Strategic Imperatives for Tesla: A SWOT Analysis of Market Position and Technological Innovation in the Electric Vehicle Industry

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Abstract: This research aims to find the problems that Tesla is facing by using SWOT analysis and in which way could Tesla overcome these problems. The research question is the SWOT analysis on Tesla, BYD, Toyota and the comparison analysis. The research use SWOT method and comparison method as the main methods. The research found out that tesla's threats are mainly on battery and the competition with hybrid cars. The solution is to enhance the special design for EV and maintain a good relationship with battery supply companies.

1 INTRODUCTION

Tesla is an electric vehicle design and manufacture corporation located in Silicon Valley. The company mainly focus on producing electrical cars. Tesla has many gigafactories that fulfill the demand. The company was founded in July 2003 by Martin Eberhard and Mark Tarpenning, who financed the company before Series A was funded. Elon Musk led the Series A round of funding and became the main leader in the company (Bhardwaj, S., Pandey, R., Sharma, S., Sejal, S., Iyer, G., Sharma, S., ... & Kulkarni, S., 2020).

The main goal for Tesla is getting profit by selling electric vehicles and keep its leading position in the market. Tesla target their product's market location in a very different way. They focused on high-performance, high-price electric vehicle that can stand with those luxury brand such as BMW and Porsche (Hoffman, A. N., 2011).

As the leader of the industry, it seems that there is no doubt that Tesla will continue to grow wild and gain the entire market. But environment protection then became a very important topic in the world. People tend to buy EV. Governments hands out policies that supports the development of EV companies. Many competitors join in this market and try to gain the market value that belongs to Tesla. Under this circumstance, Tesla has to understand the problems by diving into the problems they are now facing. In order to raise the revenue, Tesla decide to lay off their employers. This can affect everyone in the supply chain. According to research, the lay-off will have a negative impact on the company's reputation and eventually lead to the crash of the supply chain. Tesla manufacture its own battery system. Producing a battery requires lots of raw materials such as copper, cobalt and nickel. Tesla doesn't control these raw materials and the violet of price may cause huge loss. There are some uncontrollable factors such as the unclear politics and economic prospect (Sathish, S., & Weenk, E., 2020) (Günther, H. O., Kannegiesser, M., & Autenrieb, N., 2015). Tesla have to know the problems they are now facing in order to avoid all the negative effect that the uncontrollable risks bring to them.

2 LITERATURE REVIEW

There are some previous studies discuss about the potential risk of Tesla.

One way of discussing the problems is by dive in to this firm's finical reports. By looking the data the company reported, researchers have found out some major problems. For instance, under the pressure of low-cost and high-quantity Chinese EV, Tesla can't domain the EV market in China and thus the revenue growing speed has already slow down. Compared with those tradition automobile manufacture corporations, Tesla's product spends too much time in the inventory. This will also add a lot of extra expenses (Ivanchenko, N., 2017). Tesla's decision-making team also knows these problems and they

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have already improved some of the questions. Now, Tesla works with Toyota in order to control the inventory time. Another way to detect the potential problems is comparing the object company with some other companies that perform well in the same field. There are also lots of papers. Recent research points out that the R&D route between Tesla, Toyota and BYD is totally different. Tesla's patient system is purely based on EV. BYD also have some gasoline engine patients, but they changed the strategy in some point of time and begin to focus on EV technology. Toyota, on the other hand, focus both the gasoline engine and the EV technology for a long time (Park, Y., Nakaoka, I., & Chen, Y., 2020).

Both of the methods have problems. For the first method, it is not a good way to search for a solution. Business is a very complex system and not every point can be found in the chart that provided to the investors. Most important, it can only find out macroscopic problems. These problems are combined by a series of small problems. So, it can't touch the core of the problem. As for the second method, it is a good method to find real problems. But the comparison in previous search doesn't have a clear logic system. That means, every paper will have a different evaluate dimension. This will make the reliability of the result become low.

What I want to do in this paper is to combine both of the methods and to make the result more accurate. SWOT is the best system that can be used to analysis the case. SWOT analysis is aimed to find out the strengths, weaknesses, opportunities, and threats in order to find out the most urgent part that the company should change (Jackson, S. E., Joshi, A., & Erhardt, N. L., 2003). By applying this method, I can use the SWOT matrix as a tool in order to dig more details. Previous studies have already used SWOT to analysis the smart driving system of Tesla, the globalization of Tesla and so on (Kumari, D., & Bhat, S., 2021) (Mangram, M. E., 2012). These papers are focused on the operation strategy. But there are no papers that discuss Tesla's management model using SWOT and compare both the strength and weakness with other strong competitors.

