WASHINGTON COLLEGE

PERSONAL PORTFOLIO
SOFTWARE ENGINEERING

REAL-TIME STOCK PORTFOLIO TRACKING SYSTEM

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March 2025

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1. INTRODUCTION

In recent years, investing has quietly transformed. What was once an exclusive domain for professional traders, wealthy families, and large corporations has gradually become accessible to everyday individuals. The stock market is no longer just a symbol of economic power; it is now a space where people from all walks of life can work towards building wealth, securing their financial future, or simply learning how the global economy operates. This change didn't happen overnight. It was fueled by technological advancements, the rise of social media's influence, and a growing recognition that financial literacy is no longer a luxury but a necessity.

Yet, for many newcomers, entering the world of investing isn't easy. It often comes with confusion, uncertainty, and a feeling of not belonging. Many existing platforms are built with experienced professionals in mind. They rely on technical jargon, present overwhelming charts, and display data in ways that can alienate those without prior knowledge. For beginners, the challenge isn't just the financial risk; it is also the sense of being outsiders in a system that feels inaccessible and unwelcoming.

Our project seeks to bridge this gap. The Stock App is not just a tool to track stock prices; it is a gateway to empowerment, designed specifically for first-time investors who are eager to take control of their finances but need a helping hand to get started. With a clean and simple interface, real-time price updates, intuitive tracking of gains and losses, and easy portfolio management, the app aims to make investing approachable and as natural as managing a savings account or budgeting.

Beyond its features, the app recognizes the emotional journey of investing—the excitement of seeing a stock rise, the stress of market dips, and the confidence that comes from making informed choices. Whether users are saving for retirement, preparing for a future goal, or simply exploring the market out of curiosity, this Stock App is designed to support them every step of the way. It is not about turning everyone into a financial expert but about giving people the tools and confidence to participate in a world they've long been told wasn't meant for them.

2. AIM STATEMENT

Our project focuses on creating a stock tracking app that is simple, accessible, and designed specifically for beginner investors who may find traditional trading platforms intimidating. The goal is to provide a clear, user-friendly experience where users can track and understand stock performance without needing advanced financial knowledge. By simplifying the process, we aim to make investing approachable for a broader audience and help new investors build confidence as they explore the stock market.

The app's primary focus is on simplicity and ease of use. Users will be able to monitor their selected stocks effortlessly, viewing straightforward performance data that compares a stock's progress over days, months, or even years. Managing a personal portfolio will be seamless, allowing users to add or remove stocks with minimal effort. To keep users informed without requiring constant market surveillance, the app will include optional notifications when a stock shows consistent underperformance over time.

To deliver this experience, the app will connect to a reliable stock market API, ensuring that users have access to accurate, real-time data. This information will be displayed through a clean

and intuitive interface that emphasizes clarity over complexity, making it suitable for users of all experience levels.

The Starter Page will introduce users to the app and act as their central navigation hub. It will feature a Bottom Navigation Bar for quick access to key sections, such as a Search Page for discovering new stocks and a Portfolio Page for managing saved stocks. To support beginners, the Starter Page will also include a brief Introduction Section, explaining the basics of stocks and how to use the app in simple terms. This onboarding feature will help even complete novices feel comfortable and confident as they begin their investing journey.

The Portfolio Page will provide a comprehensive overview of the user's investments. It will display their current portfolio with detailed information about each stock's performance, including daily gains and losses as well as long-term trends. Users will have the option to remove stocks from their portfolio as needed, and the app will generate alerts if a stock experience sustained losses for more than a week, giving users the opportunity to reassess their strategies.

The Stock Exploration Page will highlight stocks that the user has not yet added to their portfolio. Each stock will include a short description to offer context, especially for beginners unfamiliar with certain companies or industries. Users will be able to view basic performance data, daily gains and losses, and easily add stocks to their portfolio with a single button. A "favorite" option will allow users to save stocks for future reference, while filter tools will make it simple to sort through available options. For those who want to dive deeper, the page will also provide links to external resources for further research.

Through this design, the app will go beyond offering practical stock tracking tools. It will foster a sense of confidence and understanding in beginner investors, empowering them to take an active role in managing their financial future. By combining functionality with accessibility, the app will encourage users to engage with the stock market in a way that feels approachable and rewarding.

