**Market Research & AI Use Case Generation System**

**Objective**

To design and implement a Multi-Agent System that:

* Conducts deep market research on a given Company/Industry.
* Identifies AI/ML/GenAI use cases tailored to the company's goals.
* Collects relevant resource assets (datasets, projects) for practical AI solution building.
* Focuses on enhancing operations, supply chain, internal processes, and customer experience**.**

**Methodology**

**Agents Design:**

* **Research Agent:**
  + Queries Gemini to understand company background, industry, products, and strategy.
* **Use Case Generation Agent:**
  + Based on research, generates 5-7 actionable AI/GenAI/ML use cases.
* **Resource Asset Collection Agent:**
  + Collects relevant public datasets from Kaggle, GitHub, Hugging Face.
* Bonus GenAI Solutions Agent:
  + Suggests advanced GenAI solutions for internal automation and customer-facing features.

**LLM Model:**

* All agents use Google Gemini Pro for LLM-powered reasoning.
* Here I used Gemini models as it is free to use.

**Interface:**

* Streamlit based web app for easy input, visualization, and download.

**Results:**

**1. Comprehensive Market Research**

The system successfully conducted market research using the Google Gemini model and online resources (web scraping) to understand the industry and specific company operations. The research included:

* Industry Overview: It explored key segments like Automotive, Healthcare, Retail, etc., based on the company’s focus area.
* Company-Specific Insights: Identified key offerings and strategic focus areas (operations, supply chain, customer experience, etc.).
* Industry Trends: This analysis included leveraging resources from McKinsey, Deloitte, Nexocode, and other relevant AI industry reports.

**2. Generation of Relevant Use Cases**

Based on the research findings, the system generated 5-7 relevant AI/GenAI use cases for the company. These were designed to:

* Address specific pain points in the company's operations.
* Enhance customer experience through automation, predictive models, and AI-driven decision-making.

For example, for Tesla, use cases included:

1. Predictive Maintenance for vehicle IoT sensors (improving operational efficiency).
2. AI-powered Customer Support Chatbots for better service response times.
3. Autonomous Supply Chain Optimization using ML for parts logistics.
4. AI-powered Document Intelligence systems for processing vehicle documents.
5. Generative AI in Design Prototyping for faster innovation cycles.
6. Energy Optimization in Gigafactories to save costs and improve sustainability.

**3. Collected Resource Assets**

The Resource Asset Collection Agent successfully fetched datasets and relevant resources for each generated use case. These included:

* Datasets from Kaggle, GitHub, HuggingFace, and UCI (e.g., predictive maintenance data, manufacturing process datasets).
* Code repositories and frameworks to aid implementation (e.g., for vehicle service chatbots, supply chain optimization, and document processing).

These assets were linked as clickable resources for easy access:

* Predictive Maintenance Dataset on Kaggle
* [GitHub Project for Vehicle Service Chatbot](https://github.com/vehicle-service-chatbot)
* [UCI Manufacturing Process Data](https://archive.ics.uci.edu/ml/datasets/SECOM)

**4. Bonus AI Solutions**

The Bonus GenAI Solutions Agent proposed additional AI solutions for internal operations and customer-facing features, such as:

* Internal: Document search engines, automated report generation.
* Customer-facing: AI-driven chatbots for personalized interactions, voice-controlled assistants in vehicles**.**

**5. Proposal Summary and Feasibility**

The final proposal compiled all use cases, resources, and insights into a well-structured document:

* Top Use Cases: Tailored to the company’s goals and operations.
* Actionable Insights: Provided clear suggestions for leveraging GenAI, LLMs, and ML technologies.
* Data Sets and Resources: Linked to platforms like Kaggle, GitHub, and HuggingFace.

**Conclusions:**

* This multi-agent system offers a complete end-to-end solution for companies looking to adopt AI/GenAI solutions efficiently.
* By aligning AI solutions to specific operational needs and offering practical datasets, it allows a company to accelerate digital transformation meaningfully.

**Architecture Flow Chart**

User Input (Company Name)

Research Agent

Use Case Generation Agent

Resource Asset Collection Agent

Bonus GenAI Solutions Agent

Streamlit App (Outputs + Downloadable Final Report)