Research on the Consumer Behavior Characteristics and Marketing Strategy of New Energy Vehicles——Taking BYD and Tesla as Examples

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Abstract. The problems of energy crisis and environmental pollution brought about by the rapid development of the automobile industry have become increasingly prominent. The development and promotion of new energy vehicles have become one of the solutions. Many vehicles have joined the queue to produce and sell new energy vehicles. However, different brands have different factors influencing consumer behavior and face different marketing problems. Therefore, it is significant to study the user characteristics of new energy vehicles and provide solutions for existing problems. This paper uses the method of literature research and comparative analysis, taking BYD and Tesla as examples, to study the characteristics of consumer behavior and marketing strategies of the two brands, respectively. Finally, the author finds that the main problems of BYD are the lack of promotion of the concept of green marketing and the single market. The main problems of Tesla are reflected in the direct selling model, selling price, after-sales service, and the market. At the same time, for these problems, the author gives some corresponding solutions. This paper has played a role in promoting the development of two new energy vehicle companies and can also help marketers to formulate and improve existing marketing strategies.

Keywords: Consumer Behavior Characteristics; Marketing Strategy; New Energy Vehicles; BYD; Tesla.

1. Introduction

1.1 Research background

China's automobile industry has developed rapidly with the economic construction process advancement. Since 2009, China has continued to be the largest country in the world in terms of production and sales of automobiles. In 2021, the production and sales volume of automobiles in China were 23.172 million and 23.489 million, respectively [1]. Meanwhile, the number of car ownership is also increasing year by year. By the end of 2021, the number of vehicles in China has reached 395 million, increased by 6.32% over 2020 [2]. Nevertheless, a series of social problems brought about by the growth of car ownership are also increasingly prominent, especially the pressure from the energy crisis and environmental pollution, which poses new challenges to the development of China's automobile industry in the future.

From the perspective of the energy crisis, the total amount of resources on earth is limited. According to estimates by the American Petroleum Institute, the unexploited crude oil reserves on earth can only be used by humans for no more than 95 years, which is already less than 2 trillion barrels. Until 2050, the development of the world economy will increasingly rely on coal. Then between 2250 and 2500, coal will also be depleted, and fossil fuel supplies will dry up. And vehicles are a huge "consumer" of fossil fuels. In the face of the coming energy crisis, the world must recognize that it should adopt a strategy of broadening sources of income and reducing expenditure. Namely, we need to develop new energy sources while saving existing energy.

Regarding environmental pollution, vehicle exhaust emissions have become one of the main culprits. In other words, vehicle exhaust emissions can cause serious air pollution. According to the United Nations Environment Programme, around 7 million people die yearly from air pollution [3]. In addition, air pollution can change the climate and have an impact on the health of the planet. For example, carbon dioxide in car exhaust emissions is a greenhouse gas that will keep the planet warm.

Subsequently, the melting of glaciers will lead to sea level rise, triggering many natural disasters. Also, the survival of many animals will be threatened.

Therefore, to solve these problems and develop new energy sources, it is also necessary to reduce the use of existing energy sources. The research of new energy vehicles is one of the best ways. It can not only reduce the utilization of limited energy but also reduce the pollution to the environment and even achieve almost zero pollution. In order to alleviate the existing energy shortage problem and realize the structural adjustment and transformation of the automobile manufacturing industry, China has begun vigorously developing and promoting new energy vehicles [4]. By the end of 2021, the number of new energy vehicles in China reached 7.84 million, increased by 59.25%, and is expected to exceed the 10 million mark in 2022. During the past decade, there was significant growth in the number of newly registered new energy vehicles in China, from 650,000 in 2017 to 2.95 million in 2021 [1].

Since new energy vehicles do not need to burn fossil fuels or use less, it saves car owners much money. At the same time, the country strongly supports residents in purchasing new energy vehicles. For example, if an individual buys a new energy vehicle, he can get a license plate for free without having to wait in line to buy it. These advantages make new energy vehicles popular among people. An increasing number of people are preferred to buy it. New energy vehicle sellers of various brands have developed different marketing strategies to attract consumers. Therefore, studying the consumer characteristics of new energy vehicles and existing marketing strategies can help marketers to formulate strategies better.

