Thomchelik Tunca
Capstone Senior Design
Writing Assignment 3
12/8/2016

# Business Proposal

Today, the human race is faced with-potentially-the biggest epidemic it encountered in history. At an all-time-high of 7.125 billion inhabitants, more humans are using, and are beginning to use fossil fuels to power their everyday tasks. The amount of byproducts of combusting fossil fuels, such as $CO_2$, has dramatically increased, evident all around the globe in the declining health of the planet. Lakes and rivers have run dry, temperatures have risen to a historic highs-altering ecosystems, and the North and South Poles ecosystems are melting, leading to the rise of sea levels, to the extent that India is predicted to become submerged.

However, we live in a time where people are educated enough to understand that the pollution they are creating is killing the Earth; luckily they are willing to help. The only problem is the average human is too lethargic to take action. If only there was a fun and easy way to track an average person's $CO_2$ emissions to make them more aware of how harmful they are being to the earth. This solution would encourage people can slowly emit less $CO_2$, helping to save planet Earth. Now there is a solution to this problem! The solution is the Eco-Friendly Android application, exclusively. The following document will provide an overview of the application's functionality, business plan, and its social impact.

The Eco-Friendly application follows a user throughout the day and automatically tracks how many pounds of $CO_2$ they emit due to their mode of transportation (walking, biking, car, bus, and metro) used for their daily trips. The application uses different data collection methods that populate a database to determine the user's means of transport. The data collection methods include the phone's GPS, to determine exactly where the user is (via geographical longitude and latitude), and accelerometer, to determine how fast the user is moving. The application sends the database this information every 30 seconds. If the user moves outside a radius of 40 meters (mirroring the idea that the user is leaving their current location) and the accelerometer is moving, the application starts a trip and tracks what kind of transportation the user uses. The database component has a large role in the application's operation, as it contains entries from every 30 seconds of every trip that the user makes. These entries function to determine what mode of transportation the user is using and for how long. For example, if the latest two entries of the database are 10 feet apart and both entries demonstrate movement at a slow speed, the user is walking. The application will compute that the person is walking on their trip until they either are in the same 40 meter radius for a couple of database entries and if they are not accelerating. These two indications mean the trip is finished.

The mode of transportation recognition is a key algorithm used in Eco-Friendly. After the application understands that the user has started a trip, the next step is to determine by which mode the user is traveling, whether it is by walking, biking, taking a car, or using public transportation. Each of these methods of travel have their own way for the application to recognize which method the user is using for a specific trip. Walking and biking will be the easiest forms of travel to identify. If the user is walking, the phone's accelerometer will be traveling at a low speed in the latest database entries (e.g. than 5 MPH). If the accelerometer captures low speeds, then the user must be walking to their destination. Biking has a speed threshold faster than walking but much slower than any vehicle out on the road. The application therefore will understand that the user is biking if the user is traveling at a speed no faster than 5-15 MPH. The more challenging part is determining automatically if the user is in a car, bus, or metro.

The Google Maps API has a feature that recognizes bus and metro routes, stops, and more. This feature is fundamental be the key to differentiating if the user is in a car, bus, or metro. All three of these modes of transportation share a key difference from biking or walking: each is faster. Thus, the start condition of being in a car, bus, or metro is if the user is traveling at an average speed of 15 MPH or higher. Data is compared to the location of each database entry using the GPS and if the user is in a car then the car will not be bound to any route or bus stop on the map. This means it will determine the user is in a car if their travel patterns show the user freely roaming the roads. The determination of the mode of transport being a bus is simpler than a determining it is a car. The application will deduce the user is on a bus route when the user's pattern is "stop and go", following the path of a road.

The "stop and go" pattern is evident when speed accelerates before and after a Google Maps API-determined bus stop. The last mode of transportation to determine is automatically figuring out if the user takes the metro. This is more complicated than the other modes of transportation because the application will not have an internet signal or data connection between stops. The application will have to understand, with the use of Google Maps, that the user appears and disappears at a random point on the map in an urban area, waiting at each stop for a period of time. By "plotting" these points where the user is found in the database, the application can compute similarities to the metro routes housed in the Google Maps API and determine which metro line the user has selected.

