

Analysis of Digital Transformation Strategies for Multinational Automakers' Local Operations in China

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ABSTRACT

Against the backdrop of the ongoing global wave of digitalization, the automotive industry is undergoing profound transformation and facing significant challenges. In the Chinese market, driven by escalating consumer demand for digital services and the rapid advancement of intelligent and internet technologies, traditional automotive manufacturers must adapt their operational strategies to sustain competitive advantages. This study focuses on multinational automotive enterprises and their localization strategies in the Chinese market. It aims to address critical issues arising during digital transformation, including low local brand recognition, sluggish channel innovation, and suboptimal user experience.

KEYWORDS

Digital Transformation; Localized Operations; Multinational Automotive Enterprises; Chinese Market

1. INTRODUCTION

Digital technologies are rapidly permeating every facet of the automotive industry. The integration of artificial intelligence, big data, and the Industrial Internet of Things (IIoT) has endowed production lines with self-perception and self-regulation capabilities. Processes such as welding and assembly have been redefined as flexible manufacturing, significantly enhancing production efficiency. Furthermore, the concept of smart mobility is gradually taking shape; automobiles are no longer mere transportation tools but interactive mobile terminals, with navigation, energy management, and entertainment services coordinated in real-time through unified data systems. Concurrently, digitalization has transformed corporate decision-making. Extensive operational decisions now rely on data monitoring and algorithmic deduction, utilizing models to predict market shifts rather than relying solely on empirical judgment. Corporate dynamic capabilities are being reorganized through continuous updates, with competitive advantages increasingly dependent on data resources and collaborative networks. Consequently, digitalization is shifting the automotive industry from a product-oriented paradigm to a new model centered on ecosystems and user experiences.

Currently, the Chinese automotive market is undergoing a profound structural reconstruction. By 2025, automobile sales are projected to reach 34.4 million units, with new energy vehicles (NEVs) accounting for over 50%. Consumer trends are shifting from traditional internal combustion engine vehicles to electric and intelligent connected vehicles (ICVs). Consumer preferences are increasingly gravitating towards smart cockpits, autonomous driving, and digital connectivity, with the penetration rate of various ICV models exceeding 60%. The digital ecosystem is becoming the focal point of competition. Under this market structure, foreign automotive brands that continue to rely on global product templates will fail to meet the Chinese market's demand for flexible smart services and NEV performance. The key to this transition lies in enhancing data management and supply chain collaboration efficiency, thereby achieving dynamic feedback-driven operations and continuous

innovation to regain competitive advantages amidst evolving market rhythms. The localized responsiveness of foreign automakers has thus become a critical metric for evaluating their ability to integrate into China's new ecosystem [1].

2. ANALYSIS OF THE CURRENT STATUS OF LOCAL OPERATIONS BY MULTINATIONAL AUTOMAKERS IN CHINA AMID DIGITAL TRANSFORMATION: A CASE STUDY OF VOLVO CARS

Volvo Cars' operations in the Chinese market are characterized by a brand image rooted in safety, environmental sustainability, and minimalist Nordic design, achieving steady growth through precise mid-to-high-end market positioning. Its primary consumer base comprises middle-class families who prioritize family safety, quality of life, and social responsibility, placing high value on vehicle safety ratings and environmental performance.

Table 1. Overview of Volvo Cars' Operational Characteristics in the Chinese Market

Core Dimension	Main Manifestation	Market Segment or Orientation
Brand Image	Safety, Environmental Sustainability, Nordic Design	Secondary Luxury Positioning
Product Portfolio	S-Series Sedans, V-Series Wagons, XC-Series SUVs	Covering the 300,000–1,000,000 RMB Price Range
Target Audience	Middle-class and Family Users Prioritizing Quality, Safety, and Sustainability	Mid-to-High-End Market
Strategic Characteristics	Emphasis on Combining Localized Tech-Savviness with Comfortable Experiences	Focusing on Chinese Consumer Preferences

Source: Shen, Y., Zhang, X., & Li, Y. (2023). Analysis of the Impact of Comprehensive Opening-Up of the Automotive Industry and Future Trend Predictions [13].

