Google Cloud

PRESENTS

# Agentic AI Day

Build the next generation of intelligent agents

Powered by H2S

## Team Details

a. **Team name:** Binary players
b. **Team leader name:** Jivan Jyoti Jala
c. **Problem statement:** Empowering teachers in multi-grade classrooms

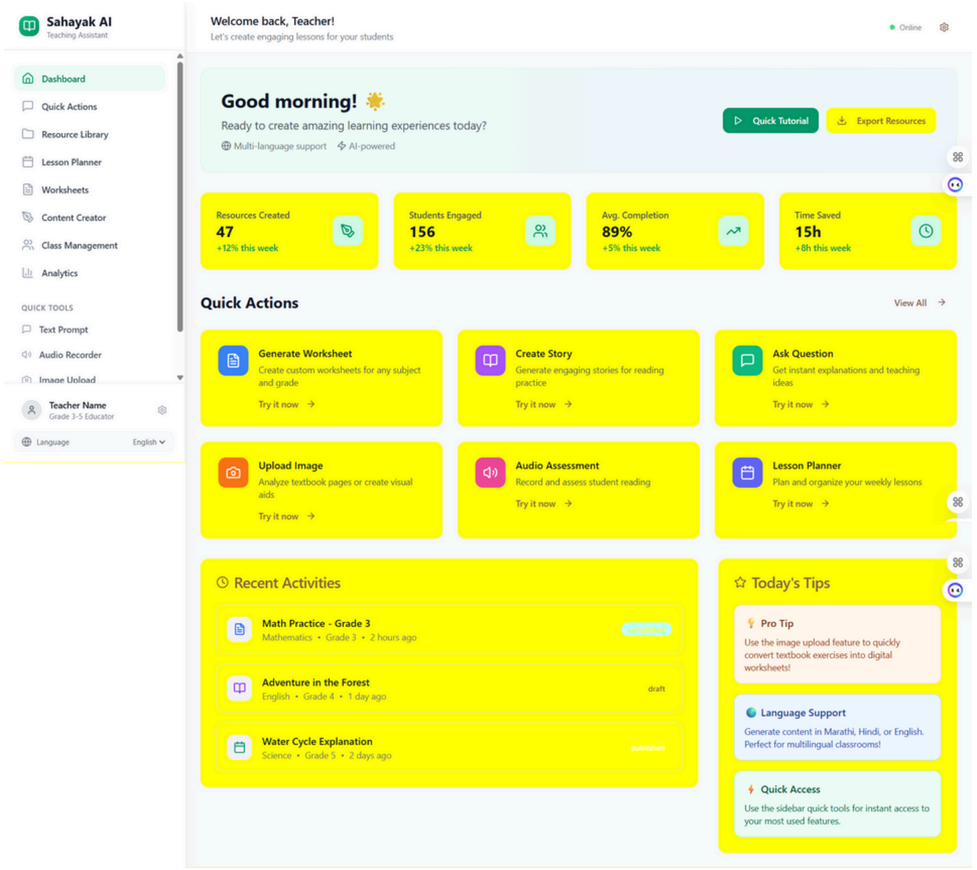
# Brief about the idea – Sahayak (Your AI Teaching Assistant)

Many teachers in India teach multiple grades in one classroom — it's tough and time-consuming.

***Sahayak*** is an AI-powered teaching assistant built to empower teachers in multi-grade, under-resourced classrooms across India

The assistant can:

1. Generate regionally relevant stories and examples in the local language.
2. Turn textbook images into multiple worksheets tailored by grade level.
3. Act as a knowledge explainer and analogist in simple terms.
4. Design visual charts and drawings for chalkboard teaching.
5. Plan lessons and suggest engaging classroom activities.




*Using **Gemini's multimodal** capabilities, **Firebase** for real-time sync, and **Vertex AI Speech-to-Text**, Sahayak reduces teacher burden and amplifies their effectiveness—making quality learning accessible for every child.*

## How is it Different?

1. Most tools like ChatGPT or Bard are web-only and English-first — ***Sahayak*** supports local languages and even works offline using Firebase.
2. While other tools generate generic content, ***Sahayak*** creates hyper-local, culturally relevant materials from the teacher's voice, typed prompt, or textbook image.
3. Existing tools typically cater to one grade level — ***Sahayak*** instantly customizes content for multiple grades in the same classroom.

