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A Strategic Audit of Tesla

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Abstract

This paper examines in depth one of the most innovative companies in recent years: Tesla. Redefining what it means to be an electric car, Tesla has produced impressive cars year after year. However, they've run into tremendous production issues and have still yet to make any significant profits. This strategic audit analyzes Tesla's current place in the market and considers many perspectives to come to a proposed recommendation. This recommendation is to secure its market share and resolve production issues. This could be accomplished through sticking to only a few Tesla car models, then iterating year after year, and then building out a Tesla ecosystem through supplementary products like solar roofing.

Key Words: Tesla Inc., PEST analysis, innovation, SWOT analysis, Electric Cars, Strategic Audit

Background

History

Tesla, Inc. formerly named Tesla Motors was founded in 2003 by Martin Eberhad and Marc Tarpenning. Named after Nikola Tesla, Tesla set out to revolutionize and popularize electric vehicles. After more than $30 million in funding by Elon Musk in 2004, they began working on their first car, the Roadster. After the first two CEOs resigned in 2007 and 2008, Elon Musk took the reins of the company and released the Roadster to great success in 2008.

Since then Tesla has been on a mission to "accelerate the advent of sustainable transport by bringing compelling mass market electric cars to market as soon as possible". Attempting to make electric cars the future of the vehicle industry, Tesla has invested heavily in infrastructure and manufacturing. They have built 1,441 supercharger stations to effectively replace gas stations (Tesla.com). They have purchased a massive factory in Fremont California to implement a mostly automated vehicle building pipeline. Finally, Tesla is looking to build 3 new Gigafactories to ramp up production of lithium-ion batteries to ultimately increase the production of their mass-market electric cars (Electrek).

Product Lines

The 2008 Roadster was Tesla's entrance into the luxury car market. Targeted at early adopters, it was highly innovative and used as a proof-of-concept to verify that Tesla could make a successful fully-electric vehicle. It was the first highway legal all-electric car to use lithium-ion battery cells. It was incredibly performant, with an estimated range of 245 miles and

a 0 to 60 mph time in 3.6 seconds (Tesla.com). To match the incredible performance came a hefty price tag of roughly $109,000. This car was unlike any other car ever manufactured, needless to say, the roadster was redefining what It meant to be an electric vehicle. Tesla sold about 2,450 Roadsters in more than 30 countries before it was decommissioned in 2012. However, there are plans to release a second version of the roadster in 2020.

In 2012, Tesla pivoted focus to other types of cars including new sedan and SUV models. The Model S was their first shot at a sedan offering. It was a more accessible option for most consumers, targeted less at sports car fanatics and more at the broader luxury car market. Starting from $75,000 it was still very expensive, but still had incredible performance sporting a 155 mph top speed and a zero to 60 mph time in 4.1 seconds (Tesla.com). By 2018, Tesla has sold over 260,000, proving that there is a tremendous demand for this type of car. Also proving that they could ramp up production and meet their promises to investors.

Following the success of the Model S came the Model X, Tesla's start at entering the SUV market. It has all the same great features of the aforementioned models: performance, safety, fully-electric, but can now seat up to 7 people. The SUV segment is the largest segment of the market, so it was vitally important that Tesla has some share of it. Soon, Tesla will release its second SUV model, the more affordable Model Y.

One of the most important models Tesla has ever made is the Model 3. It's a sedan, much like the Model S, however with one huge difference: a price of only $35,000. It is easily the cheapest Tesla, and with this price comes tremendous demand for the car. As a result, Tesla

