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Abstract:

Financial Investments aims to create an asset that creates hope that your money will grow with time. Investing in the right investment is a challenging task as you have to consider everything from the rate of returns to the risk each investment carry with themselves. This research focuses on understanding the financial investment patterns of Gen Y who fall under the age group of 18-30 based on the survey about the financial investment for Fidelity Investments. This paper proposes the development of the mobile app which can cater to every need for financial investment based on the survey. The mobile app will act as a social media platform for investments. The mobile app will also have information about a particular investment, wallet to keep your money, and a referral program to improve the investment knowledge and pattern of Gen Y.

The world is transforming rapidly, we are moving to place where the number of interactions online, define the role of a business strategy for a company. Hence, a platform that allows the financial market to become a come-in all situation like other industries such as retail, banking, communication, and several others.

1. Introduction

Fidelity Investments Inc., frequently referenced as **Fidelity**, is one of the world's most successful American retail investment services corporation located in Boston, Massachusetts. Fidelity Investments Inc. provides its customers with one of the most extensive ranges of mutual funds in the industry such as fund distribution, brokerage, retirement services, index funds, wealth management, cryptocurrency, securities execution and clearance, and life insurance with a combined total customer asset value number of $6.7 trillion and assets under management at $2.46 trillion in 2018.

Fidelity has aimed to continue to break new ground and attract more clients, both individual and corporate, to its growing retail, institutional, and brokerage businesses. Fidelity's wild growth has been accounted for persistent innovation and ongoing reliance on research. Therefore, Fidelity investments company has noticed that few millennials are interested in making investments nowadays and encouraged us to investigate the factors that would encourage new millennials to make more investments.

Basically, the purpose of the project is exploring the prime reasons why the young generation has a problem to invest and what are the issues when they try to invest, leveraging the research results to help Fidelity promote investing options for young generation via their platform/app, conducting research to find out on *"how do we design an app to attract new-gen in investing?", "what functional module should we include to make the platform interactive?"* and designing the functional module/app, involving social networking, investment information sharing, real-time market trend tracking, and customized content promoting.

The crucial features of the app will include but not limited to, social networking, investment information sharing, real-time market trend tracking, and customized content promoting. Ideally, users could gain lightweight yet high-value information among the personalized friend zone through flexible and effortless operations, which could satisfy the needs for convenience of the young generation as well.
We want to complete the task of providing an approach for young people to utilize scattered time slots and a small amount of money to construct a flexible investing strategy. Hopefully, this brand-new design in the current market would attract attention and even change the traditional concept of investment.

2. Methodology

2.1. Data collection

Our data was collected from the confidential survey, which has been spread over Clark University. There are twenty questions in each survey inquiring about personal information, financial status, preference, and attitude toward financial products. Seventy-six responses were collected and analyzed in order to see how Millennials consider investments and what products they would like to invest in. Further details about the survey are introduced in the next section.

2.2. Survey

The survey is designed to discover the opinion that Millennials hold to investment. Therefore, the questions are divided into three scopes: personal information, financial status, and preferences about investment. The questions

2.2.1. Personal information

This part collects the personal information of respondents, including their age, year in college, major, immigration status, and gender. We believe that these factors are related to the individuals' opinions of investment, which is the most important object that we focus on.

2.2.2. Financial status

In this part, we designed the questions as follows: "are you dependent on your guardians for your daily expenses?", "do you currently have a student loan? ", "what is your average monthly income?", "What are your expenditures on inessentials each month?", and "what percentage of your annual income would you invest?". Since the financial status affects people's willingness to invest, we would like to obtain a general picture of the financial status of the Millennials and investigate the relationship between this factor and the Millennials' attitudes toward investment.

2.2.3. Preferences

This section in the survey is majorly concentrating on three aspects to analyze how Millennials would invest and where their interests lay in. The aspects and corresponding questions are listed below

Aspects	Questions	Options
Financial products that respondents are interested in	What kind of financial products are you investing in? / Do you have any plans to invest for your retirement?/ Do you look at your investments as an emergency fund?	Stock, fund, bond, insurance, savings account, others, not interested at all / Yes, no, maybe/ Yes, no, not sure/
Factors that affect respondents to invest	What factors would you consider before making a financial investment?	Rates of return, risk manageable, easy entrance, easy management, others
Education for investment	Which of the following ways do you often obtain or passively receive information about financial products?/ How would you scale your knowledge of investment?/ Would you like to get educated on how to make financial investments?/ How would you like to get educated on making financial investments?	▪ Newspaper or magazine, social media or Youtube, friends' recommend, online advertisements, TV, bank recommend, family members ▪ 1 to 5 ▪ Yes, no ▪ Seminar, webinar, investment mobile app, YouTube, social media

In order to ensure the accuracy of the survey, all the questions are anonymous.

