MIS 4000/5000

Final Report

Emerging Technologies
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Table of Contents

Executive Summary

Well-written executive summary (1-3 pages; ~10% of paper length)

Overview

AutoProphet is a financial analysis tool designed to create a portfolio and to fulfill all of their needs while investing. Having features similar to news pages to understand what is going on in the world within the media. A learn page to allow new and adept users to understand key terms and how to invest within the market and the changes that are being made. AutoProphet also has tools for real-time data and reports for every company that shows financial statements and ratios. Lastly also provides information to users and allows pages to answer frequently asked questions. Our software will allow users and investors to gather all of their investment information and make decisions right within ours.

The groundwork has been laid for its development by creating the foundational database to store textual question-and-answer data. During this project the structure of the database was designed and implemented, quality assurance guidelines were established, system-level prompts created, scrapers developed, and a pre-processing system was created to ensure data readiness. Additionally, an AI chatbot was trained to handle textual data effectively, setting the stage for future scalability. These efforts not only provide a robust foundation for future developers but also enhance the platform's potential to deliver a seamless and informative user experience, ultimately benefiting investors in the long run.

Opportunity and Opportunity Domain

Many financial tools on the market meet the needs of experienced investors but fall short in supporting novice investors who are new to the field. This gap presents a significant opportunity for us to address by creating a platform that caters to both seasoned and beginner investors. With the recent surge in first-time investors, providing accessible, beginner-friendly tools and information can attract a broader user base to our product. By specializing in this niche, we aim to establish our platform as a competitive force in the financial market.

Our approach to supporting novice users includes step-by-step guidance throughout the website and a dedicated Education/Learn section. This page will feature tutorials, short lectures, and essential lessons on key financial and investing principles. While also providing a useful chat bot that will be able to answer a variety of financial questions. The chat bot will provide advice on financial literacy and topics. The goal is not to use the Chatbot for financial advice outside of basic knowledge.

Solutions

The evaluation of solutions in the financial industry is crucial to understanding market competitiveness and user satisfaction. Key factors including the mobile app, website, cryptocurrency trading capabilities, retirement planning assistance, risk analysis feature, and education system were identified for a fair comparison.

It is important to note, while comparing AutoProphet to other applications, the context in which AutoProphet was created. While the following alternative solutions were built for profit by professionals, AutoProphet was a student-led project that was focused as much on the process as the final solution. Comparisons to other solutions should be viewed as means of improvement for students in future rather than solely criticism for AutoProphet.

AutoProphet has many competing solutions such as Robinhood, Fidelity, Acorns, and Crypto.com. Each of these applications have different key features that draw users for different reasons. AutoProphet, in the future, should aim to differentiate itself in a similar context in order to attract users for different reasons than they are drawn to other applications. Furthermore, Autoprophet excels in the education system and risk analysis, but lacks in cryptocurrency trading as a mobile application. This focus on education and risk analysis can help differentiate AutoProphet amongst competitors and make it stand out to prospective users.

Financial Analysis

The financial viability of our app lies not only in its development costs but also in its revenue potential, driven by a well-structured pricing model and its ability to capture a significant share of the online investing market. Development costs are estimated at 2,260–2,706 labor hours, translating to an investment of $113,009–$135,277. These costs depend on factors such as team experience, work ethic, and project timelines. While in-house development salaries average around $116,000 annually, outsourcing options, including freelance hires, range from $13.00 to $60.00 per hour or higher. Insights from appdevelopmentcost.com were instrumental in calculating these estimates and understanding the financial requirements for a scalable and market-ready product.

To monetize the app, we have designed a three-tiered subscription model catering to different investor needs: 1. Basic Tier – $5/month: - Offers a low-depth chatbot assistant. - Ideal for individuals with small portfolios seeking straightforward financial insights. 2. Pro Tier – $30/month: - Provides a standard-depth chatbot assistant. - Designed for small businesses and users managing multiple sizable portfolios. 3. Enterprise Tier – $200/month: - Features a high-depth chatbot assistant. - Tailored for large-scale portfolio management requiring intense, perpetual analysis of complex financial data. This tiered structure aligns with the app's value proposition by catering to novice investors, small business owners, and large-scale enterprises, ensuring accessibility while addressing varied financial management needs.

The app's unique market positioning—offering integrated real-time market data, direct trading capabilities, and accessible financial education—positions it as a leader in the self-directed investing space. This is particularly appealing to younger, tech-savvy demographics who demand user-friendly solutions that blend trading functionality with educational resources and risk management tools. By addressing these critical gaps and fostering confidence in users to navigate financial markets, the app has strong potential for long-term profitability. While initial development costs represent a significant investment, the combination of an innovative product, a clear pricing strategy, and robust market demand creates a compelling case for financial success.

Management

The management practices employed throughout the semester were centered on Scrum methodologies, including regular Scrum ceremonies such as Daily Stand-Ups, Sprint Planning, Sprint Reviews, and Retrospectives. Tools like Discord, Notion, Google Docs, and Google Sheets were used to ensure seamless communication and documentation, promoting transparency and organization within the team. These practices aimed to enhance collaboration and keep the project moving forward efficiently while adapting to team members' needs and preferences. These Scrum practices also helped break the project into manageable tasks, enabling clear tracking of progress and accountability.

While the overall structure and communication practices proved effective, there were challenges in implementing documentation practices mid-semester. The shift to a more formalized documentation system created confusion for some team members, especially those less familiar with Scrum. Initially, there was a lack of clarity around the expectations for documenting work, which delayed the implementation of effective solutions and caused frustration. This situation highlighted the need for a clear, upfront plan for documentation, as well as more consistent guidance for team members at different levels of familiarity with Scrum.

However, as the semester progressed, adjustments were made that helped address these challenges. By the end of the term, clearer instructions and guidelines for documentation were established, which improved communication and organization. These adjustments allowed the team to develop a more cohesive understanding of expectations, resulting in smoother workflows and better project outcomes. Nevertheless, the earlier confusion could have been avoided with better preparation from the start, ensuring everyone was on the same page.

For future iterations, it would be beneficial to establish documentation practices and expectations from the outset. Not all team members were familiar with Scrum methodologies, and a formal introduction to these practices early on could bridge knowledge gaps and improve team alignment. Providing team members with additional resources or training on Scrum and documentation tools could ease the transition and help them adapt more quickly. Furthermore, establishing a more structured plan for Scrum master transitions would ensure continuity and minimize disruptions. Setting clear expectations from the beginning would enhance productivity, foster better team cohesion, and ensure smoother project management for future endeavors.

Introduction

i. A brief introduction to the problem and problem domain

This project aims to provide extensive educational, analytical, and investment tools in a user-friendly interface to guide investors through the online investing and trading process. Our platform works to minimize the potential for losses while optimizing returns for investors from all backgrounds. The educational and risk analysis portions work together to provide investors with information to create their own risk management strategies. Historical price, volume, and SEC data is accessible in the platform to analyze the current and past performance of stocks to predict future behavior.

AutoProphet

ii. A brief description of the product

Financial Application

AutoProphet is a comprehensive financial analysis and investment tool designed to meet the diverse needs of investors. Unlike other investment tools that often lack functionality and fail to provide a user-friendly platform, our product aims to address these shortcomings effectively.

The project's ultimate goal is to amalgamate the strengths found across various platforms on the internet. This includes features such as beginner-friendly investment tutorials, access to comprehensive company financial ratios and information, industry and company-specific news updates, and a robust platform for stock investment. These features set us apart from our competitors, as they are typically not integrated into their products.

Our platform serves as a one-stop solution, providing users with access to a plethora of tools to make well-informed investment decisions. We recognize the importance of attracting users and investors with varying levels of experience. Thus, we prioritize simplicity and accessibility to cater to novices while ensuring advanced functionalities to support seasoned investors. By covering a broad spectrum of user needs, we aim to establish ourselves as a preferred choice in the market.

ChatBot

AutoProphet has a revolutionary financial chatbot designed to provide instant, reliable answers to all your financial questions and inquiries. Unlike other solutions that cater to specific niches, such as tax, budgeting, or investment, AutoProphet offers a comprehensive, sector-spanning approach. It is tailored for anyone navigating the world of finance, from novices with little to no experience to seasoned financial experts and investors.

Our chatbot consolidates the distinctive features of existing platforms into a single, user-friendly interface. Whether your query concerns taxation, investment strategies, financial planning, or academic

research, this chatbot delivers precise, actionable insights. No longer will you need multiple tools or platforms to address different aspects of finance. AutoProphet serves as a centralized solution, offering a seamless experience for all finance-related inquiries.

This tool is not just a chatbot; it's your trusted financial advisor. By providing accurate, timely information, it empowers users to make informed decisions that enhance their personal or professional financial outcomes. This chatbot is going to be a game-changer in the financial technology space. It will integrate the best features from existing platforms and elevate them into a unified, user-friendly experience. Whether you are tackling a financial challenge, exploring new investment opportunities, or seeking guidance for your financial journey, AutoProphet is your indispensable partner.

Competition

iii. An introduction to existing competitors and why your solution will gain traction in the market

Financial Application

Overview

In the crowded and dynamic landscape of online investing platforms, our app encounters formidable competitors ranging from established brokerage giants like Robinhood and ETRADE to renowned financial information platforms such as Yahoo Finance and Seeking Alpha. Robinhood and ETRADE have built massive user bases by offering commission-free trading, user-friendly interfaces, and access to a wide range of investment products. Similarly, platforms like Yahoo Finance and Seeking Alpha have garnered popularity among investors by providing comprehensive financial data, analysis, and market news. While these platforms cater to different aspects of investing, they all serve as significant players in the industry, offering valuable resources and tools to investors of various experience levels.

Identifying Gaps in the Market

However, despite their strengths, these competitors often lack a holistic approach, with brokerage platforms focusing primarily on trade execution and financial information platforms prioritizing data dissemination without comprehensive educational support or risk analysis tools. Furthermore, the landscape is not limited to brokerage and financial information platforms; other players, including robo-advisors like Betterment and Wealthfront, offer automated investment management services, appealing to investors seeking hands-off portfolio management. These robo-advisors typically provide diversified investment portfolios based on users' risk tolerance and financial goals, eliminating the need for active trading. While they offer convenience and simplicity, they may not provide the same level of control or educational resources as our app aims to deliver.

The Need for an Integrated Solution

Thus, while the competition is diverse and intense, it underscores the importance of a solution that seamlessly integrates trading functionalities, comprehensive educational resources, and advanced risk analysis tools to empower investors of all levels. Our product exists to capitalize on the untapped audience of beginning investors, while simultaneously fulfilling the needs of the pre-established investing community. Our product will gain traction in the market. Whereas the pre-established formula of

investing websites is not effective at educating novice investors, our product will provide tools for a user to continuously learn about the market. Our product will also retain the necessary tools and features for advanced investing, as is standard on other trading platforms.

Financial ChatBot

Chatbot Market Growth
The market for financial chatbots is expanding rapidly, with numerous AI-driven platforms emerging to assist users with everything from basic financial management to advanced investment strategies. While our chatbot has clear competitive advantages, it's essential to acknowledge the competition we face from both traditional financial platforms and emerging AI technologies. Understanding this competitive landscape is crucial to identifying where we can differentiate ourselves and where further innovation is required.

AI ChatBot Competitors

ChaptGPT
One of the most significant competitors in the financial chatbot space is ChatGPT. As a large language model developed by OpenAI, ChatGPT has become widely popular for its ability to engage in conversational AI, answer questions, and offer general advice on a variety of topics, including finance. Its natural language processing (NLP) capabilities allow it to understand complex queries and respond in a coherent, human-like manner. However, while ChatGPT can provide useful financial information, it lacks a specialized focus on finance and does not provide tailored financial advice or personalized solutions for managing individual financial portfolios. Our chatbot, in contrast, is specifically designed to address both basic financial questions and more advanced financial concepts, positioning it as a reliable tool for users at various stages of financial literacy.

