CRIMIPLEGIA

Final Report

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I. Product Description

Brief Description of the Product

Crimiplegia is an information based company that helps travellers from all over the world to understand potential risks better and feel safer when travelling to the US. Data is useless, unless is correctly interpreted; that is where Crimiplegia comes in. At Crimiplegia, we aim to interpret criminality data in the best way possible so that our users can travel more, and worry less.

Our Vision

Our vision at Crimiplegia is to utilize criminality information that is available to us in order to keep our users informed and give them peace of mind. Moreover, our main goal is to make easy to understand crime data available to everyone so that they can utilize it in their daily lives. We make travelling easy and eradicate any source of uncertainty that might exist for potential travellers. As a result, will boost tourism in the US, generate new jobs, and improve the nation's economy.

Who is Crimiplegia

Crimiplegia is a startup with two main components, and with two different development stages. First, we aim to generate a database that will unify over 18,000 databases containing criminality records from all over the US, translating the information and categorizing it. Through a series of APIs, we aim to generate software that pulls the data from all sources and stores it in our own databases. Second, we intend to design mathematical algorithms to analyze the information and present it in simplified way to our users.

The first stage of the company is to build Crimiplegia's phone app in order to help our users understand potential risks and make conscious decisions when traveling. The app will extract millions of criminality records, analyze and interpret them. After building a user base, our second stage is to become data providers to companies who want to minimize risks by taking our data into consideration when making important decisions. For example, Fedex can find better routes, or a local entrepreneur can find a better location to start a coffee shop.

II. Product-Market Fit

Solving a real problem

When it comes to determining the safety of certain towns or neighborhoods, our customers most likely do not spend the time to search the internet for police reports about recent crime

activities, nor research travel sites to find out whether a place they want to visit is known to be safe or not safe, since that is tedious work.

However, one thing for certain, people are worried for their own safety and the safety of their loved ones. Unfortunately, there are not well-known and used platforms that combat this uncertainty and fear.

Our customers

We are targeting international travelers who want to be safe during their trips. This ranges from people who travel for business reasons, students who are studying abroad, or families who are planning to go on vacation. We want to keep everyone safe.

In a business to business standpoint, businesses will have our safety ratings melded into their applications to further enhance their own applications and attract more customers of their own, or could simply use our information to minimize risk and cut potential losses.

Product-Market Fit

Ultimately, with our product, we are making traveling safe again. There are a lot of criminality API's, therefore, we are making the lives our users easier by merging all of these API's together and offering clean data to our users. In addition, there are locations where our API's does not cover. Therefore, we'll crowdsource recommendations so that our users can have the best and dependable app in the market. Our mission is to give users a criminality rating of every city and town so that they would spend less time worrying and more time enjoying their travel.

III. Hypothesis

Essential hypotheses

Here we discuss some of the most important hypothesis we tested. The complete list of hypothesis is included in Appendix A, it is categorized by leap-of-faith, growth, and value hypotheses.

"People recognize that criminality levels have increased dramatically"
"People feel unsafe when traveling to unknown places due to the increased levels of crime"

> These two hypotheses are core to our product idea; people will not use our service if they are not feeling doubtful about visiting certain places. These were the first hypotheses we needed to validate before we could decide to continue our product idea. When we first started off, we had to think of and test experiments tailored for this purpose. Some of our MVPs include one-on-one in-person interviews, testing our landing page, and providing a text service concierge MVP. Most of these early experiments validated these crucial hypotheses and the "problem" we were trying to solve. After we validated this, we confidently move forward and focus our idea.

"We can obtain crime data and identify the area or neighborhood where the crimes occur"
"It is possible to gather data from APIs and use it to create our own database"

These hypotheses were crucial because they provide the technological backbone for our product. Once we decided we were going to focus on an app that compiled crime data, one of the first questions we needed to answer was; is this technologically possible? To answer this question, we went to Professor Pengyu Hong, an expert in the field, who quickly confirmed our hypothesis; it could be complex, but the technology is definitely there. Once we knew that this type of data gathering was feasible, we could focus our efforts on continuing the idea, instead of possibly pivoting.

"Businesses would be interested in advertising in our app"

This hypothesis is important because we view ad revenue as our primary source of revenue in the first stage of the company. We plan to use ad revenue so that we don't have to charge users for our app, so we needed to verify that businesses would be interested in advertising. Otherwise, we would have no revenue, and our business would not be sustainable. After an extensive interview with a restaurant owner, we could verify that there would be interest in advertising on our app. The exact financials would vary depending on the number of our users, but we left the interview with some confidence knowing that there is validation in our hypothesis.

IV. MVPs

Here we present some of our most relevant MVPs that helped us validate our hypothesis. The complete list of MVPs is included in appendix C.

[MVP #1]: Qualtrics Survey. Interest in traveling recommendations and safety.

This was a simple Qualtrics Survey sent out to Brandeis students. The questions aim to validate the following hypotheses:

1. **People are actively concerned about their safety when traveling**
2. **People would be interested in a personalized activity planned in the app (Pivoted and eliminated)**
3. **People want a universal app that combines all their travel necessities into one (Pivoted and eliminated)**

Our results demonstrated that although people would not mind having a personalized activity planner in the app, their main concern was the safety aspect and the convenience factor. Nearly all but two people (2/27) said that they care about the safety aspect. The personalized activity planner was liked, but it was not the main concern for this app. People wanted an app that made everything convenient and showed the safety rating in different areas. As a result, we pivoted and eliminated the activity planner.

[MVP #2]: One-on-one interviews. Interest in traveling recommendations and criminality ratings.

This MVP was designed to test two hypotheses. That people are not completely satisfied with Yelp because the app doesn't take into account your personal preferences and taste. And that people need better information about criminality when traveling because it's a bigger concern nowadays. We asked questions addressing issues about criminal activity and regarding their experience with Yelp and the value of having personalized recommendations.

The results were consistent throughout all interviewees; the criminality app idea is of huge interest to people, specifically college students who are traveling to places they have never been to before. It was most interesting to have criminality gradient maps (just as the ones used to present weather information) embedded in apps as Google maps.

Regarding apps such as Yelp, people thought it was a necessity to have personalized recommendations in order for them to be useful when choosing a place to eat in, for example, but did not think it wasn't really worth it to include this feature since it would just make our app less clean. This MVP resulted in a zoom-in pivot, and we decided to focus on the criminality rating/map only.

[MVP #3]: Landing Page. Measuring interest in our company. (see Appendix B.I)

The main point of creating the landing page is to test the hypothesis that people think our company provides value and is solving an existing problem. In the main page we have a general overview of what the company is, a button that can take the user to a page where there is more specific information, and we have also included a button that says "Try our app here!", which leads to a "you caught us early!" page and a email signup form. We are using google analytics to see how far users get to, and how many people sign up for the email notification. The url of the site is: www.crimiplegia.com

The results were positive and helped us validate our value hypothesis. About 40% of the people who visited the first page wanted to learn more, and navigated to the "about" page or the "try our app" page. In the "try our app" page, we have a feature where users can input their ZIP code and ask the website to generate a criminality report for their area.

The results were clear and helped us to validate the hypothesis that people want to know and understand the criminality levels for specific ZIP codes across the nation. More than 60% of the people who visited the website actually tried out this feature, which means they were interested in the core product idea.

[MVP #4]: API. Is it possible to get geo-based criminal records?

We have a leap of faith hypothesis that we needed to test and it is a technical one: We can obtain crime data from different areas and use them to generate a score. If we cannot obtain the data for our criminality API, our whole project has to pivot. Luckily for us, we found several APIs that can be of use. We have also consulted experts in the field who confirmed that consolidating these API's is definitely feasible.

[MVP #5]: The app for USERS. Are they interested in our product. (see Appendix B.II)

We performed an AB test in order to test our hypothesis that safety ratings will be a factor in a user's choice of restaurant, and to extrapolate from it; in a user's choice in outside activities. The A test shows a list of 5 Italian restaurants with no safety ratings. The B test shows the exact same list, but with safety ratings and ranked.
https://invis.io/FA93A895P

In a test of 22 participants (11 in each test), the results show that the majority of users will choose the higher safety rated restaurants, when given the information.
The results of this experiment show that users will choose the more safe option, when they are given the information. This validates the hypothesis that safety data will influence a user's choice in restaurant, and potentially in other outside activities.

[MVP #6]: Texting Criminality Service. (see Appendix B.III)

The MVP that we worked on was seeing if people were comfortable with receiving a safety rating through text. We developed a UI mock-up of how a text message conversation would look like, and we decided that we were also going to give criminality stats.

Then, we tested to see how people wanted to receive information. We used an A/B test, and we learned that the majority of people are more interested in receiving both safety rating and the criminality report all at once; instead of having to go back and request more info for the criminality stats. Our results were mostly positive; users happily used our texting service, and some used it multiple times.

[MVP #7]: Paper Prototype.

The next MVP that we worked on was a paper prototype of the application. Which allows one to see all of the web pages our app will be offering. Once the the UI mock up was done then we went on to test it out with students to see if they can walk themselves through it without having anyone explaining anything to them. After these tests, everyone that we talked to told us that our paper prototype was self explaining, and clean.

[MVP #8]: Competitor Companies.