3. TARGET AUDIENCE & SEGMENTATION

This section focuses on identifying the project's primary target audience, emphasizing key psychographic and behavioral traits that influence the tool's design and functionality. By analyzing these core characteristics, we can create a user experience specifically tailored to the needs of those who will gain the most value from it. Audience segmentation serves as a clear guide, enabling us to prioritize the right features and ensure the tool stays relevant and effective for its intended users. The goal of this section is to provide a detailed understanding of who these users are and what motivates their decisions, helping to fine-tune the tool's purpose and direction.

3.1. OUR MAIN TARGET AUDIENCE

The primary target audience is made up of professionals in the finance industry, specifically those involved in investments, such as stock analysts, portfolio managers, and financial

advisors. These individuals have a deep understanding of the market and depend heavily on data to guide their decisions. For them, each choice is a calculated move based on factors like market trends, economic indicators, and statistical analysis. As a result, this group has a data-driven mindset, placing strong emphasis on efficiency, precision, and reliability. They aren't just looking for tools to manage investments—they need solutions that enhance their decision-making by delivering real-time insights and trustworthy information critical to their daily work.

From a behavioral perspective, this audience demonstrates specific patterns that influence the type of tools they prefer. They are avid users of stock tracking platforms, constantly monitoring market movements and staying informed on the latest financial news. Frequent trading is part of their routine as they actively seek opportunities to optimize their portfolios. These professionals are highly engaged with financial data and trends, always searching for ways to outperform competitors and improve their strategies. The tool they use must deliver actionable, real-time data, enabling them to conduct in-depth stock analysis, make predictions, and forecast financial outcomes without delay. Additionally, they often rely on external platforms or services, meaning the tool should integrate seamlessly with their existing systems or provide comparable advanced features. This audience typically has a strong foundation in economics, business, or finance and frequently uses sophisticated analytics to ensure their decisions are as accurate and informed as possible.

3.2. NOT OUR MAIN TARGET AUDIENCE

The secondary target audience or the rest of the audience, in contrast, includes casual investors and retirees. Unlike active traders, this group focuses more on long-term financial security rather than the fast-paced nature of daily stock trading. Psychographically, they tend to take a more cautious. In contrast, the secondary target audience consists of casual investors and retirees. This group is less active in the fast-paced world of daily stock trading and places greater emphasis on long-term financial stability. Psychographically, they exhibit a more conservative approach to investing, preferring reliable, steady, long-term options over the more volatile, short-term gains that often dominate financial news. They seek trust and security in their investments rather than the speed and efficiency valued by more active market participants. For these individuals, a secure, thoughtful investment strategy that avoids unnecessary risks is paramount. Their focus is on creating a sustainable financial future, often with the goal of growing their wealth slowly and steadily over time.

Behaviorally, this secondary group tends to rely on financial advisors or other trusted sources for decision-making, rather than engaging in the frequent checking of stock performance. They are not as involved in day-to-day market fluctuations but rather take a patient approach to managing their portfolios. Their engagement is more passive in nature, as they typically buy and hold stocks for longer periods. As such, their need for real-time stock tracking tools may not be as pressing as it is for the primary target group. Instead, they would likely benefit from tools that allow them to track significant market events, receive notifications about major movements, and be alerted when a larger shift in the market occurs that could affect their long-term investments. These investors tend to avoid high-risk assets, opting instead for safer, more stable options such as index funds and bonds. Their primary goal is to protect their capital and enjoy moderate, but steady, returns over time without the anxiety of risky short-term trades.

4. USER PERSONAS

The "User Persona" section is designed to represent the various types of users who could benefit from the investment platform, based on an in-depth analysis of their needs, behaviors, and challenges. These personas were developed through research that aims to capture not only the users' goals and motivations but also their frustrations and limitations within the financial landscape. Rather than simply describing user profiles, this section seeks to explore the relationship between the individual and the platform. This approach ensures that every design decision is guided by the real needs of the users, resulting in a more tailored and impactful experience.