Claude
Another key competitor is Claude, an AI platform developed by Anthropic. Claude is another advanced language model that competes with ChatGPT in offering generalized conversational AI services. Its capabilities are similar to those of ChatGPT, but it may have differences in how it handles certain types of queries, including those related to finance. While Claude excels in offering generic information across multiple topics, it is not as specialized in financial guidance as our chatbot, which has been built specifically for the purpose of helping individuals manage their finances and gain financial literacy. Additionally, Claude and similar platforms don't necessarily prioritize the same level of financial data accuracy, ethical guidelines, or real-time financial advice that our chatbot ensures.

Google's Gemini
Google's Gemini is another competitor that cannot be overlooked. Gemini is an AI chatbot developed by Google and is designed to assist users with general information, including finance. Like other advanced language models, it leverages NLP to provide accurate and relevant responses based on the context of the questions asked. However, Gemini, while being highly capable, is also a general-purpose AI, not specifically tailored to the complexities of financial decision-making. In contrast, our chatbot is built with a specific focus on providing financial advice, tips, and answering a broad range of finance-related questions, making it a more specialized tool for users looking for financial assistance.

Personal Finance Platforms

Cleo
Platforms like Cleo have also established themselves as strong players in the financial chatbot market. These AI platforms provide budgeting assistance, spending tracking, and basic financial advice. Cleo, for example, offers users personalized financial insights based on their spending habits. These platforms, though useful for handling daily transactions and personal finance management, often fall short in terms of offering in-depth financial education and advice for users who want to understand broader financial concepts, such as investment strategies, retirement planning, and tax optimization. Our chatbot, by comparison, is designed to help users navigate not only personal budgeting but also complex financial topics, providing a comprehensive learning experience.

Mint
In addition, Mint, which is owned by Intuit, competes by providing users with tools to track spending, manage budgets, and receive personalized financial insights. Mint, while popular among budget-conscious users, lacks the interactive, conversational elements of a chatbot, and it doesn't provide real-time financial advice. Our platform, on the other hand, provides a more dynamic, conversational user experience, offering both immediate responses to financial questions and personalized financial education.

Betterment and Wealthfront
AI-powered financial advisory services like Betterment and Wealthfront are also important competitors. These platforms offer automated financial advice, particularly around investment portfolios and retirement savings. While they use algorithms to make recommendations based on user data, they do not typically offer the same range of financial guidance that our chatbot does. Our chatbot aims to fill the gap between basic financial management and complex investment planning by providing clear explanations, advice on budgeting, tax strategies, and helping users understand how to optimize their financial future. Furthermore, while platforms like Betterment are investment-focused, our chatbot is designed to provide users with a broader range of financial knowledge and actionable advice.

General-Purpose AI Platforms
In addition to these financial platforms, we also face competition from a variety of general-purpose AI platforms, such as Microsoft's Copilot and IBM Watson. These platforms are increasingly being integrated into enterprise solutions to assist with everything from data analysis to customer support. While these platforms are highly capable, they don't specialize in finance, nor do they cater to the general public in the way our chatbot does. IBM Watson, for example, is often used by financial institutions for internal business operations, but it is not accessible to individual users seeking personal financial advice.

Future Competition and Innovation
As AI technology evolves, we expect the competition to intensify. More advanced AI systems will likely enter the market with specialized financial knowledge and tools, and more financial institutions may develop their own proprietary chatbots to compete for market share. However, by focusing on data accuracy, ethical guidelines, continuous improvement, and providing a user-centered platform, our

chatbot is positioned to stand out. Its ability to engage with users in real-time, offer personalized financial guidance, and evolve with each interaction makes it a highly competitive product in the growing market of financial AI chatbots.

Conclusion

Ultimately, while the competition is formidable, we believe that our chatbot's specialization in financial knowledge, its ability to evolve with feedback, and its focus on accessibility for users at all levels of financial literacy gives it a strong competitive advantage. The chatbot's continuous development ensures that it will remain relevant in a fast-changing market and provide users with the tools they need to take control of their financial futures.

Competitive Advantage

Financial Application

AutoProphet Application

Our app represents a pioneering approach in the realm of online investing by seamlessly integrating the functionalities of traditional brokerage platforms with the comprehensive insights offered by financial information services. Unlike standalone financial information platforms, which predominantly focus on providing market data and analysis, our app goes a step further by enabling users to execute trades directly within the platform. This integration not only simplifies the investing process but also enhances user experience, eliminating the need for investors to navigate multiple platforms to make informed decisions.

Educational Benefit

Furthermore, our app distinguishes itself by offering an extensive educational curriculum that surpasses the rudimentary resources commonly provided by brokerage platforms. Tailored specifically for novice investors, this curriculum covers fundamental concepts in finance and trading, empowering users to develop a solid understanding of the intricacies of the financial markets. By prioritizing education, our platform equips users with the knowledge and skills necessary to navigate the complexities of investing confidently. Additionally, our app integrates advanced risk analysis tools, providing users with valuable insights into potential risks associated with their investment decisions.

Financial Chatbot

Overview

Our financial chatbot has a unique competitive advantage that sets it apart in the rapidly growing field of AI-driven platforms. Unlike many established financial tools, our chatbot is specifically designed to cater to both individuals with limited financial knowledge and those who are already familiar with finance. This dual approach opens up a wide range of possibilities for us to engage with diverse audiences, from

non-accountants seeking basic financial assistance to experts looking for a reliable platform for financial inquiries.

Fresh Innovation & Knowledge

One of the primary advantages of our chatbot is its youth and vibrancy. As a team of college students, we bring fresh perspectives to the project. We are keenly aware of the challenges young people face in managing their finances, and we are passionate about providing solutions that resonate with our generation. This gives us a unique edge in designing a chatbot that speaks the language of younger users while also addressing the needs of more experienced individuals. Our understanding of how technology can be integrated into daily life allows us to build a tool that is intuitive and user-friendly for people of all ages and backgrounds.

