

A SWOT Analysis of Competitive Advantages and Challenges of Huawei and Xiaomi in the New Energy Vehicle Industry

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Abstract. Based on the global goals of "carbon peaking and carbon neutrality" and the intelligent transformation of the automobile industry, this paper applies the SWOT framework to analyze the strategic entry of Huawei and Xiaomi into the new energy vehicle (NEV) industry. The study focuses on the differences in the strategic positioning, competitive advantages and challenges, and potential optimization paths of the two companies. The research shows that Huawei, with Information and communication technology (ICT) at its core competence, adopts the "Huawei + automaker" corporation model and positions itself as an "intelligent vehicle solution provider." Huawei emphasizes the output of Gan Kun intelligent driving systems and HarmonyOS cockpits, demonstrating strong technological research and development capabilities, while facing limited control over vehicle production and manufacturing. In contrast, Xiaomi leverages its AIoT ecosystem to directly enter vehicle manufacturing and continues its cost-performance-oriented market positioning. Xiaomi adopts a diversified strategy supported by strong marketing capabilities and effective cost control, but its development is constrained by sufficient automotive manufacturing experience and challenges in achieving breakthroughs in the high-end market. A comparative analysis of the two firms reveals that the success of tech- companies in cross-industry expansion lies in fully leveraging core strengths while making up for weaknesses through strategic cooperation. Brand-layered operations and ecosystem synergy have become important directions for the continuous development of the industry. The research enriches the literature on cross-industry strategies of technology enterprises and provides references for the strategic optimization of Huawei and Xiaomi and implications for the high-quality development of China's NEV industry.

Keywords: New energy vehicles, Cross-border strategy, Ecological synergy, SWOT analysis, Comparative Studies

1. Introduction

Driven by the global "carbon peaking and carbon neutrality" goals and the intelligent transformation of automobiles, new energy vehicles (NEVs) have become a core direction of industry development, characterized by accelerated technological iteration, expanded market, and deepened ecological synergy. Existing academic research has extensively examined issues such as technological research and development, industrial policies, and market competition. However, systematic studies focusing

on technology enterprises crossing into the NEV industry remained limited. In particular, comparative analyses of the two representative cross-border models—Huawei (technology output) and Xiaomi (vehicle manufacturing)—are still insufficient, and a comprehensive strategic analytical framework has yet to be fully established.

This paper focuses on Huawei and Xiaomi as two typical technology enterprises entering the NEV industry. The main research questions are as follows. First, it aims to explain the differences in strategic positioning and business model between Huawei as a "provider of intelligent vehicle solutions," and Xiaomi as an "independent vehicle manufacturer." Second, based on the SWOT framework, this study illustrates the strengths, weaknesses, opportunities and threats faced by the two companies during their cross-industry expansion. Third, it explores how strategic layout and resource allocation can be optimized to address cross-border challenges.

Methodologically, this study combines case analysis, documental research and comparative analysis. At the theoretical level, it enriches existing research on cross-border strategies by examining differentiated cross-border models adopted by major technology enterprises and provides new analytical perspectives for subsequent studies. Besides, the findings offer decision-making references for Huawei and Xiaomi in optimizing their NEV strategies, while also providing guidance for technology enterprises intending to enter the NEV market. In addition, this research contributes insights into the high-quality and sustainable development of China's NEV industry.

2. Strategic analysis of Huawei's entry into the NEV race

2.1. Huawei's development overview and strategic layout

2.1.1. Huawei's development overview

Huawei Technologies Co., Ltd. was founded in 1987 by Ren Zhengfei in Shenzhen, Guangdong Province, China. As a global leader in (Information and Communication Technology (ICT) infrastructure and smart terminals, Huawei has long been committed to the core ICT sector, driving sustainable development through continuous technological innovation. Its digital technologies have gradually expanded from personal-use scenarios to household environments and organizational operational systems, forming an intelligent ecosystem characterized by interconnected applications.

