

InvestorScope

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*a seamless, intuitive way for amateur investors
to discover new investment opportunities.*

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Team

Aaron Sekhri - Speaking, Writing, Design

David McLaren - Development, Documentation

Matt Appleby - Design, User Testing, Documentation

David Khavari - Management, Development

Introduction

The system being evaluated is a mobile-first, consumer-oriented web application. The driving purpose behind this experiment is creating a stock-discovery process that is effortless and fun. We hope that this series of tests will serve as a structured and concrete way of understanding how potential customers will interact with the product, and our rationale behind the experiment is that user-centered design and iteration will be the best way to flesh out the core functionality and aesthetics of our high-fidelity prototype.

Mission Statement

To create a seamless, intuitive way for beginning to intermediate investors to discover new and under-appreciated investment opportunities.

Prototype Description

The prototype was a set of low-fidelity drawings implemented on the prototyping application POP. We drew the prototype drawings using our sketches from previous class projects as inspiration. All the screens involved in our prototype can be seen in entry one of the appendix section. We designed a home page that was the main hub for all of the activity on the application (photo 1), and the five core functions we presented on the home page were search, the ability for the customer to check the status of his or her portfolio, a stock recommendation engine (photo 2), the ability for the customer to see which stocks it is following, and finally, Market View (photo 3), our name for a data table which customers can sort by parameters of these choice to compare investment opportunities.

The three functions we implemented on the low-fidelity prototype were search, the recommendation engine, and a rudimentary version of Market View. The reason for this is that the three tasks we decided to test, in ascending order of difficulty, are search, recommendation, and Market View. The interaction ideas used were touch, swipe, and inputted text. The entire system can be seen in entry one of the appendix.

Method

Participants

The participants were all friends of friends, that we did not know. We asked some of our friends to give us the names of some of their acquaintances who we did not previously know. We asked that they be college-aged students with a casual or tangential interest in investing, as those are the customers who we focused on for our contextual inquiry. None of the participants had been previously exposed to the project and they were compensated with a coffee and a snack each. The participants were two women and one man, two were sophomores and one was a senior, and one of the three was an international student. Their names are Christina, Sevde, and Nick. We tried to increase the geographic, scholastic, and gender diversity in this round of the experiment.

Environment

We conducted the experiment in our experiment participants' dorm rooms, because that is where we hypothesize they will eventually use it. We wanted it to be in an environment that was comfortable and convenient for them, and one that they were familiar with. We conducted the experiments on the same Android tablet each time. An image of one of the experiments is in entry two of the appendix section.

Tasks

The three tasks we asked our participants to undertake, in order of difficulty, were search, using the recommendation engine, and using Market View.

Procedure

Aaron Sekhri was the computer, Matthew Appleby was the facilitator, and David McLaren was the test participant. Once we had practiced our experiment with David, we performed our experiment on our three participants in exactly the same way (entry three of the appendix is the agreement they signed with us to take part in the experiment). We first introduced them to the application, taking them through the first few pages of the application. After arriving at the home page, we gave a description of the five functions listed there (entry four in the appendix is the interview transcript). Once we made sure they understand what the application was, we gave them the tablet to complete the three tasks outlined above.

Test Measures

The test measures we used were the number of errors, the time to complete a task, and the satisfaction (out of ten) of each participant after they had completed individual tasks. We

selected these as they give us both good process data as well as good bottom-line data, which will all be put to good use in our subsequent iterations.

Results

Our results were generally good. Participants did not take too long to achieve the goals and complete the tasks we set out for them, with the surprising exception of task one. With task one, they took a long time executing the search itself, which we have duly noted. They were most pleased with task two, because they were most impressed with the idea and its implementation (with a few minor qualms that are easily fixable). They made the most mistakes with task two, but given we have identified the issue, we can suppose that it will not present too large a problem on our next iteration. Additionally, they took the most time with that task because they enjoyed using it most. They took the least time and had the least errors with our third task, but that is partially because they found it underwhelming and not particularly informative.

