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Research on the Advantages and Disadvantages of Tesla's Supply Chain in China

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ABSTRACT
The development of new energy vehicles has always been one of the development projects that countries attach importance to, and major automobile companies are gradually turning their attention to the new energy vehicle market. As a pioneer in the new energy vehicle industry, Tesla has a significant advantage in the new energy vehicle supply chain, and the Monopoly Law has a great restriction on Tesla's further occupation of the market. This paper analyzes the strengths and weaknesses of Tesla's supply chain based on the criteria of value, scarcity, irreplaceability, and difficulty of exemplary identification of core competencies, and uses SWOT analysis to study how Tesla can expand its market share through supply chain advantages. But as long as it can overcome these problems, Tesla can maintain its position as the number one electric car company in China.

Keywords: *Tesla, Monopoly, Supply Chain, China.*

1. INTRODUCTION

1.1. Research Background

With the arrival of Tesla in the Chinese market, the development of the domestic new energy vehicle industry has gradually matured, and the market competition has become more and more fierce. It is not difficult to see from the sales volume that, in addition to the first domestic enterprises to enter the new energy vehicle market and Wuling, which strives for cost performance, the number of state-created enterprises accounts for a significantly higher proportion than foreign enterprises; Tesla is always in the first place in the sales list among many competitors, and domestic enterprises have to compete in The first point is generally not applicable to enterprises that attach importance to technological innovation, which is related to the cost of compressed manufacturing, the quality control of the enterprise's goods, this paper attaches importance to supply chain risks, so the technical aspects of the discussion; Tesla's exclusivity for technology has a greater connection with its supply chain advantages, such as its excellent three-electric technology is attributed to this, but also This means that domestic companies need to imitate and innovate in supply chain competition, while Tesla's disadvantages are obvious, such as the inimitability of its core competitiveness, which also reflects the necessity of innovation in enterprise competition.

1.2. Literature Review

For the supply chain technology discourse, Yang Yang and He Ziwei (2015) pointed out three basic characteristics of the new energy vehicle supply chain: first, short supply chain exploration time and high vulnerability of the supply chain; second, difficult to predict the end demand of the supply chain; (3) high dependence on technology, once there is a technical link failure, the supply chain management cannot continue [1]. For supply chain manufacturing direction analysis, the automobile is a big piece, its structure is complex, there are usually tens of thousands of parts, different models are completely different, and the same model has many individual requirements. Therefore, the process is quite complex from order review to production planning and material planning to sales [2]. Liu Haohua (2015) points

out the traditional cars are powered by internal combustion engines, with 30,000 to 50,000 parts, closed production, and a long value chain with a high degree of interdependence [3]. In contrast, the structure of new energy vehicles is simple, such as pure electric vehicles, only 3,000 parts, with the battery, motor, and electronic control in the powertrain system as the core components, using new lightweight, composite materials and advanced electronic devices, etc. The number of components in the powertrain will be reduced by more than 100 from the traditional approximately 1400. Moreover, new energy vehicles are closely related to the energy supply industry, electronics industry, etc., and need charging infrastructure for protection. Second, specifically on the cooperation between new energy vehicle enterprises and other suppliers, Wang Yanchen and Liu Ling (2019) new energy vehicle supply chain contains all the processes from raw material suppliers to the completion of product manufacturing and delivery to end-users, that is, including planning, procurement, acceptance, storage, manufacturing and assembly, distribution and other processes, the supply chain system is more complex, and in actual operation, product flow, information flow, and capital flow are formed. Product flow refers to the flow of auto parts from the supplier to the vehicle manufacturing plant, the vehicle from the manufacturing plant to the customer's entity; information flow is the two-way communication between suppliers, manufacturers, and customer on-demand, technology, quality, and other information in the production process of auto parts and vehicles [4]. Further specifically to the new energy vehicle supply chain of the vehicle technology as well as procurement direction, new energy vehicle electronic control sales continue to explode, significantly exceeded market expectations, are expected to achieve more than double the annual growth. Since the second half of this year, the production and sales data of new energy vehicles continue to exceed expectations, the latest Ministry of Industry and Information Technology announced that from January to September 2015 production of 156,000 units, an increase of nearly three times. The fourth quarter is the peak season for new energy vehicle production and sales, and new energy vehicle production is expected to rise all the way. Benefitting from the rapid expansion of the new energy vehicle market scale, the production and sales of new energy vehicle electric control will also grow [5].

In summary, most of the reports are designed to reflect the importance and irreplaceability of the supply chain of new energy vehicles, while several scholars and reports can be concluded that supply chain advantages play a vital role in the new energy vehicle market competition, the supply chain technology is crucial, which will involve the level of technology owned by the enterprise itself, as well as its ability to provide inimitable innovation, and scarcity. Rarity, but also reflects the market advantage that Tesla has gained and its advantages in the supply chain are inseparable, the latter part of this paper will mention the three electric control systems that Tesla has, which has a huge advantage among its peers, which will also involve its exclusive advantage. In the core competency criteria, this paper will analyze how Tesla obtains supply chain advantages incorporate cooperation by the direction of supply chain partners mentioned in the previous literature.

The SWOT analysis used later in this paper will also be more focused on Tesla's disadvantages in the supply chain, how to find opportunities in the disadvantages, solve them and highlight their advantages, to find relevant development opportunities, and suggest shallow problem-solving directions to help relevant companies find breakthroughs in the bottleneck period.

1.3. Research Contents

This paper will analyze the reasons for Tesla's advantages and disadvantages in the supply chain, and secondly, this paper will analyze the disadvantages of Tesla and propose solutions to prove that if the new energy vehicle enterprises solve their more obvious disadvantages, they can get a greater chance of a competitive advantage.

2. CRITERIA OF CORE COMPETENCE

The four main criteria for identifying a company's core competencies include value, scarcity, irreplaceability, and difficulty in modeling. Core competencies are often one of the most important elements of business competition and can continue to bring stable and high profits for enterprises. As a pioneer in the new energy vehicle industry, Tesla needs to grasp its core competencies. It has been proved that Tesla's advantages in the supply chain are inseparable from its core competitiveness, and the disadvantages it faces are also reflected in its core competitiveness, while most enterprises are aware of the importance of core competitiveness, and the unique technology of each enterprise can also be unique in the industry competition. We take the famous American chain Wal-Mart as an example. Since its establishment in 1962 has endured, the core competitiveness is one of the important reasons.

2.1. Value

Walmart can give a convenient and fast consumer experience, and can also provide occasional promotions because Walmart controls the cost of purchase and cost of sales. For Tesla, value is one of the biggest advantages, even if the price once required strong purchasing power of consumers. The establishment of a super factory and localized production in China is an advantage of Tesla over its overseas counterparts in terms of price. The shift from overseas sales to domestic sales has significantly reduced the cost of sales and avoided a large number of

tariff expenses, and the reduction in labor costs has also reduced the input for manufacturing costs. In this way, the sales price is lowered several times, thus lowering the threshold of consumption. Cooperate with Chinese communication operators to speed up the informatization of car products, and also increase or decrease the visibility of the products. In terms of service, Tesla has enhanced its after-sales service by establishing charging piles on a large scale. Provide more obvious advantages in the supply chain.

2.2. Scarcity

Wal-Mart's most unique service special logistics system, Wal-Mart's distribution stations have provided distribution services for more than 4,000 stores worldwide and have the largest company transportation fleet in the United States. Tesla also has a strong advantage in scarcity, that is, Tesla's powerful three-electric system (including battery, motor, electric control system), this technology and Tesla for the battery supplier cooperation has a close link [6].

Before Tesla's domestic production, in-depth cooperation with companies such as Panasonic and LG to ensure the supply of Tesla batteries and the advanced degree. And after the domestic production, Tesla due to domestic battery manufacturers to cooperate, for example, Ningde Time have cooperated with Tesla to extend the contract to 2025. Tesla will purchase lithium-ion power batteries from Ningde Time [7,8]. As can be seen from Table 1, compared to domestic brands, the energy released by Tesla cars is stronger than that of domestic brands when using the same battery type and the same drive motor, and there is a considerable gap between domestic brands and Tesla in the more high-end car models.

Table 1. Tesla electric control system disassembly

Cae	Drive Motor	Trickle Charge (0-100%soc/h)	Rapid Charge (0-80%soc/h)	Electrical Machinery	Energy (kwh)
Weilai es8	AC asynchronism motor	8	1	Ternary lithium battery	67
modelx 75D	AC asynchronism motor	6—8	0.75—1	Ternary lithium battery	75
modelx 100D	AC asynchronism motor	6—8	0.75—1	Ternary lithium battery	100
modelx p100D	AC asynchronism motor	6—8	0.75—1	Ternary lithium battery	100

2.3. Irreplaceability

In terms of irreplaceability, Tesla is facing a more obvious disadvantage. For Tesla's unique entertainment in-car system, compared with the same performance and stability of the android system, Tesla's Linux-based in-car system can get rid of the relative limitations of the android system suppliers, such as the potential risk of technology monopoly, and play a role in the supply chain. However, due to the similarity of functions and the fact that the Android system is also based on the LINUX system for improvements and continuous updates, Tesla cannot surpass the Android system in terms of system technology, and Tesla's on-board system has limited functions and is difficult to achieve irreplaceability [9].

2.4. Difficulty in Model

For Tesla's brake system, the brake system used by Tesla is the BOOSTER brake system. Compared with the traditional brake system, this brake system makes the car consume less energy, is safer, and is more suitable for the maximum energy recovery of new energy vehicles. In other words, the high performance of the braking system will certainly prompt peers to follow suit and mass market. The "brake failure incident" makes Tesla's reputation damaged, in this part of the supply chain, Tesla is at a greater disadvantage and is one of the most important issues to be resolved.

At the same time, Tesla open all the patents, the public also makes Tesla cars more easily copied by others, which will make in the peer competition, Tesla can get the exclusive advantage is rarer. However, there will be differences in the supply chain, for example, the after-sales service provided by the company, and the cooperation with suppliers usually mirror the strength of the company itself, which is often difficult to imitate, so the supply chain advantage is the core competitiveness of Tesla.

3. SWOT ANALYSIS ON TESLA'S SUPPLY CHAIN

SWOT analysis is usually divided into the following four points: Strengths, Weaknesses, Opportunities, and Threats, and this paper will focus on the supply chain strengths and weaknesses of Tesla, and in this, it will combine the opportunities and threats of Tesla in the market, which will help to further analyze the strengths and weaknesses of Tesla in the market.

3.1. Threats

According to the previous complaint, compared with

other driverless technology companies, Tesla is at a greater disadvantage in driverless technology, in terms of technical level, the technology used by Tesla is relatively backward, and it is difficult to stand in front of the industry; in addition, the technology used by Tesla is misrepresented or over-exaggerated by public opinion and other phenomena, resulting in a greater disadvantage, so there is a greater threat in the supply chain and industry competition, and this will This means that the threat Tesla encounters will not only be the threat of competition from peers but will also involve the threat to the company's reputation and technology development caused by the technology used by Tesla.

3.2. Weaknesses

The disadvantages that Tesla faces in the industry include the threats it encounters in the industry and the huge impact it has, the bottlenecks it encounters at the operational level of the system that it fails to excel, and the advantages of the many technologies it uses that are less and more problematic. According to the previous analysis of the threats encountered by Tesla, Tesla's failure to excel in driverless technology, causing problems and causing public opinion, will be one of the most important technical problems that Tesla needs to pay attention to, and Tesla also needs to upgrade this technology to prove that Tesla's strength does not need to exaggerate; on the system level, Tesla's use of the car system according to the previous article can be learned, Tesla failed to Tesla needs to make better optimization of the system and more functions and upgrades, in other words, it is dedicated to customer experience and after-sales innovation, which will help Tesla to get better value in its core competitiveness and compete with its peers. This will make up for the supply chain disadvantages that Tesla faces at the system level; among the many technologies used, Tesla has fewer advantages, typically the BOOSTER brake system used by Tesla, as we know from the previous article, the brake technology used by Tesla can better serve the electric car, but Tesla cannot get the exclusive advantage of the disadvantages that may be brought by the mass, and, Tesla in the use of this technology when the problems arise, such as brake failure brought about by traffic accidents, and Tesla needs to carry out product optimization for this brake system, and the related technical improvement of the cooperation company and related agreements.

3.3. Opportunities

For the various threats and disadvantages encountered by Tesla at the same time, in fact, the improvement program is a relative opportunity. For example, Tesla has the disadvantage of not being able to excel in system operation due to the difficulty of innovation, but this can lead to solutions such as improving the quality of after-sales service and multiple software upgrades, and this is a new major advantage of Tesla's supply chain in terms of performance, and at the same time, Tesla can also get good reviews from customers to expand its market share, and the rise in customer purchases will generate more corresponding advantages in the supply chain of production. The rise in customer purchases will generate more opportunities in the production supply chain.

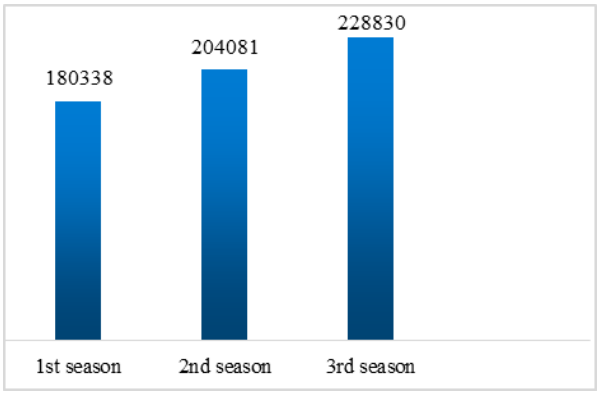

Figure 1 Amount of model3 delivered.

Figure 2 Tesla model3 price change.

According to Figure 1 and Figure 2 about Tesla's annual report data can also be concluded that Tesla has a huge competitive advantage in the marke[10], in the conditions of price reduction can have a significant sales increase benefit, so the opportunity is still obvious if, in the case of solving the obvious disadvantage, it is expected that sales will continue to grow. For the advantage, the effect of price reduction is obvious, in the period of damaged reputation can still be appropriate to reduce the price of the way to restore the reputation, improve sales and competitiveness, so for the same competitors that are, peer companies can also be appropriate according to the situation to reduce prices and rise in reputation and cost performance.

3.4. Strength

Through the previous literature review, we can learn that Tesla's supply chain advantage will be closer to the hardware procurement aspect, because Tesla has a higher than industry average level of three electric technology. Which will mean that the Tesla car's electric performance

can be higher than the peer level, it has proved that Tesla has a unique control system, in the company's cooperation with more than battery suppliers for Deep cooperation in order to supply timely, is one of the favorable evidence of Tesla's advantage here. At the same time, combined with the previous analysis, Tesla's opportunities can be understood that Tesla's advantages can still be obtained from solving the disadvantages. The reason is that if Tesla makes up for the obvious disadvantages. Then Tesla is highlighted is a more obvious advantage. In other words, Tesla now has the advantages can also attract the corresponding customers, but if Tesla will highlight the advantages and disadvantages, the resulting supply chain The advantage will be more significant and more effective.

4. RESULTS AND DISCUSSION

The swot analysis used in this paper addresses Tesla's disadvantages in the supply chain, how to find opportunities in the disadvantages, highlight its strengths, so as to discover relevant development opportunities and propose shallow problem-solving directions to help relevant enterprises find breakthroughs in the bottleneck period. In the core competitiveness criteria, this paper analyzes how Tesla obtains supply chain advantages incorporate cooperation in accordance with the direction of supply chain partners mentioned in the literature. Through the SWOT analysis method, we clearly find out the current advantages and current threats faced by Tesla. At present, Tesla still has the world's largest electric car market, but as stated in the threat, Tesla also faces challenges from all car companies around the world, especially in China, many new electronic car factories with government support are ready to challenge this position, only to ensure the uniqueness of their current technology, as well as the continued stability and irreplaceability of the supply chain, in order to make Tesla better secure its current position. Then, through our analysis of core competencies, Tesla is still slightly lacking in some of its scarce supply chains, such as the batteries and systems that we have listed in the article. Only by improving these things can Tesla's promotely be enhanced to mirror its own corporate strength. This article uses Tesla's related research results and official data as the analysis basis to summarize the current development status of Tesla's supply chain.

5. CONCLUSION

In conclusion, this paper analyzes the strengths and weaknesses of Tesla's supply chain based on the core competencies of value, scarcity, irreplaceability, and difficulty of exemplary identification criteria, and uses SWOT analysis to examine how Tesla can expand its market share through supply chain advantages. Through the above series of studies, we recognize what necessary adjustments need to be made to the current supply chain if Tesla is to continue to maintain its position as the world's number one electric vehicle manufacturer. Of course, there are certain research limitations in the current paper, such as government policies are an important part of the picture, including people's attitudes towards EVs. While we recognize the benefits of EVs, the pollution caused by disposing of batteries can also be a headache for people. At the same time, although the government is currently strongly supporting electric cars, it is still unknown whether new policy adjustments will be made after electric cars become truly popular. But as long as Tesla stabilizes its supply chain in the current situation, while defending its corporate position and reputation, it can still gain a lot of profit and success.

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