The Application of Digital Technology in Tesla Automobile Industry: Key Factors and Global Market Expansion

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Abstract. This study aims to explore Tesla's success factors and its key moves in its global market expansion. Tesla is unique because it is not just a car manufacturer but a software-driven technology company. This article first introduces Tesla's application in a single operating system, integrating all software into a logical system to improve vehicle operating efficiency and user experience. Secondly, this study discusses Tesla's Supercharger network and how this network can provide users with convenient charging solutions to promote the popularity of electric vehicles. Next, this article explores Tesla's strategy of building a factory in China and how this move helps Tesla maintain a competitive advantage in the global market. Finally, this article highlights Tesla's closed loop of hardware and software and how it continuously improves the performance and functionality of the car through continuous iterations of software. The findings of this study will help understand Tesla's business model and success and provide useful inspiration for other companies in the increasingly competitive electric vehicle market.

Keywords: Tesla, Electric Vehicles, Digital Transformation, Global Market Expansion.

1. Introduction

In digital communication technology, the popularization of 5G technology has become a major trend [1]. 5G technology is an important development direction of digital communication technology, which provides an opportunity for the comprehensive upgrade of digital communication technology and improves the transmission speed, bandwidth, reliability, coverage, and intelligence level of digital communication technology [2, 3]. At the same time, as it is applied in more scenarios, the high security provided by quantum communication technology will become a new starting point for developing digital communication technology. This leads to a broad prospect of digital communication technology, especially in the smart home, driverless, mobile payment, and other fields with a wide range of applications [4, 5]. Specifically, digital communication technology will also support the development of emerging technologies such as artificial intelligence, virtual reality, and blockchain, which require high-speed and reliable communication technology to ensure data transmission. Tesla is eating the dividend of this [6-8].

Tesla is an electric vehicle and energy company in the United States. The founder named the company "Tesla Motors" to commemorate the physicist Nikola Tesla. Tesla is committed to providing every ordinary consumer with pure electric vehicles within their consumption capacity. The company's vision is to accelerate the global transition to sustainable energy. Tesla plans to develop a network of supercharger stations and service centers to boost car sales. Tesla also plans to reduce the cost of electric vehicles to make them mainstream. Tesla CEO Elon Musk said the company will soon reveal plans for a Tesla Super Factory that will be crucial to its efforts to make its cheap electric car. Tesla's many initiatives are aimed at making cheap and easy-to-use electric cars for customers, which is one of Tesla's ways to attract loyal customers [9, 10].

In recent years, Tesla, one of the world's most well-known automobile manufacturing companies, has faced waves of turmoil against it. This report will analyze the advantages and opportunities that Tesla can grasp commercially and give suggestions for Tesla's current challenges and threats. This study wants to find out how digital technology helped Tesla to become nearly a monopoly in all market share of electronic vehicles.

2. Application of Digital Technology in Enterprise Operation Management

2.1. The Application of Digital Technologies in Tesla's Supply Chain

Tesla, as a company whose main business is electric vehicles, undoubtedly attaches great importance to the importance of the supply chain. To improve the efficiency and accuracy of its supply chain, Tesla has adopted digital technologies to support its supply chain operations. This technology plays an important role in Tesla's supply chain.

First, Tesla uses digital technology in logistics management to achieve efficient logistics operations. Through IoT technology, Tesla can track logistics information in real-time, including the location, quantity and status of goods. This real-time monitoring allows Tesla to ensure the safe transportation of goods while improving the visibility and accuracy of the transportation process.

Secondly, in terms of supplier management, Tesla's digital technology system helps to manage suppliers comprehensively. Tesla can track supplier delivery times, prices and quality information to ensure supply chain reliability. In addition, digital technology also enables Tesla to evaluate the performance of suppliers, providing them with feedback and suggestions to improve supplier quality and efficiency continuously.