2.3. Data Preparation

2.3.1. For Tableau visualization

Survey data is usually horizontal, and to analyze our data in for detailed analysis, we had to pivot our columns based on the respective Response ids and Question ids. We converted our textual responses to numeric binary data, using python, to further clean the data for our analysis, we used tableau prep. It helped us pivot our tables and group our questions. It provided us with the processing ability to create cross-tabulating subgroups for our check-all questions, along with providing us with deeper insights. For analyzing Linkert type questions, we provided weights to our selected responses and got a more profound understanding of millennial behaviour towards investing.

Before Processing: Horizontal form survey data

Timestam	Question	Question	Question	Question	Question	Question	Question	Question	Question	Question	Question	Question	Question	Question	Question	Question	Question	Question 19
2019/10/2	Graduate	24	Business r	Yes	Female	I already h	Fund;Insu	Rates of re	Friends re	No	No	3	Yes	Webinar	Partially	No	$1000 - $ 2	$500 - $10	<5%
2019/10/2	Graduate	25	STEM maj	Yes	Male	No	Insurance	Rates of re	Social me	Yes	Yes	2	Yes	Webinar;I	Yes	Yes	< $500	< $500	15% - 20%
2019/10/2	Graduate	23	STEM maj	Yes	Female	Yes	Saving acc	Rates of re	Social me	Yes	Yes	4	Yes	Seminar;Ii	No	No	$500 - $10	$500 - $10	<5%
2019/10/2	Graduate	23	STEM maj	Yes	Female	Maybe	Insurance	Rates of re	Friends re	Yes	Not Sure	2	Yes	Youtube t	No	No	< $500	$1000 - $2	5% - 10%
2019/10/2	Senior	21	Literature	Yes	Female	No	Not intere	Easy mana	Newspap	Yes	Yes	1	Yes	Webinar;Y	No	No	$500 - $10	< $500	5% - 10%
2019/10/2	Graduate	23	Business r	Yes	Female	Maybe	Saving acc	Rates of re	Bank reco	No	Not Sure	3	Yes	Webinar;I	Yes	No	< $500	$1000 - $2	5% - 10%
2019/10/2	Senior	23	STEM maj	Yes	Female	No	Stock	Rates of re	Online ad	No	Yes	3	Yes	Youtube t	No	No	< $500	$500 - $10	10% - 15%
2019/10/2	Graduate	23	STEM maj	Yes	Male	Yes	Stock;Savi	Rates of re	Newspap	Maybe	No	3	Yes	Investmer	Partially	No	$1000 - $ 2	$1000 - $2	10% - 15%
2019/10/2	Graduate	24	STEM maj	Yes	Female	Yes	Stock;Fun	Rates of re	TV;Parent	Yes	No	1	Yes	Seminar;Ii	Yes	No	< $500	$500 - $10	<5%
2019/10/2	Graduate	21	Business r	Yes	Male	Maybe	Stock;Savi	Rates of re	Parents/fa	Maybe	No	2	Yes	Webinar	Yes	No	$1000 - $ 2	$1000 - $2	<5%
2019/10/2	Graduate	23	Business r	Yes	Female	Yes	Stock;Fun	Rates of re	Social me	Yes	Yes	3	Yes	Investmer	Yes	No	< $500	$1000 - $2	5% - 10%
2019/10/2	Graduate	22	STEM maj	Yes	Female	Maybe	Saving acc	Easy mana	Newspap	Yes	Not Sure	3	Yes	Social me	No	No	$500 - $10	$500 - $10	10% - 15%
2019/10/2	Graduate	23	Business r	Yes	Female	I already h	Fund;Savi	Rates of re	Social me	No	No	2	Yes	Investmer	Yes	No	$2000 - $3	$1000 - $2	<5%
2019/10/2	Graduate	22	STEM maj	Yes	Male	Maybe	Stock;Insu	Rates of re	Newspap	Yes	Yes	2	Yes	Seminar	Yes	No	< $500	$500 - $10	10% - 15%
2019/10/2	Graduate	23	STEM maj	Yes	Female	Yes	Stock	Rates of re	Newspap	Yes	Not Sure	2	Yes	Webinar;I	Partially	Yes	< $500	< $500	5% - 10%
2019/10/2	Graduate	22	STEM maj	Yes	Female	I already h	Stock;Fun	Rates of re	Social me	Yes	Yes	3	Yes	Investmer	Yes	Prefer not	< $500	< $500	5% - 10%
2019/10/2	Graduate	22	STEM maj	Yes	Female	Yes	Stock;Fun	Rates of re	Bank reco	Yes	No	4	Yes	Seminar;V	No	No	$1000 - $ 2	$500 - $10	15% - 20%
2019/10/2	Graduate	22	STEM maj	Yes	Female	Yes	Stock;Fun	Rates of re	Social me	Yes	Yes	4	Yes	Webinar;I	Partially	No	$1000 - $ 2	$500 - $10	>20%
2019/10/2	Graduate	24	STEM maj	Yes	Female	Yes	Stock;Fun	Rates of re	TV;Parent	Yes	No	1	Yes	Seminar;Ii	Yes	No	< $500	$500 - $10	<5%
2019/10/2	Graduate	28	Business r	Yes	Male	Yes	Stock;Fun	Rates of re	Social me	Yes	No	4	Yes	Investmer	Partially	No	< $500	$500 - $10	5% - 10%
2019/10/2	Junior	20	STEM maj	Yes	Male	Yes	Stock;Oth	Rates of re	Newspap	Yes	Yes	3	Yes	Youtube t	Yes	Yes	$500 - $10	$500 - $10	10% - 15%
2019/10/2	Sophomo	20	STEM maj	No	Female	Yes	Stock;Savi	Rates of re	Social me	Yes	Not Sure	3	Yes	Not Sure	Partially	Yes	$500 - $10	< $500	5% - 10%

