Project Design Phase
Solution Architecture

Date	27 June 2025
Team ID	LTVIP2025TMID31153
Project Name	Edu Tutor AI: Personalized Learning with Generative AI and LMS Integration
Maximum Marks	4 Marks

Solution Architecture:

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to:

Purpose:

EduTutor AI aims to deliver a personalized learning experience using generative AI. Its architecture connects users with language models through a lightweight interface, enabling concept explanation, grammar tutoring, and quiz generation from topics or PDFs — all without requiring complex backend frameworks.

Architecture Overview:

The architecture is composed of the following layers:

- User Interface Layer (Gradio)
  A no-code, interactive interface built entirely with Gradio Blocks, enabling:

    o Login/Register functionality

    o Concept input

    o Language selection

    o PDF upload for test generation

    o AI response display

- **Logic & Processing Layer (Python)**

    o Handles user input, session management, and routing logic

    o Uses PyPDF2 to extract and process PDF content

    o Stores user session data and quiz state using Python dictionaries (user_sessions)

- **AI Model Layer (Hugging Face Transformers)**

    o Integrates the IBM Granite 3.3-2B-Instruct model using Hugging Face pipeline

    o Performs text generation for:

      ▪ Concept explanations

      ▪ Grammar lessons (Hindi/English)

      ▪ Quiz/test creation from topics or PDF inputs

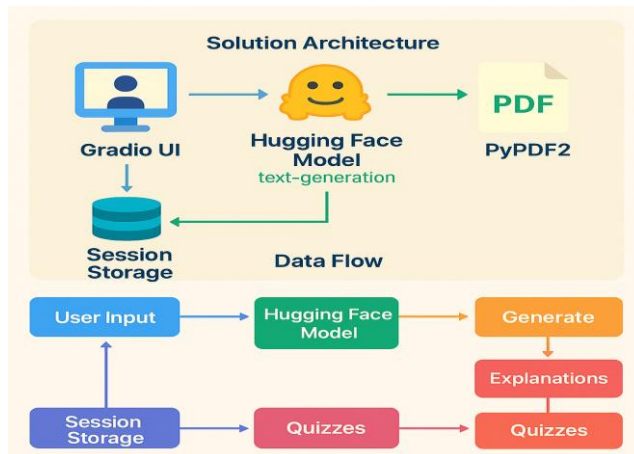**Example - Solution Architecture Diagram:**

Figure : Architecture and data flow of the EduTutor AI: Personalized Learning with Generative AI and LMS Integration.