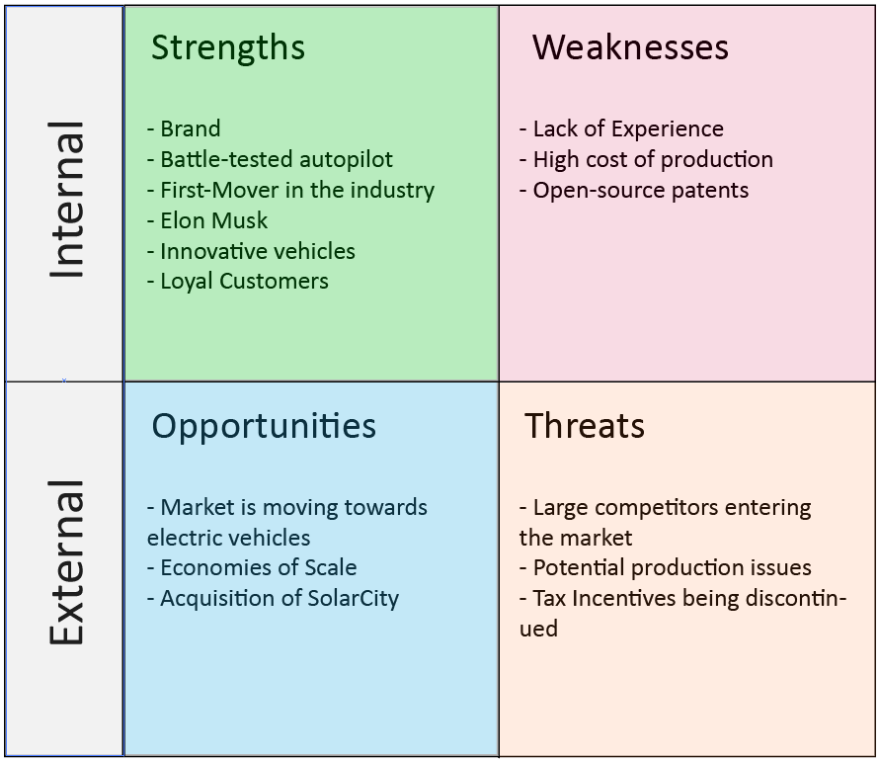
is trying to ramp up production to meet this demand, which has been more challenging than anticipated.

Major Issues & Challenges

Production. This is Tesla biggest issue and has been the main reason why Tesla is not profitable. In 2017 when Tesla was unveiling the Model 3, they took $1,000 reservations for the car. Elon Musk promised to build 5,000 vehicles in a week by the end of 2017 however, he fell short of the promise making only 800 the final week of the year (CNBC). With tremendous production problems and trouble automating the car, Tesla had a waiting list of half a million customers who put down $1,000 deposits to reserve their Model 3 (CNBC). Only eventually hitting the goal of 5,000 per week in June of 2018, Elon disappointed many of the customers and confidence in Tesla's ability to produce cars plummeted.

The problem seems to lie in automation and lack of experience. Instead of making cars a more traditional way, Elon was set on making a fully autonomous factory of highly complicated robots. However, these robots have seemed more trouble than they're worth. Attempting to automate general assembly has been one of Tesla's biggest risks which has not been paying off. The process was too complicated and there were too many challenges with automation. A fully autonomous factory sounds great in theory, however, implementation, especially this early in a company's life cycle, was far-fetched and almost had dire consequences.

SWOT Analysis



External Analysis

Competition

Tesla is the first American automotive company to go public in more than 50 years, needless to say, Tesla is entering an old well-established market. From major players like Ford, BMW, Honda, Audi, Lexus, Mercedes Benz; Tesla has and will continue to have a tremendous amount of competition. Luckily Tesla is a first-mover in the almost-untouched fully-electric luxury car segment of the larger car market.

Tesla is in a fantastic position in the market right now, however, the industry is trending towards an entirely-electric future. Global warming and pollution are becoming more prevalent issues, and the world is starting a revolution to become more environmentally-friendly. Electric cars will be one of the first major shifts in our culture, and for good reason. Electric car engines are tremendously more efficient (CleanTechnica). Electric cars are also quieter, have instant torque, can be fueled by energy from renewable resources, and with new technological advancements, electric cars have just as much range as the traditional gasoline car (CleanTechnica).

