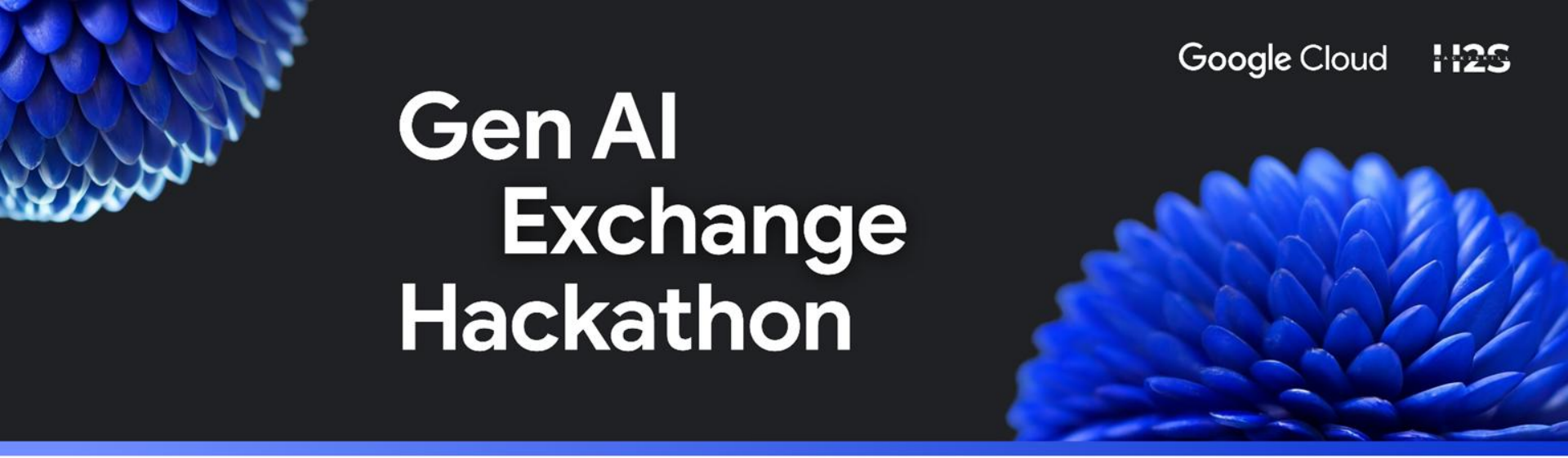


Team Name : **GenAI_Adventurer**

Team Leader Name : Yasmeen Begum

Problem Statement : **Personalized Career and Skills Advisor**

Brief about the prototype

Layer	Component	Purpose
Frontend	Web App (Cloud Run)	Student interface for profile input, career exploration, and skill recommendations
Orchestrator Agent	Vertex AI Agent Engine	Coordinates multi-agent workflows, manages session state, and delegates tasks
Specialized Agents	Planner, Profiler, Recommender (Cloud Run + ADK + A2A)	Handle skill mapping, career path planning, and personalized recommendations
LLM Backbone	Gemini 2.0 Flash (Vertex AI)	Powers reasoning, instruction following, and tool use across agents
Database	Spanner (Graph Mode)	Stores user profiles, career paths, skill graphs, and agent interactions
Tool Server	MCP Server (Cloud Run)	Exposes APIs for external data sources (job market, certifications, etc.
DevOps	Cloud Build + Artifact Registry	CI/CD for agent containers and web app
Storage	Cloud Storage	Stores build artifacts, logs, and optionally annotated reports
Debugging	A2A Inspector	Live testing and inspection of agent interactions during development

List of features offered by the solution

Opportunity should be able to explain the following:

How different is it from any of the other existing solutions?

