Week 3. Research Assignment 1
10/13/2024

Attempt 1 ⌄   ◯ In Progress
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Unlimited Attempts Allowed

⌄ **Details**

There is a burgeoning market for AI assistants and agents that offers opportunities for data scientists and data engineers. Before embarking upon a consulting or product development opportunity in this field, it may be a good idea to conduct a competitive review of the marketplace.

Consider the challenges facing new product developers in this domain. There can be substantial software development costs. Following Porter's Five Forces Model, a company may want to consider market factors prior to embarking upon a major design and development effort.

Supplier power. There may be software dependencies on systems provided by the major players, including OpenAI, Microsoft, Alphabet/Google, and Meta/Facebook.

Threat of entry. Cloud resources allow easy entry not only for your startup, but also for other startups operating in the same product or service category.

Substitute products. Here we need to think broadly about the many systems that may be employed to provide similar value to clients/customers. This includes traditional (non-AI) systems that have been operational for many years.

Management Problem

A Fortune 500 company involved in financial services is looking for a data scientist to help in exploring AI product opportunities. In particular, it would like to learn more about the application of AI within corporate information infrastructure, specifically focusing on leaders and emerging players in this field. The company is interested in understanding the current landscape, emerging technologies, and new growth opportunities, with a focus on financial services. Are other financial services firms utilizing AI and to what extent? The firm is looking for a data scientist who can provide insights into existing players, emerging technologies, and potential growth areas in AI for financial services.

The company is considering a number of potential new product opportunities, such as automated trading, stock-broker agents, and financial advisors. Conversational agents that can quickly provide stock quotes and financial analysis are also being considered. The company is aware of contemporary developments in financial machine learning and may be able to provide such services directly to its clients. Financial machine learning is an active area algorithmic trading, as can be seen in a quick search of Amazon shows. It is possible that the company will be building a system for linking financial clients directly with a conversational agent.

This represents a significant consulting opportunity for you. To secure the engagement, in addition to documenting your qualifications through your resume, personal website, and code repositories from past projects, the firm is looking for a preliminary report that shows you have a firm grasp of the information technology space that comprises AI. The report needs to go beyond what traditional technology evaluation firms provide. The report needs to go beyond what GenAI tools can provide. That is, demonstrate the special expertise you have acquired as an MSDS student and data science practitioner.

Reports from Technology Review Firms

Start by locating reports on conversational assistants (chatbots) and AI agents. **Gartner** 🗗 **(https://en.wikipedia.org/wiki/Gartner)** and **Forrester Research** 🗗 **(https://en.wikipedia.org/wiki/Forrester_Research)** represent trusted sources for evaluating information technology product categories. These may comprise your initial sources.
Consider the possibility of crawling and scraping the web with automated tools such as Python **Scrapy** 🗗 **(https://scrapy.org/)** or Go **Colly** 🗗 **(https://pkg.go.dev/github.com/gocolly/colly/v2)** .
Conduct interactive sessions with Google search or ChatGPT to gather additional information about tools for building conversational assistants and AI agents.

Assignment Requirements

You are not required to write an analyst's report. This is not a writing assignment, per se. Rather, your job is to conduct the background research and provide documentation that would be relevant to an analyst's report.

Your public GitHub repository for this assignment should provide
- A description of repository folders and files
- Information about the sources consulted for the research
- Program code associated with web crawling and scraping (if utilized)
- Review your approach to using Generative AI (if utilized)
- Documentation, including downloaded articles, screenshots, and text documents
- Your README.md file should include a recommendation for management: Are there significant opportunities for automating financial services using conversational assistants and AI agents?

Assignment Deliverables

- Link to your GitHub repository with the **.git** extension.
- Program code for web crawlers and scrapers, if used
- Include text files for dialogs with Generative AI tools, if used
- Documentation of research results.
- The **Readme.md** file of your GitHub repository should review your methods and results, as well as your recommendation for management.

Grading Guidelines (50 total points)

- Review the objectives of your research (10 points)
- Description of the methods/tools used for the research (10 points)
- Documentation of research results (10 points)
- Interpretation and recommendation to management (10 points)
- Exposition (10 points)

References
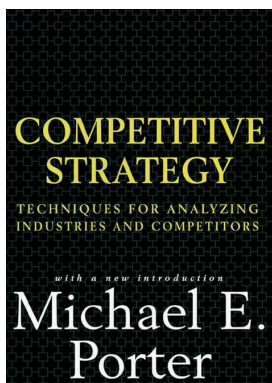
Porter, Michael E. 1998. *Competitive Strategy: Techniques for Analyzing Industries and Competitors.* New York: Free Press. [ISBN-13: 978-0684841489] Chapter 1, The Structural Analysis of Industries, pages 3–33, Chapter 2, Generic Competitive Strategies, pages 34–46. On Course Reserves.

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