Software Requirement Specification

for

BrainBox

Version 1.0.0

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Prepared by Group 1

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Revision History

Version	Date	A, M, D	Assignee	Change Description
0.1.0	06/01/2025	A	ChuongDQ	Setup document base
0.2.0	09/01/2025	A	ThuyNT	Add information for section I. Introduce - A. Purpose - B. Scope - C. Definitions, Acronyms, and Abbreviations - D. References - E. Overview
0.3.0	10/01/2025	A	ThuyNT	Add information for section II. Overall description
0.4.0	10/01/2025	A	ThuyNT	Add information for section III. Specific Requirements
0.5.0	10/01/2025	A	ThuyNT	Add information for section IV. External Interface Requirements
0.6.0	10/01/2025	A	ThuyNT	Add information for section VII. Appendices
0.7.0	10/01/2025	M	ChuongDQ	Format Document
0.8.0	10/01/2025	A	LinhLM	Add System Feature
0.9.0	10/01/2025	A	LinhLM	Add Business Rules
0.9.1	16/01/2025	M	ThuyNT	Update information for II. Overall Description
1.0.0	15/02/2025	M	ChuongDQ	Release SRS v1.0.0

*A - Added, M - Modified, D - Deleted

Table of contents

I.   Introduction

A. Purpose

- The purpose of this document is to define the functional and non-functional requirements for the **BrainBox** e-learning platform. This platform is designed to provide learners with high-quality, paid courses while enabling teachers to easily create and manage their content. The document serves as a guideline for stakeholders, developers, and testers to ensure the successful implementation of the platform.

B. Scope

- **BrainBox** is an online learning platform aimed at delivering a scalable and user-friendly experience for both learners and instructors. The platform offers features such as course creation, progress tracking, interactive quizzes, multimedia support, and seamless communication via Zalo and email.
- Key objectives include:
    + For Learners: Personalized course recommendations, progress tracking, interactive learning, and gamification.
    + For Teachers: Tools for course creation, revenue tracking, and learner management.
    + For Admins: Advanced management of users, courses, and payments, with analytics for platform insights.The system will support mobile and web applications, ensuring accessibility and reliability for all user types.

C. Overview

- The **BrainBox** SRS outlines the requirements for an e-learning platform focused on user-friendly features, secure payment, and personalized learning. It covers system description, functional and non-functional requirements, key features, and design constraints. External interfaces like UI/UX, communication protocols, and system models are detailed for clarity. The document ensures alignment among stakeholders and serves as a guide for development and implementation.

II.   Overall Description

A. Product Perspective

- The **BrainBox** e-learning platform is a standalone system designed to deliver scalable and personalized online education. It aims to provide high-quality content while ensuring smooth teacher-learner interactions and efficient management of courses.
- This system is entirely new and does not extend any existing platform. It includes the following core components:
    + User Portal: For learners and teachers to interact with the platform.
    + Admin Dashboard: To manage users, courses, and system analytics.
    + Payment Integration: To handle transactions securely.

B. Product Features

- Learner Features: Advanced search, progress tracking, personalized recommendations, and community engagement.
- Teacher Features: Course creation tools, revenue analytics, and learner management.
- Admin Features: Course moderation, user management, and comprehensive analytics.

- Payment Support: Integration with multiple gateways for secure and seamless transactions.
- Communication: Zalo and email notifications for updates and inquiries.

C. User Classes and Characteristics

- Learners:
  - + **Characteristics:** Individuals looking to gain new skills or knowledge through paid courses.
  - + **Needs:** Easy course discovery, personalized learning paths, and progress tracking.
- Teachers:
  - + **Characteristics:** Educators or professionals creating and selling courses.
  - + **Needs:** Tools to upload content, manage learners, and monitor revenue
- Admins:
  - + **Characteristics:** Platform managers ensuring quality control and handling user management.
  - + **Needs:** Moderation tools, analytics, and role-based access control.

D. Operating Environment

- Client-Side:
  - + Desktop: Compatible with Windows, macOS, and Linux.
  - + Browser Support: Google Chrome, Mozilla Firefox, Safari, and Microsoft Edge.
  - + Mobile: iOS and Android apps for on-the-go learning.
- Server-Side:
  - + Backend: Hosted on cloud providers supporting Node.js frameworks.
  - + Database: PostgreSQL for efficient data handling.

E. Design and Implementation Constraints

- Technology:
  - + Backend: NestJS.
  - + Frontend: Next.js with Shadcn/ui as support library for a responsive user interface.
- Budget: Fixed budget with a focus on cost-effective cloud hosting.
- Timeline: Development must be completed within 3 months.

F. Assumptions and Dependencies

- The system assumes each user (teacher or student) has a valid phone number and email address.
- Zalo API or equivalent messaging system will be available for communication.
- The system will rely on third-party services for:
  - + Payment Gateways: PayPal, local banking integrations.
- Communication APIs: Zalo Open API, SendGrid for email.
- Internet connectivity is assumed for all functionalities except offline learning.
- Teacher content creation assumes compliance with platform standards.