The logged critical incidents as well as the raw data can be found in entry five of the appendix.

Discussion

Our participants generally were pleased with the application. They liked its general functionality, the interface, and its overall aesthetic/visual style. They all said that they felt that the application was at a "good" state already; that is, there were no major revisions that they felt were necessary, no major functionality changes, and they were quite happy with the features that were already available (although two said they would have liked to explore more of what the application had to offer, even in the low-fidelity stage). We take this as a validation of our earlier decisions and are happy with the feedback. We are mindful of the fact that our experiment told us nothing about our "Following" and "Portfolio" functions, and will be careful to incorporate some of the feedback from this stage when we do implement them.

On the improvement side, they listed a number of things that they believed could make the application better. The first issue all three had was with the search feature. What was the easiest task ended up taking far more time than it should have, simply because there was no "Go" button on the keyboard, to facilitate the actual execution of the search. They were confused by what they saw on the page and we will certainly make sure that is not the case with our prototypes going forward.

One other feature they did not particularly like was the fact that the application was not as informative or educational as it could be. They felt that the recommendation engine just

seemed to spit out recommendations without any justifications, which they felt would have been useful, as that would have contributed to their overall learning.

They also wanted the homepage to look more obviously like a homepage. They did not feel as if our design captured the fact that it was the main feature hub of the application, which is something we will obviously have to change. Additionally, on the recommendations page, they hoped for a more intuitive set of cues to navigate the information, because the breadcrumbs at the bottom of the page were insufficiently informative for them.

Finally, many were confused with Market View. They did not feel that the sorting function was informative, and nor was its intuitive. They did not understand what the rankings could tell them, where they were coming from, and wished that they could rank by non-numerical parameters.

Ultimately, they were happy with the application, and appreciated the core functionality (although many disliked the way Market View had been implemented, they saw its potential, especially for non-numerical parameters). We will take all of these recommendations back to the drawing board for our next product iterations, and build a better product because of the experiments we conducted.

