Business Requirements Document (BRD)

Project Title: Kids Language Learning Web Platform
Date: October 9, 2025
Project Status: Pre-Development

EXECUTIVE SUMMARY

Project Overview

This document outlines the business and functional requirements for a new, interactive web platform dedicated to teaching young children (ages 4-6) in Sri Lanka. The project's objective is to create an engaging, browser-based experience where children can learn to Speak, Read, and Write in three languages: English, Tamil, and Sinhala. Our goal is to build a fun, gamified learning environment accessible from any modern web browser, incorporating features like voice recognition for pronunciation and interactive tracing for handwriting.

Project Goals & Opportunity

Within the scope of this academic project, we aim to address a noticeable gap in the digital education space: the lack of a high-quality, trilingual learning platform for young children in Sri Lanka. The project will serve as a proof-of-concept, demonstrating how a modern web application can provide an engaging, multi-sensory educational experience. The core challenge and opportunity lie in integrating three distinct languages into a seamless, fun, and interactive curriculum.

Project Success Criteria

The success of this project will be evaluated based on the following criteria:

- **Technical Implementation:** Successful development and integration of the core technology stack, including the Angular frontend, the ASP.NET Core backend, and the speech recognition API.
- **Functional Completeness:** Delivery of all key features as defined in the project scope, including the Learn, Speak, Write, and Test modules.
- **User Experience:** A fully functional and responsive user interface that is intuitive and engaging for the target audience (children aged 4-6).
- **Final Demonstration:** A successful end-of-project presentation showcasing a complete user journey—from parent registration to a child completing a learning activity in each of the three languages.

1. BUSINESS OBJECTIVES

1.1 Primary Objectives

1. **Educational Impact:** To provide a tool that helps children master basic literacy and life skills before they start Grade 1.
2. **Language Development:** To create a natural, immersive environment for children to learn Sinhala, Tamil, and English concurrently.
3. **Market Penetration:** To become the go-to pre-school educational website for parents in Sri Lanka.
4. **User Engagement:** To design content so fun and rewarding that children are excited to learn and practice.
5. **Scalability:** To build a flexible and robust web architecture that can support future content growth and feature expansion.

1.2 Strategic Goals

- **Year 1:** Establish a strong brand presence and cultivate a user base of 50,000+ families.
- **Year 2:** Roll out a premium subscription tier and significantly expand the content library.
- **Year 3:** Explore opportunities for regional expansion into neighboring South Asian markets.

2. SCOPE

2.1 In Scope

- **User Registration:** A secure system for parents to create an account and set up profiles for one or more children.
- **Core Learning Modules:**
    - **Learn:** Interactive flashcards and short animated videos.
    - **Speak:** Microphone-based activities for word repetition and pronunciation.
    - **Write:** On-screen canvas for letter and word tracing via mouse or touch.
    - **Test:** A mixed quiz engine to reinforce learning.
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- **Syllabus:** A three-level curriculum covering the alphabet, phonics, simple words (Level 1), numbers, colors, nouns (Level 2), and basic sentences (Level 3).
- **Gamified Progress Indicators:** Visual cues for children (e.g., stars, unlocked levels) to see their own progress.
- **Multi-Language Support:** Full content and UI availability in English, Tamil, and Sinhala, with an easy toggle feature.

2.2 Out of Scope

- **Parent Dashboard & Analytics:** A dedicated interface for parents to view detailed progress reports is considered out of scope for the initial build and is detailed in the Future Scope section.

- Live video tutoring or chat with educators.
- Parent-to-parent community forums.
- Third-party advertising within the platform.

2.3 Assumptions

- The platform will be accessible via modern desktop and mobile web browsers (e.g., Chrome, Safari, Firefox, Edge).
- Users will have a stable internet connection for streaming video and interactive content.
- Parents will oversee their child's learning sessions.

3. FUNCTIONAL REQUIREMENTS

- **FR-1 (Learn Module):** The system shall display animated flashcards containing an image, a word, and an audio clip for pronunciation.
- **FR-2 (Speak Module):** The system must be able to capture audio input from the user's microphone to be sent to the speech recognition engine for validation. The system will then display immediate, fun feedback.
- **FR-3 (Write Module):** The system shall provide an interactive drawing area using **HTML5 Canvas** where children can trace letterforms with a mouse or touch input.
- **FR-4 (Test Module):** The system shall generate quizzes with a mix of activities. A scoring and rewards system (stars, badges) will be integrated to provide feedback to the child.
- **FR-5 (User Management):** The system shall support parent account creation and the management of multiple child profiles under a single account.
- **FR-6 (Backend Progress Logging):** The system's backend must log all user activity and track scores for completed activities. This data will be stored for future use.

3.7 Key Business Entities

The system will need to manage information about the following core concepts:

- **Parent Account:** The main account holder.
- **Child Profile:** The individual learner associated with a Parent Account.
- **Syllabus Level:** A distinct stage in the curriculum (e.g., Level 1, Level 2).
- **Learning Activity:** A specific task for a child to complete (e.g., a video, a quiz, a tracing game).
- **Progress Record:** A record of a child's completion of an activity.

4. NON-FUNCTIONAL REQUIREMENT

- **NFR-1 (Usability):** The user interface must be extremely child-friendly, featuring large, clickable elements, bright colors, and minimal text.

- **NFR-2 (Performance):** The website must be lightweight and fast. Page load times should not exceed 3 seconds, and interactive elements should be responsive.
- **NFR-3 (Responsiveness):** The platform must be fully responsive, providing an optimal viewing and interaction experience across desktops, tablets, and mobile phones.
- **NFR-4 (Security):** All user data, especially information related to children, must be encrypted and handled securely.

5. TECHNOLOGY STACK

Frontend:

- **Framework: Angular (TypeScript)** - A powerful framework for building dynamic, single-page applications.
- **UI/Styling: TailwindCSS / Bootstrap** - For creating a responsive, mobile-first, and kid-friendly design system.
- **Interactive Elements:**
  - **HTML5 Canvas:** To provide the interactive area for the letter tracing feature.
  - **Microphone Input:** Will require a browser-compatible solution to capture audio for the 'Speak' module.

Backend:

- **Framework: ASP.NET Core (C#) Web API** - A high-performance, cross-platform framework for building the backend logic and APIs.
- **Authentication: Identity / JWT** - To manage secure user registration and login.
- **Database: SQL Server** - The designated relational database for storing user progress and syllabus data.

Speech Recognition:

- **Service: Google Cloud Speech-to-Text API** - To be used for analyzing the child's spoken words and providing data for pronunciation feedback.

6. FUTURE SCOPE

While the initial project focuses on the core learning experience, we have a clear vision for future enhancements.

- **Parent Dashboard & Analytics:** Developing a comprehensive dashboard for parents to view detailed progress reports, track learning milestones, and manage their child's profile settings.
- **AI-Powered Personalization:** Implementing an adaptive learning engine to customize the educational journey for each child based on their performance.
- **Companion Mobile Apps:** Developing streamlined native mobile apps (e.g., using React Native) to offer a convenient, on-the-go experience.
- **Expanded Curriculum:** Broadening our syllabus to cover more advanced topics and new subjects like basic math and science.