- Agentic Intelligence: Unlike static career portals or rule-based advisors, this system uses multi-agent orchestration powered by Gemini models to dynamically reason, adapt, and personalize guidance.
- Graph-Based Profiling: It models student traits, skills, and career paths as a graph in Spanner, enabling nuanced recommendations based on relationships and trends.
- Real-Time Adaptability: Through MCP integration, it pulls live data from job markets and learning platforms, ensuring advice stays relevant to evolving roles.
- Tool-Using Agents: Agents don't just suggest—they act. They query APIs, analyze gaps, and even recommend certifications with actionable links

How will it be able to solve the problem?

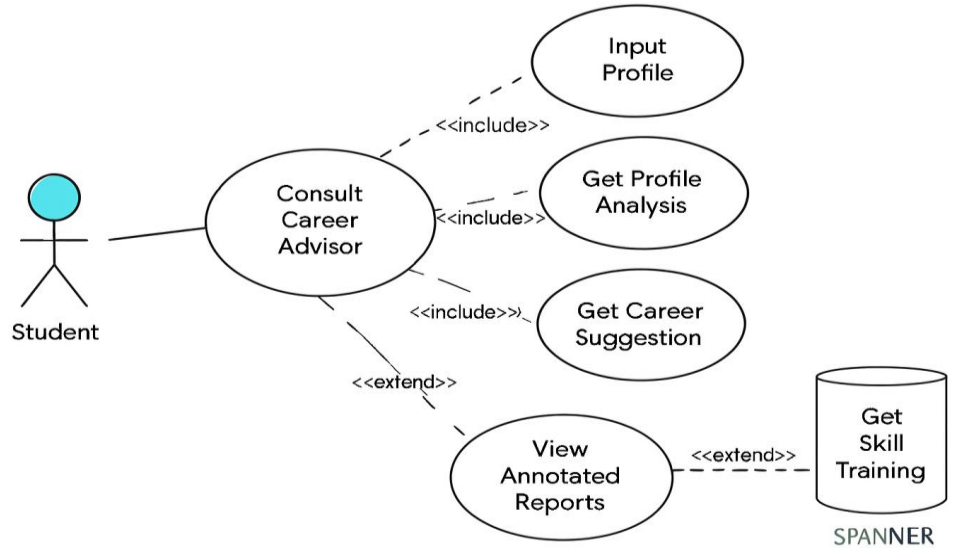
- Personalization at Scale: Each student gets a unique roadmap based on their interests, aptitude, and goals
- Skill Gap Bridging: The system identifies missing skills and suggests targeted learning paths, making students job-ready.

USP of the proposed solution

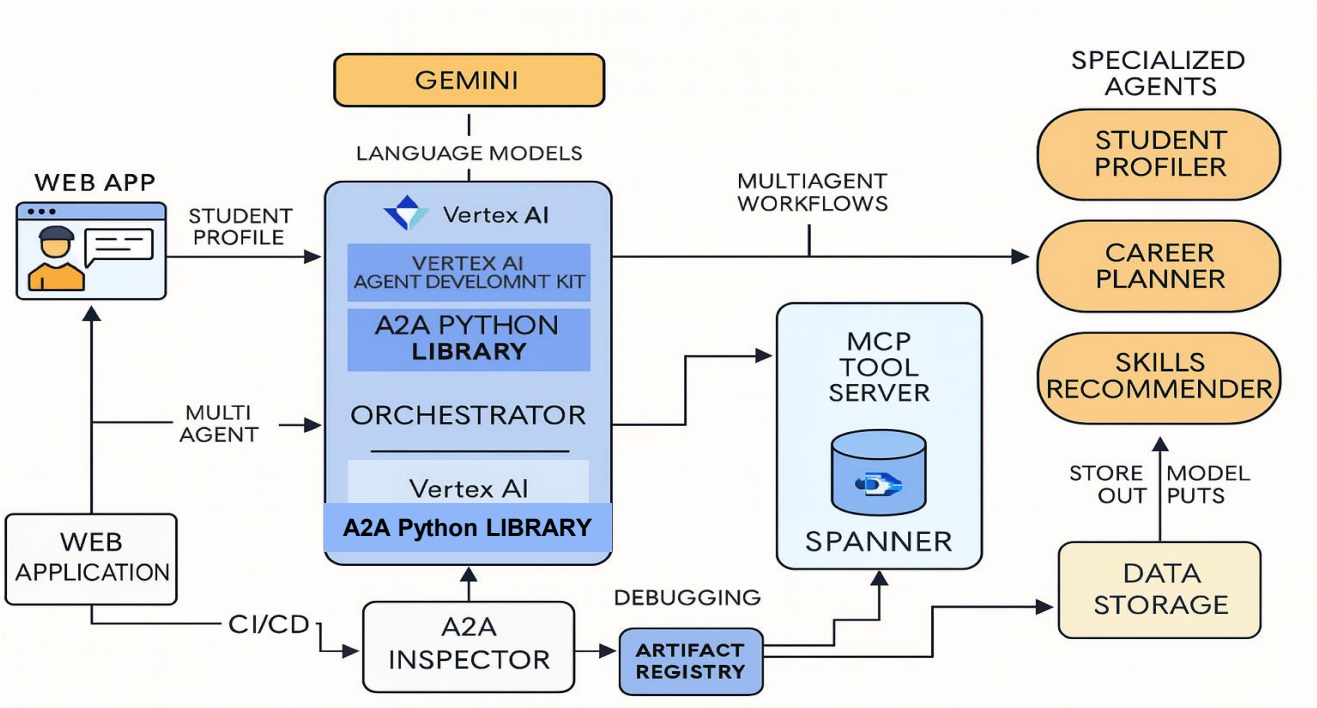
- Modular, Scalable, and Cloud-Native: Built on GCP using Vertex AI, Cloud Run, and Spanner for seamless deployment and expansion.
- Conversational & Actionable: Students interact naturally, and agents respond with reasoning.

Process flow diagram or Use-case diagram

Add a flow diagram or a use case diagram or an architecture diagram.



Architecture diagram of the proposed solution



Technologies to be used in the solution:

-AI & Agent Frameworks
Vertex AI (Gemini 2.0 Flash): For reasoning, instruction following, and tool use by agents
Agent Development Kit (ADK): To define agent logic, memory, and workflows
A2A Python Library: Enables agent-to-agent communication and task delegation
Model Context Protocol (MCP): Connects agents to external APIs and tools

- Backend & Microservices
Cloud Run: Hosts containerized agents (Profiler, Planner, Recommender) and the web app
MCP Tool Server: Exposes APIs for job market data, certification platforms, etc.
Spanner (Graph Mode): Stores student profiles, skill graphs, and career relationships

- DevOps & Infrastructure
Cloud Build: Automates Docker builds for agents and app
Artifact Registry: Stores and secures container images
Cloud Storage: For logs, annotated reports, and build artifacts

- Debugging & Testing
A2A Inspector: Live testing, agent card validation, and JSON-RPC inspection

-Frontend
React or Next.js (optional): For building the student-facing web interface
Material UI / Tailwind CSS: For clean, responsive design

-External Integrations
Job Market APIs (e.g., Lightcast, LinkedIn, Naukri)
Learning Platforms (e.g., Coursera, Google Career Certificates, SkillBoost)

Estimated implementation cost (optional):

Component	Service	Estimated Cost
LLM Inference	Vertex AI (Gemini 2.0 Flash)	~$50–$150
Agent Hosting	Cloud Run (3–5 agents	~$30–$100
Orchestrator Agent	Vertex AI Agent Engine	~$50–$100
Database	Spanner (Graph Mode)	~$100–$200
Tool Server	Cloud Run (MCP Server)	~$20–$50
Storage	Cloud Storage	~$10
CI/CD	Cloud Build + Artifact Registry	~$10–$30
Debugging	A2A Inspector	Free (open-source tool)

Total Estimate: $270–$640

Google Cloud H2S

Gen AI Exchange Hackathon

Thank you