

The impact and trend of China's current modification environment on automotive customization and related supply chain development

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ABSTRACT

Currently, the personalized demand of Chinese automotive consumers is constantly increasing, and benefiting from environmental changes, the modification industry has made significant progress, which also has a profound impact on the customized modification supply chain. Exploring the changes and trends in China's modification environment is beneficial for providing reference and basis for the development of domestic automotive customization and modification supply chain business models, thereby promoting the compliant, orderly, and positive development of the entire industry.

KEYWORDS

Customized modification; Supply chain; Environmental change.

1. INTRODUCTION

With the rapid development of the social economy and the continuous improvement of people's living standards, traditional automobile production and sales models are difficult to meet the diverse and personalized needs of consumers. In this context, customized modification of automobiles has emerged and gradually become a hot topic in the automotive industry. Customized modification of cars can not only meet the personalized needs of consumers, but also increase the value and added value of the car, and ensure the quality and compliance of the modification. Therefore, the automotive customization and modification market has enormous development potential and broad market prospects, but it is necessary to establish a customized modification supply chain system to lay the foundation.

The customized modification market for automobiles in China is still in its early stages and faces many problems and challenges. This article will discuss the current development status and prospects of customized modification in China, including the supply management system for automotive modification, the existing problems in the development of the automotive customized modification supply chain, and corresponding countermeasures and suggestions.

2. CURRENT STATUS AND PROSPECTS OF CUSTOMIZED AUTOMOTIVE MODIFICATIONS IN CHINA

With the maturity of China's automobile industry and the youthfulness of consumer groups, the concept of automobile consumption is undergoing changes, and the demand for automobile modification is becoming increasingly strong. With the promotion of the government, enterprises, and consumers, China's automobile modification industry will usher in an explosive period.

2.1. Analysis of the Development Environment for Automotive Modification in China

2.1.1. The automotive sales market is gradually recovering

Affected by factors such as energy, environment, transportation, and the slowdown in China's macroeconomic growth rate, the new car sales market has gradually shifted from high-speed growth to medium to low-speed stable growth. But with the gradual relaxation of epidemic prevention policies and the introduction of various consumer promotion policies by the government, market vitality continues to recover, and both supply and demand are steadily improving. In 2022, China's automobile sales reached 26.86 million units, a year-on-year increase of 2.1%. In particular, the new energy vehicle market has shown explosive growth, with sales of 6.89 million vehicles in 2021, a year-on-year increase of 93.4%, far higher than the overall growth rate of the new car market.

