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A Discussion on Cross-Border E-Commerce Marketing Strategies for Small and Medium-Sized Enterprises in the Era of Big Data

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Abstract

The global e-commerce competitive environment is experiencing significant shifts as a result of how big data technologies allow a business to analyze an individual consumer's actions more thoroughly than ever before. Cross-border e-commerce companies are beginning to make their marketing decisions based on data rather than just intuition. Large companies with the inherent capability of gathering large amounts of data from the marketplace have taken leading positions in this shift while SMEs are facing increasing competitition as a result of limited resources. Businesses are changing how they interpret their consumers' demands in addition to changing the ways in which they communicate marketing messages to their consumers; as a result, Small and Medium-Sized Enterprises (SMEs) have to reassess their strategic marketing strategies. Therefore, creating a marketing strategy that is aligned with the limited resources of SMEs in this big data environment is both an urgent practical imperative and an important area for future research.

Keywords

Big Data; Small and Medium-Sized Enterprises; Cross-Border E-Commerce; Marketing Strategies; Targeted Marketing.

1. Introduction

Big data technology has fundamentally reshaped the competitive dynamics of the worldwide e-commerce sector by enabling firms to examine consumer behaviour through extensive data analysis, shifting the basis of market competition from scale-driven advantage to data-driven capability. The marketing decisions of cross-border e-commerce businesses are continuing to move from making decisions based on prior experience to those that can be made based on analytical data from a wide range of different data streams. Because large platform companies possess the ability to exploit the unique advantage they have through their big data resources to gain a competitive advantage, small and medium-sized sellers are now facing increased levels of competition than they have previously faced due to their lack of available resources. Businesses can now view their consumers' needs from new perspectives, and have created more efficient pathways for sending marketing information to consumers. SMEs must review the logic of their marketing strategies; therefore, the creation of a marketing strategy that fits well within the resource constraints of SMEs in big data is not only a timely and urgent business issue but also provides the potential for an academic discussion that deserves more in-depth study [1].

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2. Trends in the Transformation of the Cross-Border E-Commerce Marketing Landscape Driven by Big Data

2.1. The Digital Reconstruction of Consumer Decision-Making Pathways

Consumers leave substantial volumes of traceable digital data when engaging in cross-border shopping activities on online retail sites, providing researchers and practitioners with rich behavioral records for reconstructing the end-to-end purchase process. This data provides a solid basis for deducing the full cross-border shopping process for consumers engaged in that activity. Cross-border e-commerce companies utilize data analysis tools to effectively reconstruct the true attention dimensions and preference structures of their consumers. Businesses now have an opportunity to move from a very crude methodology of inferring consumer intent by their experience, to having a base of factual, structured data. There are numerous records created from the occurrence of a purchase intention to the time of completion of that purchase, such as; page views, keyword searches and price comparisons. Through these records, businesses use targeted influence at key points during the customers' purchase decision in order to convert the decision-making path of each customer from a black box to an identifiable, transparent and active chain. The data captured allows cross-border e-commerce marketers to have a better strategic indication of how they should conduct their marketing activities.

2.2. The Shift in Marketing Communication Models from Broad-Reach to Targeted Engagement

Cross-border e-commerce platforms have accumulated large amounts of data on user behaviour that provide the foundation for delivering targeted advertisement campaigns, enabling these platforms to market products to specific groups of high-value customers rather than broadcasting to a mass audience. Big data technologies allow companies to determine how different types of consumers focus on and accept advertisements based on geographic location, allowing them to match the right marketing messages with the right audiences, resulting in improved efficiency of advertising resources.

2.3. The Foundation of Market Competition Shifting from Scale Advantages to Data Capabilities

The competitive logic of the cross-border e-commerce market is undergoing a deep transformation, and store size and financial strength are no longer the core variables that determine a company's market position. Sellers with massive inventory of goods have an advantage in traditional models, relying on the breadth of category coverage to obtain traffic and orders. In the big data environment, consumers' personalized demands continue to strengthen, and the requirements for product matching with their own needs are constantly increasing [2]. The depth of understanding of user needs by enterprises has gradually become a key factor affecting purchasing decisions. Sellers who can effectively collect and analyze consumer behavior data can obtain more accurate judgment basis in product selection direction, pricing strategy, and inventory arrangement, and the standard of survival of the fittest in the market will shift accordingly.

