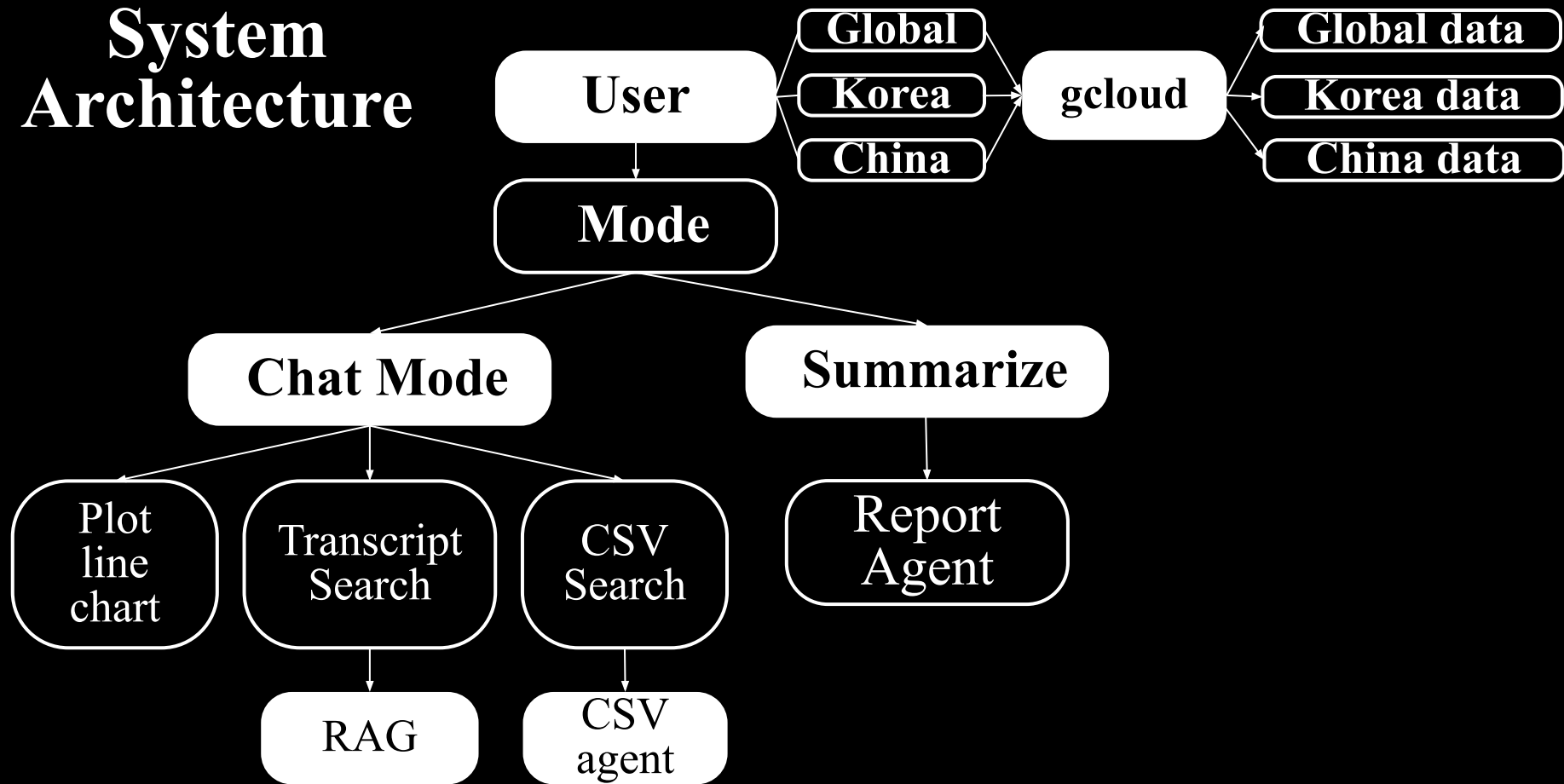# 木工小隊

Agenda

- **Features**
- **System Architecture**
  - **User Role**
  - **Plot line chart**
  - **RAG**
  - **CSV agent**
  - **Report agent**
- **Data Summarization**
  - **Generate summary report**
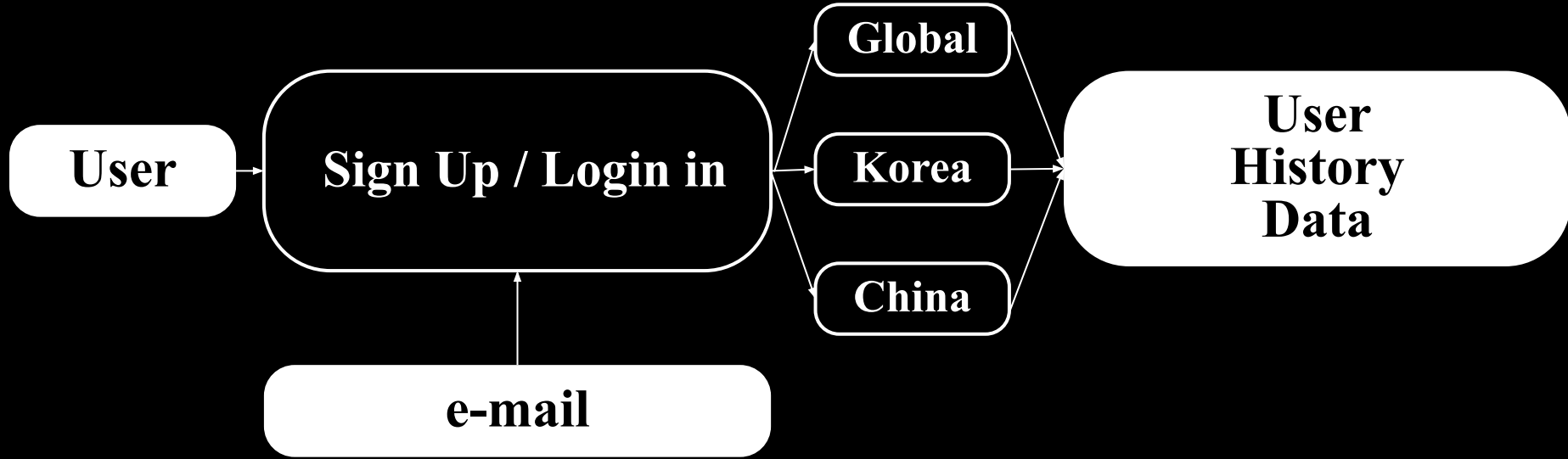- **User Experience & UI friendliness**

Features

- **Auto financial data analysis report generator**
- **Data visualization**
- **Information Retrieval from csv data and transcript**
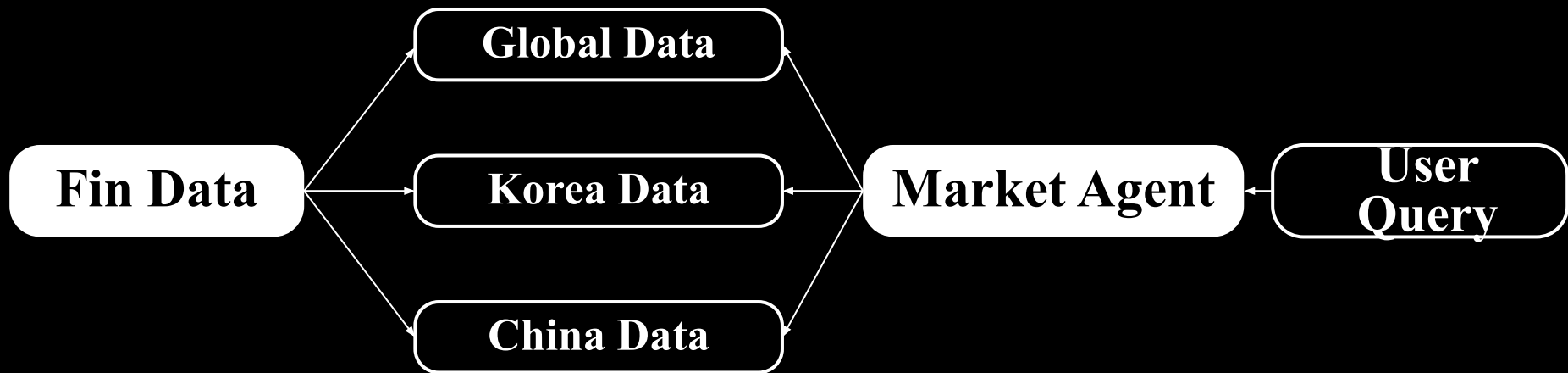
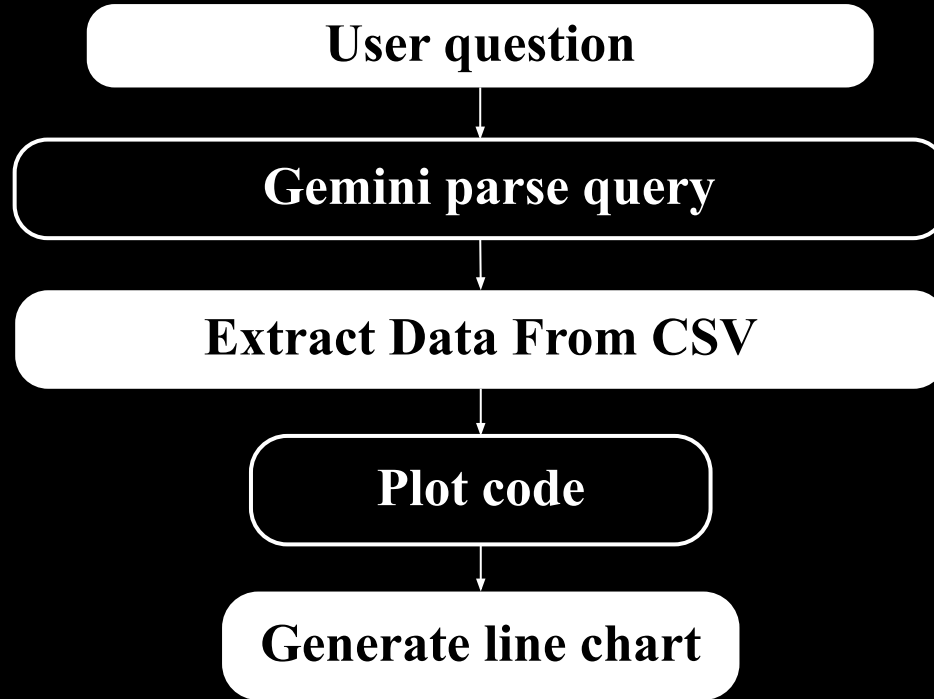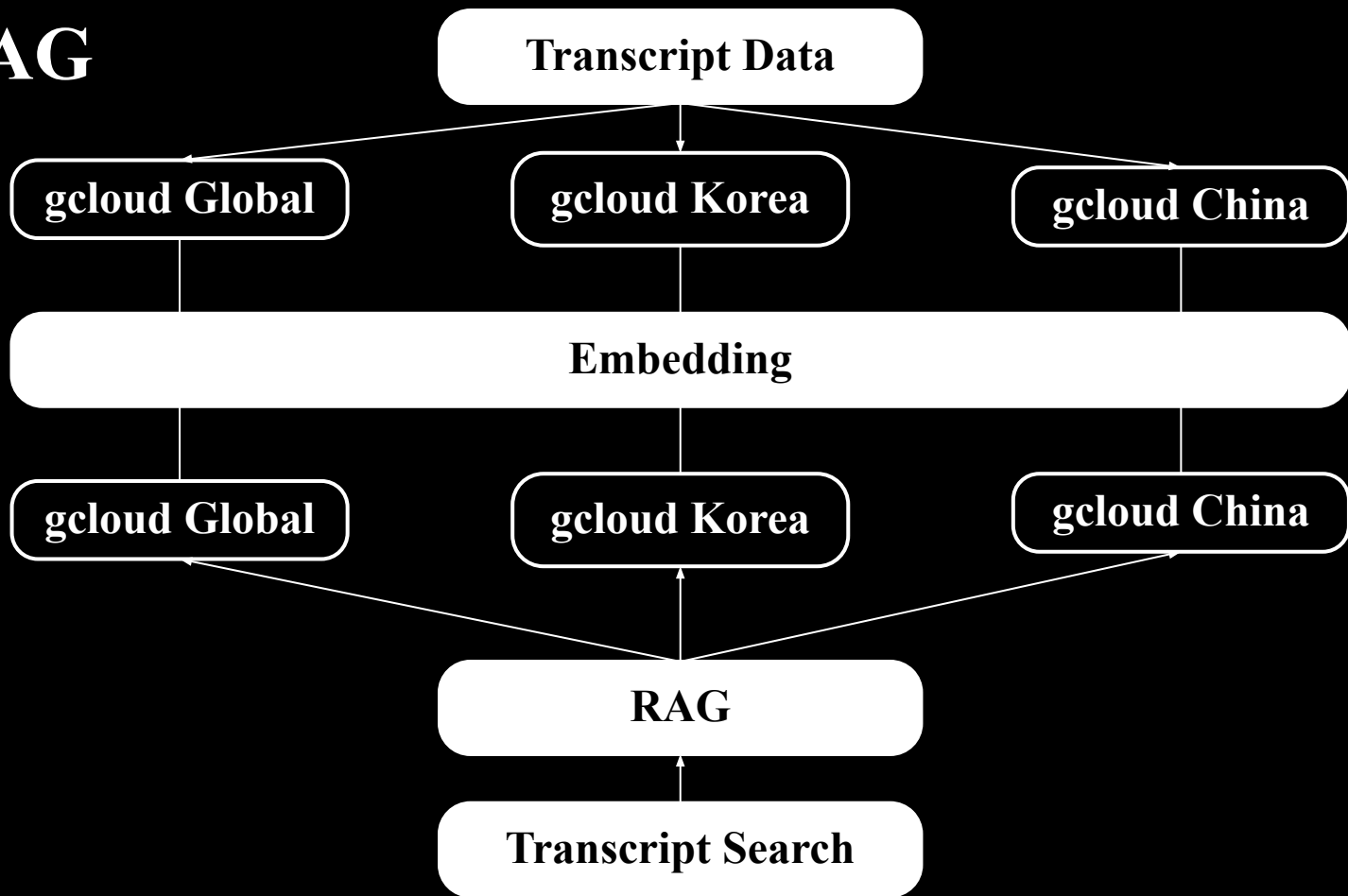# System Architecture

Create User

Data Authentication

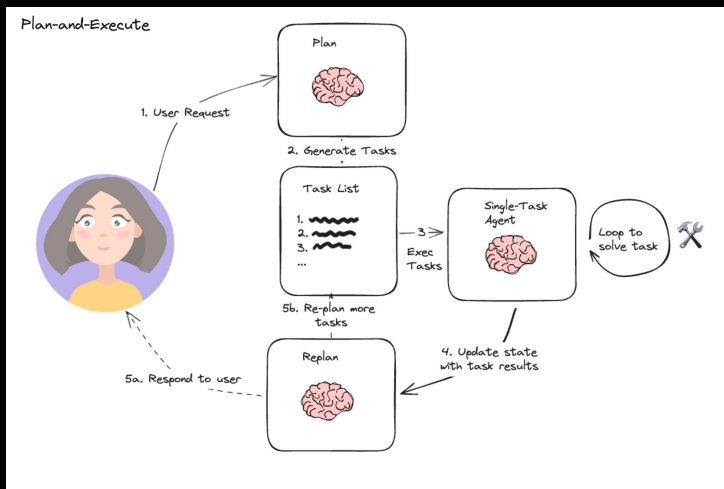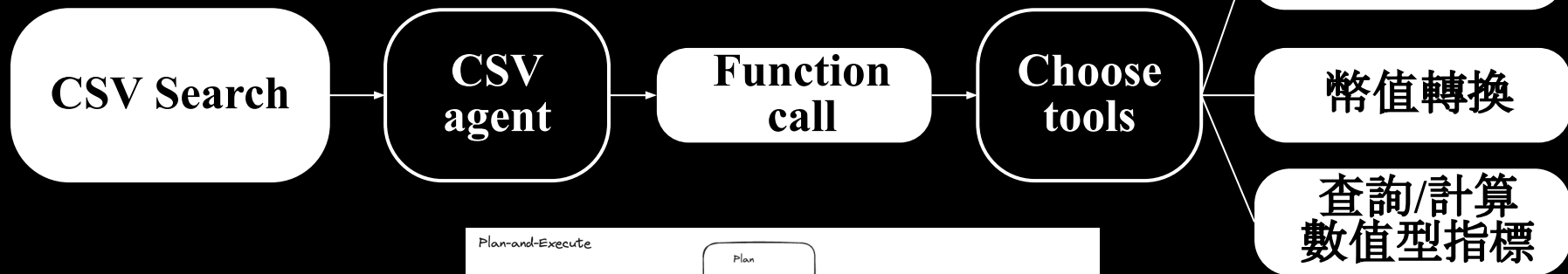
- 當 User 提問, 系統根據 User Role 提供對應的資料

Plot line chart

User question

↓

Gemini parse query

↓

Extract Data From CSV

↓

Plot code

↓

Generate line chart

RAG

```
                    ┌──────────────────┐
                    │  Transcript Data │
                    └──────────────────┘
        ┌──────────────┐  ┌──────────────┐  ┌──────────────┐
        │ gcloud Global│  │ gcloud Korea │  │ gcloud China │
        └──────────────┘  └──────────────┘  └──────────────┘
        ┌──────────────────────────────────────────────────┐
        │                    Embedding                       │
        └──────────────────────────────────────────────────┘
        ┌──────────────┐  ┌──────────────┐  ┌──────────────┐
        │ gcloud Global│  │ gcloud Korea │  │ gcloud China │
        └──────────────┘  └──────────────┘  └──────────────┘
                          ┌──────────────┐
                          │     RAG      │
                          └──────────────┘
                          ┌────────────────┐
                          │Transcript Search│
                          └────────────────┘
```

CSV agent

```
CSV Search → CSV agent → Function call → Choose tools → 歷年財年轉換
                                                       → 幣值轉換
                                                       → 查詢/計算數值型指標
```


Plan-and-Execute

1. User Request
2. Generate Tasks
   Task List
   1. ~~~~
   2. ~~~~
   3. ~~~~
   ...
3. Exec Tasks
   Single-Task Agent
   Loop to solve task
4. Update state with task results
5a. Respond to user
5b. Re-plan more tasks
   Replan
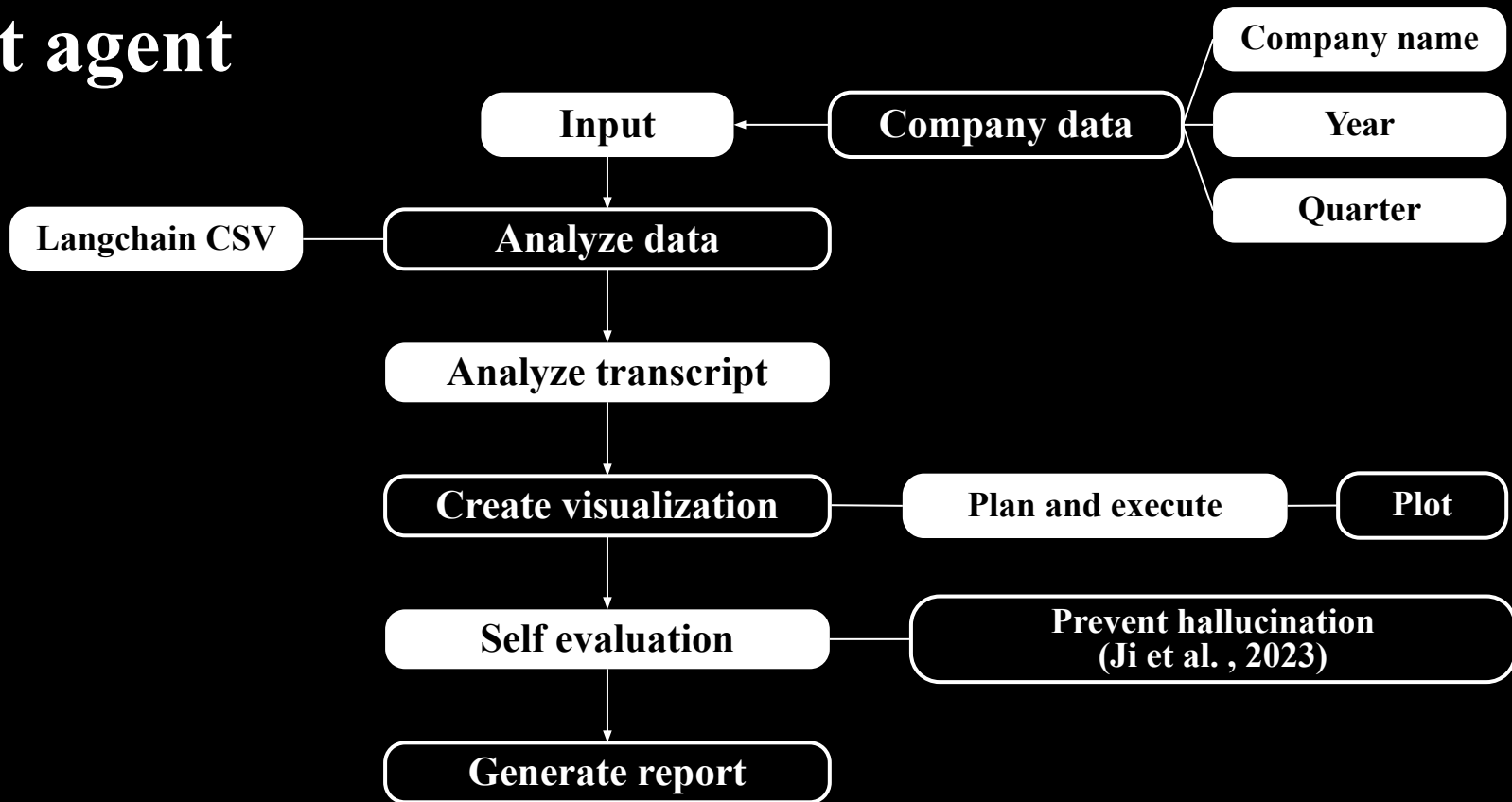
Report agent