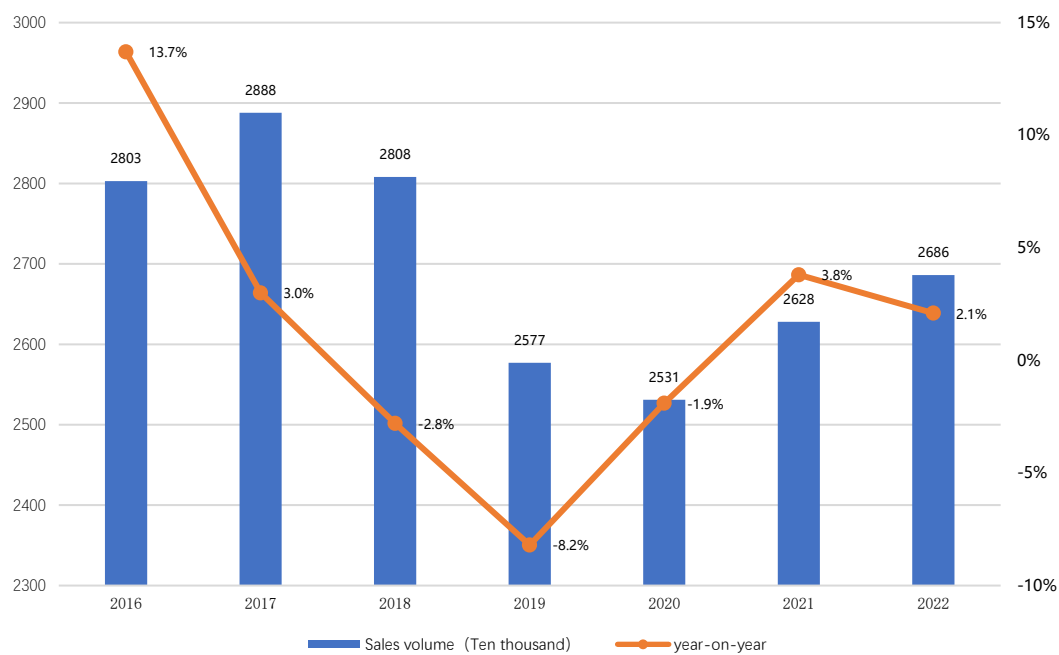


Figure 1. China's automobile sales and growth rate from 2016 to 2022

2.1.2. Continuous relaxation of modification management policies

As an important means of promoting consumption, automobile modification is conducive to fully unleashing consumption potential. The country, relevant departments, and local governments have also repeatedly proposed to accelerate the development of the automobile modification industry. In April 2022, the General Office of the State Council issued the "Opinions on Further Releasing Consumption Potential and Promoting Sustainable Recovery of Consumption", proposing to "establish and improve the management mechanism of the automotive modification industry, and accelerate the development of the automotive aftermarket.". In response to the reform of "streamlining administration, delegating powers, and improving services", the "Regulations on the Registration of Motor Vehicles" implemented in May 2022 have clarified the scope of compliant modification projects at the ministerial level, and added change filing, simplifying the process of vehicle modification changes and facilitating unified law enforcement for nationwide modification inspections. In the absence of a fully established system for automobile modification management in China, relevant departments are actively promoting the opening up of modification projects to further meet the needs of the people for automobile modification.

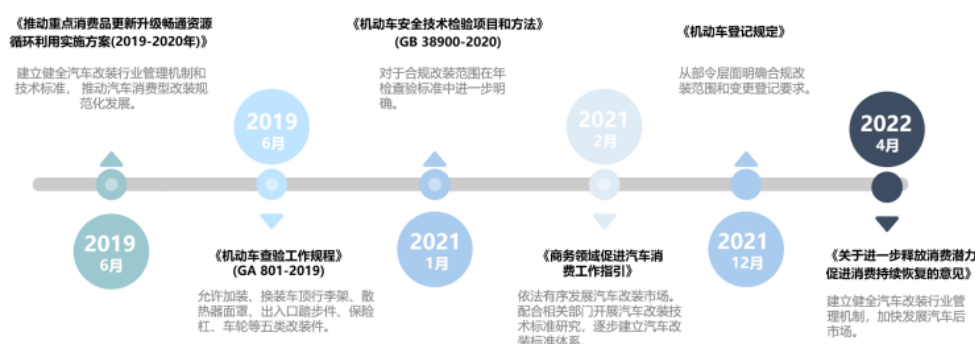


Figure 2. History of Automobile Modification Policies

2.1.3. The increasing demand for modification

Automobile consumption has shifted from a single car purchase to a diversified development of related services in the post market, and automobile modification has become a hot topic. According to statistics from the Traffic Management Bureau of the Ministry of Public Security, as of the end of 2022, the total number of automobiles in China has reached 319 million, with 464 million drivers, providing a huge potential consumer group for the development of the automotive modification industry. In addition, as the current main group of car buyers, the post-90s and post-00s have undergone a significant change in their consumption concepts, placing greater emphasis on vehicle personalization, differentiation, and customization, and a stronger willingness to modify.

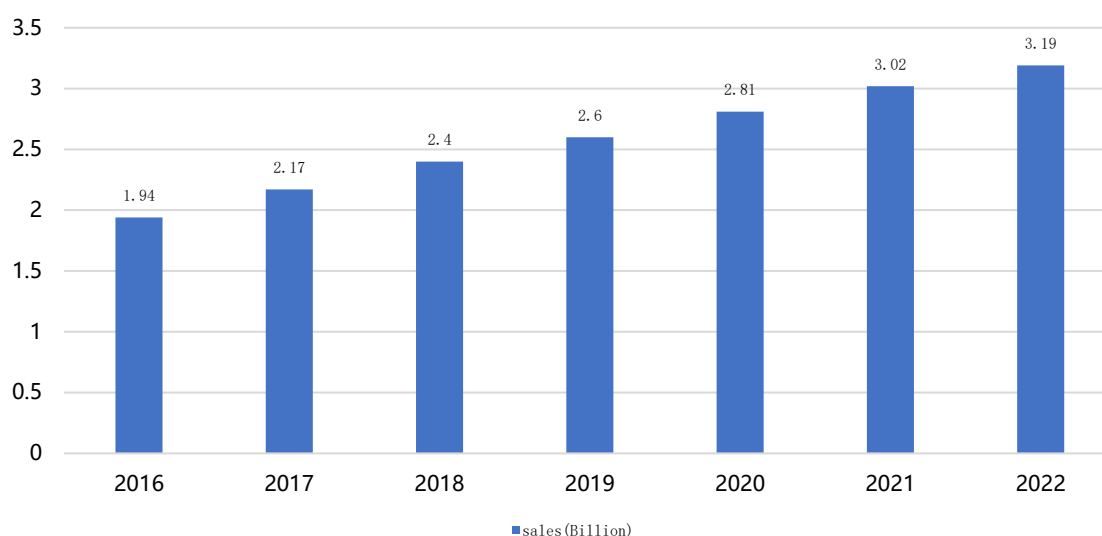


Figure 3. China's automobile ownership from 2016 to 2022

2.1.4. Continuously enriching modification cultural activities

Currently, China's automobile modification exhibitions, competitions and other diverse modification activities continue to emerge, forming a group of influential modification activity IPs in the industry. Various regions are also vigorously developing automobile modification parks, creating platforms for automobile modification exhibitions by introducing domestic and foreign automobile modification brands, establishing automobile modification cultural clubs, and improving automobile modification supporting services. Although many car modification exhibitions and competitions have been postponed or suspended due to the impact of the epidemic, modification parts companies, modification service companies, and others promote modification culture to more car consumers through short video platforms, showcasing the unique charm of car modification.



Figure 4. China Automotive Modification Exhibition

2.2. Development characteristics and trends of the automotive customization and modification industry

According to the different implementation entities, China's automotive modification industry can be divided into three categories: customized modification, authorized modification, and consumer modification. The three types of modifications promote each other and meet the modification needs of different consumers.

Table 1. Modification Types

Number	Type	Explain
one	Customized modification	The act of a car manufacturer making changes to the exterior, interior, or performance of a vehicle before leaving the factory.
two	Authorized modification	The act of specialized vehicle manufacturers modifying vehicles to provide specific usage functions.
three	Consumer modification	The act of modifying the exterior, interior, or performance of a vehicle through channels such as 4S stores and car modification stores after leaving the factory.

The current automotive modification market in China is showing a sustained growth trend, especially with the rapid development of the front-end installation market, which has promoted the development of the entire modification supply chain. At present, more than 20 car brands have launched customized or limited edition models, and more than 60 specialized vehicle companies have obtained modification authorizations from car companies. However, there is still a certain gap in the overall market size compared to consumer modification. Although rear end modification is constrained by policies and regulations, mainstream exterior and interior modification projects such as bumpers, luggage racks, and wheels have been relaxed, which can meet the basic modification needs of consumers. Authorized modification has formed a relatively stable market after years of development, especially for luxury business MPVs, with a single vehicle price of nearly one million yuan.

2.2.1. Accelerate the layout of enterprises in the automotive modification industry

Automobile companies focus on building product and system architectures. In 2022, the sales of customized modified vehicle models showed an exponential growth. According to data from motor vehicle insurance, the sales of customized and modified car models have rapidly increased since 2022,

with 98000 units sold in 2022, a year-on-year increase of 562%. Although it accounts for a relatively low proportion of overall car sales, its development potential and growth rate are obvious. Some car companies have set up separate modification departments to accelerate product development cycles and coordinate customized modification businesses, and carry out overall management of customized modification products. Among them, Chinese brand products are more abundant, while joint venture and foreign brands are mostly in the exploratory stage due to constraints in decision-making methods and development processes. The pace of product launch and promotion efforts are significantly weaker than Chinese brands.

