

Intelligent Development of New Energy Vehicles under Information Technology

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Abstract: Due to the pressure of energy and environment, China's new energy vehicle industry has made great achievements in recent years. China has unique conditions to develop new energy vehicles. With the operation of large-scale technical facilities, China's domestic market is changing from fossil fuels to clean fuels. Based on the development of artificial intelligence, this paper studies the development status of new energy vehicles. This paper briefly introduces the progress and achievements of intelligent energy control of new energy vehicles, and looks forward to the further development trend of intelligent energy control of new energy vehicles. Facing the future, adhere to the development direction of China's automobile industry with new energy, intelligence and other emerging technologies, and support the high-quality development of the automobile industry with scientific and technological innovation, so as to further ensure the sustainable supply of energy and realize the sustainable development of the automobile industry.

1. Introduction

With the gradual formation of "automobile society", the number of cars is on the rise, while oil and other resources are stretched. A large number of gasoline vehicles continue to emit harmful gases and pollutants. However, the final solution is certainly not to limit the development of the automobile industry, but to develop new energy sources instead of oil. In the context of energy shortage and environmental pollution, the Chinese government takes the development of new energy vehicles as a major measure to solve energy and environmental problems and achieve sustainable development. Automobile manufacturers also take new energy vehicles as an important strategic direction to seize the commanding height of the automobile industry in the future.

2. Definition of New Energy Vehicles

New energy vehicle refers to the vehicle with advanced technical principles, new technologies and new structures, which is formed by taking unconventional vehicle fuel as the power source and combining advanced vehicle power control and driving technology. Unconventional vehicle fuels refer to fuels other than gasoline, diesel, natural gas (NG), liquefied petroleum gas (LPG), ethanol gasoline (EG), methanol, dimethyl ether, etc.

Affected by the economic crisis in the 1990s, the price of crude oil continued to rise. Therefore, new energy vehicles began to develop slowly. For the electric energy with high utilization rate, new energy vehicles have also been labeled as green environmental protection, energy conservation and emission reduction. Since entering the 21st century, they have been developed into important strategic emerging industries by countries all over the world. After more than 20 years of development, the global new energy vehicle industry has entered a period of rapid development. Governments and large automobile companies around the world have shifted from conservative wait-and-see to active R&D strategic investment(Lu Jinfu,2019).

3. Classification of New Energy Vehicles and Information Systems

New energy vehicles are mainly divided into electric vehicles and hybrid electric vehicle. See Table 1 below for details.

Table 1 Classification of new energy vehicles.

New energy vehicle	Type	Characteristic
Electric vehicle	Electric vehicle (EV)	Rely on charging the battery in advance to provide energy for the car.
	Fuel Cell Vehicle(FCV)	Power generation with hydrogen as fuel to provide energy for vehicles.
Hybrid electric vehicle	Hybrid electric vehicle (parallel)	Engine and motor are used as driving power.
	Hybrid electric vehicle (Series)	Engine is only used to start the generator, and the car runs on the generator discharge.

Compared with traditional fuel vehicles, the motor response speed of new energy vehicles is faster and more accurate, and the command operation of system commands is more accurate. At the same time, most of the starting batteries carried by traditional vehicles are 12V lead-acid batteries, which is not suitable for carrying many sensing instruments and electronic and electrical equipment in the future development. On the contrary, the power platform of new energy vehicles is more suitable for carrying and supporting the load of intelligent equipment, which is more in line with the requirements and direction of vehicle intelligent development. By March 2021, the top five new energy vehicles in the sales list are basically smart vehicles, and the average number of new energy vehicles has reached 75%. Figure 1 below is an analytical diagram of common new energy vehicles:

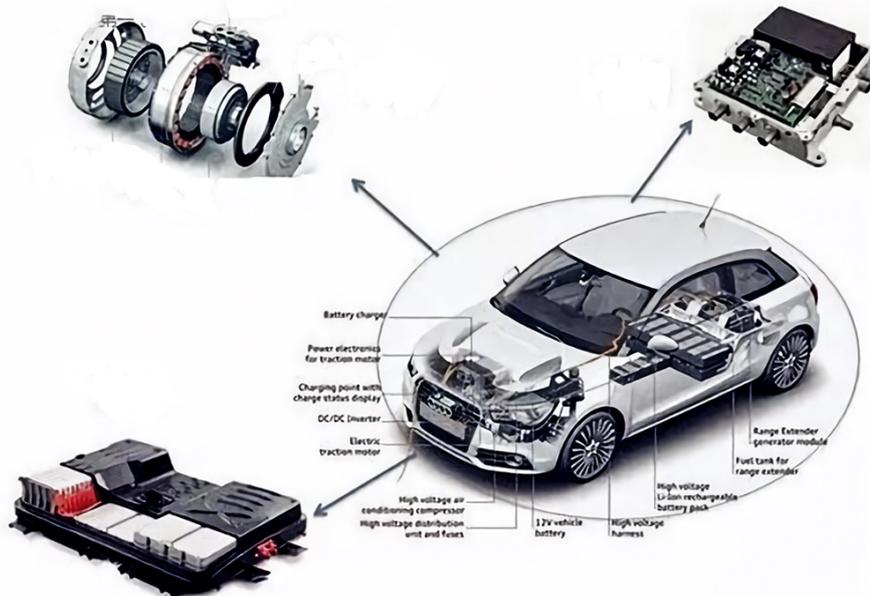


Figure 1 Analysis diagram of new energy vehicles.

4. Progress and Current Situation of New Energy

New energy vehicles refer to vehicles that use non petroleum fuels as the power energy of new energy vehicles, or mix petroleum fuels with new energy vehicles. The technology and structure of new energy vehicles are relatively novel. In particular, new energy vehicles have fully applied the latest technology of vehicle power control system and starting system. They are an updated means of transportation using high-end technology. In the context of China's sustained social and economic development, cars have entered thousands of households in China. According to the investigation of relevant public security and traffic management departments in China, by the end of 2021, the number of traditional fuel vehicles in China has reached 350 million. With the continuous improvement of the public's awareness of energy consumption and environmental protection, China has formulated energy conservation and emission reduction strategies, issued a series of strategies related to new energy vehicles, and increased financial subsidies for new energy vehicles. The new energy vehicle production industry has ushered in an important period of accelerated development.

5. Strategic Direction of Intelligent Development of New Energy Vehicles

China's market has both advantages and disadvantages for the development of intelligent networked vehicles, and China's automobile industry system is getting closer to perfection. At present, there is also a deep technical accumulation for vehicle manufacturing and modular platform construction, and the product quality has been continuously improved. The key technologies of domestic vehicle enterprises in different fields are also constantly breaking through. In terms of infrastructure construction, China's road network construction capacity, 5G communication capacity and the establishment of Beidou navigation satellite system have been in the forefront of the world, providing a basic guarantee for the development of intelligent vehicles.

Facing the increasingly prominent safety problems caused by traffic congestion and the increase of cars, it is not enough to promote green travel. Future new energy vehicles should be intelligently combined with vehicles equipped with modern information technology. Internet of things technology will be widely used in automobiles, and the Internet of vehicles will become the development direction of the automobile industry. In this context, new energy vehicles are also developing towards intelligence and networking(*Hu Tengfei, Liu Xiaoguang,2019*). In February 2021, 11 departments including the national development and Reform Commission, the Ministry of industry and information technology and the Ministry of science and technology jointly launched the innovation and development strategy of intelligent vehicles, and clearly pointed out that intelligent vehicles have become the strategic direction of the development of the global automobile industry.

6. New Energy Vehicles and Intelligent Realization of Information Technology

Relevant personnel proposed to use Internet thinking to look at the future automobile industry, build a combination of hardware and software to reconstruct the value chain of the automobile industry, so as to introduce more service content and innovative thinking. Cars are not only a means of transportation, but also people's mobile information terminals and interactive life scenes, which will generate new consumer demand and market opportunities. New energy vehicles and intelligent vehicles are the key to achieve important breakthroughs in China's automobile industry. The understanding of vehicle networking should be from the traditional "vehicle before network" to "network before vehicle".

Industry experts agree that the next outlet of the Internet of vehicles is to focus on users and constantly innovate mainstream technologies and business models. The Information Service Committee of China Automobile Industry Association shows that opportunities and challenges coexist in China's automobile industry. The opportunity lies in the continuous growth of domestic car ownership, the strong development of Internet applications, and the national promotion of Beidou navigation, broadband China, information consumption and other strategies. The challenge lies in China's large but not strong automobile manufacturing industry and relatively weak automobile service industry. After entering the era of "industry 4.0", the automobile industry is facing gradual transformation in the aspects of information application, ecological construction, service innovation and customer first. China can start with the Internet of the automobile industry, seize the commanding height of the competition of the automobile industry in the future, and realize the balanced development of automobile manufacturing industry and automobile service industry.

Intelligent vehicle design technology includes adaptive cruise system, active collision avoidance system, automatic start stop system, automatic parking system, vehicle steering signal system, night vision system, panoramic image, fatigue monitoring system, lane departure alarm system, etc., including auxiliary driving technology, automatic driving system, vehicle body stabilization system, etc. High tech intelligent vehicle technologies such as uphill assist system, such as voice intelligent control, navigation system, positioning interactive service, intelligent glass, intelligent airbag system, etc. With the development of various science and technology, the intelligent degree of automobile is higher and higher, which promotes the rapid development of society and provides better services for the society.

In the process of transformation, many external challengers from the Internet world, such as Google, Baidu, Microsoft and apple, are more dangerous competitors than the industry. Some people have pessimism that the Internet and IT enterprises can subvert various traditional industries, such as Jingdong shopping mall, Taobao subverting traditional retail businesses, Alipay subverting traditional finance as an example, so that the automotive industry is always at risk of being subverted. Because it is rooted in the soil of the emerging virtual economy, follows the game rules completely different from the real economy, and has the ability of Internet thinking that traditional enterprises do not have. Intelligent vehicle is a comprehensive system integrating environmental perception, information processing and multi-level computer-aided driving functions. It integrates cutting-edge technologies such as computer, modern information sensing, information processing, communication engineering, artificial intelligence and automatic control, and organically combines with traditional mechanical technology to form a high-tech complex.

7. Conclusion

In the era of information technology and Internet, the research on intelligent vehicles has become the development trend of the automotive industry. It combines the unparalleled advantages of safety, comfort and environmental protection, and will become the overlord of the automobile market in the future. China takes the development of new energy vehicles as a national strategy, speeds up the process of technology R&D and industrialization, and drives the development of communication, materials, electronics and other related industries. According to the suggestions of the State Council, energy-saving and new energy vehicles have become the development direction of China's automobile industry, and the next 10 years will usher in an important strategic opportunity period for the transformation and upgrading of the automobile industry. At present, China's automobile production and sales scale ranks first in the world and is expected to continue to grow in the future. We should seize the opportunity, seize the deployment, accelerate the cultivation and development of energy-saving new energy automobile industry, promote the optimization and upgrading of automobile industry, and realize the transformation from a large automobile industry to a strong automobile industry. At the same time, due to the impact of cost and technology maturity, cars have achieved the popularization of green, science and technology and intelligence.

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