Long-Term Investment

Another competitive advantage we hold is the continuous nature of the project. This chatbot is not just a one-time product but an evolving solution. As part of a long-term initiative, future groups will have the opportunity to continue refining the platform, adding new features, and incorporating feedback from users. This ensures that the chatbot will remain relevant and adaptable in the ever-changing landscape of finance and technology. The ability to continuously improve based on user feedback and emerging trends in the financial world positions our chatbot for long-term success and sustainability. Future teams will be able to fine-tune the chatbot's functionality, improving accuracy and usability, which provides us with a lasting advantage over competitors who may not have a system in place for continuous iteration.

Data Accuracy

Our commitment to data accuracy is also a significant competitive advantage. Throughout the development of the chatbot, we have taken great care in sourcing data from verified and reputable financial institutions, ensuring that the information provided by our chatbot is accurate and trustworthy. We have worked closely with the quality assurance (QA) team to ensure that all content is thoroughly vetted and aligned with industry standards. This attention to detail and focus on data integrity gives us a competitive edge, as users can trust the chatbot to provide reliable financial advice and answers to their queries.

AI Technology

Moreover, the AI technology behind our chatbot is designed to learn and adapt over time, allowing it to provide more relevant and personalized financial guidance as it interacts with more users. This means that the chatbot can become increasingly efficient in handling complex financial questions and can evolve to meet the specific needs of individual users. Unlike static financial tools, our chatbot improves with each interaction, ensuring that it always offers cutting-edge solutions to its users.

Agile & Cross-Collaborative Environment

Our competitive advantage also stems from the collaborative nature of the project. By working together as a team, we have been able to combine diverse skills and knowledge to create a more effective and holistic solution. From technical development to database management and quality assurance, each team member has contributed their expertise to build a chatbot that is functional, intuitive, and capable of addressing a

wide range of financial questions. This collaborative effort allows us to work efficiently and produce high-quality results that may be difficult for competitors to replicate.

ChatBot Advantage

Finally, our chatbot's accessibility stands out as a key advantage. We have designed the platform to be user-friendly and accessible to individuals with various levels of financial literacy. Whether someone is a complete beginner or an experienced financial professional, the chatbot provides responses that are clear and tailored to the user's level of understanding. This makes our platform highly versatile, attracting a broad user base and positioning us to fill a gap in the market for a financial assistant that is both sophisticated and approachable.

Opportunity and Domain

Opportunity Analysis

i. Describe the problem/opportunity in detail. How many people are affected by the problem (i.e., market analysis)? How could people benefit by solving the problem?

The Challenge: Complexity and Inaccessibility of Online Investing for Novices
The challenge we aim to tackle is the overwhelming complexity and inaccessibility of online investing for novice users. This issue significantly impacts individuals new to investing, who often lack the knowledge and resources needed to navigate financial markets effectively. With a growing number of people entering the world of online investing without a solid foundation in finance, there is a clear demand for solutions that bridge this knowledge gap. By creating a platform designed specifically for beginners, we can support a broad audience eager to engage in the financial markets but deterred by their intimidating complexity.

Our Opportunity: AI Chatbot for Financial Literacy
Our opportunity is to provide an AI chatbot that can deliver financial literacy to individuals. By developing the necessary framework for this chatbot, we have created a backend capable of scraping and cleaning data, as well as training and testing models. In the future, this infrastructure will allow for the creation of a chatbot that ensures the data it uses is clean, well-documented, and accurately reflects high-quality information.

Empowering Users: Simplifying Investment Decisions
Addressing this challenge offers an opportunity to empower individuals with the tools and resources necessary for confident and informed investment decisions. Through a user-friendly platform that includes educational resources, real-time market data, and intuitive risk analysis tools, we aim to simplify the investing process. By breaking down financial market complexities, our solution seeks to democratize investing, making it accessible to a diverse range of users.

Goal: Enhancing Financial Literacy and Inclusion
Ultimately, our goal is to empower individuals to take control of their financial futures while contributing to the larger mission of enhancing financial literacy and inclusion. By creating a platform that bridges the knowledge gap, we can provide users with the skills and confidence to make informed financial decisions and engage meaningfully with the market.

Domain Analysis

ii. Describe the problem domain in detail. Who are the key stakeholders? What are their characteristics? How should the design of the product account for these characteristics? In what environments do they engage with the problem? How does your design fit with the environment in which it will be used?

Problem Domain: Online Investing and Stock Trading

The problem domain we're delving into revolves around the complexities of online investing and stock trading, particularly for novice users. Key stakeholders in this domain include individual investors, financial advisors, and educators. Individual investors vary widely in their characteristics, ranging from those with limited financial knowledge to others with more experience but seeking further guidance. Financial advisors typically possess expertise in investment strategies and risk management and may serve as valuable resources for novice investors. Educators play a crucial role in providing foundational knowledge and resources to empower individuals to make informed investment decisions.

Design Considerations: User-Friendliness and Accessibility

The design of our product should account for these diverse characteristics by offering a user-friendly interface coupled with comprehensive educational resources. Novice users may require simplified explanations and step-by-step guidance to navigate the platform effectively, while more experienced investors may seek advanced tools for analysis and risk management. Additionally, the product should be accessible across various environments, including web browsers and mobile devices, to accommodate users' preferences and lifestyles. By ensuring a seamless user experience across different platforms and environments, our design aims to meet users' needs regardless of where they engage with the problem, ultimately enhancing accessibility and usability for all stakeholders in the domain.

Solution Focus: Centralizing Finance-Related Queries

Our solution focuses on addressing the challenge of centralizing answers to finance-related queries, particularly for individuals who are new to the finance industry. Our stakeholders encompass a wide range of professionals, including auditors, tax experts, financial advisors, investors, and educators. These groups exhibit diverse needs and characteristics, ranging from those with minimal financial knowledge to seasoned professionals eager to explore innovative ideas and insights.

