Dean&Francis
ISSN 2959-6130

A comprehensive analysis of Tesla's development in China

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Abstract:

In the past 10 years, Tesla, with its disruptive technology and excellent product power, has worked hand in hand with the upstream and downstream of China's new energy industry, leading the fundamental change in the automotive industry. Since 2014, the number of Tesla car owners in China has grown from 15 to more than 1.7 million, and Tesla Shanghai Gigafactory continues to export "Chinese samples" of intelligent manufacturing to the world. At the same time, in the past decade, the number of new energy vehicles in China has jumped from 216,400 units to more than 20 million. According to the data of the Passenger Association, in the first two weeks of April 2024, the new energy retail penetration rate of China's passenger car market has exceeded 50%. Tesla continues to reshape the field of transportation and travel with innovative technologies. From electric vehicles, to energy storage devices, to artificial intelligence and robots, Tesla's business landscape has far exceeded the ordinary sense of electric car companies. Musk has announced that on August 8, Tesla will release its latest Robotaxi driverless taxi, which media say may usher in the next industrial revolution. These are the keypoints of this paper.

Keywords: Tesla; development; China

1. Introduction

Tesla, Inc., a company founded in 2003 by Elon Musk and a group of engineers, has revolutionized the automotive and energy industries with its commitment to sustainability andinnovation. From its humble beginnings, Tesla has grown into a global leader in electric vehicles (EVs) and renewable energy solutions, driven by its mission to accelerate the world's transition to sustainable energy. The company's product line, which includes the Model S, Model 3, Model X, and Model Y, is renowned for its performance, safety features, and advanced auto nomous driving technology. Beyond vehicles, Tesla has expanded its offerings to include energy storage solutions such as the Powerwall, Powerpack, and Megapack, which allow for efficient storage and use of renewable energy. A key element of Tesla's strategy is its Gigafactories, particularly the one in Shanghai, China, which plays a pivotal role in scaling production, reducing costs, and serving the growing demand in the Chinese market. As Tesla continues to push the boundaries of technology and sustainability, it faces

both significant opportunities and challenges, especially in the Chinese market [1].

2. Basic Fact Analysis

Several critical factors emerge when analyzing the market in which Tesla operates using Porter's Five Forces model. Firstly, the competitive rivalry in the Chinese EV market is intense. Tesla faces stiff competition from international automakers like BMW and Mercedes-Benz and domestic companies such as NIO, Xpeng, and BYD. This competition drives the need forcontinuous innovation and product improvement to maintain and grow Tesla's market share. Secondly, the threat of new entrants, while mitigated by the high capital requirements and advanced technology needed in the EV industry, is bolstered by government incentives for new energy vehicles (NEVs) in China. Despite this, Tesla's established brand and technological leadership provide it with a robust defense against potential newcomers [2-4]. The bargaining power of suppliers is another critical force, given Tesla's reliance on specialized components such asbatteries. However, Tesla has mitigated this risk through vertical integration and strategic partnerships with local suppliers, particularly in China. On the buyer side, the wide range of EV options available gives consumers significant bargaining power. Tesla counters this through its strong brand image, advanced technology, and the prestige associated with its vehicles.

Lastly, the threat of substitutes, including traditional internal combustion engine vehicles and alternative transportation modes, is somewhat diminished by the global shift towards sustainability and government policies favoring NEVs, particularly in China. Tesla's strategy in China centers on localization, innovation, and strong government relations. The Shanghai Gigafactory is a cornerstone of this strategy, enabling Tesla tomanu facture vehicles locally, thereby reducing costs and avoiding import tariffs. This facility allows Tesla to meet the rising demand for EVs in China and the Asia-Pacific region while maintaining a competitive edge through cost efficiency. Innovation remains a key focus for Tesla, with continuous improvements in product offerings tailored to the Chinese market, such as localized software updates and advanced autonomous driving features. Furthermore, Tesla is expanding its network of charging stations and service centers to enhance customer convenience and satisfaction across China. The company's investment in research and development also ensures it remains at the forefront of technological advancements, particularly in batterytechnology and energy efficiency. Additionally, Tesla's corporate social responsibility (CSR)initiatives align with China's environmental goals, fostering a positive relationship with the government and enhancing its brand image in the local market [3].

