Software Requirements Specification (SRS)

Project: BiomeInnovation Digital Platform

Version: 1.0

Date: October 26, 2023

Author: Software Architect

Status: Formal Requirement Document

1. Introduction

1.1 Purpose

The purpose of this document is to specify the functional and non-functional requirements for the BiomeInnovation Digital Platform. This system is designed to digitalize pet health operations, replacing manual legacy processes with a dynamic, secure, and scalable Serverless Web Application. It manages the full lifecycle of pet health testing: from kit ordering to laboratory processing and automated report delivery.

1.2 Scope

The platform encompasses the following modules:

- **Customer Portal:** Order management and report visualization.
- **Lab Assistant Panel:** Laboratory data entry and sample tracking.
- **Admin Panel:** System governance and business oversight.
- **Serverless Infrastructure:** Cloud-native backend (API Gateway, Lambda, DynamoDB).
- **Report Microservice:** Automated analysis and PDF generation engine.
- **Third-Party Integrations:** Payment (Stripe), Shipping APIs, and MS365 Email.

1.3 References

1. BiomeInnovation Backend and FrontEnd Requirements Document (PDF).
2. BiomeInnovation Website Analysis: https://biomeinnovation.com.au/.

2. Overall Description

2.1 User Characteristics

- **Customers:** Pet owners requiring a seamless UI to purchase kits, track sample progress, and understand complex health data via simplified reports.
- **Lab Assistants:** Technical staff requiring a high-efficiency interface for accurate, high-volume data entry and status management.
- **Administrators:** Business managers requiring high-level visibility into financial transactions, order flow, and user access control.

2.2 Operating Environment

- **Cloud Provider:** Amazon Web Services (AWS).
- **Hosting Model:** 100% Serverless architecture to minimize maintenance overhead and provide cost-effective scaling.
- **Client Side:** Modern web browsers (Chrome, Firefox, Safari, Edge) via a responsive Single Page Application (SPA).

3. Functional Requirements

3.1 Authentication & Authorization (AuthN/AuthZ)

- **REQ-01:** Users must be able to Register, Login, and Reset Passwords via email.
- **REQ-02:** Support for Two-Factor Authentication (2FA) is mandatory for enhanced security.
- **REQ-03:** Role-Based Access Control (RBAC) must distinguish between Customers, Lab Assistants, and Admins.
- **REQ-04:** API Gateway must handle initial authentication tokens before invoking backend logic.

3.2 Customer Panel

- **REQ-05 (Order Management):** Customers shall be able to purchase Microbiome Test Kits.
- **REQ-06 (Payment):** Integration with Stripe (or equivalent) ensuring PCI/DSS compliance. Data must be encrypted at rest in DynamoDB.
- **REQ-07 (Visibility):** Real-time tracking of sample status (e.g., "Received," "Processing," "Complete").
- **REQ-08 (Report Access):** Secure viewing and downloading of PDF reports upon completion.
- **REQ-09 (Support):** Integrated ticketing system for customer inquiries.
- **REQ-10 (Communication):** Subscription management for health newsletters.

3.3 Lab Assistant Panel

- **REQ-11 (Data Entry):** Secure interface for manual import of complex sample data and test results.
- **REQ-12 (Search):** Lookup capabilities for orders via Order ID or Customer Name.

- **REQ-13 (Workflow):** Ability to update the current processing stage of any active sample.

3.4 Report Generation Microservice

- **REQ-14 (Trigger):** Automatic process initiation upon Lab Assistant data submission.
- **REQ-15 (Logic):** Analysis of sample data against predefined health benchmarks to generate pet-specific suggestions.
- **REQ-16 (PDF):** Generation of formatted PDF reports stored securely in AWS S3.
- **REQ-17 (Notification):** Automated alerts (Email/SNS) to customers once reports are finalized.

3.5 Admin Panel

- **REQ-18 (User Control):** Management interface to view, edit, or ban user accounts.
- **REQ-19 (Oversight):** Holistic dashboards for orders, financial transactions, and system health.

3.6 External Integrations

- **REQ-20 (Shipping):** API integration to map addresses and generate shipping labels for kit delivery.
- **REQ-21 (Email):** Routing of system communications via Microsoft 365 (MS365) infrastructure.

4. Non-Functional Requirements

4.1 Performance

- **REQ-N01:** API response time (latency) must be ≤ 200ms for standard requests.
- **REQ-N02:** System must utilize AWS auto-scaling to handle traffic surges without manual intervention.

4.2 Security

- **REQ-S01:** All PII (Personally Identifiable Information), payment data, and lab results must be encrypted at rest and in transit.
- **REQ-S02:** Full compliance with PCI/DSS standards.
- **REQ-S03:** Internal Lab tools should utilize VPC endpoints or Private APIs to reduce the public attack surface.

4.3 Reliability & Availability

- **REQ-R01:** Target uptime of 99.9%.
- **REQ-R02:** Automated daily backups using DynamoDB on-demand backup capabilities.

4.4 Maintainability

- **REQ-M01:** Full CI/CD pipeline for automated testing and multi-environment deployment (QA, Pre-Prod, Prod).
- **REQ-M02:** Version control managed via GitHub with a structured branching strategy.

5. Technical Stack

Component	Technology	Purpose
Frontend	React.js / Vue.js	User-facing Single Page Application.
Hosting	AWS S3 + CloudFront	Global content delivery and static hosting.
Backend API	AWS API Gateway	Entry point, throttling, and Auth management.
Compute	AWS Lambda	Serverless execution of business logic.
Database	Amazon DynamoDB	Scalable NoSQL storage for all application data.
Async Tasks	AWS SQS	Queue management for report generation.
Notifications	AWS SNS + MS365	Multi-channel user notifications.
File Storage	AWS S3	Secure repository for PDF reports.

6. Development Roadmap

- **Phase 1:** AWS Infrastructure setup, Authentication module, and User Registration.
- **Phase 2:** Core Business Logic, Payment Gateway integration, and Customer Portal basics.
- **Phase 3:** Lab Operations interface, Report Generation Microservice, and SQS implementation.
- **Phase 4:** Admin Dashboard development, QA Testing, and Performance Tuning.
- **Phase 5:** CI/CD Finalization and Production Go-Live.

Approval Sign-off: *Client Representative (BiomeInnovation)*: _____

Software Architect (Solution Provider): _____