III.   Specific Requirements

A. Functional Requirements

1. User Registration and Authentication:

- The system allows users to register accounts using email, phone numbers, and passwords.

- Supports login via multi-factor authentication (2FA).
- Users can recover passwords via email or SMS.

2. Course Management:

- Users can search for courses by keywords, categories, or price ranges.
- Instructors can create, edit, and delete their own courses.
- Admins can moderate course content before publishing.

3. Payment System:

- Supports payment through PayPal, Stripe, and local banking methods.
- Users can view their payment history and download invoices.

4. User Interaction:

- Users can rate and leave feedback on courses.
- The system sends notifications via email or messaging apps (e.g., Zalo) for new courses or promotions.

5. Analytics and Reporting:

- Instructors can access revenue and student performance reports.
- Admins can view comprehensive reports on users and courses.

B. Non-functional Requirements

1. Performance:

- The system must handle up to 100 requests per second without interruptions.

2. Security:

- User data must be encrypted during storage and transmission (AES-256, HTTPS).
- Only authorized accounts can access sensitive data.

3. Scalability:

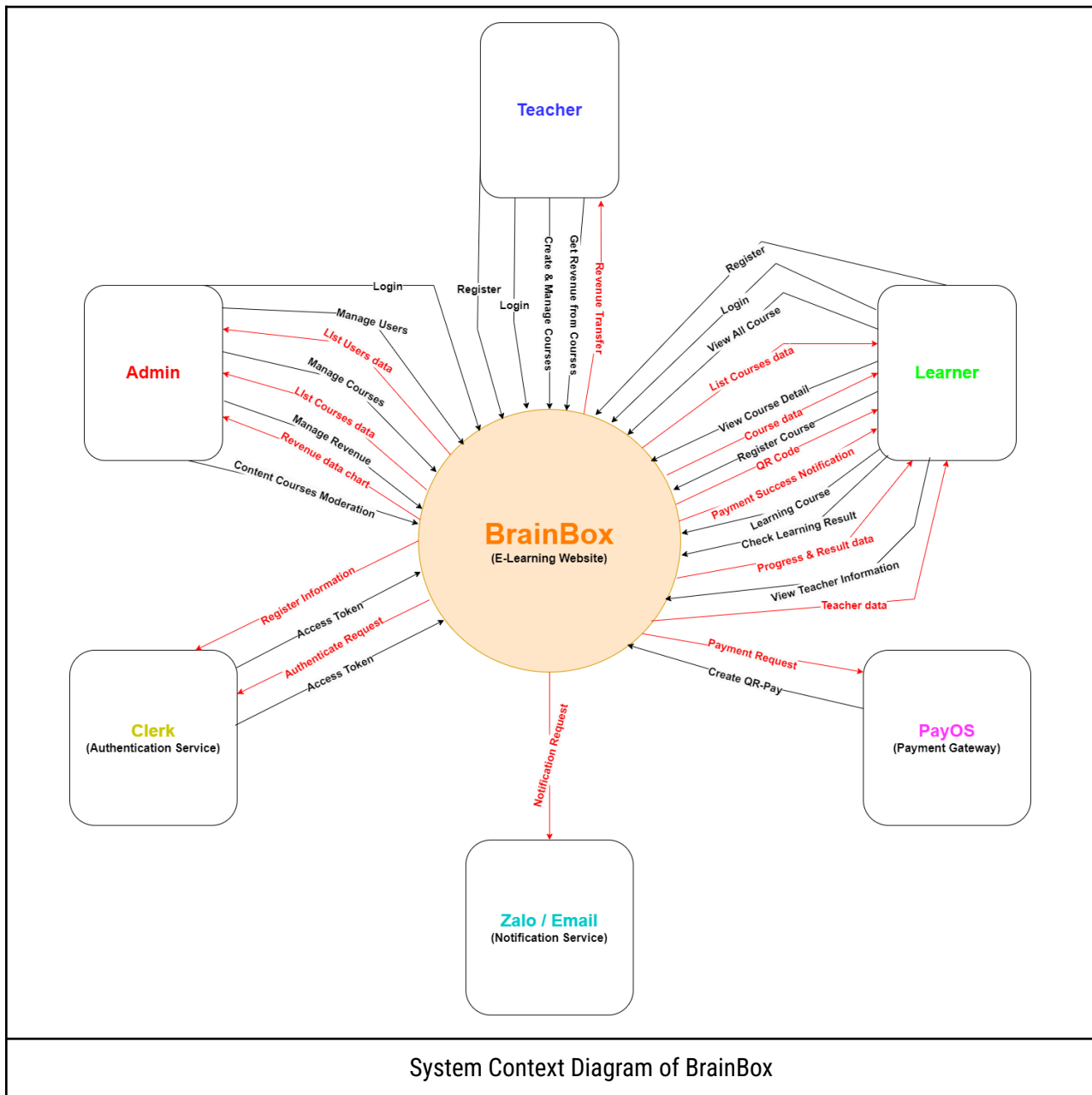- The system must support up to 1 million concurrent users.

