NO B.S.

Vision Statement

The NO B.S. project is intended to help people be aware of potentially fake news articles online before they make their reading choices by giving them a single website where the verification process of articles is automated, and eventually blockchain will further help legitimize article probability ratings.

Team Members

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Introduction

Fake news is extremely pervasive in our society. It is being spread at an even faster rate in today's world because of the widespread reaches of the internet. People on social media platforms read and talk about fake news without being able to distinguish it from reality. This is mainly due to fake news being very difficult to verify. The verification process includes a person thoroughly reading an article, gaining some suspicions from it, going to research the key suspicious words in the article, and then comparing the results to what was in the article. Even if someone researches the topic of an article that they found suspicious, there is no guarantee that they can find the truth about it. Large companies have gone on crusades to stop the spread of fake news like Facebook and Twitter, but have come up relatively short.

Our goal for this project was to help combat the spread of fake news by giving people an avenue to verify news in a quick and easy manner. From this goal, NOB.S., our news detection website idea was born. Our website allows people to enter in the URL of an article that they want to verify and through our algorithms, a validity score will appear. Basically, our website will do all of the hard work that a person would have to go through in order to verify a news article. This makes our website an easy and trustworthy tool that people can use to see if an article they see it true or not. Since people will be able to tell if articles are real or fake, the spread of fake news will be hindered. People will be able to call out sources putting out fake news and only refer to articles that they know are verified to be true.

Lean Canvas

Problem	Solution	Unique Value Proposition	Unfair Advantage	Customer Segments
- Social Media is filled with "fake news". - People tend to believe anything on the internet. - There is no filtration that filters fake news out. -Verifying news is complicated and takes a long time **Existing Alternatives** - Analyzing what one reads better.	- A user is on social media => sees an article and wants to verify its truthness => pastes its url to our search engine => after analysis from our algorithm receives level of truthness **Key Metrics** -Website traffic -Users referred -Accuracy of fake news detection	Our website is a single platform where people can enter in news articles to find out how valid they are as opposed to going through the complicated verification process they would normally go through.	**-** Millions of users are already online consuming information. - People are already aware of the existence of fake news. -Simplifies the process of verifying news **Channels** - Website	- Young individuals who are constantly on social media and tend to believe anything on the internet. - Middle Aged individuals who are on Facebook where a lot of fake news exists. **Early Adopters** - Any social media user - Facebook Users -People who read news

Cost Structure	Revenue Streams
- IT infrastructure and development - Marketing	**-** We would have a page where our search engine lives that could serve as a platform to advertise which would be one form of revenue. - Another form of revenue would be a continual service charge that would allow for the service to be integrated into users' everyday browser.

Additional Notes for Lean Canvas

- **What characteristics of your early adopters make them valuable to the product development?**
  - We believe that our early adopters should be young people who have profound social media presence online. These users have to have a need to browse news of today. In order to be more enthusiastic about what they are reading. People need to want to know that what they are reading is accurate.
- **Why are your channels effective in reaching your targeted early adopters?**
  - Our channels are effective because we would be advertising on social media platforms that are visited by millions of people on a daily basis. Having users see these ads will allow for them to grow curious about what our software is. This would then allow for them to try the software and then lead to word of mouth. Having ads online would also allow for a wider audience which would also allow for more publicity.
- **How do the listed key metrics provide accurate evaluation of your product's success?**
  - The key metrics would allow for us to measure our products success by analyzing how many users are using our products software. The amount of people visiting the site, installations and downloads all would allow us to see how much our app is growing as well as if adjustments need to be made.

Value Proposition Canvas

Product

<table>
<tr><th>Gain Creators</th><th rowspan="2">Product Features</th></tr>
<tr><td>
- What we can offer to consumers is a resource to their everyday life.
- What our product will provide is the ability to provide a truth accuracy to what they are reading.
- Truth filtration to what they see on a day to day basis.
</td></tr>
</table>

Gain Creators
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- What our product will provide is the ability to provide a truth accuracy to what they are reading.
- Truth filtration to what they see on a day to day basis.

Pain Relievers
- Our product would relieve the customers pains by giving them the opportunity to confirm that what they are consuming is accurate.
- Our product would allow for them to verify a articles accuracy by inputting it into our search engine.

Product Features
- What our product offers is a resource to verify that what they are reading is accurate.
- Our product possesses a search engine which allows for a user to input an articles url or title which would then output a statistics run through in order to tell the user how accurate what they are reading is true.
- What our goal is to eventually enable our product to be a plug in that could be integrated to a social media platform like Facebook in order to filter "fake news" out of a users timeline.

Customer

Needs & Goals
- Consumers need to be socially aware of actual news.
- They need to be confident that what they are reading is accurate
- They need to stay up to date of what is going on now and where things will go.

Tasks
- What we are trying to do is make the customer more socially aware.
- Make the consumer more aware of what they are reading or seeing on social media.

Pains
- What is currently frustrating to consumers is not being aware that the information they are taking in is "fake"
- People may want to be more socially aware but reading fake news hinders their ability to do so.

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Additional Notes for Value Proposition Canvas

- **What customer pain does each product pain reliever address**
  - What our product pain relievers address is all of a customers pains. By having a search engine that would allow for a consumer to verify what they are reading. They would have the ability to input an articles url or article title into our search engine and receive a breakdown which will let them know the accuracy of what they are reading. What they will be able to do eventually is integrate our product into a social media platform of their choice in order to filter out their timeline from "fake news". This would in turn be able to make our consumers more socially aware and allow them to stay up to date with the current events in the world without being worried that what they are reading is not true.
- **What customer gain does each product gain creator address**
  - Our product gain creator targets all of our customer gains. The reason why we are able to do this is because even though our product is not too complex it does solve a major problem in the social community. A customer is able to get what they want with our product because it allows for them to verify that what they are reading is legitimate. By allowing the customer this they are able to become more socially aware by not hindering their lives with "fake news". Our product would allow for them to know if what they are reading is "fake news" or not. Our plug in feature which would eventually be available will allow for users to integrate our product to their social media platform of their choice. This would also allow for our customers to stay up to date by adding a filtration system to eliminate "fake news" to what they are seeing on a day to day basis.

3 × 3 × 3 Goals

Three-week
- Goals:
  - Research on how we could implement the idea that we have and how we could execute it.
  - Research how we could implement the blockchain into our ideas.
  - Have development environment set up.
- Minimum Success Criteria:
  - Idea is well thought of.
  - Plan for execution is made.
  - Coding begins.
- Assessment Plans:
  - App development
  - Research on blockchain
- Agenda:
  - Jesus, Raymond and Tony begin researching what resources are out there that will allow us to implement our ideas.
  - Andrew begins sketching ideas of what our application will look like
  - Ryan begins doing blockchain research.
  - Nick delegates and continuously keeps the team up to date with deadlines.
- Main Risks:
  - Idea is not solid yet.
  - Possible web crawling could be a cause for problems
- Results:
  - Well thought out plan for executing our prototype.
  - Research was done

Three-month
- Goals:
  - Have our MVP ready.
  - Documentation of our progress ready.
- Minimum Success Criteria:
  - A working prototype that shows basic functionality of what we want to eventually have.
  - Documentation that describes what we are trying to reach if for some reason a prototype has not been finished.
- Assessment Plans:
  - App development
  - Research on blockchain
- Agenda:
  - Work collaboratively to bring forth a working prototype.
  - Research blockchain
  - Document what we are actively doing
  - Integrate our findings into our documentation and app.
- Main Risks:
  - Not having a working prototype ready
- Progress:
  - MVP attained.
  - Styling in application and minor "nice to have" details are being integrated.
  - Presentation to describe and explain our product.

Three-year
- Goals:
  - Turn our product into a plugin that could eventually be integrated into a social media platform that will allow for a better news filtration system. "Fake news" would be filtered out.
  - Create our own search engine so we do not have to rely on NewsAPI
- Minimum Success Criteria:
  - A plugin that is at least compatible with Facebook since most of today's "fake news" are seen on there.
  - 5,000 daily users
  - 95% accuracy in verification scores
- Assessment Plans:
  - App development
  - API Integration
- Agenda:
  - Continuous work on the app development.
  - Get licensing and fees cleared.
  - Legal documentation.
- Main Risks:
  - Licensing

Research Method 1

Title: Understanding others Combating Fake News Using the Blockchain

Method: Internet Research

Method Summary:

      While our approach seemed unique at the time, we thought that we might not be the only people that are looking to fight against fake news on the internet using the blockchain as part of their weaponry. The main company that we found out about was Civil.co. Civil.co is a website that prides itself on being community-owned, as they believe that being owned by a single entity is one of the main downfalls of free journalism. We read through their mission statements, assessed some of the news stories that could be found through their website, and studied how they implemented the blockchain as a core part of their platform.

Research Design/Implementation:

      We conducted research by looking through the documentation of their platform, as well as finding how the blockchain served to be an integral part of their work.

Data Collection:

      The data we collected was a number of articles that were posted to the Civil platform, as well as the various Credibility Indicators that might be used on different articles (https://civil.co/credibility-indicators/).

Analysis:

      We looked through the higher posting newsrooms on Civil.co and compared them with the Civil Registry (https://registry.civil.co/registry/approved) to see if they were on the "Approved", "In Progress", or "Rejected list". We found it hard to find newsrooms that were being challenged for their content. While it might be due to the infancy of the platform, given the number of newsrooms that are actively posting using the Civil platform, it shows that the platform actually does work at keeping honesty at the forefront of their game.

Findings:

       On the Civil.co platform, the journalists hold a cryptocurrency called CVL, or Civil tokens. The tokens represent how much of the platform you "own". As with any blockchain, this means that the network is completely distributed amongst many owners, so one single person doesn't have absolute power. These tokens can be used to vote on other newsrooms (journalists and companies that post stories using the Civil platform) and snuff out content that is unethical. This keeps the platform free and honest for the users who come to find news stories that matter to them. Additionally, the users are involved in the process too, as they can sign up as members and use the cryptocurrency to send peer-to-peer tips directly to the posters that they support and like reading.

Research Method 2

Title: How to Implement the Blockchain in a way that is empowering for the user and easy to understand

Method: Surveys and Internet Research

Method Summary:
       In general, the blockchain is still a very new technology that many people do not understand. At its core, the blockchain is focused on having a public ledger, or book, where transactions are public and the data cannot be hidden or changed once it is initially made. With this core idea in mind, we set out to find a new way to implement the blockchain in our website that made it as simple to understand as that previous statement, so that even people who hadn't heard of the blockchain can understand why it is important to use.

Research Design/Implementation:
       We interviewed a few people, from people who aren't tech savvy at all to people who might spend all day on their computers. We wanted to find out what people already previously knew about the blockchain. Most of them could not explain the technology, while some could roughly explain that blockchain was somehow tied to cryptocurrency but not much else. We knew that we would have to explain the blockchain aspect to some users viewing our website that might not have heard of it, so we decided to work on finding a simple explanation that could be easy to understand for newbies and blockchain enthusiasts alike.

Data Collection:
       The data that we collected was the degree of blockchain understanding held by the people we interviewed, as well as answers to some general questions that we asked them, such as whether or not they had heard of cryptocurrency. After these questions, and a brief explanation of the blockchain, we asked some of them to help us select an explanation of the blockchain that we could later use in our website's documentation (from a set of short sentences that were written beforehand).

Analysis:

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Out of the five people that were interviewed, only two of them had heard of the blockchain. Including those two, three of them had heard of cryptocurrency, but one of them could not relate the blockchain to cryptocurrency due to lack of any research outside of hearing about crypto on mainstream news. After providing them with a short explanation of the blockchain and how it was related to cryptocurrency, we put out a paper that had 3 choices for explanations of the blockchain in regards to our product. Using their understanding, we had them select the explanation that they thought was the most straightforward and easy to understand.

Findings:

Generally, we found that people liked the shorter explanations that we had provided them. These were 2-3 sentences in length. While we had some longer explanations that stretched up to a paragraph, most commented that while the longer selections gave more information, the sheer length might steer people away from using our platform as a whole. We chose the explanation that had the most votes, and decided to put it in our website documentation for new users.