1.2 Literature review

Li analyzed Audi's macro and microenvironment, determining that Audi's new energy vehicle target market is the six first-tier cities where new energy vehicles are developing rapidly. The main consumers are high-income males who prefer the Audi brand and have environmental protection concepts. For the marketing strategy, Audi will continue to widen the market and highlight the sense of technology and the brand concept it advocates. Meanwhile, Audi should build a dedicated network channel for new energy vehicles following high standards. They are supposed to support the sales and service of new energy vehicles through factors in terms of specialized personnel qualifications and professional tools to improve user satisfaction. In order to ensure the effective implementation of the marketing strategy, two guarantee mechanisms have also been formulated, namely, the installation of charging facilities and the after-sales service process of new energy vehicles [5]. Fang used macro-environmental, micro-environmental, and SWOT analysis to evaluate the NIO's new energy vehicle brand. This author proposed that NIO should use marketing strategies such as strengthening core technologies, accelerating product development and layout, improving user service levels, reducing product costs, consolidating high-end new energy vehicle market segments, and cultivating brand competitiveness [6]. Li used the SWOT analysis to analyze the strengths, weaknesses, opportunities, and threats in marketing new energy vehicles. Based on the marketing theory, he proposed some strategies such as precision marketing, brand personification, social marketing, and interactive marketing [7].

Most articles mainly study new energy vehicles' domestic and foreign development status and some marketing strategies. In contrast, few scholars have studied the relationship between consumer behavior characteristics and marketing strategies of new energy vehicles.

1.3 Research framework

In this paper, the author will start by analyzing the current status of the new energy vehicle industry. Secondly, the general characteristics of consumer behavior are introduced. Thirdly, the author will analyze the factors influencing consumers' purchase intention of new energy vehicles in two representative brands, BYD and Tesla. Finally, the current problems of the two brands in marketing strategies will be summarized, and some suggestions will also be given.

2. Methods

2.1 Literature research method

The literature research method summarizes the content of the material related to this article by reading, analyzing, and categorizing the literature. This paper will provide constructive suggestions for the new energy vehicle industry by collating various literature on the status, prospects, potential consumers, and marketing strategies.

2.2 Comparative analysis

Comparative analysis is a method of comparing two or more items and presenting new ideas. It is generally used to find common patterns. This paper will compare the consumer behavior characteristics and marketing strategies of two new energy vehicle brands, BYD and Tesla. Since the main markets of the two brands are different, the most suitable marketing strategy for the domestic and foreign development of new energy vehicles can be obtained by summarizing the characteristics of consumers and existing marketing problems.

3. Results

In recent years, developing new energy vehicles has become an effective measure to solve the energy crisis problems and environmental pollution. And it is a global consensus and common action now. The new energy vehicle markets in developed countries such as the United States, Germany, and Japan have developed rapidly. Still, China has also made great achievements in the new energy vehicle industry, showing the characteristics of multi-industry integration [8]. China's existing new energy vehicle industry has gradually matured, and its future development will no longer depend on various incentive policies but on the market itself. And China has also established a complete industrial policy to guide the development of the new energy vehicle industry. Improving the market competitiveness of products in terms of quality and technology will become the future direction of China's new energy vehicles [9]. At the same time, with the help of the big data system, new energy vehicles will accelerate the realization of large-scale commercial applications, the deep integration of industries, and sustainable health development.

By sorting out the data, the author finds that a vehicle is an indispensable transportation tool for modern people, and the primary concern of consumers is its cost performance. Middle-aged people are potential consumers of new energy vehicles. In addition, many factors affect consumers' purchases, such as energy-saving and insurance services, driving needs, brand-cost needs, information-special needs, entertainment needs, safety needs, and visual needs [10]. Besides, the policies promulgated by the government will also influence consumer behavior.

3.1 Factors analysis of Chinese consumers' intention to buy BYD and Tesla's new energy vehicles

3.1.1 Factors analysis of BYD

In terms of the behavioral characteristics of consumers, there are mainly 6 factors that will affect Chinese consumers' intention to buy BYD's new energy vehicles: brand image, brand reputation, self-image congruence, subjective norm, perceived behavioral control, and environmental attitude [11].

