The Strategy Promotes Automobile Industry's Self-Innovation Ability under the Era of "Internet+"

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***Abstract*—The advent of the era of "Internet +" to accelerate the innovation of the auto industry, at the same time, it's impact and stimulate to the auto industry cannot be ignored. The automobile industry is knowledge and technology-intensive industry, the future competition will be based on the innovation ability of competition, vigorously promoting the self-innovation ability of auto industry has become the first task of auto industry economic structure adjustment and strategic development priority in China. This paper first discusses the necessity and the urgency of the improving the independent innovation ability of Chinese automobile industry, then analyzes the present situation and principal problems for the independent innovation of China's auto industry , finally, the dissertation puts forward the strategy on raising the Self-Innovation Ability of the auto industry.**

Keywords- Internet +; Auto Industry; Self-Innovation

I. INTRODUCTION

With the coming of the "Internet +" age, technological progress and industrial upgrading present a new booming trend, the cross-border integration of Internet and the car will bring dramatic change in automotive industry, the big change was driven by the Innovation and breakthrough on car safety, energy saving, information, intellectualize, networking and new energy, etc.

The automotive industry plays an important role in the manufacturing industry in our country, after entering the 21st century; China's automobile industry has been soaring in an amazing speed. and the output and the sales continued to increase, especially in recent years the rapid development of automobile industry, China has rapidly grown to become an automobile superpower. In 2015, China's production and sales increased 24.5 million cars, a world record. But compared with the advanced level in world, China's auto industry is relatively backward, lack of competitiveness in energy saving, intelligent manufacturing, technical innovation, information, etc, faced the bottleneck. Made in China 2025 has drawn up a grand blueprint for China's manufacturing industry development in the next decade, The depth integration of the Internet and traditional industries will occupy the commanding heights of the new round of development, therefore, China's auto industry should seize the development opportunity, to seek the independent innovation of auto industry.

II. THE NECESSITY AND URGENCY OF ADVANCING CHINA'S AUTOMOBILE INDUSTRY'S ABILITY FOR SELF-INNOVATION UNDER THE ERA OF "INTERNET+"

Internet has not only brought about the revolutionary progress in our workplace, entered many aspects of our daily life, but also brings people more widely digital demand for auto products--the combination of cars and the Internet will become the future development direction. With the coming of the era of Internet +,the function of the car is also quietly changing, has been from the earliest complex mechanical body gradually transformed into a complex mechanical and electrical integration of machinery, FRID, GPS, mobile communication and wireless network, became the inventor and user of the high and new technology. Internet + car is the combination of cloud computing, Internet of things and mobile terminals, this combination will produce a huge market, attract Internet companies, mobile operators and traditional automobile enterprises to join.

The future cars will be a mobile data from large factory, brakes, airbags, tire pressure and engine, etc, all the time produce vast amounts of data, and upload the data through wireless communication technology to the cloud, the big data analysis based on cloud platform can bring infinite play space for traditional auto makers. Undoubtedly, internet + car will be the next blue ocean in auto industry, has enormous developing and innovating space. Enhance China's auto industries' capacity for independent innovation is of great significance to promote the sustainable development of automobile industry, to explore countermeasures to promote the independent innovation ability of Chinese automobile industry is the utmost urgency.

III. THE PRESENT SITUATION FOR THE INDEPENDENT INNOVATION OF CHINA'S AUTO INDUSTRY

The Characteristics of China's Automobile Enterprises' Independent Innovation

China's automobile enterprises' independent innovation condition has different characteristics, mainly divided into two categories, one innovation power is represented by large auto group and backbone enterprise, another is represented by medium and small-size auto businesses, focused on independent development.

Large auto group and backbone enterprises is the important basis of auto industry in our country, research and development(R&D)spending significantly higher than the industry average level, and has set up its own R&D center. Because of the large market competitiveness and other causes, China's auto enterprise's self-exploitation ability is weak, China's auto enterprises in terms of technology, talents, scale, etc, are no longer competitive. But in recent years, with the independent innovation guide of nation policy, the independent innovation ability of car enterprises in China is also rising. Such as in the process of independent brand development, Shanghai Automotive Industry Corporation (SAIC) insists on independent development and deepens international cooperation. FAW through the cooperation with the foreign party, has trained a large number of technical management personnel, developed new products, and improve its own R&D ability.

Unlike large auto group, at the beginning of entering, China's independent R&D of small and medium-sized automobile enterprises already with independent research and development and the independent brand awareness, these enterprises' technology innovation is mainly for the independent R&D, but due to the lack of capital investment and technical strength, they commonly adopted to imitate advanced products at home and abroad technology learning.

The basic characteristics of two type's enterprises' self-innovation (see table 1.)

TABLE I. THE BASIC CHARACTERISTICS OF TWO TYPES ENTERPRISES' SELF-INNOVATION

The main content	Large state-owned auto enterprises	Independent brand small and medium-sized enterprises.
The technical development strategy of the enterprise	Through the introduction and absorbing foreign advanced technologies, adopt joint venture or corporative mode to develop new products, gradually enhance the level of technology, and form a relatively independent R&D ability	Starting from the product imitation, through continuous integration, use of resources at home and abroad to develop their own R&D ability, encourage the introduction and absorbing foreign advanced technologies
Market strategy	Start from independent, medium and high quality product	from the low price to the quality win strategy
The degree of control over research and development	Most technology from abroad, through the integrated innovation and secondary innovation gradually control the core technology	Most technology from domestic and foreign automobile enterprises, re-innovation based on absorb international mature technology and open technology
The market adaptability of product	The independent brand products market advantage is unclear	The independent brand of products in the low-end market get recognition, the exports continue to grow
R&D investments	R&D spending increased year by year, but its rate still remains low.	R&D intensity is higher, but the amount is still inadequate
Technological-talents training	Through personnel exchanges and training with multinational companies to cultivate talents, technology and management are seriously brain drain	Pay attention to talent introduction and nurture, through the way of "the poacher" to attract technology and management talent
The technological innovation	Enterprise' technology innovation system and function	Basic established car research and development institutions,

Data sources: The state council development research center of industrial economic research, China's automobile industry development report 2015[R]. Beijing: Social Sciences Academic Press

Chinese Automotive Industry's Independence R&D into the Status quo

China automotive industry yearbook of statistics, for nearly a decade, China's automobile industry R&D spending has been present growth trend. The R&D spending in 2006-2015 as shown in figure 1, in terms of the total amount of spending on research and development, the total R&D spending in 2006-2015 showed a trend of rapid growth, increased from 24.48 billion yuan to 24.48 billion yuan. But as far as R&D spending accounts for the proportion of revenue, China's automobile industry R&D spending accounts for the proportion of revenue in 2006-2008 shows the tendency of growth, and show downward trend since 2009, And since 2009 R&D spending accounts for the proportion of revenue are all below 2%. Thus it can be seen that, although in recent years China's automobile industry R&D spending in rapid growth, but compared with western developed countries, China's automobile industry independent R&D input intensity is still not very high.

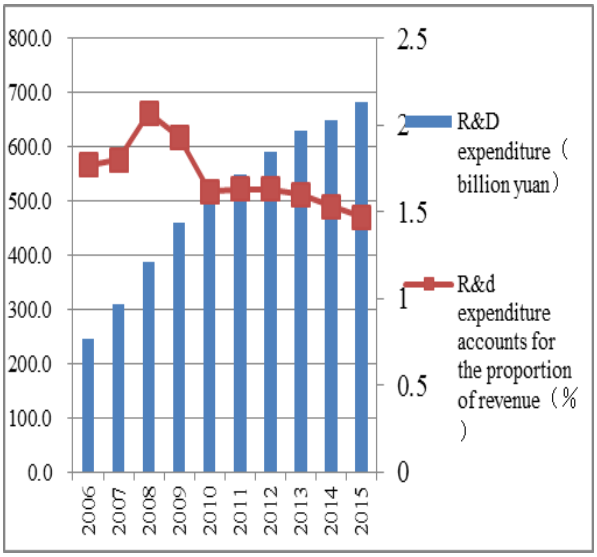

Figure 1. China's automobile industry R&D expenditure in 2006-2015

In addition, in the past decade, the engineering and technical personnel of the auto industry of China is also increase continually. China's auto industry engineering technical personnel number of specific circumstances in 2006-2015 as shown in figure 2, in terms of the total number of engineering and technical personnel, the number of China's automobile industry engineering technical personnel growth speed is very fast, in the 2006-2015 increased from 220,000 to 446,0000 persons, in addition, engineering and technical personnel account for the proportion of the total number of employees, in 2006-2015 the rate increased from 11.9% to 16.1%, a figure that has climbed steadily. It's easy to see the independence R&D capability and consciousness of our automobile industry are in gradually improved.

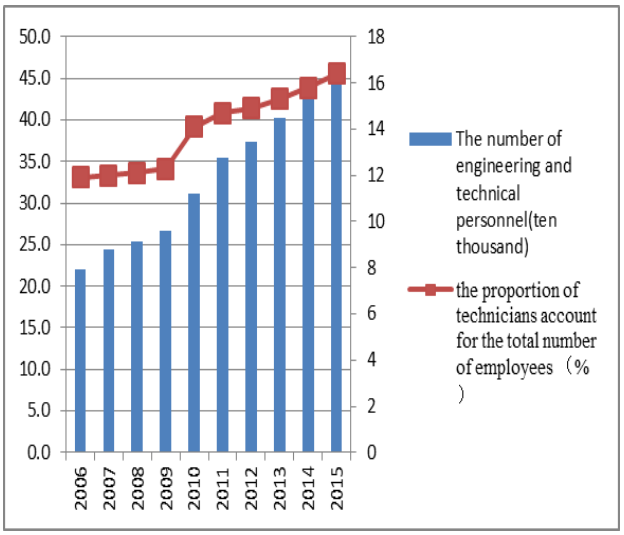

Figure 2. The number of China's auto industry's engineering and technical personnel in 2006-2015

IV. THE MAIN PROBLEMS FOR THE SELF-INNOVATION OF CHINA'S AUTOMOBILE INDUSTRY

Lack of R&D Funds, Shortage of R&D Personnel

In recent years, although the absolute number of R&D investment in China's automobile industry is in the rapid growth, But R & D investment accounted for the proportion of revenue has been relatively low, Since 2008, it has been under 2%, Ford, GM, TOYOTA and other foreign auto enterprises' R & D expenditures are generally accounted for about 4% of revenue. Thus it can be seen, to improve the ability of self-innovation of China's auto industry, automobile enterprises must further increase R & D investment.

In the automotive industry R & D personnel construction, in the past ten years, the proportion of scientific research personnel to the total number of workers showed a trend of gradual growth in automobile industry, 2006-2015, this proportion rose from 11.9% to 16.1%, but, in multinational company it accounts for about 30%, it can be seen that the construction of the engineering and technical personnel of the Chinese automobile industry still needs to be further strengthened. In addition, China's automobile industry engineering and technical personnel of the knowledge structure is relatively simple, the overall R & D capability is not very high.

The Independence R&D Capability of China's Automobile Enterprise is Insufficient

The independence R&D capability of China's automobile enterprise is insufficient, mainly displays the vehicle product and the spare parts research and development ability insufficiency. Compared with developed countries, the number of patent applications per year in China is limited and the quality is not high. On the one hand, China's large state-owned automobile group is a joint venture, the core technology of the car is often mastered by foreign countries, we do not have the key core technology. On the other hand, represented by the independent brand enterprises, the production of most products for the low-end market, small scale, low profit, this has a direct impact on the number of corporate R & D expenditures, but also indirectly affect the ability of independent innovation of enterprises.

In the vehicle development, although our country automobile enterprises have the vehicle integration technology and the body of the enterprise internal development ability, but like the chassis, electronic control and other key technologies are still controlled by foreign enterprises, In addition, China's auto parts industry tend to attach importance to the production, do not attach importance to the development, follow up on technology, less independent intellectual property rights, which leads to the ability of R&D is relative short.

V. THE COUNTERMEASURES OF IMPROVING THE INDEPENDENT INNOVATION ABILITY OF AUTOMOBILE INDUSTRY

Increase the Investment in R&D, Strengthen the Cultivation of Innovation Talents

To improve the ability of independent R&D of automobile enterprises in China, the focus is to increase investment in R & D and the introduction of automobile technology and training of automotive technology and management personnel.

Automobile enterprises to achieve the development as soon as possible, must rely on their own strength, develop products with core technology market competitiveness, the talent is the key to independent innovation, China's auto enterprises lack of relevant personnel, do not have a complete R & D team, therefore, China should step up the establishment of effective talent introduction and training mechanisms.

Seize the Opportunity to Promote the Development of Internet + Automobile

With the integration of Internet + car depth, electronics, mobile internet technology, internet technology, human vehicle internet technology and other high-tech means will be used more and more in conventional cars. Manufacturing cars is huge system engineering, a car from design to market

needs through a long development process. So, for the non-automotive industry of the Internet, IT companies, cooperate with the traditional car companies build more feasible. Only truly joint development can complement each other, promote the technical progress of both sides and mutual benefit between industries.

Vigorously Develop the Independent Brand

Firstly, the government should actively introduce relevant policies to encourage the development of auto industry, such as preferential fiscal and taxation policy, government procurement policy, etc.

Secondly, speed up the digestion, absorption and application of advanced technologies, increase the strength of the digestion and absorption and application of advanced technologies, this is China's independent brand automobile enterprise practical technology development route.

Thirdly, improve the level of product quality and brand awareness. At present, China's own brand car is still in the low-end market, the technical content of its products as well as the product's popularity is not high, as a result, automobile enterprises should pay attention to the construction of this area.

Enforce Construction of Talent Team

Independent innovation is ultimately relying on talent, however, the total number of personnel of Chinese auto industry has bigger gap, and there are a lot of gaps from the technical personnel to management.

Not only lack of R&D personnel, but also lack of interdisciplinary talents, more lack of knows both modern automotive technology and management of high-quality talent. Existing knowledge workers, the overall level is not high, lack of targeted training. And the staffs are mostly concentrated in the manufacturing sector, fewer talents in support and automobile production services. The talent team construction is the key to the personnel training, talent training is an important section of improve enterprise independent innovation ability; the car should be enhanced in future talented person's raise.

First of all, should play the role of college talent cultivation on car, to construct a group of colleges and universities into a domestic important auto talent training base.

Secondly, through the enterprises and research institutions to implement all kinds of talent cultivation plan again, upgrading the enterprise and research institutions' ability of talent cultivation, improving the level of practitioners knowledge and vision, enhancing their R&D capabilities.

Thirdly, enterprises, universities and research institutions should give play to their respective advantages in the areas resources and market and push related cooperation programs to bear early fruits.

Finally, encouraging science and technology and R&D personnel to participate in the activities of all kinds of innovation practice. At the same time, gather a group of auto high-end talents of science and technology and innovation team, inspire talent innovation enthusiasm.

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