The established brands will inevitably start making fully-electric vehicles to compete with Tesla. With the experience these manufacturers have, it's possible they will be ahead of Tesla in manufacturing, one of Tesla's largest pain points. Not to mention, since Tesla has open-sourced all their patents, it's likely the other car brands will be entering the market with very comparable cars. Tesla's only hope is to keep ahead of the curve and to take full advantage of their early-mover advantage.

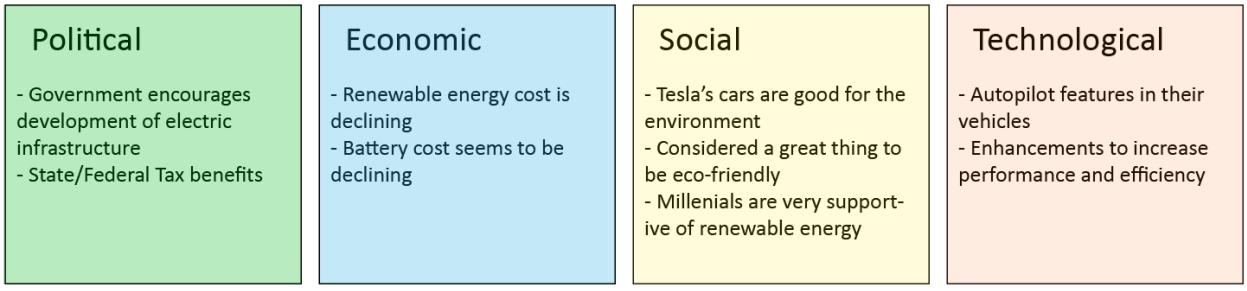
Legal

Tesla has been producing fully-electric vehicles and because of this car buyers are liable to receive federal income tax credits. To be more specific, this currently includes a $3,750 tax credit for vehicles delivered from January 1 to June 30, 2019, and a $1,875 tax credit for vehicles delivered from July 1 to December 31, 2019 (Tesla.com). This might not seem super significant but combined with some state incentives up to about $2,500 in rebates, these government discounts can be huge. This is a massive benefit for Tesla since customers are

paying less for their cars, but Tesla still reaps the benefits of them paying full price. The bad news is that since Tesla has sold over 200,000 electric vehicles, the federal tax credit is now shrinking. The federal tax credit was once $7,500 but is now being halved every 6 months (Electrek). This effectively raises the price of a Tesla for every American consumer and ultimately has an important impact on the number of cars sold by Tesla.

Tesla has also had some legal troubles with their autopilot features. The ethics and safety of autonomous cars are still not fully fleshed out. When the autopilot feature is at fault, who is to blame? Tesla has faced its fare-share of lawsuits around faults with their autopilot features. For example, Joshua D. Brown died in a car crash after his Model S failed to spot a turning white truck (Fitzpatrick). It's hard to know if Tesla was at fault for the crash, but in any case, incidents like these exacerbate fear over autopiloted vehicles. Pushing for an entirely self-driving car is the future, but it's clear that the law is going to lag behind and Tesla will have to keep that in mind as they move forward.

PEST Analysis



Internal Analysis

Patents

Tesla's mission is to accelerate the advent of sustainable transport, and in doing so they have decided to open source all their patents. In their own words: "If we clear a path to the creation of compelling electric vehicles, but then lay intellectual property landmines behind us to inhibit others, we are acting in a manner contrary to that goal". This move is unheard of in really any major industry. Essentially releasing the "secret sauce" to a well selling car sounds absolutely insane. However, they seem to be doing this to contribute to their mission, disregarding all common sense around privacy or competitive advantage.

This type of thinking has been fantastic for their brand. They are often seen as honest, trustworthy, and as being pioneers of the future. Tesla is building a future where companies might work together instead of fighting over company secrets. This may be a huge benefit in making electric cars more mainstream. Also, this will allow other manufacturers to use the same electric charging stations as Tesla. However, it is to be seen how this decision will impact their company long-term. It effectively eliminates the barriers to entry for other car manufacturers, which is asking for competition.