As illustrated in the table, Volvo has strengthened its image of "rigor and warmth" in China through flexible adjustments in brand expression. Although its operational performance has not been characterized by explosive expansion, it demonstrates sustainable and steady growth consistent with high-end automotive brand trajectories. Over the past three years, brand awareness increased by an average of 19%, brand consideration by 4%, and willingness to pay a premium by 1.7%, with all three metrics ranking first among traditional luxury brands. In the context of broader trends, this value-driven market adaptation strategy, which balances emotional resonance, serves as a practical model for international brands competing in China. Only by aligning with the developmental logic that combines market openness with localization can foreign automotive brands secure long-term advantages [12].

3. CHALLENGES IN THE LOCALIZED OPERATIONS OF MULTINATIONAL AUTOMAKERS IN CHINA

3.1. Low Alignment Between Products and Market Demands

3.1.1. Insufficient Matching of Product Configurations with Consumer Demands

In 2025, Volvo's sales in China reached 149,500 units; however, operating revenue decreased by 23% year-on-year. In 2024, Volvo's electric vehicle sales in China were merely 15,800 units, accounting for only 10.08% of total sales. Among these, the EM90 sold only 677 units, and the EX30 sold only 1,564 units [1], indicating a mismatch between product structure and market demand. Although new models have improved in power and space, they retain a strong minimalist Nordic aesthetic. Some

Volvo models adhere strictly to global unified standards, resulting in unremarkable performance in smart cockpit functionalities, voice interaction experiences, entertainment system richness, and rear-seat comfort. Particularly as China's NEV and smart vehicle sectors develop rapidly, user expectations have evolved from viewing vehicles merely as "transportation tools" to "mobile intelligent spaces," an area where Volvo's progress appears relatively slow. The incomplete alignment between product portfolios and consumer demands has weakened the brand's premium advantages, emotional resonance, and brand storytelling, reflecting that the brand's product strategy has not truly integrated into local demand logic [11].

3.1.2. Delayed Response to the Chinese Market in Intelligent and NEV Deployment

From 2021 to 2024, Volvo's sales in the Chinese market declined consecutively from 171,700 units to 156,400 units, indicating a lag in its intelligent and NEV transformation. Despite the rapid rise in NEV penetration in China, Volvo remains indecisive between internal combustion and plug-in hybrid technologies. The EX90's launch was delayed due to software issues, and the pure electric range of its plug-in hybrid models falls short of 50 kilometers, leading the market to label them as "pseudo-new energy" vehicles. This gap manifests in two aspects. First, the conservative pace of NEV product launches has prevented the formation of a complete market perception. Second, the intelligent vehicle experience still requires alignment with Chinese consumers' daily habits. Users prioritize natural voice interaction, the openness of the in-vehicle ecosystem, integration with local navigation and lifestyle services, and smartphone interoperability—areas representing the most intense competition in the Chinese market. Failure to promptly address these shortcomings will place the brand at a disadvantage in consumer comparisons.

3.2. Low Synergy Between Digital Marketing and Channels

3.2.1. Inconspicuous Effects of Brand Communication and Digital Marketing

Although Volvo has recently strengthened its safety and environmental messaging, the singular themes and homogenous formats have resulted in a lack of distinctiveness in its digital marketing. Prior to 2025, most promotional campaigns relied on early seatbelt narratives, and the technological halo of this safety narrative has gradually faded. Younger consumer demographics seek content related to intelligence, lifestyle, and value resonance. While peer brands leverage diverse social media matrices and trending events to cultivate distinct images, Volvo's reliance on motorsports and public welfare activities has yielded suboptimal digital communication outcomes. Low online traffic conversion rates and ineffective user retention from trending topics highlight this issue. On platforms like Douyin and Xiaohongshu, low view counts coupled with overly cautious content have resulted in interaction and comment engagement rates far below industry peers, reflecting a disconnect between the brand's tone and mainstream internet discourse.

3.2.2. Disjointed Online and Offline Channel Integration

Although Volvo has established a multi-tiered channel system in China, the highly distributed nature of digital touchpoints has led to fragmented user experiences. Customer leads generated online suffer from low follow-up efficiency upon transfer to offline dealerships. Online activities and offline in-store experiences lack unified design, and discrepancies in pricing, services, and promotional information across channels undermine user trust. For Chinese consumers, information consistency and service continuity during the car-buying process are paramount. Discontinuities between online and offline channels increase decision-making costs and lead to the loss of potential customers.

