

Core Features of the Dyslexia Web Portal

◆ Reading Assistance

- **Text-to-Speech (TTS)** for reading aloud.
- **OCR (Optical Character Recognition)** to extract and read text from images/PDFs.
- **Dyslexia-friendly fonts** like OpenDyslexic or Lexend.
- **Color overlays and contrast adjustments** for better readability.

◆ Writing Assistance

- **Speech-to-Text (STT)** to allow users to dictate instead of typing.
- **AI-powered spelling and grammar correction** tailored for dyslexic users.
- **Word prediction and autocomplete** to assist in faster writing.

◆ Speaking Assistance

- **Pronunciation practice using AI** to enhance phonetic understanding.
- **Interactive voice response (IVR) integration** for verbal practice.

◆ Additional Features

- **Gamified learning modules** for engagement.
 - **Multisensory input** (visual, auditory, kinesthetic) to reinforce learning.
 - **AI-powered reading coaches and chatbots** for personalized feedback.
 - **User progress tracking & reporting.**
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Recommended Tech Stack

● Frontend (User Interface)

- ✓ **React.js / Next.js** – Highly responsive UI with accessibility features.
- ✓ **Vue.js / Angular.js** – Alternative options for a dynamic web experience.
- ✓ **Tailwind CSS / Bootstrap** – For designing an accessible, user-friendly interface.
- ✓ **Web Speech API** – Native browser API for Speech-to-Text and Text-to-Speech.

● Backend (Server & APIs)

- ✓ **Node.js + Express.js** – Lightweight and scalable for real-time operations.
- ✓ **Django (Python) / Flask** – Great for AI/ML-based analytics and NLP integration.
- ✓ **FastAPI** – If using Python for AI-based functionalities.

● Database

- ✅ **PostgreSQL / MySQL** – Structured data storage for user profiles and settings.
- ✅ **MongoDB / Firebase** – NoSQL options for flexible, real-time interactions.
- ✅ **Redis** – For caching frequently accessed content and speeding up queries.

🔴 **AI / NLP (Speech & Text Processing)**

- ✅ **Google Cloud Speech-to-Text & Text-to-Speech APIs** – High-quality STT & TTS.
- ✅ **Amazon Polly** – Converts text to natural-sounding speech.
- ✅ **OpenAI Whisper / GPT API** – Advanced AI for reading & writing assistance.
- ✅ **Microsoft Azure Cognitive Services** – AI-powered speech & vision recognition.

🟡 **Accessibility Enhancements**

- ✅ **ARIA (Accessible Rich Internet Applications) roles** – To improve UI accessibility.
- ✅ **Screen Reader Compatibility** – Ensures support for NVDA, JAWS, and VoiceOver.
- ✅ **Dyslexia-friendly fonts & color themes** – User-customizable settings.

🟣 **Mobile Support**

- ✅ **React Native / Flutter** – Cross-platform mobile app for Android & iOS.
- ✅ **PWA (Progressive Web App)** – Allows offline access and mobile compatibility.

Hosting & Deployment

- ✅ **AWS / Google Cloud / Microsoft Azure** – Scalable cloud solutions.
- ✅ **Vercel / Netlify** – If using Next.js for easier deployment.
- ✅ **Docker + Kubernetes** – For scalable containerized applications.

Additional Recommendations

- 🏆 **User Testing with Dyslexic Individuals** – Ensure usability before launch.
- 🔄 **Multisensory Learning Approach** – Combine text, audio, and interactive UI.
- 🎮 **Gamification** – Encourage learning through fun and interactive modules.
- 🔑 **Privacy & Security** – Ensure GDPR/HIPAA compliance if dealing with personal data.

🚀 Final Thoughts

Building an **AI-powered Dyslexia Web Portal** requires a strong combination of **AI, accessibility design, and interactive learning techniques**. By using **React.js, Node.js, AI-powered APIs (Google Cloud, OpenAI Whisper, or Microsoft Cognitive Services)**, and a **flexible database**, you can create a highly intelligent and adaptive learning tool for dyslexic users.