We researched potential competitors, and found there are two types of businesses similar to us. There are some websites that can be used to see how many crimes have occurred in specific locations in a specific period of time. These websites however, offer vague information and it is hard to understand the significance of the data. The other kind of businesses are those who have actually interpret the data and provide some analysis. These companies provide much more useful information, but some have failed because they have not been careful with their political correctness.

The conclusion is that there is a lot of room for development of new types of analysis of criminality data, which can be used for different applications. This puts us at an advantage over websites that just show raw statistical information. Moreover, we have information on why some similar companies have failed and know what aspects of our product (and marketing) have to be treated carefully.

[MVP #9]: Political correctness and wording of product.

After releasing our Landing Page on social media, we got some negative feedback regarding the wording and purpose of our company. Some people argued that this was encouraging neighborhood profiling and it was an exaggeration of what is actually going on. Some people were uncomfortable with how we were describing the world: full of terrorists and criminals everywhere. We decided to reach out to some of these people in order to understand their views. As a result, we updated our vision statement and added a disclaimer, which states that our scores are purely based on the data we collect, so we are not profiling any neighborhoods. We found out that the wording was problematic, but the product was still valuable, even to the troubled people.

One-on-one interviews. Safety concerns.	Great concern about safety
Qualtrics Survey. Interest in traveling recommendations and safety.	Little interest for personalized day planners
Reaching out. Validating a targeted group of users.	Didn't hear back from tageted group
One-on-one interviews. Interest in traveling recommendations and criminality ratings.	Great interest in Criminality ratings
Landing Page. Measuring interest in our company.	Strong interest in our company
API. Is it possible to get geo-based criminal records.	We can obtain crime data from different areas
Companies as customers. Are they interested in our product.	Companies are interested in our product
The app for USERS. Are they interested in our product.	App users are interested in our product
Reaching out. Explore the growth engine -- Social Media	Social media has given us growth
A/B Texting Design Tests.	Users indeeed want simplified user design
Texting Criminality Service.	Users are willing to receive a safety rating through text
Pricing Page.	21% Conversion: users would want to buy our app
Appeal of product through Landing Page.	40% Conversion: went to "try it out" page
ZIP Codes Criminality Ratings.	66% Conversion: tried it out!
Paper Prototype.	People were walked themselfs through the wireframes
Kickstarters.	No kickstarter has responded
Meeting with expert in BigData and Stat. Analysis.	It is possible to build our product
Competitor Companies.	We were successful in targeting our competition
Political correctness and wording of product.	Fixed wording of product and recieved no negative feedback

V. Technical Considerations

Our databases make up the backbone of our application. The first database is the one where we store the data that we retrieve from Application Programming Interfaces (APIs), and the second one is the data from crowdsourcing. To gather data for the database, we first gain access to the required APIs and then do a call to them to get the data. Every API has different retrieval formats, such as Json or XML, so after we get all the data we want, we need to categorize them and convert them to a uniform format. After converting them, we will analyze and convert the data into ratings for locations around the world.

Here comes the question, how will we do this? To solve this technical issue we consulted with Professor Pengyu Hong, an expert in the field of machine learning, statistical analysis, and Big Data. We believe his expertise would aid us in our road to developing this product. Professor Hong describes that it's absolutely possible to achieve this albeit it being very complex and difficult. Our issue resides in how many formats the data can be presented in. Moreover, Professor Hong articulates that, through the use of a natural language, we can access the databases, pass all the data, and categorize it. After we have figured out the way to "decipher" the information, it is fairly simple to do a statistical analysis of the data. This is assuming that the format of the data does not change in any of the sites providing the data. We don't know how many different "formats" there are, and if the data in any of this cases is categorized, which would make the process easier. Maintaining an active and updated database after the initial schlep factor is fairly simple, unless many of the APIs start changing their formats.

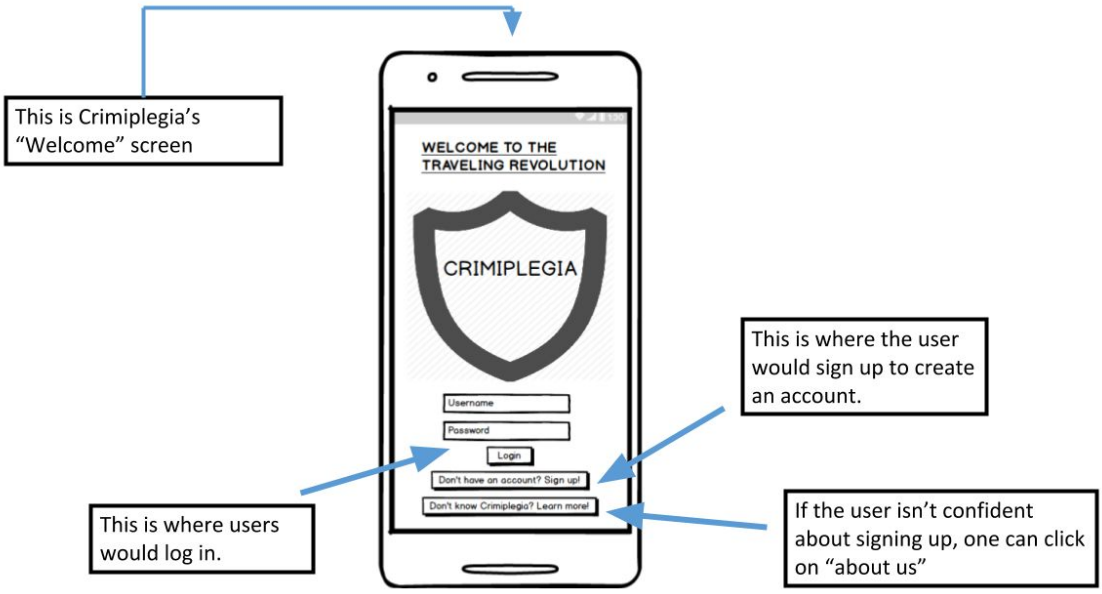
Our second database is crowdsourcing information through the people that use our application, so it is much easier to handle this information because the format is chosen by us. There is a leave feedback feature in the application that basically lets the user critique or laud the areas they have been to. This data is passed into our second database and categorized as well.

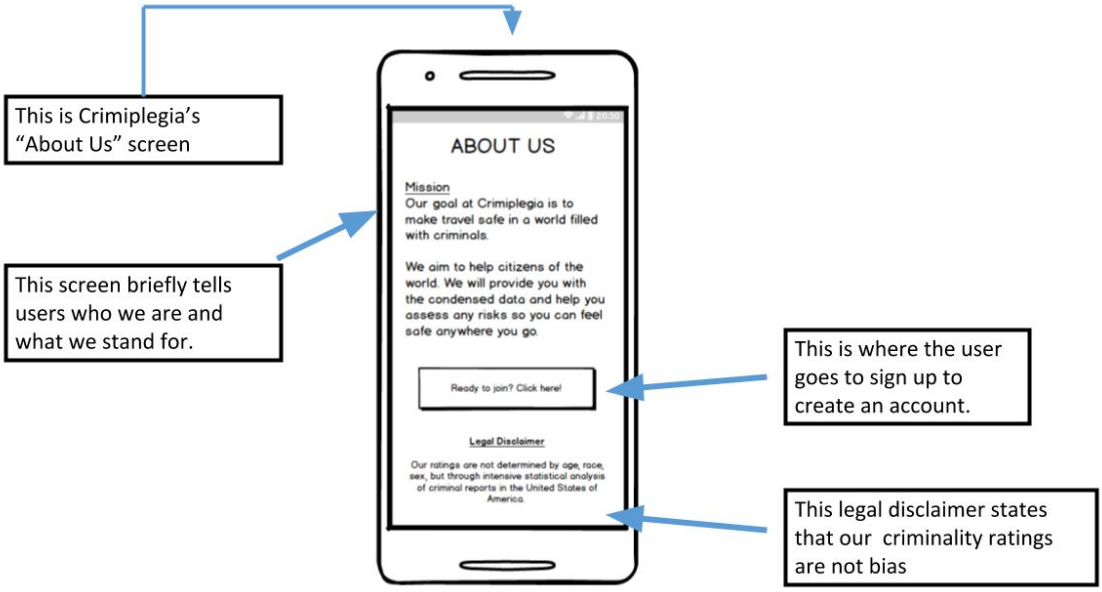
Once both our databases are populated and categorized, we need to interpret the data. We can dissect the United States into many contiguous portions and then generate a score for the area. This score is comprised of the following: the number of crimes multiplied by each crime's severity, i.e. manslaughter as a 5 and theft as a 1 and summed up with our crowdsourced data. Since the crowdsourced data is human giving input and can be biased, it holds less weight compared to the data we retrieved from the APIs. After each sector gets its own raw score, we take into account the population count and size of the location to scale the raw scores fairly down to a scale of 10.