The way the application will calculate the user's daily mass of $CO_2$ emissions by calculating how much $CO_2$ a vehicle emits for the time period the user was in it. Almost all of the buses and metro trains in DC are the same make and model so it is easy to compute their carbon emissions. However, the calculation must account for the notion that there is more than one person in each bus or train car. The user will be prompt to select an approximation of how many people are on the bus/train with them. The $CO_2$ will then be scaled with this number. Finding out the $CO_2$ emission of a car is a more challenging problem to solve because all cars emit different amounts of $CO_2$. The application will prompt the user to

input what kind of car they are in. This is a simple prompt asking for the car's make, model, and year. When the user inputs this information, the application will go into a separate database to retrieve the amount of carbon dioxide that the specific car emits.

After the application calculates the total daily $CO_2$ emission by the user, it will then display a section to show the user's daily emission history. Eco-Friendly prompts the user every morning telling them if they are using more or less $CO_2$. It will also show the user any alternative transportation routes that will decrease their $CO_2$ emission. These alternative routes may have less traffic, to decrease the amount of wasted $CO_2$ generated while idling, or perhaps will suggest walking to work instead of taking a 10-minute car ride. Eco-Friendly will also have an interesting neat feature that ranks each local user so people will want to do better than their friends and community.

Eco-Friendly presents a great business opportunity. The pollution humans are emitting will affect every single person on this earth in the near future, even if some people are already "eco-friendly". If this pollution continues, no one will have a place to live and humans will become more and more likely to suffer catastrophes, such as extinction. Each day, this concept is becoming more tangible to the people on this planet, via the media and more sustainable events. These public channels are, more now than ever, convincing people to do their part in cleaning up Earth. Thus, the market niche Eco-Friendly targets is the "green" population: each human who has a smartphone and wants to have an opportunity to do their part in saving the Earth. This population is vast and is growing at an astonishing rate, due to increased media coverage and evidence the planet's declining health (such as the warm winter season the Northern hemisphere is currently undergoing). Eco-Friendly is a simple yet powerful solution to users that did not care to take action, who did not have the time to take action, or who just did not know how to do their part in saving the planet. Eco-Friendly provides a solution to all of these concerns as it automatically does it for you. The Eco-Friendly application is the first of its kind to help lower global $CO_2$ emissions on an individual level so everyone can live a better, cleaner life.

Selling this product will be exceedingly profitable. Eco-Friendly will not take that much capital to maintain. The reasoning for this is when the algorithms are created, they do not need to be modified as tracking the user's $CO_2$ emissions will remain constant. Eco-Friendly will generate revenue one of two ways: as a free application that has advertisements and as a priced application that is advertisement-free. The paid version of the application will have a reward system that will send the users environmentally-friendly gifts for staying below a certain amount of $CO_2$ for a consecutive amount of time. For example, if they keep their $CO_2$ emissions below 100lbs for a month they will get a water bottle, and if they can continue this trend for a year they will get a solar powered backpack.

Advertisements are going to be a large part of the expected revenue because of the volume of users we predict that will be using to the application on a daily basis. Eco-Friendly has specifications that

are made to attract the user in to use the application increasingly each day. The goal of the application is to encourage betterment of one's $CO_2$ emissions to improve the planet's health. People will find that they are helping out the human species and feel good about themselves, more or less without exerting much effort. Humans are naturally competitive, and Eco-Friendly takes advantage of this. The application therefore has a local ranking mechanism that ranks users in the same area code. People are presented with their ranking on the home screen. Seeing a decreasing ranking will stimulate competition, convincing users to come back and improve their standing. This increasing trend in use may also generate an increased number as users, as current users may encourage their friends to join the competition. Because of the always improving number of users, more firms will seek to advertise on Eco-Friendly, generating more revenue for the business.

Promoting sales of Eco-Friendly is expected to not be too much of a challenge. The application will be branded as being both beneficial to the users (via the reward system), as well as the environment. Eco-Friendly's advertisement campaign will start advertising in places that have environmentally friendly atmospheres, targeting initial users that already seek to better the planet's health. For example, we will be placing ads around Whole Foods, Sweet Green, green school campuses, farms, and anywhere there is a high interest in being more sustainable around the DC area. We will also target social media, such as Facebook, Twitter, and Snapchat, with a video teaser my colleagues and I have worked on to promote the application. Alongside the video teaser we will have a micro website to have another graphical way to explain what the application does, instead of having people watch a full video clip. In addition, Eco-Friendly will have a refer-a-friend function, which will also give the user some rewards points to get closer to their prizes.

