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Research on the Construction of a Private Domain Full-Life Cycle Operation Platform for Automotive Brands

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Abstract: This paper presents an integrated private domain operation platform designed for new energy vehicle manufacturers, covering four core modules: potential customer acquisition, marketing outreach, refined operations and maintenance, and data review. The platform integrates automotive-specific features such as social media traffic generation, referral-based viral growth, AI-powered automated marketing, and multi-dimensional user tagging and profiling. By connecting diverse customer acquisition channels, it enables tiered user management and a closed-loop operational cycle. The platform effectively accumulates brand-owned user assets, reduces customer acquisition costs, and improves conversion efficiency, providing a practical technical framework and theoretical foundation for automakers' private domain development and dealer performance evaluation.

Keywords: New energy vehicles, private domain traffic, user full lifecycle, refined operations, community platforms, digital marketing.

1. Introduction

The domestic new energy vehicle market has shifted toward competition in existing demand, with brand rivalry evolving from product hardware upgrades to user operation capabilities. New players such as NIO, Li Auto, and XPeng have leveraged apps, enterprise WeChat, and car owner groups to accumulate private domain assets, relying on word-of-mouth referrals from loyal customers to reduce costs and improve efficiency. In contrast, most traditional automakers still depend on 4S dealerships, making it difficult to directly connect with users. After public domain marketing campaigns, traffic quickly dissipates due to the lack of long-term nurturing mechanisms, revealing significant shortcomings in user operations. As a high-value, durable consumer good with a long decision-making cycle, automobiles involve a user lifecycle lasting 3 to 5 years, requiring automakers to establish sustainable communication channels. Private domain operations aim to convert public domain traffic into controllable platforms—such as enterprise WeChat and communities—to enable continuous, low-cost one-to-one engagement. However, current general-purpose private domain SaaS tools are primarily designed for fast-moving consumer goods and lack support [1-2] for automotive-specific scenarios like test drive invitations, referral programs by existing customers, after-sales maintenance, and offline events. Additionally, most automakers still rely on subjective judgment in private domain operations, lacking quantifiable evaluation models that would enable horizontal comparisons and ongoing optimization across multiple dealerships and regions.

This paper designs a full-chain private domain operation platform for new energy vehicles, achieving dual significance: practically, it establishes an integrated platform that connects automakers, dealers, and users directly, accumulating controllable digital assets of vehicle owners for the brand, reducing customer acquisition costs, and enhancing operational quality throughout the entire lifecycle; theoretically, it introduces a multi-objective decision-making model into the evaluation of automotive private domains, providing a complete calculation formula for operational metrics, addressing the challenge of quantifying performance evaluation, and filling the gap in quantitative research in this field.

2. Current Research Status at Home and Abroad

2.1. Current State of Research on Domestic Private Domain Operations

Domestic academic research on automotive private domain operations primarily focuses on two directions: qualitative studies of marketing strategies and the implementation of digital tools. At the marketing strategy level, scholars have proposed a five-stage model encompassing lead generation, community cultivation, conversion and sales, customer retention, and viral referrals, as well as a closed-loop framework of "public domain traffic acquisition—private domain user retention—precision operation—repurchase and referral." However, these models are largely qualitative and lack technical platform architecture and quantitative evaluation models. Regarding tool implementation, current solutions each have significant shortcomings: self-developed apps face high download barriers and are ineffective for traffic acquisition; third-party referral tools offer limited functionality and cannot support long-term operations; and dealer community software suffers from severe data silos, preventing automakers from accessing comprehensive data or conducting unified performance assessments. As a result, China lacks an integrated private domain operation platform covering the entire customer lifecycle, and no mature quantitative evaluation model has yet been established. This paper takes this gap as its innovation point, simultaneously advancing research on platform architecture design and the development of quantifiable assessment models.