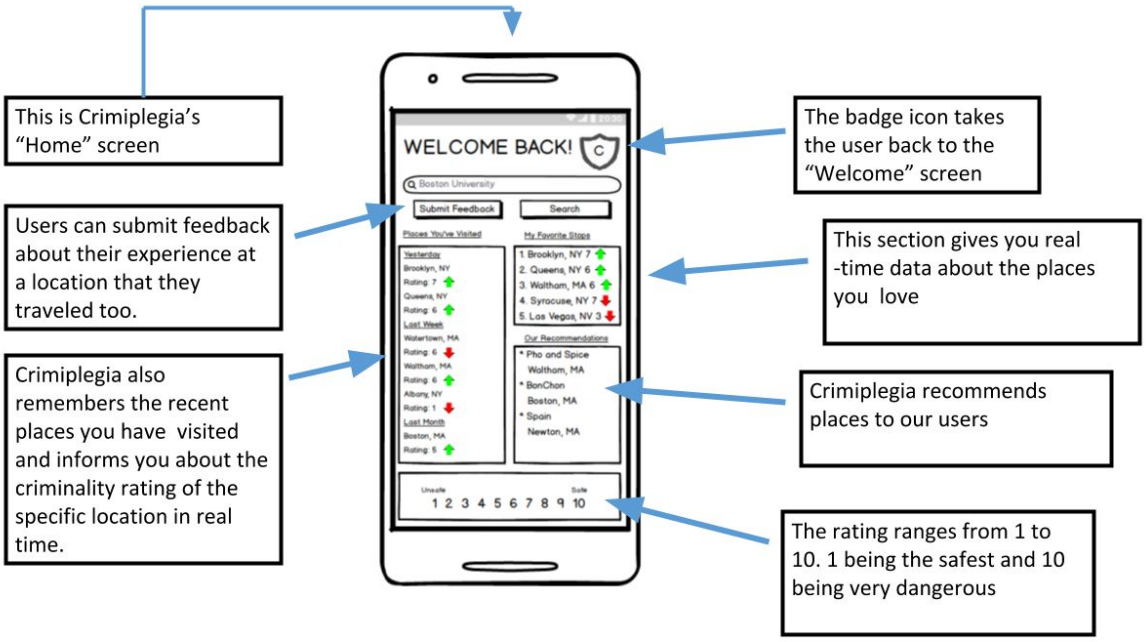
Aside from our databases, another technical consideration was the building of the application. Building the application is not too difficult of a task, whether it's using Swift for iOS or Java for android. It can be done simply using basic screens since most of the work is done by communicating with our database. When the database technical hypotheses was completed, we were complete with our technical concerns.

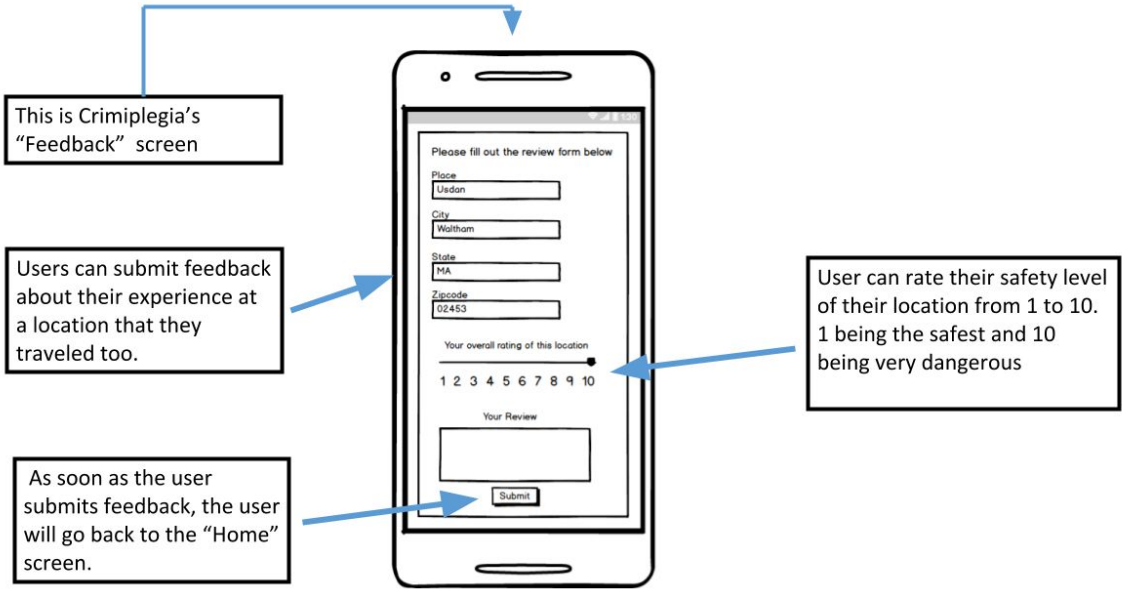
VI: User Interface and Screen Flow

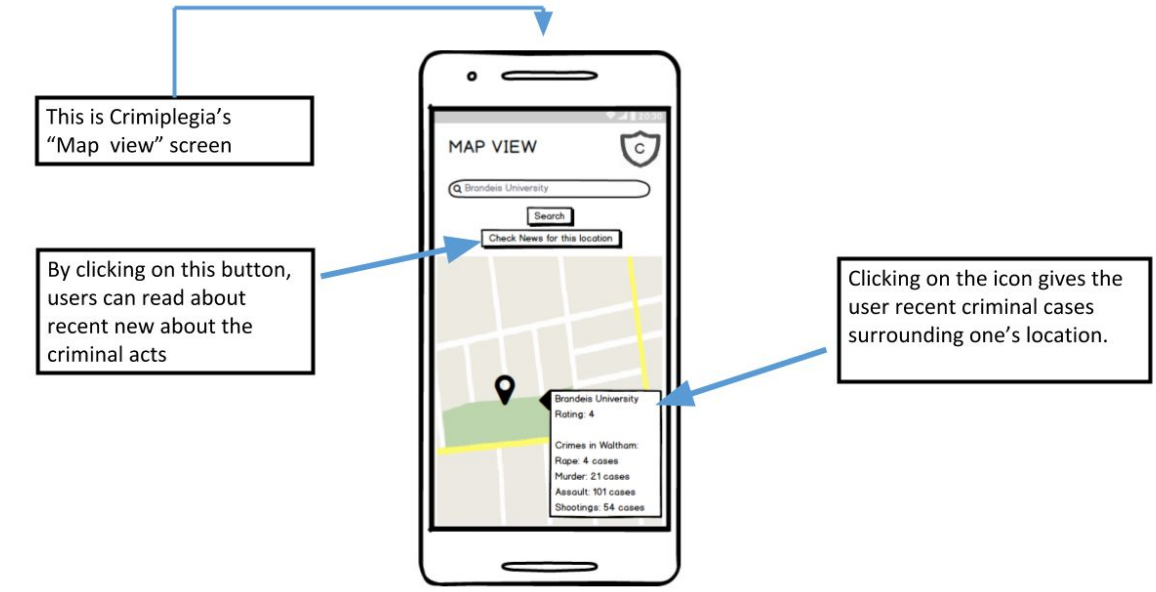
This diagram shows the flow of screen to screen in the user interface and gives an explanation of what each feature offers to our users.

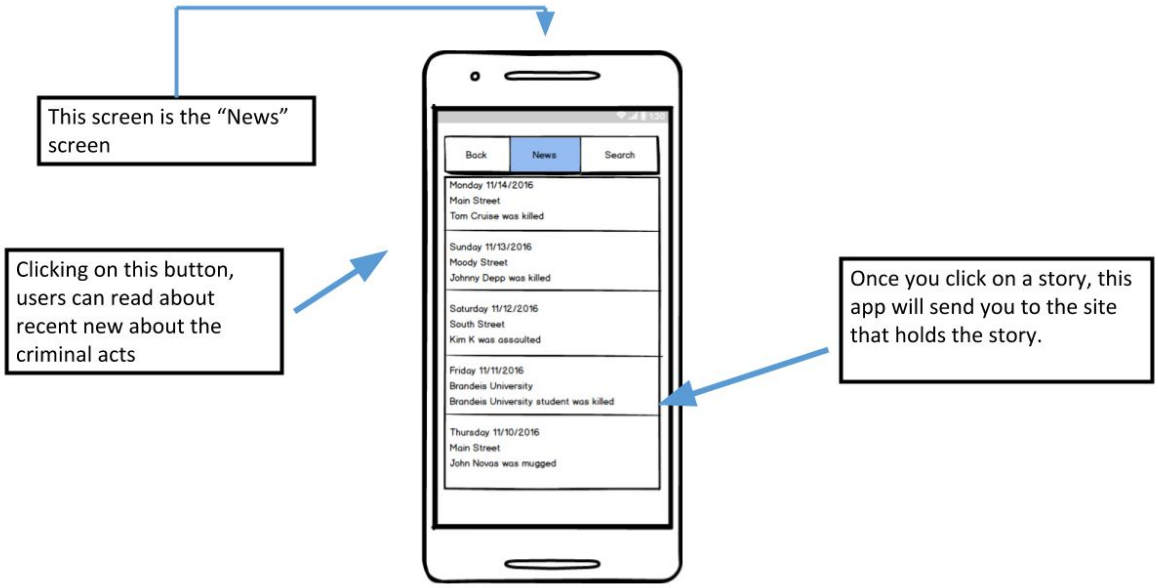

This is Crimiplegia's "Welcome" screen
WELCOME TO THE TRAVELING REVOLUTION
CRIMIPLEGIA
Username
Password
Login
Don't have an account? Sign up!
Don't know Crimiplegia? Learn more!
This is where the user would sign up to create an account.
This is where users would log in.
If the user isn't confident about signing up, one can click on "about us"