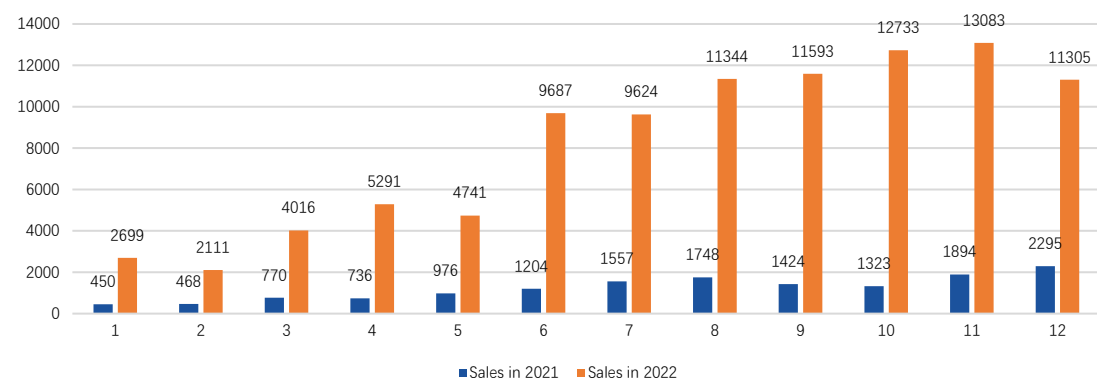


Figure 5. Sales of customized modified vehicle models from 2021 to 2022

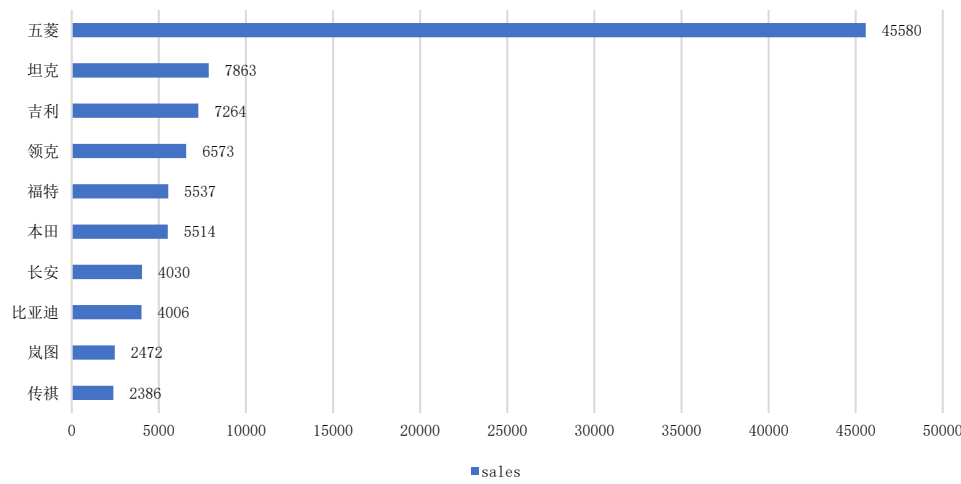


Figure 6. Top 10 Sales of Customized and Modified Brand Models in 2022

Car modification is included in the sales and after-sales system. Car companies are gradually transforming their sales and service systems, and retrofitting will become an important component in addition to sales, after-sales, financial and insurance services. According to research, more than 15 car companies are actively exploring the use of 4S stores, direct sales stores, online shopping malls, etc. to carry out modification business, meet a series of consumer needs for "selection purchase modification", improve product added value and user experience, such as SAIC MG XPOWER, SAIC GM Wuling, FAW Volkswagen, Lotus, etc. Meanwhile, with the increase in the number of new energy vehicles, the after-sales business of enterprises will be further compressed, and modification, as an emerging business, will provide support for the after-sales business system of enterprises.