After Data Processing: Long form survey data

	A	B	C	D	E	F	G	H	I	J
1	Index	Gender	Year	Major	Question Grouping	Questiontext	NumericResponses	TextResponses	QuestionID	
2	1	Female	Graduate	Business r	How would you like to g	How would you like to g	0	0	Q14_app	
3	1	Female	Graduate	Business r	How would you like to g	How would you like to g	0	0	Q14_notsure	
4	1	Female	Graduate	Business r	How would you like to g	How would you like to g	0	0	Q14_seminar	
5	1	Female	Graduate	Business r	How would you like to g	How would you like to g	0	0	Q14_sms	
6	1	Female	Graduate	Business r	How would you like to g	How would you like to g	1	1	Q14_webinar	
7	1	Female	Graduate	Business r	How would you like to g	How would you like to g	0	0	Q14_youtube	
8	1	Female	Graduate	Business r	What factors would you	What factors would you	0	0	Q7_bond	
9	1	Female	Graduate	Business r	What kind of financial pr	What kind of financial p	1	1	Q7_fund	
10	1	Female	Graduate	Business r	What factors would you	What factors would you	1	1	Q7_insurance	
11	1	Female	Graduate	Business r	What factors would you	What factors would you	0	0	Q7_no	
12	1	Female	Graduate	Business r	What factors would you	What factors would you	0	0	Q7_others	
13	1	Female	Graduate	Business r	What factors would you	What factors would you	0	0	Q7_saving	
14	1	Female	Graduate	Business r	What factors would you	What factors would you	0	0	Q7_stock	
15	1	Female	Graduate	Business r	What factors would you	What factors would you	0	0	Q8_entrance	
16	1	Female	Graduate	Business r	What factors would you	zxx	0	0	Q8_management	
17	1	Female	Graduate	Business r	What factors would you	What factors would you	0	0	Q8_others	
18	1	Female	Graduate	Business r	What factors would you	What factors would you	1	1	Q8_return	
19	1	Female	Graduate	Business r	What factors would you	What factors would you	0	0	Q8_risk	
20	1	Female	Graduate	Business r	Which of the following v	Which of the following	0	0	Q9_ad	
21	1	Female	Graduate	Business r	Which of the following v	Which of the following	0	0	Q9_bank	
22	1	Female	Graduate	Business r	Which of the following v	Which of the following	0	0	Q9_family	
23	1	Female	Graduate	Business r	Which of the following v	Which of the following	0	0	Q9_friends	
24	1	Female	Graduate	Business r	Which of the following v	Which of the following	0	0	Q9_newspaper	
25	1	Female	Graduate	Business r	Which of the following v	Which of the following	1	0	Q9_others	
26	1	Female	Graduate	Business r	Which of the following v	Which of the following	1	1	Q9_social	
27	1	Female	Graduate	Business r	Which of the following v	Which of the following	1	1	Q9_tv	
28	1	Female	Graduate	Business r	Do you have any plans to	Do you have any plans t	2	No	Question 10	
29	1	Female	Graduate	Business r	Do you look at your inve	Do you look at your inv	2	No	Question 11	
30	1	Female	Graduate	Business r	Would you like to get ed	Would you like to get e	1	Yes	Question 13	
31	1	Female	Graduate	Business r	Are you dependent on y	Are you dependent on	0	Partially	Question 15	
32	1	Female	Graduate	Business r	Do you currently have a	Do you currently have a	2	No	Question 16	
33	1	Female	Graduate	Business r	What is your average mo	What is your average m	2	$1000 - $ 2000	Question 17	
34	1	Female	Graduate	Business r	What are your expenditu	What are your expendit	1	$500 - $1000	Question 18	
35	1	Female	Graduate	Business r	What percentage of you	What percentage of you	0	<5%	Question 19	
36	1	Female	Graduate	Business r	What is your age?	What is your age?	24	24	Question 2	
37	1	Female	Graduate	Business r	Are you an international	Are you an internationa	1	Yes	Question 4	
38	1	Female	Graduate	Business r	Have you ever thought a	Have you ever thought	0	I already have inv	Question 6	