This is Crimiplegia's "About Us" screen
ABOUT US
Mission
Our goal at Crimiplegia is to make travel safe in a world filled with criminals.
We aim to help citizens of the world. We will provide you with the condensed data and help you assess any risks so you can feel safe anywhere you go.
Ready to join? Click here!
Legal Disclaimer
Our ratings are not determined by age, race, sex, but through intensive statistical analysis of criminal reports in the United States of America.
This screen briefly tells users who we are and what we stand for.
This is where the user goes to sign up to create an account.
This legal disclaimer states that our criminality ratings are not bias


This is Crimiplegia's "Home" screen
Users can submit feedback about their experience at a location that they traveled too.
Crimiplegia also remembers the recent places you have visited and informs you about the criminality rating of the specific location in real time.
WELCOME BACK!
Boston University
Submit Feedback
Search
Places You've Visited
Yesterday
Brooklyn, NY
Rating: 7
Queens, NY
Rating: 6
Last Week
Watertown, MA
Rating: 6
Waltham, MA
Rating: 6
Albany, NY
Rating: 1
Last Month
Boston, MA
Rating: 5
My Favorite Stops
1. Brooklyn, NY 7
2. Queens, NY 6
3. Waltham, MA 6
4. Syracuse, NY 7
5. Las Vegas, NV 3
Our Recommendations
* Pho and Spice
Waltham, MA
* BonChon
Boston, MA
* Spain
Newton, MA
Unsafe
Safe
1 2 3 4 5 6 7 8 9 10
The badge icon takes the user back to the "Welcome" screen
This section gives you real -time data about the places you love
Crimiplegia recommends places to our users
The rating ranges from 1 to 10. 1 being the safest and 10 being very dangerous


This is Crimiplegia's "Feedback" screen
Users can submit feedback about their experience at a location that they traveled too.
As soon as the user submits feedback, the user will go back to the "Home" screen.
Please fill out the review form below
Place
Usdan
City
Waltham
State
MA
Zipcode
02453
Your overall rating of this location
1 2 3 4 5 6 7 8 9 10
Your Review
Submit
User can rate their safety level of their location from 1 to 10. 1 being the safest and 10 being very dangerous





VII. Business Plan

Market

The market is enormous enough such that the company has great potential for growth. However, we calculate that after a year of having the product active and online, we could reach 0.2% of the businesses in the 10 states with most tourist activity. 0.2% of the market in these

10 states represents a value of $330,000 per year. Hence, we could focus our efforts to only 10 states (by the end of the year) and then virally expand to include all the states. As such, we can grow the percentage of businesses paying for advertising from 0.2% to an ultimate goal of 5% nation wide. This would represent a realistic value of $30,000,000 dollars per year, in a market with a total value of $600,000,000.

State	Tourists / year	Restaurants
California	6,364,000	69,908
Florida	6,026,000	39,143
New York	5,922,000	45,681
Hawaiian Islands	2,727,000	3,370
Nevada	2,364,000	5,603
Massachusetts	1,429,000	15,397
Illinois	1,377,000	27,189
Texas	1,169,000	43,670
New Jersey	909,000	17,957
Arizona	883,000	9,314
Total	**29,170,000**	**277,232**
	*Advertising Fee	$50.00
	Restaurants in the US	1,000,000
	International tourists in the US	45,500,000
	Market Value in Top 10 States (Monthly)	$13,861,600.00
	Maket Value in Top 10 States (Annually)	**$166,339,200.00**
	Market Value in the US (Monthly)	$50,000,000.00
	Market Value in the US (Annually)	**$600,000,000.00**
	If percentage of Aquired Businesses:	0.20%
	Revenue from Top 10 States (Annually)	$332,678.40
	Revenue Nationwide (Annually)	$1,200,000.00

Competitors

There are no direct competitors. No company is trying to unify and use the criminality data nationwide to inform the public and help make informed decisions when choosing area-specific places to eat or drink in. However, there are businesses that have unified criminality databases and have used the information as part of their products.

There are some websites that can be used to see how many crimes have occurred in specific locations in a specific period of time. These websites however, offer vague information which makes it hard to understand what does this statistics mean. Some of this websites show you the crime statistics so you can take criminality into consideration when buying a new house.

Some examples of these companies are SpotCrime and the failed SketchFactor. SpotCrime simply shows dropped pins in every location where a crime has been documented. As you look for a city, you will find crowded maps with excessive information, arriving to a unique and irrelevant conclusion: there's a lot of crime, but so what? SketchFactor instead opted to crowdsource. Instead of collecting data from official sites, SketchFactor would gather feedback from across the nation. However, the data was mostly useless since users of the application would not take it seriously. Moreover, SketchFactor also provided only the location of a myriad crimes which do not provide any insight. Eventually, SketchFactor had to close after accusations of having a racist approach.

There are also other businesses who have actually used this to make an analysis of some sort and interpret the statistical data. In this case, the information provided is much more useful to someone accessing it. Nonetheless, some of these companies have failed because they have not been careful with their political correctness.

Our conclusion is that there is a big opportunity to analyze criminality data in new and more useful ways. This puts us at an advantage over websites that are showing raw statistical information. Moreover, we have information on why some similar companies have failed and know what aspects of our product (and marketing) have to be treated carefully. This puts us at an advantage over companies that have already used statistical analysis to solve similar problems but failed to become sustainable.

Costs	Amount / month
Website Host	$20
Online Server	$100
Developer Salaries	$3,750
Two Full-Time Developers (Full Year)	
Annual Costs	**$91,440**
Two Full-Time Developers (Six Months)	
Annual Costs	**$46,440**

Costs

The costs are minimal. In the development stages we need to host a website, pay for servers. Moreover, we need to pay the salaries of two programmers to develop the product.

After the first stage, the costs of the company are marketing costs. Money is needed to pay for advertising and to pay a group of developers. The developers work towards the implementation of new features, maintenance of the databases, fixing bugs, and expanding the product.

Pricing Model

Crimiplegia's application will implement a freemium model. The app will be free to download and will allow for up to 10 searches. After 10 searches, a necessary monthly subscription of $0.99 is needed. However, the app will have several ways to unlock the premium version; these "hacks" will focus on growing the user market of the app. For example, if the user refers the app to some friends, he or she will be able to permanently unlock the premium version of the app.
On the client side, we are selling advertising (to pre-approved businesses who wish to remain on the top of our recommendations list) at low costs. We offer a new way to advertise and be endorsed by our company. We have currently planned to start with a monthly rate of $50, and after more users are acquired the rates can go up any reasonable amount that is in accordance with the number of users that can be reached through the app.

Growth

We need to acquire the group of users (people who download the app) and the group of clients (businesses that pay for advertising).

Users will be acquired in many different ways, including:

- Contacting travel agencies and advertise through them
- Implement a freemium model, where customers can obtain the premium version when referring to friends
- Generate active social media company profiles
- Advertise in most popular tourist locations and attractions
- In-app features to share on social media

- Offering codes for promotions when signing-in to businesses through social media

Companies that pay for advertising, although this might be a slower acquisition process, will be acquired as the user base grows by:

- Create a comprehensive website with detailed information about our product, pricing, and the perks of being part of the group of Crimiplegia's selected businesses.
- Once we generate some users, we will pitch our product to selected companies that are located on areas that have a high number of searches through the app. We will acquire more users as time advances, and even though some areas in every state will not have high user traffic, we will be able to target those areas that have high user traffic in the early stages and start acquiring clients early on.

Projections and Estimations

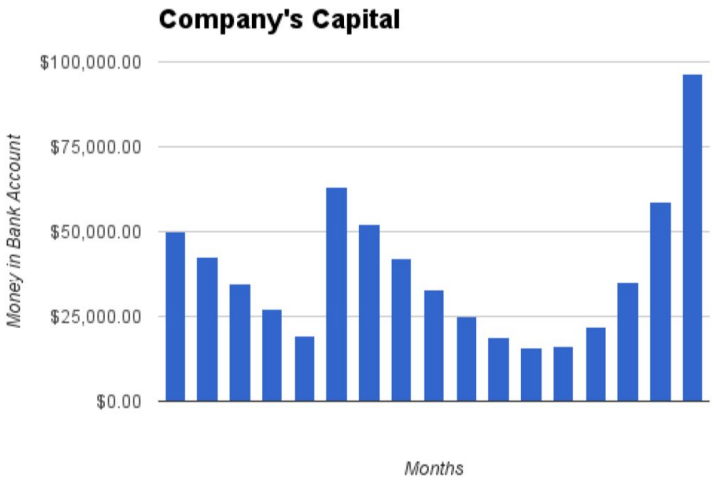
We are projecting that after three years of being active (not including the first year where we are developing the product and company), we will be able to reach about 3% of our targeted clients in the top 10 states, and a 1% of the businesses nationwide. This represents a value of $10,990,000 dollars per year.

