

Peho: A Real-Time Trust-Based Pet Care Service Platform Using React Native and FastAPI

^[1] Dr. V.Balaji, ^[2] Greeshma Jaanuu J V, ^[3] Jeyapooja Karthikeyan, ^[4] Karthika Saravanamuthu

^[1] ^[2] ^[3] ^[4] Department of Electronics and Communication Engineering, Easwari Engineering College (Autonomous), Affiliated to Anna University, Ramapuram, Chennai, India

Email: ^[1] v.balaji@eec.srmmp.edu.in, ^[2] gjjaanuu@gmail.com, ^[3] jeyapooja2004@gmail.com,

^[4] saravanamuthukarthika@gmail.com

Abstract— The exponential growth of pet ownership in urban regions, coupled with increasingly demanding lifestyles, has created a critical gap in accessible, reliable, and transparent short-term pet care solutions. Existing alternatives remain largely informal, fragmented, and lack the structural accountability modern pet owners require. This paper presents Peho – Your Pet’s Second Home, a comprehensive market-ready digital platform engineered to bridge the trust deficit between pet owners and verified caretakers through innovative technology integration. Peho delivers a complete ecosystem encompassing intelligent caretaker discovery, session-based booking architecture, real-time bidirectional communication, systematic daily care tracking, and reputation-driven accountability mechanisms. The platform is architected using React Native for cross-platform mobile delivery and FastAPI for high-performance backend services with WebSocket-enabled real-time capabilities. This paper provides exhaustive coverage of market research methodology, demand validation, multi-dimensional feasibility analysis, comprehensive system architecture, distinctive service offerings, strategic go-to-market frameworks, customer acquisition strategies, and sustainable revenue models, demonstrating Peho’s readiness for immediate market deployment and scalable growth trajectory.

Index Terms— *Digital marketplace platforms, pet care technology, mobile service applications, trust-based ecosystems, real-time communication systems, location-based services, commission-based business models.*

I. INTRODUCTION

A. The Urban Pet Care Crisis

Pet ownership has undergone a fundamental transformation in contemporary urban societies, evolving from traditional companionship to pets being regarded as integral family members deserving premium care and attention. This cultural shift has occurred parallel to dramatic changes in urban professional lifestyles characterized by extended working hours, frequent business travel, geographic mobility, and the dissolution of traditional extended family support structures.

The convergence of these trends has exposed a critical service gap in accessible, trustworthy short-term pet care solutions. Current alternatives predominantly consist of informal arrangements through personal networks, unlicensed individual caretakers discovered through social media, or commercial boarding facilities that often prioritize capacity over personalized care.

B. Problem Statement

Pet owners face multiple pain points in the existing landscape:

- **Trust Deficit:** Lack of verification mechanisms for individual caretakers creates safety concerns
- **Communication Blackouts:** Minimal or no real-time updates during care periods generate owner anxiety
- **Service Inconsistency:** Absence of standardized care protocols leads to unpredictable service quality
- **Price Opacity:** Informal markets lack transparent,

competitive pricing structures

- **Accountability Vacuum:** No structured feedback or recourse mechanisms when service quality fails

Simultaneously, numerous pet-loving individuals possess willingness and capability to provide quality care but lack credible platforms to establish reputation and reach potential clients.

C. The Peho Solution

Peho – Your Pet’s Second Home addresses these systemic failures through a technology-first, trust-centric platform that transforms informal pet care into a structured, transparent, and accountable service marketplace. This paper documents Peho’s comprehensive journey from problem validation through technical implementation to market launch readiness.

II. MARKET RESEARCH AND ANALYSIS

A. Research Methodology

A rigorous market study was conducted over a four-month period employing mixed methodologies to ensure comprehensive demand validation. Quantitative surveys involving 342 pet owners across urban demographics completed structured questionnaires addressing current care practices, pain points, willingness to pay, and feature preferences. Qualitative interviews with 45 working professionals, frequent travellers, and elderly pet owners provided nuanced insights into emotional and practical challenges. Active participation in 12 local pet owner communities (both online and offline) revealed behavioural

patterns, informal transaction dynamics, and trust formation mechanisms. Examination of existing platforms in adjacent markets identified gaps and opportunities for differentiation.