Data Summarization: Summary Report

- Financial Performance: Revenue, EPS, Cost structure & financial ratios analyzed
- Market Trends & Risks
- Forward Outlook
- Sustainability & governance initiatives noted

Data Summarization: Summary Report

Prompt: "You are a financial analyst with expertise in corporate earnings reports, market trends, and financial data interpretation. Your task is to analyze the following transcript and extract key insights to assist in generating a high-quality financial report.

Please analyze the following transcript and provide:
1. Company Overview
   - Company name if mentioned
   - Industry sector if mentioned
   - Stock ticker symbol if mentioned
   - Target stock price if provided
   - Latest market price if provided
   - Buy/Hold/Sell recommendation if available

2. Financial Performance
   - Latest revenue figure and YoY/QoQ comparison if available
   - Latest EPS figure and trends if mentioned
   - Gross margin or other profitability metrics if available…"

Data Summarization: Summary Report

Apple Inc. Q2 2022 Performance Analysis Report

Executive Summary

This report provides a comprehensive analysis of Apple Inc.'s financial performance in Q2 2022, leveraging both quantitative data analysis and qualitative insights extracted from the company's earnings call transcript.

Apple reported strong revenue growth in Q2 2022, driven by robust demand for iPhones, Macs, and services. Despite facing macroeconomic headwinds, including supply chain constraints and inflationary pressures, the company demonstrated resilience and delivered record-breaking EPS. The report highlights key data points, critical insights from the earnings call, and concludes with strategic recommendations for Apple moving forward.

Key Findings from Data Analysis

- **Positive Revenue Trend:** Apple's revenue has demonstrated consistent growth between 2020 and Q2 2022. Visualization_0.png likely illustrates this positive trend, providing a clear visual representation of Apple's financial progress.
- **Cost Structure Insights:** The "Cost Structure per Quarter" bar chart (visualization_1.png) provides valuable insights into the proportion of different cost components (e.g., Cost of Goods Sold, Operating Expenses) relative to revenue each quarter. Analyzing this visualization will reveal trends in cost management and profitability.
- **Financial Health Metrics:** Visualization_2.png, the "Financial Ratios Table," likely presents key financial ratios such as profitability margins, liquidity ratios, and efficiency ratios. This table enables a comprehensive assessment of Apple's overall financial health and performance.
- **Growth Rate Comparison:** Visualization_3.png, displaying "Revenue and Operating Income Growth Rate," provides a comparative view of growth trends over time. This allows for analysis of growth drivers and potential areas of concern.
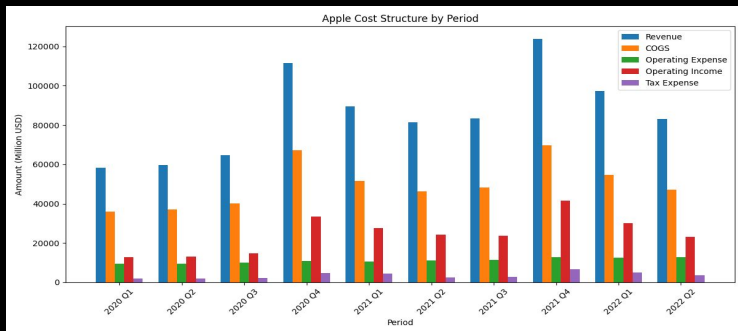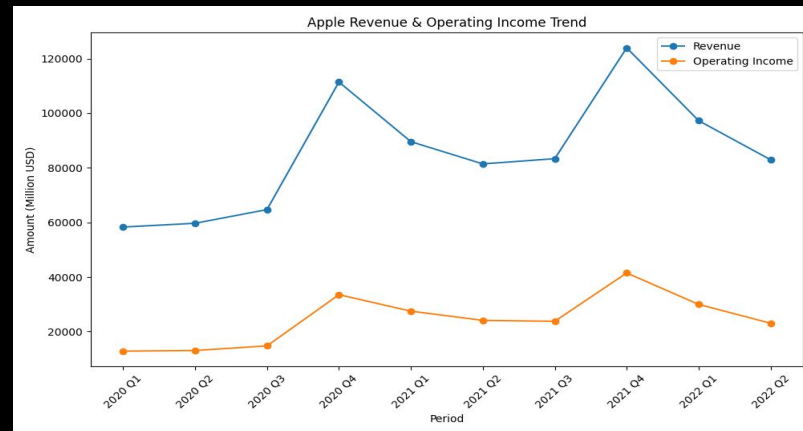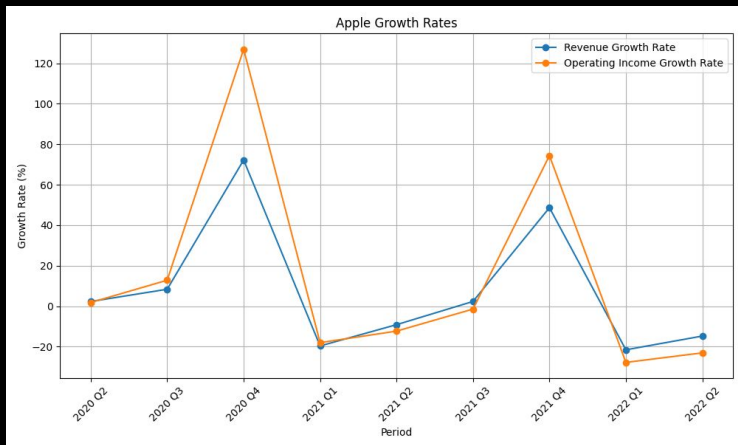
Highlights from Transcript Analysis

