Business Plan:

Key Partner	**Key Activities**	**Value Propositions**	**Customer Relationships**	**Customer Segments**
Taiwan Power Company We could work with national electricity providers in order to better calculate the amount of electricity. We could also provide anonymous information to the national electricity companies for additional revenue.	**Production of product** Initial productions could be done by hand whereas mass-productions could be further implemented in factories on later stages of the venture. **Development:** **Software:** Short-term goal: to make a website/online store Long-term goal: develop different platforms app includes: (Andriod/IOS). The software will calculate the energy consumption and generate a user-friendly graph to display the data. The app could also limit the usage of every smart power outlet in order to accommodate the goals set by the user. Notifications could be sent to phones once the limit have been reached, suggesting the user to turn off the power supply for an estimated period of time. **Hardware** Arduino UNO: The board is equipped with sets of digital and analog input/output pins that may be interfaced to various expansion boards and other circuits. Arduino (SCT-013): We can use these sensors with a processor, like Arduino, to measure the intensity or power consumed by a load. Arduino(ESP8266): The ESP8266 WiFi Module is a self-contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your WiFi network. We will analyze the data from the measurement and send back to our APP/website. **Marketing** Utilize online advertisements to increase the number of people that come into contact with the service that we provide.	**Provide vital household to house-owners.** House-owners usually lack the information needed in order to reduce the monthly utility fees. House-owners oftentimes are left in the dark as to ways to effectively reduce the usage of energy. We sought to provide a clear and transparent line of communication that the utility companies fail to establish by presenting a service that installs smart outlets within houses in so that data could be collected, analyzed, and given to the users. **Propose feasible solutions for goals set by home-owners.** Another functionality that could also be implemented within our service is personalized goal settings. The app that our service provides could also have the ability to suggest how to reduce energy consumption based on the desires of the user. The suggested plan could then adjust itself based on the user response from alerts and monthly reports.	**Customer Services** Customer services could be provided within the app so that troubleshooting could be easily solved. Additionally, monthly surveys and on-demand personnel check-ups could provide the customers with a friendly and convenient relationship **Tutorials** Tutorials could be posted online on a section of our online store in order to teach our users how to interpret their data. Benchmarks and national averages could also be listed in order for our users to have an idea of how much they are spending.	**Homeowners** When the households are paying their utility fee, they only know the total amount of fee they need to pay in a month. By using our service, they can clearly access to the cost of each electronic device that they used. With this information, it is much easier for them to reduce the utility fee of costly products in order to reduce the monthly fee as a whole. **Factory Owners** Suffering from the high cost of machinery and electricity, company and factories will do anything to reduce their production costs. Companies usually cannot effectively manage their usage of electricity of machinery, limiting their abilities to maximize their profit. Therefore, the service that our company provides analyzes the usage of each machinery and equipment so that factory-owners could efficiently reduce their electricity bills.

	Key Resources		**Channels**	
	Physical Resources Machine - Machines will be needed to produce our the modules of our product at a fast scale. Systems - Systems are needed to continuously develop our product in both hardware and software. Transportation - Transportation is needed in order to transport our people to the place of installation.		**Self-created online store.** Build a website for customers to subscribe to our service and also provides an online tutorial and statistics for the users to compare. **Social Media** Advertise our service via social media such as facebook, intagram, etc.	

Cost Structure	**Revenue Streams**
Material Cost: Material costs would initially be the costliest part of our company as our services rely on the reliability of our products. Material costs would include the money needed to buy the components and the money needed to transport our employees and products to said location for installation. Development Fees Development fees would mainly derive from revenue we earned from past purchases. These development fees would be relocated into sectors of hardware development and software development. Hardware development would improve the current modules that we have by adding different sensors to include different functionalities in the future. Software development would be used to fix bugs and add more functions to the app and website. Advertisement Fees Advertisement fees would also derive from revenue made with previous purchases. These fees would be used to advertise on social media and on real life in order to maximize our contact with all types of people Employee Wages Employee wages would be the type of fees needed when the company has grown to a certain size. By then, employees need to be hired in order to continue our services to a large number of people. Thus, some fees would be allocated for paying the employees that we hire.	**Service Fees** Service fees will be our main source of income. These are one time fees that are paid to our company before we install the smart outlets into the users' homes. This fee will vary depending on the number of sensors needed to be implemented. **Basic and Premium Plans** Basic and Premium Plans are mainly targeted at factories or buildings that require large scale reduction of electric fees. These plans would include regular check-ups and maintenance that would not be available to regular household owners. This could also be part of our gross revenue.

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Introduction to Venture Creation

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Abstract

The smart home industry has risen exponentially since the introduction of in-home personal assistant devices such as Google Home and Alexa. Despite this massive growth, the energy management aspect of smart homes has been one of the more underdeveloped sectors of the smart home industry. Energy management, for instance, does not have as big as a market share when compared to applications of smart homes in fields of security, HVAC, etc.. The service that we plan to provide allows consumers to monitor their energy consumption in a simple and accessible manner by providing the data and analytics in an app. This type of convenient service is not present in any companies in the market at this particular time. By providing services from the installment of smart adapters to the accessibility of an app that could present the data in a user-friendly way while also proposing plausible limits towards the electricity usage, we believe that our company will have the ability to drastically shift the direction of the smart home industry towards the energy management aspect.