Factories

Tesla's first factory is in Fremont, California and has been the workhorse behind all of Tesla's cars. It is easily one of the most technologically advanced car factories in the world. With white floors, natural light skylights, and automated robots everywhere, this is certainly a

factory of the future. Elon Musk has been set on automating a huge amount of their manufacturing pipeline, to mixed success. Over-automation has been a problem for Tesla, but Elon is pushing forward with this idea and has overall been very successful with their Fremont factory.

Lithium-ion batteries are the core of Tesla's cars. The base of every Tesla car is made of 7,104 batteries (Electrek). These are the same type of batteries that power your smartphones or laptops. No other major car manufacturer is using these batteries and if Tesla wants to scale up rapidly to meet the demand of the Model 3, they need to produce more. This was the reasoning behind building Tesla's "Gigafactory". At a whopping 5.5 million square feet, this factory is one of the biggest buildings in the world.

Tesla's Gigafactory is a huge investment on Tesla's part, with the end goal to accelerate their car production. They are building 3 massive factories: one in Nevada, one in Buffalo NY, and one in Shanghai China. These factories will be mostly dedicated to producing batteries and engines at phenomenal rates. Achieving economies of scale with these factories will make a major impact on the profitability of their car manufacturing.

Brand

Tesla's clear purpose, wholesome goals, innovative products, and futuristic aspirations have served to influence people around the world. They are dedicated to shaking up the auto industry and the world is certainly ready for it. Their brand has been one of the major reasons they have done so well. Everyone wants Tesla to succeed. Who wouldn't want a new futuristic supercar that is also saving the environment? It's a no-brainer, and people have taken note.

Over half a million people put down $1,000 reservations for their Model 3s. They trust Tesla and are investing in them to succeed. Another important aspect to note is that Tesla does not spend much money on advertisements. This is very surprising considering the $11 billion dollars the other car companies are collectively spending on marketing annually (Daniel). Tesla's taking full advantage of incredible unveiling events, tweets from their CEO, and just the likable nature of the company. This brand image serves as a huge asset to Tesla, and they certainly wouldn't be where they are today without it.

Strategy Options

Evaluation Criteria

Before I get into the various strategies Tesla can take to secure their successful future as a company, we need to establish what criteria to evaluate Tesla on. Tesla should focus on two major areas to succeed in the upcoming years: manufacturing profitability and market penetration.

A huge focus for Tesla has been scaling up their production to meet the tremendous demand for their cars. If Tesla can cut costs on its production and ultimately produce more cars at stable rates, they will be in a great position for the future. To truly evaluate if Tesla will succeed, we will look at the number of cars they produce and the cost of manufacturing those vehicles, ultimately resulting in our first evaluation criteria: profit per car.

The other goal for Tesla should be to penetrate the market as much as possible while they're still the leaders in this segment. If Tesla can ensure their brand stays strong and can find

a way to protect their share of this market segment, they will be in a great position for the future.

Option 1

Automation has been a major blocker for their company. Tesla has run into countless problems and it's likely they will continue to have some production issues if they keep making new models. Tesla should stick to a few models of their cars: a roaster, a sedan, an SUV, and potentially a utility car like a semi. If they follow the strategy of every other auto manufacturer and stick to a few good models and refine them over time, they will be able to make consistent profits by keeping the same formula and eliminating the troubles of recreating a production process.

Option 2

Invest in the ecosystem Tesla is making. Tesla acquired SolarCity in 2016, with this acquisition came solar panels. The idea that solar roofs can power your Tesla's wall battery will be a huge opportunity for Tesla. Similar to Apple's ecosystem approach, if Tesla can produce high quality products, make it somewhat difficult to switch to other brands, and be a part of everyone's home, they will be very difficult to dislodge from the industry.

Option 3

Create a sub-brand of cars to target even cheaper segments of the market. Tesla has been obviously targeting the luxury fully-electric car market, but if they produce a cheaper version of their model 3 that caters to everyone, they will make huge strides on their mission to

a fully-electric future. Tesla will not want to dilute their brand by putting out a lesser quality product, therefore they will need another brand to target the cheaper market.