Third, Tesla's production management benefits from the support of digital technology. Tesla's production system can track every part of the production line in real-time, including its location, quantity and status. This real-time monitoring not only helps improve the efficiency of the production line but also allows Tesla to control and adjust to meet market demand remotely.

In addition, Tesla's inventory management also benefits from applying digital technology. Inventory management systems can track inventory's location, quantity, and status, enabling real-time inventory management. This means that Tesla can replenish and allocate goods promptly according to demand, better meeting customer needs.

Finally, Tesla deeply understood supply chain data through data analysis. Data analytics systems can track various data in the supply chain, including logistics, supplier, production and inventory information. Through data analysis, Tesla can identify bottlenecks and optimization points in the supply chain and develop corresponding improvement measures to improve the efficiency and accuracy of the supply chain.

Digital technology plays a key role in Tesla's supply chain. These technologies enable Tesla to achieve real-time monitoring and management of the supply chain, continuously optimize supply chain operations, ensure that the supply chain is efficient and accurate, and thereby provide customers with better products and services. Under the leadership of digital technology, Tesla has promoted its development and positively impacted the supply chain management field.

2.2. Key Factors for Success and Global Market Development

Tesla's success story lies in its technological leadership in the automotive industry, unique business strategy, and global market development. Tesla doesn't just sell cars; it sells a vision, a future based on sustainable energy and innovative technology. Here are the key factors for Tesla's success:

First, Tesla's continuous technological innovation has made it a leader in electric vehicles. Tesla's battery technology has been at the forefront of the industry, allowing its vehicles to have longer ranges and shorter charging times. In addition, Tesla's self-driving technology is also industry leading. Although self-driving technology is improving, Tesla has already taken the lead in the market.

Secondly, Tesla adopts a different sales model from traditional car companies. Tesla uses a direct sales model, selling its cars online and in direct-operated stores rather than relying on traditional car dealers. This model allows Tesla to control product pricing and sales channels better, establish closer ties with customers, and provide a better car-buying experience.

In addition, Tesla has actively explored the global market, especially the Chinese market. Tesla has established its factory in China, reducing production costs and improving the competitiveness of its products. Tesla has also launched models in China that meet local market needs and has expanded

its charging network to provide more convenient charging services. These initiatives have enabled Tesla to achieve impressive success in the Chinese market.

Finally, Tesla's vision is also key to its success. Tesla doesn't just sell cars; and it sells a sustainable future. Tesla's mission is to drive the world's transition to sustainable energy, reduce carbon emissions, and protect the planet. This vision has attracted the attention of many consumers and investors, making Tesla a highly sought-after company.

Tesla has achieved such great success because it has adopted a unique strategy in terms of technology, sales model, global market expansion and vision. Tesla is more than just a car manufacturer; it represents a new future with sustainable energy and innovative technology at its core. This vision and innovative spirit make Tesla a unique company and are key to its success.

3. Future development and challenges

3.1. Development Direction

Although Tesla is leading in electric vehicles, business competition is extremely fierce. Continuously introducing cutting-edge technologies and products is necessary to maintain the company's competitiveness. In terms of innovation, Tesla has always been doing well. Like the Tesla Super Factory, its existence has enabled Tesla to change the traditional battery module assembly process and put all the tedious processes in the same factory assembly line, greatly reducing time and transportation costs and improving production efficiency.

Regarding the D2C sales model, Tesla has already adopted it as the most important sales method, and it is believed that Tesla will continue to use this model for a long time. To be successful, direct-to-consumer companies need to build their distribution channels, which can be more expensive in the short term. But it's a good idea in the long run, especially since Tesla is so popular worldwide that selling products is not difficult for them.

3.2. The Threats

On the one hand, Tesla's threats cannot be ignored. With the Chinese government's new energy vehicle policy strengthening, more and more domestic car companies have entered the new energy vehicle market, bringing greater competitive pressure to Tesla. In addition, Tesla needs to improve its brand image and reputation in the Chinese market and strengthen communication with consumers to maintain its position in the Chinese market.