3. Non-Market Issue

One of the most significant non-market issues Tesla faces in China is the regulatoryenvironment concerning data security. The Chinese government has implemented stringent regulations to protect data privacy and ensure that data generated within its borders remain sunder its control. The Cybersecurity Law, which came into effect in 2017, requires companies to store data collected in China on local servers and obtain government approval before transferring data overseas. In 2021, the Data Security Law further strengthened these requirements, imposing additional restrictions on the collection, storage, and processing of data. Tesla's vehicles, which are equipped with advanced sensors and cameras, collect vast amounts of data, including information about the vehicle's surroundings, driving behavior, and user preferences. This has raised concerns among Chinese regulators, who are wary of the potential national security risks posed by foreign companies collecting sensitive data. Compliance with China's data security regulations is crucial for Tesla to avoid penalties, maintain its license to operate, and protect its brand reputation. To address these challenges, Tesla has committed to storing all data collected in China locally and has invested in the necessary infrastructure to do so.

The company is also actively engaging with regulators to ensure that its data practices are transparent and compliant with Chinese laws. This proactive approach not only mitigates the risk of regulatory action but also helps to build trust with the Chinese government, which is critical for Tesla's long-term success in the market. By demonstrating its commitment to data security and compliance, Tesla can maintain its competitive position in China while continuing to expand its market presence. To address the non-market issue of the Tesla company, executives and CEOs need to map the whole non-market environment specifically of their company before designing non-market strategies. There are several crucial factors embraced when analyzing Tesla using the (IA)3-framework. This framework is mainly built around six factors and each factor is closely related to other factors. After mentioning the issue above, Tesla needs to find out the actors that are involved in this non-market issue and their interests [5].

Firstly, the main party included is the Chinese government as a result of playing a critical role in regulating and overseeing Tesla's operations in the Chinese's local markets. China has implemented several strict policies and regulations that required Tesla to comply with and follow. The government wants to prevent their data and information

leakage. It will particularly check the process of collecting and transferring their data [6]. For example, as mentioned above, the Chinese and Beijing governments have introduced cybersecurity law and data security law. The Chinese government mainly wants top rotect their state sovereignty and security. Tesla's electric vehicles collect a large amount of data such as drivers' driving histories, locations or cameras. These data collected might involve information concerning state or military secrets. Therefore, it may threaten national security and development once the data is exposed. What's more, citizens are concerned about their own privacy and information, which leads to social instability. Thus, the government must take the data regulation seriously once it has security risks. In addition, several Chinese regulators and agencies also play an essential role in improving the security level of Tesla and the whole EV industry. For example, the China Association of Automobile Manufacturers (CAAM) or the highest Chinese market regulator or Cyberspace Administration of China, which are dedicated to enhancing the standardization and development. They need to ensure that Tesla's data processing methods comply with local laws and will help correct their behaviors in the market. Their principal interests are to establish a safe and reliable market environment.

Furthermore, with the data security assurance, it can promote the sustainable development of the whole industry as this could attract new investments and gain more trust from customers. Another key actor involved in this issue is the consumer group. Consumers in China regard the protection of their privacy and personal information as one of the most valuable factors. They would like their own privacy to be protected from leaking out. Consumers might suffer from it if their information is misused by others. This will contribute to inconvenience and even financial losses. However, With the implementation of data security control, the rights and interests of consumers could be guaranteed and their personal information would be safe. Additionally, consumers could enjoy purchasing and driving Tesla's vehicles and services without concerns. Tesla would therefore bring a lot of confidence to consumers. Hence, the profitability of Tesla would increase and is able to gain more market share. For domestic industries in China, Tesla's development would bring a lot of competitive influence to other EV industries in the Chinese market. The competitive rivalry in the Chinese EV market is very intense. Tesla can set a high benchmark for other manufacturers. The data security control in China could trigger other companies to focus more on enhancing their data security to raise their competitiveness. Therefore, once the EV industries in China are under the same competitive conditions, domestic industries are able to utilize their own advantages to develop. Moreover, they can push the development and innovation of the whole EV market in the long run. Each actor involved in this issue has their different information and assets. Firstly, The Chinese government holds a large amount of resources and the capability of implementing policies and rules. They could hires killed laborers or utilize advanced technology to help monitor and test the data security problem that each enterprise may have.

In addition, the Chinese regulators have a series of policies and regulations related to data security. Regulators have the right and authority to conduct inspections and supervisions on these industries. Some regulatory agencies can monitor the data processing methods and processes to ensure compliance with the policies. For the consumer groups, the data types and the data collection methods are crucial for them. The consumers have raised their awareness of the data risks. The information within the data may have locations, driving history, cameras and sensors that include drivers' privacy. Consumers do not want their data to be stolen or exposed. Some domestic industries also focus more on dealing with the data security problem as Tesla has set a high benchmark for them. They must consider having more improvements and innovation to raise their competitiveness. The brand reputation is crucial for their future development and profitability. Hence, they need to ensure their data security in order to gain consumers' trust and loyalty. A set of potential outcomes will occur with the evolution of this non-market issue. If this issue has a negative development that Tesla doesn't pass the inspection of data security, the government and regulators will impose sanctions for violating regulations. For example, they might impose fines or penalties that restrict the production and operations of Tesla in China out of concerns for data security [4]. The market share and profitability would decrease rapidly as the Chinese market is the second largest market for Tesla and accounts for a huge amount of their sales. Moreover, consumers might lose their confidence in Tesla and they will put pressure and public opinions on Tesla. However, if Tesla proactively addresses this non-market issue, the reputation will enhance. It can gain more consumer trust, and attract more people to increase competitiveness and gain more market share. Additionally, Tesla can obtain more collaboration opportunities with domestic industries or government agencies to increase scale production.