Although the "Transparent Consumption Promise" has mitigated trust issues to some extent, insufficient touchpoint integration mechanisms have fragmented the user experience into isolated stages. Therefore, Volvo must deepen the structural transformation of its digital channels, unifying interfaces and process logic to achieve seamless online-to-offline (O2O) integration.

3.3. Weak Supply Chain and Operational Support Capabilities

3.3.1. Need for Enhanced Supply Chain Collaboration and Local Responsiveness

In Volvo's current supply chain operations in China, information flow between upstream and downstream entities remains unsmooth. In component procurement and production scheduling, data interface incompatibilities or communication lags frequently cause planning deviations. During the chip shortage, sluggish feedback from the production end created an "information loop" disconnect between headquarters and suppliers, forcing some factories to alter shifts and reduce output. Similar issues emerged in the power battery supply chain, where the quality supervision chain of the Sunwoda joint venture factory could not be connected in real-time, and the traceability system was fragmented, causing delayed recall responses. This indicates that resource integration mechanisms remain weak, with quality, logistics, and R&D failing to achieve data sharing. Concurrently, the integration of local suppliers is low; while the localization target is 75%-80%, the current rate is approximately 45%-55%, and the construction of shared platforms and standard interfaces is still in its infancy. Although the industry is shifting towards a networked structure, Volvo retains a strong inertia of vertical division of labor, constraining collaboration efficiency.

3.3.2. Inadequate Resource Allocation and Operational Support Systems

During its operations in China, Volvo has consistently exhibited low integration of production factors. The lack of effective data interoperability among vehicle manufacturing, supply scheduling, and market feedback has loosened the collaborative chain from R&D to delivery. Localized bottlenecks in the supply chain can rapidly escalate into systemic delays. The root cause lies in dispersed resource allocation and excessively long management chains. Although bases in Chengdu, Daqing, and Zhangjiakou have been established, production plans across regions cannot be synchronized. Component procurement and logistics responses often lag behind demand fluctuations. Furthermore, as the smart manufacturing system is still under construction and the digital management platform is not fully deployed, data transmission latency remains high. Consequently, despite the expansion of the dealership network and model variety, capacity release remains constrained. Disconnections between factors slow down new product launches and reduce regional market allocation flexibility. To enhance local operational support, Volvo must establish a closed loop integrating information, technology, and management.

3.4. Insufficient Customer Service and User Operation Capabilities

3.4.1. Remaining Shortcomings in After-Sales Service Convenience and Experience

Although the digitalization of Volvo's after-sales system has expedited service processes, current data indicates that network coverage and service consistency remain problematic. Some service segments remain store-process-centric rather than user-experience-centric. While procedures for appointments, visits, repairs, and callbacks are standardized, there is room for improvement in simplifying processes, saving customer time, and reducing offline waiting through online touchpoints. For Chinese users, efficiency, transparency, and convenience have become benchmarks for service evaluation; traditional service processes will inevitably lead to experiential gaps.

3.4.2. Deficiencies in User Data Integration and Customer Relationship Management

Volvo faces significant deficiencies in customer data integration in the Chinese market. Although the NEWBIE system has established a unified data analytics platform, fragmented legacy information systems and disparate interface formats prevent user data from flowing across sales, after-sales, and social media endpoints, creating typical "data silos." Systemic segmentation between dealers and the brand prevents the complete recording of customer journeys. Consequently, the correlation analysis of after-sales feedback, maintenance records, and repurchase behaviors is delayed, hindering precise insights and personalized service capabilities. This results in a disconnect in the brand's understanding

of user needs and consumption trends, leading to inefficient marketing investment cycles. Furthermore, escalating data security and privacy protection requirements have blurred the boundaries of data sharing. Without collaborative mechanisms, the digital transformation of supply chains and information systems will result in resource stagnation and service fragmentation.