Parameters	
Advertising fee (Monthly)	$50.00
User subscription (Monthly)	$0.00
Initial # of Customers	100
Initial # of Businesses	25
Programmers	2
Salray/programmer	3750
Website Fee (Monthly)	50
Database Costs (Monthly)	100
Growth Businesses (8% Weekly)	40.00%
Growth Customers (8% Weekly)	40.00%

Money Left	Months	Extra Funding	Marketing
$50,000.00	1	$50,000.00	$0.00
$42,350.00	2	$0.00	$0.00
$34,700.00	3	$0.00	$0.00
$27,050.00	4	$0.00	$0.00
$19,400.00	5	$0.00	$0.00
$63,000.00	6	$60,000.00	$10,000.00
$52,100.00	7	$0.00	$5,000.00
$41,900.00	8	$0.00	$5,000.00
$32,680.00	9	$0.00	$5,000.00
$24,832.00	10	$0.00	$5,000.00
$18,904.80	11	$0.00	$5,000.00
$15,666.72	12	$0.00	$5,000.00
$16,193.41	13	$0.00	$5,000.00
$21,990.77	14	$0.00	$5,000.00
$35,167.08	15	$0.00	$5,000.00
$58,673.91	16	$0.00	$5,000.00
$96,643.48	17	$0.00	$5,000.00

Moreover, we have identified all costs in the development stages and use them as parameters to calculate the anticipated profit in the first 16 months. We assumed that it will take 5 months to build the first version of the app, and that will get extra funding as soon as the product has been built. The total cash in the company's bank account is also shown in a bar graph. Moreover, we calculate to spend $10,000 initially on marketing, and $5,000 monthly in order to substantially grow our user and client base.

VIII. Conclusions



The Lean Startup methodology has allowed us to pivot several times and stir into the right direction. We have been able to validate our hypothesis and come up with a product that can become the core of a sustainable business. We have found a product with value to our customers, and what seems to be a working engine of growth. We know, however, that the proposed engine of growth will need to be tuned on the run. No theoretical engine of growth will be optimal without testing it and measuring its performance in a real market. We have identified the technical challenges and, even though developing the product represents a tremendous amount of work, we have validated the functionality of the product by consulting experts in the fields of machine learning, statistical analysis, application development, and big data.

We recognize that besides building a nationwide criminality database, the biggest challenge is to grow the user base continuously. In order to assure a constant growth (we aim for a weekly 8% growth), we will reinvest the profits in marketing campaigns, directed advertising, and to develop in-app features that will give a viral growth to our app.

APPENDIX A

List of Completed Hypotheses

Here we categorize our hypotheses. Those hypotheses that have been validated by the MVPs (that are fully explained in the next section) are preceded by the text [Validated].

Leap of faith hypotheses:

- **[Validated]** People recognize that criminality levels have increased dramatically
- **[Validated]** People feel unsafe when traveling to unknown places due to the increased levels of crime
- **[Validated]** People would benefit from a universal criminality rating system incorporated to the apps or sites they usually use to travel (i.e. Google maps, Yelp, expedia.com, etc...)
- **[Validated]** We can obtain crime data and identify the area or neighborhood where the crimes occur.
- **[Validated]** It is possible to gather data from APIs and use it to create our own database

Growth hypotheses:

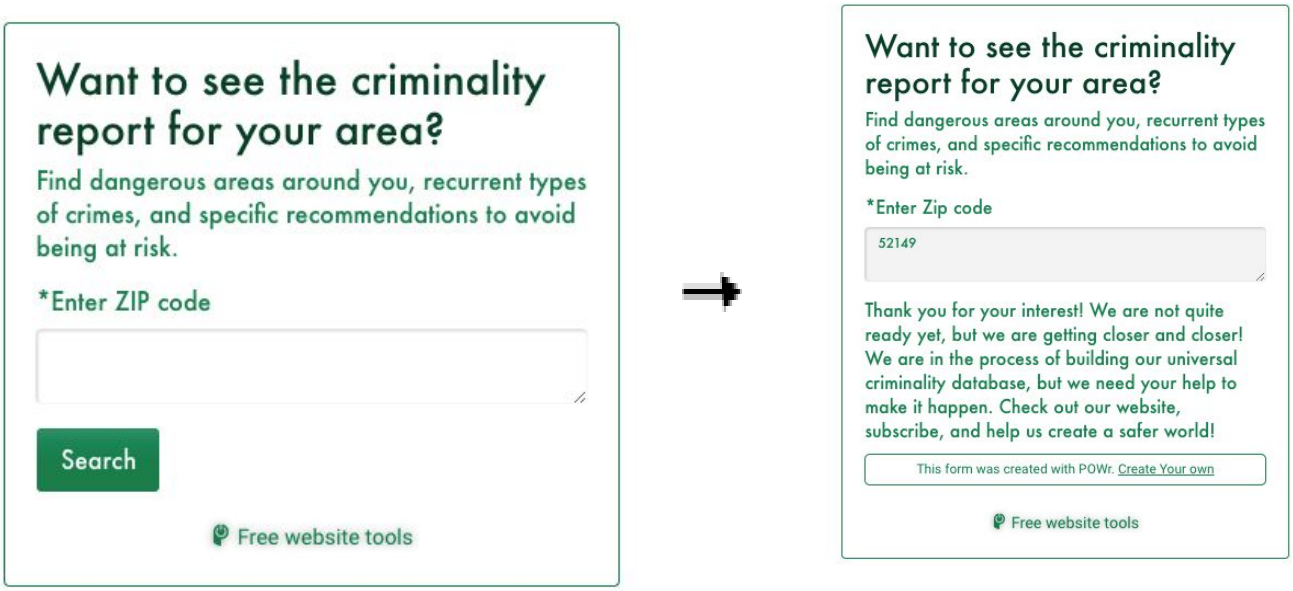
- **[Failed - phone app is not interesting]** People would agree to pay a small amount for the app (The ultimate travelling app, before our pivots)
- **[Validated]** The company can grow and acquire users using social media
- **[Validated]** When testing our MVPs, people who are experiencing the MVP will have an objective view on the value and functionality of the company, allowing us to interpret the results accordingly
- **[Validated]** It's possible to gather data on safety levels through crowdsourcing

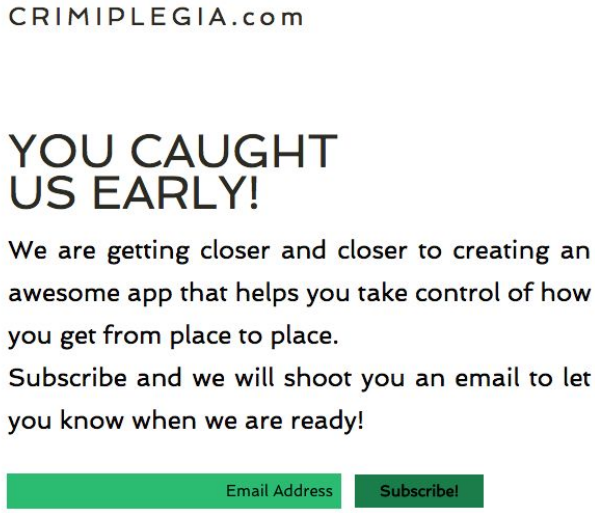
Value hypotheses:

- **[Validated]** It is important for people to be aware of the safety of places they are traveling to
- **[Validated]** People are not completely satisfied with the information provided by companies as Yelp; there's uncertainty about some factors as criminality levels
- **[Validated]** People are willing to text in order to receive our crime information
- **[Validated]** People are interested in using our UI prototype
- **[Validated]** People are able to transition from page to page in the app smoothly
- **[Validated]** Businesses would be interested in advertising in our app

APPENDIX B

I.


Want to see the criminality report for your area?
Find dangerous areas around you, recurrent types of crimes, and specific recommendations to avoid being at risk.
*Enter ZIP code
Search
Free website tools
Want to see the criminality report for your area?
Find dangerous areas around you, recurrent types of crimes, and specific recommendations to avoid being at risk.
*Enter Zip code
52149
Thank you for your interest! We are not quite ready yet, but we are getting closer and closer! We are in the process of building our universal criminality database, but we need your help to make it happen. Check out our website, subscribe, and help us create a safer world!
This form was created with POWr. Create Your own
Free website tools


CRIMIPLEGIA.com
YOU CAUGHT US EARLY!
We are getting closer and closer to creating an awesome app that helps you take control of how you get from place to place.
Subscribe and we will shoot you an email to let you know when we are ready!
Email Address
Subscribe!

CRIMIPLEGIA P. Chen K. Mei G. Narvaez J. Novas

II.

La Campania
CRIME RATING: 9
$$$ • Italian

504 Main St
Waltham, MA 02452
(781) 894-4280

Casa Razdora
CRIME RATING: 7
$ • Italian, Pizza

115 Water St
Boston, MA 02109
(617) 338-6700

Bottega Fiorentina
CRIME RATING: 6
$ • Italian, Fast Food

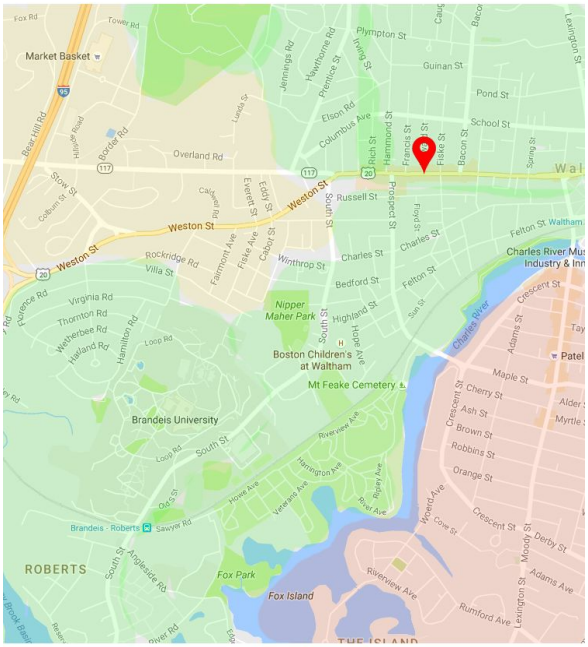
1231 Centre St
Newton, MA 02459
(617) 564-0713

