Team Details

a. **Team name:** FAIR Labs
b. **Team leader name:** Sandhiya
c. **Problem statement:** AI Teaching Assistant - Sahayak
d. **Team members:** Abhijay, Aditya, Elakkiya, Karthika

Sahayak - The Ironman Suit For Teachers

Imagine a teacher in an under-resourced area equipped with a powerful tool like Iron Man's suit, powered by AI to supercharge their teaching capabilities.

Introducing **"Sahayak"** – the AI teaching companion that helps teachers

- Create hyper-localized lesson plans, worksheets, quizzes, and visual aids.
- Generate culturally relevant content in regional languages.
- Instantly differentiate materials for multiple grade levels in one classroom.
- Transform text lessons into visual stories and create animated explanations for complex concepts.
- Assess student work and provide clear, actionable feedback in real-time.
- Create efficient weekly planners that organize student activities and optimize classroom time.

Sahayak is built to uplift teachers and redefine learning —
"Because every teacher deserves a suit of armor to fight educational challenges"

Opportunities

- How different is it from any of the other existing ideas?
  - A unified AI platform, handles worksheets, quizzes, videos, and more with minimal models.
  - Seamless integration, low latency, and tailored for low-resource, multi-grade schools.

- How will it be able to solve the problem?
  - **MCP Architecture:** Server manages all AI tasks; client offers a lightweight, teacher-friendly app.
  - Simplifies deployment and scales easily.

- USP of the proposed solution
  - On-demand video creation along with audio transforms classrooms - helping teachers to explain complex concepts visually and effectively in less time.

Why MCP?

- MCP acts like “USB-C for AI integrations” - a universal, scalable, secure communication layer between LLMs and external systems.
- Offers standardized integration across diverse tools/systems, eliminating one-off connector code for each LLM-tool pairing

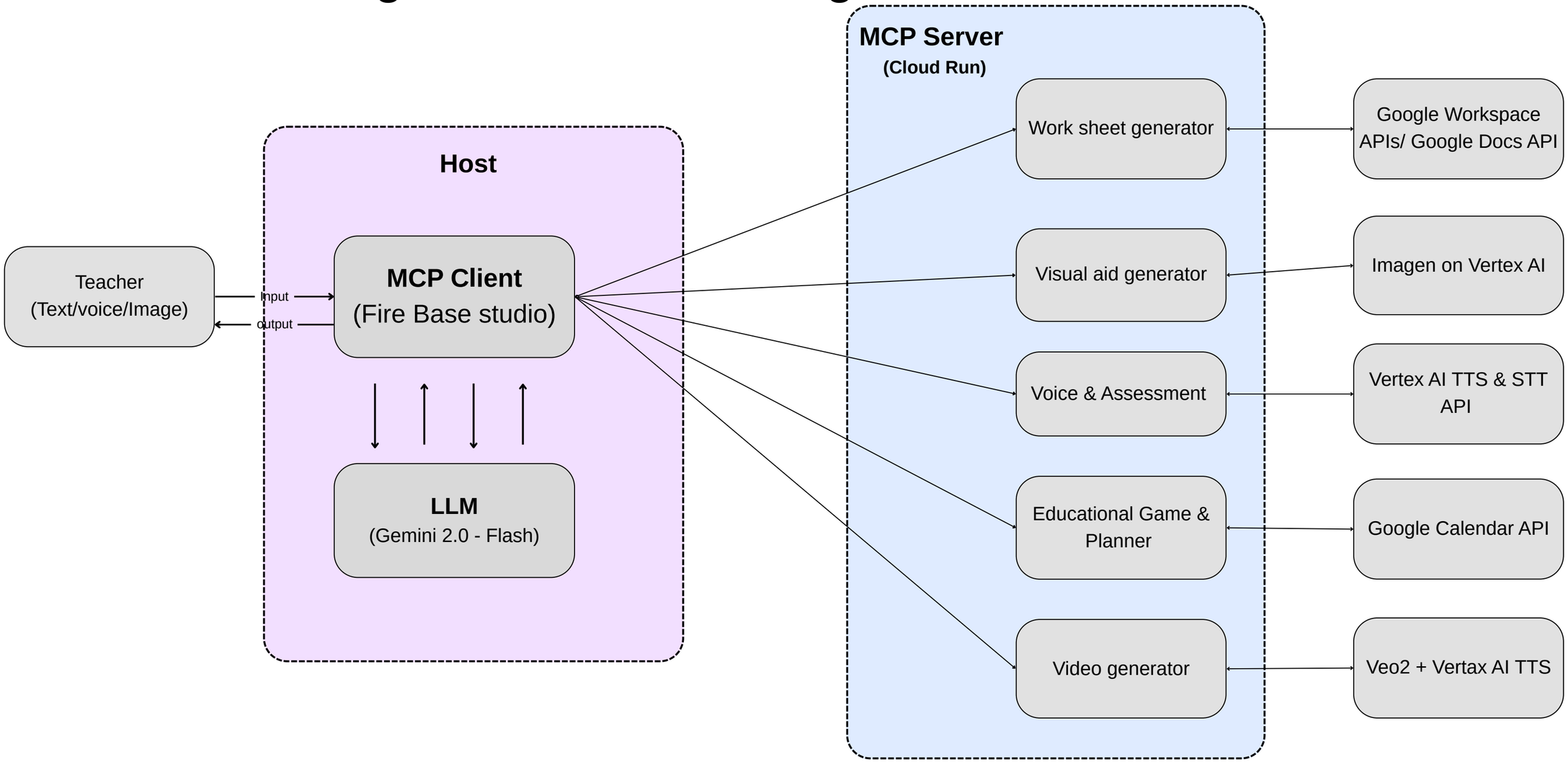
How MCP Solves the Problem?