The Competitive Environment

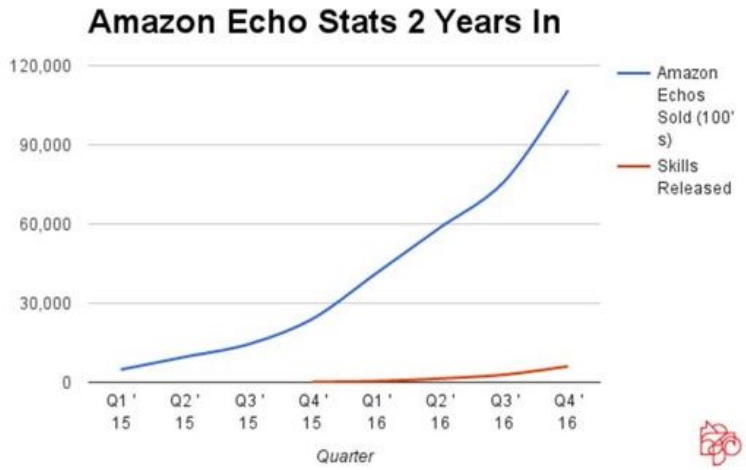
Market Size and Niche

Hundreds of complaints are sent to American Electric Power (AEP) every month complaining about the rise of electricity bills; however, the utility companies themselves fail to provide a viable solution. Keeping in mind with the increasing number of complaints and the rise of smart homes in North America, it is safe to assume that there are thousands of households that are in need of a particular type of service that helps inform them of the specific usages of their appliances. The services that we provide (which includes data recording, data analysis, maintenance, and customer service), is something special in which the current market does not provide. Another factor that continues to drive up the demand for services like the one we provide is the increasing electricity bills in various cities. The political divide within the United States has caused the instability of energy providers such as coal-powered power plants and nuclear reactors. This instability has forced electric companies such as AEP to drive up the prices, causing unsatisfied consumers. Therefore, with the combination of the rising prices of electricity and the untransparent nature of utility companies, there would be an increasing number of people that fall into our criteria of target consumers, further increasing the market size.

Key Trends

Social Trends

The increasing popularity of personal assistants such as the Amazon Alexa shows the willingness of the public to further involve technology in their everyday lives. As can be seen on the graph, with minimal new functionalities being released, the sales of Amazon Echos are still increasing at a rapid pace. Additionally, with smart homes being implemented in new generations of housings to improve accessibility for the homeowners, this period of technological development is perfect for the introduction of smart outlets that could record and analyze power usage data. By introducing smart adapters now, it continues the social trend of accessibility to all the information of the house.



Technological Trends

The current technological trend also favors the release of our service. As technology becomes more advanced, people find ways to integrate these technologies into places that were not possible in the past few years. Houses are one of the key subjects of this implementation. This trend can be seen in the popularity of companies such as Nest that provides a variety of technological services to houses. Additionally, the worth of the entire smart home industry is projected to improve by 120% just in the next year alone! This shows the undeniable trend that applications in technology are inevitable in the upcoming years.

Growth and Accessibility of Resources

Growth in this particular sector of the smart home industry is relatively slow due to the lack of convenience provided to the public. As can be seen with companies such as YOUTHINK and Poniie, the market currently lacks services that truly satisfy the needs of their consumer base. The product that these companies provide show the data of a single power outlet through a LCD screen connected to the power outlet. This is extremely inconvenient to the users as they usually do not need information from one single socket; instead, they need a summary of all the data from appliances throughout their homes. This shows that the companies that are currently in the market are out-of-touch with the needs of the consumers. Additionally, these companies have low exposure to the public due to selling their products exclusively on Amazon and eBay, creating a barrier in the communication between the company and the consumers. These factors effectively prove the fact that the market is currently in need of a service that actively provides user-friendly information to the consumers. We believe that our venture would have the ability to fill in the gap and satisfy the current needs of the consumers.

Resources would be extremely difficult to obtain at the start of the venture without any major fundings. Our venture requires the cooperation of multiple services such as the product's ability to measure and record electrical data, the app's ability to collect, analyze and display the data, and our ability to respond to any case of maintenance. Thus, without major funding, it would be extremely hard to create everything from scratch. However, after a steady revenue is established, our companies could begin its self-sustainability by continuing development on all fronts of our service and innovating new functionalities and products.

Possible Threats in Market

A free market, however, is not without its competitor. The entrance of big utility companies makes our service vulnerable as it could possibly lead to a drastic shift in the market. One example of a sudden entrant is if a utility company increases transparency to its consumers. If that happens, it negates the need of the consumers to use our service. In order to combat that possibility, our business plan proposes to cooperate with existing utility companies by providing them with data. This could create a symbiosis relationship between the utility company and our venture corporation, allowing us to profit while also helping the utility companies with something they need. Smart home companies could also pose as plausible competitors if they decide to invest in technology that is similar to the service that we provide. One possible way to combat that situation is to also cooperate with these companies by providing our services to them for a certain amount of money. In that way, we could still dominate the market of smart home energy consumption while these pre-existing companies do not need to spend additional capital in investment.

