

Google Cloud

PRESENTS

Agentic AI Day

Build the next generation of intelligent agents

Powered by **I2S**

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

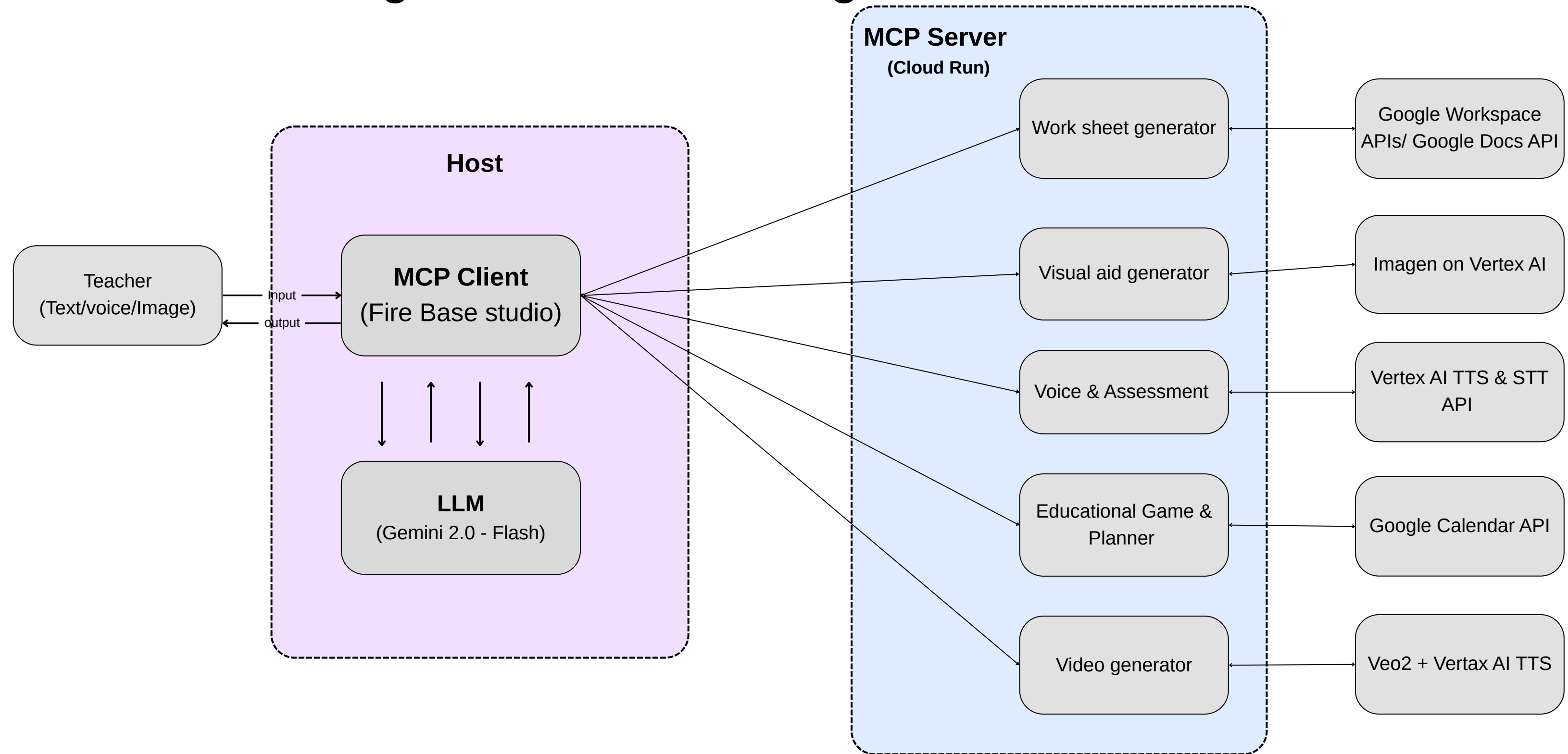
How MCP Solves the Problem?