There is not another application available on either the Apple App Store or Google Play store that is quite like Eco-Friendly. Not only is Eco-Friendly unique in its selling features, but is also in an up-and-coming genre. This new era of being more environmentally aware is expected to become the next industry that booms. Similar to the fitness industry that tracks everything that a user is doing, such as fitbit and Nike+, to better a user's health, this app will revolutionize how people track the harm they are doing to our earth. However, time is of the essence. Research demonstrates that developers are starting to increase familiarity with the green industry and are making applications that interface the public from a sustainable perspective. However, unlike Eco-Friendly, those other applications do not address if the user is getting better or worse at emitting $CO_2$ with their transportation choices. Moreover, many do not coach the user in how to better their $CO_2$ emissions by altering their travel routines every morning. As the planet's health worsens every day, different firms will try to take advantage of this new industry and create applications similar to Eco-Friendly. Wouldn't you want to be the first to have this technology and beat all the expected competition?

The most economical part about Eco-Friendly is the minimal maintenance it will need in the future. Most of the application will be automated, meaning less long-term upkeep. All the algorithmic steps of computing the total daily $CO_2$ emission of a user will proceed in the same order in each use. Unlike a regular application, there will not be a multitude of different branches in the application's logic potentially make it crash. Minimal upkeep, moreover, usually means maximal profit in the future. The only maintenance that will be needed is for new features to add to Eco-Friendly. The cost of maintaining the application will also be insignificant as the software only entails the work of a couple of programmers (maybe 2 or 3), compared to the dozens that are needed for other, more work intensive, applications.

After Eco-Friendly is advertised and initially downloaded, the low cost of maintenance and maximized profits will produce a good amount of capital to expand the company. When $150,000 is reached, the second leg of this project's business plan will begin: tracking bracelets. Almost all tracking applications, whether it be for health or physicality, are using bracelets, or other wearables, to have a more accurate read on their users activities. The wearables we will produce are a little different than other tracking bracelets because they will compute the $CO_2$ emissions of our user. This advancement in the business plan will make our profits increase dramatically as something like this has never been done before, especially in such an up-and-coming industry. After the wearables have been produced and distributed, each will track the user in more ways than just their traveling habits. The wearable will enable the tracking and calculation the smallest additions of your carbon footprint. This might be something as small as each step you take, or as large as computing a user's $CO_2$ emissions on a plane or boat.

The only risk you will be taking if you decide to make a deal with Eco-Friendly is the time in which we execute this business plan. In due time, others will understand that there is a great deal of interest in cleaning up the Earth. I wholeheartedly believe that I am the right man to lead this era of green technology. My past experiences in business include starting a family airline business (Best Air) in Turkey from scratch and watch it bloom. I know exactly how to start a new business and will apply my past experiences to have Eco-Friendly to succeed. This idea will be a precedent of green mobile applications and will be imitated for years to come.

Another fascinating fact about this application is how positive of a social impact it has in the world. The earth is becoming so increasingly polluted with greenhouse gases (mainly $CO_2$) that people need to start take action or the human population will soon need to find another planet to live on. No matter how big or small the effort, Eco-Friendly will help. Eco-Friendly's main goal is to try and lessen earth's carbon dioxide content by making people more conscious about how much they are emitting on a daily basis. If this application was used widely we may even see earth's carbon dioxide levels drop. This in turn would impact everyone on earth. People would live in a safer, cleaner atmosphere and will give

their children a better tomorrow. There is virtually no way this application could be put to bad use, negative impact the environment, or even be used unethically as its only function is to better humanity.

In conclusion, Eco-Friendly is an once-in-a-lifetime investment opportunity to start a new era in green technology. Our planet is becoming unhealthier each day. Humans are polluting the earth at an all-time high, which is why a solution is needed right away. The demand for an answer to this problem is going to rise exponentially when the earth begins to exhibit even more dramatic evidence of its declining health. Eco-Friendly is the first step to a cleaner, more vibrant world, if not for us then for the generations to come. In a fun and simple way, this application will automatically follow and calculate a user's $CO_2$ emissions with minimal maintenance. Not only does the application demonstrate a great deal of profit potential, but it proves to be ethical and sustainable in every way possible. One download of Eco-Friendly, one step closer to saving the world!