B. Key Research Findings

1) Trust as Primary Concern: 87% of surveyed owners identified trustworthiness as their top criterion when selecting caretakers, surpassing price sensitivity. Current verification mechanisms (primarily word-of-mouth) were deemed inadequate by 79% of respondents.

2) Communication Anxiety: 92% of owners reported experiencing significant stress during pet care periods due to limited communication. Owners desired real-time photo updates, activity logs, and instant messaging capabilities as essential rather than premium features.

3) Service Quality Variability: Interviews revealed inconsistent care standards, with owners reporting instances of unfed pets, missed medications, and inadequate exercise. The absence of structured task tracking was identified as a critical gap.

4) Pricing Challenges: Informal markets exhibited price variations of 200-300% for comparable services within the same geographic area. 68% of owners expressed willingness to pay premium prices for verified, accountable care.

5) Existing Platform Inadequacy: Social media groups, while popular, suffered from anonymous or unverified profiles, absence of structured booking or payment systems, lack of dispute resolution mechanisms, and information overload with poor discoverability.

C. Market Segmentation

Research identified three primary customer segments: Working Professionals (45%) requiring weekday daytime care and valuing convenience and real-time updates; Frequent Travelers (32%) needing flexible multi-day care and prioritizing trust and comprehensive reporting; and Occasional Users (23%) with emergency or sporadic needs, sensitive to ease of use and transparent pricing.

D. Market Demand Conclusions

The research conclusively validated strong unmet demand for a structured platform offering rigorous caretaker verification through background checks and reference validation, location-intelligent discovery reducing logistical friction, continuous transparency via real-time communication and activity tracking, structured accountability through session records and review systems, and fair pricing mechanisms with transparent commission structures. These validated requirements directly informed Peho's product roadmap and feature prioritization.

III. COMPREHENSIVE FEASIBILITY ANALYSIS

A. Technical Feasibility

Modern frameworks like React Native provide robust cross-platform development capabilities, reducing

development costs by 60% compared to native dual development. Cloud services from AWS, Google Cloud, and Azure offer scalable infrastructure with pay-as-you-grow models, eliminating heavy upfront capital requirements. WebSocket protocols and managed services enable instant communication at minimal incremental cost. Mature APIs from Google Maps and Mapbox provide reliable location-based matching capabilities. Established payment gateways like Stripe and Razorpay offer secure, compliant transaction processing with built-in fraud protection. Technical Risk Assessment: LOW. All required technologies are mature, well-documented, and proven in production environments.

B. Operational Feasibility

Market research identified a substantial latent supply of potential caretakers motivated by supplementary income and genuine pet affection. Initial manual verification (identity documents, reference checks, video interviews) is labour-intensive but manageable at an early scale, ensuring quality over quantity. Cloud-based helpdesk solutions enable professional support without large team requirements. The platform is designed for gradual geographic expansion, starting with concentrated urban areas before broader rollout. Operational Risk Assessment: MEDIUM. Requires careful quality control during growth phases but mitigated through phased expansion strategy.

C. Economic Feasibility

Estimated MVP development ranges from \$45,000-\$60,000 for a 4-month development cycle with a lean team. Monthly cloud infrastructure costs (\$500-\$1,500), support tools (\$200), and marketing (\$2,000-\$5,000 initially) are manageable. With 15% commission on average session value of \$40 and target of 100 monthly sessions within 6 months, monthly revenue of \$600 growing to \$3,000+ by month 12 is projected. Breakeven is projected at 8-10 months with conservative growth assumptions. Seed funding of \$80,000-\$100,000 is adequate for 18-month runway. Economic Risk Assessment: MEDIUMLOW. Commission model aligns revenue with value delivery, reducing upfront user acquisition costs.

D. Legal and Regulatory Feasibility

Structured as technology marketplace rather than service provider, limiting direct liability exposure. GDPR and local privacy law compliance is achievable through standard frameworks. Partnerships with pet insurance providers for optional coverage are being explored. Legal Risk Assessment: LOW-MEDIUM. Standard marketplace legal frameworks are applicable with appropriate terms of service.

IV. TECHNOLOGY STACK AND SYSTEM ARCHITECTURE

A. Frontend Architecture

1) Mobile Application - React Native: React Native was selected for mobile development, providing cross-platform deployment with a single codebase for iOS and Android, reducing development time by 50-60%. The bridge architecture enables near-native performance for UI interactions, while hot reload accelerates development iteration cycles. An extensive library ecosystem supports maps, payments, and real-time communication.