In the field of intelligent vehicle solutions, Huawei has launched the Gan Kun series of product solutions centered on intelligent driving. Among them, Gan Kun Intelligent Driving and HarmonyOS Cockpit work together to enhance driving and riding experiences. Meanwhile, Gan Kun Vehicle Control, Gan Kun Vehicle Lighting, and Gan Kun Vehicle Cloud have developed in parallel. The cumulative shipment volume of intelligent components has exceeded 23 million units. In addition, Huawei has established cooperative relationships with more than 600 industrial chain partners to provide automakers with high-quality intelligent vehicle components and service support. By 2024, smart car solutions achieved its first annual profit [1].

2.1.2. Huawei's strategic layout

As a leading enterprise in network and communication equipment, Huawei believed that core technology is the key to the long-term development, human resources constitute the basis of core competitiveness, and marketing strategies are critical for shaping users' minds. In the current complex international environment, Huawei placed greater emphasis on independent technological breakthroughs, internal human resource optimization, and marketing strategy selection [2].

First, Huawei continues to increase investment in technological research and development. According to Huawei's 2024 annual report, Huawei allocates more than 10% of its annual revenue in research and development (R&D) each year. In 2024, R&D expenditure reached RMB 179.7 billion, accounting for about 20.8% of total revenue, while cumulative R&D expenditure over the past decade exceeded RMB 1,249 billion. As of December 31, 2024, Huawei employed about 113,000 R&D personnel, representing 54.1% of its total workforce [1]. Second, in terms of human resource management, Huawei has optimized its organizational structure and implemented a full employee shareholding [3]. Huawei has established multiple regional divisions, branches, and training institutions, enabling its service network to cover global markets. The nested internal organizational structure has contributed to improved operational stability and efficiency. Third, its marketing strategy focuses on product differentiation, business focus enhancement, and adjustments to its globalization strategy. Different product series are designed to meet different consumer groups' needs, while continuous investment in network and communication equipment strengthens technological advantages. In response to constraints in European and American markets, Huawei has shifted its resource direction by building 5G networks, establishing production facilities, and intensified research on communication algorithms to improve service quality and competitiveness.

Overall, Huawei's core layout in technology R&D, human resources, and marketing constitutes the foundation of its "intelligent connectivity" ecosystem and provides a solid logical basis for its entry into the NEV market. The global organizational network and efficient operation system support the expansion of its automotive business, while differentiated and focused marketing strategies are deeply integrated into intelligent vehicle solutions. Huawei's entry into NEV sector can thus be regarded as a natural extension of its ecosystem strategy into cross-domain scenarios.

2.2. SWOT analysis of Huawei's entry into the NEV race

Advantages: In an increasingly competitive technological competition, core technology is the key to enterprise competition. Based on its long-term R&D strategy, Huawei has strengthened its innovation capabilities through sustained investment in research funding and talent. Centered on 5G technology, it extends ICT technologies to smart cars, optimizing the development model of the traditional automotive industry. Huawei DriveONE helps Avatr build a smart electric coupe SUV with ultra-fast charging, super power, and long range. HIMA's Snowy Owl Intelligent Silent Range Extender system, through Snowy Owl's advanced algorithms and intelligent control model, automatically adjusts the power generation and engine speed in combination with road conditions, speed, weather and other factors to ensure that the vehicle is always in the best condition.

Disadvantages: Huawei still face barriers in the field of smart cars, lacking core technology and talent, and some core software still relies on suppliers. As a latecomer, Huawei requires substantial human and financial resources to achieve technological breakthroughs. According to a report related to Huawei's enterprise business, in China, 90% of software-related graduates engage in upper-level application development, while less than 10% enter basic software such as embedded systems, operating systems and security. To address this issue, Huawei launched the HarmonyOS Talent Development Program on May 24, 2021, introducing more than 15 HarmonyOS courses into universities and collaborating with 17 leading institutions, including Peking University and Tsinghua University, to cultivate foundational software talent.