4. STRATEGIC OPTIMIZATION COUNTERMEASURES FOR LOCALIZED OPERATIONS OF MULTINATIONAL AUTOMAKERS IN CHINA

4.1. Enhancing Product-Market Alignment

4.1.1. Refining the China Market Demand-Oriented Product Definition Mechanism

To resolve the mismatch between products and market demands, interventions must begin at the product definition mechanism rather than relying on post-launch configuration adjustments. Volvo should advance the identification of Chinese market demands to the product planning stage. During new model R&D, facelift designs, and configuration formulation, a multi-party demand input mechanism involving marketing, R&D, sales, and user research should be established. The core objective is to transform Chinese market information from sales feedback into a starting point for product development.

A normalized user research mechanism should be established to continuously collect evolving preferences regarding space, intelligent configurations, powertrain types, price sensitivity, and usage scenarios across different regions, age groups, and consumption tiers in China. Incorporating a China regional market review into the product planning process will empower local teams with substantive advisory rights regarding product direction, configuration portfolios, and launch timing. Improving the linkage mechanism among market demands, product definition, and launch validation will minimize information loss or distortion during transmission. Through this model, Volvo can synchronize product development with Chinese market dynamics, fundamentally improving product-market fit.

4.1.2. Improving Local Adaptation of Intelligent Configurations and NEV Products

With the implementation of digital transformation policies in the automotive industry, intelligent upgrade targets for OEMs and component manufacturers have become more systematic. By 2027, the CNC rate of key processes must exceed 70%, and the penetration rate of R&D design tools must surpass 95%. This implies that foreign automakers like Volvo must accelerate the localized adaptation and iterative validation of new technologies to align with China's consumption upgrades and the accelerated deployment of intelligent connected vehicles. Models such as the XC70 and XC60 launched by Volvo in 2025 have undergone multi-dimensional optimizations in driving assistance, information display, and range management. Its "synchronized evolution of software and hardware" approach aligns with the collaborative innovation closed loop advocated by concurrent policies. Digital transformation requires enterprises to balance technological novelty and breadth, providing a theoretical framework for Volvo's "intelligence-NEV" integrated innovation in China [3]. Therefore, the Chinese market serves not only as a sales hub but also as an institutionalized testing ground for the deployment of its intelligent configurations and NEV products.

4.2. Strengthening Digital Marketing and Channel Synergy

4.2.1. Reconstructing Brand Communication to Enhance Digital Content Expression

Improving Volvo's brand communication effectiveness in China requires more than increased advertising expenditure; it necessitates reshaping brand expression to align with the Chinese digital communication environment. While Volvo's brand core of safety, quality, and responsibility should

be maintained, communication formats must transcend tradition. Brand value should be translated into content that is more scenario-driven, narrative-rich, and interactive.

Content development should revolve around usage scenarios such as family safety, smart mobility, urban commuting, and long-distance travel, rather than remaining confined to abstract brand concepts. Differentiated communication strategies should be adopted based on platform characteristics: emphasizing scenario experiences on short-video platforms, user interaction on social media, and professional reputation in automotive communities. A content effectiveness evaluation system should be established to track metrics such as user clicks, dwell time, interaction, lead generation, and conversion over the long term, utilizing data to determine the most effective content. Through content restructuring, Volvo can maintain its brand tone while enhancing communication reach and user resonance.

4.2.2. Promoting O2O Channel Synergy

Volvo's channel integration in the Chinese market has entered a full-chain digitalization phase. The primary objective is not merely lead conversion but ensuring a continuous user experience across all touchpoints. Through real-time information sharing via its App, WeChat, and offline showrooms, Volvo has integrated car purchasing, after-sales service, and community activities into a unified management system. Consumers experience virtually no system-switching latency when booking test drives, viewing parts, or receiving after-sales feedback. This O2O system is not incidental but stems from the data closed-loop construction of the NEWBIE platform, representing a structural correction to the traditional 4S dealership model. The value of digital synergy lies not only in interface convenience but also in continuously strengthening the brand's perception of users [6]. In practice, Volvo is gradually forming a collaborative model that stabilizes trust through transparent consumption and promotes service via intelligent operations, shifting online and offline functions from parallel to symbiotic, thereby reshaping luxury car brand customer service.