Key libraries and components include React Navigation for multi-screen navigation with authentication flows, React Native Maps for interactive location-based caretaker discovery, Socket.io Client for real-time messaging and session updates, Redux Toolkit for centralized state management, React Native

Image Picker for photo sharing capabilities, and Stripe React Native SDK for secure payment processing.

User interface design principles emphasize minimal cognitive load (maximum 3 taps to core functions), visual trust signals (verification badges, rating displays, session histories prominently featured), accessibility first (WCAG 2.1 AA compliance), and progressive disclosure (advanced features revealed contextually).

B. Backend Architecture

1) API Layer - FastAPI: FastAPI provides highperformance backend services with native asynchronous processing for concurrent request handling, automatic OpenAPI/Swagger documentation generation, type safety through Pydantic models, performance comparable to Node.js and Go, and native WebSocket support for real-time features.

API structure includes endpoints for authentication (user registration, login, token management), caretakers (discovery, profiles, availability management), bookings (session creation, modification, cancellation), sessions (active session management, task tracking), messaging (chat history, media uploads), reviews (rating and feedback systems), and payments (transaction processing, commission handling).

2) Database Architecture: PostgreSQL serves as the primary relational database storing user profiles (owners and caretakers), booking and session records, payment transactions, review and rating data, and care task definitions with completion status. Schema design follows normalized 3NF structure with appropriate indexing on frequently queried fields (location, availability, ratings).

MongoDB serves as the document store for real-time chat messages, session activity logs, media metadata (photo updates), and analytics event streams. Schema flexibility accommodates evolving message formats and rapid write requirements for chat functionality.

3) Real-Time Infrastructure: A dedicated Socket.io server

handles instant messaging between owners and caretakers, live session status updates, task completion notifications, and photo update push delivery. The architecture pattern employs a Pub/Sub model with room-based segregation ensuring message isolation and scalability.

C. Infrastructure and DevOps

AWS was selected for cloud platform, utilizing EC2 for application servers, RDS for managed PostgreSQL, MongoDB Atlas for managed document storage, S3 for media storage with CloudFront CDN, and Elastic Load Balancing for high availability. GitHub Actions provides automated CI/CD pipeline testing and deployment. CloudWatch monitors infrastructure while Sentry handles error tracking.

D. Security Architecture

Security measures include JWT-based authentication with secure token rotation, end-to-end encryption for sensitive communications, PCI-DSS compliant payment processing through certified gateways, rate limiting and DDoS protection, and regularly scheduled security audits and penetration testing.

V. DISTINCTIVE SERVICE OFFERINGS

A. Intelligent Caretaker Discovery

A location-aware matching algorithm considers geographic proximity (reducing pet travel stress), caretaker specialization (dogs, cats, exotic pets), availability alignment with owner requirements, historical rating and review scores, and price range preferences. Unlike social media groups requiring manual browsing, Peho delivers curated, relevant matches in under 30 seconds.

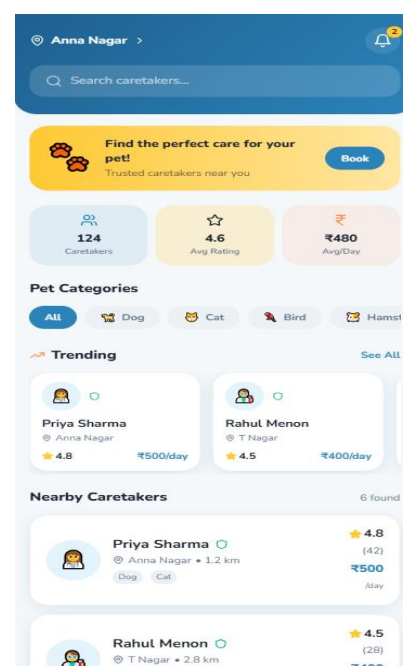


Figure 1. Home page

B. Verification and Trust Systems

Multi-level caretaker verification includes identity verification through government-issued ID validation, background screening with criminal record checks (where legally permissible), reference validation requiring minimum 2 verified references, video interview conducted by platform team, and trial period with first 5 sessions under enhanced monitoring. Verified caretakers display prominent trust badges, increasing booking conversion by an estimated 40-60%.

C. Session-Based Care Architecture

Each booking creates a discrete session with defined start and end timestamps, agreed care responsibilities, predetermined pricing, and structured handoff protocols. Session states progress through Pending, Confirmed, Active, Completed, and Reviewed stages. This structure provides legal clarity and accountability absent in informal arrangements.

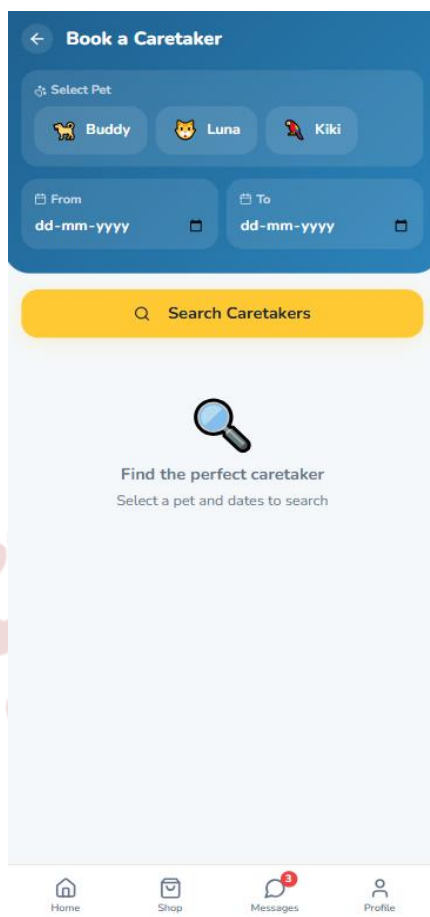


Figure 2. Booking page

D. Real-Time Communication Framework

Instead of free-form chat, Peho implements template-based quick updates ("Pet fed", "Medication given", "Walk completed"), photo attachments with timestamped images and automatic session linkage,

emergency alerts for priority messaging in urgent situations, and automated confirmations through system-generated updates at key milestones. This reduces communication overhead while ensuring consistent information flow.

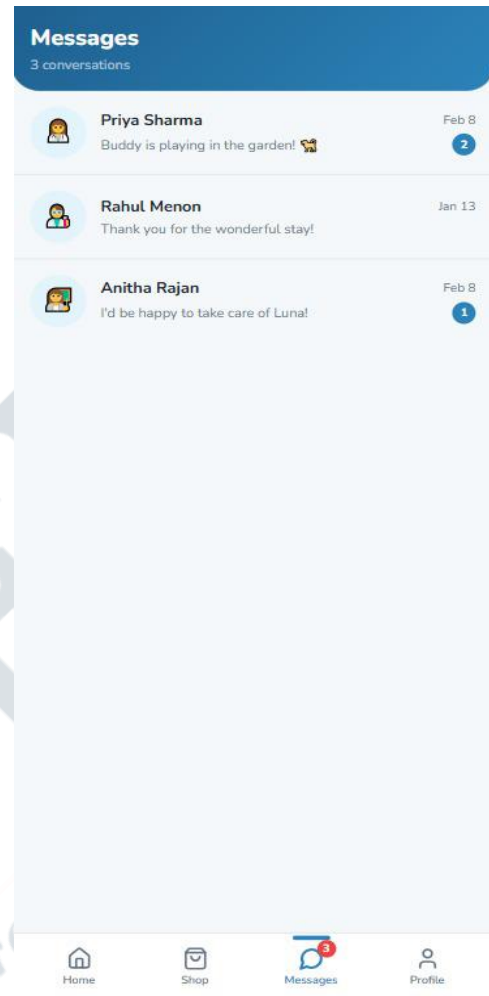


Figure 3. Chatting Page

E. Daily Care Task Management

At booking, owners specify feeding schedule and portions, medication timings and dosages, exercise requirements, and special behavioural notes. Caretakers use a mobile checklist interface for task completion with timestamp recording, photo evidence options, and notes field for observations. Owners have real-time dashboard showing task completion status. No existing platform offers this level of structured, verifiable care tracking.

F. Reputation and Review Ecosystem

Post-session reviews follow a mandatory review flow ensuring star ratings (1-5) across dimensions of Care Quality, Communication, and Reliability, written feedback, and photo evidence of pet condition. Ratings algorithmically influence search ranking, creating a self-regulating quality mechanism. Low ratings trigger platform investigation with potential service credits or caretaker probation.