Agostino's Restaurant
CRIME RATING: 4
$$ • Italian

23 Washington St
Natick, MA 01760
(508) 655-6643

Osteria Nino
CRIME RATING: 2
$$ • Italian

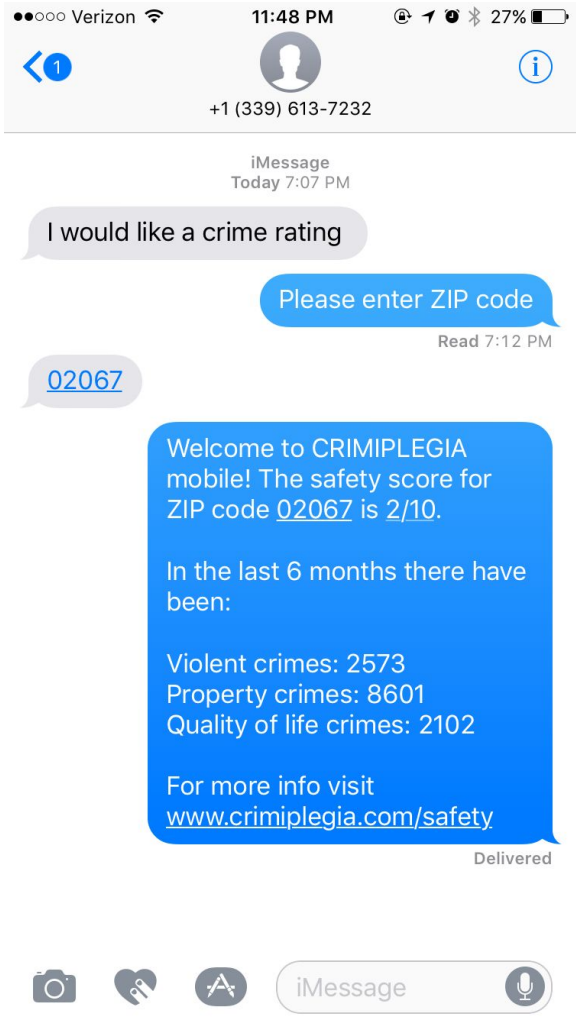
19 3rd Ave
Burlington, MA 01803
(781) 272-1600



La Campania
CRIME RATING: 9
$$$ • Italian

504 Main St
Waltham, MA 02452
(781) 894-4280

III.


●●○○○ Verizon
11:48 PM
27%
1
+1 (339) 613-7232
iMessage
Today 7:07 PM
I would like a crime rating
Please enter ZIP code
Read 7:12 PM
02067
Welcome to CRIMIPLEGIA mobile! The safety score for ZIP code 02067 is 2/10.
In the last 6 months there have been:
Violent crimes: 2573
Property crimes: 8601
Quality of life crimes: 2102
For more info visit www.crimiplegia.com/safety
Delivered
iMessage

APPENDIX C

[MVP #1]: One-on-one interviews. Safety concerns.
The purpose of these one-on-one interviews was to test the hypothesis that **students who studied internationally were concerned about the safety of the country/town they were going to study in**. 9 college-aged males were interviewed, originating from Venezuela, India, Morocco, China, Canada, and Russia. The small sample size definitely has factors to take into consideration; a survey of all men will be limiting because it has been shown in studies that men are less fearful than women are.

The questions asked and a summary of answers are below:

When deciding to study internationally, was the safety of the country or town ever an important factor in your decision? All 9 answered no, the safety of the country or university town was never a huge factor in their decision. When asked for their reason, half of them answered that their home country is more dangerous, so they were not afraid. The other half responded that America is not known to be a dangerous country, so they did not give it much thought.
Notes: This answer invalidates the hypothesis. However, this answer could be skewed because all of them attend Brandeis. If the students being surveyed were at a school in a higher-risk town, the results could change.

Had you ever been to Waltham? Were you ever concerned about the safety of the town?
6/9 had visited Brandeis/Waltham, and while they did not find Waltham to be incredibly warm or welcoming, none had any concerns with safety. Of the 3/9 who had never visited, they reasoned that they had been to other cities, i.e. Boston, NYC, and so felt Waltham would not be as different

Would knowing a rough rating of the safety of the area you were going to have affected your decision?
8/9 responded that it would most likely have not have affected their decision, unless the rating was incredibly low compared to the average. The one from Canada said it might have affected his decision.

The results of this MVP invalidate our hypothesis, yet there are some flaws to account for before we completely discount this hypothesis. We need to expand our sample size and demographic pool outside of college-aged males, and include females also, as well as American students looking to study outside of America. Once we have data for those groups also, then we can make a more definitive answer on this hypothesis.

[MVP #2]: Qualtrics Survey. Interest in traveling recommendations and safety.

This was a simple Qualtrics Survey sent out to Brandeis students on various groups on Facebook and given to them in person. The questions aim to validate the following hypotheses:

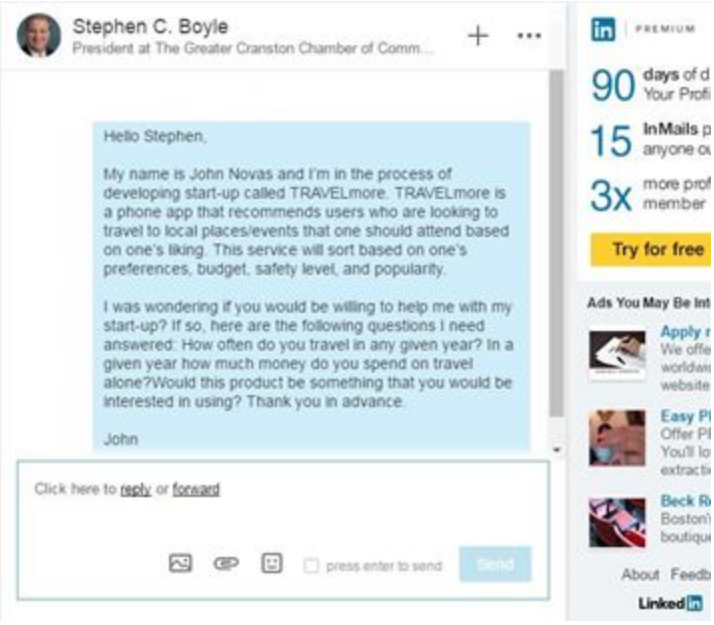
1. **People are actively concerned about their safety when traveling**
2. **People would be interested in a personalized activity planned in the app (Pivoted and eliminated)**
3. **People want a universal app that combines all their travel necessities into one (Pivoted and eliminated)**

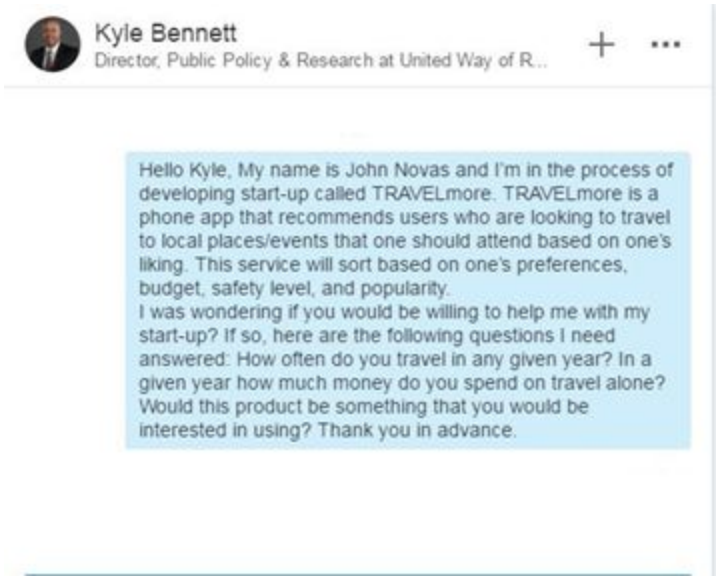
This MVP demonstrated that although people would not mind having a personalized activity planner in the app, their main concern was the safety aspect and the convenience factor. Nearly all but two people (2/27) said that they care about the safety. The personalized activity planner was liked by many, but it was not the main concern for this app. People wanted an app that makes everything convenient and showed the safety rating in different areas. As a result, we pivoted and eliminated the activity planner.

[MVP #3]: Reaching out. Validating a targeted group of users.

The hypotheses we want to prove is that the elderly who travel a lot will be using our web application because the elderly are at an age where they are concerned about their health and their wellbeing. Therefore our app is doing its job in making sure that the elderly keeping themselves safe. The specific demographic we plan to target are senior citizens and people who are getting ready to retire and are avid travelers. We sent this email some of our connections on LinkedIn for the maximum effect because LinkedIn represents the oldest age demographic with over 100 million users over 50!

The following screenshots are the message we sent out to a few of our connections.





At this point we still haven't heard back from them. We believe the reason why we haven't heard back is because senior citizens are not as frequent in social media as young adults.
As a result, we are now planning interview in person a handful of senior citizens in order to see if they would find our product useful.