4. Availability:

- The system must maintain 99.9% uptime (Service-Level Agreement - SLA).

5. Usability:

- The interface must be user-friendly and support multiple languages (English and Vietnamese).

C. System Models

System Context Diagram of BrainBox

IV. External Interface Requirements

A. User Interfaces

1. Learner Dashboard:
- Displays enrolled courses, progress tracking, and recommended courses.
- Navigation bar for accessing Wishlist, Certificates, and Account Settings.

2. Teacher Dashboard:
- Tools for course creation, learner progress tracking, and revenue analytics.

3. **Admin Dashboard:**
   - Features for approving courses, managing users, and generating reports.

4. **Wireframe Overview:**
   - **Homepage:** Search bar, featured courses, and categories prominently displayed.
   - **Course Page:** Contains detailed course descriptions, previews, instructor details, and enrollment options.
   - **Progress Page:** Tracks milestones, badges, and certificates.

5. **UI/UX Requirements:**
   - **Responsive Design:** Seamless performance across desktops, tablets, and mobile devices.
   - **Accessibility:** Adherence to WCAG standards to ensure inclusivity for users with disabilities.
   - **Consistency:** Uniform design language for buttons, icons, and navigation elements.
   - **Personalization:** Customized recommendations and personalized dashboards.

B. Hardware Interfaces

- User Devices: Compatible with desktops, laptops, tablets, and smartphones with internet connectivity.
- Server Requirements: Dedicated or cloud-based servers to host the application, supporting database queries and multimedia content.
- Peripheral Integration (if needed): Microphone and camera support for live sessions and video uploads.

V. System Features

A. Teacher Management

- Teachers can self-register and manage their profiles.
- They can create, update, and organize course content, and track student progress.

B. Learner Management

- Students can self-register, manage their profiles, and enroll in courses.
- Their learning progress and completion rates are automatically tracked.

C. Course Management

- Teachers can create, edit, and organize courses.
- Courses can be categorized, and analytics provide performance insights.

D. Revenue Management

- The system tracks course sales and calculates instructor payouts.
- Admins can manage discounts, promotional campaigns, and payment records.

E. Notification System

- Information about course updates, payments, or deadlines is sent via email or in-app alerts.
- Engagement reminders are sent for incomplete courses or upcoming deadlines.

F. Payment System

- Supports secure transactions through various payment methods like cards and digital wallets.
- Invoices are auto-generated for successful payments.

G. Reporting and Analytics

- Provides insights into user activity, course performance, and revenue trends.
- Teachers and admins can generate custom reports for better decision-making.

VI. Business Rules

ID	Business Rule	Description	Related Modules
BR-001	Unique email	Only one can create an account with one email.	User
BR-002	Course enrollment	Learners can only access courses after successful enrollment.	Course
BR-003	Password Strength Requirement	Passwords must contain at least 8 characters, including at least one uppercase letter, number, and special character.	User
BR-004	Session Expiry	User sessions must expire after a specified period of inactivity (e.g., 30 minutes) to enhance security.	User
BR-005	Email	Email must be in a valid format.	User
BR-006	Price	Course price must be greater than 0 and must be an integer.	Course
BR-007	Permission	Only teachers can create courses.	Course
BR-008	Phone number	Each user account must be associated with a unique phone number to ensure account authenticity.	User
BR-009	Full name	Full name must be at least 10 characters.	User
BR-010	Paging	10 records per page	

VII. Appendices

A. Glossary

List of terms, acronyms, or definitions used in the document:

- **BrainBox**: The name of the e-learning platform.
- **2B**: Abbreviation for the platform.
- **OAuth2**: Open standard for access delegation, providing secure single sign-on.
- **API**: Application Programming Interface, enabling system integration.
- **Zalo Open API**: API used for chat and notifications on Zalo.

- **SendGrid/Mailchimp**: Platforms for sending email notifications.
- **Gamification**: The application of game-design elements (e.g., badges, leaderboards) to motivate user engagement.
- **Multimedia**: Various types of content such as video, audio, PDFs, and interactive materials.
- **Admin**: Platform administrator responsible for user, course, and system management.

B. References

List of reference documents, including technical documents, designs, and other relevant standards:

- OAuth2 documentation: https://oauth.net/2
- Zalo Open API documentation: https://developers.zalo.me
- SendGrid API documentation: https://sendgrid.com/docs/API
- Mailchimp API documentation: https://mailchimp.com/developer
- Stripe API documentation: https://stripe.com/docs/api
- Relevant standards for SRS documentation: IEEE 830-1998.