2.3.2. For the machine learning process

We focus on three concepts as follows during the machine learning application process:

a) The relationship between the willingness of an individual to get educated about investment thought the mobile application and other factors.

b) The relationship between the tendency of an individual to choose high return rate products for investment and other factors.

c) The relationship between if the reason that drives an individual to invest is monetary and other factors.

To further process our learning, we first dropped the useless column, Timestamp, and checked the missing values. Two rows are missing the answers to the financial status questions. Due to the small size of our dataset, we replaced the missing values by the most frequent values instead of dropping the whole row.

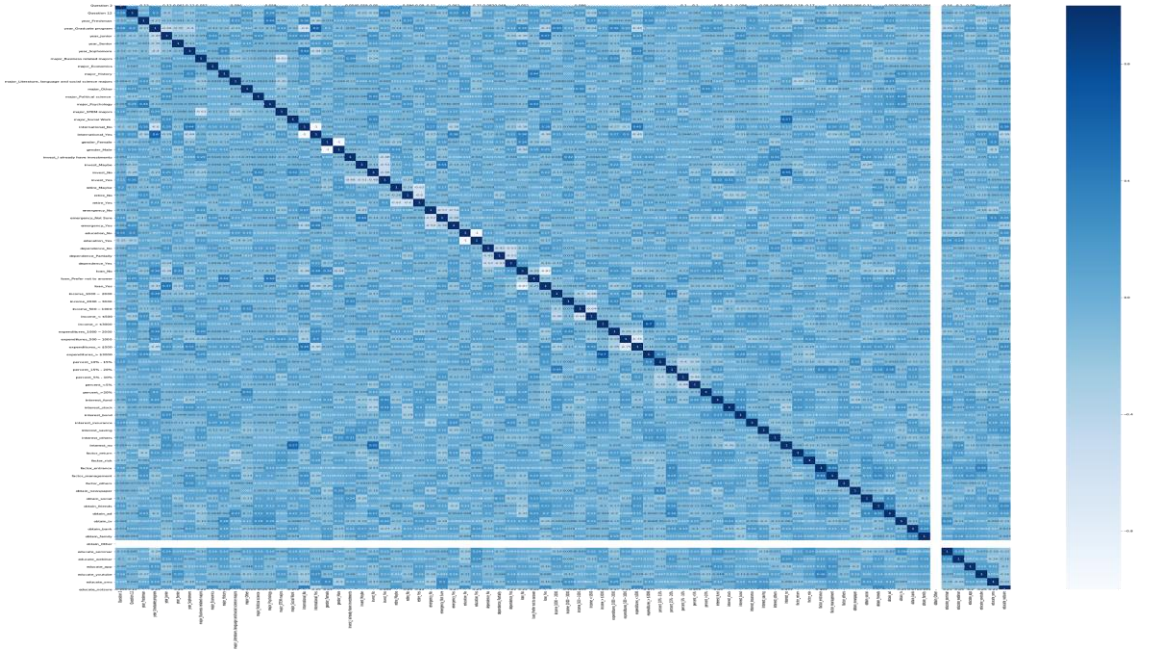
All the categorical variables are converted to dummy variables based on their properties as the second step. For example, if the column contains 'Yes' or 'No', it will be changed to 1 and 0 correspondingly; for the multiples choices columns like question 7, "What kind of financial products are you investing in", which people can choose one than one option, each option is marked as 1 or 0 in a new column to represent whether the respondent chose it or not.

The independent variables and the dependent variable for each research concepts are as follows:

	Dependent variable	Independent variables
Concept a	If an individual would like to get educated through a mobile application	Other variables
Concept b	If an individual would like to choose the high-return-rate products (stock and bond) or low-return-rate products (bond, insurance, savings account, others)	Other variables
Concept c	If the factor that causes an individual to invest is monetary (rates of return) or not (risk manageable, easy entrance, easy management, others)	Other variables

We normalized the age, a numeric variable, and "how would you scale your knowledge of investment?", a scale variable through 0 to 5, as in the range (0,1). Then we got the correlation between the independent variables and the dependent variable for each of the three concepts; the variables that highly correlated to each other are dropped in this case.