Figure 7. Automotive companies' aftermarket modification business

Modification enterprises are developing towards branding and chain operation. Authorized modification enterprises have already reached a certain scale in China, especially in the field of MPV modification commercial vehicles, forming well-known brands such as Laurence and Katie in the industry, greatly enhancing product premiums through modification. Based on a relatively fixed consumer circle and professional modification plans, automobile modification service enterprises establish direct or cooperative stores in different cities, continuously expanding their business scope. For example, Yunliang Off road provides comprehensive solutions from product, image, technology, operation, finance, software, etc. Its stores have covered more than 40 provinces and cities including Beijing, Chengdu, Xinjiang, Guangzhou, Changsha, Shanghai, Shenyang, Xi'an, etc.



Figure 8. Yunliang Off road Cooperative Enterprise

Electrification and intelligence have brought about a wave of mild car modifications. There are significant structural differences between new energy vehicles and fuel vehicles, making it difficult to make significant modifications to the vehicle's power and chassis. At present, the consumer group of new energy vehicles in the domestic market is mainly young users who are willing to try new things. According to industry research, nearly 70% of Tesla owners will change the color of their vehicles due to factors such as delivery cycles and optional costs. In addition, with the widespread application of OTA upgrade technology, car companies are more likely to upgrade their vehicle software, such as car infotainment, audio, power output, braking performance, etc., to meet personalized consumer needs through various means, and even achieve thousands of people and thousands of modifications.

2.3. Market size and forecast of customized automobile modification

Customized modification of automobiles has entered a period of development and growth. With the rapid growth of consumer demand for automobiles in China, car owners are increasingly pursuing fashion, aesthetics, comfort, and individuality, and there is also an increasing demand for modification. The current overall modification ratio in China is about 1-2%, with a significant gap

compared to mature countries such as Germany and the United States. From 2020 to 2022, the size of China's automotive modification market increased from 70.5 billion yuan to 93.5 billion yuan, with a compound annual growth rate of 16.3%. It is expected that the overall size of the modification market will reach 160 billion yuan by 2025. Among them, the annual growth rate of customized modifications is close to 100%. With the continuous improvement of China's automobile modification management system, the overall modification ratio in China is expected to catch up with mature overseas markets. According to VDAT statistics, the modification ratio in Germany is about 60%, and the overall size of China's modification market is expected to reach trillions.

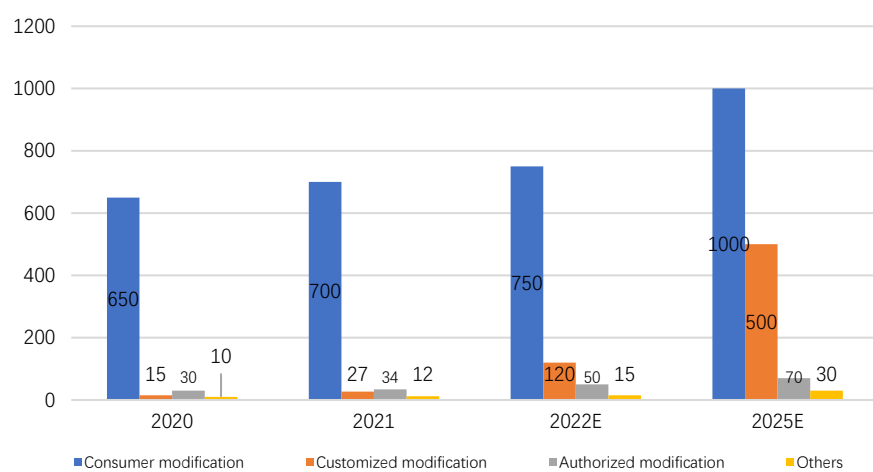


Figure 9. Scale of China's automobile modification market (100 million yuan)