Prototype

Goal:

      Have a navigable website that enables a tester to complete the general flow for understanding whether or not an article that they have come across is likely fake or not fake news.

Summary:

      In this prototype, every major page of the website has been implemented as well as the major features. This includes the home page with the search bar (for entry of keywords/article URLs), a loading page (if necessary), the results page (which shows the article entered, percentage value, related articles, and a link to a Twitter statistics page). On the Twitter statistics page, you can see stats that are garnered from Twitter that are related to the searched article.

      Link: https://xd.adobe.com/view/353842a8-1c62-48e4-44f2-f4752c6a0119-4309/?fullscreen

Assessment:

      We planned to achieve the objectives by seeing if the user could complete the main flow of taking an article they have and being able to successfully understand whether or not it might be fake news using our website. Additionally, we had other test flows, such as a user being able to find how many times their article was talked about on Twitter in the past 24 hours.

Data Collection:

      To collect data, we performed surveys. For each survey, we had one volunteer, one interviewer, and one recorder. The data that we collected was how long a user took on each page of the website, or where they would tend to look first on each page. For each feature and page on our website, we had specific questionnaires set up to ask each user when they came across that part of the website. We asked questions about the pros and cons on each webpage, including what they thought of the navigation, layout, and the type of content that was presented to them.

Analysis and results:

We analyzed the data from the surveys that we did with the users, placing emphasis on any points that might have been mentioned by multiple interviewees. In general, we found that most people appreciated the simplistic look of our website. One said that it was comfortable to use as the home page with its simple search box felt like Google. While that simplicity was a plus, we found it to be the source of some pain points on our site as well. For example, while some people liked the Twitter functionality, some were initially confused by what it was for. While it is presented to the user as "What's Happening on Twitter?" on the results page of an article that was searched, some people thought that it would show actual tweets by people instead of statistics and graphs.

Lessons Learned:

We learned that while our idea to keep the site simplistic was a good one, there were areas that needed to be changed because it was too simplistic. For example, while we wanted to keep the results page (the webpage reached after entering an article URL) simple, some people thought that a missing back button to search another article was concerning. We rectified this issue in our later designs by adding the search bar to the top of the page, and making the logo link back to the home page. Additionally, we found that it was necessary to have user-viewable documentation sooner rather than later for aspects of the website like how our article percentages are calculated, so we made that task higher on our agenda to have completed sooner.

MVP Visual Design and Specifications

Product Hypothesis:

To achieve our goal of reducing the spread of fake news, our product will solve the difficulty of verifying the validity of news articles for people who use the internet as their primary outlet for news by delivering a single location (a website) for fact checking within three months. We'll know this product was successful when we see that the website is up and running and has an accurately reports the validity of news 70% of the time with 10 daily users.

Implication:

Having the website up and running is critical to the product because we will be able to gain statistics and insights from it while it is running. For example, we will be able to measure the website traffic and see how accurately the product reports news. Having real users using the product will also train the machine learning algorithm in the fake news detector that we are using. Discovering the accuracy of reports is important because it is the whole purpose of the product and needs to be high in order to be successful.

Evaluation:
- Metrics: We will measure the number of users and accuracy of validity in reports
- Data Collection: We will collect data on how many users use the website and how accurate our reports are.
- Assessment Plan: If these numbers surpass what our estimates are then we will continue working as these numbers will be considered a success. If the numbers are less what we expect then we will do some research into what went on which may include interviewing users.

Design:

The website design is very simple in order to emphasize our goal of giving consumers an easy and quick way of looking up news articles. There is a search bar, the logo, a submit button, and a blockchain button. When the user submits a query, the article and related articles will show up below with titles, a picture, the beginning of the article, statistics about the article (truth score and probability) and a read button that takes the user to that article in a new tab.
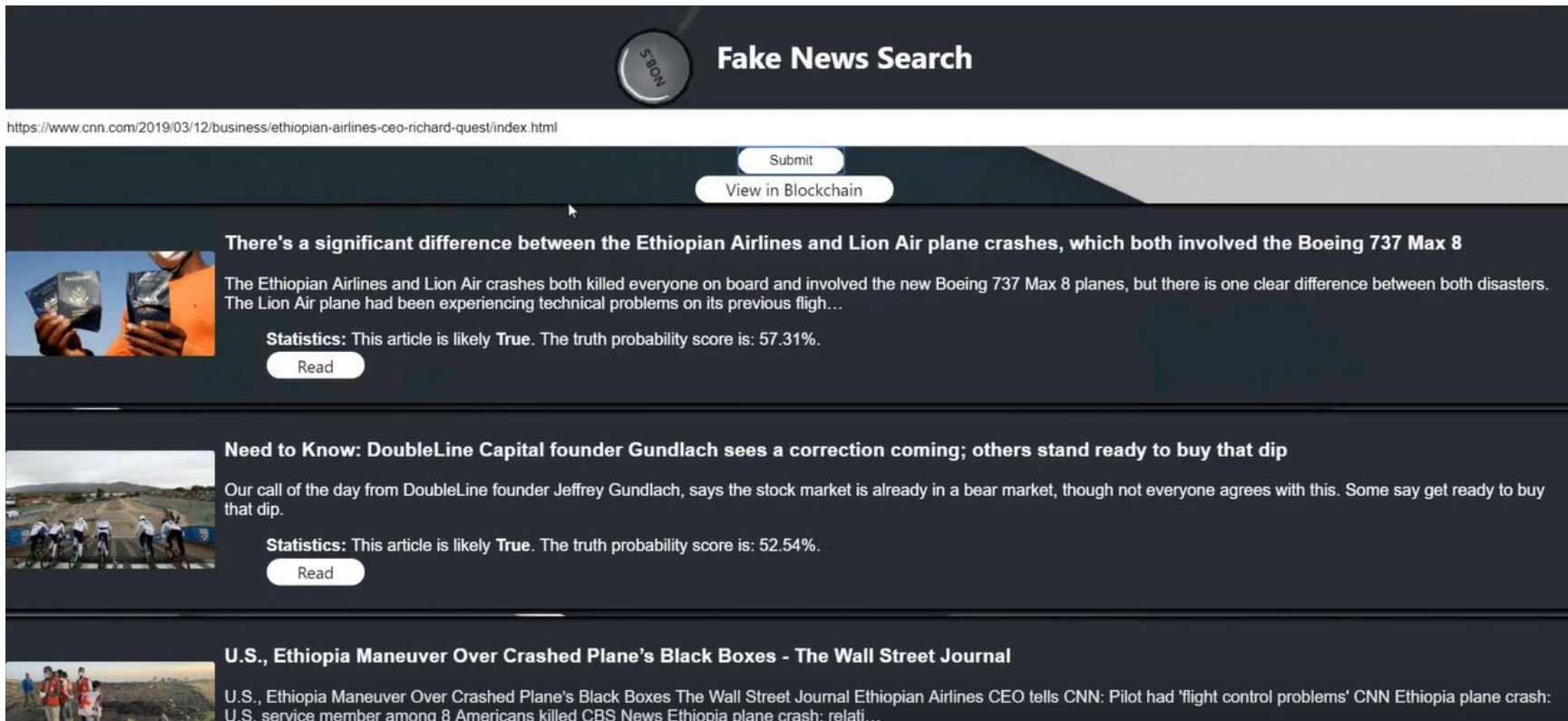
Specifications

      We adopted minimalistic ideas in our UI design. We made buttons and text entry boxes as few as possible. Since our main idea is to help user detecting doubtful news sites, we put only one text entry box at the very top. To make it even more easier to use, we combined url search and keywords search in one text entry box. The search results are presented by the matchness ranking. The user can get a sense of the website in a first glance. We parsed the photo and news overview from the source and bound the analysis in a noticeable way.