- Solves the M×N integration problem: one protocol replaces the need for separate adapters to connect M models with N systems
- Decouples reasoning from execution: agents focus on planning while MCP routes tool calls (e.g. DB queries, API calls)
- Maintains multi-step context: carries state across workflows - for example, Creates content for worksheet, exports that to Google Docs - ensures continuity

List of features offered by the solution

Phase	Feature Area	Key Features
Phase 1: Core Features (20 hours)	**Content Generation Engine**	- Local language story generation - Grade-appropriate worksheet creation - Cultural context integration
	Multimodal Textbook Processing	- Upload and analyze textbook pages - Generate differentiated worksheets - Extract key concepts automatically
	Knowledge Base Integration	- Simple Q&A system in local languages - Age-appropriate explanations
	On-Demand Video Creation and Animations	- Transform text lessons into visual stories - Generate animated explanations for complex concepts
Phase 2: Enhanced Features (10 hours)	**Firebase Studio Integration**	- Real-time content sharing - Teacher collaboration features - Progress tracking
	Deployment & Polish	- Firebase hosting setup - Mobile-responsive design - Basic teacher onboarding

Process flow diagram or use-case diagram



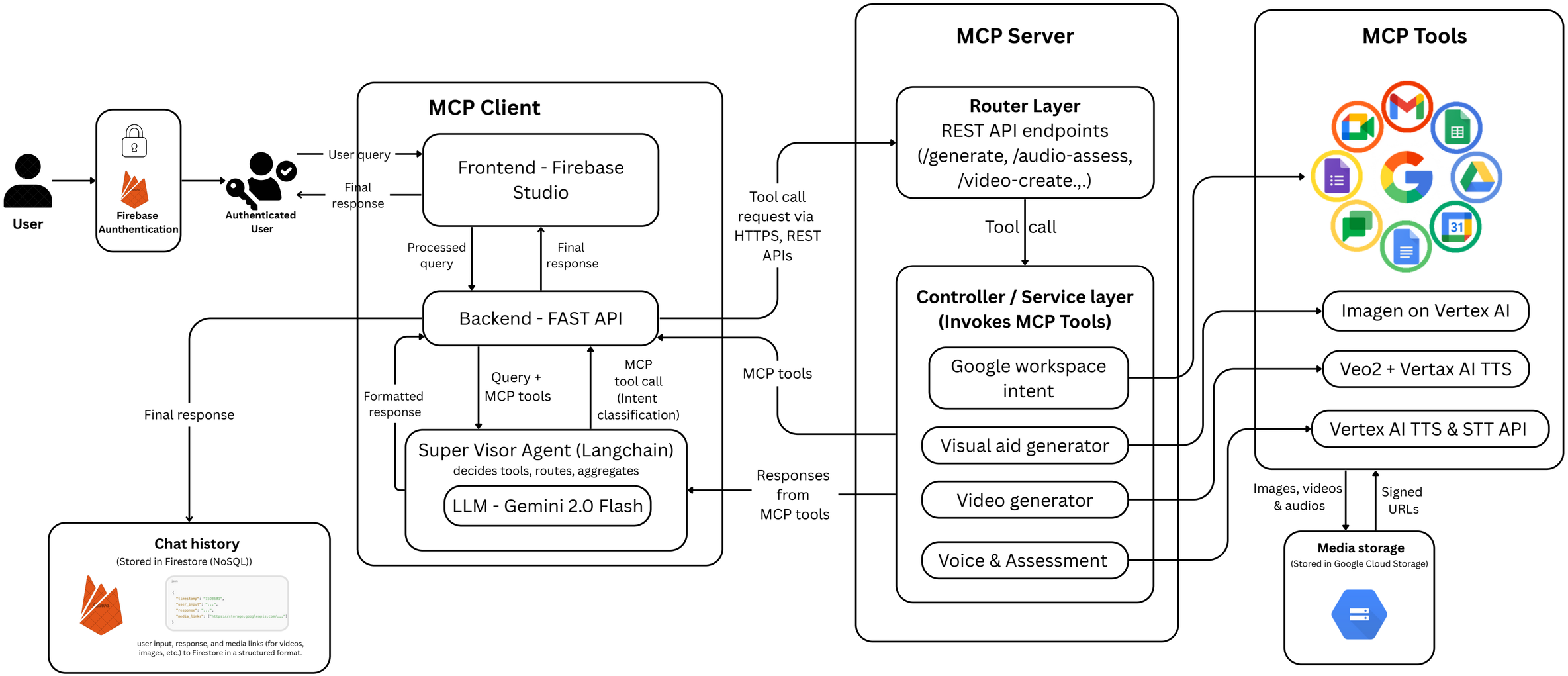
Technologies to be used in the solution

Component	Technology/Model	Purpose
MCP Server	Cloud Run / GKE	Hosts APIs, orchestrates AI tasks
MCP Client	Web/mobile app via Firebase Studio	Teacher-facing interface, handles user input/output
Core AI Model	Gemini 2.0 Flash (Vertex AI)	Multimodal content generation, language, reasoning
Speech/Audio	Vertex AI Speech-to-Text, TTS	Audio assessments, text-to-speech for local language
Video Generation	Veo2 (Google)	Generate educational videos from audio or prompts
Storage	Cloud Storage / Firestore	Store materials, user data, logs
Integration	Google workspace APIs	Export worksheets/quizzes for HITL

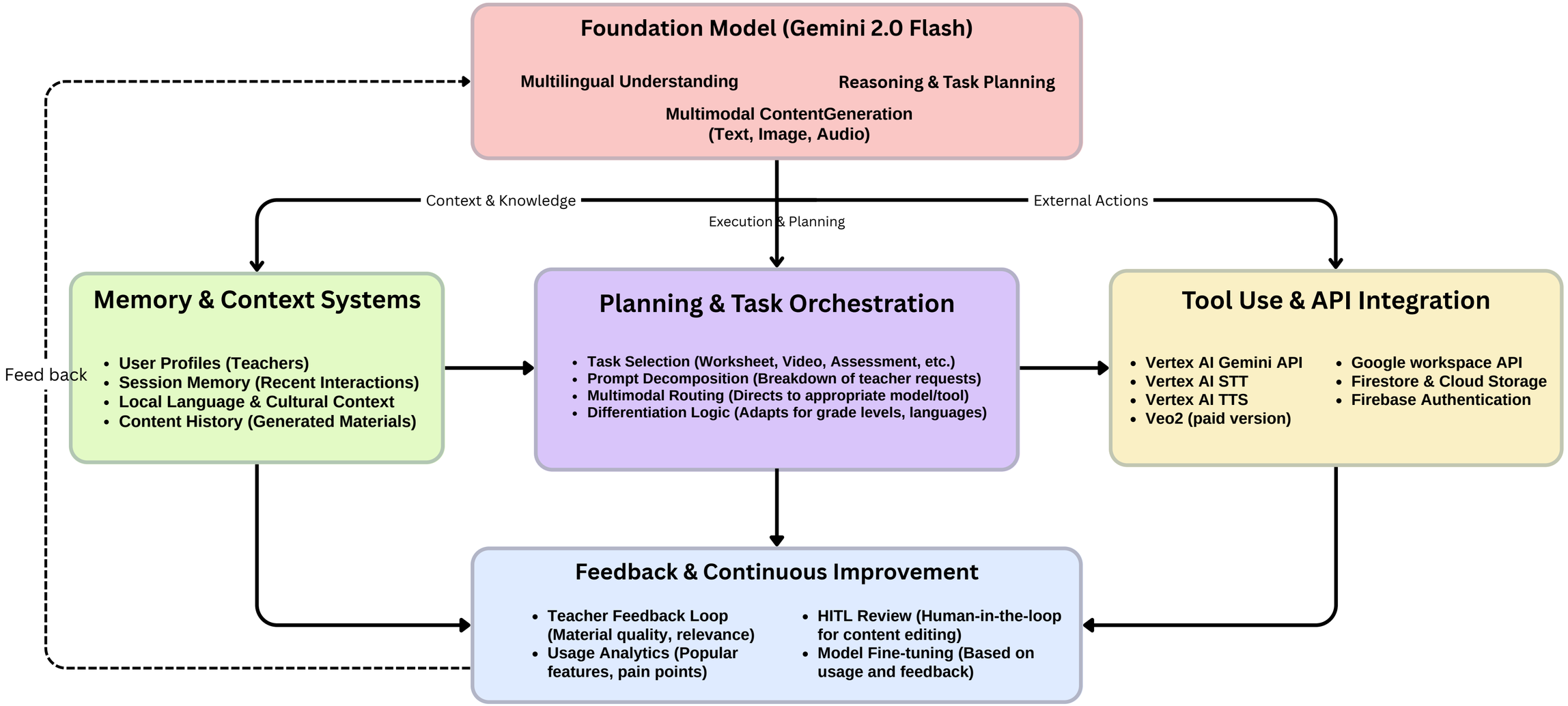
Classroom Feature Mapping with Google & Gemini AI Stack