4.1. JAKE

Jake is 43 years old and works as a Senior Financial Analyst. He was recently promoted, which has increased his workload, leaving less time to monitor his investments. Currently, Jake must check multiple sites to keep track of his portfolio, which is slow and inefficient. His main need is an app that centralizes his entire portfolio in one place, with real-time updates, automatic alerts for sudden changes, and robust security. Jake is looking to streamline his workflow and make informed decisions without wasting time, helping him maximize returns and minimize risks. In addition, he would like the app to be customizable and visually clear, with tools such as automatic profit and loss calculations.

4.2. CHAD

Chad is a 31-year-old father of two who lives a middle-class life with his wife. Although financially stable, he and his wife are concerned about the future cost of their children's college tuition. Chad wants to start investing to secure that fund, but he's a novice investor with no time to constantly monitor the market. He needs a simple, clear app, free of complex financial jargon, that allows him to track his investments, receive key alerts, and set long-term goals. His priority is stability and sustained growth, not risky bets, and he wants to feel like his money is working for his family without causing him additional stress.

4.3. JOHN

John is a 38-year-old office worker who wants his savings to grow beyond a bank account. In his spare time, he researches the stock market, comparing stocks in Excel to find the best opportunities. Although he likes analyzing data, the process is very tedious, and he would like to have an app that shows him the historical performance of stocks and offers clear visualizations to speed up his decisions. His goal is to diversify his investments and ensure a solid financial future, without wasting hours on manual processes. He is looking for a tool that combines historical data, intuitive graphics and timely alerts to act at the right time.

4.4. RICHARD J. SMITH

Richard is 21 years old and comes from a wealthy family. His parents gave him a small portion of their inheritance to invest as proof of his financial ability. If he manages to grow that capital responsibly, he will receive a larger sum. Richard is not looking for risky investments, but for steady and safe growth. Without deep experience in finance, he needs an app that makes it easy for him to track profits and losses, assess risks, and receive clear alerts on the performance of his investments. In addition, he wants predictive tools to better plan and demonstrate to his family that he can manage the family assets prudently.

4.5. ZEKE

Zeke is a 29-year-old office worker who dreams of a lucky break that will make him rich. His investment strategy is reactive, based on viral trends and advice from communities like r/WallStreetBets. He buys and sells stocks impulsively, guided more by emotion than analysis. After several losses, he realizes he needs an app that helps him better understand his investments, showing smart analysis, risk alerts, and comparisons to the market. He seeks a tool that gives him real context, helping him make more rational decisions and avoiding the trap of mindlessly following the hype.

4.6. BEN

Ben, 62, is close to retirement and wants to ensure that his investments provide him with stability and peace of mind during his retirement. He is looking for a simple and clear tool that allows him to monitor the performance of his portfolio without technicalities, alert him to major declines and suggest when to move his money to safer options. His priority is to protect his savings so he can enjoy his free time with his grandchildren, without the stress of complex financial decisions.

5. VALUE PROPOSITION

When thinking about investment apps, it's easy to assume that every user has the same goal: making money. But the reality is far more nuanced. Investments aren't just about numbers, they are deeply personal, shaped by fears, habits, knowledge gaps, and an individual's stage in life. With this perspective, it becomes clear that Jake, Chad, John, Richard, Zeke, and Ben don't need just another generic investment app. They need a tool that understands why they invest, how they make decisions, and what they fear losing. This tool must adapt to their unique needs and realities.

Jake's struggle highlights the frustration of fragmented control. Every day, he juggles multiple platforms, each with a complicated interface, just to answer a simple question: how are my investments doing? Even then, his biggest concern remains. What if something goes wrong while he's not paying attention? For Jake, the app would serve as a unified hub for his financial world, alerting him to important changes and giving him the one thing all investors long for: peace of mind, supported by robust security measures like two-factor authentication.

Chad's story is different. He's not just investing in himself but in his children's future over the next 18 years. His challenge isn't just finding good investments but also deciphering the complex language of finance. Every term and report feel like a puzzle he can't quite solve. Chad needs an app that communicates clearly, cutting through jargon and offering straightforward insights into long-term growth trends. It should also provide digestible updates he can read between soccer practice and late-night work emails. For Chad, understanding isn't a luxury, but essential to securing his family's future.

John takes a more analytical approach, but his biggest obstacle is time. Investments are like side projects for him, and he can only check them in short bursts. His once-detailed Excel sheets are now neglected. John needs an app that transforms raw data into clear, meaningful graphs with historical performance available briefly. He doesn't want to dig for patterns but wants them to surface automatically. Alerts would act as his second set of eyes, ensuring he doesn't miss critical moments when a stock shifts from good to bad.