Stakeholder Needs and Characteristics

- **Auditors** play a critical role in ensuring robust internal controls and preventing fraud, requiring tools that streamline their workflows and help maintain compliance.
- **Tax experts** assist clients by solving complex tax issues and offering strategic advice, emphasizing accuracy and efficiency in their services.
- **Financial advisors**, with their expertise in investment strategies and risk management, serve as invaluable resources for both novice and experienced investor as seeking guidance on managing risks and maximizing returns.
- **Educators**, on the other hand, empower individuals with foundational financial knowledge and resources, equipping them to make informed decisions in their financial journeys.

Chatbot Design: Tailoring to Stakeholder Needs

The design of our chatbot is tailored to meet the diverse needs of these stakeholders by providing a user-friendly interface that simplifies navigation and interaction. For users with limited financial knowledge, the chatbot will deliver step-by-step guidance and clear, simplified explanations to help them effectively solve their problems. Meanwhile, experienced users can access more in-depth insights and analytical tools to support advanced financial analysis and decision-making.

Ensuring Accessibility Across Platforms
To ensure accessibility and convenience, the chatbot will be available across multiple platforms, including web browsers and mobile devices, allowing users to interact with the solution in their preferred environment. By offering a seamless user experience across different platforms, the chatbot accommodates the varied lifestyles and preferences of its users. Furthermore, the chatbot's design will incorporate adaptive responses, adjusting to the user's level of expertise to deliver context-aware answers that align with their needs.

Conclusion: Bridging the Knowledge Gap in Finance
Ultimately, our solution aims to bridge the knowledge gap in the finance industry by providing comprehensive, accessible, and effective resources for all stakeholders. By addressing the unique requirements of each user group, the chatbot enhances usability and supports informed decision-making, making it a valuable tool for navigating financial challenges.

Solutions

Solution Criteria

i. Identify important criteria by which you will compare your solution to competing solutions. Don't overly bias the criteria in favor of your design. Be fair to all competing solutions.

Introduction
The solution criteria used to evaluate the finished product should be focused on fairly comparing AutoProphet to other existing products. It is important to assess the quality of the final product, but also to determine whether the product improves a real-world problem or fills an existing gap in the market.

Evaluation Criteria
The important criteria which our solution will be compared to competing solutions are:
   ● Mobile App, Website
   ● Cryptocurrency trading capabilities
   ● Retirement Planning Assistance
   ● Risk Analysis Feature
   ● Education system

Competing Solutions

ii. Identify competing solutions and important features of these solutions

Competing solutions to our product include Robinhood, Fidelity, Acorns and Crypto.com. Below is a comparison of their features relative to our own product.

Robinhood

Robinhood offers most of the features our product provides, with the exception of not having the risk analysis comparison of our product. Additionally, it also has an IPO Access feature, allowing investors to trade companies before they are on the market. Lastly, Robinhood has a mobile application and offers access to trading certain cryptocurrencies.

Fidelity
Fidelity shares similarities to our product, with the addition of having retirement planning assistance features for those customers interested. In addition, Fidelity has a mobile application for accessibility.

Acorns
Acorns is a mobile application that rounds credit/debit purchases up to the next dollar and automatically invests the user's spare change into stocks for gradual investment.

Crypto.com
Crypto.com is a platform that supports transactions with a plethora of decentralized tokens, cryptocurrencies, as well as fiat and traditional currencies. Similar to other competitors, Crypto.com has a mobile application for greater user access and trading.

Solution Comparison

iii. Compare each of the solutions based on the criteria identified, including your own product design using a comparison diagram.
iv. Describe how the solution changes processes in the problem domain and how those changes improve the problem domain for users.

Financial Application Comparison

Comparison Matrix: Financial Application

	Auto Prophet (Our Solution)	Robinhood	Fidelity	Acorns	Crypto.com
Mobile App	**No**	Yes	Yes	Yes	Yes
Website	**Yes**	Yes	Yes	Yes	Yes
Cryptocurrency trading capabilities	**No**	Yes* (Limited selection)	Yes* (Limited selection)	No	Yes
Retirement Planning Assistance	**No**	Yes	Yes	Yes	No
Risk Analysis Feature	**Yes**	Yes* (Limited selection)	Yes	No	No
Education System	**Yes**	Yes	Yes	Yes	Yes

Mobile App: This feature was compared because of its role in opening the availability of the tool to a larger market segment of users.

Website: This feature is the most important criteria for the platform. It allows users to access the platform on essentially any device.

Cryptocurrency trading capabilities: This feature is important because it expands the overall investment options for users and has seen a massive increase in interest in the past 4-5 years.

Retirement Planning Assistance: This feature caters to those who want to be financially prudent and plan ahead for their retirement.

Risk Analysis Feature: This feature is important because it allows for users to see how a company is in terms of the risks that are relevant to it.

Education System: This feature is important because it is important for users to be familiar with the investments they are working with and getting an idea of how they work.

Financial ChatBot Comparison

Comparison Matrix: Financial ChatBot

Feature	Our Chatbot	AI Platforms (ChatGPT, Claude, Google Gemini)	Cleo	Betterment	IBM Watson
Specialized in Finance	✅	❌	❌	❌	❌
Provides Personalized Financial Advice	✅	❌	✅	✅	✅
Real-Time Financial Assistance	✅	✅	✅	✅	✅
Ethical Data Handling & Privacy	✅	✅	✅	✅	✅
Data Accuracy with Verified Sources	✅	✅	❌	✅	✅
Targeted at Non-Financial Users	✅	❌	❌	❌	❌

Specialized in Finance: This feature was compared because the chatbot's ability to focus solely on finance allows it to provide more accurate and relevant insights, particularly for novice users. AI platforms like ChatGPT are general-purpose tools that may not always cater specifically to financial needs.