This study is aimed at using SWOT to analysis Tesla's management model. Then I will stand from the perspective of Tesla and see what can I learn from the SWOT analysis from BYD and Toyota.

3 METHODOLOGY

In this part, I will start from the analysis of Tesla's SWOT matrix. Then I will use BYD and Toyota as two targets and try to find out how to fix the WT area in Tesla's SWOT matrix.

3.1 Tesla's SWOT

3.1.1 Strengths

I will discuss the strengths of Tesla in this paragraph. Tesla is the most successful electric vehicle company in the US and therefore it has a very good reputation. With its reputation, Tesla has a license from the government in order to push the program of the Auto Driving System. Tesla also focusing on Auto Driving System. The EV's engine was designed and originated by Tesla. Tesla supervises the manufacture of battery system and control system. Therefore, the EV is very safe and high-tech. A good reputation can also let consumer trust their Auto Driving System and the electric system. This is very important and is a part of Tesla's strength. Many people want a stable, safe, high-tech EV that is produced by a high-end company. Tesla can fit all of these requirements. Therefore, when people choose an EV, they will first consider Tesla's product. Another point is that Tesla has a very good design and innovation team. They are very critical in Tesla. As EV uses the battery as the power source and the electric motor as the engine. The electric motor uses less space than the fuel engine. But the battery needs lots of space. So, in order to fully use the car space, the design team of Tesla just made the frontier as a boot and put all of the battery at the bottom of the car. The design is so special that makes lots of people pay attention to the car. This example shows that the special design based on the characters of the electricity can be faddish, thus increasing the income of the company. Third, the leadership of Elon Musk is strong and unique. Elon Musk has a lot of brilliant ideas and he is good at managing the cost of producing a product. Tesla also has many Gigafactory around the world. These fully automated factories can produce huge amounts of product in a short period of time. The technical group can realize Musk's ideas and products can be sold at an acceptable price based on the Gigafactory. This is also a very important reason that Tesla's product has an acceptable price and lots of special features. These are three main strengths Tesla has.

3.2 Weaknesses

Then, I will discuss the weakness of Tesla. Elon Musk likes to speak about some controversial topics. He also likes to share his ideas about Tesla on the X platform. This may potentially damage the company's reputation. Another weak point is that

Tesla doesn't have a resilient supply system. For example, Tesla only uses Panasonic's battery because of their partnership. I will dive into the battery problem in the threat part later. The supply company list for Tesla is so short that until 2011, there were only 9 companies served as Tesla's suppliers (Karamitsios, A., 2013). There is no replacement company for Tesla to use when the supplier has problems. This may raise the potential waiting time for buyers when their cars are affected by one supplier's problem. Eventually, the selling volume will drop down.

3.3 Opportunities

There are some potential opportunities for Tesla. The first is to combine AI technology with the driving control system. Tesla has already developed their own autopilot hardwire called FSD Chip. As I said before, Tesla is the leader of the Auto Driving System so they gain a lot of data to make the system more stable and reliable. Second is that there are still lots of potential markets for Tesla to gain. For example, Thailand and Vietnam don't have so many EVs on sale. If Tesla can sell their EV in the market, that will be a milestone for their revenue.

3.4 Threats

Finally, I will point out the threats that Tesla faces. Although Tesla owns Gigafactory all over the world, the company still doesn't have the ability to produce batteries. Battery is the most important technology in the EV sector. Elon Musk and Panasonic still want to use cylinder power batter. This is mainly because the 4680 battery can contain more power and the assembly of the power unit will be much easier. Unfortunately, the 4680 cylinder power battery has many technical problems. Panasonic said they won't provide 4680 cylinder power battery to Tesla (Hyunjoo Jin, Kiyoshi Takenaka., 2023). Without a low-cost battery solution, Tesla will soon lose its leadership position. Both the Lithium Iron Phosphate Battery and Nickle Cobalt Manganese Battery are much safer and can contain more power in the same weight compared to the traditional Li-ion Battery. The second problem is more dangerous. Now, companies are focusing on the Hybrid EV. Hybrid EV uses an internal combustion engine as a supplementary power source. The Hybrid EV has some advantages. There are many places that don't have the charging pile because the area is too far from the rich area and Tesla doesn't want to construct there. If you are in peak hour, you need to wait for a long time to charge your car and your car may spend all of the power before you charge it. With the combustion engine, these worries won't exist. Also, the combustion engine will only run in the most efficient area so the fuel consumption of the engine will be lower than the usual fuel car. The hybrid EV combines the internal combustion engine's benefits and the EV's benefits. Companies can also deploy an auto-driving system on the car. But Tesla doesn't have such a plan to produce the hybrid EV. This means that Tesla will lose one track and the market share will drop significantly.