To give some examples of threats, just a few days ago, a Tesla in China caught fire immediately after the crash, and it was very difficult for firefighters to deal with it after arriving because the Tesla is a trolley car, and the chemical substances in the battery caused great trouble to extinguish the fire. If you do not know the situation recklessly according to the usual plan to extinguish the fire, then it may cause a second fire, which is very dangerous.

How to face the threats? Tesla's future in the Chinese market has both challenges and opportunities. For Tesla, the key is strengthening brand building, improving product quality, and enhancing communication with consumers to meet market demand better.

To sum up, Tesla's crisis of trust in the Chinese market is worrying, but it also reflects the market's high expectations of Tesla. Tesla needs to improve its image in the Chinese market further and strengthen communication with consumers to maintain its leading position in the Chinese market. At the same time, the huge potential of the Chinese market also provides Tesla with unlimited opportunities. Tesla needs to make full use of its advantages in technology and innovation to expand its share in the Chinese market and make greater contributions to the development of the global new energy vehicle market.

Improve battery technology. The battery packs used by Tesla are not entirely manufactured in-house. For now, Tesla has to rely on other companies to supply batteries. However, with the rapid development of the electric vehicle industry, the number of orders received by Tesla has increased significantly. Tesla's Model 3 orders have accumulated 500,000, and Tesla needs at least 30GWh of

high-performance 21700 batteries to complete the cumulative orders of current Model 3 customers [5]. Therefore, Tesla's reliance on suppliers to provide battery packs is unfavorable.

On the one hand, Tesla needs to increase the number of suppliers, preferably in the vicinity of individual factories, to find suppliers to achieve supply chain stability. On the other hand, Tesla needs to achieve self-production of batteries and break through the charging speed of batteries as much as possible. Tesla cars currently take about five to six hours to charge fully, but that doesn't make it easy for users to recharge during the day temporarily. Therefore, Tesla should break through to three to four hours of full charge as soon as possible to facilitate the use of old users and attract new users to buy.

Increase the number of charging piles. If Tesla wants to increase sales, it must increase charging stations. In particular, Tesla's Chinese market has been greatly affected due to the small number of charging piles and unreasonable layout. Therefore, Tesla needs to improve the charging problem of electric vehicles further. Tesla should increase the number of charging stations. The current number of Tesla charging stations is about one in five kilometers in a major city. However, to meet most users' charging needs, Tesla should distribute charging piles in the parking lots of major communities and shopping malls and set charging piles for electric cars in gas stations.

3.3. Future Target Market Changes

When electric cars were first introduced in the Chinese market, the Chinese government proposed a subsidy policy for the purchase of electric cars. This has led to more Chinese customers buying electric cars instead of gasoline cars, and Tesla's position in the Chinese market has greatly improved. However, now that electric vehicles have been promoted, the Chinese government intends to cancel this subsidy policy, which means that Tesla's market in China will be adversely affected. And with the emergence of more domestic electric vehicles, Tesla's market share is less dominant. In contrast, Tesla holds a large market share in Europe and the United States.

4. Conclusion

This study conducts an in-depth analysis of Tesla's success factors. It summarizes the following key factors: the application of a single operating system, the construction of a supercharging network, the establishment of a Chinese factory, and the close integration of hardware and software. Tesla's success comes not only from its advanced electric vehicle technology but also from its unique business model and global market development strategy. By combining software with hardware, Tesla changed the traditional automobile industry's landscape and proved software's importance in automobile manufacturing. In the future, Tesla will continue to promote the development of electric vehicle technology, continuously improve user experience, and contribute to sustainable travel. This research provides valuable lessons for other companies to help them succeed in the emerging electric vehicle market. Tesla's success story will continue to inspire innovation and drive the entire automotive industry in a more sustainable and smart direction.

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