## USP (Unique Selling Points)

1. ***Multimodal***: Works with text, image, and audio.
2. ***Localized***: Supports prompts and responses in regional languages.
3. ***Firebase-powered***: Real-time sync + offline support.
4. Built with ***Google's latest AI (Gemini + Vertex AI)*** for performance and flexibility.

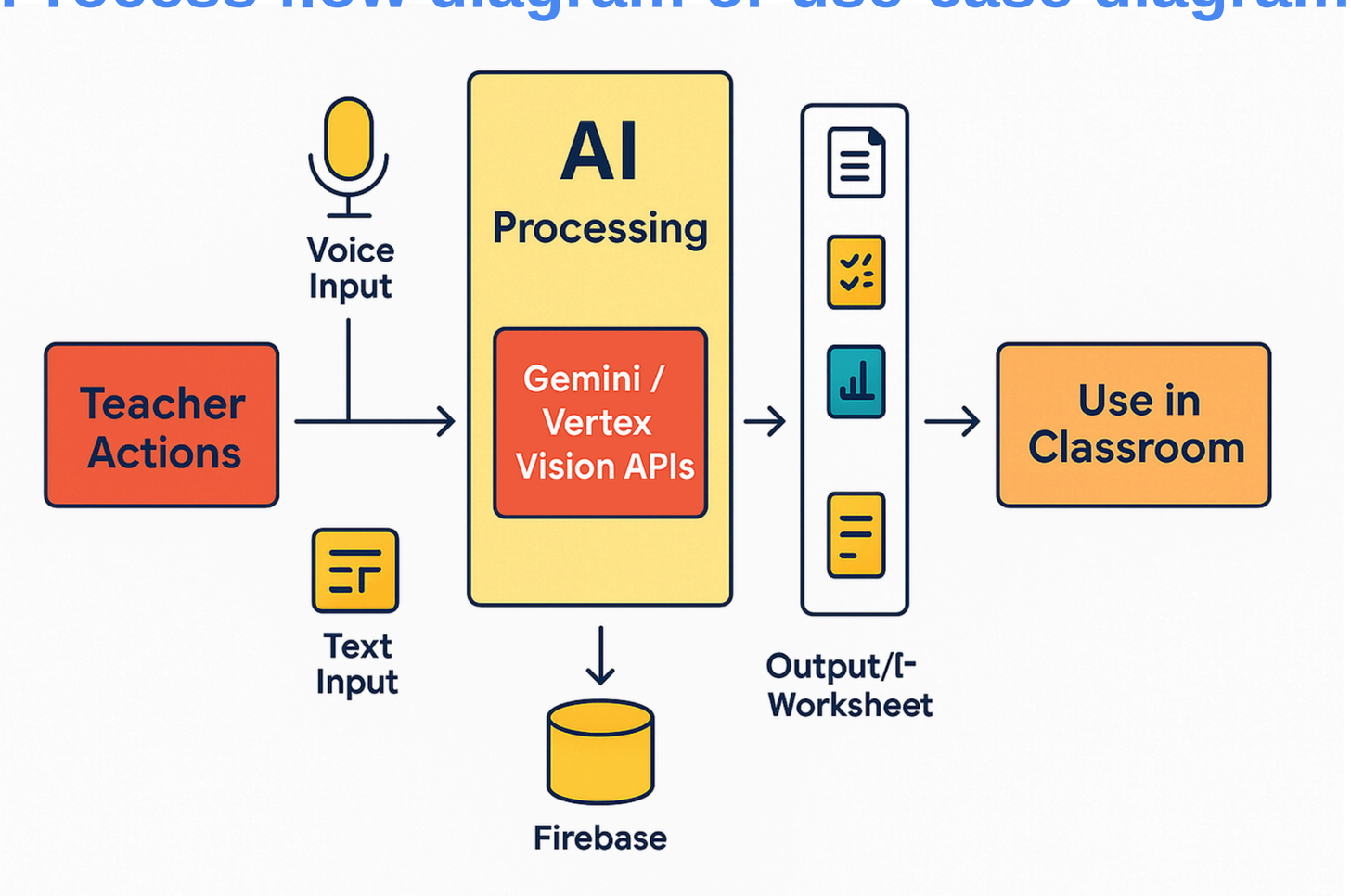
## How Does it Solve the Problem?

