The Research of the Automobile Industry in Wuhan on the Context of New Technology, New Energy and Intelligentization

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Abstract. Nowadays, China's automobile manufacturing industry has developed rapidly and the overall quality has been steadily improved. After several years of rapid development, with the continuous progress of technology, new energy and intelligent technology began to popularize. However, the production and sales of self-owned brand passenger cars have shrunk greatly due to the decline of overall sales of passenger cars. As the headquarters of Dongfeng Motor Group, Wuhan has certain cluster advantages in R&D of self-owned brand vehicles, but it has been in a loss state in recent years, and there is an obvious gap between Wuhan and the first-line self-owned brands. Therefore, it is worth discussing how to seize the development opportunity, promote the quality of its brand and become a first-line brand. This paper analyses the development status, challenges, and bottlenecks of Wuhan self-owned automobile brand quality improvement under the development background of new technology, new energy and intelligent, and puts forward the strategy of Wuhan self-owned automobile brand quality improvement. This paper suggests that we should strictly implement the automobile quality regulations, establish the quality assurance and traceability system of self-owned brands, increase the support of new energy sources for self-owned brands and the development of intelligent car service, and build a quality basic technology sharing platform, so as to achieve the purpose of improving the quality of Wuhan's self-owned automobile brands.

Keywords: Self-owned brand; Intelligentization; New energy vehicle; Brand quality.

1. Introduction
The production and sales of passenger cars in China continue to decline year by year. After several years of rapid development, the production and sales of self-owned brand passenger cars have also shrunk greatly, with the market share falling from 47% in the peak period to 36% in 2019. Among them, the sales of the first-line self-owned brand is stable and its share is rising against the trend, but the sales of the second-and-third-line self-owned brands has declined significantly, and even there is the risk of being marginalized.

It has become a consensus that China urgently needs to strengthen the development of its self-owned brand automobile industry. Without core technology and self-owned brand of automobile industry, it is impossible to establish a truly self-owned automobile industry power. As the headquarters of Dongfeng Motor Group, Wuhan has certain cluster advantages in the R&D of its self-owned brand cars. At present, Dongfeng has listed a few self-owned passenger car models, and new energy models such as electric vehicles have been launched, which has achieved a milestone leap forward. However, Dongfeng has been in a loss state, and there is a significant gap with the first-line self-owned brands such as Great Wall, Geely and BYD. In the fierce competition between Chinese and foreign brand cars, although
Wuhan's self-owned brand cars occupy a certain market share, it is worth discussing how to seize the development opportunity, promote the quality of its brand and become a first-line brand.

2. Development Status of Wuhan Self-owned Automobile Brand

Today, the rapid development of China's automobile manufacturing industry, the overall quality presents a steady upward trend. However, according to the data of "Automobile Industry Blue Book: Report On The Development Of China's Automobile Industry (2020)", due to the impact of the industry's macroeconomic downturn and industrial policy adjustment, the production and sales of China's automobile industry in 2019 will further decline after 2018, with a total sales of 25.769 million vehicles, a year-on-year decrease of 2.312 million, or 8.2%. From the change of demand structure, in the past few years, SUV has gradually become a popular consumption trend, and the market share has increased year by year. Especially after 2013, the proportion of SUV demand side increased significantly. However, with the change of domestic economic situation, domestic consumers' demand for SUV has also shown a downward trend since 2018. However, since 2016, China's new energy vehicles started the 1.0 Era, and the development strategy of new energy vehicles with self-owned brands is more radical than that of foreign automobile brands (Song, 2019). Such as BAIC, BYD and other mainstream auto companies, the sales of new energy vehicles almost occupy the whole market share of China's new energy vehicles. Wuhan is one of the six major automobile industry cluster development cities in China. The automobile industry is the largest pillar industry in Wuhan. There are seven automobile enterprises and nearly 500 automobile parts enterprises including chassis, body, and automobile electronics. Among them, there are 2 vehicle enterprises under construction. The total industrial output value has accounted for more than 20% of Wuhan's total industrial output value. In 2018, Wuhan has produced 1.7 million passenger cars, with a total output value of 320 billion yuan. In the first half of 2019, Wuhan's five major passenger vehicle enterprises have produced 762300 vehicles, with a total industrial output value of 94.065 billion yuan.

At present, the scale of new energy passenger vehicles in Wuhan is growing. Dongfeng Honda, SAIC General Motors, Dongfeng Passenger Cars, Dongfeng Peugeot Citroen and Dongfeng Renault will all put into production new energy vehicles within this year, while Geely Automobile and Dongfeng Yunfeng two projects under construction will lay out new energy vehicles in Wuhan. The fuel cell vehicle industry chain has been continuously improved. Wuhan has gathered fuel cell vehicle and component enterprises such as Wuhan Kaiwo, Wuhan HydraV, Zhongyu Power, Zihuan Industrial Research Institute, Wuhan Hynertech Co Ltd., etc. Fuel Cell Bus Demonstration lines have been opened in Donghu Development Zone and Wuhan Development Zone respectively, and fuel cell buses have been put into operation on the road. Three hydrogenation stations have been built in Wuhan, and five will be built within the year, effectively ensuring the popularization and application of fuel cell vehicles. As a local automobile brand in Wuhan, Dongfeng Yueda Kia ranks first in the domestic mainstream vehicle quality score list with its excellent automobile quality. Wuhan local automobile brands adhere to the concept of "cost performance" and can shine brilliantly in the mainstream models. Wuhan local brand car enterprises do not choose to take the high-end route to mass produce luxury cars. It is necessary to have a deep understanding of the problem that the quality of their own luxury cars is not ideal. This indirectly reflects that the quality development of Wuhan self-owned automobile brands is based on mainstream models, with the collaborative development of quality of new energy vehicles.

3. Challenges of Wuhan self-owned Automobile Brand Development

The problems encountered in the quality development process of Wuhan self-owned automobile brand are similar to those of other overseas brands. Due to the insufficient guarantee of production quality in the early stage of development, self-owned automobile brands will experience the stage of poor product quality and low consumer awareness. With the vigorous investment in R&D and quality control of self-owned brand automobile enterprises, the quality of automobiles will be greatly improved and the competitiveness of vehicle products will be increased (Zhao, 2014). The increase of competitiveness will enhance consumers' awareness of the brand, and then enhance the value of its self-owned brand. This is a necessary process for the development of domestic self-owned brands, and also a process for Wuhan local brands.
3.1 Challenges Brought about by Environmental Change

With the tension of international situation, the influence of domestic economic situation and the arrival of 5G Era, these changes will increase the differences between self-owned brands and overseas brands in the development process, that is, the quality improvement of self-owned brands is facing new challenges due to the changes in the environment, which are essentially different from the challenges faced by overseas brands in the initial development process. Not only the self-owned brands are facing these challenges, but also the overseas brands need to face the challenges caused by such great environmental changes. Therefore, for Wuhan self-owned brands, we should not only rely on the experience of quality improvement of traditional overseas brands, but also adjust the strategic improvement according to the current era background. In a word, the current quality improvement strategy adjustment of domestic automobile self-owned brands is in the exploration stage under the 5G Era, and Wuhan local automobile brands have been in the first place among the advantages, taking the lead in the automobile quality improvement journey under the 5G Era.

In addition, the tense international situation will affect the import and export trade of China's auto self-owned brands. As the main export trade of domestic automobile self-owned brands is Southeast Asia market, as Southeast Asia is an emerging market, its demand for automobile brands is up to the standard, and the price is user-friendly. This means that overseas high-end automobile brands are in a disadvantageous position in the Southeast Asian market. On the contrary, China's self-owned brands with high automobile quality standards and high price performance ratio have obvious advantages (Li, 2020). Therefore, China's self-owned brands in the Southeast Asian market will not be affected by the international situation. The main impact on China's automobile self-owned brands is the European and American markets. Because the European and American markets pay more attention to the quality and quality control of automobile brands, consumers' demand for cars is that brand quality control is greater than price. In this kind of consumption preference, China's auto brands are unable to compete with overseas old brand auto powers, so the market share of China's auto self-owned brands is very small in this market. This means that the international situation between China and Europe and the United States is tense, and the impact on China's auto brands is also very small. In addition, the main impact of international tension on the quality improvement of China's auto self-owned brands is that the import of auto parts, vehicle assembly technology and core engine technology are hindered.

3.2 Challenges Brought by the Change of Demand

With the steady improvement of Chinese people's consumption level, the overall demand for cars has changed. Although the quality of domestic self-owned brand cars has been significantly improved, the quality requirements of consumers will also gradually improve, so the quality problems will never disappear because of the good development of enterprises. For example, today's consumers have shifted from traditional focus on single function value of automobiles to diversified and personalized consumption preferences (Sun, 2020). In this trend, Wuhan local automobile manufacturers will pay more attention to the consumer experience and tailor-made personalized products for consumers. Therefore, Wuhan local brands should not only pay attention to the quality of traditional automobile functions, but also pay attention to the quality of customized technology. In addition, the consumers in the automobile market are becoming younger gradually, and the preference of young consumers for automobile brands is mainly overseas high-end brands. Compared with mature foreign automobile brands, young consumers are not very interested in domestic cars which at the initial stage, while Dongfeng Motor and SAIC General Motors brands in Wuhan are not in their choice. However, young people have realized that the power of China's self-owned automobile brands is rising, and they are still full of expectations for the development of domestic brands, which is a potential direction for the future development of Wuhan self-owned brands to attract their consumer demand.

In addition, with the progress of science and technology, the country puts forward the demand for green travel, which promotes the development trend of the automobile industry to the direction of new energy, intelligence and Networking (Shao, 2017). And from the recent excellent performance of new energy vehicle brand, Tesla, the development mode of intelligent new energy vehicle accompanied by vehicle networking has become the general trend. Market demand and social demand are converted from
traditional fuel vehicles to new energy vehicles, which also puts forward new technical requirements and vehicle quality requirements for Wuhan automobile brand enterprises.

3.3 Challenges Brought by the Change of Business Model
With the development of Internet and other new formats and new models, cars are changing from vehicles to large mobile intelligent terminals and data storage space. In order to adapt to this change, the production mode of automobiles has also made corresponding changes. The production mode of Wuhan's local brand automobiles needs to turn to the intelligent manufacturing system of interconnection and cooperation, and the automobile enterprises realize the efficient allocation of resources through the globalization strategy. At the same time, the automobile industry combines the upstream and downstream industries, which greatly increases the efficiency of automobile R&D and manufacturing (Wang, 2017). At the same time, with the emergence of the business model of Internet and sharing economy, Wuhan local automobile enterprises should not only ensure the quality, but also adapt to this new business model guided by consumer demand.

4. Bottleneck of Wuhan self-owned Automobile Brand Quality Improvement

4.1 Bottleneck of Technology Infrastructure
It is not only the local automobile brands in Wuhan, but also the main reason why the quality of domestic self-owned brand vehicles lags behind the foreign old brand automobile enterprises lies in the weak stage of vehicle manufacturing infrastructure, and the increasingly stringent laws and regulations standards formulated by the state, that is, the requirements for vehicle manufacturing infrastructure are higher and higher. The gap between the two results in the bottleneck state of the quality of the self-owned brand automobile. How to make up for the quality gap will be the key to think about. In addition, with the increasingly stringent national regulations and standards on automobile quality, the technical requirements are higher and higher, which makes Wuhan self-owned brand not only solve the problem of weak manufacturing infrastructure technology of its self-owned brand cars, but also face external technical requirements, which makes Wuhan self-owned brand in a dilemma.

4.2 Bottleneck of Quality Assurance System
For China's automobile industry, a perfect quality assurance system is an effective trigger to improve the product quality of China's own brands. (LEER J.W.H, 1995). Compared with the foreign automobile industry will formulate strict and perfect quality requirements standards in each link, the domestic automobile industry only has certain quality requirements for whole vehicle products, and the quality assurance system for spare parts and assembly link is not perfect. For Wuhan's self-owned brand cars, only in the production of each link in accordance with strict quality standards, so as to occupy a place in the automotive market, otherwise the shoddy quality assurance system corresponds to the crisis of consumers' distrust of Wuhan's self-owned brand quality. Therefore, how to improve the quality fidelity system for Wuhan self-owned brand is the bottleneck that needs to be broken.

4.3 Bottleneck of New Technology
In addition to the quality requirements of traditional fuel vehicle consumers, self-owned brand vehicles also need to face the technical bottleneck of consumers' demand for new vehicles. With the continuous expansion of consumer demand for new energy vehicles, the business focus of self-owned brand vehicles has shifted to a certain extent. How to grasp the consumer demand of new energy vehicles will be the problem that self-owned brand vehicles must face in the future. Among them, the new technology requirements of new energy vehicles are constantly high, especially the power battery technology will perplex many automobile enterprises. Cost, safety and convenience are important reference indicators to measure new technologies. Whether they can meet the requirements of the indicators will set a higher standard for the technical quality of new energy vehicles developed by self-owned brands, which is also a breakthrough in the current demand.
4.4 Lack of Self-owned Brand Quality Technology Sharing Platform
Nowadays, basic technology sharing can solve the problem that some self-owned brands are facing elimination due to their unqualified technical quality. However, the self-owned brand enterprises lack this technology sharing platform, especially in the case that the head self-owned brand has obvious technical advantages, the enterprise is in the perspective of technology protection, and there is a tendency to resist technology sharing. This makes the basic technology sharing resources of the head self-owned brand are not fully allocated, which to a certain extent there is a waste of technical resources. The lack of common basic technology sharing platform makes it difficult to achieve win-win cooperation between large-scale self-owned brands. Enterprises are not willing to share interests and risks, and it is difficult to get the optimal allocation of their own resources. To some extent, this restricts the development of self-owned brand automobile industry to high-end.

5. Wuhan Self-owned Automobile Brand Quality Promotion Strategy
At present, China's automobile industry is gradually aware of the importance of brand quality effect, and the state in the form of "Guidance" to enhance the quality of its self-owned brand to the level of strategic requirements. This directly defines the strategy of automobile power with quality first, and standardizes the overall requirements of high quality in the automobile industry. It can be seen from practice that the self-owned brand automobile has made great progress due to the national strategic requirements. However, the strategic requirements should also develop with the development of the times, to improve the quality strategic requirements of self-owned brands, and formulate strict automobile quality regulations.

5.1 Strictly Implement the Automobile Quality Regulations
Compared with European and American countries, the domestic automobile quality regulations are too loose, and the entry threshold is very low. The domestic self-owned brand automobile products have lower requirements in safety, environmental protection, anti-theft and energy saving than foreign brands, which makes the self-owned vehicle enterprises in a disadvantage position in the quality comparison competition with foreign brands. In order to promote the quality improvement of the self-owned car enterprises, the most direct way is to implement strict quality standards and regulations. This measure will eliminate some self-owned brands that do not meet the production standards, which will raise the threshold for the industry entry. What is positive feedback to consumers is the improvement of the quality of domestic self-owned brand vehicles.

5.2 Establish Quality Assurance and Traceability System for Self-owned Brands
The domestic self-owned brands formulate corresponding quality improvement projects in the whole process of product production, form a complete set of quality breakthrough production lines in the upstream and downstream industries of vehicle production, strengthen the research and development of new materials and new technologies, and achieve effective separation, so as to get rid of the dependence on foreign competitors' technology. Self-owned brand automobiles should be strictly controlled from the quality of appearance design, the quality of parts and components, the quality of vehicle assembly, and the quality of core technology, and more advanced Internet technology should be used to realize the effective combination of Internet and quality service.

5.3 Increase Support for the Development of Self-owned Brand’s New Energy and Intelligent Vehicle Service
With the increasing demand for new energy and intelligent connected vehicles, self-owned vehicle enterprises also have confidence in the development of new energy vehicles and intelligent vehicle. Judging from the current development trend of the automobile industry, whether or not to win the market of new energy in intelligent network vehicle is an excellent opportunity for self-owned brands to realize the revitalization of national brands. Whether the product quality can make a brand depends not only on the market, but also on the government's increasing support in this field, which makes Wuhan's self-owned automobile enterprises have sufficient funds for new technology research and the technical quality can be guaranteed.
5.4 Build a Basic Technology Sharing Platform for Quality
With the help of big data technology, Wuhan self-owned automobile enterprises build a basic technology sharing platform to realize sharing learning of different levels of market segments. Self-owned automobile enterprises can learn from each other. The sharing of basic technology not only solves the problem of waste of technical resources of automobile enterprises, but also realizes the optimal allocation of resources, so that the automobile enterprises can cooperate and share risks. In addition, the construction of this platform can effectively save the cost of infrastructure of automobile enterprises, which is of great significance in improving product quality, improving innovation ability and overcoming key technical problems.

6. Conclusion
Under the change of the environment, how to improve the quality of China's auto brand has become an important problem. The problems of domestic self-owned brands, such as the bottleneck of quality technology infrastructure, the imperfect quality assurance system and the lack of basic technology sharing platform, need to be solved. This paper focuses on the analysis of the challenges brought about by the changes in the environment, business model and demand, and some existing problems of Wuhan self-owned automobile brand, then puts forward the strategy of improving the quality of Wuhan self-owned automobile brand. From the implementation of strict quality laws and regulations, the establishment of self-owned brand quality assurance and traceability system, increasing support for the development of new energy and intelligent car service, and the construction of quality basic technology sharing platform to improve the existing problems, to achieve the purpose of improving the quality of Wuhan self-owned automobile brand.

Acknowledgments
This paper is supported by the Open Fund Project of Manufacturing Industry Development Research Center on Wuhan City Circle of Jianghan University under grant WZ2017Y08.

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