- Solves the $M \times N$ 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	<ul style="list-style-type: none">- Local language story generation- Grade-appropriate worksheet creation- Cultural context integration
	Multimodal Textbook Processing	<ul style="list-style-type: none">- Upload and analyze textbook pages- Generate differentiated worksheets- Extract key concepts automatically
	Knowledge Base Integration	<ul style="list-style-type: none">- Simple Q&A system in local languages- Age-appropriate explanations
	On-Demand Video Creation and Animations	<ul style="list-style-type: none">- Transform text lessons into visual stories- Generate animated explanations for complex concepts
Phase 2: Enhanced Features (10 hours)	Firebase Studio Integration	<ul style="list-style-type: none">- Real-time content sharing- Teacher collaboration features- Progress tracking
	Deployment & Polish	<ul style="list-style-type: none">- Firebase hosting setup- Mobile-responsive design- Basic teacher onboarding

Process flow diagram or use-case diagram



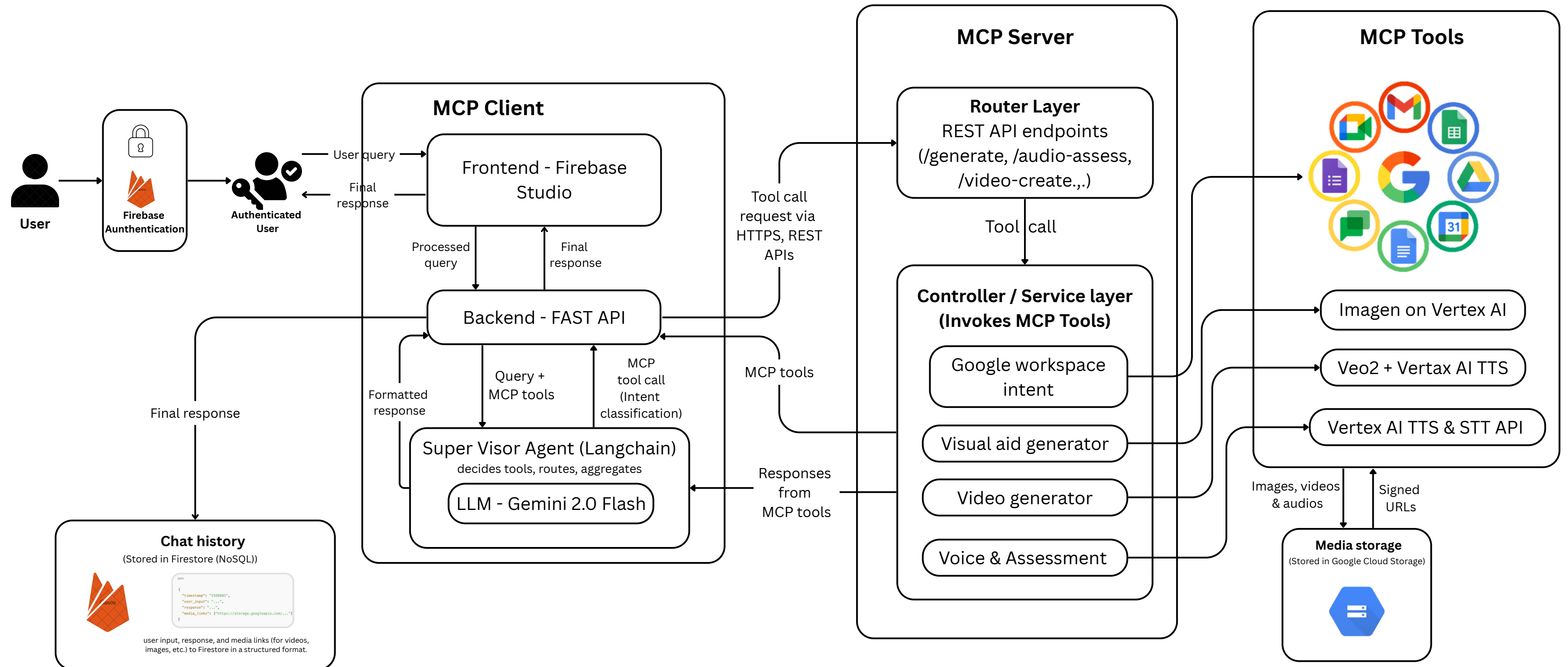
Technologies to be used in the solution

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

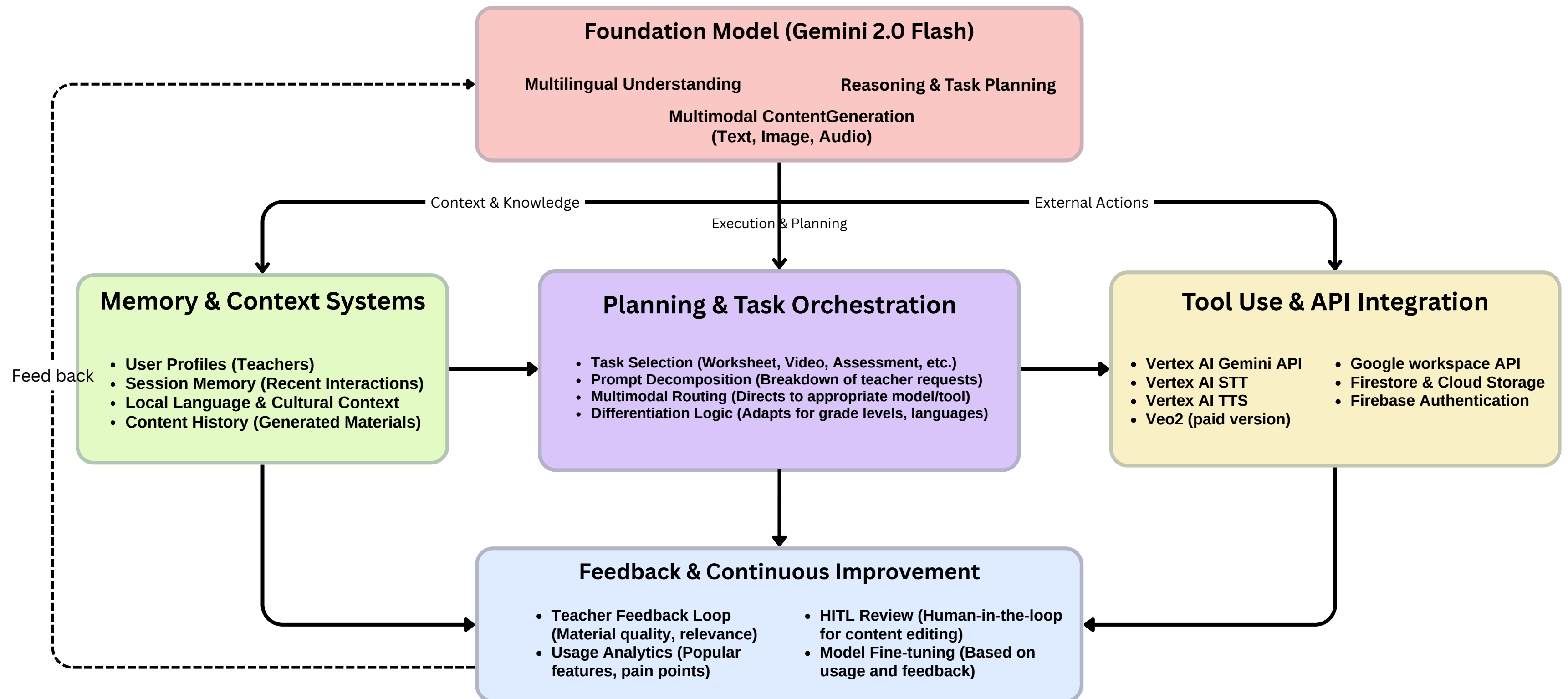
Classroom Feature Mapping with Google & Gemini AI Stack

