Stock Picker
Project Part 1: Proposal/Concept

University of Nevada Reno

Computer Science and Engineering

CS 425 - Software Engineering

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Stock Picker Application

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1. Abstract:

Our project aims to simplify and streamline the investment process. Previous forms of investing software are built by individuals who understand economics and trading but not simplicity and computer science. Our end project will be elegantly suggesting stocks to an individual in an intuitive way. The user will input parameters in the form of risk tolerance, geographic location, and much more; providing them with the right stock for them. An example of this is if the user doesn't like a government or industry they can opt out of certain industries, practices, policies and invest knowing they aren't doing something wrong. Further functions can be expanded upon if the user insists but it will start out small and grow as the user becomes more comfortable. By interpreting previous data sets and other stock exchange news the program will be able to provide users with an informative and simple hands on experience.

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2. Project Description:

The main goal of our project is to create a web application that enables users to make simple decisions when it comes to trading. By analyzing user preferences, our web application would present potential trades that the user could place based on a variety of factors such as risk tolerance, potential volatility, preferred industries, market sentiment, and more. We are hoping to achieve a simplified trading product that allows entry level traders to conveniently and efficiently make decisions when placing trades. We believe this product is significant and a needed tool in the current trading environment. There are

currently many services which provide easy and convenient entry into trading. However, while most of these existing services such as Robinhood provide easy access to begin trading, they leave full discretion to their users in deciding which stocks to invest their money in, with little-to-no guidance on the trades they're placing. To the inexperienced trader, this could be detrimental to growing one's account, as a potentially enticing trade may not be as appealing if they just had more information to base their decision on. Unfortunately, while trading information is readily available, it can be difficult to understand and process in a way that is meaningful to base decisions off of. That is why with our product, we aim to make the trading process more friendly to the entry-level trader by presenting all the necessary information upfront in a simplified manner, so users can make informed decisions with just a click of a button.

The main functionalities and characteristics of our project are as follows; firstly, we want the project to generate unique trades for users. It will do this by taking in the answers to a questionnaire that users will complete at the time of setup for their account and personalize its suggestions based on their answers. Secondly, we want it to serve information to users in a highly readable and approachable way. We will have multiple different boxes and charts that make info related to the trade easy to digest. Thirdly, the interface will have a stack of trade suggestions users can cycle through until they find one they like. Finally, we want the action of placing a suggested trade to be an easy one click operation. Typically placing a trade can be a convoluted process and a big obstacle and one of the key benefits of our service would be sidestepping that.

In regards to our intended audience, our intention is for our product to serve as a useful tool in simplifying trading for entry level traders. Over the last few years, the number of retail traders has been increasing, with retail trading volume peaking at 40% in the first quarter of 2021[5]. This means there has been a steady influx of new and potentially inexperienced traders into the market, all of which would be a perfect target audience for our product.

Our overall goal is to produce a good piece of software that makes trading accessible, nearly automated, and trustworthy to the inexperienced user. As far as our key usability goals go we have a few.

Firstly we want the service to be easy to use. There should be little to no self education required to utilize our trading platform. Secondly, All of the basic to mid-level information (current stock price, position value, volume of trades on ticker, etc) relevant to the trade should be easily viewable. Thirdly, the program should look professional enough to inspire trust in a tentative user.

The goal of our project is to create a simple trading platform. Once this is completed we will be in a position to add endless functions. New buttons can be added with different features showing off new skills and capabilities. Further new markets can be included such as options, futures, real estate predictions, and crypto currency. We could also add more informational graphs and diagrams. This project does not have an end and because of this our possibilities for expansion and upgrades are limitless.

The challenges and obstacles that we may encounter during development will most likely center around the technology aspect of the project. For one, being able to connect to the REST based ThinkOrSwim API that was mentioned will be a key part in getting our product to function as intended. If for whatever reason using the ThinkOrSwim API is unfeasible, we will have to determine an alternative solution to connecting our product to a brokerage. Another challenge we may face would be the front-end development for the project. As we intend for our product to be website based, we'll need to develop a solid user interface for an ideal experience. Although we expect the design aspect of site creation to go smoothly, as we have members experienced in graphic design, overall as a team, we are somewhat lacking in front-end creation. This relates to another likely challenge we'll face, which is connecting the front to the back-end and which database we end up utilizing. Though it may prove challenging, we are confident that we will be able to familiarize ourselves with using a web framework, and be able to create a visually appealing and functional website for our product.

As far as the technology we plan to use, for our framework we intend to use vue.js and HTML. For our database we're looking at using Firebase. One of our team members has used Firebase for his occupation and we feel that picking something someone one our team has some familiarity with will set us up for the best chance at success. To connect to the stock market and complete trades, we plan to utilize the ThinkOrSwim open API. ThinkOrSwim is a very popular trading brokerage that allows its user

to place trades for a small commission on each trade. If time allows we could even let our users select from multiple brokerages to place their trades. For graphics creation, one of our team members is already skilled in graphic design and will be using the Adobe Creative Cloud suite to create all assets for the project with input from teammates. Finally for web hosting we will employ the use of Microsoft Azure or a service similar in nature.