Provides Personalized Financial Advice: The chatbot's ability to provide tailored advice sets it apart from many AI platforms. While platforms like Cleo and Betterment offer some level of personalized advice, our chatbot takes it a step further by offering a broader range of financial topics and personalized interactions.

Real-Time Financial Assistance: This feature is crucial for users seeking immediate answers and support. Our chatbot, along with other platforms like Cleo and Betterment, provides real-time help,

making financial decision-making more accessible.

Ethical Data Handling & Privacy: Ethical considerations are vital in financial platforms. Our chatbot prioritizes the user's privacy and ethical data handling, ensuring that their financial data is secure, which is a common feature across all platforms like IBM Watson, Betterment, and Cleo.

Data Accuracy with Verified Sources: The chatbot ensures that all financial advice is backed by reliable, verified sources, increasing the trustworthiness of the information provided. This sets it apart from Cleo, which does not always guarantee the accuracy of its sources.

Targeted at Non-Financial Users: A key strength of our chatbot is its accessibility to non-financial users, helping them understand and make informed decisions about their finances. Unlike other AI platforms, Cleo, Betterment, and IBM Watson cater more to users with at least some financial knowledge or expertise.

Financial Analysis

i. Assume you were to start a company around this product. Conduct a financial analysis of the proposed solution that includes:

Financial Application

Overview of Financial Analysis for Development

In conducting a comprehensive financial analysis, our team has undertaken the task of estimating the expenses involved in developing the Auto Prophet stock investment application.

Assessment Tool and Methodology

Leveraging a user-friendly online tool provided by appdevelopmentcost.com, we meticulously assessed various factors influencing the development costs. This tool facilitated our analysis through a structured questionnaire comprising 21 questions. These questions spanned critical aspects such as software platforms, application security, data storage, utility features, team dynamics, and application quality, among others.

Key Questions and Responses

Each question presented a range of response options tailored to mirror the specific requirements and functionalities of Auto Prophet. Our selections were made based on a careful consideration of the application's unique needs and desired outcomes. Subsequently, the tool computed an estimated total expense range reflective of the development scope envisioned for Auto Prophet.

Outlined below are the key questions utilized in our assessment, along with the corresponding responses chosen to customize the development of Auto Prophet:

- Questions:
    - 1) Which platforms will you use for your app?
        - Web App
        - Running Total Min - $13,536
        - Running Total Max - $16,197
    - 2) Do you need an icon for your app?
        - Yes
        - Running Total Min - $14,100
        - Running Total Max - $16,872
    - 3) How do you wish to secure your app?
        - Data Encryption
        - Running Total Min - $15,792
        - Running Total Max - $18,897
    - 4) Which option would you like to store your application data?
        - Cloud Database
        - Running Total Min - $18,894

- - ■ Running Total Max - $22,608
  - ○ 5) Select all of the login features that you need in your app.
    - ■ Email user login
    - ■ Running Total Min - $24,534
    - ■ Running Total Max - $29,357
  - ○ 6) Select all of the media features that you need in your app
    - ■ Audio Playback, Video Playback
    - ■ Running Total Min - $31,302
    - ■ Running Total Max - $38,071
  - ○ 7) Select all of the utility features that you need in your app
    - ■ User profiles, Search Bar
    - ■ Running Total Min - $40,044
    - ■ Running Total Max - $48,531
  - ○ 8) Select all of the ux features that you need in your app
    - ■ Push notifications, Activity feed
    - ■ Running Total Min - $50,196
    - ■ Running Total Max - $60,884
  - ○ 9) Select all of the general features that you need in your app
    - ■ Ads
    - ■ Running Total Min - $55,131
    - ■ Running Total Max - $66,789
  - ○ 10) Select the amount of third-party services that your app will include
    - ■ 3
    - ■ Running Total Min - $80,511
    - ■ Running Total Max - $98,312
  - ○ 11) Select any additional feature that you need to include
    - ■ 2-Factor Authentication
    - ■ Running Total Min - $86,856
    - ■ Running Total Max - $106,192
  - ○ 12) Do you need a tablet version for your app?
    - ■ No
    - ■ Running Total Min - $86,856
    - ■ Running Total Max - $106,192
  - ○ 13) What level of design are you planning to have in your app?
    - ■ Custom
    - ■ Running Total Min - $96,096
    - ■ Running Total Max - $115,432
  - ○ 14) How many screens will your app have?
    - ■ 10 to 25
    - ■ Running Total Min - $92,893
    - ■ Running Total Max - $111,638
  - ○ 15) On average, how many users will use your app?
    - ■ 1,000 - 10,000
    - ■ Running Total Min - $89,690

- ■ Running Total Max - $107,843
  - ○ 16) How much time can you be available for the development team? Weekly meetings, sprint review, etc
    - ■ 4 hours every week
    - ■ Running Total Min - $89,690
    - ■ Running Total Max - $107,843
  - ○ 17) How much experience do you have building mobile apps?
    - ■ I have never been involved in this process before.
    - ■ Running Total Min - $107,628
    - ■ Running Total Max - $129,412
  - ○ 18) What's the state of your mobile app?
    - ■ I have a solid idea of what I want to build but I need to define some specific features
    - ■ Running Total Min - $125,565
    - ■ Running Total Max - $150,980
  - ○ 19) What level of quality/fidelity do you need for your app?
    - ■ Medium Quality
    - ■ Running Total Min - $135,224
    - ■ Running Total Max - $163,059
  - ○ 20) How are you planning to manage your project? (Project Manager)
    - ■ It will be managed by the internal team (Only if you are sure of your team capabilities)
    - ■ Running Total Min - $135,224
    - ■ Running Total Max - $163,059
  - ○ 21) Do you have a web version of your app ready?
    - ■ Yes
    - ■ **Total Min - $113,009**
    - ■ **Total Max - $135,277**

Cost Breakdown and Estimates

Following the completion of the development cost demonstration, our team received a comprehensive summary encapsulating the outcomes derived from the questionnaire responses. The summary provided detailed insights into the projected resources required for the development of our stock investment software application.