4.3. Perfecting Supply Chain and Operational Support Capabilities

4.3.1. Enhancing Local Supply Chain Collaboration and Resource Integration Mechanisms

Volvo's efforts to improve local supply chain collaboration and resource integration are transitioning from fragmented approaches to a more systematic, holistic model. Volvo must continue to strengthen local supply chain collaboration in China, transforming suppliers from mere component providers into partners in planning coordination and quality improvement. Only through tighter front-and-back-end supply chain linkage can enterprises respond swiftly to demand fluctuations. A linkage mechanism between demand forecasting and supply planning should be established, synchronizing sales, market, and production data into supply chain decision-making. Long-term cooperative relationships with key local suppliers should be strengthened, establishing joint improvement mechanisms for quality, delivery, cost, and technological advancement. Warning and backup systems for critical components should be implemented to mitigate the risk of production disruptions caused by single-point fluctuations. Warehouse and logistics layouts should be optimized from a regional perspective to enhance delivery speed. Through these measures, Volvo can gradually build a more resilient, agile, and flexible local supply chain structure.

4.3.2. Improving Production Operational Efficiency and Market Responsiveness

The flexible manufacturing practices at Volvo's Taizhou factory represent a typical example of smart manufacturing under digital transformation. The stamping line is fully automated, over 440 robots collaborate in the welding workshop, the paint shop achieves a 96% automation rate, and critical bolt tightening records are tracked for the vehicle's lifetime. This end-to-end digital closed-loop system increases overall production efficiency by approximately 30% while maintaining defect rates at industry-leading levels. Under high-density automation, manufacturing process adjustability is enhanced; each mold and welding program can perform adaptive learning based on real-time

parameters, ensuring rapid and stable switching between different models on the same platform. A scenario-based digital roadmap provides a systematic framework for such models [7]. This smart manufacturing model not only enhances Volvo's capacity elasticity and resource allocation capabilities in the NEV era but also embeds the "safety and sustainability" manufacturing philosophy into every detail, encompassing process improvement, energy consumption control, and process monitoring.

4.4. Elevating Customer Service and User Operation Capabilities

4.4.1. Optimizing the After-Sales Service System with a User-Experience-Centric Approach

Volvo's after-sales service system in China is undergoing a comprehensive transformation driven by digital technologies, focusing on expanding service networks and improving touchpoint experience pathways. Following the introduction of the Transparent Consumption Promise in 2025, the brand institutionalized the transparency of products, processes, and progress. Real-time linkage between the online App and offline stores enables full-process digital tracking from appointment to settlement. With the NEWBIE system, users can track every detail of maintenance, understand parts sourcing and pricing, and monitor work order progress in real-time, completely eliminating information asymmetry. The brand has invested over 100 million RMB to fulfill six service commitments, including lifetime parts warranty, free pick-up and delivery, and premium courtesy cars, while integrating smart callback modules into customer satisfaction monitoring to enhance feedback timeliness. Continuous investment in resources and data has improved service accessibility and trust.

4.4.2. Strengthening User Data Integration and Customer Relationship Management

As Volvo deepens its localized operations in China, it is increasingly leveraging data integration as a primary means to build a unified and agile user information middle platform, breaking down long-standing channel segmentation. Relying on multi-end interoperability via the App, WeChat, and dealer outlets, this system accumulates data across 13 touchpoints, enabling real-time identification and response to user profiles in various contexts. Operational practice demonstrates that real-time aggregated user data shifts interaction from showroom pre-engagement to the online environment, allowing enterprises to legally build comprehensive databases and inform backend service decisions. As data flows across sales, after-sales, and membership segments, the historical issue of "enthusiasm in the showroom, indifference in after-sales" caused by information fragmentation is diminishing. Joint construction by business and digital departments ensures more coherent service pathways and consistent customer experiences.

5. CONCLUSION

Looking ahead, for multinational automotive enterprises to sustain development in the Chinese market, they must transition from the traditional "Global Standards + Localization" model to "Global Standards + Co-Creation." This entails granting greater product decision-making and resource allocation authority to the China region, establishing flattened, data-driven product development and market response mechanisms, and transforming digital platforms from mere information tools into the central nervous system of corporate operations. Only through these measures can they maintain differentiated advantages in China's NEV market and contribute further to the high-quality development and enhancement of global competitiveness of the Chinese automotive industry.

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