Mechanism Analysis of Private Domain Traffic Operation Empowering the E-commerce Transformation of Physical Retail Industry — A Research Review and Mechanism Deconstruction

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Abstract: *The deep integration of the digital economy and the real economy has revolutionized traditional brick-and-mortar retail, rendering the offline passenger flow-dependent static business model increasingly obsolete. Widespread industry pain points—overreliance on public domain traffic, exorbitant customer acquisition costs, feeble user loyalty, and disconnection between online and offline operations—have severely hindered the high-quality e-commerce transition of physical retailers. Characterized by autonomous control, repeatable user outreach, low marginal costs, and high customer lifetime value, private domain traffic has emerged as a pivotal solution for retailers to mitigate traffic-driven market competition and realize seamless omni-channel growth. This paper adopts literature review, mechanism deconstruction, and comparative analysis to establish an integrated research framework encompassing research overview, transformation predicaments, empowerment mechanisms, cross-model comparisons, practical constraints, optimization strategies, and concluding prospects. Drawing on two comparative analytical frameworks—one contrasting public and private domain operational models, the other examining transformation capacities of retail players of varying scales—this study systematically unpacks the internal transmission pathways through which private domain traffic facilitates physical retailers' e-commerce shift. The findings reveal that private domain traffic resolves structural transformation bottlenecks via six core channels: traffic restructuring, cost optimization, customer value maximization, cross-scenario integration, data-driven empowerment, and business model innovation. Relative to extensive public domain operations, refined private domain management better aligns with the inherent strengths of physical retail, including robust offline trust-building and geographically concentrated local consumer bases. This paper delineates prevailing research gaps and industrial transformation frictions while defining differentiated transition blueprints, offering theoretical foundations and actionable guidelines for the digital upgrading of brick-and-mortar retail and the systematic deployment of private domain operational ecosystems.*

Keywords: *private domain traffic; private domain operation; physical retail; e-commerce transformation; digital empowerment; operational mechanism*

1. Introduction and Literature Review

1.1 Research Background and Theoretical & Practical Significance

Against the backdrop of digital economic expansion, unified online-offline operations have become an irreversible megatrend within physical retail. Amid saturated stock-market competition, traditional brick-and-mortar retailers face eroding locational advantages and shrinking organic in-store foot traffic. The prevalent extensive e-commerce transition strategy—reliant on paid traffic procurement across public domain platforms—entails excessive operating expenditures, minimal operational autonomy, and an inability to accumulate proprietary user assets, resulting in superficial, unsustainable transformation for most firms. The maturation of refined private domain traffic management delivers an innovative pathway for physical retailers to surmount e-commerce transition barriers, reconstruct customer-centric operational architectures, and construct differentiated competitive moats. Investigating the empowering mechanisms of private domain systems for retail transformation carries dual value: theoretically, it enriches the theoretical framework of digital retailing; practically, it advances cost reduction, efficiency gains, and high-quality omni-channel development across the physical retail sector.

1.2 Domestic and International Literature Review

Overseas scholars have cultivated a sophisticated theoretical paradigm anchored in customer relationship management, customer lifetime value, and community-based refined operations. Empirical international studies corroborate that sustained stewardship of existing customer cohorts effectively curtails corporate operating expenses and elevates brand loyalty, laying foundational theories for private domain research. Nevertheless, such scholarly conclusions are rooted in Western social retail ecosystems and demonstrate limited adaptability to China's distinctive private domain infrastructure.

Domestic literature clusters around three core thematic streams: transformation obstacles confronting physical retailers, the practical value of private domain traffic, and tactical frameworks for private domain deployment. While Chinese academics universally acknowledge private domain traffic's positive catalytic effect on retail digitalization, extant scholarship suffers three notable limitations: superficial mechanistic analysis, insufficient cross-group comparative research, and fragmented theoretical framing, failing to develop a holistic interpretive system for private domain empowerment pathways.

