

Smart Quizzer Quizzer AI

Adaptive Learning Platform

An AI-powered personalised quiz and learning experience that transforms how students engage with educational content.

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Project Overview

Smart Quizzer AI represents the next generation of educational technology, leveraging artificial intelligence to create truly personalised learning experiences. Built during Infosys Springboard internship, this platform combines cutting-edge AI with modern web technologies to deliver adaptive assessments that evolve with each learner.

Tech Stack: React | Flask | Google Gemini AI

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The Problem with Traditional Assessment Systems

Current quiz and assessment platforms struggle to meet the diverse needs of modern learners, creating barriers to effective education.



Static Content

Questions remain unchanging, failing to adapt to individual learning styles and knowledge levels.



One-Size-Fits-All

Identical difficulty levels for all students, regardless of their proficiency or learning pace.



Limited Feedback

Minimal explanations leave learners uncertain about why answers are correct or incorrect.

Manual Question Creation

Educators spend countless hours crafting questions, taking time away from teaching.

Missing Analytics

Lack of meaningful insights into learning patterns and progress over time.

Outdated Interfaces

Clunky, unintuitive designs that frustrate rather than inspire learners.

Our Solution: Intelligent, Adaptive Learning

Smart Quizzer AI transforms the educational experience by combining artificial intelligence with intuitive design, creating a platform that truly understands and responds to each learner's needs.



Adaptive AI-Powered Question Generation

Dynamically creates contextually relevant questions tailored to individual learning paths and knowledge gaps.



Real-Time Difficulty Adjustment

Automatically calibrates question complexity based on performance, ensuring optimal challenge levels.



Personalised Explanations

Delivers detailed, context-aware feedback that helps learners understand concepts thoroughly.



Visual Analytics & Learning Insights

Comprehensive dashboards track progress, identify patterns, and highlight areas for improvement.



Multi-Format Content Support

Upload materials in various formats—PDF, DOCX, TXT, CSV, JSON—for instant quiz generation.

AI Question Generation: The Heart of the Platform

AI-Powered Question Engine

- **Google Gemini AI Integration:** Leverages cutting-edge language models for intelligent question creation
- **Contextual Relevance:** Generates questions that align perfectly with uploaded content and learning objectives
- **Multiple Formats:** Supports MCQ, True/False, and Short Answer questions
- **Custom Content Upload:** Accepts PDF, DOCX, TXT, CSV, and JSON files for seamless content processing



Adaptive Learning Engine



Dynamic Difficulty

Adjusts question complexity in real-time based on learner performance and response patterns.



Bloom's Taxonomy

Classifies questions using established cognitive frameworks to ensure comprehensive skill development.



Smart Recommendations

Provides personalised learning paths and next-step suggestions based on performance data.

Intelligent Feedback & Analytics



Intelligent Feedback System

Our multi-layered evaluation approach ensures learners receive meaningful, actionable feedback that accelerates understanding.

- **Context-Aware Explanations:** Detailed reasoning for every answer, tailored to the specific question and learner's response
- **Multi-Method Evaluation:** Combines exact matching, keyword analysis, and semantic understanding
- **Personalised Tips:** Customised recommendations for improvement based on individual learning patterns



Visual Analytics Dashboard

Comprehensive insights transform raw data into actionable learning intelligence.

- **Real-Time Progress Tracking:** Live updates on performance metrics and achievement milestones
- **Difficulty-Level Breakdown:** Visual representation of performance across question complexity levels
- **Response-Time Analysis:** Identify patterns in time management and question-solving efficiency
- **Performance Trends:** Track improvement over time with historical data visualisation

User Management & Security

Admin Dashboard – Centralized Management Console

The Admin Dashboard provides educators and administrators with full control and visibility across the Smart Quizzer AI platform.


It simplifies management of users, quizzes, and system analytics through a clean, intuitive interface.

Comprehensive User Profiles

Learners can maintain detailed profiles with editable personal information, skill level indicators, and complete learning history tracking. The system remembers preferences and adapts to individual needs over time.