2.2. Current Status of Overseas Private Domain Operations Research

In the field of overseas marketing, there is no concept

equivalent to the "private domain traffic" found in domestic markets. Instead, the theoretical foundation lies in Customer Lifetime Value (CLV) theory and Customer Relationship Management (CRM) theory. In foreign markets, automobiles are considered high-involvement commodities, where long-term, stable two-way interactions between brands and consumers significantly enhance customer loyalty and increase the likelihood of repeat purchases, upgrades, and referrals. However, existing international literature primarily focuses on customer relationship marketing strategies, with almost no research addressing the platform architecture for community-based private domain operations within the WeChat ecosystem. The mathematical expression for customer lifetime value is shown in Formula [3-5] (1).

$$CLV = \sum_{t=0}^{n} \frac{(R_t - C_t)}{(1+i)^t} \quad (1)$$

Where CLV represents CLV customer lifetime value, R_t denotes C_t the revenue generated by the user for the brand during the t-th operational cycle, C_t represents the operational costs incurred by the enterprise during the t-th operational cycle, n is the user lifecycle duration, and i is the discount rate. Formula (1) indicates that extending the user lifecycle and reducing operational costs can significantly enhance customer value. Although overseas automakers have adopted CRM systems early on, they rely primarily on email and SMS, which are ill-suited to China's WeChat community environment. Moreover, these systems lack localized features such as test drive invitations, dealer tiering, and referral programs for existing customers, resulting in high implementation costs and poor adaptability when directly introduced into the domestic market.

3. Platform Architecture Design

3.1. Platform Objectives

The integrated private domain community operation platform is developed for new-energy domestic automakers and their nationwide authorized dealers. The overall goal of the platform is to leverage online digital community management tools to establish a full-cycle closed-loop private domain ecosystem, covering lead generation, marketing outreach, refined operations, and data analysis review. This addresses the shortcomings in automakers' back-end support across key business areas such as community management, lead nurturing, and long-term customer service.

The platform development follows three core principles: First, it focuses on consolidating user assets across all channels by integrating diverse traffic sources—such as short-video platforms, offline auto shows, store foot traffic, and referrals from existing customers—into controllable private domains like WeCom (Enterprise WeChat) and car enthusiast communities in a compliant manner. Second, it emphasizes cost reduction and efficiency improvement by leveraging AI tools to handle high-frequency customer inquiries and enabling precise, personalized marketing through user tagging and profiling, thereby reducing labor costs and enhancing campaign effectiveness. Third, it prioritizes process control and measurable outcomes by enabling automakers to monitor real-time operational data from dealerships nationwide, establishing a quantifiable evaluation system, comparing store performance horizontally, and guiding iterative optimization of underperforming operations.

3.2. Platform Ring Business Architecture

The platform is structured into a three-tier closed-loop system based on user lifecycle: traffic acquisition layer, marketing engagement layer, and refined operations layer.

(1) Traffic Inflow Layer: Aggregates leads from short videos, offline auto shows, in-store visits, and referrals by existing customers, while tagging the source channel.

(2) Marketing Engagement Layer: Deliver test drive invitations, new vehicle information, promotional campaigns, maintenance reminders, and other content tailored to different audiences, including potential customers, interested buyers, prospective owners, and existing owners.

(3) Fine-grained Operations Layer: Achieve tiered operations through AI customer service, message aggregation, and user tagging and profiling to maintain long-term communication between the brand and users.

4. Research on the Adaptation of Private Domain Customer Acquisition Module Functions to Automotive Business Scenarios

Private domain customer acquisition marks the starting point of operations, aiming to legally and effectively bring potential consumers from public domains into a brand's private domain pool. Online social media efforts rely on platforms such as Douyin and Xiaohongshu, while offline activities include auto shows, test drive events, and in-store foot traffic—among which referrals from existing customers yield the highest conversion rates and lowest acquisition costs. Once users enter the pool, they move into the marketing engagement phase. The pool includes diverse groups such as non-visit prospects, trial-drive-intention customers, near-purchase candidates, and both new and returning owners. Sending generic messages indiscriminately risks user resistance; thus, specialized tools are essential for achieving targeted, personalized outreach. Broad, unrefined messaging is unsuitable for long-term operations. Instead, refined modules powered by AI enable layered, categorized, and scenario-based precision management of private domain users, ensuring effective communication and improved user retention.

4.1. Social Media Traffic Generation Feature

Currently, public platforms such as Douyin, Xiaohongshu, and Video Accounts strictly regulate off-site traffic redirection. Directly leaving contact information may result in content restrictions or removal. This platform's social media referral module offers a compliant solution: operators can generate customized lead-generation material packages tailored to each platform, including keywords, automated private message responses, and referral posters. Fans simply send the designated keyword to receive instructions on how to add the consultant via WeCom. The backend automatically assigns traceable tags to each referral path, records channel sources, and tracks new potential leads from each platform, enabling secure and measurable private domain [6] lead generation. The mathematical expression for cost per lead from a single channel is shown in Formula (2).

$$C_i = \frac{B_i}{N_i} \quad (2)$$

Here, C_i represents the cost per lead acquired through channel i, B_i represents the total advertising budget allocated

to channel i, and N_i represents the total number of potential customers successfully directed into the private domain pool via channel i. By using this formula to calculate customer acquisition costs across different new media channels, marketing budgets should be prioritized toward channels with higher lead quality and lower acquisition costs, enabling dynamic optimization of public-domain advertising spending.

4.2. WeChat Moments Automated Marketing Feature

WeChat Moments has become a crucial platform for sales consultants to promote vehicle models. However, under traditional methods, content versions are inconsistent, messaging varies, and posting times differ, making it difficult for automakers to maintain centralized control. The automated WeChat Moments marketing tool offers four core capabilities: unified content management, scheduled publishing, one-click distribution across multiple accounts, and tracking of engagement performance. Automakers can upload promotional materials—such as new model announcements, promotional campaigns, and brand educational content—to a centralized library and distribute them instantly to dealerships nationwide. Dealers select specific sales consultant accounts and set preferred posting times; the system then automatically publishes the content at the designated time, ensuring consistency in both messaging and timeliness. The mathematical expression for the Moments interaction conversion rate is shown in Formula (3).

$$\eta_i = \frac{Q_i}{V_i} \times 100\% \tag{3}$$

Here, n_i represents the interaction conversion rate of the i-th social media post; Q_i denotes the number of users who inquired about vehicle models after that post was published; and V_i is the total number of private domain users who were able to view that post. Operations personnel use this interaction conversion rate to evaluate how different types of promotional content attract potential customers and guide future content creation strategies.

4.3. AI Capabilities Empowering Marketing

As the community and user base expand, sales consultants struggle to respond in real time around the clock, and delayed responses can diminish lead interest and damage customer experience. This platform employs a collaborative model combining AI-powered customer service with human agents: operations staff build a dedicated automotive knowledge base in the backend, inputting standardized, high-frequency Q&A content such as vehicle configurations, store hours, test drive appointments, maintenance schedules, after-sales rescue services, warranty policies, and referral incentives. When users initiate inquiries, the AI agent automatically identifies intent and matches it with relevant knowledge base entries for instant replies. For complex issues that require negotiation—such as pricing discussions, complicated after-sales disputes, or customized purchase plans—the system automatically generates a ticket and routes it to a dealership's human customer service representative for follow-up. This approach effectively offloads repetitive inquiries, significantly improves response speed, and enhances the overall private domain user experience.

4.4. Customer Tag and Profile Management Function

Multidimensional user tag profiles serve as the technological foundation for automakers to achieve precise operations. This platform enables operation personnel to assign custom tags to each private domain user, with the tagging system covering four key dimensions, as detailed below:

(1) Lead status tags: Record the user's decision stage and demand characteristics, including uncontacted leads, scheduled test drives, preferred vehicle type (SUV/sedan/MPV), budget range, and intended purchase timing, helping sales teams manage follow-up pacing effectively.

(2) Vehicle Attribute Tags: For existing vehicle owners, link specific model details, license plate registration date, mileage, last maintenance time, and other information to provide data support for after-sales service and timing decisions regarding upgrades or replacements.

(3) User Behavior Tags: Track users' interaction patterns across brand touchpoints, such as attending offline test drives, participating in car owner road trips, or claiming maintenance coupons, to reflect user engagement levels and preference tendencies.

(4) Channel Attribution Tag: Indicates the source channel through which a user first entered the private domain pool, including channels such as Douyin referral, Xiaohongshu referral, auto show referral, and referrals from existing customers, enabling evaluation of customer acquisition quality and return on investment across different channels.

The vast amount of tag data is aggregated to create personalized user profiles for each private domain customer, enabling clear and distinct user segmentation. When conducting marketing campaigns, operators can precisely target specific audiences by combining multiple tags. For instance, they can send new SUV launch benefits exclusively to potential customers interested in SUVs, or offer anniversary maintenance discounts only to owners who have had their vehicles for over a year. This approach eliminates indiscriminate advertising harassment and significantly improves engagement and conversion rates.

5. Platform Comprehensive Benefit Analysis

5.1. Economic Benefits

(1) From the automaker's perspective: The platform channels public domain leads into the brand's proprietary asset pool, enabling automakers to directly connect with users and accumulate controllable digital assets, rather than leaving potential customer resources solely in dealers' hands. Leveraging a referral-based lead generation function from existing owners, automakers can obtain low-cost, high-quality leads through word-of-mouth from current customers, effectively reducing long-term public advertising costs. Through precise marketing campaigns powered by a multi-dimensional tagging system, the platform significantly reduces ineffective ad disruptions, improves user reach and conversion efficiency, thereby boosting vehicle order conversion rates and after-sales service repurchase revenue, extending the lifetime value of vehicle owners, and fueling sustainable brand growth.

(2) At the dealership store level: AI customer service

automation tools can handle a large volume of frequent, standardized inquiries within communities, significantly reducing repetitive human effort in community operations and enabling sales consultants to focus on high-value follow-up tasks. The AI private messaging aggregation capability ensures timely consolidation of potential leads across all channels without omission, lowering the risk of losing high-value prospects and accelerating the conversion process from interest to order. This overall enhances store sales efficiency and lead utilization quality, achieving dual goals of cost reduction and performance improvement.

5.2. Management Efficiency

This platform has established a digital control hub for automakers, enabling real-time monitoring of dealer community operations across the country and centralized management of marketing content. It effectively addresses past issues such as inconsistent private domain capabilities and fragmented brand messaging among regions. Additionally, by integrating an entropy weight-TOPSIS quantitative evaluation model, it objectively generates comprehensive performance scores for each dealership's private domain operations, providing scientific data support for operational assessments and incentive-based reward or penalty mechanisms. This drives the national private domain management toward a standardized, digitalized, and refined virtuous cycle.

5.3. User Experience Benefits

Precise tag-based user profiling enables targeted marketing content delivery, effectively reducing disruptions from irrelevant ads for potential and existing customers, thereby making every touchpoint more valuable. The integration of AI-powered smart customer service significantly improves response speed to user inquiries, ensuring immediate and efficient interaction experiences. Meanwhile, the registration process for online and offline car enthusiast events has been simplified, lowering participation barriers and boosting user engagement. Together, these initiatives create a smoother and more considerate end-user service experience, strengthening new energy vehicle owners' sense of belonging and loyalty toward domestic brands, while laying a solid foundation for increased future upgrade and repurchase intentions, as well as higher referral rates from satisfied customers.

6. Conclusion

The private domain operation platform developed in this paper can fulfill four core functions: customer acquisition, marketing, operations, and data analysis. The platform can be iteratively upgraded in four aspects going forward: first, integrating data interfaces with automakers' DMP, CRM, and after-sales systems to enable seamless business data exchange and enrich user profile dimensions; second, incorporating a fine-tuned large language model tailored for the automotive industry to automatically generate personalized marketing copy and community content, thereby alleviating operational pressure; third, adding new operational modules targeting niche interest groups such as off-road modification and family road trips to enable deeper, community-based engagement; and fourth, introducing new evaluation metrics—such as after-sales maintenance conversion rate and referral success rate—on top of existing indicators to continuously refine the performance assessment system.

The platform leverages key technologies such as social media traceability and traffic generation, viral growth through existing vehicle owners, automated marketing in social circles, AI-powered private message aggregation, multi-dimensional user profiling, and comprehensive data dashboards to help automakers accumulate their own digital user assets, reduce customer acquisition costs, improve conversion efficiency, and strengthen digital control over nationwide dealer community operations. The Entropy Weight-TOPSIS model provides an objective and practical quantitative tool for horizontally comparing regional operational performance and conducting quality evaluation and supervision. The research outcomes offer a theoretical framework, mathematical models, and actionable solutions for the construction and performance assessment of private domain platforms among domestic new-energy autonomous brand automakers.

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