- **Strong Q2 2022 Results:** Apple achieved record revenue of $97.3 billion, representing a 9% YoY increase. Notably, iPhone revenue grew 5% YoY, reaching $50.6 billion. Services revenue also hit an all-time high of $19.8 billion, up 17% YoY.
- **Market Dynamics:** While iPhone 13 demand remains strong, Apple faces challenges in the wearables market and anticipates significant opportunities in the enterprise sector.
- **Macroeconomic Headwinds:** Supply chain disruptions, inflationary pressure, and geopolitical uncertainties (specifically the war in Ukraine) pose ongoing challenges to Apple's operations.
- **Future Outlook:** Apple expects continued services growth, albeit at a slower pace, and anticipates supply constraints to impact revenue by $4-8 billion in the June quarter.
- **Capital Allocation:** The company announced a 5% dividend increase and an additional $90 billion authorized for share repurchases, signaling confidence in its future prospects.
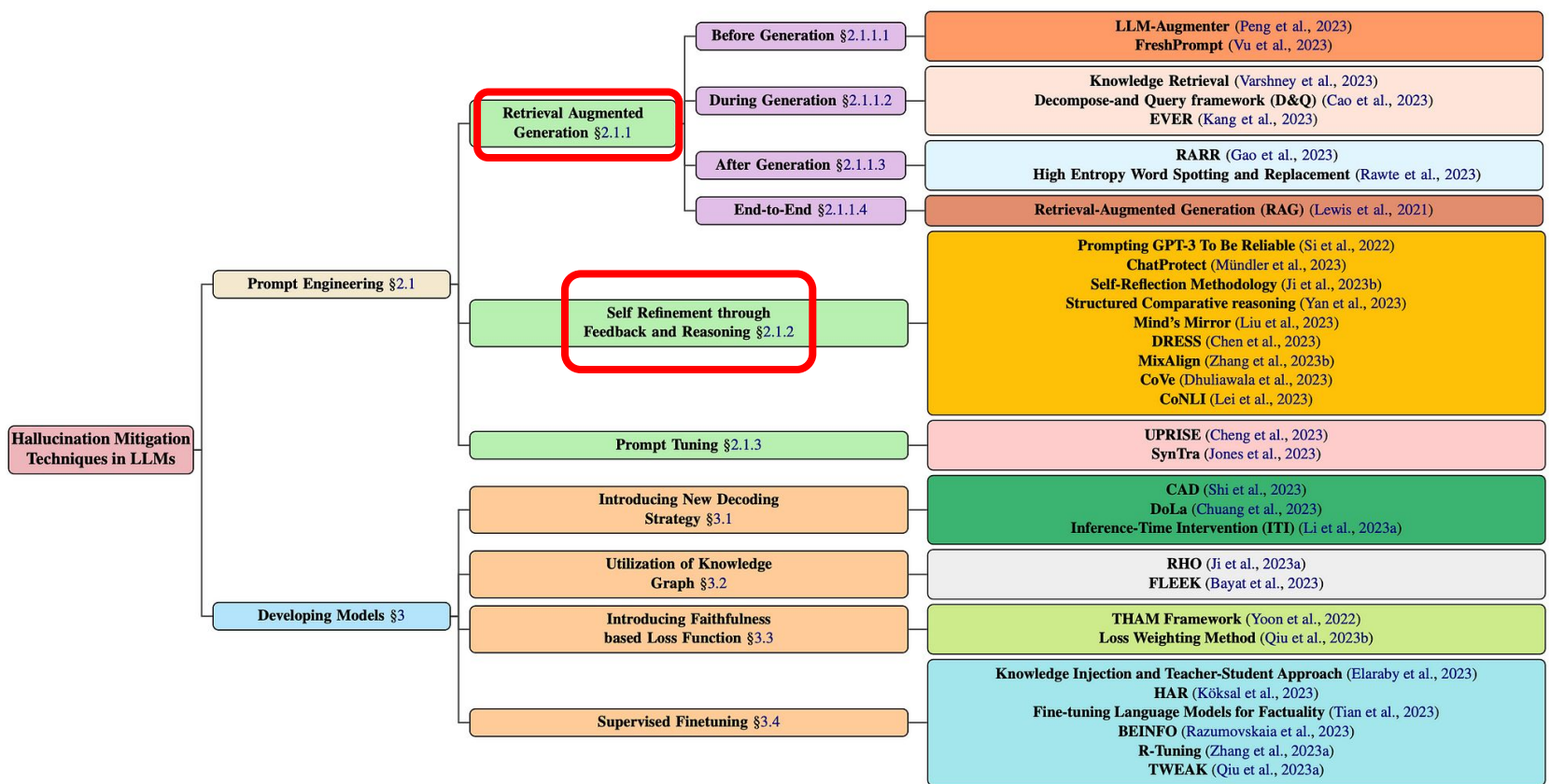
Conclusions and Recommendations

Apple's Q2 2022 performance demonstrates continued strength and resilience in the face of a challenging global landscape. The company's robust financial performance, coupled with strategic investments in growth areas like services and the enterprise market, positions it well for future success.

Data Summarization

Period	Gross Margin	Operating Margin	Net Margin
2020 Q1	0.38	0.22	0.19
2020 Q2	0.38	0.22	0.19
2020 Q3	0.38	0.23	0.19
2020 Q4	0.4	0.3	0.26
2021 Q1	0.43	0.31	0.26
2021 Q2	0.43	0.3	0.26
2021 Q3	0.42	0.29	0.25
2021 Q4	0.44	0.33	0.28
2022 Q1	0.44	0.31	0.26
2022 Q2	0.43	0.28	0.23

Hallucination

Hallucination

- Retrieval Augmented Generation (RAG)
  - Save text embedding into vector database

- Self refinement through feedback
  - Refine the response to achieve better result

Reference

- LangGraph. (n.d.). Plan and execute. LangChain. Retrieved February 15, 2025, from https://langchain-ai.github.io/langgraph/tutorials/plan-and-execute/plan-and-execute/

- Ji,Z., Yu, T., Xu, Y., Lee, N., Ishii, E., & Fung, P. (2023). Towards mitigating LLM hallucination via self-reflection. *Findings of the Association f Computational Linguistics: EMNLP 2023*, 1827–1843. Association for Computational Linguistics. https://doi.org/10.18653/v1/2023.findings-emnlp.123

- Beyond Traditional Fine-tuning: Exploring Advanced Techniques to Mitigate LLM Hallucinations. https://huggingface.co/blog/Imama/pr

- Chatbot UI template: https://www.chatbotui.com/