1.3 Research Framework and Marginal Contributions

Centered on private domain traffic's catalytic impact on physical retail's e-commerce transition, this study employs a multi-layered analytical workflow integrating literature collation, mechanistic deconstruction, cross-model comparison, and strategic optimization to systematically unpack industrial transformation pain points, core empowerment logics, operational disparities, and high-quality development pathways. Its three primary marginal contributions are as follows. First, it systematically deconstructs the complete transmission mechanism through which private domain infrastructure empowers retail transformation, supplementing gaps within existing digital retail theoretical frameworks. Second, it establishes two differentiated comparative matrices to clarify operational disparities and adaptive boundaries between public and private domain models, as well as retail enterprises of disparate operational scales. Third, it proposes lightweight, tiered optimization strategies grounded in real-world industrial constraints, balancing rigorous theoretical deduction with industrial implementability[1].

2. Structural Predicaments of E-commerce Transformation in Physical Retail

2.1 Skewed Traffic Composition and Overreliance on Public Domain Channels

The e-commerce transformation of contemporary physical retail remains disproportionately reliant on mainstream public domain platforms, where traffic acquisition is rigidly governed by proprietary platform algorithms and bidding protocols. Within saturated stock markets, public domain traffic dividends have evaporated, and customer acquisition costs rise annually, trapping small-and-medium-sized (SME) brick-and-mortar retailers in a reactive operating cycle where revenue generation hinges entirely on continuous paid traffic investment. Additionally, public domain traffic is legally owned by platform operators rather than individual merchants, fostering a transaction model dominated by one-off purchases and precluding the accumulation of proprietary user assets—an impediment to constructing sustainable long-term traffic pipelines for e-commerce operations.

2.2 Disjointed Online-offline Operations and Insufficient Cross-channel Integration

Most physical retailers only execute superficial online channel rollouts, with siloed online store and offline brick-and-mortar operations, alongside inconsistent membership, pricing, and service protocols. Offline foot traffic cannot be digitally archived, while online channels fail to capitalize on offline experiential value and localized service strengths. This segregation of online and offline touchpoints dissipates physical retail's inherent trust-building and scenario-based competitive edges, obstructing the formation of a cohesive omni-channel retail ecosystem[2].

2.3 Extensive Customer Management and Widespread Atrophy of User Asset Value

Traditional physical retail adopts undifferentiated, broad-brush customer management, lacking standardized frameworks for user segmentation, consumer profiling, and long-term relationship stewardship. Corporate-user engagement terminates immediately post-offline transaction, while online public domain transactions lack subsequent customer activation workflows. Repeat purchase behavior relies exclusively on algorithmic platform recommendations, and merchants cannot independently extract latent customer lifetime value, yielding low conversion rates for offline foot traffic and substantial depreciation of proprietary user assets.

2.4 Prohibitive Transformation Costs and Limited Transition Capacity for SME Retailers

Public domain operations demand recurring expenditures on traffic bidding, platform commissions, and promotional outreach, generating persistently high marginal operating costs. Large chain retailers can amortize transformation expenses via economies of scale; by contrast, SME brick-and-mortar merchants face constrained capital reserves, a shortage of digital specialists, and inadequate digital operational proficiency. Exorbitant trial-and-error costs create a tripartite transition barrier for SMEs: reluctance to invest, insufficient technical capacity, and negligible tangible returns from half-baked digital upgrades.

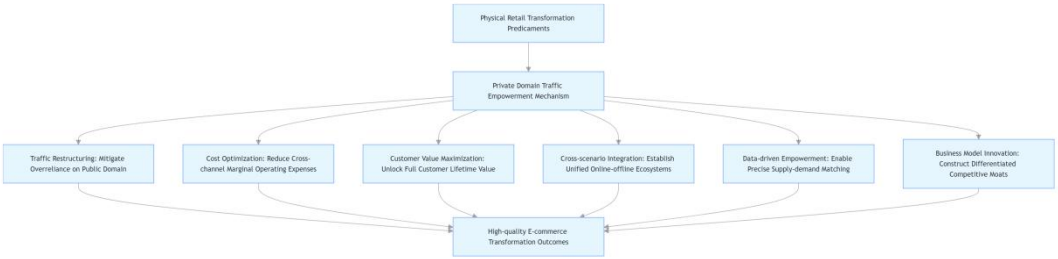
2.5 Deficient Data Infrastructure and Inaccurate Supply-demand Alignment

Operational decision-making within traditional physical retail is predominantly experience-driven, absent systematic data aggregation and analytical capabilities. Under public domain operational paradigms, merchants can only access basic transactional datasets, lacking granular insights into consumer preferences and latent demand characteristics. Experience-based judgment exacerbates supply-demand mismatches—including misaligned product assortments, irrational inventory allocation, and inefficient marketing spending—substantially undermining the quality of e-commerce transformation.