Opportunity: The market for NEVs is very promising. New energy vehicles mainly operate on electricity and are in line with the green development proposed by the state. There are also government support policies, such as the vehicle purchase tax reduction policy for new energy

vehicles, which has been extended from December 31, 2023 to December 31, 2027, an extension of four years. It has driven the rapid development of new energy vehicles.

Threats: Key technologies such as high-efficiency and high-density drive motor systems have not yet been broken through, and the problem of poor battery range and short battery life has become a huge obstacle to the development of enterprises. The shortage of chips has also become a stumbling block on the smooth development path of new energy vehicles [4].

3. Strategic analysis of Xiaomi's entry into the NEV race

3.1. Xiaomi's development overview and strategic layout

3.1.1. Xiaomi's development overview

Xiaomi Corporation was founded by Lei Jun in Beijing, China. It was officially established in April 2010 and listed on the main board of the Hong Kong Stock Exchange on July 9, 2018. Centered on smartphones, smart hardware, and IoT platforms, Xiaomi's core products cover various smart home devices such as the MIUI system, the Mi Chat app and Xiaomi phones [5]. Since 2015, Xiaomi has been deeply exploring diversification, consolidating its core business while accelerating expansion into smart home and Internet-related fields. Today, Xiaomi has made steady progress in the mobilephone market and gained a place in the smart home sector.

Xiaomi has built a leading consumer-grade AIoT (AI+IoT) platform. As of December 31, 2024, the number of IoT devices connected to the AIoT platform (excluding smartphones, tablets and laptops) has reached 905 million [6]. Under the leadership of its founder Lei Jun, Xiaomi has been committed to the development direction of "mobile phones as the core, IoT as the focus," aiming to construct a comprehensive smart living ecosystem [7].

3.1.2. Xiaomi's strategic layout

With intensified market competition and industrial transformation, Xiaomi has constantly adjusted its strategy to promote diversified development. This diversification is reflected in product, geographical and marketing dimensions. In terms of products, Xiaomi is not just a mobile phone manufacturer, but a technology company based on the Internet. It also developed its own MIUI operating system. In 2014, Xiaomi launched its smart home brand "Mi Home" and ventured into the IoT business. In 2020, Xiaomi further upgraded its "phone +Alot" strategy to "phone ×Alot", a series of actions that not only increased the diversity of Xiaomi's products but also enhanced the company's market competitiveness and promoted its development [7]. In terms of geographical dimensions, in 2014, Xiaomi embarked on a global journey and entered markets such as India and Southeast Asia. Relying on cost-effective and high-quality products, Xiaomi has grown rapidly in the global market. In terms of marketing, Xiaomi has expanded its physical "Xiaomi Home" stores to give consumers a more intuitive experience of the products and provide them with more humanized services, while operating online stores to facilitate consumers' purchases and save costs. The simultaneous online and offline sales have significantly increased customer satisfaction and recognition, enabling the company to develop rapidly in the long term.

Xiaomi's diversified layout constitutes the practical foundation of its "mobile phone ×AIoT" ecosystem strategy and supports its entry into the, NEV market. The technological accumulation in intelligent interaction, the global user base, and the omni-channel operational system jointly provide

core support for Xiaomi's entry into the NEV field. Xiaomi's layout in the NEV sector can therefore be viewed as an extension and value realization of its ecosystem strategy.

3.2. SWOT analysis of Xiaomi's entry into the new energy vehicle race

Advantages: Compared with Huawei's technology-output-oriented approach, Xiaomi's R&D logic emphasizes consumer experience adaptation based on the "phone × AIoT" ecosystem. In terms of cost and distribution channels, Huawei mainly outputs technical solutions and relies more on partnerships with automakers, while Xiaomi mainly focuses on online marketing, saving the rent of offline stores and the costs of middlemen, and outsourcing its hardware manufacturing to leading factories, reducing manufacturing costs and enabling it to gain greater profits at a lower marketing cost. From mobile phones to smart homes, Xiaomi has built high visibility for the enterprise and laid a solid foundation for entering the new energy vehicle market [8].