4. Discussion

Tesla's market allies in China are crucial for the company's success in this highly competitive and rapidly growing market. One key ally could be domestic suppliers of

critical components like batteries, semiconductors, and other essential materials for electric vehicles. By partnering with leading Chinese battery manufacturers such as CATL, Tesla can ensure a steady supply of high-quality batteries while also benefiting from local expertise and potentially favorable pricing. Additionally, collaboration with Chinese technology firms for software development and AI integration can enhance Tesla's vehicles, making them more appealing to tech-savvy Chinese consumers. These alliances not only provide Tesla with the necessary resources but also enable the company to tailor its products to meet the specific needs and preferences of the Chinese market. Tesla faces significant competition in China, primarily from domestic EV manufacturers who have a strong foothold in the market. Companies like BYD, NIO, and XPeng are not only well-established but also have a deep understanding of the local market dynamics and consumer behavior. These companies benefit from their ability to swiftly innovate and adapt to market changes, often supported by favorable government policies that promote domestic brands. Furthermore, traditional automotive giants like Volkswagen and General Motors are also aggressively entering the EV space in China, creating a crowded and highly competitive environment. These market adversaries pose a substantial challenge to Tesla's market share and require Tesla to continuously innovate and strategize to maintain its position. In the non-market realm, Tesla's potential allies include environmental organizations, research institutions, and government bodies that are aligned with the goals of sustainability and clean energy. By collaborating with these entities, Tesla can strengthen its position as a leader in the global transition to renewable energy [6]. For instance, working with government agencies that are focused on reducing carbon emissions and promoting green technology can help Tesla secure favorable regulations and incentives. Moreover, partnerships with environmental NGOs can bolster Tesla's reputation among consumers who prioritize sustainability, thus enhancing the company's brand image in China. Tesla also faces non-market challenges from various sources, particularly regulatory bodies that enforce strict compliance with local laws.

The Chinese government has implemented stringent regulations regarding data security, environmental protection, and industrial practices, all of which Tesla must navigate carefully. Additionally, rising nationalism and anti-foreign sentiment could lead to increased scrutiny of Tesla's operations, particularly as it is an American company operating in a sensitive geopolitical context. Public perception and media coverage in China can also act as non-market adversaries if Tesla is perceived as not fully respecting local norms or regulations, potentially leading to consumer backlash or stricter government oversight.

Tesla's decision to localize production in China is a strategic move that goes beyond mere cost reduction. By establishing the Gigafactory in Shanghai, Tesla not only avoids import tariffs but also significantly shortens its supply chain, allowing for quicker response times to market demand and reducing logistical complexities. Localization also positions Tesla favorably with the Chinese government, which has a clear preference for domestic manufacturing and investment. The Shanghai Gigafactory enables Tesla to produce vehicles specifically designed for the Chinese market, with adjustments to meet local tastes and regulatory requirements. approach not only enhances Tesla's operational efficiency but also builds goodwill with Chinese authorities, who are keen to promote local employment and technological advancement through foreign investments. In a market as vast and diverse as China, brand perception is crucial. Tesla's strategy in this area focuses on building its brand as a symbol of innovation, luxury, and environmental responsibility. To achieve this, Tesla invests heavily in marketing campaigns that emphasize its cutting-edge technology, such as Autopilot and battery innovations, which resonate with China's tech-savvy consumers. Moreover, Tesla leverages its global brand reputation, positioning itself as a premium product that reflects the aspirations of China's growing middle and upper classes.

Tesla's brand-building efforts also include expanding its retail and service network across China, ensuring that customers have easy access to Tesla's products and services. High-visibility stores in major cities and presence in luxury malls further enhance Tesla's brand image, making its ynonymous with status and sophistication. Tesla's pricing strategy in China is carefully calibrated to balance competitiveness with the maintenance of its premium brand image. By producing vehicles locally, Tesla is able toreduce costs and offer competitive pricing without compromising on quality. For example, Tesla has strategically priced its Model 3 and Model Y vehicles to attract a broader segment of the Chinese market, including younger, middle-class consumers who aspire to own a Tesla but may have previously considered it out of reach. Tesla also employs a dynamic pricing model that allows it to adjust prices in response to currency fluctuations, changes in material costs, and shifts in government policies such as subsidies for EV purchases. This flexibility ensures that Tesla remains competitive while also capturing a significant share of the growing EV market in China. Tesla's approach to partnership management in China is a critical nonmarket strategy that involves fostering strong relationships with key government bodies and regulatory agencies. In a market where government influence is

substantial, building these connections is essential forn avigating the complex regulatory environment.