Appendix

Entry One - Prototypes

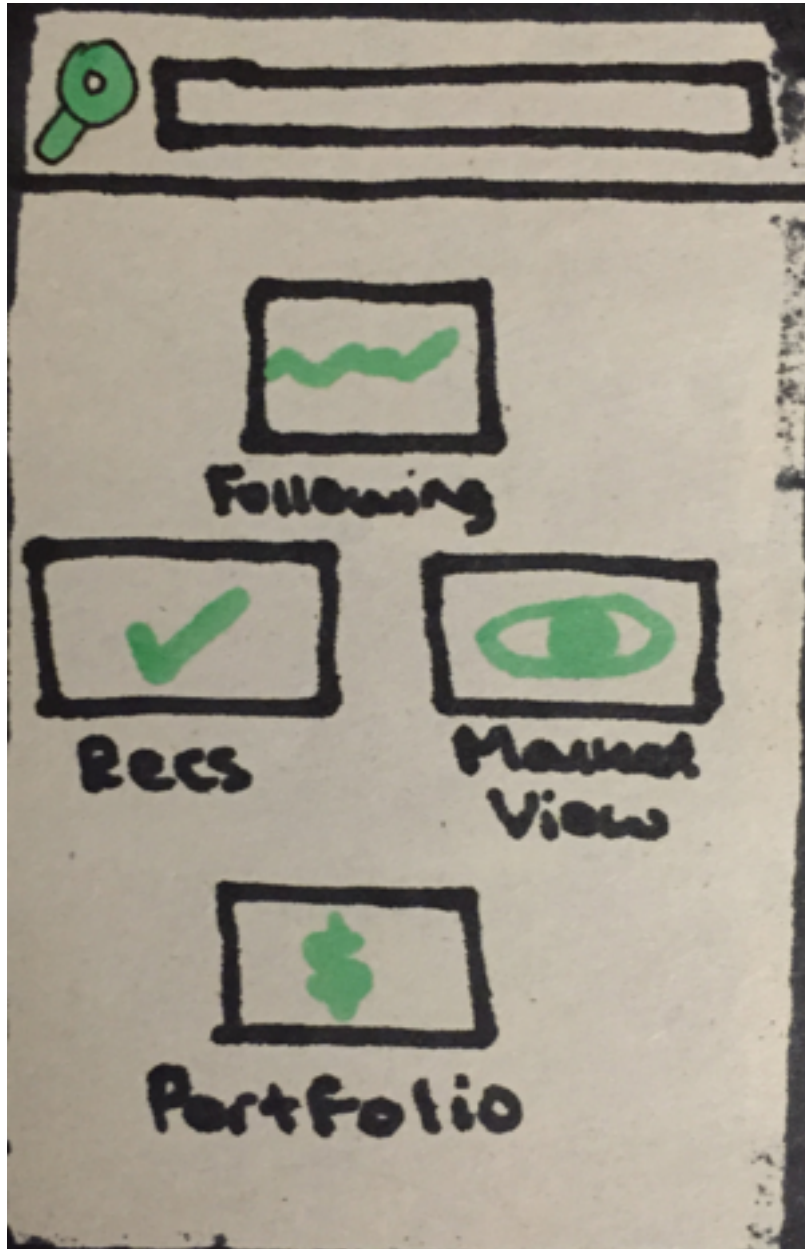