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3. Capability Gaps and Practical Constraints in Cross-Border E-Commerce Marketing for SMEs

3.1. Insufficient Accumulation of Data Assets Limits the Foundation for Implementing Targeted Marketing

Most SMEs rely on third-party platforms when conducting cross-border e-commerce. The user browsing records, purchase behavior, evaluation content, and after-sales feedback generated by daily store operations are deposited on the platform, and the data that sellers can obtain is relatively limited. The data interface opened by the platform to merchants is usually aggregated and processed, and enterprises often receive processed reports rather than original behavior logs. The granularity and timeliness of the data are difficult to support deep consumer insights. The construction of user profiles, determination of demand trends, and deployment of personalized recommendation algorithms that marketing decisions rely on require sufficient and continuous behavioral data. The absence of fundamental information leads to a different state of play regarding 'big data' marketing for SMEs compared with large companies. A bigger problem is an absence of awareness around systematic data collection methods within SMEs throughout their processes. Several forms of interaction data could have been stored through basic tools have become lost because of unstructured storage methods, compounding the lack of data assets. However, it is also challenging for companies to create exclusive data repositories that could inform marketing decisions under resource constrained circumstances, as the third-party data does not align well with the company's specific business scenarios [3].

3.2. Weak Data Technology Application Capabilities Impact the Efficiency of Marketing Decisions

SMEs lack sufficient platform data to carry out data cleaning, tagging, and modeling for analysis. Thus, much gathered data remains simple statistics, unable to yield useful marketing insights. SMEs generally lack dedicated data analysis staff, and basic office programs cannot store the massive user-generated data. Professional data analysis programs require substantial money and time to purchase and learn, creating technical difficulties for using data to enhance performance. Marketing plans still rely on managers' subjective judgment and past experience, based on available information; thus, the data's real value in decision-making often falls short. Although some managers recognize data-driven decision value, articulating project goals remains difficult, primarily because they often lack full understanding of objective methods. Consequently, they lose focus on analysis outputs, creating large, directionless data piles after receiving requests.

3.3. Organizational Resources and Talent Reserves Struggle to Support the Transition to Data-Driven Operations

To implement data-driven marketing, organisations need to restructure. A flat management model typically exists in SMEs, so there are not many specialised data operations roles, which means the processes of how data is collected, analysed and interpreted and how strategies are developed from that data are split across multiple functional persons, resulting in a lack of clarity of boundaries of authority and responsibilities, poor collaborative effectiveness. Additionally, large organisations have a competitive advantage in hiring technology talent for data, so salary ranges and career growth opportunities are limited for persons with cross-border e-commerce and data analysis skills to attract them. The internal team currently does not have a systematic approach to planning how data literacy would be trained and invested in for employees. The communication problem between business divisions and technical personnel is evident; for example, front-line operators do not understand how the data tool was designed to operate, and designers do not understand how it is needed to operate in the

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business environment [4]. The difference in communication style due to the lack of common language is substantial enough to cause problems integrating information thoroughly into daily sales decisions. In SMEs, decision-makers typically play multiple roles, with focus pulled in many directions, so they will not devote significant amounts of time to opportunities involving developing data-driven capabilities. Therefore, their efforts to obtain sufficient driving force for a transformation of data-driven systems are severely hampered.