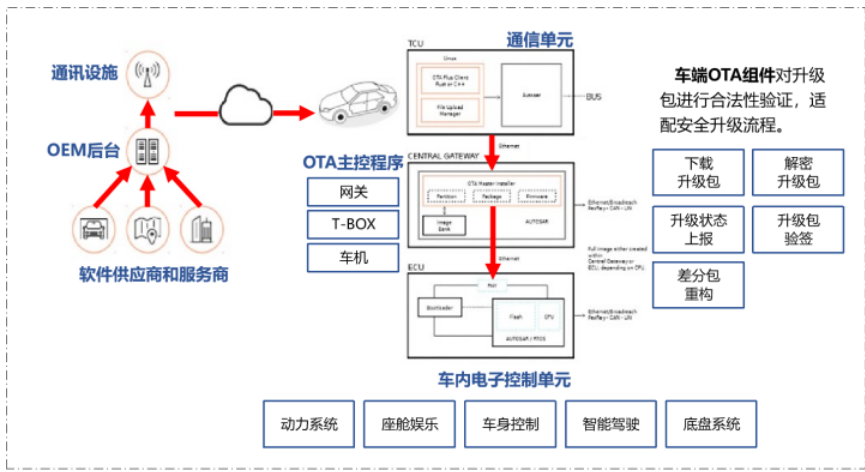


Figure 10. OTA Technology Architecture

3. THE URGENT PROBLEMS THAT NEED TO BE SOLVED IN THE DEVELOPMENT OF THE AUTOMOTIVE CUSTOMIZATION AND MODIFICATION SUPPLY CHAIN INDUSTRY

3.1. The modification management system needs to be improved

Among them, domestic production enterprises need to have a notice and print a certificate of conformity before they can produce and sell domestically.

On December 6, 2018, the Ministry of Industry and Information Technology issued the "Management Measures for Road Motor Vehicle Production Enterprises and Product Access", which optimized the

management process of the "Announcement". For vehicle products that have already obtained access, changes in product parameters, configurations, and other matters were changed from the original reapplication to filing management. Vehicle product family management was promoted, and enterprises were encouraged to apply for product access according to the family for model products of the same family, significantly reducing the number of access product models, Thus reducing the burden on enterprises and meeting consumer modification needs in the production process. The changes in management policies of the Announcement have driven the development of customized automobile production, and due to passing relevant tests, safety is more guaranteed. Many car companies have added many optional parts and pictures in the remarks section of the announcement. On the one hand, the vehicle is already equipped with diverse configurations when it leaves the factory, and consumers can customize it in advance. On the other hand, vehicles can also be equipped with optional parts as noted in the notice after leaving the factory, and the public security traffic management department will verify the information in the notice before registering them. For downstream enterprises in China's customized modification supply chain, it is very important to enter their supply system through quality audits and ratings by the host factory, and incorporating more suppliers into the automotive industry is also beneficial for improving the production efficiency of modified products.

