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Generating Annual Reports with FinRobot: A Multi-Agent Approach on Five Tech Giants

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J. Huang



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0.Introduction

The rapid advancement of AI semiconductors has driven the rise of companies like NVIDIA, AMD, and Intel, while tech giants such as Apple and Google are also making significant investments in this cutting-edge field. To better understand how these companies performed in 2024, efficient tools for analyzing financial reports are essential. FinRobot, an open-source financial LLM platform built on Multi-Agent System architecture, offers a promising solution.

Therefore, I used FinRobot's tutorial notebook (`agent_annual_report.ipynb`) to automatically generate annual reports for five companies: NVDA, AMD, INTC, AAPL, and GOOGL. The process involved setting up the local environment, debugging and modifying the code, and finally generating all five reports.

In this blog, I will show you the comparison of the annual reports generated by FinRobot for these five companies, and provide a reasonable analysis of the results.

1. Adapting the FinRobot Tutorial Notebook

While FinRobot's tutorial provides a comprehensive framework, some adjustments are still needed to actually generate the reports.

```
os.environ["FMP_API_KEY"] = "..."  
os.environ["OPENAI_API_KEY"] = "..."
```

First, we need to input the OpenAI and FMP API keys into the model so that it can call upon these two services.

```
print("FMP key ok:", os.environ["FMP_API_KEY"][:8], "...")  
print("OpenAI key ok:", os.environ["OPENAI_API_KEY"][:8], "...")
```

Test whether the two API keys have been properly configured.

```
config_list = [{  
    "model": "gpt-4.1",  
    "api_key": os.environ["OPENAI_API_KEY"],  
    "base_url": "https://api.openai.com/v1",  
}]
```

I directly defined the model configuration within the script. Since the experiment involves a single model and does not require multi-model routing or dynamic configuration switching, this approach simplifies the setup and improves code transparency while still retrieving API credentials securely from environment variables.

```
def order_message(recipient, messages, sender, config):  
    # Extract the path to the instruction text file from the last message  
    full_order = recipient.chat_messages_for_summary(sender)[-1]["content"]  
    txt_path = full_order.replace("instruction & resources saved to ", "").strip()  
    txt_path = txt_path.splitlines()[0].strip()  
    with open(txt_path, "r") as f:  
        instruction = f.read() + "\n\nReply TERMINATE at the end of your response"  
    return instruction
```

I added an extra preprocessing step when extracting the file path from the message content. By isolating only the first line and trimming whitespace, I ensured that only the valid file path is passed to the file-opening operation. This makes the function more robust and reduces the risk of file-loading errors caused by unexpected formatting in the message.

```
with Cache.disk() as cache:
    user_proxy.initiate_chat(
        recipient=expert,
        message=task,
        clear_history=True,
        max_turns=500,
        summary_method="last_msg",
    )
```

I increased `max_turns` from 50 to 500 to allow more interaction rounds between agents, ensuring that complex tasks can be fully completed without premature termination. Additionally, I enabled `clear_history=True` to prevent previous conversations from affecting the current task, improving reproducibility and reducing unintended context interference.

The rest of the code remained unchanged. After testing, the adjusted code successfully generated all five reports.

2.Comparative Analysis of the Five Reports

The technology sector in 2024 is undergoing a structural transformation driven by artificial intelligence and accelerated computing. The semiconductor industry has shifted from a traditional PC-centered demand cycle to an AI-driven infrastructure expansion cycle, benefiting GPU leaders such as NVIDIA while intensifying competition among AMD and Intel. Meanwhile, platform-based companies like Apple and Alphabet operate within a more mature growth environment, leveraging ecosystem advantages and recurring revenue streams to maintain stability. Overall, the industry is characterized by high capital intensity, rapid innovation cycles, and increasing geopolitical complexity.



In the following section, I will analyze the performance of these five companies based on the generated reports, and then compare these findings with their actual historical performance and current market conditions.

2.1 Industry Consistency Analysis

The generated reports show clear evidence that the system recognizes the AI-driven expansion cycle within the sector. Among the five companies, NVIDIA demonstrates the most explosive growth, with revenue increasing by 114% year-over-year to \$130.5 billion. AMD follows with a 34% year-over-year revenue increase, reflecting recovery and increased competitiveness in data center markets. Alphabet reports a more moderate but stable 15% year-over-year revenue growth, driven primarily by digital advertising and cloud services. Apple shows relatively stable revenue performance characteristic of a mature hardware and ecosystem-driven company. In contrast, Intel exhibits comparatively weaker revenue momentum, highlighting its transitional challenges within the semiconductor industry.

Overall, while each company's situation differs, profits are growing across the board. This reflects the consistency within the industry and aligns with the booming reality of the semiconductor and tech sector. This validates the credibility of the reports generated by FinRobot.

2.2 Company-Level Differentiation

In many cases, AI-generated analyses tend to rely on templates. However, in this task, each company's situation is different — if the model simply applied a generic template, the generated reports would likely be inaccurate. Therefore, we need to examine whether this issue also appears in the reports produced by FinRobot.

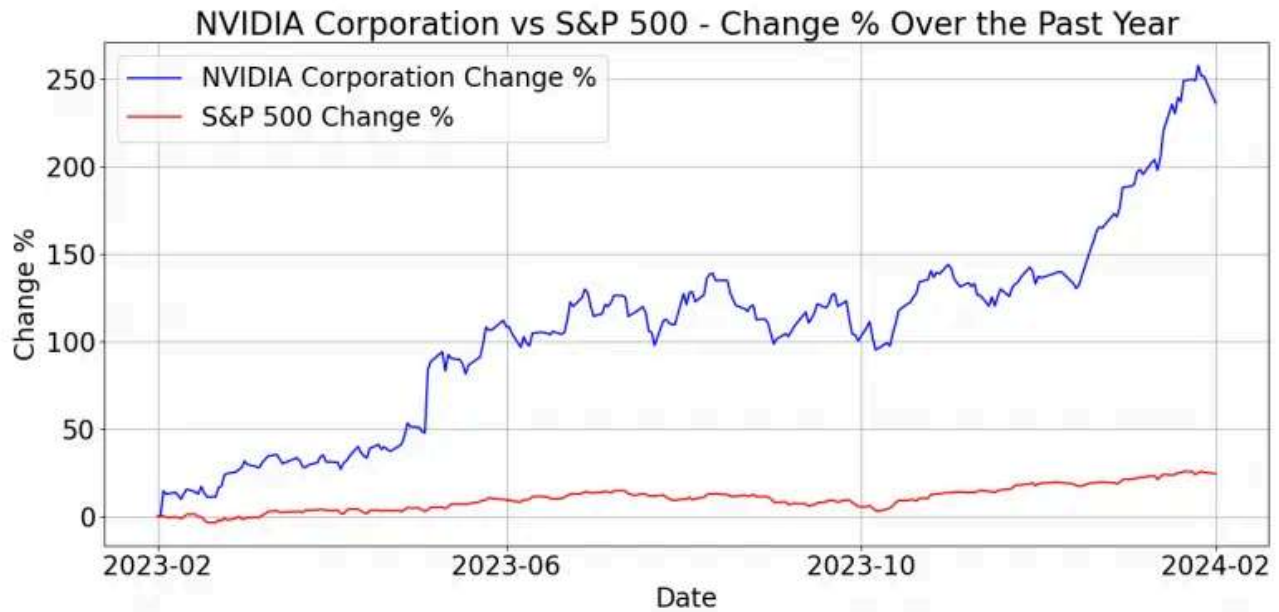
If FinRobot were simply using a template, we would expect all five reports to share a similar structure and tone, with only the numbers swapped out. But the actual results tell a different story.

NVIDIA is positioned as the undisputed leader in AI infrastructure, with strong language throughout the report backed by explosive numbers — 114% revenue growth, 75% gross margin, and 75.3% ROIC. AMD, in contrast, is framed as a competitive challenger rather than a market leader. Its numbers are solid (34% revenue growth, 50% gross margin) but not dominant, and the tone is noticeably more measured. Intel stands out even more clearly: weak revenue performance, 35% gross margin, near-zero ROIC, and a Risk Assessment section that emphasizes structural challenges — all pointing to a company facing serious difficulties. Apple and Alphabet, meanwhile, are not even positioned within the semiconductor competition narrative. Their reports focus instead on ecosystem strength, advertising, and services growth, reflecting their distinct business models.

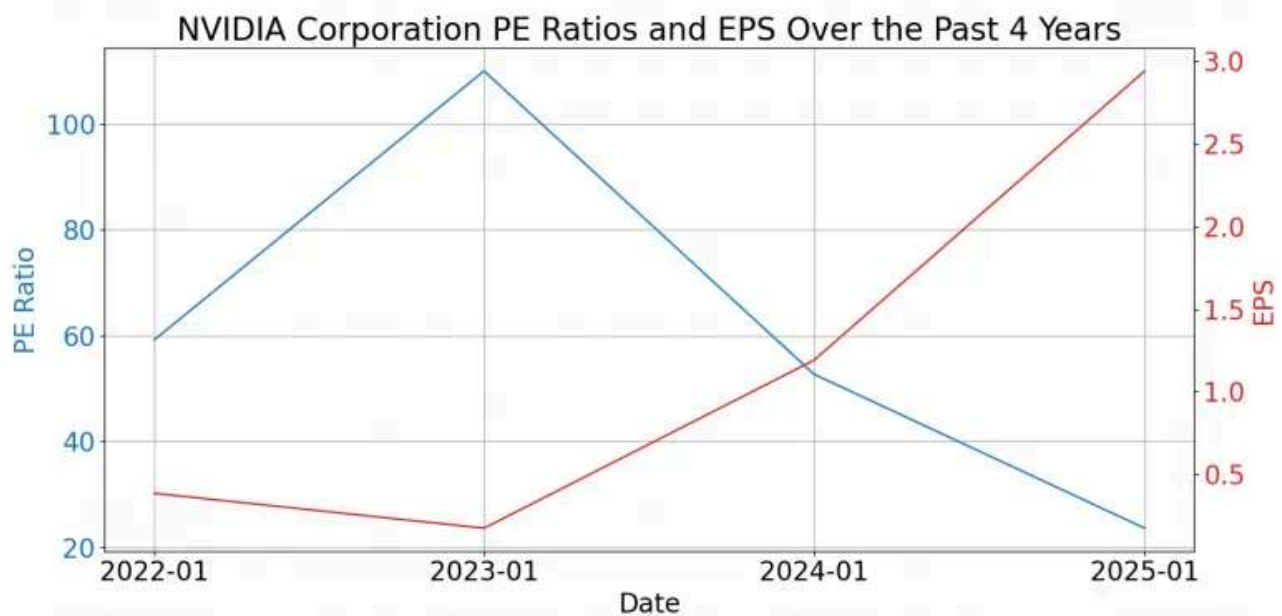
2.3 Financial Accuracy & Visual Consistency

Next, let's examine whether the numerical descriptions, tabulated financial data, and visual charts in each report are consistent and free of contradictions. Taking the NVIDIA report as an example, the Operating Results section states that revenue increased by 114% year-over-year to \$130.5 billion. This growth is supported by the Financial Metrics table, which reflects substantial revenue expansion. Meanwhile, the PE & EPS chart visually aligns with this narrative, as earnings expansion appears consistent with strong financial performance. In the end, we can see that the text, data, and charts all convey the same message. The same holds true for the other reports after checking.

Share Performance



PE & EPS



2.4 Risk Assessment and Competitive Analysis: How Well Do They Match Reality?

Finally, we want to check whether the risk assessments actually align with each company's real-world situation. Taking NVIDIA and Intel as examples, we can see how well FinRobot captures the distinct challenges each company faces.

NVIDIA

The risk assessment section of the report focuses on three main issues: aggressive capital spending, large-scale stock buybacks, and dependence on sustained AI demand. Although NVIDIA is without a doubt the current leader in the AI chip space, the market still has some concerns — for example, whether the AI market is becoming overheated with too many players jumping in, and whether other major companies might also develop their own chips and take away part of the market. The fact that the report mentions these risks shows that it has captured real concerns present in the market.

The competitive analysis compares NVIDIA with its peers and points out that its profit margins and return on capital are significantly higher than AMD and Intel's, which is consistent with reality. Relying on its CUDA ecosystem and dominant position in data center GPUs, NVIDIA's profitability is indeed far ahead right now. The report's view that its high valuation is supported by performance is also consistent with the mainstream view in the market.

