**Edututor ai-solution architecture**

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Team ID:** **NM2025TMID00819**

**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 |
| **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