Solar Powered Mobile Phones

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Marketing Analysis:

Situation Analysis

Along with call quality, a cell phone's battery life is one of the most important considerations when choosing a handset. It's never fun to watch your cell phone die when you're in the middle of an important call. And it's no fun either to have little power when you're nowhere near a charger. While manufacturers make lots of promises about a phone's battery life, they don't always hold true to producing long battery life spans. The best solution should be to find a way to produce electricity in a friendly manner, especially for small electronic devices and at the same time be accessible everywhere.

Market Summary

Current trends are the increase in cell phone use along with a growing environmental awareness. It is always a problem and inconvenience carrying more chargers for electronic devices (camera, cellphone, and computer) when travelling, especially when all electronic systems are not the same around the world, and people traveling need different converters. In order to solve this issue, our team has formulated a new product that will eliminate the use of chargers to make charging more convenient to cell phone users in an environmental friendly way. The target market for this product can range from environmentally friendly people, to the younger generation of people that rely or depend on their cell phones, to the tourists and travelers in which the usage of cell phones is essential and necessary. This would appeal to environmentally friendly people because eliminating the use of chargers would be saving and conserving energy. Beyond being a nuisance to consumers, the proliferation of phone-specific chargers is bad for the environment.
Target Market:

Geographic’s

- **World Region**: North American
- **Country Region**: Pacific
- **City Size**: 500,000 – 1,000,000
- **Density**: Urban, Suburban
- **Climate**: Northern

The geographic factors chosen to represent our product effectively would be primarily in an urban setting such as San Francisco. The reason being is that the city is densely populated by a multi-cultural melting pot of ethnicities and professions. To further elaborate, San Francisco (S.F.) has a population of 825,863 residences and is considered urban. (“San Francisco-California”.2013). According to California Demographics by Cubit, San Francisco “Is the 13th most populated county in the state of California out of 58 counties”. In addition to its population S.F. retains a fairly weighted income per household.

Demographics

The most important demographic criteria we’ve researched are the age, income, occupation, and education. These areas all seem to correlate and show that most of the residents are in between the ages of 20-34 years and about 34 percent hold at least a bachelor’s degree. (“San Francisco-California”). The reason why this is relevant is because it shows that our target market will be willing to understand our product and how it works. The income portion of the demographics suggests our audience is able to afford our product instead of a cheaper alternative phone. In addition, occupations regarded as technical, managerial, and students are substantially relevant since they occupy the greatest percentage of residences in San Francisco.
Behavior Factors/ Psychographics

The current lifestyles and personalities our product is targeted to are the achievers that are ambitious, outgoing, and usually are derived from the middle to upper class. The solar smart phone is intended to catch the eyes of people who are willing to use green technology for everyday use. It will provide a convenience benefit by having the option to use conventional charging or the alternate of solar power charging. The use of our product will generally come down to how often they use their own phone; and since a majority of people has cell phones it can appeal to more new/first time users. The attitudes that we want to encourage are positive, friendly, and enthusiastic solutions for users.
The Market

Market Needs
In today’s world, cell phones play a major role in our everyday lives. Cell phones are becoming more popular day by day as people become more dependent on technology. Cellphones are taking over the phone market, while landlines are becoming obsolete. With everyone always being on his or her cell phone, it calls for a more efficient charging mechanism. This is where our idea comes into play; we are introducing the first cell phone with a solar panel on the front screen and back panel. The front screen is one that you can see through, which will charge your phone about 40 percent of the way and the back panel would be a full solar panel so that it could get the full charge. This solar panel cell phone concept would help out a lot because with everyone being on their phone from when they wake up till when they go to sleep they can charge it wherever whenever they would like. With people always being on the go whether it’s from class to work to even traveling, their phones can be constantly charging. This would take over the cell phone world once other technology companies begin to see how effective solar panels are. This solar panel will be convenient and save people money and time by eliminating the need to purchase multiple chargers.

As the cell phone market evolves and more consumers rely on texting and phone applications, it is important to understand phone trends to maintain a competitive advantage. I think solar cell phones will allow brands to capitalize on the demand for portable, hi-tech and easy to use communication technologies to pave the way for a faster and more profitable future.

