Technical Document - Business Requirement Document (BRD)

1. Project Overview

The document provides an in-depth analysis of the technical and business aspects of an eCommerce platform developed for the pet care industry. The project aimed to bridge the gap between traditional pet care services and digital transformation by creating a comprehensive marketplace for pet products, healthcare services, and professional consultations. The platform was designed for both web and mobile applications, ensuring accessibility across various devices.

The key objectives of this project were:

- Enable pet businesses to expand their reach via a digital storefront.
- Provide pet owners with a one-stop shop for pet products and services.
- Improve customer experience through personalized recommendations and seamless transactions.
- Offer analytics to vendors to optimize their sales strategies.

2. Problem Statement

Challenges Before Implementation:

Prior to implementing this solution, pet care businesses primarily operated through physical stores and franchise models. This traditional setup posed several challenges:

- **Limited Market Reach:** Vendors struggled to reach a wider audience beyond their physical locations.
- **Lack of Customer Insights:** Businesses lacked data-driven insights into customer preferences and behaviors.
- **Inefficient Order Management:** Manual order processing led to delays and errors.
- **Absence of a Unified Payment System:** Customers faced difficulties due to limited payment options.
- **Inconvenient Booking & Service Management:** No online booking system for veterinary services, grooming, and boarding.

3. As-Is vs. To-Be State

As-Is State (Before Implementation):

- Services were provided only through physical stores and franchises.
- Customer engagement relied on traditional marketing (flyers, word-of-mouth).
- Order fulfillment was manual, leading to inefficiencies.
- No centralized system for tracking inventory and customer preferences.

To-Be State (After Implementation):

- A **centralized digital platform** enables seamless transactions and service bookings.
- Enhanced customer engagement through **personalized recommendations** and push notifications.
- Automated inventory and order tracking for efficiency and accuracy.
- Multiple payment options integrated for **secure and flexible transactions**.
- AI-driven **market insights for vendors** to optimize product offerings.

4. Solution Provided

The eCommerce platform was built with a **user-first approach** to ensure an intuitive and efficient experience. The core components included:

- **Multi-Vendor Marketplace:** Vendors can register, list products, and manage inventory.
- **AI-Powered Personalization:** Intelligent recommendations based on purchase history and user behavior.
- **Secure Payment Gateway Integration:** Multiple payment options, including digital wallets, credit/debit cards, and net banking.
- **Real-Time Order Tracking:** Users can track their orders from placement to delivery with live updates.
- **Cross-Platform Compatibility:** The solution was developed for **iOS, Android, and web browsers**.

5. Technology Stack

Frontend:

- React.js (Web)
- Kotlin (Android)
- Swift (iOS)

Backend:

- Node.js (Express.js framework)
- Microservices Architecture
- MySQL Database (AWS RDS)

Infrastructure:

- AWS Cloud (EC2, RDS, S3, Load Balancers)
- Docker & Kubernetes for CI/CD Deployment
- Jenkins for Continuous Integration
- Firebase & Push Notifications

6. Implementation Strategy

The project followed **Agile methodologies**, ensuring flexibility and continuous improvement. The implementation plan included:

- **Sprint-Based Delivery:** The project was divided into 2-week sprints, each delivering key features.
- **Feature Prioritization:** Business impact and customer demand determined feature releases.
- **Incremental Deployments:** Regular updates allowed for real-time feedback integration.
- **Testing & Validation:** Comprehensive testing cycles, including unit, integration, and user acceptance testing.
- **Post-Launch Monitoring:** Performance metrics and security checks ensured stability.

7. Key Functionalities

- **User Registration & Profile Management:** Easy onboarding for buyers and sellers.
- **Product & Inventory Management:** Vendors can upload and manage their product listings.
- **Shopping Cart & Checkout:** A seamless shopping experience with multiple payment options.
- **Push Notifications & Order Updates:** Users receive real-time updates on orders and promotions.
- **Analytics Dashboard for Vendors:** Insights on customer behavior and sales trends.

8. Process Flows & Diagrams

User Journey:

1. **Buyer:** Registers → Browses products/services → Adds to cart → Completes purchase → Tracks order → Leaves feedback.
2. **Vendor:** Registers → Lists products → Manages orders → Tracks sales performance → Engages with customers.
3. **Admin:** Manages users → Approves vendors → Monitors transactions → Ensures system security.

9. Challenges & Mitigations

Challenges Faced:

- **Complex Vendor Onboarding:** Required clear verification and approval workflows.
- **High Traffic Management:** Ensured system could handle peak loads.
- **Security & Compliance:** Protecting sensitive customer data was a priority.
- **User Adoption:** Encouraging users to transition from traditional shopping to digital platforms.

Mitigation Strategies:

- Implemented **automated vendor verification** to simplify onboarding.
- Designed a **scalable cloud infrastructure** to handle high traffic loads.
- Adopted **AES-256 encryption** for data security and GDPR compliance.
- Launched an **educational campaign** to help users transition to the digital platform.

10. Lessons Learned & Future Scope

Lessons Learned:

- Early integration of analytics is crucial for tracking user behavior and sales trends.
- **User feedback loops** significantly enhance platform usability and adoption.
- Automated testing frameworks ensure **higher reliability** and reduce deployment risks.

Future Scope:

- Expansion into **international markets** with localized language support.
- **AI-powered virtual assistants** for personalized shopping assistance.
- Implementation of **blockchain-based payment solutions** for increased security.
- Development of **AR/VR-based virtual pet consultations**.