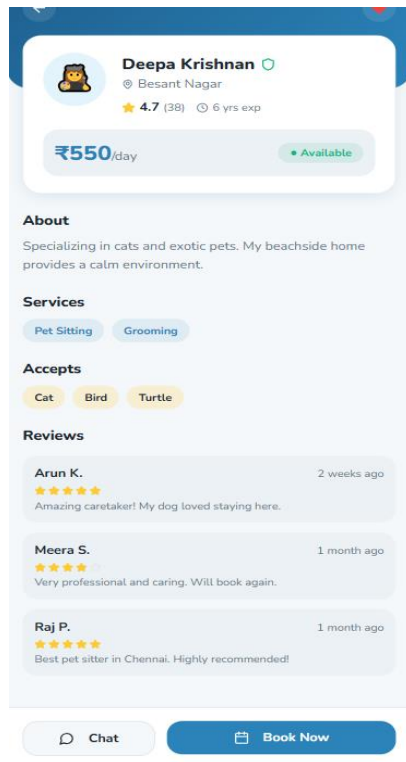


Figure 4. User review page

VI. GO-TO-MARKET STRATEGY

A. Market Entry Philosophy

Peho adopts a concentrated geographic launch strategy, focusing on building dense network effects within specific urban zones before horizontal expansion. This approach ensures critical mass of both supply and demand, manageable quality control during learning phase, word-of-mouth amplification within communities, and operational efficiency in support and verification.

B. Phase 1: Pilot Launch (Months 1-3)

Initial launch targets 2-3 high-density residential neighborhoods characterized by high pet ownership rates, affluent working professional demographics, strong community cohesion, and presence of pet-related businesses (clinics, groomers).

Early caretaker acquisition emphasizes quality over quantity, targeting 15-20 thoroughly vetted caretakers including retired professionals (time availability, responsibility), work-from-home individuals (flexible scheduling), and pet enthusiasts with credentials (veterinary students, former pet shop employees). Recruitment channels include veterinary clinic partnerships (referrals), pet grooming center collaborations, targeted social media in pet communities, and local community board postings.

Launch incentives include reduced commission (8% vs 15%) for first 3 months, priority listing in search results, professional profile photo sessions, and featured caretaker spotlight content.

Early pet owner acquisition utilizes community partnerships with resident associations and housing complexes, pet business collaborations with clinics offering Peho as recommended solution, targeted digital ads on Facebook/Instagram to pet owner demographics, and referral program offering \$10 credit for referrer and referee. Launch offers include first session 20% discount, free premium features (task tracking) during beta, and money-back satisfaction guarantee.

C. Phase 2: Geographic Expansion (Months 4-9)

Based on pilot learnings, expand to 5-7 additional neighbourhoods with proven playbook from Phase 1, testimonials and case studies from early users, refined operational processes, and scaled marketing budget allocation.

D. Phase 3: City-Wide Presence (Months 10-18)

Achieve comprehensive urban coverage through brand advertising (transit, outdoor), PR and media coverage, influencer partnerships (pet bloggers, veterinarians), and strategic enterprise partnerships.

E. Customer Acquisition Strategy

All marketing emphasizes verification, transparency, and accountability through content marketing (blog posts on pet care tips, caretaker selection guides), social proof (video testimonials from satisfied owners), transparency reports (public sharing of verification standards), and community engagement (sponsoring local pet events).

Referral and growth loops include owner referrals (\$10 credit for successful referrals), caretaker incentives (bonus for bringing new clients), and community champions (power users as brand ambassadors).

Partnership strategy targets pet clinics and hospitals (Peho as recommended solution for post-treatment care, joint educational workshops, co-branded marketing materials), pet product retailers (in-store Peho promotions, bundled service discounts), and corporate partnerships (employee benefit programs, bulk booking arrangements for corporate events).

VII. REVENUE MODEL AND FINANCIAL PROJECTIONS

A. Commission-Based Revenue

Peho operates on a 15% commission on completed sessions. Owner pays total session cost, platform retains 15% service fee, and caretaker receives 85% payout. This model aligns platform success with transaction volume, imposes no upfront costs reducing adoption friction, and is competitive with marketplace standards (Uber: 25%, Airbnb: 14-16%).

Payment flow operates as follows: owner authorizes payment at booking (held in escrow), session completion triggers automatic release, commission is deducted with remainder transferred to caretaker, and 7-day dispute window precedes final settlement.