3.5 SWOT Matrix

This research shows the SWOT analysis by using the matrix below.

Table 1: SWOT matrix

Strengths	**Weakness**
Good Reputation Special design and innovation based on EV. High-quality product sells at an acceptable price.	Elon Musk's behaviour. The supply chain is not resilient.
Opportunities	**Threats**
Auto-driving system. Untouched market.	Low energy density battery. Facing the challenge of Hybrid EV.

After the SWOT discussion, what I want to know is how to eliminate the threats that are listed on the matrix. I can use comparison methods to find out solutions.

4 DISCUSSION

There are four kinds of improvement that the company can use after SWOT analysis. Strengthen the strengths, seek and grab the opportunities, avoid weakness, and eliminate threats. I choose the method of eliminating the threats. A threat such as hybrid EV is a very new topic, and there have been few discussions about how to solve the problem.

In order to find out the solution for Tesla to eliminate the threats, I decided to find out the companies that are good at what Tesla is under threat. By comparing Tesla with the company, I can get the final result and lead to a conclusion.

The first problem Tesla is now facing is the battery problem. The second problem Tesla is now facing is the challenge of Hybrid EVs. Toyota is a traditional car manufacturing corporation. They have also changed into the EV section. How did they

manage to do so? Maybe Tesla can learn something from them. BYD is also a very important example as the company is good at manufacturing batteries, EVs, and Hybrid EVs. This is also a very strong competitor which I can learn from.

Toyota is a traditional internal combustion engine automobile manufacturing corporation founded in Japan. Due to the lack of energy in Japan, Toyota has already tried a series of technologies in order to save fuel usage. They have already spent a lot of money on Hybrid EV technology and fuel cell technology. The reward is very good. Now, Toyota is the leader in the Hybrid EV sector (Liu, J. H., & Meng, Z. 2017).

Now, I can find out the difference between Toyota and Tesla. Toyota has already designed and manufactured the internal combustion engine. Hybrid EV is a very good choice because they don't have battery technology. In order to follow the trends, Toyota decided to use Hybrid cars as a way to prove to the public that they have the determination to change. This is a bad point as Tesla was founded for pure EVs and they don't have any internal combustion engine patent. But Toyota doesn't have a special design for the EV car. Their design ideas are locked in the traditional mode. From this point of view, the best way for Tesla to compete with these Hybrid EVs is the design. The innovation team and the design team can make full use of the extra space that the electric system provides and make the car larger, safer, and more comfortable. Finally, Tesla still needs to spend money on building charging piles. This is the key infrastructure for EVs. Nowadays, you can find a gas station in any city no matter how poor it is. However, the charging piles need a stable electric grid that covers the entire country. Tesla needs to invest heavily in this part in order to eliminate the anxiety of EV drivers.

BYD is a manufacturing company that mainly focuses on battery and IT technology. Based in Shenzhen, this company focuses on frontier technology in the battery and electric engine section. Now, BYD is a leader in new energy vehicles in China. BYD created a new battery form that is called The Blade Battery. Tesla and Panasonic focus on the cylinder battery. This is where the problem is. The blade battery can be put together without wasting any space but the cylinder battery will have some blank space due to its shape. This means that BYD can save more energy in the same space compared with Tesla. Blade Battery is also much safer than cylinder battery. So, it is obvious that Elon Musk has to change his mind. As I have talked about before, Tesla should widen their supply system in order to make sure it can handle all of the problems that it may face. It is obvious that either the decision made by Elon Musk about the 4680 battery is wrong, or Panasonic has some research and development problems. No matter what happens, the problem will eventually affect the users' experience because they expect to have a longer trip with only one charge. From this prospect of view, Tesla should reconsider their relationship with BYD and Panasonic. The company should have a balanced relationship with both of the companies in order to keep the company's leader in the pure EV sector.

5 CONCLUSION

In conclusion, this paper mainly focuses on Tesla's SWOT. The strengths of Tesla are its reputation, special design, and acceptable price. The weaknesses are Elon Musk's personal controversial behaviors and the weak resilience of the supply chain. The opportunities for Tesla are the Auto-Driving System and the untouched market. The threats for Tesla are the 4680 battery technology can't be used to manufacture huge quantities of batteries and hybrid EV becomes the strong competitor. Then, I use BYD and Toyota as two targets in order to see if there are some possible solutions to eliminate the threats. The conclusion is that the company can go through the problems by strengthening its special design based on the EV system provided and widening the battery supply chain. This research will serve as a base for future studies in the EV operation sector. The method I provide in the paper may inspire others to analyze problems more accurately.

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