Enterprise-Grade Security

JWT-based authentication ensures secure access control, whilst encrypted password reset functionality via email provides peace of mind. Token expiration mechanisms protect against unauthorised access.

 **Privacy First:** All user data is encrypted and stored securely, with full compliance to data protection standards. Learners maintain complete control over their information.

Content Processing & Audio Feedback

Smart File Analysis

Our intelligent content processing engine transforms any educational material into an interactive learning experience.

01

AI-Powered Reading

Advanced algorithms understand and analyse uploaded materials, extracting key concepts and learning objectives.

02

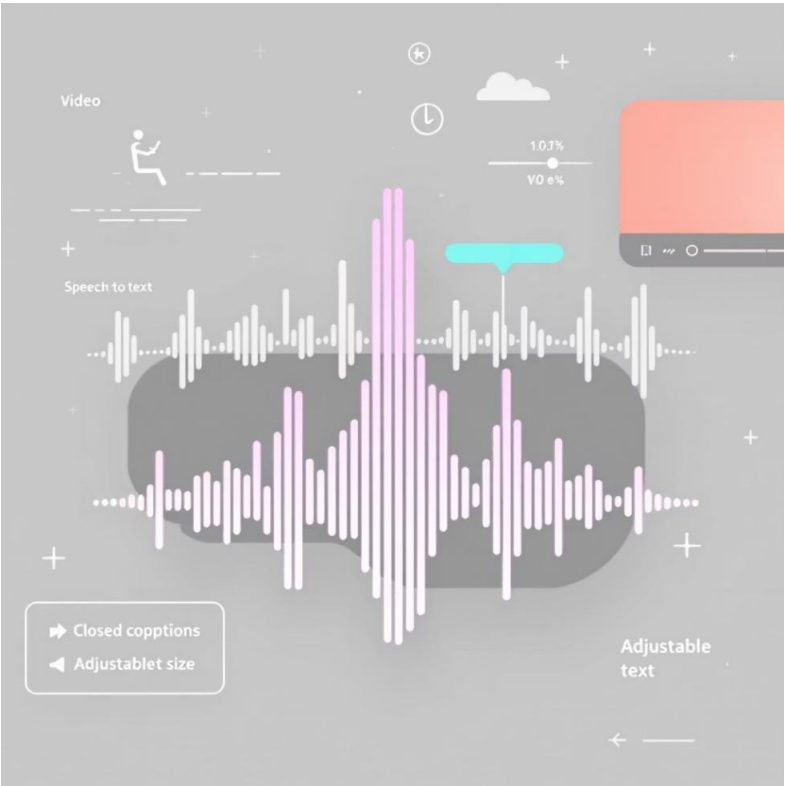
Metadata Extraction

Automatically identifies titles, reading time estimates, difficulty levels, and core topics.

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Quiz Generation

Creates comprehensive, content-specific assessments that test understanding at multiple cognitive levels.



Audio Feedback System

Enhanced accessibility through intelligent audio features that cater to diverse learning preferences.

- **Text-to-Speech:** High-quality audio rendering of all feedback and explanations
- **Live Captions:** Real-time text display accompanies audio for improved comprehension
- **Multiple Voice Options:** Customisable voice settings to suit individual preferences
- **Improved Accessibility:** Ensures platform usability for learners with visual impairments or reading difficulties



Technology Stack

Built with modern, scalable technologies that ensure performance, reliability, and seamless user experience.

Frontend

- React 18
- TypeScript
- Tailwind CSS

Modern, responsive interface with type safety and utility-first styling.

Backend

- Flask
- SQLAlchemy
- JWT Authentication

Robust Python framework with ORM and secure authentication.