1. Reduces teacher workload by automating lesson materials.
2. Makes personalized teaching possible in mixed-grade classes.
3. Supports teachers even with low digital skills or poor internet.
4. Gives audio-based reading feedback, helping identify struggling learners.

# List of features offered by the solution

| Feature | Description | Tech Used |
|---|---|---|
| **Hyper-Local Content Generator** | Creates region-specific stories/examples in local language from a prompt | Gemini Pro |
| **Multigrade Worksheet Generator** | Upload a textbook image → Get worksheets for different grade levels | Gemini Pro Vision |
| **Knowledge Explainer Bot** | Answers complex student questions with analogies in local language | Gemini + Translate API |
| **Visual Aid Creator** | Generates line diagrams and blackboard-friendly visuals from text input | Gemini (text-to-image logic) |
| **Reading Assessment Tool** | Converts student reading audio into transcripts & fluency scores | Vertex AI Speech-to-Text |
| **Lesson Plan Assistant** | Suggests structured weekly plans with activities | Gemini |
| **Educational Game Generator (Optional)** | Creates interactive games based on topics (e.g., quiz, match-the-following) | Gemini |
| **Content Library & Storage** | Stores generated content for reuse, tagging & offline access | Firebase (Firestore + Storage) |
| **User Authentication** | Login/Signup with teacher role-based access | Firebase Auth |