Use Case	AI Tool/Platform
Hyper-local content generation	Gemini 2.0 Flash
Differentiated worksheets from images	Gemini 2.0 Flash (Multimodal)
Instant knowledge base (Q&A)	Gemini 2.0 Flash
Visual aid generation (drawings/charts)	Imagen (Vertex AI)
Audio-based reading assessments	Vertex AI Speech-to-Text
Lesson planners, game generation	Gemini 2.0 Flash
Video generation for content	Veo 2, Google TTS
Export to Google Docs/Forms for HITL review	Google Workspace APIs

Architecture diagram of the proposed solution



Architecture diagram of the proposed solution - Highlevel abstraction



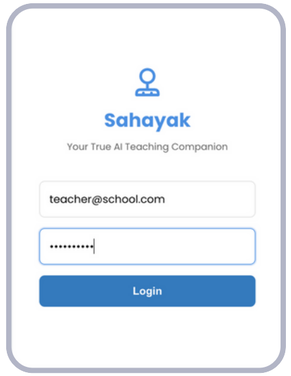
MCP Server-Client Architecture – High-Level Workflow

1. **User Interaction & Authentication**
   - User accesses MCP Client (App) via web/mobile.
   - Authentication handled by Firebase Auth (OAuth/JWT).
2. **Request Routing & Session Management**
   - Requests routed through API Gateway (FastAPI backend).
   - Session/context stored in NoSQL DB for quick retrieval.
3. **Input Processing & Storage**
   - Text queries are preprocessed.
   - Media files (images/videos) uploaded to Cloud Storage.
4. **Agent Orchestration & Tool Invocation**
   - FastAPI calls AI tools: Gemini 2.0 (LLM), Speech-to-Text, Veo2 (video).
   - Agents coordinate multi-modal processing and task execution.

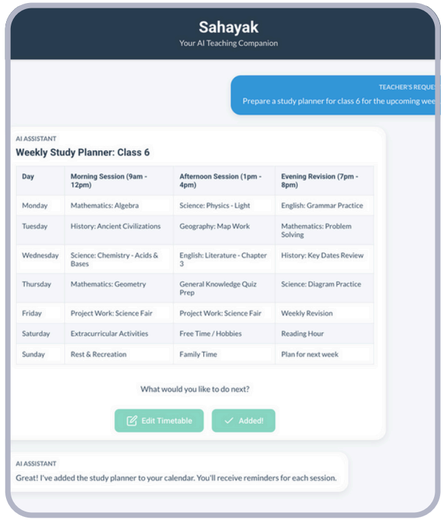
Response Generation & Data Management

1. **Response Aggregation & LLM Finalization**
    a. Tool outputs aggregated and refined by Gemini LLM.
    b. Final answer formatted and prepared for client delivery.
2. **Client Response Delivery**
    a. FastAPI sends structured response back to MCP Client (App).
3. **Data Persistence & Analytics**
    a. Chat history and metadata stored in Firestore (NoSQL).
    b. Media assets saved in Google Cloud Storage with references in DB.
    c. Analytics and monitoring via BigQuery and Cloud Logging.

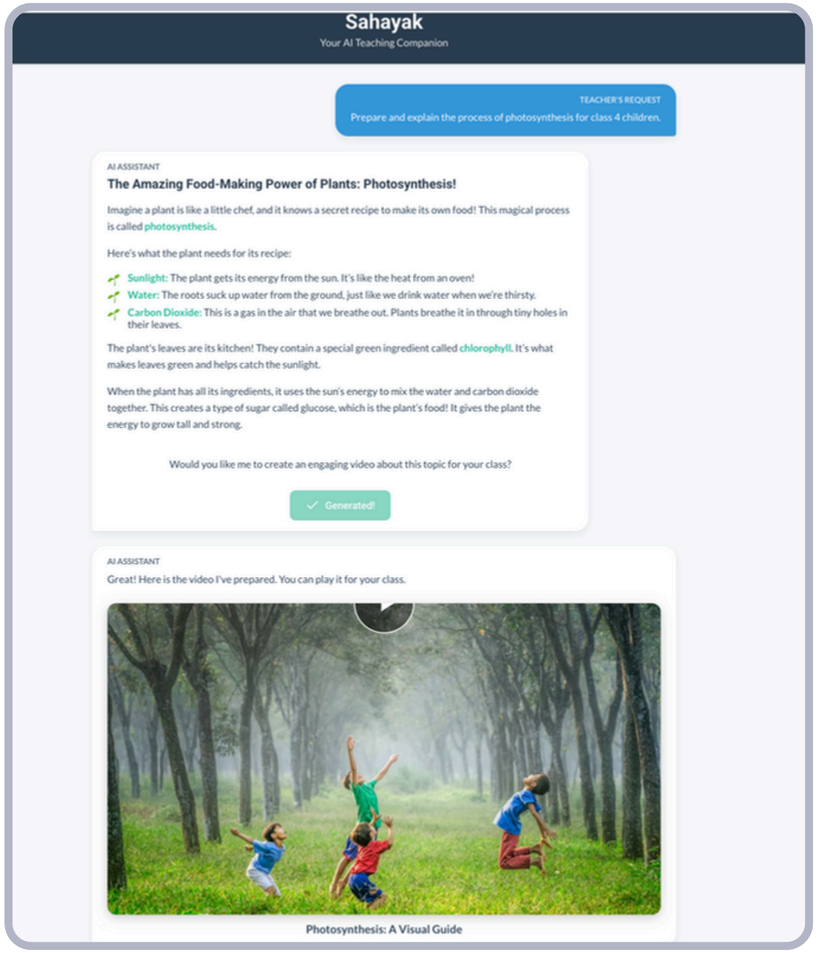
Wireframes/Mock diagrams of the proposed solution



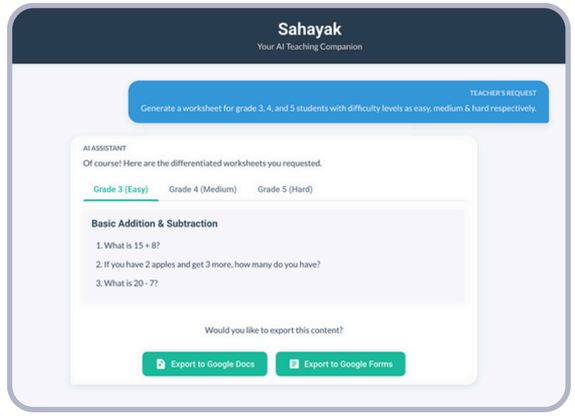
User login



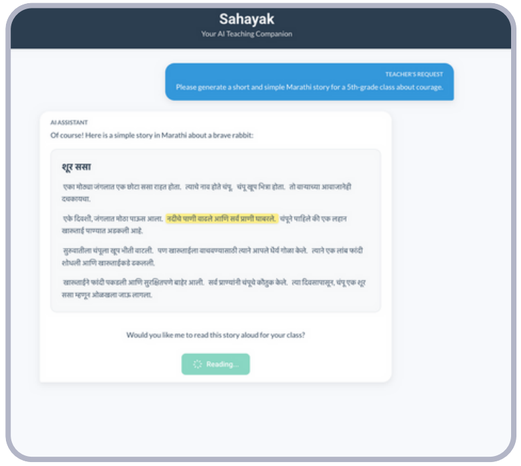
Weekly planner



On demand - video generation



Worksheet generation for different grades



Voice assistant - reading regional content

Future scope

Including three user roles:

- **Teacher** (Primary Agent) – The heart of the solution
- **Student Agent** – Personal learning companion
- **Well-Wisher Agent** – Bridging communities with classrooms
- **Primary Agent (Teacher):** Creates lesson plans, evaluates work, generates visuals & differentiated materials instantly.
- **Secondary Agents:**
  - Well-Wishers provide time, resources, mentorship.
  - Students get AI-driven assistance, oral tests, and progress insights.

Google Cloud

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Thank you!