**Final Project Design**

**EECS 582 Spring 2018**

Due: Monday, February 5, 8:00 AM (submit to BlackBoard, under Assignments)

File Type: Microsoft Word

**Team Name: Team 6**

**Team Members and email addresses:**

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**Team Meeting time:**

Mondays at 12:45pm

**Lab Meeting time:**

Wednesdays at 1pm

**Contact:**

Hannah Johnson

**Project Sponsor (if any):**

No Sponsor

**Project Description**

* We believe that everyone should have access to an intelligent financial advisor tailored to their specific needs. More than a majority of millennials do not seek financial advice from professionals. Due to the lack of guidance, millennials will learn the consequences of their financial actions such as undertaking large amounts of loans, not investing for their retirement, and much more the hard way. Even if millennials were to seek online resources, the information would be scattered and not tailored to their specific situation. Myne seeks to solve this lack of guidance by giving users a look into their finances with interactive visualizations showing information such as top spending categories, daily habits. Additionally, users will be able to query the application to learn additional details about their spending behavior.
* The end result of this project will be a web application where users can provide their financial banking data and basic demographic information to view a variety of data visualizations regarding their spending habits. Myne will prompt users to consider the reasons for specific trends in their data like the following: “During the week, you consistently spend the most around 1pm on Fridays. What are you usually doing during this time?” What sets Myne apart from other financial applications is the ability to explore their transactions visually from a variety of angles. For example, users can view their overall spending habits, but also their spending habits over time at specific locations.

**Project Milestones**

*First semester*:

* Acquire and research required resources and APIs. Completion date: 10/6/17.
* First iteration of prototypes/mock-ups. Completion date: 10/20/17.
* Complete requirements document of all possible user interactions with app. Completion date: 10/20/17
* Ethnographic user research in the form of user interviews. Completion date: 11/17/17

*Second semester*:

* Update prototypes/wireframe mockups. Estimated completion date: 2/5/18
* Transition Plaid data to database. Estimated completion date: 2/5/18
* Add visualizations of User data to application. Estimated completion date: 2/26/18
* MVP application implementation. Estimated completion date: 3/5/18
* User testing and written results. Estimated completion date: 4/2/18

**Gantt Chart can be accessed here:** <https://drive.google.com/open?id=14C6KsDfactlOczfaQkKnfrQhSX796WX1>

**Project Budget**

Estimated cost: $0

Myne will be minimal in cost. We are developing a web application with no hardware needs. Our project will be hosted on Heroku using their Free plan. If we discover we need to upgrade to the next tier (“Hobby”), our costs will be $7/month to host our project. Also, we will rely on the free (testing) tier of API’s for the MVP of our project. We do not foresee any special training to implement our app.

**Work Plan**

* Ashley:
  + Backend development
  + Database management
  + Use Highcharts API to develop visualizations
* Rabel:
  + Backend development
  + Database management
  + Retrieval of data from Plaid API
  + MVP validation by interviewing possible users
* Hannah:
  + Initial wireframing (pencil and paper, Sketch app)
  + Interactive prototype of higher fidelity front-end mock-ups (Marvel app)
  + Development of front-end views (HTML, CSS, Bootstrap framework)
  + User Research
* Josh:
  + Backend development
  + QA/code refactoring

**Github link**

<https://github.com/rabelmarte/myne>

**Final Project Design**

At a high level, our web application is aiming to provide our users with a holistic sense of their spending habits. Users grant us access to their banking information and in return we will provide them with a variety of data visualizations and promptings to help recognize trends in spending habits and ways to improve them.

Plaid is an API that enables us to connect with users’ various financial accounts. Using Plaid Link, which handles credential validation, multi-factor authentication, and error handling for each institution that is supported, the user is able to enter their login information and easily sync their financial data to our application without having to enter manual records. Our application never stores any financial login information, but instead we receive a token from Plaid with which we can communicate with their API to regularly update our users’ financial data. Plaid handles all of the data scraping of financial data and we just communicate with their API to retrieve it.

The visualizations will be generated using Highcharts, a popular JavaScript charting framework. Highcharts is used by 72 of the world’s 100 largest companies and will allow us to create useful interactive visualizations for our users. We chose this framework because it is well documented, mobile responsive, and easy to integrate into a Ruby on Rails application. Additionally, Highcharts is available for free for non-commercial use.

To implement our web application we are using the framework Ruby on Rails because of its strong community support and most of our team members are familiar with it. Ruby on Rails uses the model-view-controller principle to divide the application’s implementation into three interacting sub-systems.

The models in our database will be focused around the following concepts: Financial Accounts, Transactions, and Users. Financial accounts consist of items such as checkings/savings accounts, credit cards, loans, investment accounts, and mortgages. Using Plaid, we are able to connect with multiple financial institutions. Transactions are purchases made on a debit or credit card. These allow us to visualize a better picture of weekly and monthly habits. We organized our models in this way to ensure that the user is the center focus of the application and so that it is simple to introduce new types of financial data. In our application, users will have multiple different types of accounts and transactions that we will then use to create a holistic visual representation of their finances.

Ease of use is one of the most important parts of our application. We do not want the users to focus on the numbers. As a financial advisor, Myne will interact with users in a way that makes it simple to recognize steps that need to be taken to achieve their goals. For example, if a user wants to pay off their student loans, we would first take a look at their transaction history. If that user has unusually high spending in any category (ex. fast food), our recommendation would be to lower spending in that category and pay that money towards their student loan debt.