Photo 1

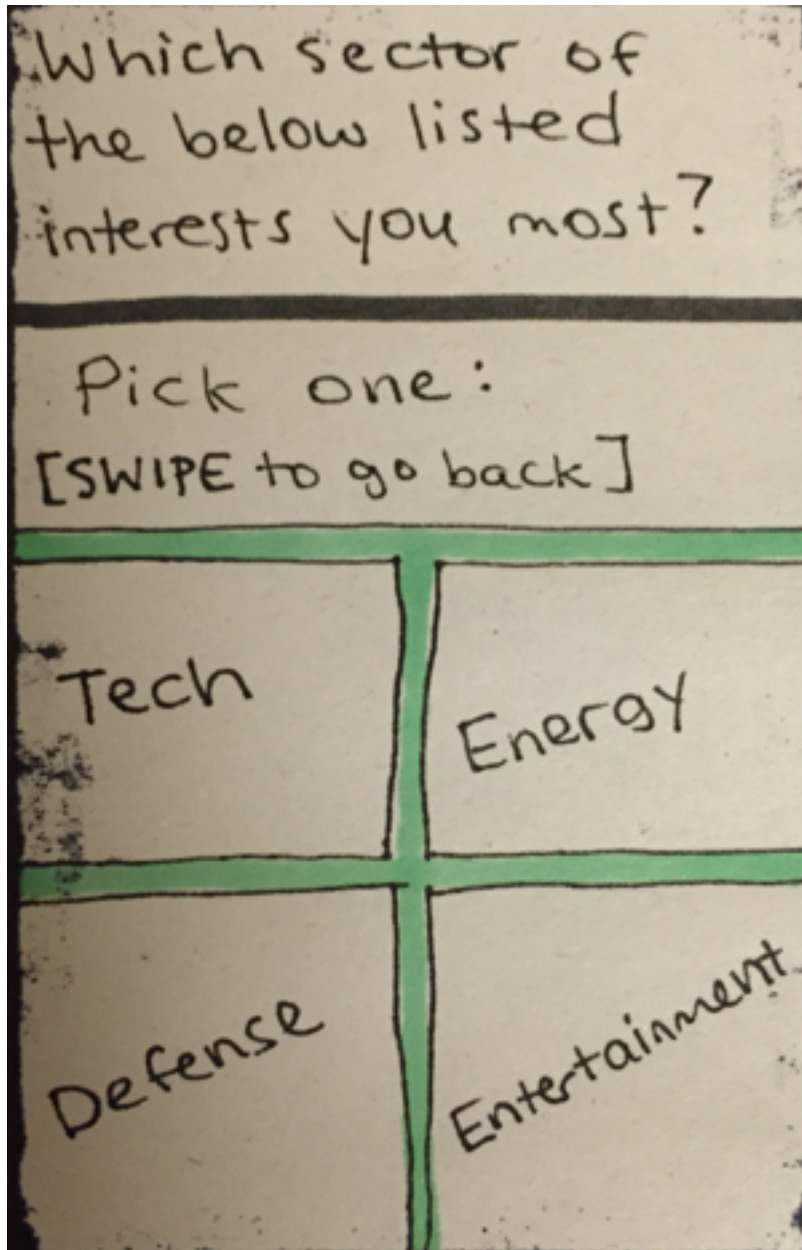


Photo 2