Implementation Documentation

Technical Description

        We chose to use React as our web development framework, because it is one of the most adopted web and app design frameworks and is the new industrial standard. We used JavaScript, CSS and the Bootstrap library for our front-end design. On the backend (since we have limited time), we implemented a News API to get the latest press data instead of crawling the web ourselves. We used Node.JS to make requests. We also implemented and edited a Fake News Detection project (https://github.com/nishitpatel01/Fake_News_Detection) to help identify fake news using Python and the Scikit-Learn library. The Fake News Detection uses natural language processing and machine learning algorithms to check if text is true or fake. This project was run on it's own server and get request were sent from our Node.JS server to get the validity scores.

        The process flow of the website runs as follows: The website is opened up locally while the python Fake News Detection is opened up in it's own server. When a user enters something on the search bar and submit, the query is checked to see if it is a website or just a normal search query. If it is a website, a fetch request is sent to the site and the html retrieved is parsed. The title of the article is take and sent to the News API to search for similar articles and get the contents of each article. The reason that we do not get the content directly from the news website is because every website has different pages so it would take a long time to learn how to parse each site. For example, the BBC has the article text split in different figure and paragraph tags while AP News is just in different paragraphs. If the query is just a word or phrase, then it is send straight to the News API to retrieve relevant articles. After we get those articles, we send as much of their content as we can to the Fake News Detection server in the form of a fetch request with the words in the URL. The python server receives the request, then parses the URL, runs the prediction algorithm over it, and then posts the results in the form of JSON which the fetch request from our website retrieves and uses as the article's truth score.

        When studying how to implement the blockchain into our technology, there were a few different methods that we researched. To start, one of the main benefits of the blockchain is that transactions and data that are made on the network are immutable and cannot be changed. To write this core principle into our technology, and help fight fake news, we decided to add a feature to our program that would "cache" the original article that the user entered. We would do this by saving the text content of the article to the blockchain itself. This helps the user compare the article that was originally posted, in case the source that they entered decides to change the article in the future. The benefits of the blockchain and its nature of being uncensorable and robust would be in full force in our project.

To accomplish this, we needed to access the blockchain through the usage of crypto. One of the most popular cryptocurrencies is Ethereum (https://www.ethereum.org/). While Ethereum might be seen as similar to other crypto like Bitcoin, the main difference is that the Ethereum platform allows people to build dapps, or Decentralized Apps (https://github.com/ethereum/wiki/wiki/Decentralized-apps-(dapps)). Decentralized Apps allow developers to create their own applications that have security and scalability in mind, with the open-source Ethereum platform at its foundation.

Additionally, we wanted to work to keep the usage costs of our platform low for us while giving us more control than the Ethereum coin would offer itself. While it would be easiest to simply post messages to the Ethereum blockchain so that the text content we're archiving can be viewed through any number of Ethereum Blockchain explorers, this would require us to purchase and spend actual Ethereum that has a considerable USD value (though fluctuating, it wouldn't be viable for our current financial situation). We instead decided to use the Ethereum technology to create and issue our own token. Ethereum has plenty of documentation (starting at https://www.ethereum.org/token) on how one can create their own crypto token on the Ethereum blockchain. This would provide us with a platform that has proven stability, a wide user base, documentation that makes it easy for us to start up, as well as extra functions that are not available for the Ethereum coin. To benefit our specific use case, creating our own token lets us add features such as centralized administrators and minting (so we can issue more of our own token for use in the future as the platform expands).

With our own unique token implemented on the Ethereum platform, integration with the NOB.S. website becomes simple to understand on the front end. Once a user has searched up an article on our website, we would automatically "cache" the text content of the article. The text content would be sent along with a transaction of our token posted to the Ethereum network, where the contents are saved and cannot be changed in the future. On the results page for the article the user searched on NOB.S., the user will see a "View on Blockchain" button. Clicking this button will lead the user to an external Ethereum blockchain viewer (such as https://etherscan.io/) for the specific transaction linked to that article. Here, the user can read through the original article's text.