Our team members feature a diverse set of skills that will correspond to different parts of the project. Our project has many possible additions where once we get the basics done our team can hit its stride. As students of UNR we have a shared learning experience which means we should be able to understand each other's work and be able to create a productive culture. Our group subscribes to multiple fields of computer science and our previous experiences should prepare us for. Loren has a background in Salesforce development and a small amount of experience in API connections and backend programming. Colin's skills pertaining to the project include multiple years of trading experience, experience in forming trading algorithms, 3 years of formal graphic design training and certification followed by 4 years of solo study and application, experience in web development for both personal use and contracted development, and completion of a class focusing in HCI. Nicholas has a passion for big data and math. Eugene is proficient in all things AI. Henry has a couple of years of experience with trading, and has worked on a personal project that involved pulling stock data. Our team expects each other to be hands on and work on all aspects of the project whenever possible.

For our advisors, while we currently do not have an advisor set, we were given some recommendations by the teaching staff. We hope to get in contact with them soon and see if that is a path we can pursue. If that does not work out, we have the option of working with one of our members, Loren’s, work manager to potentially have him as an advisor.

This project will enable our professional growth by sharpening our coding skills and helping us to understand what we can create. We will experience first hand what it takes to create a product from top to bottom. Most important from this project we will understand the value of teamwork and how to get along

with future peers. Computer science is often a collaborative job and this will be the perfect test to see how much we need to grow.

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3. Market Potential or Open Source Significance:

As far as market potential goes, our application is very versatile and able to be used by an extremely large group of people. Since the software aims to be as accessible as possible, the scope of the potential market for something like this is huge. Over the course of the COVID-19 pandemic, there has been a huge rise in the amount of average people, also called retail investors, taking part in the stock market. A large portion of these new investors are doing so using an application called Robinhood, which is a trading app that greatly simplifies the process of trading and investing compared to traditional investment firms such as TD Ameritrade, Fidelity, and J.P.Morgan [1]. From 2019 to 2020 the number of Robinhood users increased from 10 to 13 million, and from 2020 to 2021 that amount increased from 13 million to 22.5 million [2]. The drastic increase in Robinhood users seems to indicate that a trading platform with a simplified and approachable UI has a ton of market potential and possible user interest.

Competition in this space does not seem to be very high. This could potentially compare to an app like Cashapp, which allows for very few options or trading strategies, limiting the user to only buying and selling stock[3]. However, this is really only similar to our project in terms of the simplicity of UI, and it does not recommend a trade in any capacity. As previously mentioned, Robinhood is also similar in that the UI is simplified compared to other platforms. A more direct competitor to our app may be something like Motley Fool's Stock Advisor, which gives loose investment advice and potential upward moving stocks[4]. Although even this has notable differences from our application. Motley Fool's Stock Advisor mainly gives recommendations for stocks to buy and hold, gives everyone the same recommendations, and does not allow for trades to be placed directly into a platform like Think or Swim[4].

Noteworthy competitive advantages that our app provides are user customization, compatibility for placing trades within the app, and heavy simplification for accessibility for a large audience. As previously mentioned, users can customize their ideal trading strategy to find trades that match their risk tolerance and other industry preferences. Secondly, while there are other services out there that allow for third party trading via REST API, this seems to be an underutilized practice in the industry from our research. Lastly, the application's simplicity puts it far ahead of most of the competition in terms of usability for a nontechnical audience. Although there are obviously exceptions and bigger investment firms are starting to catch up in terms of UX design, there are still few major players in this space as far as trading goes.

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4. Time Worked on Project Concept:

Table 1: Time worked distribution between team members

Member	Time (hrs)	Details
Colin Comstock	2.5	● Project Description
Loren Parvin	2.5	● Market Potential or Open Source Significance
Nicholas Rinehart	2.5	● Abstract, Project Description
Eugene Eom	2.5	● Project Description

Henry Shi	2.5	• Project Description

Works Cited:

Websites:

[1]https://www.wsj.com/articles/confetti-free-stocks-does-robinhoods-design-make-trading-too-easy-11597915801

[2]https://www.businessofapps.com/data/robinhood-statistics/

[3]https://cash.app/help/us/en-us/5000-investing

[4]https://www.fool.com/order/fe_offers/wf/0ad33e84-326c-41c2-aa87-21a6e98a8996/?c=sa-inv-btr-shop&source=isashplnk3500002&testId=op-shoppage-sa&cellId=3&campaign=sa-shop-page

[5]https://www.economist.com/finance-and-economics/2021/08/21/just-how-mighty-are-active-retail-traders