The front-end of our application will be designed using HTML, CSS, and the popular CSS framework called Bootstrap. Ruby code embedded into our HTML views will populate the otherwise static pages with relevant data for our users. Our views will be designed to reflect the wireframes that we created in the fall semester using the Sketch app. We want to craft a highly personal experience for our users that mimics the style of real-life interactions with a financial advisor. Words that we want to come into our users minds when using Myne are concise, friendly, connected, consistent, and invested. To reach this goal, we will put an emphasis of effective UX Writing methodologies throughout our design.

The user flow is briefly described as follows: upon registration, users are directed to the beginning of a survey in which we collect more information from them such as their name, location, birth date, marital and employment statuses, education level, and living situation. They are allowed to exit this survey and return to it later at any time. After we collect this information we allow users to connect their banking information through an API we’ve chosen to use called Plaid. They are also allowed to do this at a later time if desired. At this point, users will be directed to their homepage that will display a search bar and several cards. Each card will represent a different page dedicated to specific visualizations about their spending habits including “Daily Habits” and “Top Spending Category.” These cards display an overview of what users will view on these pages, which will encourage them to click the cards and continue on toward more detail. One of the distinguishing features of Myne is that it will also serve as a personal financial search engine. Users will be able to use our search bar to ask a few different questions including “How much money did I spend at \_\_\_\_ last month?” Upon a successful search, users will be directed to visualizations that sum up the answers to those questions.

Our user flow is subject to improvement during a phase of usability testing that we will be conducting after the implementation of our MVP is complete. Usability testing will consist of recruiting participants who align with our target audience of college students and young professionals interested in becoming more informed about their personal finances. Using our live MVP, users will be asked to perform a series of open-ended tasks while one of our team member moderates. After the tests, the insights that were discovered will be compiled into a recommendations document that our team will use to improve our designs.

**For our illustrations, view a click-through prototype for our application here:**

<https://invis.io/UHFMA2HRWJ4#/276655738_Revised_Homepage>

**Ethical Issues**

The first ethical issue that presents itself involves a potential business model for Myne. As a personalized financial advisor, Myne could generate revenue by recommending specific financial products that would help in achieving our users’ goals. Depending on Myne’s priorities, we would need to make sure that we place the interest of the users over ours. In other words, as an application that provides personalized recommendations, we would need to recommend financial products that are in the best interest of the users but not necessarily the products that would lead to the most revenue. This is similar to an ethical dilemma that traditional financial advisors face where they must choose between selling a product that increases their bottom line or recommending a product that is best for the advisee. We do not have to sacrifice the interest of our users to make money. Instead, by acting in the best interest of our users, they will keep coming back for more advice and will consequently lead to more revenue.

Another ethical issue that Myne will encounter involves the financial data that we will be collecting. For example, we will be collecting very personal data such as how much individuals make and their financial goals. Because of this, Myne will be the central source of all the financial data of an individual. Myne is then able to analyze all of that data and make recommendations that other financial institutions could not make. This conglomerate of data will be very valuable to financial institutions because they cannot individually produce it. At the end of the day, our goal is not to sell data for advertising purposes, but our goal is to use this data to make better financial recommendations.

Finally, another ethical issue that Myne will face is dealing with how little fintech startups are currently regulated compared to traditional financial institutions. Fintech startups do not operate like a bank or an insurer, so they are not subject to the same regulations that would govern more traditional institutions in the financial system. For example, given a specific financial institution, it is very clear which agency regulates it such as the Consumer Financial Protection Bureau, the Financial Industry Regulatory Authority, and etc; it is not so clear for fintech startups. However, just because fintech startups are currently not regulated as much, it does not mean that such regulations that apply to other financial institutions should not apply to fintech startups. Therefore, if Myne seeks to be a leader in giving personalized financial advice, we must closely observe the regulations that apply to other financial institutions and follow their intent even if it complicates our process.

**Intellectual Property Issues**

At its core, the most important part of Myne will be the algorithm that takes financial data and goals as an input and outputs recommendations on how to achieve such goals. Therefore, we would want to establish this algorithm as a trade secret and take the necessary actions to control disclosure of such algorithm. We choose to not patent our algorithm because then we would be exposing to other financial institutions how we provide our recommendations. By keeping the algorithms as a trade secret, we are able to control the source code indefinitely and our competitors will not be able to replicate our results. However, what this means is that we will need to require confidential agreements, limit access to source code, and other measures to reduce the chance of our trade secrets being leaked.

Using algorithms to provide financial advice and recommendations for various financial situations is something that no major financial institution is tackling. To take advantage of this, we would want to be very strategic with our trademarks so that we are easily recognized as the leading intelligent financial advisor that provides personalized advice. When people see our trademarks, we want them to think that the power of big data and technology is being used to find the best way to achieve and tackle their financial goals.

**Change Log**

* We replaced occurrences of “Project-581” with “Myne,” the official name of our project.
* Updated project description to reflect the feature changes our team made at the end of last semester
* Updated second semester Project Milestones to reflect new schedule for our team.
* The Gantt chart has been updated to reflect new milestones
* Work plan for Ashley has been updated to include work with visualizations
* Our Github link changed. We started a new repository toward the end of last semester for work flow reasons.
* Final project design was updated to reflect new direction of Myne