

## Project Design Phase

### Solution Architecture

Date	26 June 2025
Team ID	LTVIP2025TMID33995
Project Name	EDUTUTOR AI – Personalized AI-Powered Learning Platform
Maximum Marks	4 Marks

### Solution Architecture:

#### Objective of Solution Architecture

- To bridge the gap between student learning gaps and educator insight needs using AI-powered quiz generation and analytics.
- To provide an adaptive learning environment using advanced tech like IBM WatsonX, Pinecone vector search, and Google Classroom APIs.
- To deliver real-time insights and feedback loops that drive personalized education.

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#### Key Components

Component	Technology/Tool Used	Functionality
Frontend	Streamlit	Web UI for Students and Educators (Quizzes, Dashboard, Login)
Authentication	Google OAuth 2.0	Secure sign-in with Google and integration with Classroom
Quiz Generation API	IBM WatsonX (Granite Model)	Generates dynamic quizzes based on selected topic and complexity
Storage & Retrieval	Pinecone (Vector DB)	Stores quiz history and retrieves performance vectors for analytics
Backend Logic	FastAPI	Handles API routing, quiz requests, and database interfacing
Deployment	Localhost / Cloud (Optional for future)	Runs integrated services for frontend, backend, and API

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#### Architecture Flow Description

1. Student logs in using Google OAuth.
2. Selects a topic → submits quiz request via Streamlit UI.

3. Request is routed to FastAPI backend → invokes IBM WatsonX model.
4. Generated quiz (JSON with MCQs) is shown in frontend.
5. Quiz response is submitted → score computed and stored in Pinecone.
6. Educator dashboard shows analytics based on Pinecone history.

## Features

- Real-time MCQ quiz generation
- Instant feedback and scoring
- Dashboard for students and educators
- Google Classroom integration
- Personalized performance tracking

## Solution Architecture Diagram:

