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Research on Market Development and Innovation of Third-Party Automotive R&D Institutions

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Abstract

Against the backdrop of rapid iteration in the new energy vehicle industry and continuous upgrading of automakers' R&D systems, third-party automotive R&D institutions, as a vital part of the automotive industry's R&D chain, play a key role in compensating for automakers' R&D shortcomings, optimizing the allocation of industrial technical resources, and driving industrial technological iteration. To explore the market-oriented operation and innovative development paths of third-party automotive R&D institutions, this paper relies on cooperation cases with typical domestic automakers, selects traditional automaker AA Motors and new energy vehicle startups BB Motors and CC Motors as research subjects, and reviews the practical experience of market development and project resource management of the institution. By analyzing the evolution of cooperation models, pain points, and demand differences among automakers at different development stages and of different types, it summarizes differentiated market development strategies for third-party R&D institutions targeting mature traditional automakers and emerging automakers, and extracts three core cooperation models: joint vehicle development, specialized technology construction, and government-enterprise-institute tripartite collaboration. Meanwhile, considering the current red ocean competition in the industry, it proposes innovative optimization solutions from four dimensions: business philosophy, team structure, customer classification, and technical system. The research indicates that third-party automotive R&D institutions must abandon the single-minded cost-effectiveness competition mindset, focus on forward-looking technology R&D, process system construction, and differentiated service optimization, and achieve long-term development through tiered customer operation, professional team configuration, and standardized technology accumulation. This study aims to provide practical reference and theoretical guidance for third-party automotive R&D institutions to optimize market layout, enhance industrial competitiveness, and achieve high-quality sustainable development.

Keywords

Third-Party R&D Institutions; Automotive Engineering; Market Development; Business Innovation; Automaker Cooperation Models.

1. Introduction

1.1. Research Background

In recent years, China's automotive industry has entered a critical stage of transformation and upgrading. New energy vehicle technologies have gained rapid popularity, with market penetration rates continuing to rise, driving the automotive industry into a high-growth cycle. As consumers demand higher performance, intelligence, and safety from vehicles, automakers have increased R&D investment and diversified their R&D models. For most automakers, building a full-process, full-field R&D system entirely through independent R&D involves high

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costs, long cycles, and significant technical barriers. Thus, professional third-party automotive R&D institutions have become key partners for automakers to address R&D gaps, shorten development cycles, and control R&D costs.

Currently, competition in the automotive R&D service industry is intensifying, gradually entering a red ocean phase. A large number of small and medium-sized R&D service providers have entered the market, leading to severe homogenized competition in traditional basic R&D services. In this industry environment, leading third-party automotive R&D institutions face both opportunities brought by market expansion and multiple challenges, including upgrading automakers' R&D capabilities, low-end business involution, and evolving cooperation models. As some automakers mature, their independent R&D systems gradually improve, significantly reducing reliance on outsourced R&D services. Traditional turnkey R&D cooperation models are no longer sustainable, forcing third-party R&D institutions to optimize market development strategies and innovate business management models[1].

1.2. Research Significance

Practically, based on real cooperation cases with automakers, this paper sorts out cooperation differences between traditional automakers and new energy vehicle startups, and summarizes market development solutions tailored to different clients. It provides practical references for third-party automotive R&D institutions to optimize tiered customer management, adjust cooperation models, and integrate technical resources, helping institutions reduce market competition risks and enhance cooperation stickiness. Theoretically, combined with the current industry development status, this paper improves the business innovation system of third-party automotive R&D institutions, supplements research on the market-oriented development of the automotive engineering service industry, and offers theoretical support for industrial standardization and high-end transformation.

1.3. Research Methods and Content

This paper primarily adopts case analysis and review summary methods. Taking a third-party automotive R&D institute as the research subject, it sorts out project data and operational records of automaker cooperation projects from 2013 to 2017, and analyzes the cooperation evolution of three typical clients: AA Motors, BB Motors, and CC Motors. It also reviews practical experience in market development, resource allocation, and team management of the institution, identifies market development pain points and operational shortcomings, and proposes targeted innovative optimization strategies. The core content includes analysis of typical automaker cooperation cases, summary of market-oriented cooperation models, optimization of business management innovation, and recommendations for industrial development, focusing on the market survival and long-term development of third-party R&D institutions[2].

2. Relevant Concepts and Industry Development Status

2.1. Definition of Third-Party Automotive R&D Institutions

Third-party automotive R&D institutions are specialized organizations independent of vehicle manufacturers that provide professional engineering services such as automotive performance development, testing and inspection, technical R&D, and process construction. Equipped with professional R&D equipment, technical talent reserves, and mature development processes, these institutions can deliver customized R&D services to automakers, bridge gaps in automakers' R&D resources, and meet the R&D needs of automakers of different scales and at different development stages.

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2.2. Industry Development Status

Currently, China's third-party automotive R&D industry exhibits a polarized development trend. On one hand, the low-end basic R&D service market has a low entry threshold, attracting numerous small and medium-sized institutions, resulting in severe homogenized competition, frequent price wars, and continuous compression of industrial profit margins. On the other hand, high-end forward-looking technology R&D, vehicle platform development, intelligent performance optimization, and other high-end business areas have high technical barriers, giving leading R&D institutions a distinct technological advantage. Meanwhile, automakers' R&D capabilities are gradually diverging: traditional independent automakers continue to improve their self-developed systems, while new energy vehicle startups focus on targeted technology R&D. Their demand for third-party R&D services has shifted from simple project outsourcing to system co-construction and technology co-creation, imposing higher requirements on the comprehensive service capabilities of R&D institutions[3].

3. Analysis of Cooperation Cases with Typical Clients of Third-Party Automotive R&D Institutions

3.1. Traditional Automaker Case: Cooperation Review with AA Motors

As a leading domestic independent automaker, AA Motors is a strategic partner of the third-party automotive R&D institute in this study. Their long-term cooperation clearly reflects the R&D growth path of mature traditional automakers and the evolution of cooperation models. Based on cooperation data and project records from 2013 to 2017, the cooperation between the two parties can be divided into two core stages.

The first stage (2014–2016) was a period of synchronous growth cooperation. During this period, AA Motors' vehicle sales rose rapidly, with weak independent capabilities in vehicle performance development and imperfect R&D processes, leading to heavy reliance on external R&D resources. The institute focused on special performance development projects as core cooperation content, undertaking numerous outsourced R&D projects for AA Motors and supporting the improvement of its basic R&D processes. At this time, the growth rate of automaker sales was basically synchronized with the growth rate of cooperation volume, representing a typical basic business outsourcing cooperation model.

The second stage (2016–2017) was a period of cooperation model transformation. AA Motors increased R&D investment, expanded its R&D talent pool, and built a professional R&D team of over 10,000 members, with core staff being 8–12 years of senior technical personnel. Meanwhile, it built its own testing and verification platform by referencing the laboratory hardware configuration of third-party R&D institutions, integrated high-quality international automotive R&D resources, and established a dedicated product development system. After the self-developed system matured, AA Motors' demand for outsourced R&D services decreased significantly. From 2016 to 2017, the growth rate of cooperation volume between the two parties was notably lower than the automaker's own growth rate, and traditional turnkey cooperation projects continued to shrink[4].

In terms of the evolution of cooperation content, the cooperation model between the two parties from 2013 to 2017 showed a clear iterative pattern: initially dominated by turnkey cooperation on performance development projects, gradually shifting to technical personnel leasing and semi-turnkey development services in the mid-term, and finally focusing on high-end cooperation in forward-looking technology R&D and R&D verification testing. The changes in the cooperation model directly reflect AA Motors' development process from relying on external technology to maturing independent R&D. In 2017, AA Motors' sales exceeded 1.2 million units, achieving a leapfrog upgrade from quantitative to qualitative change, with its

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technical competitiveness ranking among the top domestic independent automakers and moving toward becoming an internationally mainstream automotive group.

The cooperation case with AA Motors leads to the conclusion that for mature traditional automakers with sound R&D structures and complete functional departments, the traditional turnkey project cooperation model is not sustainable in the long run. Only by focusing on forward-looking technologies, optimizing verification methods, and innovating cooperation models can third-party R&D institutions meet the high-end R&D needs of automakers after technological upgrading and maintain long-term cooperative relationships.

3.2. New Energy Vehicle Startup Case: Cooperation Review with BB Motors and CC Motors

Table 1. Cooperation Differences Among the Three Types of Automakers

Comparison Dimension	Traditional Automaker (AA Motors)	New Energy Vehicle Startup (BB Motors)	New Energy Vehicle Startup (CC Motors)
Enterprise Development Attribute	Mature Traditional Independent Automaker	Emerging New Energy Vehicle Enterprise	Emerging New Energy Vehicle Enterprise
R&D System Maturity	Mature in later stage, weak in early stage	Imperfect, long construction cycle	Imperfect, long construction cycle
Core Cooperation Model	Turnkey → Semi-turnkey → High-End Technology R&D	Turnkey Performance Development Projects	Turnkey Performance Development Projects
Market Development Approach	Gradual penetration through long-term strategic cooperation	Single-point breakthrough via single project bidding	Single-point breakthrough via single project bidding
Core Cooperation Pain Points	Lack of R&D processes in early stage	Incomplete team, high market pressure	Incomplete team, high market pressure
Cooperation Development Trend	Reduced basic business, increased high-end technology cooperation	Systematic and in-depth comprehensive cooperation	Systematic and in-depth comprehensive cooperation

BB Motors and CC Motors are high-quality enterprises among new energy vehicle startups, with clear long-term development plans and a focus on product quality and technical R&D. However, limited by their establishment time, they share common pain points: imperfect R&D systems, long team building cycles, and high pressure from market product iteration. Their cooperation models with the institute are highly similar, serving as typical cases for third-party R&D institutions to develop markets for emerging automakers.

In terms of cooperation business, both new energy vehicle startups take turnkey performance development projects as core cooperation content, characterized by systematic and integrated development covering core performance segments such as chassis and NVH. In the early stage of market development, the institute adopted a single-point breakthrough cooperation strategy: achieving initial cooperation through bidding for single projects such as chassis development and NVH optimization based on cost-effectiveness advantages, then gradually expanding business scope after technical docking, and establishing systematic and comprehensive R&D cooperation relationships. This model aligns with the premium development rule of turnkey projects in the engineering service industry. To clearly distinguish cooperation differences among the three types of automakers in this study, a comparative analysis table is organized as follows table 1[5].

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Based on cooperation practices with the two emerging automakers, the institute has summarized three types of market-oriented cooperation strategies tailored to high-quality emerging automakers and traditional growth-oriented automakers, forming a standardized market development model to address red ocean competition in the industry.

3.2.1. Systematic Vehicle Development Cooperation for Multi-Region Resource Collaboration

Leveraging R&D resources in multiple regions including the automaker's location, Shenzhen, Changzhou, Tianjin, and Germany, a multi-core collaborative R&D system is established, and joint special project teams are formed. Throughout the entire vehicle development cycle, high-quality R&D resources are allocated to support the automaker's R&D team in completing the development of new models and platforms. The multi-region collaborative office model integrates technical, equipment, and talent resources from different regions, helping automakers shorten R&D cycles and efficiently complete vehicle development tasks, while strengthening business ties between the institution and automakers and enhancing customer stickiness.

3.2.2. Building Specialized Technology Platforms to Deepen Core Performance Modules

Giving play to the technical platform advantages of third-party R&D institutions, business segments are divided by professional fields such as chassis, NVH, and power performance. The institution assists automakers in improving R&D processes, building testing facilities, and optimizing product supporting systems, supporting automakers in constructing core performance R&D systems. The two parties conduct in-depth cooperation focusing on core technical modules, forming a mutually beneficial symbiotic relationship, transforming from simple project outsourcing to technology co-creation, and increasing the added value of cooperation.

3.2.3. Promoting Government-Enterprise-Institute Tripartite Cooperation to Build Industrial R&D Platforms

Collaborating with automakers and local governments to establish new joint R&D institutions and build regional third-party automotive industry R&D platforms. On one hand, policy resources are leveraged to secure R&D innovation grants at all levels, reducing joint R&D costs and jointly developing market-oriented products such as high-performance intelligent vehicles. On the other hand, a public industrial technology R&D platform is built to provide R&D services for automotive enterprises in the region. This model achieves a win-win-win situation: automakers develop high-quality products, governments implement industrial policies, and institutions expand business channels, serving as a key means for high-end market layout.

4. Innovative Optimization Strategies for Third-Party Automotive R&D Institutions

4.1. Optimize Business Philosophy and Expand Service Boundaries

Based on practical experience in cooperating with various types of automakers, third-party R&D institutions must break the limitation of focusing on single performance segments and expand the scope of engineering services. The business should cover full-process services including R&D system construction, pre-project research, performance scheme planning, engineering implementation, production quality control, and performance testing and verification. Meanwhile, resource allocation logic should be optimized, abandoning the single-minded cost-effectiveness evaluation standard and introducing a project value assessment system. Based on automakers' market positioning and development potential, clients are categorized into three types: potential guiding, growth-oriented, and complementary, with targeted allocation of human and technical resources to achieve market premium.

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In terms of team structure, technical personnel are divided into 4–6 professional performance development groups to undertake integrated vehicle development tasks. The functional positioning of professional technical departments is clarified, with the core goal of improving R&D quality and efficiency, providing technical support for project execution teams. A research achievement transformation incentive mechanism is established to convert technical verification and research results into commercial engineering projects, stimulating team innovation vitality and achieving sound collaborative development between technical departments and execution teams.

4.2. Improve Technical System and Consolidate Industrial Competitive Advantages

Based on practical project experience, the technical framework is improved from three dimensions: business segments, process systems, and talent cultivation. First, tiered local project teams are built in line with regional market characteristics to meet customized development needs of different regions and clients. Second, project processes are continuously refined to construct a standardized and normalized development system, translating practical experience into internal operational standards. Third, professional performance technical experts are cultivated to provide technical guidance for project execution, while market-oriented project directors are trained to accurately reflect industrial market dynamics and reverse-optimize R&D directions.

Supported by mature R&D teams and world-class development equipment, a modular and customized service system is built to provide differentiated services for different clients. Meanwhile, project technical data is continuously accumulated, internal process specifications are optimized, and active participation in the formulation and revision of industrial standards is pursued to gradually enhance industrial discourse power and evolve into top-tier automotive R&D institutions.

4.3. Classify Client Cooperation Paths for Differentiated Operation

To precisely meet the cooperation needs of different types of automakers, three types of client cooperation and operation paths are defined based on industrial practical experience, enabling refined customer management.

Guiding Cultivation Path

Targeting emerging new energy vehicle startups with immature R&D systems, mature R&D processes are introduced to assist enterprises in product development and team building. Technical resources are rationally allocated to deliver high-end customized services, achieve market premium, and capture the high-end R&D service market for emerging automakers.

Complementary Growth Path

Targeting mature automakers with proprietary self-developed processes, core technical teams are assigned to deeply participate in key projects such as platform development and quality system construction of automakers. Advanced technologies and management experience are absorbed during cooperation to break through own technical bottlenecks, achieving mutual technical complementarity and joint growth.

Deep Binding Path

Professional vehicle performance development teams are built, and composite technical talents are specifically cultivated. Focusing on customized R&D needs of automakers, key cooperation projects are deepened to support automakers in developing blockbuster products. Long-term clients are bound through high-quality projects to achieve win-win cooperation.

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5. Conclusion and Outlook

5.1. Research Conclusion

Taking a third-party automotive R&D institute as the research subject, this paper reviews cooperation cases with AA Motors, BB Motors, and CC Motors, analyzes differences in R&D needs and evolution rules of cooperation models between traditional automakers and new energy vehicle startups, and draws the following research conclusions. First, after mature traditional automakers improve their independent R&D systems, demand for basic outsourced business continues to decrease, forcing third-party R&D institutions to transform toward high-end forward-looking technology R&D. Second, new energy vehicle startups have imperfect R&D systems, making the single-point breakthrough and gradual deepening cooperation model suitable. Multi-region collaboration, technology co-creation, and tripartite cooperation are optimal solutions for emerging automakers. Third, amid red ocean competition in the industry, institutions must abandon low-price competition thinking and achieve differentiated development through client tiering, team optimization, and technology accumulation. Fourth, technological innovation and operational structure optimization are core to long-term development, requiring the coordinated matching of technical and management resources and enhanced comprehensive service capabilities.

5.2. Development Outlook

In the future, the automotive industry will continue to develop toward new energy, intelligence, and high-end positioning, leading to more diversified and refined R&D needs for automakers. Third-party automotive R&D institutions should continue to deepen their expertise in automotive engineering services, optimize team echelons, and improve standardized R&D processes. They should focus on cutting-edge technologies such as intelligent driving, new energy power, and vehicle lightweighting, increase research achievement transformation efforts, and deepen the government-enterprise-institute tripartite cooperation model to build regional and industrial public R&D platforms. Meanwhile, they should accurately classify client types, implement differentiated service strategies, continuously accumulate technical experience, and participate in the formulation of industrial standards. Through comprehensive innovative optimization, they will gradually enhance industrial competitiveness, build professional and international first-class automotive R&D enterprises, and empower the high-quality development of China's automotive industry.

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