Disadvantages: In terms of technological barriers, Huawei's weakness lies in the shortage of basic software talents, while Xiaomi's disadvantage is the high complexity of its industrial chain, and the difficulty of full-process supervision due to outsourcing production. Also, as a newcomer in the automotive field, Xiaomi's accumulation of core technologies and production experience lags far behind Huawei. In terms of investment direction, Huawei cultivates basic software talents through cooperation with universities, while Xiaomi needs to solve the dual problems of supply chain supervision and technology accumulation at the same time, with a higher degree of resource dispersion. Since all of Xiaomi's products are manufactured by outsourcing companies, as a newcomer in the field of NEVs, its production costs will increase significantly.

Opportunities: With the increasing global warming and the growing environmental awareness, the prospects for new energy vehicles are very bright. And the state strongly supports new energy vehicles, promoting their rapid development drawing upon a series of policy support [9]. Huawei has taken advantage of policy dividends to deepen its technological binding with automakers, while Xiaomi has benefited more from the enhanced environmental awareness of its users and can quickly catch the market heat of NEVs by relying on brand recognition of consumer electronics.

Threats: Huawei's threat lies in the shortage of chips and the lack of breakthroughs in core technologies, while Xiaomi's core threat is the common industry problem of poor battery life and short lifespan. Even leading enterprises find it difficult to solve such problems alone and require the joint efforts of the entire industry to overcome difficulties. And its outsourcing production model will amplify the impact of supply chain fluctuations.

4. Comparison and implications of Huawei and Xiaomi's NEV strategies

4.1. Comparison of differences in strategic positioning and business model

Huawei does not manufacture cars directly. It positions itself as a provider of intelligent vehicle solutions, focusing on breakthroughs in core technologies such as intelligent driving. Its business model is based on "Huawei + automakers" partnership, where Huawei has launched the Gan Kun series of product solutions and injected ICT technology to provide technical support to automakers.

In contrast, Xiaomi has directly entered into vehicle manufacturing, positioning its products as young and cost-effective smart vehicles. Building on brand awareness accumulated in mobile phones and smart home devices, Xiaomi continues its "hardware + Internet services" business model and emphasizes deep integration among mobile phones, smart homes and cars.

4.2. Strengths, challenges and suggestions for improvement of Huawei

Huawei has accumulated a strong technological foundation through long-term engagement in the ICT field. Continuous investment in R&D, talent cultivation, and technological innovation has enabled Huawei to establish a significant advantage in the technology field. Secondly, Huawei has broken the shackles of traditional architecture in the field of NEVs and independently established the "chip + algorithm + ecosystem" iron triangle. Based on the ICT field, it has introduced intelligent driving technology and joined the HarmonyOS ecosystem. In the field of new energy vehicles, it has adopted the HarmonyOS Smart Mobility strategy, created the HarmonyOS cockpit, and achieved seamless interconnection of multiple devices such as in-vehicle infotainment systems and mobile phones through HarmonyOS. It has built a richer intelligent ecosystem [10].

Although Huawei has a significant technological edge, it has insufficient control over the production and manufacturing of complete vehicles, because of only providing technical solutions for new energy vehicles, making the final product completely dependent on the integration capabilities of automakers, which sets a higher threshold for automakers' choices. In addition, as Huawei has always been a leader in technology, some small and medium-sized enterprises have been imitating its technology and halving the price, which has greatly affected Huawei's competitiveness in the market. In the field of new energy vehicles, Huawei, as a supplier of technology, undoubtedly makes the related technology transparent, which puts higher demands on Huawei to control the core technology of the enterprise.

In response to these challenges, Huawei should deepen cooperation with selected high-quality automakers and enhance its involvement in key stages of vehicle production to ensure effective implementation of its technologies. Strengthening intellectual property protection and imposing stricter confidentiality requirements on partners and supplies are also essential to safeguarding core technologies such as 5G communications and HarmonyOS ecosystem. It also may reduce the risk of reverse cracking of core intellectual property rights, and require contract manufacturers and suppliers to sign stricter confidentiality agreements to prevent the leakage of core processes.