3. Core Mechanism Deconstruction: Private Domain Traffic Empowering Physical Retail Transformation

Private domain traffic's catalytic effect on physical retail's e-commerce transition constitutes a comprehensive, systemic overhaul of existing business models. This paper constructs a mechanistic framework for private domain empowerment, decomposing six core transmission pathways to form a closed-loop system facilitating high-quality digital transformation.

Figure 1 Mechanism Framework of Private Domain Operation Empowering Physical Retail E-commerce Transformation



3.1 Traffic Restructuring Mechanism: Establish Proprietary, Controllable Traffic Pools

Private domain infrastructure enables merchants to continuously archive offline in-store visitors and public domain-derived incremental consumers within self-administered private domain touchpoints, effecting a fundamental shift in traffic ownership from platform monopolization to corporate autonomy. Unlike public domain traffic's one-time payment, single-cycle consumption model, private domain assets permit unrestricted, recurring customer outreach, fully decoupling merchants from restrictive platform algorithms and bidding frameworks. This delivers stable, low-cost long-term traffic pipelines for physical retailers, fundamentally resolving the dual predicaments of public domain overreliance and volatile traffic sourcing[3].

3.2 Cost Optimization Mechanism: Curtail Omni-channel Operating Expenditures

Consistent with transaction cost theory, private domain traffic incurs only one-time upfront customer archiving costs; subsequent user outreach, content dissemination, and campaign activation generate negligible marginal expenditures, effectively substituting the heavy recurring traffic procurement outlays required for public domain operations. Concurrently, consumer data archived via private domain systems guides merchants toward data-informed inventory planning and targeted marketing, minimizing resource waste stemming from overstocking and inefficient promotional spending, and comprehensively elevating physical retailers' resource allocation efficiency.

3.3 Customer Value Maximization Mechanism: Deploy Refined Customer Lifecycle Stewardship

Private domain operations drive a paradigmatic shift from one-off traffic transactions to long-term proprietary user asset management. Merchants conduct granular user segmentation leveraging private domain consumption and interaction datasets, designing tiered operational strategies for first-time buyers, high-value loyal patrons, and dormant customers. Sustained interactive engagement, exclusive membership privileges, and emotional brand connection initiatives continuously enhance user stickiness and brand identification, converting one-time transactional customers into enduring brand loyalists and facilitating low-cost user growth via organic customer referral mechanisms.

3.4 Cross-scenario Integration Mechanism: Build Cohesive Omni-channel Retail Ecosystems

Private domain traffic functions as the critical bridging medium unifying online and offline commercial touchpoints. Physical brick-and-mortar locations deliver customer acquisition, experiential engagement, and trust-building value, while online private domain channels execute long-term user stewardship, repeat purchase conversion, and organic customer referrals, eliminating the temporal and spatial constraints of offline-only operations. By integrating online pre-ordering, offline self-pickup, localized last-mile delivery, and full-spectrum after-sales services, merchants establish a unified retail paradigm defined by offline experiential touchpoints, online user stewardship, and omni-channel conversion, synergizing offline scenario strengths and online operational efficiency[4].

3.5 Data Empowerment and Business Innovation Mechanism: Forge Sustainable Competitive Barriers

Granular consumer profile data archived within private domain ecosystems enables data-driven precise alignment between supply and demand, eliminating the limitations of conventional experience-based decision-making. Furthermore, leveraging offline trust capital and refined private domain customer service, physical retailers can transition away from homogeneous low-price competition prevalent in public domain ecosystems toward differentiated value-centric service competition. Coupled with localized consumer base advantages, merchants cultivate irreplicable differentiated operational moats, realizing high-value upgrades to their core retail business models.

4. Comparative Analysis of Public-private Domain Models and Retail Entity Transformation Capabilities

4.1 Comparative Evaluation of Public and Private Domain Operational Paradigms

To explicitly delineate the differentiated competitive strengths of private domain management, this study contrasts core operational disparities between extensive public domain operations and refined private domain stewardship across six dimensions: traffic logic, cost architecture, customer management, supply-demand coordination, profit generation, and competitive positioning.

Table 1 Cross-model Comparison: Public Domain Extensive Operation vs. Private Domain Refined Operation

Comparison Dimension	Public Domain Extensive Operation	Private Domain Refined Operation	Core Operational Advantages of Private Domain
Traffic Logic	Incremental paid traffic; platform-dependent passive customer acquisition	Stock customer lifecycle management; fully enterprise-controlled traffic assets	Achieve autonomous, sustainable long-term traffic operations
Cost Structure	Recurring high investment; elevated marginal operating costs	One-time customer archiving expenditure; near-zero marginal outreach costs	Substantially reduce long-term comprehensive operational overhead
Customer Management	Predominantly one-off transactions; low repeat purchase ratios	Granular segmentation; full lifecycle customer stewardship	Maximize the economic value of proprietary user assets
Supply-demand Matching	Experience-driven decision-making; severe supply-demand misalignment	Data-informed operational planning; precise demand-supply calibration	Optimize inventory turnover and elevate overall operational efficiency
Profit & Competition Model	Single revenue stream reliant on product margins; homogeneous low-price market competition	Diversified revenue streams (repeat purchases, referrals, premium services); differentiated service competition	Construct enduring, hard-to-replicate competitive barriers

4.2 Transformation Capacity Comparison: Large Chain Retailers vs. SME Physical Retailers

Retail operators of disparate scales exhibit divergent resource endowments and operational competencies, necessitating tiered, differentiated private domain transformation blueprints. This paper contrasts transformation characteristics across four core dimensions and proposes classified developmental strategies.

Table 2 Transformation Capacity Comparison: Large Chain Retailers vs. Small-and-medium Physical Retailers

Comparison Dimension	Large Chain Retailers	Small-and-medium Retail Merchants	Differentiated Private Domain Transformation Strategies
Resource & Team Endowments	Ample capital reserves, integrated supply chains, dedicated digital operational teams	Limited operating capital, fragmented supply chains, acute shortages of digital specialists	Large chains prioritize systematic full-spectrum deployment; SMEs adopt lightweight, targeted breakthrough frameworks
Primary Operational Mode	Omni-channel, multi-platform integrated private domain layout	Localized single private channel deployment; precision stewardship of existing local customer cohorts	Align operational architectures with scale-specific competitive strengths
Core Transformation Priorities	Systematic digitalization, brand building, intelligent automated operations	Cost reduction, operational efficiency gains, repeat purchase improvement	Deploy tiered, phased digital transformation objectives
Risk Tolerance & Implementation Paths	High risk-bearing capacity; suitable for long-term strategic investment	Low fault tolerance threshold; incremental, steady iterative transformation	Adopt categorized, phased rollout workflows matched to risk resilience

5. Practical Constraints and Optimized Pathways for Private Domain Digital Transformation

5.1 Core Restrictive Barriers to Private Domain Empowerment

Five prominent structural constraints impede private domain transformation deployment within physical retail industrial practice. First, most merchant operators possess superficial understandings of private domain functionality, equating private domain management solely to social media promotional outreach and neglecting long-term strategic deployment frameworks. Second, firms lack granular customer stewardship capabilities, relying on rigid mass marketing pushes that yield minimal customer activation efficacy. Third, online-offline scenario integration remains superficial, failing to unlock the inherent experiential strengths of physical brick-and-mortar locations. Fourth, monotonous content pipelines create barren private domain ecosystems, precluding the formation of robust emotional brand-consumer connections. Fifth, chronic shortages of specialized digital operational talent constitute a critical soft constraint inhibiting high-quality private domain deployment[5].

5.2 Cognitive Upgrading and Systematic Strategic Optimization

Merchants must fundamentally overhaul their conceptual understanding of private domain operations, abandoning short-term traffic monetization mindsets in favor of long-term value appreciation for proprietary user assets. Private domain transformation initiatives ought to be embedded within enterprises' overarching digital development roadmaps. Firms should formulate phased operational KPIs alongside standardized workflows for customer archiving, activation, and organic referrals, eliminating fragmented, tokenistic private domain deployment practices.