# Process flow diagram or use-case diagram

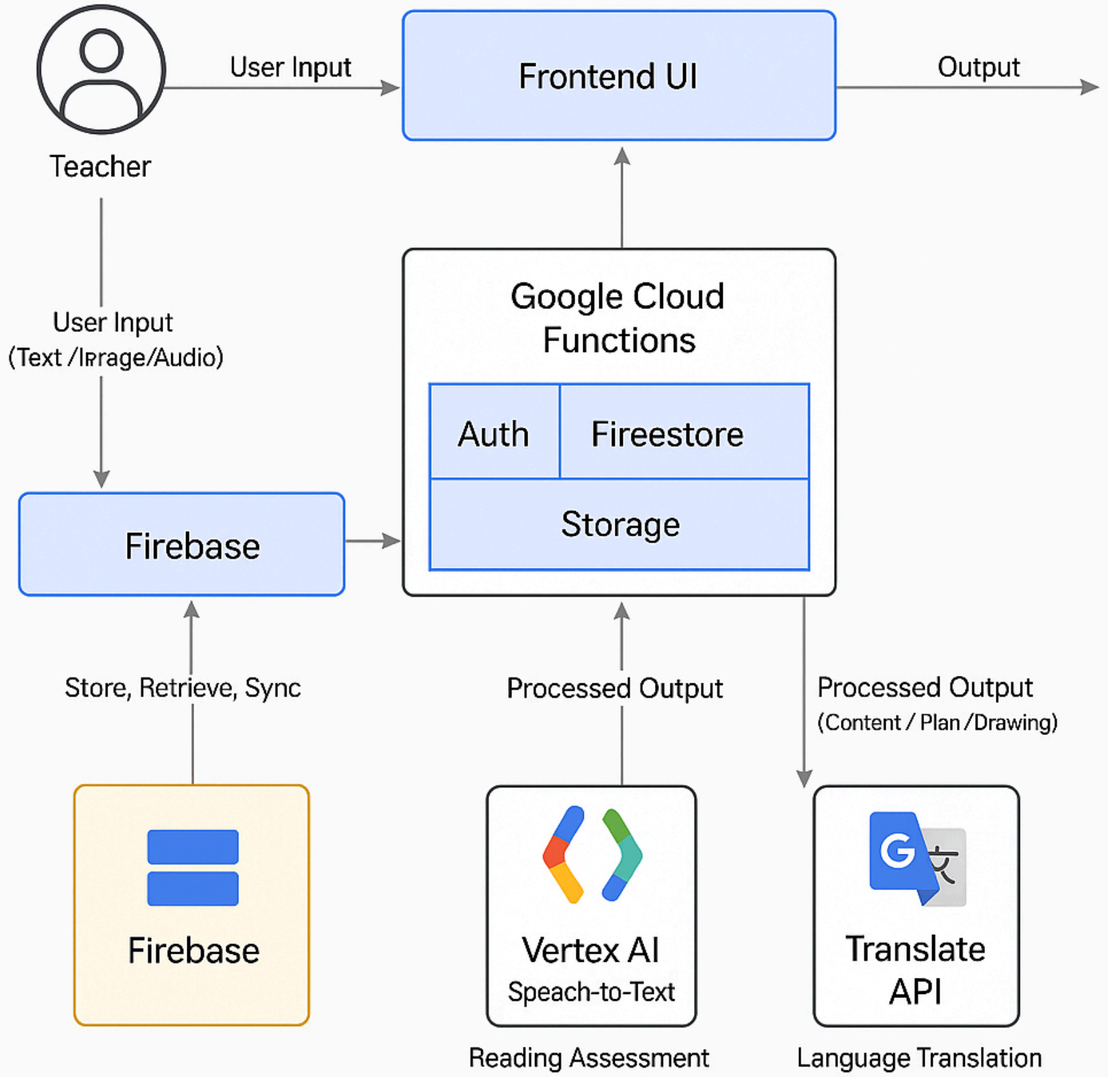



*This flowchart shows how teachers input voice, text, or images, which are processed by **Gemini** and **Vertex APIs**, saved via **Firebase**, and transformed into usable educational content for classrooms.*