According to the summary, the estimated time investment for the development process spans from a minimum of 2,260 hours to a maximum of 2,706 hours. Concurrently, the anticipated financial outlay is projected to fall within a range of $113,009 (minimum) to $135,277 (maximum) to realize the construction of our application. These figures serve as crucial benchmarks for our budgeting and resource allocation considerations as we progress further into the implementation phase of our project.

Employee Compensation Strategy

Furthermore, in our endeavor to plan for the various contingencies associated with the development process, our team has conducted a comprehensive breakdown of employee compensation. While the exact

number of employees for this nascent venture remains undetermined, we have gathered pertinent information regarding the anticipated salaries for potential team members.

Considering the prevailing market conditions, particularly in North America, where our operations are expected to primarily unfold, the average hourly rate for App Development team members is approximately $60. This rate serves as a foundational benchmark for our compensation structure.

Exploring various staffing options, we have delineated the following salary expectations:

1. **In-house Developers:** Opting for an in-house development team entails significant investment, with the average annual salary for an app developer in the US hovering around $116,554.

2. **Freelancers:** Alternatively, engaging freelance developers presents a potentially more cost-effective solution, especially for smaller projects or specialized expertise requirements. According to data from Upwork, the average hourly rate for freelance app developers ranges from $13 to $60.

These salary projections enable us to formulate a compensation strategy tailored to the needs and dynamics of our startup venture. Such considerations are integral to ensuring the attraction and retention of top talent essential for the successful execution of our stock investment software application project.

Financial ChatBot

Introduction: Unique Market Positioning
Our app's fusion of traditional brokerage services with a language model assistant fills a critical gap in the market of finance. Unlike standalone financial information platforms, our app doesn't just provide real-time market data and analysis; it facilitates direct trades within the platform, offering users a seamless investing experience. Additionally, our AI chatbot allows users greater accessibility to financial information, catering specifically to novice investors, enabling them to build a solid foundation in finance and trading.

Market Demand and Opportunity
In assessing the commercial potential of our product, the demand for accessible yet comprehensive investing platforms is evident. As more individuals venture into online investing without extensive financial knowledge, there's a growing need for solutions that provide not only trading capabilities but also educational resources and risk management tools. With the increasing popularity of self-directed investing, particularly among younger demographics, our app is poised to capture a significant market share by offering a holistic solution that addresses these needs. By providing novice investors with the necessary tools and support to navigate the financial markets confidently, our app stands to attract a wide user base and establish itself as a leader in the online investing space.

Third-Party Service Estimate: Financial AI Chatbot
Below is an estimate of what a 3-tiered third party service would look like for the Financial AI Chatbot:

Basic $5/month	Pro $30/month	Enterprise $200/month
• Low-depth chatbot assistant • Designed for individual persons with small portfolios.	• Standard-depth chatbot assistant • Designed for small business finance and multiple sizeable portfolios	• High-depth chatbot assistant • Designed for intense, perpetual analysis of complicated portfolios on a large scale.

Financial Conclusion

ii. Based on your analysis, describe whether the product is worthy of investment.

Based on the financial analysis conducted, AutoProphet appears to be a promising investment opportunity. Here are some key points supporting this conclusion:

Market Potential: The market analysis indicates a growing trend of individuals venturing into online investing without a solid foundation in finance. AutoProphet addresses this need by offering comprehensive financial analysis tools and educational resources tailored for novice investors. With an increasing number of people interested in self-directed investing, especially among younger demographics, there is a substantial market for an investing platform that can be tailored to a user like the autoprophet language model can.

Competitive Advantage: AutoProphet's unique selling proposition lies in its seamless integration of traditional brokerage services with comprehensive financial insights and educational content. This approach sets it apart from competitors by providing a one-stop solution for investors, combining the users needs with its capabilities as a risk analysis tool and educational resources.

Revenue Potential: The pricing model, whether subscription-based, freemium, or transaction-based, can generate revenue streams from a diverse user base. With a well-thought-out marketing strategy and targeted user acquisition efforts, AutoProphet can attract a significant number of users and convert them into paying customers.

Break-Even Analysis: While the initial development and ongoing maintenance costs are substantial, the break-even analysis can provide insights into the timeline for recovering these costs and achieving profitability. Factors such as user growth, retention rates, and average revenue per user will influence the breakeven point.

ChatBot Value: By combining seamless trading with accessible financial education, the app addresses the growing demand for user-friendly investing platforms. Its unique integration of brokerage services and AI support positions it to capture a wide audience, particularly novice investors, establishing a competitive edge in the online investing market.

Future Growth: As the platform gains traction and establishes itself as a trusted resource for investors, there is potential for scalability and expansion into new markets or additional features. Partnerships with financial institutions or integration with other financial services could further enhance AutoProphet's value proposition.

Overall, considering the market demand, competitive advantage, revenue potential, and strategic growth opportunities, AutoProphet appears to be a worthy investment for stakeholders looking to enter the financial technology space and capitalize on the growing trend of online investing. However, thorough due diligence, market validation, and ongoing monitoring of key performance indicators (KPIs) will be essential to ensure the success and sustainability of the investment.

Management

Management Practices

i. Describe the management practices that you used throughout the semester.

During the semester, the management structure for the Scrum teams focused on clear roles and consistent communication. Scrum masters were assigned to three teams: Application Development, Database Management, and Quality Assurance. The key responsibilities of the Scrum masters included organizing the Daily Stand-Ups, Sprint Planning, Sprint Review, Sprint Retrospective, and Product Backlog Refinement. The Scrum master was also in charge of maintaining the PI Board, SCRUM boards, and ensuring the smooth flow of work between teams.

In addition to these Scrum ceremonies, team-specific communication strategies were set in place using platforms like Discord, where team channels were created for project discussions, and voice channels were available for meetings. Resources for each meeting (e.g., meeting templates for Sprint Planning, Sprint Review, etc.) were provided through Notion, Google Docs, and Google Sheets, ensuring standardized documentation and efficient collaboration.

A key part of management involved tracking sprint progress through Weekly Trackers and keeping PI Boards updated with Sprint objectives. It was essential to ensure that these updates reflected the current state of tasks and goals to avoid confusion later in the semester.

Recommended Practices

 ii. Describe what worked well.

The management practices that worked well included:

Clear Structure and Consistency
Having a well-defined schedule for each Scrum ceremony (Daily Stand-Ups, Sprint Planning, Sprint Reviews, etc.) allowed teams to remain on track and manage their workload effectively. By adhering to a

regular cadence, teams knew when to expect discussions and could plan accordingly.

Standardized Documentation
The use of meeting templates (e.g., Notion and Google Docs templates) helped teams maintain consistent meeting notes. This ensured that all necessary information was recorded and available for reference.

Communication Channels
Discord was highly effective for real-time communication, particularly with a mix of text channels for team discussions and voice channels for meetings. The clear organization of channels (e.g., specific channels for project discussions and a side-channel for more private conversations) helped ensure that communication was streamlined.

Flexibility in Tools
By offering multiple tools (Notion, Google Docs, Google Sheets), teams could choose what suited their workflow best. This flexibility supported diverse needs and improved overall productivity.

Changes Over the Course

 iii. Describe changes you made to practices throughout the semester.

Scrum Master Change for QA Team: Midway through the semester, the Scrum master for the Quality Assurance team changed. To facilitate the transition and ensure continuity, I created a communication guide to help the new Scrum master get up to speed. This documentation not only supported the Scrum master but also helped the rest of the team adjust to the change. As a result, the team felt more confident and better prepared for the challenges ahead.

Documentation Consistency: Initially, documentation practices were applied midway through the semester, which led to some confusion and delays. Teams were often unaware of certain expectations for documentation, like updating the Weekly Tracker or maintaining the PI Board. To address this, clearer guidelines were provided later, ensuring that everyone understood their roles from the start. This was critical for streamlining processes and avoiding future discrepancies.

Future Recommendations

iv. Describe what you would have kept the same or done differently if you were to continue to develop the system.

Management Practices

Establish Documentation Practices at the Start

One of the key lessons learned is that documentation should be established at the beginning of the semester, not midway through. Not every team member or Scrum master is familiar with Scrum practices, and having clear templates and guidelines from the start would help bridge this knowledge gap. Even with resources provided, some individuals struggled to grasp the expectations for documentation, particularly with tools like Notion and the PI Board. Starting early with detailed expectations would ensure everyone is on the same page.

Include More Scrum Education
A suggestion for future teams would be to include a training or onboarding session on Scrum practices and tools at the beginning of the semester. This would help individuals, especially those new to Scrum, understand the roles, ceremonies, and the importance of tracking progress accurately. It would also reduce the learning curve and improve team cohesion.

Review and Update Communication Channels Regularly
While Discord was effective for the most part, it's important to evaluate how well it's working regularly and to refine the structure if necessary. In future iterations, it would be beneficial to review how team members are using communication channels and determine if additional guidelines or tools might be needed for more efficient collaboration.

Implement a Clearer Transition Plan for Scrum Master Changes
While the communication guide for the Scrum master transition was successful, creating a more formalized process for onboarding new Scrum masters would streamline future transitions. This would ensure a smoother process and reduce any potential confusion when there are role changes.

Financial Application & ChatBot

Continuous Data and NLP Updates
Keeping the AI chatbot updated with new data and enhanced natural language processing (NLP) capabilities ensures that AutoProphet remains competitive in the ever-evolving financial technology landscape. Regular updates to its financial domain knowledge will allow the chatbot to provide more accurate and contextually relevant responses, enhancing its reliability and utility. This continuous improvement cycle ensures that the platform evolves alongside market trends and user needs, maintaining its status as a cutting-edge, user-centric financial assistant.

Interactive Education Features for Financial Literacy
Incorporating education sections with interactive and engaging content can significantly improve financial literacy among users. By adding features such as quizzes and gamified learning modules, the platform can cater to different learning styles and levels of expertise. For beginners, these resources can simplify complex financial concepts, while advanced users can benefit from deeper insights into investment strategies and market dynamics. Expanding the educational offerings ensures that the platform remains a valuable tool for users at all stages of their financial journey, fostering a more informed and confident investor base.

Personalized Investment Recommendations through AI
Incorporating advanced AI technologies into the AutoProphet chatbot can improve the user experience by providing tailored investment recommendations. By analyzing user behavior, financial goals, and market trends through machine learning models, the platform can offer actionable insights that align with individual preferences and investment strategies. These personalized recommendations not only make the platform more intuitive but also empower users to make informed decisions with confidence. Whether a user is a novice or an experienced investor, this feature ensures that each interaction feels relevant, adding immense value to their financial journey.

Real-Time Data Integration for Live Updates
Integrating real-time data feeds directly into the chatbot would allow it to provide live updates on market trends, stock performance, and other critical financial metrics. Users could ask for the latest updates or projections and receive instant, accurate information, enhancing the chatbot's utility for active traders and investors. This feature would make the chatbot indispensable for users seeking timely insights and informed decision-making.

User Feedback for Iterative Learning
Finally, the chatbot could include a feedback mechanism to learn from user interactions. By collecting and analyzing feedback, the chatbot can identify areas for improvement and adapt its responses over time. This iterative learning process ensures the chatbot evolves with user expectations and continues to deliver an exceptional experience tailored to their needs.

Appendices

Appendix A: [Charter Document](#)

Appendix B: [Vision Document](#)

Appendix C: [PI Board](#)

Appendix D: [ERD Diagram](#)

Appendix E: [Data Guidelines](#)

Appendix F: [Notion](#)

Appendix G: [Final MIS 4000/5000 Presentation](#)

Appendix H: [BA5200 Business Report](#)

Appendix I: [GitHub Management](#)

Appendix K: [GitHub Workflow](#)

Appendix L: [Backend Demo](#)