4.3. Strengths, challenges, and suggestions for improvement of Xiaomi

Xiaomi has adhered to a high cost-performance positioning and has enhanced brand awareness through diversified expansion into smart home products. Relying on its AIoT platform, it has linked cars with mobile phones, smart homes and other products, improving the users' experience and recognition. Secondly, Xiaomi has accumulated marketing experiences like online marketing and hunger marketing, which can greatly control the marketing cost of automobiles. And through the online feedback mechanism, it can more efficiently understand the users' experience and problem feedback, accelerating the product update and iteration speed and quality improvement [8].

Nevertheless, as a newcomer to vehicle manufacturing, Xiaomi lacks sufficient experience in automotive production processes and complex system integration. Its long-standing emphasis on cost performance also constrains investment in high-end configurations and advanced intelligent driving systems, limiting competitiveness in the high-end NEV market.

Here are a few suggestions for Xiaomi's current predicament. Firstly, Xiaomi should break the deadlock in terms of technology, and increase investment in technology research and development and manufacturing resources. Through introduce outstanding talents in the field of automotive production and manufacturing, Xiaomi could deepen technical cooperation with automakers, and widely learn related technologies of automotive manufacturing to break through the bottleneck in automotive manufacturing. Secondly, it's a good idea to promote brand stratification. On the basis of

consolidating the existing high cost-performance product line, Xiaomi may expand the high-end product series. More advanced intelligent driving systems, high-end interior configurations and other technologies could gradually accumulate Xiaomi's brand awareness and recognition in the high-end market, and enhance the competitiveness of Xiaomi cars.

4.4. Implications for China's NEV industry

Firstly, technological cross-border should play to strengths and avoid weaknesses. Xiaomi has long experience in making mobile phones but lacks the ability to make cars, while Huawei, with its strengths in ICT technology, has made up for its shortcomings in car manufacturing by not making complete vehicles but only working with car manufacturers as a provider of smart car technology. Therefore, when making cross-industry moves, it is necessary to identify one's own strengths and weaknesses, and make up for the weaknesses to better leverage one's own advantages by means of cooperation, mergers and acquisitions, etc.

Secondly, brand positioning stratification and ecosystem synergy should go in both directions. Xiaomi is restricted by its high cost-performance ratio and has been hindered in the high-end market, while Huawei, through its HarmonyOS Smart Mobility ecosystem, has linked different automakers to create new energy vehicles of different grades [11]. Therefore, companies should break the single brand positioning, create diversified products, and create brand products at different levels through technological and service differentiation.

5. Conclusion

This paper dissects the strategic layout and competitive situation of Huawei and Xiaomi in the NEV industry. The results indicate that Huawei, with ICT at its core competence, positions itself as a provider of intelligent vehicle solutions and advances the HarmonyOS ecosystem through the "Huawei + automaker" cooperation model. Its strength lies in technological R&D, while challenges remain in vehicle production coordination and the protection of core technologies. In contrast, Xiaomi has entered vehicle manufacturing by leveraging its AIoT platform, emphasizing a high cost-performance strategy supported by strengths in online marketing, cost control, and brand influence. However, Xiaomi remains constrained by limited automotive manufacturing experience and difficulties in achieving breakthroughs in the high-end market. The strategic differentiation indicates that cross-industry layout plays to strengths and avoids weaknesses. Brand stratification and ecosystem synergy emerge key drivers of sustainable development of the industry.

Despite these insights, this study has limitations. The analysis is primarily qualitative and lacks detailed cooperation mechanisms and quantitative validation. Future research may also examine the long-term adaptability of different cooperation and manufacturing models adopted by Huawei and Xiaomi, as well as pathways for breakthroughs in core intelligent vehicle technologies and battery supply constraints. By integrating external factors such as the "carbon peaking and carbon neutrality" policy and evolving international market conditions, future research can more systematically assess strategic adaptability and risk management capabilities, providing forward-looking references for technology enterprises to cross into the NEV industry.

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