Identifying the Competitors

The main design of current products on the market consists of adding a screen module on a power outlet that monitors the current usage. One such example is the YOU THINK Electricity Usage Monitor. The following are customer complaints that we have found online and the highlighted aspects are functionalities that could be improved upon.

Roll over image to zoom in

Richard:

"Wonder why they chose to show cumulative time but not absolute? In other words, for instance, like with my fridge, which I am now checking the consumption of when it is not running, the draw is 0.00 watts. Great. However, the accumulated time counter ONLY counts minutes while power is being drawn. So.... while it is great to know exactly how much time the fridge was on, this unit does not indicate the span of real-time passing ..."

GaryW:

"I don't really mean to turn this into a math lesson but you can calculate other usage amounts from the figures above. For my dehumidifier, I divided the consumption time (in minutes) by 1440 (the number of minutes in a day) and divided the electricity consumption by that result and found that the dehumidifier was consuming about 3 kWh per day. The power consumption when the unit is running is 720 watts (0.72 kW), by dividing the 3 kWh by that I calculated that the dehumidifier is running a little over 4 hours per day."

Nature of Competition

The nature of the competition is simple. Whoever provides a better service to the consumers win. In the current market, there are minimal companies that are providing the abundance of services that we propose to provide. However, this does not stop other big corporations from investing in technologies similar to ours, causing a disruption in the market. Therefore, we believe that in order to survivor in this particular market, cooperation is needed. Cooperation with utility companies would allow us to have easy access to the power distributions of an entire city while cooperation with different technology companies would allow us to continue our services on a different platform.

Idea

The Opportunity

House-owners usually lack the information needed in order to reduce the monthly utility fees. Oftentimes, they are left in the dark as to ways to effectively reduce the usage of energy. Therefore, we sought to provide a clear and transparent line of communication that the utility companies fail to establish by presenting a service that installs smart outlets within houses in so that data could be collected, analyzed, and given to the users. Thus, given the demand for transparency and information within the household, we believe that we could provide the service that is most applicable to the needs of the customers by not only allowing them to have easy access to their electricity use but also providing them with viable plans.

Potential and Viability

In addition, we also propose the implementation of personalized goal settings within our service to suggest ways to reduce energy consumption based on the desire of the user. One main difference that is service provides is that we do not immediately cut off the power supplies to certain appliances when the limit has been reached. Research has shown that directly cutting off the power supplies will damage many electrical appliances in the household. Therefore, our app chooses to notify the consumers via phone notifications instead, allowing the consumers to turn off the appliance if they so choose. Suggested plans could then adjust themselves based on the user response from alerts and monthly reports. Additionally, our product's ability to connect to the cloud and store data proves shows further potential in not only the development of our smart adapter but also the inclusion of such services with a smart home system.

Overall, our service is unique from other smart adapters that currently exist in the market because of two main points. First of all, we analyze and present data via app services, meaning that the information is more convenient to obtain for the consumers. Secondly, the data will not be lost if there is a power shortage or blackout, making us one of the most reliable services in the market.

Marks of Distinction

Interviews

According to our first interview with Dr. Long Lee Ke from National Tsing Hua University, there are a few things that our business plan lacks and can be improved upon. First of all, he mentioned that our business would be a lot more profitable if we were providing a service

rather than selling individual smart adapters. While selling sockets seems to be profitable, smart adapters are usually overpriced, causing consumers to be less willing to buy our product. Albert also noted that active communication between the smart adapters and the online platform is innovative.

In our second interview with Dr. Ka from National Taiwan University of Science and Technology business apartment, he pointed out a contradiction between our revenue stream and business purposes. The main problem that we are trying to help alleviate the in increasing prices of utilities. However, if our main revenue stream comes from subscriptions fees from these homeowners, it defeats the purpose of reducing the prices in the first place as there are additional fees that need to be paid. Therefore, finding the balance between the price of the service and their need to reduce their cost is an essential aspect that must be figured out within our business plan.

In our third interview with Dr. Lee, he brought up many points that we had never considered throughout our brainstorming process. He noted that despite the viability of our product, we still have to consider the electricity that our adapters consume when sending data to our online database. He has concern over the network stability of the smart adapters. He wonders whether or not our adapter could be accessible to different countries due to the variety of different voltages that countries use.

From these interviews, we came up with potential ideas that could solve or alleviate the issues that were brought up. One idea is to implement either the 32KB Flash memory, 2KB SRAM, or 1KB EEPROM in our smart adapter. After doing some research we figured that the 1KB EEPROM is the best module to implement as it is non-volatile, readable, and writable.

However, the data must be read in the byte and it is slower than SRAM. Another option is to implement the EEPROM. If long term loss of the internet is plausible, we can use EEPROM to store long-term information.

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