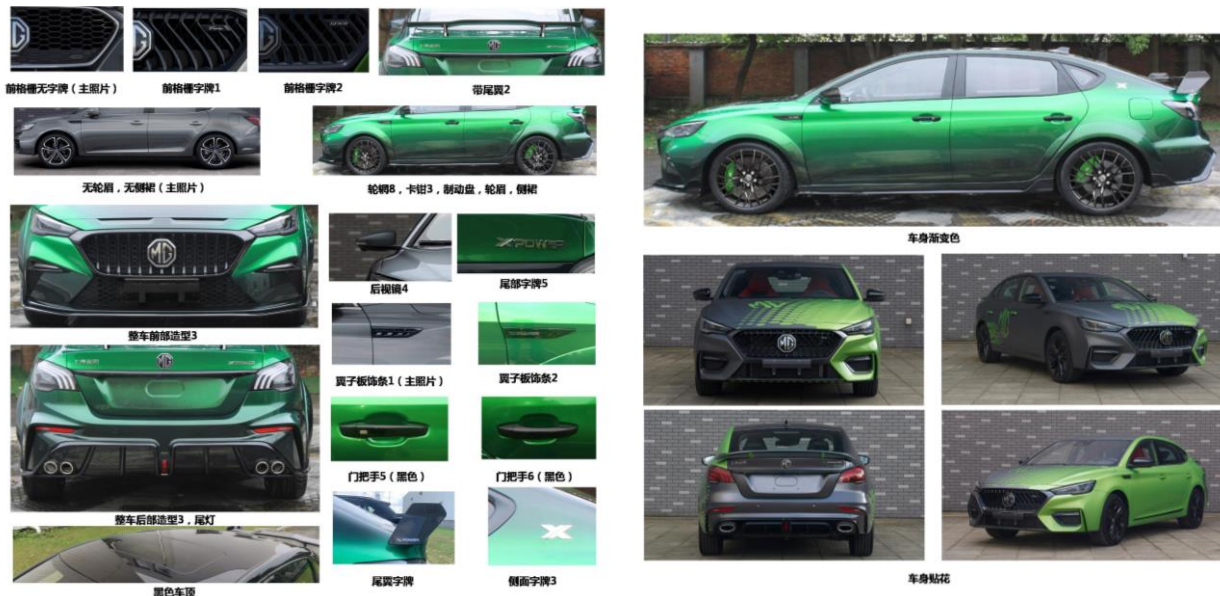


Figure 11. SAIC MG XPOWER Announcement Optional

For customized modification products, China lacks a complete management model and working mechanism for the automotive modification industry, which makes it difficult for China to continuously open up automotive modification projects. The management of the automotive modification industry involves multiple departments such as commerce, market supervision, and public security, and it is necessary to clarify the division of management functions between the competent department and relevant departments. At the same time, China has not established a classification management system for automotive modification projects. Although five types of modification projects (entrance and exit step parts, roof luggage racks, radiator masks, bumpers, and wheels) have been relaxed, there is no clear technical requirement to be met. Public security traffic management and annual inspection agencies lack specific and actionable guidance documents, which seriously affects the product design and manufacturing of automotive and component enterprises, and thus affects the deep development of the entire industry.

3.2. Lack of management and training system for modification personnel

The technical level of automotive modification practitioners in China does not match the development of the modification industry. The technical level of automotive modification practitioners is not high, their professional abilities are not strong, and they have not received professional skill training for automotive modification. China has not established a management system and regulatory mechanism for automotive modification personnel, nor is there a nationally influential professional modification training institution, resulting in significant deficiencies in the management, training, assessment, certification, and other aspects of automotive modification personnel. The technical level and business ability are uneven, which poses certain safety hazards to modified vehicles.

The uneven work quality of modification practitioners not only affects the overall image and service quality of the automotive modification industry, but also poses a potential threat to consumer rights, affecting the growth of China's automotive customization and modification consumer population, hindering consumption, and hindering the long-term development of the customization and modification industry.

3.3. The quality of modified parts needs to be standardized and improved

China has established a corresponding technical standard system for new car products and some component products, but there is no unified quality requirement in the field of automotive modification. Some manufacturers produce automotive modification parts with substandard processes and inferior materials, resulting in many parts being unable to fully guarantee their quality and reliability. This may pose potential risks to the safety performance of the vehicle, posing safety hazards to drivers and other drivers.

Compared to after-sales maintenance parts, modified parts have the characteristics of high unit price value and brand premium, so the problem of counterfeit and inferior modified parts is prominent. If it involves key vehicle components, it will lead to the occurrence of major safety accidents. There are some low-quality car modification parts in the market, which often attract consumers with low prices, but their quality and performance cannot match those of parts sold through legitimate channels. This not only affects the performance of the vehicle, but may also lead to an increase in maintenance and replacement costs, bringing unnecessary economic burden to the owner.

3.4. Modification simulation tools and lack of reliable consumption channels

Currently, modification consumers mainly understand the characteristics and installation effects of modified products through communication with car enthusiasts, online cases, and merchant introductions. They cannot visually see the overall effect of the modified vehicle, and there is a lack of decoration simulation software services similar to the home decoration industry in the industry, which also affects the release of consumer demand. At the same time, consumers lack reliable channels to purchase modified products, which can easily lead to counterfeit and substandard products, incorrect products, and seriously affect the car modification consumption experience.

