Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	27 June 2025
Team ID	LTVIP2025TMID32976
Project Name	EduTutor AI: Personalized Learning with Generative AI and LMS Integration
Maximum Marks	4 Marks

Architecture Layers & Flow

Layer	Technology	Description
User Interface Layer (Local)	Streamlit	Collects user input such as concept/topic; displays explanations and MCQs
Application Logic Layer (Local)	Python	Handles prompt generation, session management, and quiz formatting logic
AI Model Layer (Cloud)	IBM Watsonx via ibm-watsonx-ai SDK	Uses Granite model (granite-3-8b-instruct) to generate topic explanations and MCQs
Data Storage Layer (Local)	In-memory Dictionary (Python)	Temporarily stores session data and results during runtime
External Interfaces	IBM Watsonx API Credentials	Secure communication with IBM foundation model APIs

Table 1: Components & Technologies

S.No	Component	Description	Technology
1	User Interface	Interactive UI for input and output display	Streamlit
2	Application Logic	Prompt construction, logic handling, and output formatting	Python
3	Session Handling	Tracks user inputs/output per session	Python in-memory structures
4	External API	Accesses IBM Watsonx foundation model	IBM Watsonx AI SDK (ibm-watsonx-ai)
5	Machine Learning Model	Performs natural language generation	granite-3-8b-instruct
6	Infrastructure	Execution environment for app	Local Runtime / Cloud-hosted via Hugging Face Spaces

Table 2: Application Characteristics

S.No	Characteristic	Description	Technology
1	Open-Source Frameworks	Built using open tools	Streamlit, Python, IBM SDK
2	Security Implementations	Credentials stored securely (locally or in Hugging Face secrets)	API Key + Project ID
3	Scalability	Modular layers (UI → Logic → Model); extendable	Streamlit + API-based logic

4	Availability	Run locally or deploy on Hugging Face Spaces or Streamlit Cloud	Python + Streamlit Cloud
5	Performance	Fast text generation via optimized cloud APIs	IBM Watsonx optimized models

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