

# AI/GenAI Use Case Generation System – Multi-Agent Architecture

## Objective

This project implements a multi-agent system that performs:

- Industry research
- Strategic insight extraction
- Use case generation
- Dataset mapping

All tailored for a given company/industry using Generative AI (Gemini Pro).

## System Architecture

Flow of agents:

1. User inputs company and industry.
2. **Research Agent** identifies the company's strategic focus.
3. **Use Case Agent** suggests GenAI/ML use cases.
4. **Resource Agent** finds dataset resources from Kaggle, HuggingFace, GitHub.
5. Results are saved in a markdown file.

### Architecture Diagram

Step	Agent/Process	Description
1. User Input	-	Company, Industry
2. Research Agent	Gemini API	Gets strategy info
3. Use Case Agent	-	Identifies AI/GenAI use cases
4. Resource Agent	Kaggle / HF / GitHub	Searches dataset links
5. Export	-	Save to Markdown, Show in UI

## Agents & Responsibilities

### Research Agent

- Uses Gemini API to understand market trends, strategic goals, and industry focus.

### Use Case Agent

- Based on research, it generates company-relevant AI/ML use cases.
- Focus: customer experience, operational efficiency, automation, etc.

### Resource Agent

- Suggests dataset links or search queries for each use case.
- Uses Google search with Kaggle, HuggingFace, and GitHub constraints.

## Sample Input

- **Company:** Nike
- **Industry:** Retail

# Sample Use Cases Generated

- AI Inventory Forecasting**  
Automate and optimize stock prediction using time-series ML models.
- Virtual Fashion Assistant (GenAI)**  
Suggest fashion items using conversational AI trained on product catalogs.
- Customer Support Chatbot**  
NLP model trained on historical chat logs for 24/7 customer service.
- GenAI for Product Descriptions**  
Automate product listing creation using LLMs.
- AI-powered Visual Search**  
Upload image → get similar Nike products using computer vision.

# Dataset Resources

Example searches:

- [Search Kaggle for Inventory Forecasting](#)
- [Search HuggingFace for Chatbot Datasets](#)
- [Search GitHub for Visual Search Models](#)

# Deliverables

Component	Status
Multi-Agent Logic	Done
Markdown Output	Done
Architecture Flow	Done
Gemini Integration	Done
Dataset Suggestions	Done
UI (Streamlit App)	Done
Report	Done

# Future Work

- Add real-time search scraping APIs (Tavily, Serper)
- Connect to live Kaggle API for auto-retrieval
- Export to PDF or Notion
- Integrate with RAG pipelines (LangChain or LlamaIndex)

# References

- [Google Gemini API Docs](#)
- [Kaggle Datasets](#)
- [DeepLearning.ai – Multi-Agent Systems](#)
- [McKinsey Report: AI in Retail](#)