Brand image: The brand image of BYD's new energy vehicle can be defined as the brand's association in consumers' memory. Namely, the characteristics of BYD vehicles first come to their minds whenever this brand mentions them. For instance, BYD is an early Chinese brand that started researching new energy vehicles.

Brand reputation: Brand reputation is the degree of people's favor and trust in a brand, which reflects the brand's value level in consumers' minds. For BYD, the sale performance of products will

have a great relationship with brand awareness. The more people understand and recognize BYD, the more consumers will be willing to buy its products.

Self-image congruence: Self-image congruence can be understood as whether the information BYD hopes to convey to the outside is consistent with consumers' real perceptions. The higher the match between the two, the more successful the branding is.

Subjective norm: Consumers' buying behavior is often influenced by others in terms of friends, family, colleagues, neighbors, etc. For example, some consumers are very likely to buy a product due to their friend's recommendation.

Perceived behavioral control: Perceived behavioral control is mainly reflected in the company's expected difficulty in the pre-purchase stage of BYD vehicles. If it is not difficult enough, consumers' control over the purchase process will easily be transformed into their true purchase intentions for BYD's new energy vehicles.

Environmental attitude: Environmental attitude can be defined as consumers' positive or negative perception of BYD environmental protection. Consumers may buy new energy vehicles because they are good for protecting the environment. Meanwhile, consumers prefer to buy green products that can protect the environment. But it does not mean that they will ignore the quality and price of the product.

3.1.2 Factors analysis of Tesla

According to the research, the factors that affect consumers' willingness to purchase Tesla's new energy vehicles are mainly reflected in the performance, safety and comfort, cost advantages, and supporting services of the vehicle. In addition, customers' perceived value, the real subjective perception of consumers after purchasing a product, will also affect their purchase intention. And the higher the perceived value of customers, the stronger the consumers' purchase intention is. Nevertheless, the vehicle's appearance less impacts the customer's perceived value [12].

3.2 Problem identified by BYD and Tesla's current marketing strategy

3.2.1 Problem identified by BYD

Although BYD's current green marketing is outstanding, many problems must be optimized and solved. For example, BYD lacks the concept of green marketing and fails to make users aware of the importance of green consumption. Besides, their market is too single [13].

Initially, BYD hopes to convey the concept of environmental protection and new energy vehicles to consumers, but the real effect has not yet reached expectations. They are eager to pursue short-term benefits without green marketing concepts and ignore long-term market development. For instance, they do not focus on the research and development of technology. Moreover, due to the lack of experience in green marketing, their sales methods and channels are still dominated by traditional methods, resulting in them losing many development opportunities.

Nevertheless, it is important to create the concept of green marketing. It can make consumers aware of the significance of green consumption. However, users who lack the concept of green consumption tend to focus on the performance and price of products. After that, the lack of charging stations for new energy vehicles and the higher price will be emphasized, making consumers who care about environmental protection and green products less likely to buy BYD's products.

Finally, BYD (2019) stated in its annual report that the demerits of BYD are its over-dependence on the Chinese market. It is not only detrimental to BYD's development in the international market but also easy to be influenced by the domestic economy and policies. At the same time, in recent years, more and more automobile companies have begun to develop new energy vehicles to compete with BYD. In addition, there are also competitive new energy vehicle companies like Tesla in foreign countries competing with them in the international market. Therefore, over-reliance on a single market can increase a company's business risk and reduce its international competitiveness.

3.2.2 Problem identified by Tesla

Tesla is a representative enterprise of new energy vehicles in the United States. Although it has many advantages in the international market, it still has some marketing problems.

1. Direct selling model

The direct selling model adopted by Tesla can effectively reduce product inventory and capital occupation, obtaining the most direct and effective user feedback. However, because of the use of offline experience stores for marketing, Tesla needs to be fully responsible for the design and decoration of all storefronts. It will increase daily operating costs and seriously affect the speed of store expansion. In addition, Tesla only relies on selling new vehicles to make profits due to its brand setting, but the profits on the service are ignored, such as the after-sales and maintenance of vehicles. Ultimately, in the short term, Tesla won't be able to make the expected gains. Nor can they effectively make huge profits in the long run.

2. Selling price

Tesla, in China, due to the higher price of new energy vehicles, the main consumers are the middle-class people. As a foreign brand, Tesla has not built a factory in China, so all products rely on imports. However, it also means that they need to afford high tariffs. This is why its price is so high that many people are reluctant to buy Tesla's new energy vehicles. Besides, Tesla's brand positioning has always been related to environmental protection and high technology, which determines that it is not a mass consumer brand. Consequently, Tesla has a very low market share.

3. After-sales service

As vehicles are transportation tools, consumers are most concerned about their stability and practicality. However, the frequent quality problems of Tesla's new energy vehicles make people consider whether to choose a high-priced brand like Tesla. Facing this problem, the after-sales service supported by Tesla in China cannot provide users with satisfactory service. Their after-sale department insists that there is nothing wrong with the vehicle. Therefore, they should not take responsibility for it. The owner needs to pay for the repair if there is a problem. In addition, Tesla's supporting equipment in terms of charging facilities is far from enough.

4. Marketing

Tesla insists on relying not on payment but on word-of-mouth marketing. However, using the word-of-mouth marketing method will make it difficult to improve the bad reputation caused by frequent vehicle problems. When generating negative news, all departments must cooperate and optimize the products. In addition, moderate advertising and public relations are also necessary, which can help the company to eliminate negative effects [14].

4. Discussion

For the marketing problems faced by BYD, the author believes there are three solutions. First, BYD cannot only pursue short-term interests, but long-term development is the foundation for a company to occupy the market stably. Therefore, it is no use in building a brand image to imitate other companies. Owning the core technology of independent research should be the primary consideration of BYD. Besides, BYD can also improve its sales methods and channels. In this era of rapid Internet development, more and more people are turning to online shopping. BYD can take advantage of this opportunity to optimize the mode of online purchase. For example, BYD can improve the practicality of online purchases, tailoring products to consumers according to their needs. Also, BYD can invite celebrities or promoters to endorse their products to further increase the brand's popularity.

Secondly, BYD should strengthen the construction of a green brand and convey the concept of green consumption to consumers. BYD needs to make consumers realize that they are buying BYD products for environmental protection and green consumption. In order to achieve it, BYD can actively participate in public welfare activities and establish the social responsibility for environmental protection to gain consumer recognition. At the same time, BYD can highlight what they have done through advertising and other publicity methods so that the public can understand the ideas they want to convey.

Table 1. Top 5 Global Sales of EV Automotive Groups in 2021

Rank	Brands	Sales	Market shares
1	Tesla	936,172	21%
2	SAIC	609,730	13%
3	Volkswagen Group	451,131	10%
4	BYD	323,143	7%
5	Hyundai Motor Group	216,562	5%

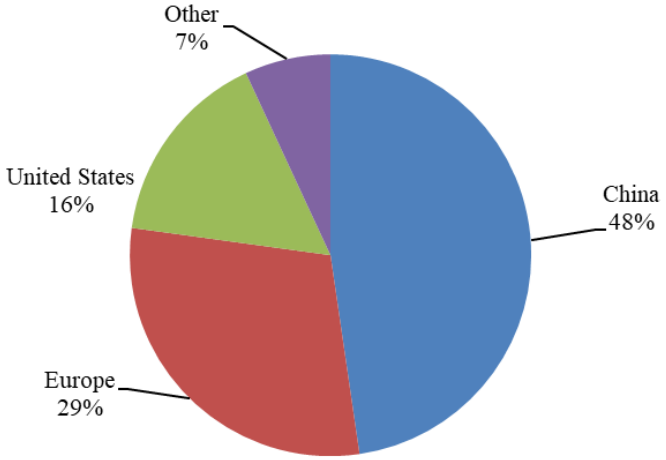

Fig. 1 Regional Electric Vehicles Stock in 2020

According to Table 1, although BYD has a good development in the Chinese market, its market share is very low globally. Tesla's market share is three times that of BYD. And according to Figure 1, in addition to China, the United States and European countries have a high proportion of the number of new energy vehicles. Therefore, the author does not think BYD can just focus on the Chinese market and ignore foreign markets. It is also necessary to expand overseas markets. Proper promotion or cooperation with other foreign brands can help BYD gain more recognition in overseas markets.