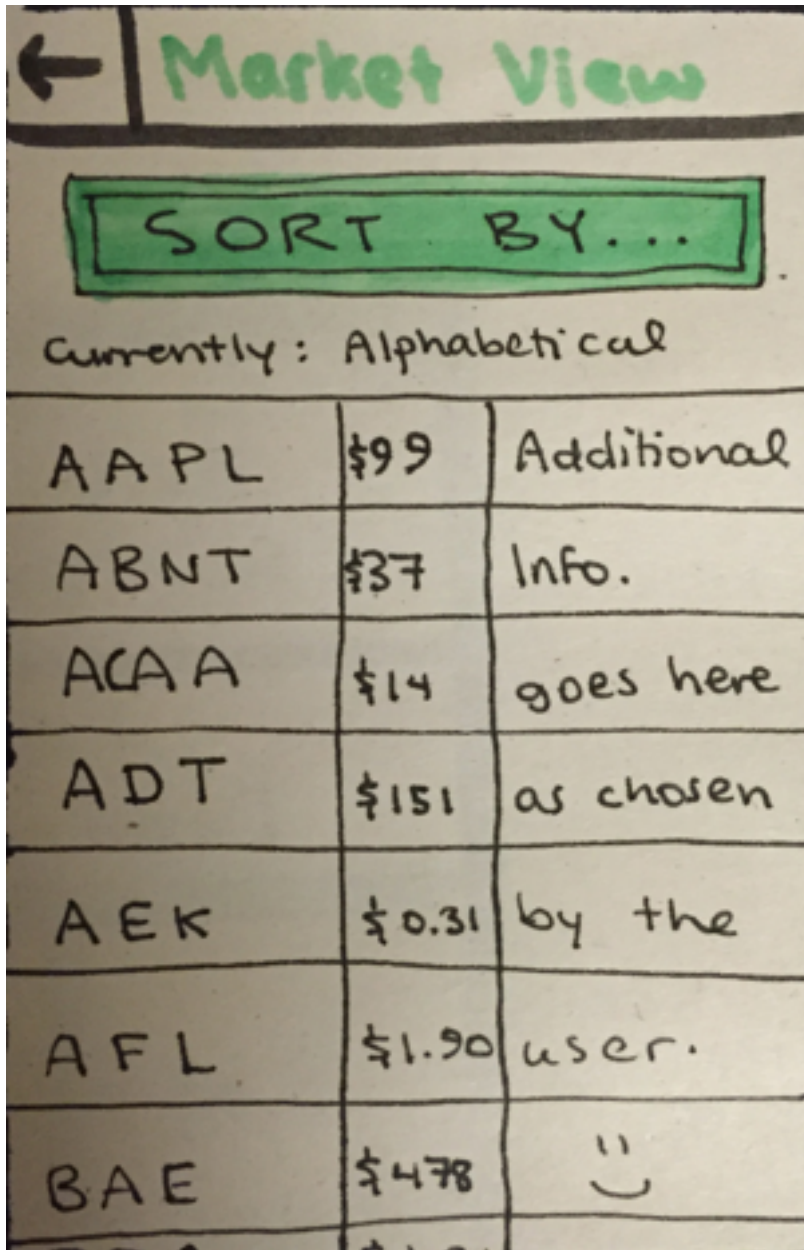
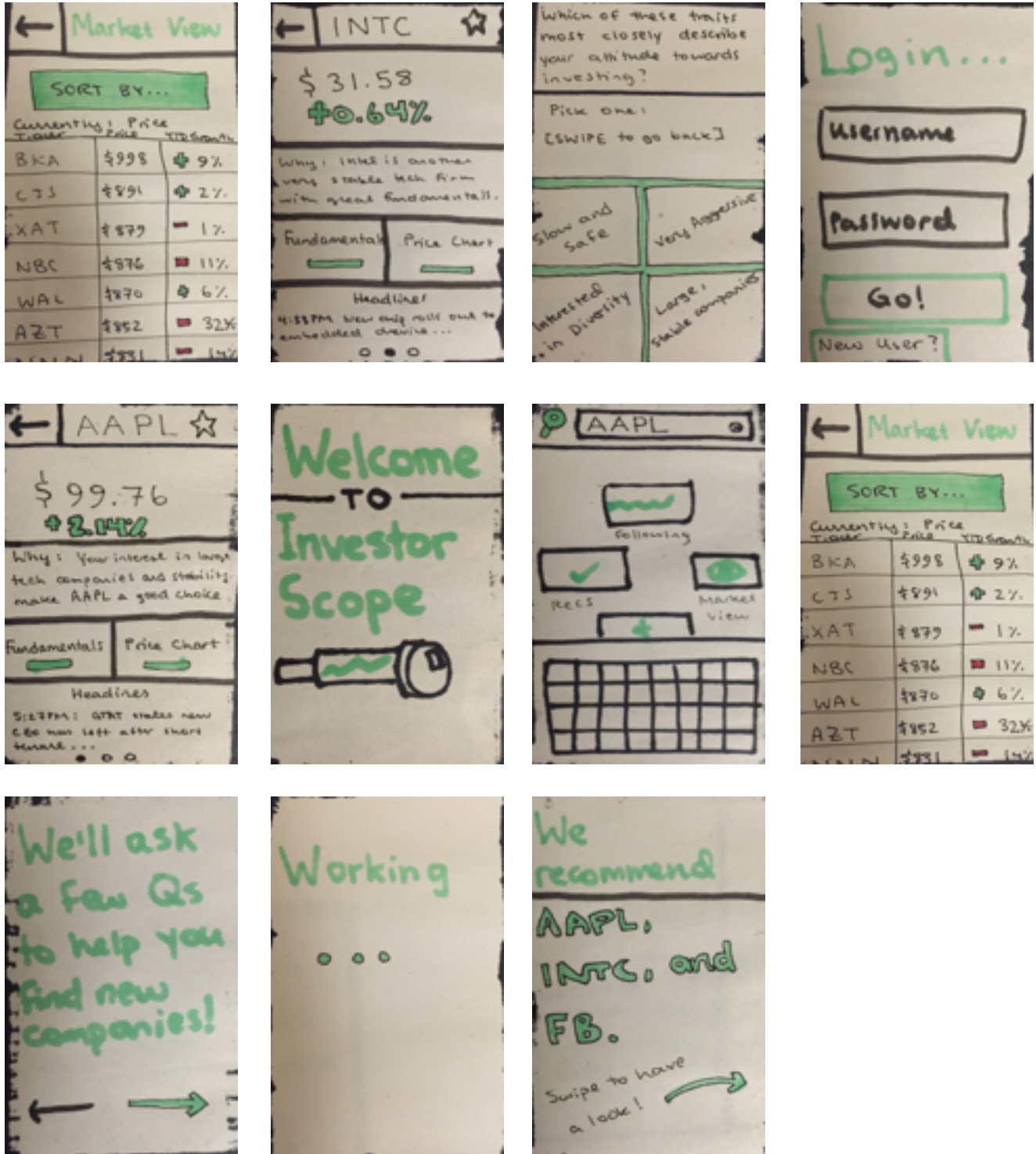