# Technologies to be used in the solution

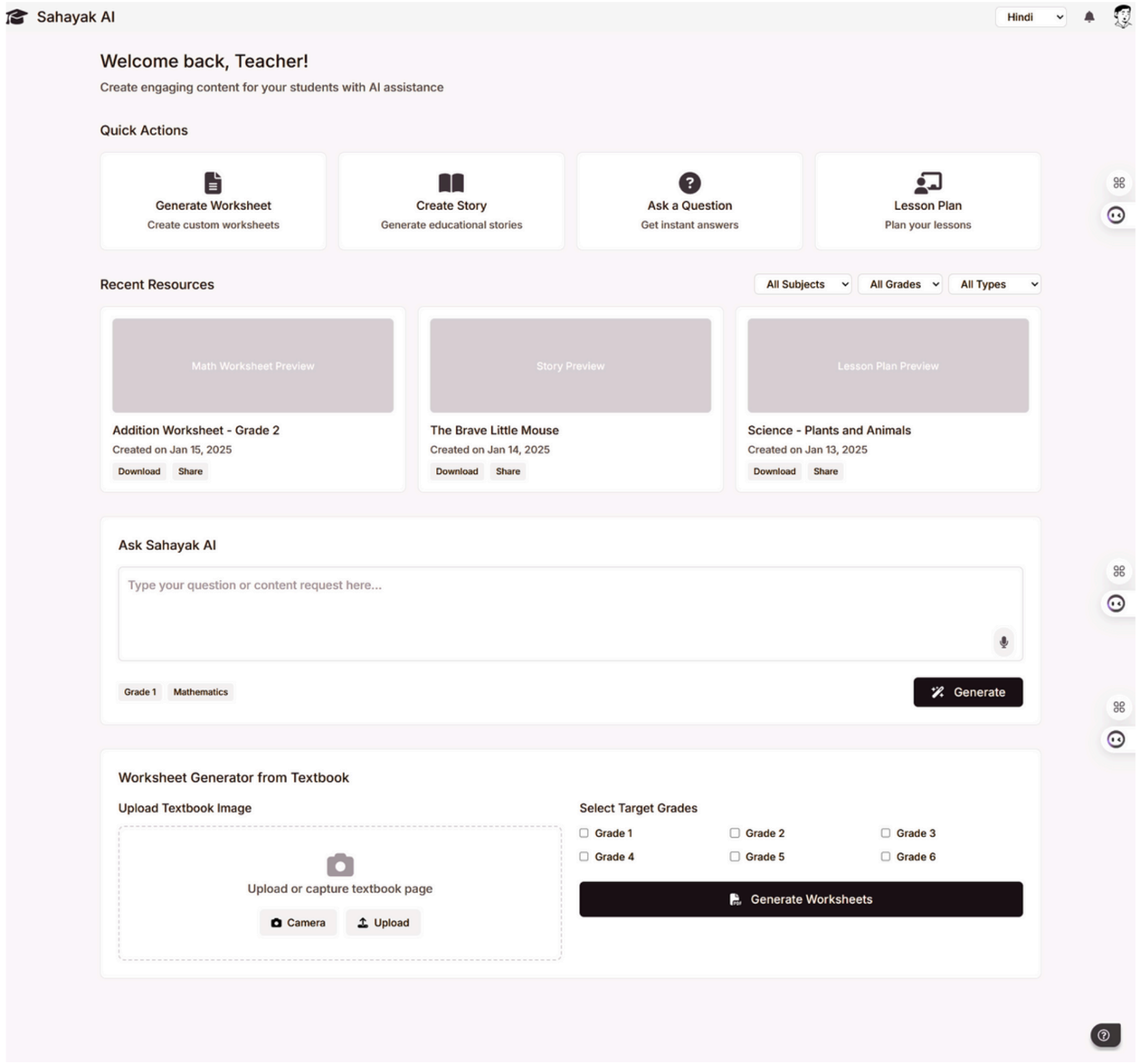
| Module/Component | Technology/Tool Used | Purpose/Functionality |
|---|---|---|
| **Frontend UI** | React / Flutter | User interface for web or mobile |
| **Styling & UI Components** | Tailwind CSS / Material UI | Fast, responsive, accessible design |
| **AI Content Generation** | Gemini Pro (Text) | Generate local stories, explanations, and lesson content |
| **Multimodal Input Processing** | Gemini Pro Vision | Generate differentiated worksheets from textbook images |
| **Reading Assessment** | Vertex AI Speech-to-Text | Convert student speech to text and measure fluency |
| **Language Translation** | Google Translate API | Support for local language prompts and responses |
| **Backend Infrastructure** | Firebase Cloud Functions | Handle API calls and business logic |
| **Realtime Database** | Firebase Firestore | Store user data, resources, and lesson plans |
| **Media Storage** | Firebase Storage | Store uploaded textbook images, PDFs, and audio recordings |
| **User Authentication** | Firebase Auth | Secure login/signup for teachers |
| **Deployment** | Firebase Hosting / Firebase Studio | Host web/mobile app and deploy instantly |

# Architecture diagram of the proposed solution




1. Teacher gives input (text, image, or audio) via Frontend UI.
2. Input is sent to ***Google Cloud Functions*** for processing.
3. Cloud Functions route data to:
    a. ***Gemini API*** → for text/image content generation.
    b. ***Vertex AI Speech-to-Text*** → for reading assessment.
    c. ***Google Translate API*** → for language translation.
4. ***Firebase*** handles:
    a. ***Auth*** → secure login.
    b. ***Firestore*** → store content & user data.
    c. ***Storage*** → save images, PDFs, audio.
5. Processed output is sent back to Frontend UI.
6. ***Firebase*** syncs all data for real-time classroom use.

# Mock diagram of the proposed solution




## Sahayak AI – Dashboard Overview

1. Welcome message for the teacher.
2. Quick Action Buttons: Generate Worksheet, Create Story, Ask Question, Plan Lesson.
3. Recent Resources: View, download, and share past content.
4. Ask Sahayak AI: Type or speak queries in local language.
5. Worksheet Generator: Upload textbook image → select grades → auto-generate worksheets.
6. Language switcher & profile icon on top-right.

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## Thank you!