The correlation heat map is as below



Since there are more than seventy features in this research, we applied feature selection based on the correlation, embedded method, and random forest algorithm, and the result reveals that the correlation selection is the only applicable method for feature selection since the data size is too small to apply other selection algorithms. The classifiers are applied both with and without applicable feature selection for each concept. Because of the extremely small data size, we used leave-one-out cross-validation to achieve better results as well.

3. Result:

3.1. Machine Learning application results

3.1.1. Dependent variable: If an individual would like to get educated through a mobile application

A. Machine learning without feature selection

We selected the Support Vector Classifier (SVC) and the Linear Support Vector Classification (LinearSVC) due to the small data size. From the tables below, the accuracy based on the SVC method for the training set is 0.92, and the accuracy of the test-set is 0.88. The performance is suitable for this training set; however, since the overfitting problem is indicated,

we introduced Leave-one-out cross-validation, which measures the overall performance of a model trained on $n-1$ samples of data, and the accuracy score after the application is 69.74%. Linear Support Vector Classification (LinearSVC) gives an accuracy of 1.00 for both the training set and test set, and the accuracy score for Leave-one-out is 100% as well, which means that the model is fitted. We can tell from the confusion matrix that LinearSVC does a better job on classification, and this model can work to identify the relationship between the independent variables and dependent variables.

Accuracy Based on Different Methods			
Methods	training set	test set	Leave-one-out
SVC	0.92	0.88	69.74%
LinearSVC	1.00	1.00	100%

Confusion Matrix Based on LinearSVC		
	True Positive	True Negative
Test positive	32	0
Test negative	0	28

Confusion Matrix Based on SVC		
	True Positive	True Negative
Test positive	31	1
Test negative	4	24

B. *Machine learning with feature selection:*

After selecting features, LinearSVC has an accuracy of 0.7 and 0.44 for the training set and test set correspondingly. Its accuracy score of Leave-one-out is 58.33%. This model has relatively poor performance compared with models without features.

Confusion Matrix Based on LinearSVC		
	True Positive	True Negative
Test positive	24	8
Test negative	10	18

3.1.2. Dependent variable:

If an individual would like to choose the high-return-rate products (stock and bond) or low-return-rate products (bond, insurance, savings account, others)

A. *Machine learning without feature selection:*

From the tables below, the accuracy based on the SVC method for the training set is 0.73, and the accuracy of the test-set is 0.81; the underfitting problem is indicated. It has a leave-one-out score of 75%, so the model has a relatively good performance. LinearSVC gives an accuracy of 1.00 for the training set and accuracy of 0.62 for the test set; the severe overfitting problem might be the case. Its leave-one-out value is also the lowest, which is only 61.84%. K-nearest neighbors (KNN) provides fair accuracy for the training and test sets but unsatisfying scores of leave-one-out cross-validation. Random Forest (RF) has an accuracy of 1 and 0.75, respectively, for the training set and test set. Its leave-one-out value is 73.68%. The random forest and the SVC model perform well in terms of accuracy score.

Accuracy Based on Different Methods

Methods	training set	test set	leave-one-out
SVC	0.73	0.81	75.00%
LinearSVC	1.00	0.62	61.84%
Random Forest	1.00	0.75	73.68%
KNN	0.73	0.81	64.47%

However, based on the confusion matrix, we can readily discover that SVC determines every result in the same class. In this case, Random-forest might be better to apply for future research.

Confusion Matrix Based on SVC		
	True Positive	True Negative
Test positive	44	0
Test negative	16	0

Confusion Matrix Based on Random-Forest		
	True Positive	True Negative
Test positive	44	0
Test negative	2	14

B. *Machine learning with feature selection:*

After adding features in LinearSVC, the accuracy score of test-set and leave-one-out are improved to 0.94 and 78.95% correspondingly. The accuracy score of the test set for RF is improved to 0.88; meanwhile, its leave-one-out score goes down to 65.79%, which shows LinearSVC performs better than RF in this case, based on which the adjustments might be applied for the improvements.

Accuracy Based on Different Methods			
Methods	training set	test set	leave-one-out
LinearSVC	0.83	0.94	78.95%
Random Forest	0.83	0.88	65.79%

Confusion Matrix Based on LinearSVC		
	True Positive	True Negative
Test positive	43	1
Test negative	9	7

3.1.3. dependent variable: if people like high return rate or low return rate products

A. *Machine learning without feature selection:*

From the table below, based on the accuracy of both the training set and test set, KNN and SVC have the best performance. The performance of the RF is acceptable as well, but the apparent drop after the application of leave-one-out is very suspicious. According to the confusion matrixes, Linear SVC cand RF would be the model we selected for the future work.