4. DEVELOPMENT STRATEGIES AND SUGGESTIONS FOR THE AUTOMOTIVE CUSTOMIZATION AND MODIFICATION SUPPLY CHAIN INDUSTRY

4.1. The government improves the relevant policy system and strengthens industry guidance

The advantage of car companies launching customized modified models should lie in their ability to quickly respond to market demand, efficiently launch related products, and meet the personalized

needs of consumers. However, currently there is a lack of management policies for the customization and modification industry in China, leading to a lack of reference and guidance for relevant enterprises. They need to explore and complete production, admission and other processes, which has increased the production costs of the industry. The government can introduce special management measures for customized and modified vehicle models, shorten relevant processes, and promote the development of relevant industrial chains and industries. Relevant departments can establish strict standards and regulations to supervise and inspect the manufacturing, sales, and use of customized modified parts for automobiles, ensuring that their quality and performance meet the requirements; Strengthen the qualification certification and training of car modification shops, improve their technical level and service capabilities, and provide consumers with more reliable car modification services. The government can also play its own functional role, strengthen market supervision, crack down on the production and sales of counterfeit and substandard products, curb the circulation of counterfeit and substandard products, improve the overall quality level of modified parts, and meet the demand of consumers for high-quality products by strengthening law enforcement and increasing punishment.

4.2. Establishing a reliable and traceable certification system within the industry

Secondly, based on the standard system, we will collaborate with authoritative certification bodies to establish a comprehensive traceability certification system. Ultimately, the certification system will be promoted through government and industry platform guidance, encouraging enterprises to voluntarily participate in relevant certifications to prove the quality and safety of their products, improve component quality, reduce counterfeit and inferior products, and ensure road driving safety. The establishment of a certification system will help guide consumers to choose legitimate channels to purchase automotive modification parts, and choose qualified and reputable automotive modification shops for installation and maintenance, thereby regulating market products and promoting industry development.

4.3. Follow market rules to integrate the industrial chain and reduce production costs

In order to improve competitiveness and reduce costs, automotive customization and modification related enterprises can seek deep cooperation with upstream and downstream enterprises to achieve integration of the industrial chain, which will help improve the efficiency and synergy of the entire supply chain. Integrating the automotive customization and modification industry chain to reduce production costs is a systematic project that must follow market laws, eliminate disadvantaged enterprises, and concentrate advantageous enterprises. The automotive customization and modification industry chain generally includes links such as raw material procurement, component production, vehicle manufacturing, sales services, etc. Relevant enterprises establish an industry chain based on geography, which is conducive to reducing transportation costs and building cluster advantages.

In addition, unified industry standards and norms are also crucial in breaking down information barriers between various links and achieving information sharing and circulation. A complete automotive customization and modification standard, as well as an open and shared information platform, are conducive to facilitating communication among enterprises in various stages and improving decision-making efficiency.

4.4. Relevant enterprises attach importance to technological innovation and emerging platforms

With the continuous progress of technology, automotive customization and modification technology is also constantly innovating and breaking through. Paying attention to and applying the latest

technology is beneficial for the development of related enterprises. The application of 3D printing technology will make the production of automotive components more precise and efficient; The application of artificial intelligence and big data technology will help achieve intelligent management of the automotive customization and modification supply chain. The development of new media platforms and e-commerce platforms is beneficial for automotive customization and modification related enterprises to showcase high-quality products, expand business channels, improve market competitiveness, and also provide consumers with a more convenient shopping experience.

5. CONCLUSION

The current customized modification market for automobiles in China is still in its early stages, facing problems such as incomplete policies and regulations, inconsistent industry standards, and uneven product and service quality. These issues seriously constrain the development of the automotive customization and modification supply chain. In order to promote the development of China's automotive customization and related supply chain, the government should increase the formulation and improvement of relevant policies, enterprises should strengthen technological research and talent cultivation, and industry associations should strengthen industry self-discipline and standard setting. With the gradual improvement of policies, continuous innovation of technology, and continuous expansion of market demand, China's automotive customization and modification supply chain will develop towards scale, specialization, and intensification.

In the coming years, China's automotive customization and modification market will usher in a healthier and faster development. Policy improvement, establishment of certification system, integration of industrial chain, and technological innovation will become important factors in promoting the development of automotive customization and modification supply chain. In short, with the continuous development of China's economy and the continuous improvement of people's living standards, the automotive customization and modification market will usher in a broader development space.

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