Tesla can engage inactive dialogue with local, provincial, and national government officials to ensure its operations are aligned with China's broader industrial and environmental policies. This includes participating in government-ledinitiatives, such as smart city projects or national programs promoting electric vehicles. By positioning itself as a cooperative and compliant partner, Tesla can gain favorable treatment, such as faster approvals for new projects or extensions of incentives for electric vehicles. Additionally, maintaining transparent and consistent communication with regulatory agencies helps Tesla mitigate risks associated with sudden regulatory changes or policy shifts. In a country where environmental sustainability is increasingly prioritized, Tesla's commitment to environmental regulations is not just a legal requirement but also a strategic nonmarket approach. Tesla can demonstrate its environmental responsibility by ensuring that its operations, from manufacturing to waste disposal, adhere to the strict environmental standards set by the Chinese government. This includes minimizing carbon emissions at its Gigafactory in Shanghai, using renewable energy sources, and implementing water and energy conservation measures. Additionally, Tesla can engage incorporate social responsibility initiatives focused on environmental conservation, such as sponsoring reforestation projects or investing in community-based environmental programs. By aligning its operations with China's environmental goals, Tesla not only complies with regulations but also builds a positive reputation among both government officials and environmentally-conscious consumers. Given the heightened sensitivity around data privacy in China, Tesla's nonmarket strategy must include robust data protection measures to comply with local regulations and reassure both regulators and consumers. Tesla can implement stringent data governance frameworks that ensure customer data collected through its vehicles and services is stored and processed in China, in accordance with local laws.

This may involve building local data centers or partnering with Chinese firms specializing in data security. Additionally, Tesla can be proactive in engaging with Chinese authorities to address any concerns related to data privacy, possibly by participating in discussions on future regulations or contributing to the development of industry standards. By taking a leadership role in data protection, Tesla can mitigate risks associated with regulatory scrutiny and potential backlash, thereby securing its position in the market [1]. Tesla's strategy of market expansion through infrastructure cooperation represents ahybrid approach, combining elements of both market and nonmarket strategies. To expand its footprint in China, Tesla collaborates with both governmental and private entities to develop the necessary infrastructure that supports widespread electric vehicle adoption. This includes working with local governments and state-owned enterprises to build charging networks across major cities and highways, a move that not only supports Tesla's market expansion but also aligns with the Chinese government's goals of reducing carbon emissions and promoting clean energy. Additionally, by partnering with local utility companies and technology firms, Tesla can ensure that its charging infrastructure is integrated with existing energy grids and future smart-city developments. This collaboration helps Tesla mitigate potential regulatory hurdles while also securing the necessary resources and support to scale its operations effectively across the country.Another mixed strategy involves aligning Tesla's technological developments with thespecific needs of the Chinese market, which requires close coordination between market-driven innovation and compliance with local regulations [3]. For instance, Tesla can tailor its Auto pilot features to better suit Chinese driving conditions and regulations, incorporating local map ping data and traffic rules into its software. By doing so, Tesla not only enhances its product offering to meet local consumer expectations but also ensures that its technologies are fully compliant with China's evolving regulatory framework. Furthermore, Tesla's collaboration with Chinese tech companies can accelerate the development of localized features, such as integrating popular Chinese apps into Tesla's in-car entertainment system or adapting its user interface to better cater to Chinese language and cultural preferences. This approach allows Tesla to stay competitive in the market by offering products that are both innovative and closely aligned with local demands.

5. Conclusion

Tesla can also adopt a hybrid strategy that involves influencing policy development whilesimultaneously advancing its market strategies. By engaging in policy discussions and public-private partnerships, Tesla can help shape the regulatory environment to favor the growth of the EV industry, potentially leading to more favorable policies or subsidies that benefit Tesla directly. For example, Tesla could advocate for regulations that promote the use of renewable energy for EV charging or policies that incentivize the adoption of autonomous driving technologies. By influencing the policy landscape, Tesla can create a more conducive environment for its market strategies, ensuring that its products and services are not only compliant but also positioned to take advantage of new market opportunities created by these policies. This integration of policy influence with market strategy ensures that Tesla's

growth in China is supported by a regulatory framework that aligns with its long-term business objectives.

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