[MVP #4]: One-on-one interviews. Interest in traveling recommendations and criminality ratings.
This MVP was designed to test two hypotheses. **That people are not completely satisfied with Yelp because the app doesn't take into account your personal preferences and taste**. And **that people need better information about criminality when traveling because it's a bigger concern nowadays**. I asked six questions, the first three addressing issues about criminal activity and the last three regarding their experience with Yelp and the value of having personalized recommendations.

The questions lead to informal talks, but the results were consistent throughout all interviewees. There was a clear trend regarding criminality ratings. Having a criminality rating as an app is of huge interest to people, specifically college students who are traveling to places they have never been to before. It would be interesting and useful to have two cities compared in order for people to get a feel for the level of criminality. However, it was most interesting to have criminality gradient maps (just as the ones used to present weather information) embedded in apps as Google maps.

Regarding apps such as Yelp, people though it was a necessity to have personalized recommendations in order for them to be useful when choosing a place to eat in, for example. However, most people agreed that this aspect of a recommendation is usually substituted by the user's judgement based on all the recommendations available on sites as Yelp. People

thought it wasn't really worth it to include this feature since it would just make the app less clean.

This interviews, along with some other MVPs, resulted in a second zoom-in pivot. We decided to focus on the criminality rating/map only.

[MVP #5]: Landing Page. Measuring interest in our company.
First of all, creating the landing page of the company (now called Crimiplegia) is a step forward in giving the company structure and a identity. However, the main point of creating the landing page is to test the hypothesis **that people think our company provides value and is solving an existing problem**. In the main page we have a general overview of what the company is. There is also a button that can take the user to a page where there's is more specific information. And we have also included a button that says "Try our app here!", which leads to a "you caught us early!" page and a email signup form. We are using google analytics to see how far users get to, and how many people sign up for the email notification. The url of the site is:

www.crimiplegia.com

We hope to have positive results soon, as the page is about to be distributed among social media.

[MVP #6]: API. Is it possible to get geo-based criminal records.
We have a leap of faith hypothesis we needed to test and it is a technical one: **We can obtain crime data from different areas and use them to generate a score**. If we cannot obtain the data for our criminality API, our whole project has to pivot. Luckily for us, we found several APIs that can help us on our journey:
Unlimited Criminal Checks Offender API
UK Street Level Crime
Chicago Police Clearpath
San Francisco Crimespotting
These APIs give logs and details about crimes in certain areas. We also discovered another API called Your Mapper Crime Score API. This API has some resemblance to our api with their api displaying scores from 1-100 while ours display scores from 1-10. They are also limited to a few areas in the US, while we plan to do a universal approach.
We can incorporate all of the APIs to make a unified API that provides a consistent scale for the world.

[MVP #7]: Companies as customers. Are they interested in our product.
We're using this application to demo to possible businesses that we're working with. It's a prototype that shows how the api can be applied to their application. We entice the businesses with real time updates so that when a mass shooting happens and an area goes from a 7 to a 4, the update can happen instantly in their apps.

This MVP is used to test the follow hypothesis: **Companies will support our idea and give us feedback on it.**
We also used A/B testing here as well, showing the businesses a before and after of the screens so they have an idea of what they are expecting.
Here is the link for the invision.
https://invis.io/TP93V7T6K
We plan to give this prototype to a few companies to see what their opinion is for this idea. It's not a big pivot if some companies rejects this notion, since there are many others that may want to incorporate it.

[MVP #8]: The app for USERS. Are they interested in our product.
An AB test/app in order to test hypothesis that **safety ratings will be a factor in a user's choice of restaurant, and to extrapolate from it; in a user's choice in outside activities.** The A test shows a list of 5 Italian restaurants with no safety ratings. The B test shows the exact same list, but with safety ratings and ranked.
https://invis.io/FA93A895P

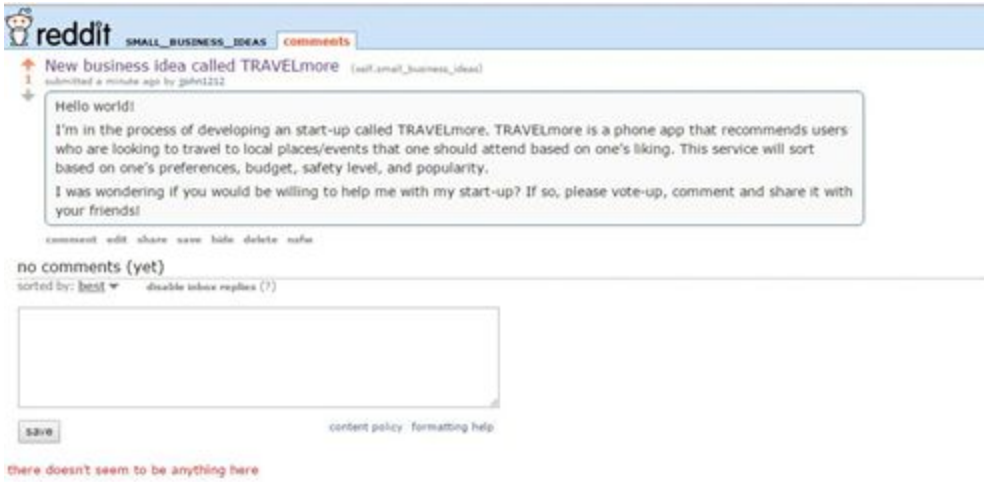
In a test of 22 participants (11 in each test), the results show that the majority of users will choose the higher safety rated restaurants, when given the information.

In test A, with no safety rating, the results were widespread amongst the options:
Restaurant 1: 2
Restaurant 2: 2
Restaurant 3: 4
Restaurant 4: 1
Restaurant 5: 2

In test 2, when given the safety rating, the results were concentrated on the higher rated ones
Restaurant 1: 6
Restaurant 2: 2
Restaurant 3: 1
Restaurant 4: 0
Restaurant 5: 2

The results of this experiment, although a very small sample size, as expected show that users will choose the more safe option, when they are given the information. This validates the hypothesis that safety data will influence a user's choice in restaurant, and in other outside activities.

[MVP #9]: Reaching out. Explore the growth engine -- Social media.
We also ended up posting our idea on Reddit, specifically because we want to grow in popularity.



Ultimately, we wanted people to like and share our post in order to see if our idea would spread all over social media. This MVP was also met for us to see the potential growth of our start-up. So far we have only received 1 up vote.

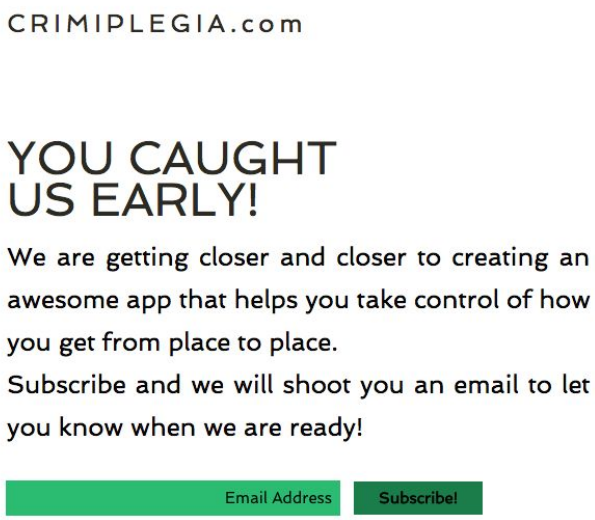
[MVP #10]: A/B Texting Design Tests.

The next MVP we worked on was figuring out whether or not people wanted to receive text message from us with the safety rating and criminality stats of their location, or should we just solely text users the criminality rating and if the user wants more info, we would then send them the criminality stats as well. After posing up the question, we went on to do an A/B test. After the test, we were able to learn that the majority of people are more interested in receiving both safety rating and the criminality report all at once; instead of having to go back and request more info for the criminality stats.

[MVP #11]: Texting Criminality Service.

The MVP that we worked on was seeing if people were comfortable or were even willing to receive a safety rating through text. Therefore, we first developed a UI mock-up of how text message conversation would look like. After we finished developing the mock up, we then decided that we were not only going to give the users safety ratings according to their zip codes but also criminality stats so that the users can know the places one needs to be cautious of. Once we finished modifying our text messages. We then begin to tell people through social media, email, and word of mouth to contact our company's number if they are interested in receiving a free safety rating. I am happy to inform that our MVP was successful and we received over 15 responses.

[MVP #12]: Pricing Page.



We have created a landing page to test our pricing hypothesis. We think that people would buy our app for a small amount through the apple app store, and android play store. The design of the page is shown in the Landing Page section in this document. The page is basically a download page with very little information. We are assuming that people who reach this page already know something about our company and product. We have two buttons to download the app and we are keeping track of how many people want to download the iPhone version and how many others are interested in the Android version. After clicking on any of the buttons, there's a pop-up that informs the visitor about our prices, and a second button to to redirect them to the respective app store. We are keeping track of how many people want to continue with the download after being aware of the price of our application.

However, since we do not have a working app, we have another page where visitors can subscribe to our mailing lists. At this point, we have completed a conversion, regardless of whether the user subscribes or not. This is the subscribe page that is not shown in the Landing Page section of this document.

