Edututor ai-solution architecture

Date: 26 June 2025
Team ID: LTVIP2025TMID34185

Project Name: Edututor ai
Maximum Marks: 4 Marks

EduTutor AI — Solution Architecture Overview

The architecture enables intelligent, adaptive, and curriculum-aligned learning by:

- Deploying **IBM Granite foundation models** for personalized quiz generation and feedback

- Using **Watson NLP** for understanding learner performance and question context

- Syncing with Google Classroom for real-time academic alignment

- Ensuring secure, scalable delivery via IBM Cloud infrastructure

EduTutor AI Architecture Diagram

Student & Educator Input Channels

- Web-based student portal (responsive UI)

- Mobile app for quiz taking and feedback review

- Educator dashboard (browser-based interface)

- Google Classroom API integration

AI Processing Layer

Component	Function
Granite LLM (Quiz Engine)	Generates adaptive quizzes and explanatory feedback
Watsonx NLP	Analyzes student text input and quiz performance to personalize paths
Language Localizer	Provides multilingual content delivery and support (e.g., Hindi, Tamil)

Backend Services

Service	Role
IBM Cloud Functions	Orchestrates quiz logic, user sessions, and content delivery
IBM Cloudant DB	Stores course metadata, quiz history, and feedback logs

Service	Role
Redis Cache	Accelerates delivery of quizzes and performance stats
Pinecone Vector Database	Stores vectorized student performance for similarity search and insights

Output Systems

- Dynamic quizzes delivered via web/mobile

- Real-time feedback visualizations for students

- Educator performance dashboards

- Topic-level intervention alerts

Security

- **IBM Cloud IAM**: Role-based access for students, teachers, and admins

- **Data Encryption**: End-to-end encryption of student data (FERPA-compliant)

- **Audit Logging**: Tracks quiz access, result updates, and instructor actions