Strategy Recommendations

Tesla has been doing phenomenally overall as a company. Any major shift is likely unwise for the company. I recommend that they do both Option 1 and Option 2. They have had production problems, and I don't have confidence that they have resolved all of them. I would love to see them refine their production process, eliminate inefficiencies, and produce good solid cars year after year. Rereleasing their older models with slight tweaks will keep people coming back for more and will benefit Tesla in that they will not have to re-make their manufacturing steps, essentially eliminating the problem of automation.

Going forward with Tesla solar roofing will put Tesla in a strong position in the industry. Solar roofs will not only support Tesla's mission for sustainability but will also solidify its brand in the home. Going back to a gasoline car would be absolutely unthinkable. If Tesla can build out an ecosystem, similar to that of Apple, they will have continuous revenue and a solid place in the market.

Implementation

Tesla is already well on its way to completing these goals. They have overcome many automation challenges and are now starting to accelerate their production. The Gigafactories and Roadster re-release are incredible decisions designed to reduce cost and achieve

economies of scale. As long as Tesla doesn't try to manufacture too many vehicle models, they will be on the right track for success.

The acquisition of SolarCity was a stepping-stone in making the whole home eco-friendly. Making an affordable roof solar panel has a lot of potential to be successful, and Tesla should focus some of their efforts in getting that in consumer's hands. After solar roof tiling, they can consider selling excess power back to the grid for other profits as well as many other promising options.

Contingency Plan

This plan relies on Tesla having enough cash to bring solar roofing to the market and to finish making their Gigafactories. Other potential threats would consist of competitors invading the market sooner than expected. Assuming the worst, Tesla could scale back production of the most unprofitable vehicles. Limit their production to only a few cars. Then refine their production even more and try to grow their market share over time.

Overall, it would be tough for this recommendation to go wrong in the first place. Tesla is in a very strong position, and they do not have to change much to become profitable in the near future.

Works Cited

Daniel. “Innovation Is Good Marketing: Tesla Brand Review.” *Brandastic*, 30 Jan. 2019, brandastic.com/blog/marketing-tesla-brand-review/.

“Electric Car Myth Buster - Efficiency.” *CleanTechnica*, 10 Mar. 2018, cleantechnica.com/2018/03/10/electric-car-myth-buster-efficiency/.

Fitzpatrick, Alex. “Why the Tesla Crash Shouldn’t Put the Brakes On Driverless Cars.” *Time.Com*, July 2016, p. 104. *EBSCOhost*, search.ebscohost.com/login.aspx?direct=true&db=aph&AN=116652551&site=ehost-live.

Lambert, Fred, et al. “Tesla Unveils Design of Gigafactory 3 in Shanghai, Announces Ambitious Capacity.” *Electrek*, 15 Mar. 2019, electrek.co/2019/03/15/tesla-gigafactory-3-design-shanghai/.

Lambert, Fred, et al. “Tesla Confirms Hitting Federal Tax Credit Threshold, $7,500 Credit Cut in Half at End of 2018.” *Electrek*, 12 July 2018, electrek.co/2018/07/12/tesla-tsla-federal-tax-credit-threshold/.

Reuters. “Musk Says Tesla Pushed out 7,000 Cars Last Week, Meeting Goal of 5,000 Model 3s.” *CNBC*, CNBC, 2 July 2018, www.cnbc.com/2018/06/29/tesla-q2-production-and-delivery-numbers.html.

“Tesla Motors Announces 2008 Roadster Production Schedule and Achievement of Critical Milestones on Crash Tests and Range Testing.” *Tesla, Inc*, 20 Apr. 2010, www.tesla.com/blog/tesla-motors-announces-2008-roadster-production-schedule-and-achievement-critic.

“U.S. Electric Vehicle Sales by Brand 2018 | Statistic.” *Statista*, www.statista.com/statistics/698414/sales-of-all-electric-vehicles-in-the-us-by-brand/.