Richard J. Smith approaches investing with a different mindset. For him, it's about image and reputation. Every investment must prove something: that he knows what he's doing. This pressure to perform means he needs constant, clear data on profit, loss, and future potential. For Richard, the app needs to be much more than a tool, it must be the proof of his expertise. Whether the investment horizon is long-term or short-term, every recommendation must feel strategic and precise, not vague or generic.

Zeke's story is a cautionary tale about emotional investing. His past mistakes reveal a pattern, buying during hype and selling out of fear. What Zeke truly needs isn't just data; it's perspective. He needs an app that tracks his losses, not to reprimand him, but to educate him. Features like historical insights, objective comparisons, and calm analyses would serve as his guide in moments of emotional decision-making. For Zeke, the app wouldn't just be a tool; it would act as a financial mentor, helping him shift from impulsive behavior to strategic thinking.

Then there's Ben, who is balancing the delicate line between retirement and security. Every withdrawal feels like a risk, and every market fluctuation feels personal. His current tools overwhelm him with complexity, drowning him in information without offering clarity. Ben needs simplicity, an easy way to monitor his savings, track his spending, and get meaningful alerts that translate market changes into actionable decisions. He doesn't want to become a financial expert; he just wants to know if he can sleep peacefully tonight.

Ultimately, the true value of this app isn't in its features but in its ability to see people for who they are—complicated, emotional, overwhelmed, and seeking clarity. Each user needs an app that not only organizes their investments but also understands them, their fears, hopes, and unspoken desire for control in an unpredictable world. This is more than an investment app. It's a reflection of what matters most to each investor: trust, understanding, and time.

6. USER STORIES

As a stock investor, I want to see the current price, net gain/loss, and historical performance of stocks in my portfolio so that I can track how my investments are performing over time.

As a daily stock investor, I want to create and manage folders to organize my saved stocks so that I can categorize them based on my investment strategies.

As a daily stock investor, I want a search bar to find specific stocks quickly so that I can efficiently manage and analyze my portfolio.

As a daily stock investor, I want to use preset filters to identify which stocks are worth keeping or selling so that I can make informed investment decisions more easily.

As a daily stock investor, I want to see a real-time calculation of how much I would make if I sold a stock at the current price so that I can quickly assess potential profits or losses.

As a daily stock investor, I want to see what the predictions are for the stocks with the last year in mind so that I can quickly cut any that are going downhill.

As an investor, I want a secure login system so that my investment data remains protected.

7. FUNCTIONAL REQUIREMENTS

Stock Tracking: The app should enable users to monitor the current price of stocks, their net gains or losses, and their historical performance within their portfolio.

Stock Organization: Users should have the ability to create and manage folders, allowing them to organize stocks according to various investment strategies.

Search Feature: A search bar must be included, enabling users to locate specific stocks quickly and efficiently.

Filters: The app should provide pre-configured filters to help users easily identify stocks they may want to keep or sell.

Profit/Loss Estimation: The app should calculate potential profits or losses in real-time, allowing users to see the impact of selling a stock at its current price.

Stock Trends: Based on the past year's performance, the app should present stock trends and predictions to assist users in making informed investment decisions.

Secure Login: The app must include a robust login system with two-factor authentication to safeguard user data and personal information.

8. NON-FUNCTIONAL REQUIREMENTS

Performance: The app must handle stock data and calculations in real-time to ensure a seamless and responsive user experience.

User-Friendliness: The interface must be intuitive and easy to use, accommodating users of all experience levels without the need for extensive training.

Scalability: The system should be capable of supporting more users and increasing volumes of stock data without compromising performance.

Security: The app must follow industry-standard security protocols, ensuring that personal and financial data is encrypted and fully protected.

Device Compatibility: The app should work seamlessly across multiple devices and platforms, including mobile (iOS and Android) and web browsers.

Availability: The app should be operational 24/7, ensuring users have continuous access to manage their investments with minimal downtime.

Data Backup: Regular backups must be implemented to prevent data loss in the event of a system failure.

User Interface: The app must offer a simple and user-friendly interface for specifying input and output files.