Accuracy Based on Different Methods			
Methods	training set	test set	leave-one-out
SVC	0.83	0.81	82.90%
LinearSVC	1.00	0.81	76.32%
Random Forest	0.98	0.94	81.58%
KNN	0.83	0.81	81.58%

Confusion Matrix Based on SVC		
	True Positive	True Negative
Test positive	0	10
Test negative	0	50

Confusion Matrix Based on LinearSVC		
	True Positive	True Negative
Test positive	10	0
Test negative	0	50

Confusion Matrix Based on Linear-KNN		
	True Positive	True Negative
Test positive	0	10
Test negative	0	50

Confusion Matrix Based on RF		
	True Positive	True Negative
Test positive	9	1
Test negative	0	50

B. *Machine learning with feature selection:*

The accuracy score after the leave-one-out application of LinearSVC has been improved to 82.90%, but the value of RF decreases to 75%. From the accuracy of the training set and test set, LinearSVC does a relatively better job than a random forest in this case.

Accuracy Based on Different Methods			
Methods	training set	test set	leave-one-out
LinearSVC	0.92	0.88	82.90%
Random Forest	0.98	0.75	75.00%

Confusion Matrix Based on LinearSVC		
	True Positive	True Negative
Test positive	7	3
Test negative	2	48

Confusion Matrix Based on RF		
	True Positive	True Negative
Test positive	9	1
Test negative	0	50

3.2 Primary Survey Questions

3.2.1 What kind of financial products you are investing in/interested in?

This question has helped us to analyze the likelihood of financial investment products among Gen Y. According to the results from the survey, we can see that the maximum people were interested in investing in stocks while the least was interested in investing in Bonds. From the graph below, we can also see that the savings account is the second choice for investing which tends towards safe investing.
When we got deep down about the preference of investing in bonds than even after getting the best rate of returns in bonds, bonds are not the preferable option for investing. This tendency towards the lack of knowledge about investing.

3.2.2 Which of the following ways do you often or passively receive information about financial products?

The question has helped us analyze the information channel that Gen Y uses to gather information regarding the investment options. As we can see in the graph that digital channels are the most preferred options to gather information for Gen Y while Television and books are the least preferred option to gather the information. Friend's recommendation is the second-best option to know about investing.

Based on these ideas we've planned to build a mobile app that will be a financial investment app having a gel of social media and friend's recommendation platforms.

3.2.3 What factors would you consider before making a financial investment?

This question has helped to know to reason why Gen Y would like to invest. To answer what factors to consider before making a financial investment, Gen Y considers the rate of returns to be the ultimate goal to invest while the ease of entrance into the investment market to be the least. Risk management is the best part to know about the health of an investment. Gen Y considers risk management as the second top attribute when investing.
When you're investing rates of return and risk management is the most important thing. To facilitate this, the app infrastructure will be built on these features.