Market Trends

Market trends are something that catches everyone’s eyes; they are the beginning of something new. Social factors are starting to change in today’s world. People are starting to become more advanced with technology. From babies to the elderly; people are starting to use the new and updated technology. Each generation is adapting to this
change and it is becoming the norm to constantly be connected through social networking, email, and even video conferencing. As the cell phone market increases, more consumers rely on texting and phone applications. Our society is constantly looking for fast and efficient ways to communicate. Discounted smartphone devices and affordable wireless plans have made ownership of some kind of mobile phone a near necessity. Once one person sees another use something new, it stirs their curiosity and influences them to do research and even make a purchase.

Cellphones account for a large portion of the huge increase in electricity consumption that has occurred in the last decade. A solar mobile phone will help slow down the increase. With people becoming more “green” and aware of their impact on the environment, this solar device will be a major improvement in the cellphone market. As consumers become responsible for the environment they are seeking out new methods and ideas to power their electronics and that includes the ultimate must have gadget, the solar cell phone.

**Market Growth**

Market growth is an increase in the demand for a certain product over time. This is a process that can take off slow or can catch on very fast. I believe that this solar charger market will grow and begin to take off at a fast pace, since the cell phone industry is one of the fastest growing in the world. Smartphones demand is increasing because they are simple to sue, affordable, and save time. The major complaint from consumers is how quickly the battery drains from a day’s usage, which is exactly why this solar panel will be profitable. The product will need to be pitched to all of the major cellphone companies, as well as keeping the consumers well informed of this new technology. First thing we should do to promote the product is showing how it works inside and out, displaying each detailed aspect of the product. Once the product is promoted enough, it could be something that begins to take over the cell phone world. This could be what everyone has been waiting for. I think solar cell phones will have the ability to completely revolutionize the way we communicate with each other worldwide.
**SWOT Analysis**

**S**
- Product easy to use
- Eco-friendly
- Easy to carry (included in your phone)
- Easy to make work (solar beams)
- Allow customers to save money (less electricity to pay)
- Long-term customer relationship
- Long lifespan (30 years)

**W**
- Not yet profitable (raw materials are expensive)
- Need to achieve economies of scale
- No product awareness yet
- Fragile

**O**
- Current green/sustainable trend
- The environment concerns people
- Demand for electricity will increase

**T**
- Fierce competition due to this current trend
- Discovery of a better alternative to solar panels
- If phone manufacturer do not want to collaborate

**Competition**

We can find many competitors in the current market due the trendy expansion of sustainable energies. But we cannot find a company that offers exactly the same product as the one we are marketing. The following companies are companies that offer product with the same goal but with another overall shape.

Everbright Solar Inc. ([http://everbrightsolar.com/products3.asp](http://everbrightsolar.com/products3.asp)) is an American high-quality solar panels manufacturer. Panels are made in the U.S., which is a big advantage for this company. Most of the components come from the U.S. and final assembly lines are based in the Silicon Valley area in Fremont (California). They sell their products
mainly online through their website and take part in some exhibition. They have different type of solar panels for different uses but the one that competes with our product is a miniature solar panel with two jack plugs. The voltage is nevertheless low (1V to 3V), panels are very small and prices as well ($18). This company is successful mainly thanks to huge solar panels for houses and because they are really innovative with for example the launch several years ago of the educational solar kit (DIY). Schools are using those. Another strong point is the customizable size of their solar panels given the need of the customers. They have over 20,000 customers yet since 2004. They try to build long-term relationship with their customers by offering a good return policy; you can return back your solar panel 2 weeks after reception. This is our main competitor.

Earthtechproducts is another competitor (http://www.earthtechproducts.com/power-monkey-extreme-solar-charger.html). They only sell online. They also offer different sizes of solar panels with different voltages. The competing product is a full equipment (12V) to charge any electronic devices with solar technology. The solar panel’s shape looks like a flip phone with solar cells on each side. That way, solar cells are protected when the flip is closed. A good point for this product is that lots of charging tips are included for the latest phone brand and a rugged and durable travel case as well. They offer 5 different colors for the case. They also ship for free and worldwide. The main problem with this product is the price: $199. People are more concerned by the environment but are they ready to pay that amount of money?