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


Sahayak
Your True AI Teaching Companion

Login

User login

Sahayak
Your AI Teaching Companion

TEACHER'S REQUEST
Prepare a study planner for class 6 for the upcoming week

AI ASSISTANT
Weekly Study Planner: Class 6

Day	Morning Session (9am - 12pm)	Afternoon Session (1pm - 4pm)	Evening Revision (7pm - 8pm)
Monday	Mathematics: Algebra	Science: Physics - Light	English: Grammar Practice
Tuesday	History: Ancient Civilizations	Geography: Map Work	Mathematics: Problem Solving
Wednesday	Science: Chemistry - Acids & Bases	English: Literature - Chapter 3	History: Key Dates Review
Thursday	Mathematics: Geometry	General Knowledge Quiz Prep	Science: Diagram Practice
Friday	Project Work: Science Fair	Project Work: Science Fair	Weekly Revision
Saturday	Extracurricular Activities	Free Time / Hobbies	Reading Hour
Sunday	Rest & Recreation	Family Time	Plan for next week

What would you like to do next?

Edit Timetable

Added!

AI ASSISTANT
Great! I've added the study planner to your calendar. You'll receive reminders for each session.

Weekly planner

Sahayak
Your AI Teaching Companion

TEACHER'S REQUEST
Prepare and explain the process of photosynthesis for class 4 children.

AI ASSISTANT
The Amazing Food-Making Power of Plants: Photosynthesis!
Imagine a plant is like a little chef, and it knows a secret recipe to make its own food! This magical process is called **photosynthesis**.
Here's what the plant needs for its recipe:


- Sunlight:** The plant gets its energy from the sun. It's like the heat from an oven!
- Water:** The roots suck up water from the ground, just like we drink water when we're thirsty.
- Carbon Dioxide:** This is a gas in the air that we breathe out. Plants breathe it in through tiny holes in their leaves.

The plant's leaves are its kitchen! They contain a special green ingredient called **chlorophyll**. It's what makes leaves green and helps catch the sunlight.
When the plant has all its ingredients, it uses the sun's energy to mix the water and carbon dioxide together. This creates a type of sugar called glucose, which is the plant's food! It gives the plant the energy to grow tall and strong.

Would you like me to create an engaging video about this topic for your class?

Generated!

AI ASSISTANT
Great! Here is the video I've prepared. You can play it for your class.



Photosynthesis: A Visual Guide

On demand - video generation

Sahayak
Your AI Teaching Companion

TEACHER'S REQUEST
Generate a worksheet for grade 3, 4, and 5 students with difficulty levels as easy, medium & hard respectively.

AI ASSISTANT
Of course! Here are the differentiated worksheets you requested.

Grade 3 (Easy)

Grade 4 (Medium)

Grade 5 (Hard)

Basic Addition & Subtraction
1. What is 15 + 8?
2. If you have 2 apples and get 3 more, how many do you have?
3. What is 20 - 7?

Would you like to export this content?

Export to Google Docs

Export to Google Forms

Worksheet generation for different grades

Sahayak
Your AI Teaching Companion

TEACHER'S REQUEST
Please generate a short and simple Marathi story for a 5th-grade class about courage.

AI ASSISTANT
Of course! Here is a simple story in Marathi about a brave rabbit:

शूर ससा
एका मोठ्या जंगलामध्ये एक छोटा सासा राहत होता. त्याचे नाव होते चंचू. चंचू खूप भिकार होता. तो वाय्याच्या आज्ञेवरच टिकून राहत होता.
एके दिवशी, जंगलामध्ये मोठा पाऊस पडला. **चंचूने पाणी काढले आणि सर्व प्राणी पावसाचे, चंचूने पाहिले की एक लहान सासाचं पाण्यात अडकला आहे.**
सुमनातील चंचूला खूप भीती वाटली. पण सासाचंही त्याच्यापासूनच होते त्याने आपले घेई सोडून दिले. त्याने एक लांब चांदी शोधली आणि सासाचंहीकडे टाकली.
सासाचंही चांदी पकडली आणि सुरक्षितपणे बाहेर आला. सर्व प्राण्यांनी चंचूचे कौतुक केले. त्या दिवसापासून, चंचू एक शूर ससा म्हणून ओळखला जाऊ लागला.

Would you like me to read this story aloud for your class?

Reading...

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.

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Thank you!