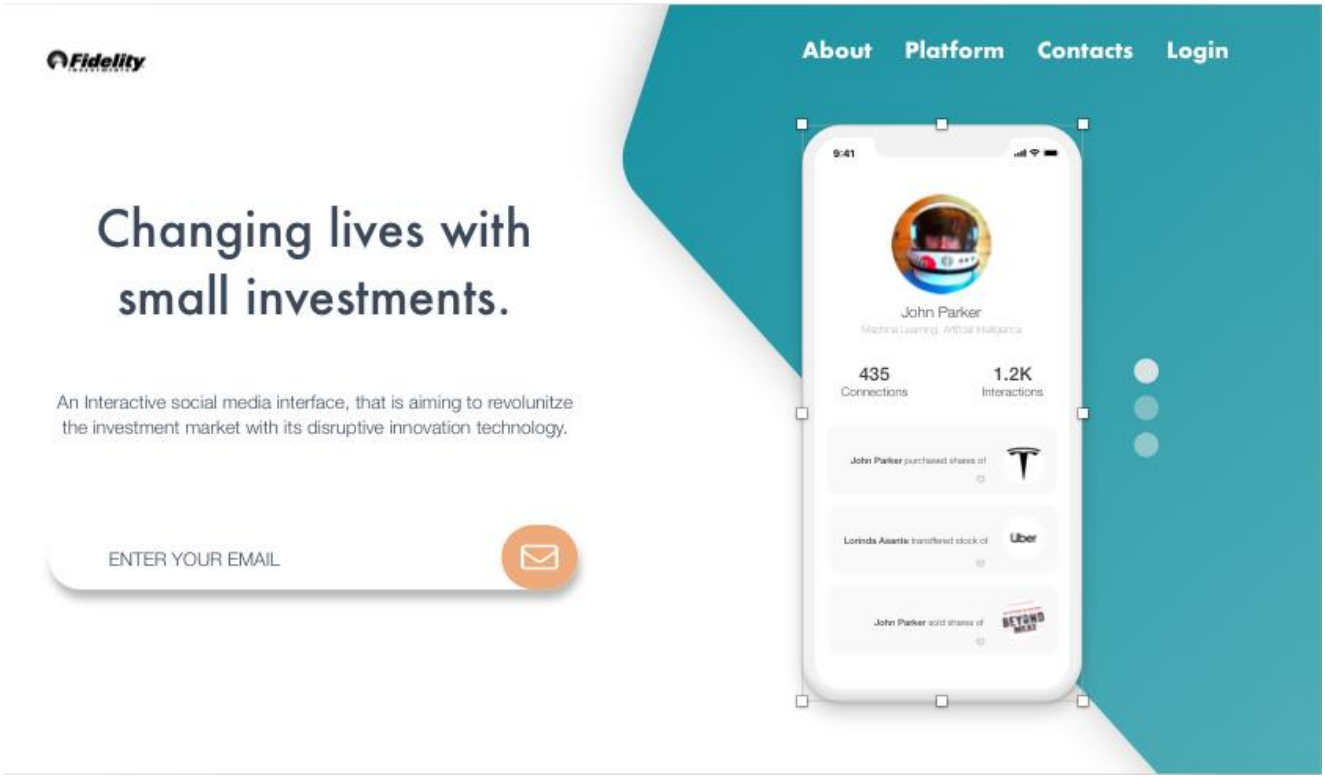
4. Conclusion

4.1. Mobile Application Development

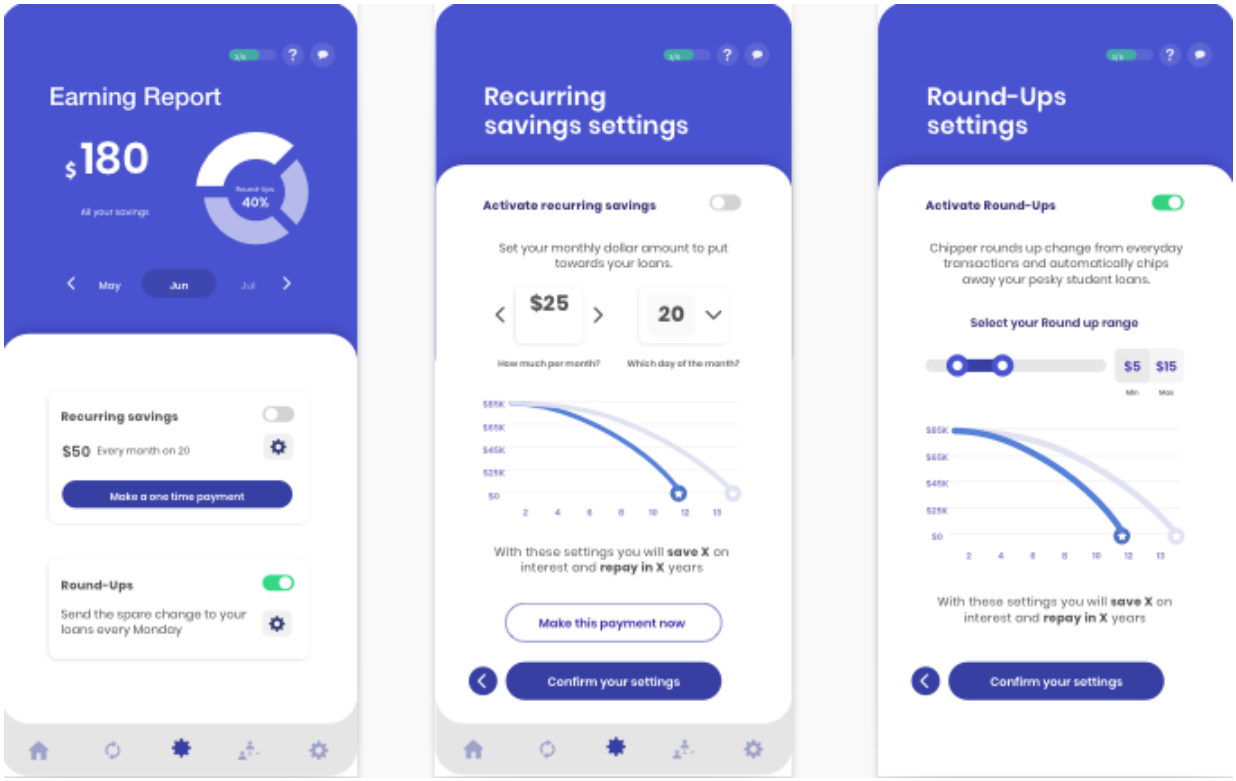
We are slowly transitioning in a society that is heavily relied on engagements on mobile platforms. The rapid expansion of the social media industry, along with the use of AI and data science to make the consumer experience easy and high perforance. However, the trasistion of the financial industry towards an interconnected universe that provdes an easy of entry along with easy management over a mobile platform has rather been scarce. Our initial survey analysis provided us with a brief analysis on millennial populations investment patterns, this helped us in filtering the necessary data. To further our analysis we build models based on our chosen variables and ran several regression models to help us gain more insights on our chose variables. We decided that a mobile application that provided customers with a feed that displays their connections daily transactions in the stock market, along with providing insights about your past investments, and the future of the stock market. We decided to design a UI/UX for our desired application.

