. **Regular Feedback Loops:** Implement regular feedback sessions where team members can express concerns and potential conflicts in a controlled environment. This proactive approach aims to catch and address issues before they develop into larger conflicts.
4. **Conflict Resolution Training:** Provide training sessions for all team members on conflict resolution strategies, emphasizing the importance of emotional intelligence, communication skills, and stress management in conflict situations. This will maintain a harmonious and productive team environment.

11.2 Procurement Management Plan

11.2.1 Access to Skills and Technologies

1. AI technology and algorithm development: The medical assistant module in the project requires an AI-driven pet health question-and-answer system, which involves natural language processing and machine learning technologies.

2. Payment: In the online mall module, the integration of third-party payment platforms requires access to the payment gateway and related APIs. By cooperating with third-party platforms, the security and reliability of the payment system can be ensured.

3. Positioning technology: Hospital positioning technology is one of the project's requirements. Accessing positioning services such as Google Maps can help locate pet hospitals.

11.2.2 Make or Buy Decisions

1. AI Medical Module: Buy. AI model development requires a large amount of data and training, which is costly and time-consuming, while existing APIs are mature and reliable. By acquiring AI technology externally, the development cycle can be greatly shortened and the accuracy and reliability of the model can be guaranteed.

2. Payment system integration: Buy. The security and compliance requirements of the payment system are very high. By integrating the existing payment platform, secure payment can be quickly implemented in accordance with industry standards.

3. Location Services: Buy. These services are already widely used and have high stability and accuracy.

4. Community and shopping mall platform: Make. The community platform and surrounding shopping mall are the core competitiveness of this project and users' experience of these functions directly affects the success of the product. Self-development can ensure that the functions are highly customized and can be continuously iterated and upgraded based on user feedback in the future.

11.2.3 Resource Allocation

Resource Type	Assigned Work Package	Responsible	Budget Allocation	Timeline
Development Team	Platform Development	Project Manager	\$60,000	Jan - Jun 2024
Marketing Budget	Campaign	Marketing Lead	\$25,000	Mar - Jun 2024
Software Licenses	Development Tools	Technical Lead	\$15,000	Jan 2024

11.2.4 Procurement Process & Timeline

Stage	Description	Responsible	Timeline
Market Research	Identify potential suppliers	Procurement Manager	Jan 2024
Document Preparation	Prepare RFP and RFQ documents	Project Manager	Jan - Feb 2024
Bidding & Negotiation	Collect bids and negotiate terms	Project Manager	Feb - Mar 2024
Contract Award	Select supplier and sign contract	Project Manager	Mar 2024
Delivery & Oversight	Monitor supplier deliveries	Procurement Manager	Mar - Aug 2024

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