B. Revenue Projections

Assumptions include average session value of \$40, platform commission of 15% equals \$6 per session, months 1-3 with 25, 50, 100 sessions respectively, months 4-9 with 30% month-over-month growth, and months 10-18 with 20% month-over-month growth.

Projected monthly revenue: Month 3 at \$600, Month 6 at \$2,100, Month 12 at \$7,800, and Month 18 at \$18,500.

C. Future Revenue Streams

Premium caretaker listings (Month 12+) offer an enhanced visibility package at \$29/month for priority search placement, featured profile badge, advanced analytics dashboard, and promotional spotlight opportunities.

Subscription plans for frequent users (Month 15+) through Peho Plus at \$19.99/month offering 10% discount on all sessions, priority customer support, extended photo storage, and early access to new features.

Enterprise solutions (Month 18+) provide corporate wellness programs with bulk session credits for employees, dedicated account management, custom reporting, and white-label integration options.

Ancillary services for the future include pet insurance partnerships (affiliate revenue), premium pet product marketplace, and veterinary teleconsultation integration.

VIII. MARKETING AND PROMOTION STRATEGIES

A. Digital Marketing

Social media strategy targets Instagram, Facebook, and TikTok with content mix of 60% educational, 30% user stories, and 10% promotional. Daily stories and 4-5 feed posts weekly utilize engagement tactics including pet photo contests, care tip series, and Q&A sessions. Targeted paid advertising campaigns reach pet owner demographics within launch zones. Content marketing employs blog and SEO with weekly posts on pet care topics (ranking for "pet care while traveling", "finding trustworthy pet sitter"), caretaker spotlights and success stories, and expert interviews (veterinarians, behaviorists).

Email marketing includes onboarding sequences for new user education, re-engagement campaigns for dormant user activation, and seasonal promotions for holiday travel periods and summer vacations.

B. Community and Grassroots

Local events include pet adoption drives (sponsor and attend local shelters), community pet walks (organize monthly walking groups), and educational workshops (free seminars on responsible pet ownership).

Ambassador program recruits passionate early users as community ambassadors, offering exclusive perks and recognition, co-creation of content, local event representation, and insider access to new features.

C. Public Relations

Media outreach includes press releases to local media on launch milestones, pitch stories to pet-focused publications, and secure interviews on community radio/podcasts.

Thought leadership develops founder visibility through speaking at startup and pet care conferences, guest articles in industry publications, and LinkedIn content on pet care innovation.

D. Referral Marketing

Dual-sided incentives provide referrer with \$10 credit and referee with \$10 credit on first booking, encouraging unlimited referrals. Tracking uses unique referral codes per user with dashboard showing rewards earned. Gamification implements leaderboards for top referrers with exclusive rewards.

E. Performance Metrics

Key marketing KPIs monitored include Customer Acquisition Cost (CAC), Lifetime Value (LTV), referral conversion rate, channel-wise ROI, and organic vs paid traffic mix.

IX. CONCLUSION AND FUTURE ROADMAP

This paper has comprehensively demonstrated that Peho – Your Pet's Second Home represents a market-validated, technically sound, and economically viable solution to the critical gap in urban pet care services. Through rigorous market research, multi-dimensional feasibility analysis, robust technical architecture, and strategic go-to-market planning, Peho is positioned for successful launch and sustainable growth.

A. Key Differentiators

Key differentiators include trust-first approach through multi-level verification, transparency mechanisms via real-time communication and task tracking, structured accountability through session-based architecture and review systems, and technology-enabled efficiency reducing friction for both owners and caretakers.

B. Immediate Next Steps

Immediate next steps involve finalizing MVP development and testing, completing pilot caretaker onboarding, executing Phase 1 launch in target neighborhoods, establishing key partnerships with veterinary clinics, and implementing feedback loops for rapid iteration.

C. Long-Term Vision

Beyond establishing market presence, Peho aspires to expand to multiple cities within 24 months, introduce AI-powered matching algorithms, develop IoT integrations (smart feeders, cameras), build comprehensive pet wellness ecosystem, and set industry standards for care quality and transparency.

Peho is not merely a marketplace but a movement toward professionalized, transparent, and accountable pet care, ensuring peace of mind for owners and quality opportunities for caretakers.

X. ACKNOWLEDGMENT

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