AI & Data

- Google Gemini API
- SQLite Database
- Real-time Analytics

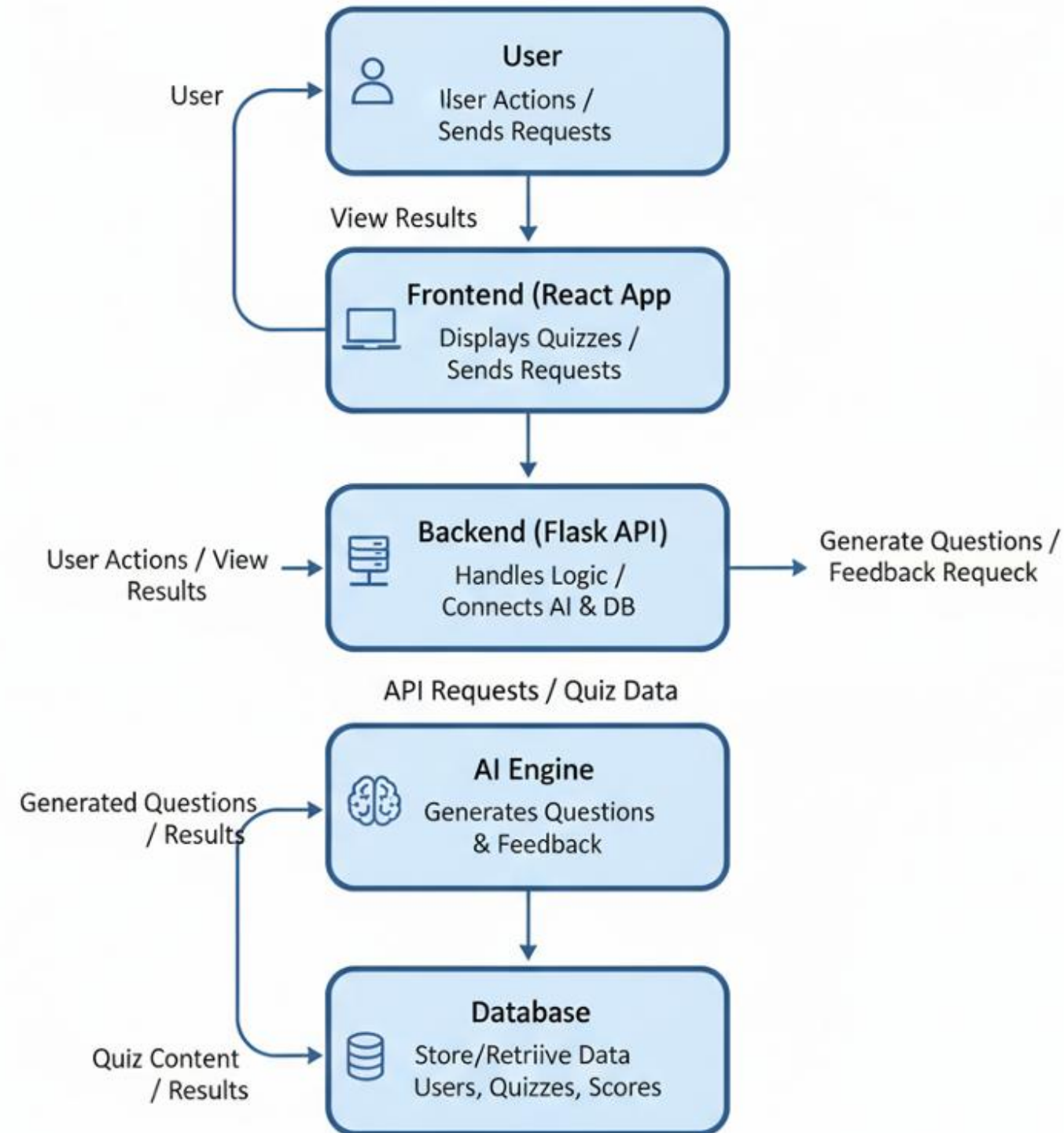
Cutting-edge AI integration with efficient data storage and processing.

Features

- Web Speech API
- SMTP Integration
- Interactive Dashboards

Enhanced accessibility, communication, and data visualisation capabilities.

Architecture Diagram



Data Flow Architecture