Photo 3

All prototypes:



Entry 2 - Interview



Entry Three - Agreement

Consent Form

The InvestorScope application is being produced as part of the coursework for Computer Science course CS 147 at Stanford University. Participants in experimental evaluation of the application provide data that is used to evaluate and modify the interface of InvestorScope. Data will be collected by interview, observation and questionnaire. Participation in this experiment is voluntary. Participants may withdraw themselves and their data at any time without fear of consequences.

Concerns about the experiment may be discussed with the researchers (Aaron Sekhri, David Khavari, David McLaren, Matt Appleby) or with Professor James Landay, the instructor of CS 147:

James A. Landay
CS Department
Stanford University 650-498-8215
landay at [cs.stanford.edu](mailto:landay@cs.stanford.edu)

Participant anonymity will be provided by the separate storage of names from data. Data will only be identified by participant number. No identifying information about the participants will be available to anyone except the student researchers and their supervisors/teaching staff. I hereby acknowledge that I have been given an opportunity to ask questions about the nature of the experiment and my participation in it. I give my consent to have data collected on my behavior and opinions in relation to the InvestorScope experiment. I also give permission for images/video of me using the application to be used in presentations or publications as long as I am not personally identifiable in the images/video. I understand I may withdraw my permission at any time

Name _____

Participant Number _____

Date _____

Signature _____

Witness name _____

Witness signature _____

Entry Four - Experiment Dialogue

Experiment Script

"Hi. Today we'd like to show you an application that makes it easier for novice investors to discover stocks, and we'd love for you to use it. [Open application on POP]. The first thing you see is the welcome screen. [Swipe to get to the next screen]. Now you need to log in. We'll just use one of our accounts for this experiment. [Swipe for the next screen]. This is the home screen. There are five separate things you can do once you're on the home screen. You can search for a stock, you can check out which stocks you are following, you can see how your portfolio is performing, you can get recommendations for stocks you don't know about, and you can sort stocks by particular parameters, using Market View. For the purposes of our experiment today, we would like you to use Market View, the recommendation engine, and the search feature. Let's begin the test."

Task Instructions

- "First, we'd like you to do a simple search of Apple's stock from the home screen. Once you've searched for the stock successfully, go back to the home screen."
- "Now, we'd like you to get a recommendation from the recommendation engine. You will have to answer a set of questions, and once you have answered them, the engine will work on giving you a set of recommendations. Go ahead and check out the first two recommendations it gives you, and then go back to the home screen."
- "Finally, we would like you to sort stocks by price. Go to Market View and sort the information according to price, and once that's done, go back to the home screen."

Entry Five - Results

Task one

Participant	Errors	Time (minutes)	Satisfaction (out of ten)
Christina	2	34	6
Nick	2	45	8
Sevde	1	40	8
Average	1.7	39.7	7.3

Critical Incidents

- Could not return to home very easily
- Could not swipe on some pages because of limitations on POP
- Was not able to use the search icon to execute the search
- Wanted more than what was offered on the page

Task two:

Participant	Errors	Time (seconds)	Satisfaction (out of ten)
Christina	3	45	5
Nick	1	38	7
Sevde	2	31	6
Average	2	38	6

Critical Incidents

- Did not understand how to use breadcrumbs to navigate results page
- Wanted to learn more about where the recommended stocks came from

Task three:

Participant	Errors	Time (minutes)	Satisfaction (out of ten)
Christina	0	28	7
Nick	2	20	5
Sevde	1	30	6
Average	1	26	6

Critical Incidents

- Did not understand what the list of stocks was actually showing/representing
- Wanted more parameters to choose stocks from