

High-Level Design:

The system is structured into three core **functional agents** and a final **report generation** module. Each agent performs a specific role in generating actionable insights and relevant datasets for AI/ML use cases.

Core Components:

1. Industry Research Agent:

- Gathers industry-specific data using the Serper API.
- Forms the basis for generating AI/ML use cases.

2. Use Case Generation Agent:

- Uses OpenAI's GPT models to generate AI/ML use cases tailored to the industry.
- Focuses on Generative AI solutions, such as document search, automated reporting, and chat systems.

3. Dataset Search Agent:

- Searches for datasets on platforms like GitHub, Kaggle, and Hugging Face based on the generated use cases.
- Uses the Serper API for efficient dataset discovery.

4. Markdown Report Generator:

- Compiles industry insights, use cases, and datasets into a structured markdown file for easy sharing and implementation.

Low-Level Design:

1. Industry Research Agent:

- **Input:** A string representing the target industry or company.
- **Process:**
 - Query the Serper API with "industry overview" as the context.
 - Parse the API response to extract titles, links, and snippets.
- **Output:** A list of industry insights

2. Use Case Generation Agent:

- **Input:** Industry insights (list of dictionaries).
- **Process:**
 - Combine insights into a formatted prompt.
 - Use OpenAI's GPT-4 to generate use cases tailored to the industry.
 - Include predefined suggestions (e.g., document search, chat systems).
- **Output:** A list of use cases

3. Dataset Search Agent:

- **Input:** Use cases (list of dictionaries).
- **Process:**
 - For each use case, query the Serper API with dataset-specific queries (e.g., "dataset for AI-powered customer feedback analysis").
 - Collect datasets from GitHub, Kaggle, and Hugging Face.
- **Output:** A list mapping use cases to relevant datasets

4. Markdown Report Generator:

- **Input:** Industry insights, use cases, and datasets.
- **Process:**
 - Format the data into markdown sections (#, ##, - for bullets).
 - Save the report as a .md file with a timestamped filename.
- **Output:** A markdown file containing:
 - Industry research insights.
 - AI/ML use cases.
 - Relevant datasets

Input Flow:

1. **Input:** User specifies an industry or company.
2. **Industry Research:** Fetch insights to form the basis of Generative AI solutions.
3. **Use Case Generation:** GPT-4 creates innovative solutions.
4. **Dataset Search:** Queries datasets for implementation.
5. **Report Compilation:** Outputs a well-structured markdown document.

This modular approach ensures scalability, reusability, and ease of integration.