5.3 Refined Customer Stewardship and Unified Online-offline Scenario Integration

Merchants must construct granular consumer profiling systems leveraging private domain interaction and transaction datasets to deliver personalized, segmented customer management—targeting activation for first-time buyers, sustained engagement for loyal active patrons, and re-engagement campaigns for dormant consumers. Deepened cross-scenario linkage is indispensable: physical stores function as trust-building and customer diversion touchpoints, while online private domains facilitate omni-channel conversion. Unifying membership privileges, reward frameworks, and cross-channel service protocols creates a closed-loop integrated retail operational model[6].

5.4 Diversified Content Ecosystem Construction and Talent Pipeline Development

Enterprises must restructure private domain content supply pipelines to mitigate excessive promotional material saturation, generating scenario-centric, lifestyle-oriented, value-added diversified content to foster stable emotional bonds between brands and consumers. A multi-layered talent cultivation framework should be established, incorporating internal specialized training, external industrial empowerment resources, and lightweight digital operational tools to offset deficits in professional digital talent, lower transformation barriers for SME merchants, and elevate industry-wide refined operational proficiency.

5.5 Public-private Domain Synergy and Full-channel Omni-channel Empowerment

Merchants must establish a unified integrated operational framework defined by public domain traffic acquisition, private domain proprietary asset archiving, and full-channel value recycling. Targeted incremental consumer cohorts are sourced via public domain platforms and archived within private domain traffic pools for sustained granular stewardship. Organic customer referrals and positive brand word-of-mouth generated within private domain ecosystems reciprocally boost public domain channel visibility, forming a closed-loop full-channel traffic growth architecture that comprehensively elevates the efficiency and quality of physical retail's e-commerce transformation.

6. Research Conclusions and Future Prospects

6.1 Core Research Conclusions

Through systematic literature collation, internal mechanistic deconstruction, and multi-dimensional cross-group comparative analysis, this paper comprehensively dissects the intrinsic logics and actionable implementation pathways through which private domain traffic operations facilitate physical retail's e-commerce transition, yielding four definitive core conclusions. First, traditional e-commerce transformation models centered on public domain platforms carry inherent structural flaws—skewed traffic composition, disjointed online-offline workflows, extensive customer management, prohibitive transformation expenses, and inadequate data infrastructure—rendering them incompatible with high-quality development requirements within saturated retail stock markets. Second, private domain traffic delivers systemic resolution to physical retail's transformation bottlenecks via six interlocking core mechanisms: traffic restructuring, cost optimization, customer value maximization, cross-scenario integration, data-driven empowerment, and business model innovation, delivering comprehensive catalytic advantages over conventional public domain operations. Third, refined private domain management substantially outperforms extensive public domain operational paradigms; large chain retailers and SME brick-and-mortar merchants must implement tiered, differentiated transformation blueprints calibrated to their respective resource endowments. Fourth, superficial cognitive biases, crude operational workflows, fragmented cross-scenario integration, monotonous content ecosystems, and talent shortages constitute the primary practical barriers to private domain deployment. These constraints can be systematically mitigated via strategic cognitive upgrading, granular customer stewardship, cross-channel scenario unification, diversified content ecosystem construction, and full-channel public-private synergy[7].

6.2 Evolving Industrial Development Trends

Future private domain-driven e-commerce transformation within physical retail will evolve along four definitive trajectories.

Private domain operations will advance toward greater granularity and intelligent automation, with data-scientific decision-making becoming universal industry standard practice.

Integrated public-private domain synergistic operations will displace siloed single-channel workflows as the dominant industrial operational paradigm.

SME retail operators will prioritize localized private domain cultivation to construct exclusive geographically rooted competitive moats.

The core value proposition of private domain management will shift from short-term traffic monetization to long-term proprietary brand equity accumulation, catalyzing industry-wide high-value upgrading of physical retail business models.

6.3 Research Limitations and Future Scholarly Directions

This paper constitutes a theoretical literature review focused on mechanistic deconstruction and systematic framework collation, lacking quantitative empirical verification. Additionally, the analysis does not delineate differentiated transformation characteristics across segmented retail verticals, including supermarkets, fresh produce retail, and apparel retail. Future scholarly inquiry can adopt quantitative empirical analysis utilizing micro-firm panel datasets to numerically quantify private domain operations' catalytic impact magnitudes. Supplementary targeted research into segmented retail verticals can further refine the theoretical framework governing private domain empowerment of retail digital transformation, delivering more precise, actionable guidance for industrial practitioners[8].

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