Financial Investment is the most important option for any company to grow and the best option for an investor to grow his/her money. If anyone is investing would like to know what's hot in the market and where to invest with correct investment recommendations. Keeping all the things into consideration, we plan to build the mobile app which will be company and investment-friendly. With this app, we're trying to bridge the gap between an investment and an investor so that both can grow together keeping every metric into consideration.

Home Page of the App



Performance Dashboard



5. Aspirations

We are expecting the app to be a complete mobile and user-friendly which can handle all the requests by an investment opportunity and an investor. This app will be a social media application for all financial investments. We're planning to build the following features for the app:

Social Media: This app will act as a social media platform for all financial investments. Any investor can buy and sell investments, post about different financial investments, like and comment on any post and share the investments with others on the platform.

Referral Program: This will be the most unique feature of our app. Any user can recommend an investment to his/her family or friends and can earn some percentage of investment profit at the time of selling.

Wallet: The wallet will be an essential part of the mobile app. All the transactions will be done through the wallet. If an investor is selling an investment then they will get the money in there wallet only. This money will be transferrable to their bank account.

Information: The information section will have all the information about the investments and will have the past performance of a particular investment opportunity. The entire information will be in the form of numbers and graphs and the informational text.

6. Reflection

Shashank

I've learned multiple metrics about the financial investment field. They are as following:

- Use of a survey to find an answer.
- Need for a financial technology platform
- Understanding the use of data analytics for text mining
- Understanding the need for multiple attributes to be considered to build a financial platform

Jaiyu

From this class and our project, I learned about the financial products, such as their types and return rates. I have learned how to use some business tools to contact with the project manager. When we conducted our survey, I learned how to make a questionnaire professionally by leveraging multiple tools. We need to make sure that the data we collected is not biased, and it is approximately objective to represent most of young generation's attitudes towards financial products. The questions should be composed in a way which will yield out most useful information. Then later in our experiment these questions can represent different variables.

The most significant is that I learned how to use python to prepare data and build model. I learn that before building a model, I need to do data-cleaning, such as replacing or droping missing values. Check variables' distribution and type as well. I obtained skill in modeling. For example, I learned to use different models, such as SVC, LinearSVC and Random Forest, to try to find out which model performs best. After that I improved my communication capability by working with group members as well. I obtained many useful suggestions and skills from my group members during this project.

Shakhnoza

Participation in the project of the Fidelity Investments has helped me to broaden my perspective in terms of financial decisions to drive innovative ideas, gain real-life experience through the

investigation and analysis of financial data. I have realized the importance of data analysis to understand the factors that would encourage millennials into investing, which in turn would generate a revenue prospects for Fidelity Investments company.

Jade

Through this experience, I learned a lot about financial investment, which is a completely new field that I have never stepped into before. It was hard for our team to work together and find an appropriate topic at the beginning, but after a few weeks, we all realized that we could complete something together and started working hard on it.

The data collection process was challenging and indeed interesting. It has been a huge problem for us to design the survey in terms of what kind of questions we should ask, how to make the survey appealing, and how to gather a considerable amount of responses. It was not a easy task to perform and relate all the responses through the machine learning method as well. When we eventually got things finished, I felt grateful that I have this experience about facing the challenges and getting over it.

Right now there are lots of possibilities and plans for future research that I could picture, including but not limited to perform the text mining of online resources such as Twitter and Facebook, design the mobile application reflected people's interests, and even make the application work. I believe this experience not only provides me a chance to take part in the excellent project and work in a great team but also affords me a new scope of the projects and research.

Sid

My experience working on the fidelity project was profound, not in terms of learning new tools, but it allowed me to gain insight into the data analysis industry. We conducted a few surveys to gather data that we then transformed using tools such as Tableau Prep, Altyrx, and Jupyter notebook; these allowed me to gain a new sense of confidence in my capabilities. I was able to make survey analysis reports using Tableau, along with using Sketch design, MarvellApp, and Adobe InDesign to design the UI/UX of the app.