Intel

The risk assessment section of the Intel report focuses on structural challenges: losing its technological edge to competitors, struggling with the IDM 2.0 strategy, supply chain disruptions, and geopolitical uncertainties like US-China export controls. These are exactly the issues Intel is dealing with in reality. Intel used to be the king of semiconductors, but now it has fallen behind TSMC and AMD in process technology, its foundry business is burning cash, and profit margins keep shrinking. The report mentions “delays in process node milestones” and “capital intensity” — both are real headaches for Intel right now. It also brings up export controls limiting access to the Chinese market, which is indeed a pressing problem.

On the competitive side, the numbers tell a clear story: profit margins dropped, cash flow turned negative, and return on capital is near zero. This matches what the market sees — a company under pressure, spending huge amounts on turnarounds with no clear payoff yet. The report's conclusion that Intel's low valuation makes sense given its weak performance also reflects how investors actually feel.

3. Conclusion

After analyzing the reports generated by FinRobot, we find that the content is generally reasonable, logically coherent, and consistent with real-world conditions. The risk assessments capture the actual concerns surrounding each company, and

the competitive analyses reflect their true market positions. While some phrasing occasionally feels a bit templated, overall the reports are trustworthy and provide a solid foundation for understanding these companies' performance in 2024.

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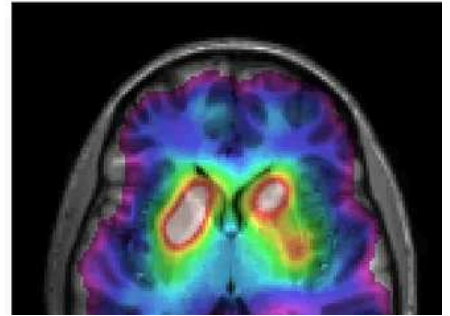
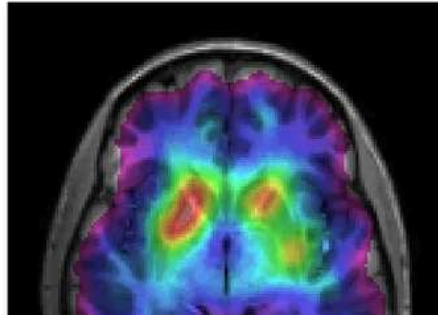
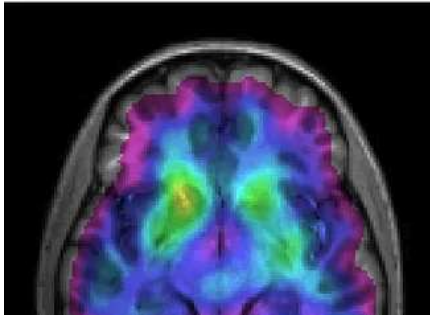
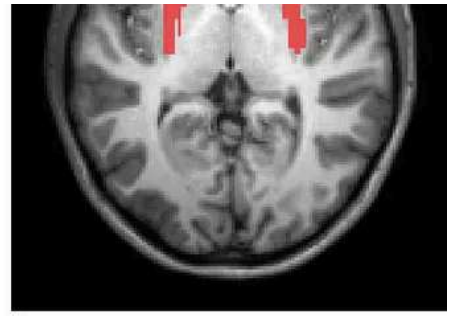
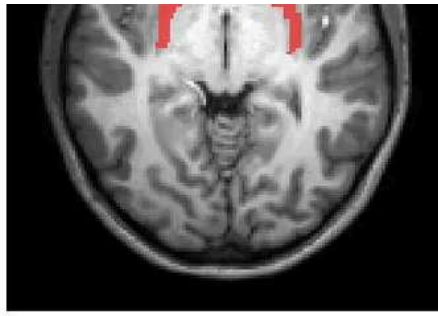
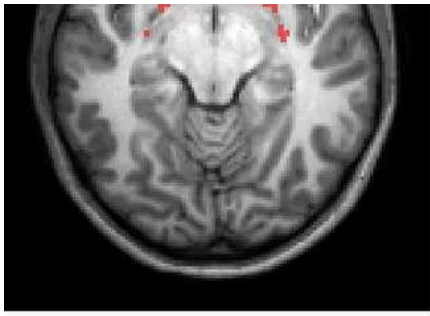
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