The author also has some suggestions regarding the marketing problems that Tesla has shown. Initially, the problem of the direct selling model can be solved by expanding the sales channels. On the surface, Tesla and Apple share many similarities in some marketing strategies, including experiential marketing, hunger marketing, and word-of-mouth marketing. Therefore, Tesla also chose to sell products based on online experience stores. However, Tesla and Apple's sales models are different. Apple has only a few dozen stores, and most of its products are sold through local distributors and customer orders. But Tesla only sells cars in its offline stores, which results in extremely limited sales. To solve this problem, Tesla can choose a combination of direct sales and franchise, which can help Tesla expand sales channels and reduce the management costs of offline stores.

Secondly, the high price of Tesla vehicles, which makes them affordable to only a small number of consumers, should also be addressed. The author believes that a lower price can be achieved through joint ventures. Tesla's vehicle prices are high because Tesla does not have a factory in China, so they need to pay high tariffs to import vehicles. Nevertheless, as a foreign brand, Apple has joint ventures with Chinese companies to manufacture products. Chinese foundries process Apple's products, and Apple only provides some parts and core technologies. Compared to directly importing the entire product, joint-venture manufacturing can reduce the cost of the product. Therefore, Tesla can also choose to jointly manufacture products with Chinese companies, lowering the products' price and making Tesla's new energy vehicles affordable to more consumers.

Thirdly, Tesla also needs to improve in terms of after-sales service. Consumers may choose a brand not only because of the product itself but also the quality of after-sales service. Especially for products that require repair and maintenance, like vehicles, the after-sales service quality will directly

affect consumers' experience. Providing comprehensive and supporting after-sales service is one of the best ways for Tesla to improve the brand's recognition. For example, while ensuring the quality of the product, Tesla must be able to solve various customer problems during the use of the vehicle. In addition, as an electric vehicle brand, Tesla should also increase the number of charging facilities with the growth of vehicle sales, ensuring that owners can enjoy the equivalent service for the money they spend.

Finally, multiple marketing options are also what Tesla needs. Only relying on word-of-mouth marketing will not have many loyal followers. Tesla can promote the brand through new media and self-media, using public opinion to create the brand's uniqueness. For instance, Tesla can sign up some influential promoters to share their user experience with the product on various platforms. It will not only allow more people to know about Tesla but also lead consumers to have a positive attitude towards the brand. Moreover, given that some Chinese people like the feeling of "customization", Tesla can let consumers design their favorite vehicles within the range of choices, which will greatly enhance the user experience.

5. Conclusion

5.1 Findings

In summary, in order to solve the problems of energy crisis and environmental pollution, the research and promotion of new energy vehicles have become the focus, and many countries around the world are committed to it. The development of new energy vehicles can protect the environment and play a role in the realization of multi-industry integration. Therefore, the government strongly supports producing and selling new energy vehicles. Many vehicle brands have started to release new energy vehicles in response to the country's call. Fundamentally, as a commodity, no matter what brand the vehicle is, what most influences consumers' purchasing behavior is its cost performance. Apart from that, different vehicle brands will have different other influencing factors. In terms of marketing, the problems presented by the two are different in using BYD and Tesla as examples. BYD's problems mainly focus on the promotion of the concept of green marketing, while Tesla's problems occur in the aspects of the marketing model and after-sales service. For the solutions, BYD can solve the problems of brand concept and market structure through publicity and cooperation with other companies. Tesla can learn from some of Apple's marketing models and strategies to solve major marketing problems. But other issues in terms of selling price and after-sales service also need to be improved.

This article organizes the development of the entire automobile industry, especially new energy vehicles. Moreover, the consumer behavior and respective marketing problems of two new energy vehicle brands, BYD and Tesla, are also analyzed. And some solutions are given. This paper has played an important role in promoting the development of the two new energy vehicle companies and can also help marketers to formulate and improve existing marketing strategies.

5.2 Limitations

However, this paper lacks the utilization of primary data and mainly uses secondary data. And the author only researched and compared two new energy vehicle brands. In future research, primary data can be obtained through questionnaires, interviews, etc. The problems existing in the entire new energy vehicle industry can also be analyzed.

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