Work-breakdown-structure Implementation Plan

Developer assignments are as follows:

Developer	**Assignments**
Jesus Ortega	Research, documentation
Nick Lyu	Project management, coding
Andrew Klossner	Designing, testing, coding
Yuexin Chen	Research, coding
Ryan Zahrae	Testing, Blockchain research, documentation
Raymond Alvarez	Coding, designing, research

1. Lean canvas (WK1-2)
    1.1. Problem
    1.2. Solution
    1.3. Unique Value Proposition
    1.4. Research on competitors
    1.5. Customer Segments
    1.6. Key Metrics
2. Value Proposition Canvas (WK2- 3)
    2.1. Product
        2.1.1. Gain creators
        2.1.2. Pain relievers

    6.5.2. Parsed search with URL (WK 9-10)
   6.6. Connecting modules (WK9-10)
   6.7. Testing (WK 10)
    6.7.1. Keyword search
    6.7.2. URL search
    6.7.3. Accurate probability scores
    6.7.4. Website links
 7. Design (WK 4 - 5)
   7.1. Prototype design
   7.2. Logo design
   7.3. Background Design
   7.4. CSS (WK 9-10)

Latest MVP

Link: https://github.com/ishootrayguns/react-environment

Install Python 3, React, Node.JS, Scikit-Learn and run npm install in both *detector* and f*ake-news-final* folder.

Initiate backend server, in *detector* folder run in command: **python3 server.py**

(Before running server.py, make sure to run the following snippet in command line/terminal:

pip install -U scikit-learn

pip install numpy

pip install scipy)

Initiate frontend server, in *fake-news-final* folder, run in command: **npm start**. The site is now ready to go. You can search an url or some keywords.

Findings:

From our testing, we discovered a few flaws in our product design. First of all, people wanted to know how the truth probability score is calculated. We can show this through a small question mark button on the corner of the scores that opens up quick write-up of how the score is calculated which is through an algorithm that uses natural language processing and machine learning. We also discovered that people had problems with how the truth scores were shown on the screen. Right now, they are just in plain white bolded text which is confusing to see among the rest of the text. Our goal would be to make some sort of visualization that represents the validity of an article that can be briefly scanned and understood. This can be done in various ways like having a truth meter similar to how Politifact has theirs. Finally, there have to be some overall UI changes to make content more readable and presentable to the user. Users should be able to understand the validity of an article at just a glance rather than search through the high amount of text that currently shows up.

Conclusion

In the span of 10 weeks we were able to bring forth our MVP. What we were able to learn throughout this time was more than anything, including how to work together effectively and how to distribute work while at the same integrating ourselves into the whole process.

Constructing an idea and putting it on paper was not too difficult as we had multiple heads brainstorming on what we should be doing. Despite that, we did come to our first stump when trying to figure out how to integrate blockchain since it is something many people are still not aware of, let alone know how it functions. Upon conducting some research and ensuring that we all as a collective understood what it was we began moving forward with the development process.

The development process brought forward a big learning curve, by having to learn a new framework (React JS) and integrate many outside tools into the project. However the backend team was able to communicate with our frontend team in order to collaborate effectively. Once we were able to get the development process flowing we began integrating the core logic of the app.

Overall, all of the above took us the whole quarter and we fortunately did not face too many obstacles. We worked together and were able to get a better sense of what it takes to work collaboratively in a development team.

Contribution and Acknowledgement

Task (In Project Report)	Contributor	Notes
Introduction	Andrew	
Lean Canvas	Jesus	
Value Proposition Canvas	Jesus	
3 x 3 x 3 Goals	Jesus	
Research Methods 1	Ryan	
Research Methods 2	Ryan	
Prototype	Ryan	
MVP Visual Design and Specification	Nick	Wrote specification
	Yuexin	
	Andrew	Wrote the other sections
Implementation Documentation	Ryan	Wrote technical documentation
	Raymond	Wrote implementation plan
Latest MVP	Andrew	
	Nick	

Conclusion	Team	
Task (Outside of Report)		
Mockups	Andrew	Created the mockups and prototype
Blockchain Research	Ryan	Research in blockchain
API/Algorithm Research	Raymond	Research in coding environment
	Jesus	Research in technical things
	Yuexin	Research in News API
Creating/Coding MVP	Andrew	Worked together to code the MVP
	Raymond	
	Yuexin	
	Nick	Get the Python server running
Testing	Andrew	Conducted the tests and wrote cognitive walkthrough
	Nick	Take observer notes
	Ryan	Wrote questions and cognitive walkthrough