EnerPlex (http://enerplex.biz/surfr-for-iphone/) is a company that has 2 main products: portable solar panels and solar panels included in phone cases. They sell online but they also have a main retailer: Fry’s (that can be found easily). Solar panels included are 5V. The phone case is an innovative product that should work well; maybe the price can be an obstacle, $70. The technology used is very good because given features; this phone case is hardly bigger than other regular phone cases. Those phone cases are only available for IPhones and Samsung Galaxy SIII. This is a good product because it fulfills two different customers’ need: the need to have your phone protected and the need to always have enough charge to still use your phone.
The Product: Solar Powered Mobile Phones

Product Offering

The target of our product is so to have a way of charging our phone without using an electric regular plug. So we are using the trendy technology of solar panels. We want to include solar panel on the back of a cellphone. But it is not something we add in the back of a cellphone; the solar panel will be part of the phone. The sun beans will get in touch with the solar cells of the solar panels and the energy produced will be converting into electricity in order to charge the phone.

The solar cells have to be very thin and light. The size (length and width) will depend on which phone the customer uses. Indeed, every phone on the market do not have the same back-size, that is why we want to make different sizes of solar panel (large product line) to fit each phone. From the beginning, we will start with most popular phones, like IPhones or Samsung ones.

How does a solar panel work?
First, there are two types of solar panels, the photovoltaic ones and the thermal ones. The thermal ones transform sun beans into heat whereas the photovoltaic ones transform sun beans into electricity. The type we are using is the photovoltaic. The principle is some kind of simple; the solar cell has 2 layers of Silicon. The layer that will be in touch with solar beans is a mix of Silicon and Phosphorous, and given the fact that Phosphorous contains more electrons than Silicon has, this layer is charged negatively. The layer non in touch with sun beans is a mix of Silicon and Boron and given the fact that Boron has more protons than Silicon has, this layer is positively charged. Solar beans contain photons and when a photon gets in touch with the negatively charged layer of Silicon the energy produced causes the break between an electron and an atom of Silicon. Positive atoms will so automatically go to the other layer (the positively charged one) and the
negative ones will automatically go to the layer negatively charged. An electric potential difference follows—this is electricity.

We can also find different types of photovoltaic cells:

- The single crystalline ones that have a good yield (from 15% to 22%) but cost a lot.
- The polycrystalline ones which have less efficient yield (from 10% to 15%) but cost less.
- The amorphous ones, cost and yield (from 5% to 10%) are low.

A yield of 10% means that if 1000W from sun beans touches the cells, 100W of electricity is produced.

For our product we are using the amorphous ones because we don’t need a very good yield and for economic reason as well. Indeed, the charger of a cellphone only requires 5 Watts when charging. After trying different yield of solar cells we found out that the best choice is to take a panel of 6V. To justify our choice we are going to use a physics formula: \( P=V \times I \) with \( P \) power in Watts, \( V \) voltage in Volts, and \( I \) intensity (or current) in Amperes. So when the solar irradiation is maximum (that means 1000W/m² = 10A), the yield would be \( P=6 \times 10=60W \% 6\%. \) Using a 6V cells means that even if the solar radiation is minimum you can charge your phone anyway. Given the fact that we only need 5W we have to put a small resistance in the circuit to avoid court-circuit to happen.

The product will be first made in China because of lower costs, especially labor cost. Once profitable, the product will be made in the United-States.

**Keys to Success**
Critical Issues

Cell phone manufacturing to each particular cell phone type could be a potential problem because it would be difficult for every specific phone to adapt to the solar panel installation. Also, deciding where to place the solar panel on the either side of the phone presents a problem. Placing solar cells on the front of the phone is difficult because today phone fronts are virtually display. In order to make this work, the solar cells themselves must be produced by transparent material that only absorbs infrared and ultraviolet light. By placing the solar cells on the back of the phone, people would be inclined to put their phones face down, which can lead to missing important alerts, or potentially harm or scratch the screen.
References:
