Analysis of the Core Competitive Advantage of the Auto Industry: A Case of Tesla' s Business Model

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Abstract. Due to environmental pressure, energy security, technological development, consumer attitudes, and policy advocacy, it is widely recognized by governments and automotive enterprises that energy efficiency and green emissions are significant directions for the future of the automotive industry. The development and popularity of new energy vehicles (NEVs) have been a trend with broad prospects. Currently, Tesla is undoubtedly the leading electric vehicle company in terms of brand awareness, market share, and new technological breakthroughs, and is highly competitive in the NEV market. This paper explores how new technologies, management, corporate culture, and brand image have helped Tesla to expand economies of scale, reduce costs and increase turnover. By using the method of case analysis, the paper analyses and evaluates the core competitive advantages of the automotive industry through Tesla's business model. In addition, the paper proposes solutions for Tesla's current establishment background, current situation, and operating environment as well as its shortcomings. And then makes some suggestions for future development. According to the analysis in this paper, the typical disadvantages of Tesla are high cost, high selling price, and limited consumer base. At the same time, this paper summarizes the above key elements and analysis and then looks at the future development of the electric vehicle industry. Through the discussion in this paper, some successful experiences and advanced ideas that can be learned from new energy vehicle companies are found. These experiences and ideas allow the future of the world's new energy vehicle market to unfold in its way.

Keywords: Core competency, business model, electric vehicle

1. Introduction

As the world economy continues to grow and people's living standards improve, global car ownership is on the rise and sustainable development is gradually becoming the international mainstream. But energy security issues, the constraints on resource exploitation, and the pollutants emitted by traditional fuel vehicles have negative impacts on the environment. Therefore, the development of NEVs has become a crucial means of sustainable development. Besides, as a strategic resource, the impact of oil on the automotive industry cannot be overemphasized. According to the distribution of the world's oil resources, with almost half of the world's oil reserves, the Middle East is one of the most important oil exporters. Many countries in the world, particularly in the Asia-Pacific region and Europe, are highly dependent on imported oil. However, the high volatility of oil prices in the Middle East and the high level of uncertainty in the policies and oil production of the major crude oil countries have led to a reactive situation for many importing countries. On the other hand, electricity resources are more readily available than oil for most countries and therefore the creation of purely electric vehicles could go a long way to alleviating the problems associated with oil imports.

Compared to other new energy vehicles, such as hydrogen fuel cell vehicles (FCVs) and hybrid electric vehicles (HEVs), electric vehicles have dominated the global automotive industry market with their significant environmental and energy-saving advantages. The development of electric vehicles is an undisputed trend. So evidently, the development of electric vehicles is an undisputed trend. And due to the rigid demand of the global automotive market, the electric vehicle industry has great market capacity and development opportunities. Previously, many experts have studied Tesla and the state of the new energy vehicle industry, but research on counterparts in learning from Tesla's role is relatively scarce for the time being. This paper explores how new technologies, management,

corporate culture, and brand image have helped Tesla to expand economies of scale, reduce costs and increase turnover through the analysis of Tesla's business model and core competencies. Meanwhile, by using the method of case analysis, this paper also analyses the strengths and weaknesses of Tesla and makes recommendations for each of its shortcomings. Finally, an outlook on the future of electric vehicles is provided. It is acknowledged that Tesla is the leading company in the new energy vehicle industry. In the hope that will serve as a reference for other EV enterprises and bring inspiration to their development through the analysis and study of Tesla.

2. Literature Review

2.1 Business Model

The concept of the business model first appeared by Bellman and Clark (1957) and was widely used in the 1990s [1]. Foreign scholars have carried out a series of studies on business models. Drucker (1994) argued that business models were business theories about organizations (or companies) [2]. Timmers (1998) first discussed business models and regarded business models as organic systems made up of products, services, and information. He believed that business models were a group of frameworks for the flow of products, services, and information [3]. Linder et al. (2000) argued that a business model was the logic that created value for an organization or a business system [4]. Boulton et al. (2000) pointed out that business models were enterprise-specific asset portfolios, and different asset portfolios represented different business models [5]. Amit, Zott (2001) argued that the business model was a combination of elements of trading activities with the aim of opening up business opportunities [6]. Massa et al. (2017) divided business model research into two aspects. At one end of the spectrum, the business model is seen as an attribute of the focal enterprise and its context, including the performance of the enterprise and the drivers of that performance. At the other end of the spectrum, the business model is understood as a cognitive model or mindset that is held by the managers of the focal enterprise and includes their decisions [7].

Domestic scholars have also carried out a series of studies in the related field. Wang and Peng (2002) argued that there were three mainstream topics related to business model research, which are the modules of the business model, the mechanisms by which enterprises operate, and the expansion and utilization of operating mechanisms [8]. Weng (2004) defined business models as meaningful combinations of core interface element forms [9]. Li (2009) argued that the business model consists of four models: financing, production, marketing, and management. He emphasized the need for the internal and external components of the business model to work together to optimize the operation of the business system [10]. Wei and Zhu (2009) proposed a six-factor model of business model. The focus was on how to effectively and rationally organize the transaction structure between stakeholders [11]. Xue et al. (2014) emphasized that business model innovation for electric vehicles should focus on looking at the electric vehicle chain from a holistic perspective. It encompassed the various elements within the EV business model and the role and status of each element in this network [12].

2.2 Core Competency

Related to the study of the core competency of enterprises, Hamel and Prahalad (1990) firstly proposed core competency. They refuted traditional combination strategies, arguing that businesses should be built around a shared competitive core [13]. Schein (1900) proved that the construction of corporate culture was the source of driving the enterprise forward at different stages of enterprise development [14]. Barton (1992) believed that core competency is not only technical and human skills, but also an interdependent, interconnected and institutionalized enterprise knowledge system that can identify and provide competitive advantages [15]. Coombs et al. (1996) cited that a core competence was a specific combination of a company's competencies, an accumulation of specialized experience that enables interaction between the company, the market, and the technology [16].

Yang (2017) believed that the core competency in the enterprise was difficult to be imitated competitors and was superior to that of competitors [17]. Yang (2017) pointed out that to win the

opportunity under the competition mechanism of the future market, car companies needed to vigorously advocate innovative technology, and increase capital investment, and R & D efforts. Also, imminently researching and striving to make greater breakthroughs in new energy technology could create their core competencies [18]. Yang (2017) argued that the innovative advantages and technological capabilities accumulated by enterprises in the process of gradually adapting to market competition and enterprise development are core competencies. It is also the basis for the survival and development of enterprises [19]. Wang et al. believed that a company's core competencies were embedded in all levels of the enterprise, consisting of competency elements and competency frameworks that enable the company to gain a sustainable competitive advantage. It was a dynamically evolving system of knowledge [20].

To sum up, different researchers have different opinions on the definition of business models and core competencies. The main reason for the differences is related to their different research perspectives. But no matter how people define the business model and core competency, it emphasizes the way companies make profits. The core lies in creating value, transmitting value, and acquiring value. That means the current enterprise competition is not only the competition between different products but also the competition between different business models. The success of the business model has created many excellent companies like Tesla, which has achieved amazing results with a different business model from traditional automobile companies. If enterprises want to acquire a competitive advantage in the market, it is essential to build core competencies so that become bigger and stronger in the market.

3. Case Description

Tesla was founded on July 1, 2003, and listed on the NASDAQ on June 29, 2010, which is named after Nikola Tesla, an American scientist. It is the largest electric vehicle (EV) and solar energy company in the United States and the first auto company in history to support bitcoin for car purchases. Tesla Energy is also one of the world’s largest suppliers of battery energy storage systems. Elon Musk is its current CEO. Tesla mainly manufactures and sells electric vehicles, solar panels, and energy storage devices. It is committed to providing every average consumer with a purely electric vehicle within their spending power. Tesla's vision is to accelerate the global shift to sustainable energy.

When Tesla first entered the automotive market, it was positioned as a high-end and niche electric sports car. Musk proposed the "master plan" in 2006 [21], dividing Tesla's development into three stages. The first stage is to build an expensive, low-output electric vehicle (Roadster) to get the first pot of gold. The second stage is to use the money earned in the first stage to build a mid-range and high-end priced, mid-volume electric vehicle (Model S/ Model X) to seize the SUV market and further increase market share. In the third stage, the money earned is used to build a more economical best-selling electric vehicle with mass production (Model 3/ Model Y). Finally, after completing the above three stages, the solar power business is laid out. After the acquisition of SolarCity, Tesla transformed itself into the world's only vertically integrated energy corporate, offering end-to-end clean energy products to its consumers.

In 2016, after completing the master plan, Musk proposed a second decade's vision, the "Master Plan Part Deux" [22]. This is a new company plan, which is a roadmap for Tesla's comprehensive layout from a simple electric vehicle manufacturer to a new energy company, which mainly includes four aspects. First, to create stunning solar roofs with seamlessly integrated battery storage. Then, expanding the electric vehicle product range to cover all major market segments. Then, using massive learning to develop autonomous driving capabilities which are 10 times safer than manual driving. Finally, making consumers' cars profitable when they are not in use.

4. Problem Analysis

4.1 Advantages

4.1.1 Technology

Tesla made multiple battery improvements in battery composition, safety, and charging capabilities. Tesla Power Pack, which uses batteries to stabilize the region's commercial power grid, is a new commercial power venture in South Australia. It was considered a sustainable energy success. Moreover, each battery must pass more stringent internal tests than the national mandatory standards before it can be put on the market. This process involves hundreds of battery safety test items to ensure the products are safe for mass production.

Tesla's self-driving technology combines machine learning and artificial intelligence. Tesla's FSD chip is currently the most powerful self-driving chip in the world, making Tesla completely free of third-party suppliers in the core technology area. The FSD single chip has a computing power of 72 Tops and a board of 144 Tops. Compared to the NVIDIA Drive PX2AI chips previously used by Tesla, the FSD is 20% cheaper to manufacture and uses only 20% more energy.

Tesla can update the self-driving system through over-the-air (OTA) technology and improve vehicle performance through software. In addition, Tesla's OTA software can be automatically upgraded to reduce generational differences. Besides, Tesla uses the largest die-casting machines at its production plant in California. The machine aims to produce most of the car frame in a single part, rather than using various components.

4.1.2 Management

Different from the franchise dealer model of traditional car companies, Tesla provides products to consumers through direct sales. Consumers can have a test drive in offline stores and then order online. Tesla produces and delivers vehicles to consumers through the logistics distribution system. For companies, the direct-sales strategy enables Tesla to have access to first-hand information about the market and to react quickly to market demand. Consumers could have a better consumer experience as there is no conflict of interest between the dealership and the auto company.

In terms of service, based on the remote fault diagnosis of massive data, some of Tesla's faults can be self-maintained through OTA. Consumers can also solve minor faults by themselves. Tesla also provides mobile services. They can directly send mobile service vehicles and technical engineers to the vehicle's location for repairs. Different from traditional car companies, when the vehicle needs to be repaired in the store, consumers can make an appointment at Tesla's offline service center in advance. Engineers check the problem and prepare the required accessories so that the owner can directly have it repaired after arriving at the store, saving time and cost.

For superchargers, mileage anxiety and the inconvenience of charging facilities have been major pain points for consumers purchasing EVs. However, Tesla's V3 superchargers address that. Tesla has now established more than 1,000 Supercharger stations worldwide. The vast network of Tesla superchargers has greatly improved the convenience of using electric vehicles, which is conducive to increasing consumer stickiness and brand loyalty.

4.1.3 Corporate culture

Tesla has a unique corporate culture. Moving fast, doing what no one can do, constantly innovating, reasoning from the "first principles", thinking like owners, and fulling steam ahead, respectively [23]. Meanwhile, different from traditional employee manuals, Tesla's employee handbook named "The Anti-Handbook Handbook" not only reflects Tesla's uniqueness but also reflects its pursuit and pride in this difference. This corporate culture helps maintain Tesla's innovative power and plays a big role in retaining and attracting talented people with the same value inclination as well. This is also one of Tesla's important competitive advantages.

4.1.4 Brand image

Tesla has a good corporate image. Tesla became the first electric vehicle brand to enter the top ten in the automotive category in 2016. After that, it became the largest automobile manufacturer in the United States. The highlight of Tesla's products is the disruptive technological innovation, setting new rules beyond people's imagination. Tesla's positioning from the beginning is to create a high-end brand image for consumers. Through brand marketing, Tesla continuously strengthens the positioning of the brand in the minds of consumers so that consumers who see Tesla cars will think of rare, high-performance, high-grade, high-tech, and low-energy labels. These labels provide consumers with good reasons to buy Tesla cars. That means not only is it the embodiment of social status, but also the ability to convey their acceptance of new technologies and new things to the outside world. This good brand image makes consumers flock to it. The core competencies above make Tesla well ahead of its other counterparts regarding the brand, sales model, and market share.

4.2 Drawbacks

First, the operating costs are high. Tesla does not have a car dealer. It manages itself from production and sales to after-sales. For example, the company needs to consider the location of offline experience stores and even the decoration style, limiting both the sales and expansion speed of Tesla. At the same time, most stores are located in the city's prime locations. The high-end and innovative designs also cost a lot of money. Tesla needs to pay for high rent and renovations.

Second, the high degree of freedom that comes with Tesla's corporate culture can easily turn into arrogance and disrespect for consumers. The April 2021 incident of female car owners defending their rights in China is a typical example. The female owner suffered brake failures while driving, which caused her parents and her to be injured. When she asked for the vehicle to be returned, Tesla officials repeatedly prevaricated, refused to compromise, and did not respond positively. After the event occurred, Tesla's arrogant response caused its reputation in China to plummet and the market value to drop.

Third, replacing gasoline-powered cars with electric vehicles is an obvious solution to today's carbon emissions problem. But Tesla doesn't offer a solution to the long-term problems of waste battery recycling and pollution which may cause environmental pollution.

Fourth, due to most automobile companies adopting the order-to-order production model, there is a long wait for consumers because the production cycle of electric vehicles spends several months.

5. Suggestions

First, compared with fuel vehicles, the overall production cost of NEVs is higher. However, in the current competitive state of the automotive industry, the space of price growth is limited, so whoever produces vehicles at a lower cost will get higher profits. Therefore, if Tesla wants to make bigger profits, it needs to reduce production costs, for example by applying "Wright's law" to increase production and achieve economies of scale. Besides, Tesla's up-front costs are higher. For example, the construction and maintenance of superchargers, destination charging, and home charging require a lot of manpower and material costs. Based on reducing production costs, and reducing the front-end cost, Tesla will gain greater profits. Moreover, Tesla can be combined with the actual situation to adopt two forms of direct maintenance shops and franchised maintenance shops. Tesla can cooperate with fully experienced maintenance chain enterprises as well. This is a great way to solve the speed problem with shop setup while saving some of the high rent and renovation costs. This is also a more convenient path for the development of after-sales service in the future.

Second, the automotive industry is highly competitive. Other competitors in the industry are also developing new energy vehicles. Therefore, Tesla should increase research and development, establish and maintain its brand advantage, and achieve differentiated competition. Also, due to the limited capacity of the automobile market, Tesla needs to increase product attractiveness based on the research and development of new energy vehicles. Meanwhile, it needs to broaden the market and

make efforts in consumer preferences. Apart from that, the EV industry should prevent a large amount of battery contamination that may occur in the future. From a sustainability perspective, electric vehicle companies' corporate social responsibility (CSR) management needs to pay more attention and efforts to the disposal of used batteries before global electric vehicle sales increase.

Third, Tesla needs to pay attention to shaping a healthy relationship with consumers. As a multinational company, it needs to fully understand the culture of other countries, respect other cultures and consumers and go deep into local cultures to avoid cultural conflicts. Although Tesla's new model has been released and brought high sales, there are just four models on market for consumers to choose from. If Tesla wants to meet its 2030 sales target, which Tesla's annual sales would reach 20 million dollars by 2030 (2021), it should launch more models to meet consumers' needs and achieve differentiated competition to base itself on the market. Production capacity is one of the most important problems restricting many electric vehicle companies' sales and delivery growth. Mostly, car enterprises use the "assembly line" production model, but it cannot fundamentally solve the problem of the long waiting time of consumers. So, greatly shortening the car manufacturing cycle is of great help to shorten the pain of consumers in the long waiting periods.

In summary, by analyzing Tesla's case, differentiated competition is the top priority for auto companies to seek greater development and reduce the cost of all aspects. While car companies seek benefits, the CSR department must also be responsible for the environment, consumers, etc. Tesla's electric cars, batteries, and solar panels address the protection and preservation of the environment because it allows other individuals and organizations to use its patent. The smaller carbon emissions and improved air quality associated with their vehicles have led to a higher quality of life for communities around the world.

6. Conclusion

It is worth noting that Tesla is far ahead of other new energy vehicle companies in terms of market share, corporate status, advanced technology, economies of scale, and overall competitiveness. It is fair to say that Tesla has opened up a whole new market. This study has found that Tesla's greatest attribute is its environmental friendliness and that its target customer base is either luxury car lovers or technology-loving environmentalists. As a result, Tesla adheres to its positioning and uses brand marketing and its label of rarity, high performance, premium, and low energy consumption to give a good reason to buy a Tesla car. That means not only a reflection of social status but also conveying to the outside world that consumers are receptive to new technology and new things. In addition, Tesla's advanced technology, unique business model, open corporate culture, and differentiated marketing strategy are also important factors that put it ahead of other new energy car companies. However, at the same time, the electric vehicle industry also faces disadvantages such as high upfront investment costs, mileage anxiety, relatively low market share, and immature technology. And due to Tesla's patent sharing, more and more car companies are starting to build cars using Tesla's technology, which will make the electric car industry increasingly competitive. This paper takes Tesla, a leading company in the new energy vehicle industry, as a case study to explore the impact of its business model and core competencies on its development. Through the analysis and study of Tesla, it provides a reference for other electric vehicle companies. In today's era of fusion of information and intelligence, manufacturing one's product advantages, breaking through technological barriers, reducing costs, and achieving economies of scale is a viable paths for the electric vehicle industry. This paper is limited by the incomprehensiveness of the data sources. In addition to pure electric vehicles, new energy vehicles also include hydrogen fuel cell vehicles and hybrid vehicles, which also have a role to play in the development of the automotive industry. Further refinements in the above areas could be made in the future to facilitate more in-depth research.

References

[1] Bellman, R., C. Clark, et al. On the construction of a multi-stage, multi-person business game. Operations Research, 1957, 5(4): 469- 503.

[2] Peter F. Drucker. The theory of the business. Harvard Business Review, 1994: 95-104.

[3] Paul Timmers. Business models for electronic markets. Electric Markets Journal, 1998, 8(2): 3-81.

[4] Linder J., Cantrell S. Changing business models: A survey of the landscape. Accenture Institute for Strategic Change, 2000.

[5] Richard E.S. Boulton, Barry D. Libert, Steve M. Samek, et al. A business model for the new economy. The Journal of Business Strategy, 2000(07/08): 29-35.

[6] Amit R., Zott C. Value creation in electronic commerce. Strategic Management Journal, 2001(22): 493-520.

[7] L. Massa C.L., Tucci A. Afuah. A critical assessment of business model research. Academy of Management Annals, 2017, 11(1): 73-104.

[8] Wang Bo, Peng Yali. Reinvent business models. IT Manager World, 2002(07): 88-89.

[9] Weng Junyi. Business model innovation. Economic Management Press, 2004: 14-16.

[10] Li Zhenyong. Business logic: A guide to successful business model design. Beijing: China Water Conservancy and Hydropower Press, 2009.

[11] Wei Wei, Zhu Wuxiang. Discovery of the business model. Beijing: Machinery Industry Press, 2009.

[12] Xue Yixi, Chen Yi, Kong Deyang, et al. Research on the innovation of electric vehicle business model based on value network. Science and Scientific Technology Management, 2014, 35(03): 49-57.

[13] Prahalad C K, Gray Hamel. The core competence of corporation. Harvard Business Review, 1990(5-6): 79-91.

[14] Edgar Schein H. The corporate culture survival guide. San Francisco: Jossey-Bass edition, 2009.

[15] Dorothy Leonard Barton. Core capabilities and core rigidities a paradox in management new product development. Strategic Management Journal, 1992(13): 111-112.

[16] Coombs Rod. Core competencies and the strategic management of R&D. R&D Manopment, 1996, 26 (4): 345-355.

[17] Yang Fan. Analysis and research on the core competency of Dongguan automobile enterprises. Southern Agricultural Machinery, 2017, 48(04): 153.

[18] Yang Derun. The development of new energy vehicles needs to build core competency. Electric age, 2017(04): 11.

[19] Yang Yushan. A brief analysis of independent innovation to enhance the competitiveness of companies. Company technology and development, 2019(03): 1-2.

[20] Wang Yi, Chen Jing, Xu Qingrui, Hao Chunmei, et al. Research on the conceptual framework of enterprise core competencies: a three-level model. Central South University of Technology Journal (Social Science Edition), 2000 (02): 117-120.

[21] Elon Musk. The Secret Tesla Motors Master Plan (just between you and me). August 2, 2006. Retrieved on October 16, 2022. Available at https://www.tesla.com/en_GB/blog/secret-tesla-motors-master-plan-just-between-you-and-me.

[22] Elon Musk. Master Plan, Part Deux, et al. July 20, 2016. Retrieved on October 16, 2022. Available at https://www.tesla.com/blog/master-plan-part-deux.

[23] Pauline Meyer. Tesla Inc.'s organizational culture & its characteristics (analysis). Panmore Institute, 2019.