**Market Research & Use Case Generation Agent**

Your goal is to design a Multi-Agent architecture system that generates relevant AI and Generative AI (GenAI) use cases for a given Company or Industry. The system will conduct market research, understand the industry and product, and provide resource assets for AI/ML solutions, focusing on enhancing operations and customer experiences.

**The Multi-agent architecture must have the following agents:**

* **Research the Industry or the Company**
  + Use a Web browser tool and understand the industry and segment the company is working in (e.g., Automotive, Manufacturing, Finance, Retail, Healthcare, etc.).
  + Identify the company’s key offerings and strategic focus areas (e.g., operations, supply chain, customer experience, etc.). A vision and product information on the industry should be fine as well.
* **Market Standards & Use Case Generation**
  + Based on the industry conducted, analyze industry trends and standards within the company’s sector related to AI, ML, and automation.
  + Propose relevant use cases where the company can leverage GenAI, LLMs, and ML technologies to improve their processes, enhance customer satisfaction, and boost operational efficiency.
* **Resource Asset Collection**
  + Collect the above use cases generated and search for relevant datasets on platforms like Kaggle, HuggingFace, and GitHub.
  + Save the resource links fetched in a text or markdown file.
  + [OPTIONAL: BONUS] If applicable, propose GenAI solutions like document search, automated report generation, and AI-powered chat systems for internal or customer-facing purposes.

**Final Proposal**

* List down the top use cases that can be delivered to the customer, ensuring they are relevant to the company’s goals and operational needs.
  + Ensure to add references through which certain use cases were suggested
  + Resource Asset links should be clickable.

**Additional Resources:**

* You may recommend the agents to refer to reports and insights on AI and digital transformation from industry-specific sources such as McKinsey, Deloitte, or Nexocode.
* Search for industry-specific use cases (e.g., “how is the retail industry leveraging AI and ML” or “AI applications in automotive manufacturing”).

**Deliverables**

* **Source code:** Submit the source code of your Multi-Agentic workflow, along with any necessary scripts, configuration files, and documentation.
* **Report:** Write a report that explains your methodology, results, and conclusions. Include anything that helps illustrate your findings. **Architecture flowchart of your implementation is MUST.**
* **Demo Video**: A video showcasing the architecture flowchart and the output generated. Bonus: Deploy the application on Streamlit or Gradio or any other relevant tools.

**Assignment Evaluation Criteria:**

* Your agent will be evaluated based on the following parameters:
  + Depth of market research and competitor analysis.
  + Relevance and creativity of use cases generated for the customer.
  + Feasibility and practicality of implementing the proposed solutions.
  + Quality and clarity of the final proposal, including actionable insights.

**Suggested Tools & Frameworks**

* Agent Frameworks: Use OpenAGI, BeyondLLM, LangChain, LLamaIndex, Autogen, or CrewAI for building AI agents. You can check DeepLearning AI short courses for quick tutorials or RAG & Agents Bootcamp.
* Search & Retrieval:
  + Leverage Tavily or Exa or Serper for advanced web search
* Dataset Sources: Find relevant datasets on Kaggle, HuggingFace, or GitHub etc.

Feel free to use any other tools you're comfortable with.

**Learning Resources**

* Deep learning Short sources:
  + <https://www.deeplearning.ai/short-courses/multi-ai-agent-systems-with-crewai/>
  + <https://www.deeplearning.ai/short-courses/ai-agents-in-langgraph/>
* RAG Agents Bootcamp: <https://aiplanet.com/courses/rag-agents-bootcamp>
* AutoGen Documentation detailed docs: <https://microsoft.github.io/autogen/docs/Getting-Started/>

**Sample Output Reports:**

* [Market research](https://docs.google.com/spreadsheets/d/1U89-gXytQ4AtkWJ2pA-kMUX0AT4gNpZr87nAD9XKxwM/edit?usp=sharing)  (only selected links are added); the competitors' list and their annual reports could be fetched (even here, we added selected links); this allows one to tell what industry leaders are doing wrt AI adoption
* [Use Case Proposal](https://docs.google.com/document/d/1bF_9oL1j48GprEI0rX-dxdS3F91bPh43IXiJ-PA77uE/edit?usp=sharing)
* [Feasibility check for datasets and building use cases](https://docs.google.com/spreadsheets/d/1U89-gXytQ4AtkWJ2pA-kMUX0AT4gNpZr87nAD9XKxwM/edit?usp=sharing)