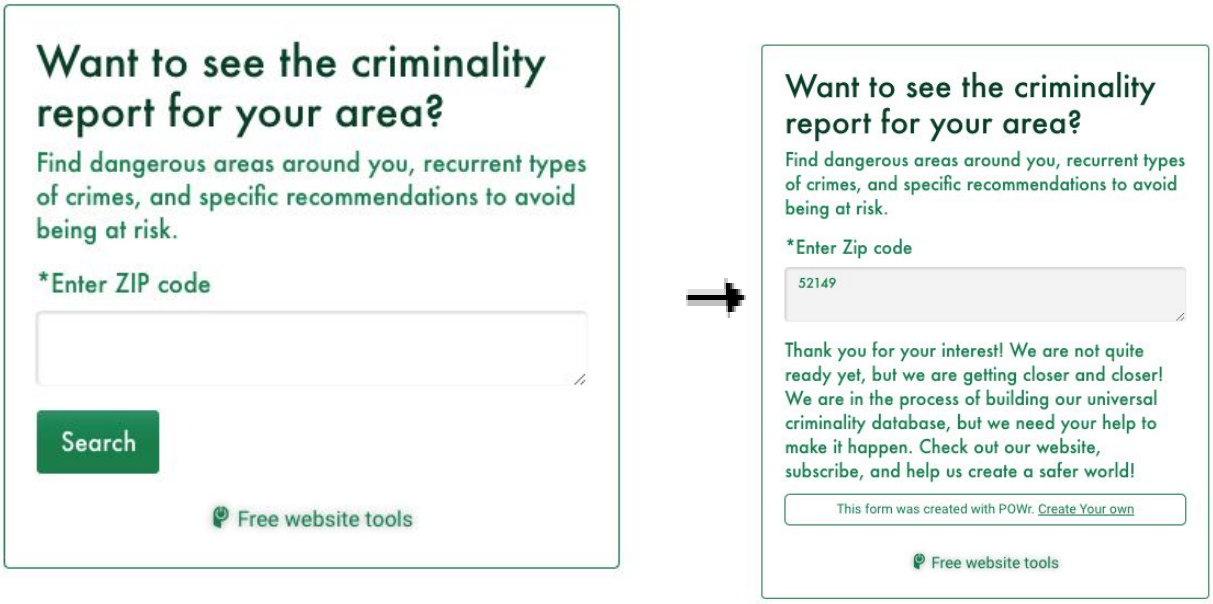
[MVP #13]: Appeal of product through Landing Page.

This is further discussed in the Landing Page section of this document. The results were positive and helped us validate our value hypothesis. We shared a general page with information about us and our product. With Google Analytics, we tracked how many people wanted to know more about us and how many would like to try out our products. About 40% of the people who visited the first page continued to click on the "about" page and the "try our app" page.

[MVP #14]: ZIP Codes Criminality Ratings.

In this MVP we shared the link to our "Try our app" page. This way people were directed only to this page without being able to go to our website's home page. In this page, we had a box for visitors to enter their ZIP code and ask the website to generate a criminality report for their area.

The results were clear and helped us to validate the hypothesis that people want to know and understand the criminality levels for specific ZIP codes across the nation. More than 60% of the people who visited the website actually tried out this feature. That's a big conversion rate. The crime reports were not really generated, instead we invited visitors to subscribe.



[MVP #15]: Paper Prototype.

The next MVP that we worked on was making a paper prototype of the app. Which allows one to see all of the web pages our app will be offering. Once the the UI mock up was done then we went on to test it out with students to see if they can walk themselves through it without having anyone explaining anything to them. After testing out our mock up, to our surprise, everyone that we talked to has told us that our paper prototype was self explaining, and clean.

[MVP #16]: Kickstarters.

We currently have four possible kickstarters to reach out to:
Name: Walk in Job Search App
Project:
https://www.kickstarter.com/projects/1697390076/the-walkinjobsearch-app?ref=discovery
Reason: This app involves users doing walk in job interviews and applications, and there's no doubt safety is a concern when going to places for a job interview. There's also more incentive for the guy to talk with us, since he's not a major company and he has not raised much funding yet.

Name: Dory, a travel booking bot

Project:
https://www.kickstarter.com/projects/1678315887/dory-a-travel-booking-bot-for-the-rest-of-us?ref=discovery
Reason: I'm not sure if he's actually going to be able to pull this one off since this is his "sideproject" and he has not raised any funds yet, but a travel booking bot matches well with our API if he is able to accomplish it.

Name: Athletic-tutoring-mobile-app
Project:
https://www.kickstarter.com/projects/1380556829/athletic-tutoring-mobile-application?ref=discovery
Reason: This is one of the kickstarter projects that already have quite a bit of funding. They are at $3040 of 2500, and they could give us their opinions on using a safety API since their app involves their clients going to places with the athletic tutors and they will be concerned if it is safe or not.

Name: Table booking app
Project:
https://www.indiegogo.com/projects/most-advanced-table-booking-app-apple-android#/
Reason: This one could be incorporated with our product just because the restaurants can use our safety ratings to lure people into booking there.

This is the email pitch we're using to contact the companies:

Dear <party>,

Hello. My name is Kelvin and I'm a student at Brandeis University. My team saw your product on Kickstarter/Indiegogo and thought your product would be applicable to a startup idea we have. It would be extremely helpful if you can take a few minutes looking at our product and see if your product has potential to incorporate ours into it.
We're developing an API where we utilize many of the crime data APIs out there and then merge them together into one unified dataset. Then, we have an application that gathers data from customers and take their opinions on the locations they visited. Their opinions are also factored into the data, which we will use to create a scale from 1-10, where an area with a 1 is relatively unsafe and a 10 is relatively safe.

[MVP #17]: Meeting with expert in BigData and Stat. Analysis.

Basic **idea** behind our project is:

> *"Use all of the information available about crime to create a universal criminality scale. We want to be able to compare how safe a city, town, or neighborhood is in comparison to all others (specially to those that are neighboring)."*

> **What do we have so far?** We can have access to criminal records across the nation (US) through a variety of APIs. So far, however, it seems that we need to consider a lot of different APIs, some coming from the national government, and some coming from local police departments.

Does this sound **possible to achieve**, from a technical perspective?

> Yes, absolutely. It can be a very complex process, but it is absolutely doable. It all depends on how many different formats are used when presenting the information. Hong said that, through the use of a natural language, we can access the databases, pass all the data, and **categorize** it. We can actively update the database so it's accurate. After you have figured out the way to "decipher" the information, it is fairly simple to do a statistical analysis of the data. This is assuming that the format of the data does not change in any of the sites providing the data. We don't know how many different "formats" there are, and if the data in any of this cases is categorized, which would make the process easier.

[MVP #18]: Competitor Companies.

We did some research to find out if there are other existing companies that could be competitors of us. What we found was very interesting. There's two types of businesses that relate to us. There are some websites that can be used to see how many crimes have occurred in specific locations in a specific period of time. This websites however, offer vague information which makes it hard to understand what does this statistics mean. Some of this websites show you the crime statistics so you can take criminality into consideration when buying a new house. The other kind of businesses are those who have actually used this data to make an analysis of some sort and interpret the statistical data. In this case, the information provided is much more useful to someone accessing it. However, some of this companies have failed because they have not being careful with their political correctness.

The conclusion of the research is that there is lots of room for development of new types of analysis of criminality data, which can be used for multiple different applications. This puts us at an advantage over websites that are showing raw statistical information. Moreover, we have information on why some similar companies have failed and know what aspects of our product (and marketing) have to be treated carefully. This puts us at an advantage over companies that have already used statistical analysis to solve similar problems but failed to become sustainable.

[MVP #19]: Political correctness and wording of product.

After releasing our Landing Page on social media, we got some negative feedback regarding the wording and purpose of our company. Some people argued that this was encouraging

neighborhood profiling and it was an exaggeration of what is actually going on. Some people were uncomfortable with how we were describing the world: full of terrorists and criminals everywhere. We decided to reach out to some of these people in order to understand their views. As a result, we updated our vision statement. We found out that the wording was problematic, but the product was still valuable, even to this troubled people. The website has been updated and is live.

[MVP #20]: Social media as a way to target potential customers.

In our continued efforts to expand our channels of growth, to outside of our close circle of connections, we posted our landing page on various social media websites in order to generate traffic and data that we could analyze. Our biggest source of social media traffic came from Facebook. We posted our products website on all of our personal pages, as well as in various smaller group pages, like Brandeis University class pages, and club pages. In this way, we reached a wider range of potential customers, as our Facebook connections range from close friends, old classmates, distant relatives, and complete strangers. And subsequently, we received valuable feedback from people from all types of groups. Facebook proved to be the most valuable social media site, as the data we gathered was plentiful and diverse.

We also used LinkedIn to target specific people to gather data. In LinkedIn, we made a post to our connections, describing our product and linking our landing page. Our demographics reached through LinkedIn range from students to upper-level executives, but we did not receive any personalized feedback. So we concluded LinkedIn was a good channel to reach potential customers, but that it was a little less personal than Facebook.

Finally, we made a post on Reddit, in the subreddit /smallbusiness/, describing our product and asking users to go to our landing page. We didn't receive any comments, and only some upvotes. We didn't not receive as much exposure as we hoped - the /smallbusiness/ subreddit has over 50,000 subscribers, but it seems our post was buried amongst the others. We concluded that Reddit was not the most effective method, as the level of feedback we received seemed to be too dependent on Reddit's sorting algorithm and whether our post would get the chance to be seen by many viewers.