4. Strategic Framework for Big Data to Empower SME Cross-Border E-Commerce Marketing

4.1. Building a Low-Cost, Highly Available Framework for Data Collection and Management

SMEs should not blindly pursue complex systems at the level of large enterprises in data infrastructure construction. Instead, they should prioritize the use of SaaS based data analysis tools and cloud based data storage services based on their actual business scale and resource conditions. Such solutions are usually charged based on usage and do not require the enterprise to maintain hardware equipment on its own. The initial investment cost is relatively controllable. Enterprises can consciously standardize the input format and storage rules of internal data such as backend order information, customer service conversation records, and social media interaction content in daily operations, ensuring that data resources scattered in various business processes can be systematically collected and called, and avoiding valuable information from being lost due to personnel flow or operational negligence. For external market information such as competitor pricing, evaluation sentiment, and changes in hot search keywords that cannot be directly obtained on the platform side, enterprises can use price monitoring tools and social listening platforms to automate the capture and preliminary organization of data sources in a relatively economical way [5]. A standardized field mapping relationship needs to be established between the data collection end and the enterprise management end, so that data entered from different entrances can be stored and retrieved according to a unified dimension, and subsequent analysis applications will not be hindered by chaotic data structures.

4.2. Implementing Targeted Product Selection and Advertising Strategies Based on User Profiles

After completing the basic data collection, SMEs need to integrate scattered user behavior records into a structured tagging system, and establish a preliminary user profile framework around core dimensions such as purchase frequency, unit price range, category preferences, and seasonal characteristics of the market. The construction of a portrait does not require a one-step pursuit of comprehensive coverage. Enterprises can start from their current main product categories, prioritize sorting out the common consumption characteristics of existing customer groups, and gradually expand to exploratory analysis of potential customer groups to reduce the complexity of portrait construction [6]. The product selection process can be based on the demand distribution reflected by the portrait to determine the acceptance level of different categories in the target market, and concentrate the limited procurement budget on products with higher matching degree, avoiding inventory backlog caused by experience based product selection. The strategy adjustment at the advertising placement level also relies on portrait information. Enterprises can set differentiated bidding schemes and creative materials for customer groups with high portrait differentiation in the platform advertising system, so that marketing budgets can prioritize reaching consumer groups with strong conversion intentions and reduce ineffective bidding consumption on flood volume [7].

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4.3. Integrating Social Media and Independent Websites to Create a Synergistic Marketing Matrix

As the core battlefield for SMEs to accumulate private domain traffic, independent websites can help them break free from complete dependence on a single platform and accumulate their own user relationship network and transaction data assets. The content operation on social media focuses on attracting potential buyers' attention on different platforms through short videos, graphic and textual evaluations, and interactive topics, guiding interested users scattered across various social channels to independent sites for deep browsing and purchase conversion. The user registration information, browsing history, and order records accumulated by independent websites can provide data support for the content selection direction of social media. Based on this, enterprises can determine which product selling points and content forms are more likely to arouse the interactive interest of target customers, thereby optimizing the content production and release rhythm of social channels. The data exchange mechanism between social media and independent websites also needs to be established. The behavior tags of users on the social end should be uniformly associated with the transaction attributes on the independent website, so that subsequent marketing advertisements can develop reach strategies based on the complete user journey, avoiding duplication or misplacement of marketing information due to channel segmentation [8].

4.4. Advancing Localized Content and Experience Optimization based on Data Insights

When SMEs enter markets in different countries and regions, the basic localization of language translation is no longer able to meet consumers' real expectations, and deeper cultural adaptation needs are emerging. There are significant differences in consumption habits, holiday periods, payment preferences, and acceptance of after-sales services in different markets, which directly affect the persuasiveness of marketing content and the smoothness of user purchasing decisions. Using data analytics, firms can extract high-frequency keywords and emotional tendencies from customer interaction records and review texts. These extracted insights enable firms to understand user preferences and construct product or service profiles tailored to specific target audiences prior to campaign execution, thereby informing content strategy and messaging design. Based on this, companies can change the order of presenting information about products/services and the format of detail pages, optimization of localized experiences must also consider payment processing versus delivery. When preferred local payment methods are not addressed or freight calculation is unclear, often the early marketing stages will be unsuccessful at the final transaction stage. Companies can improve conversion rates across multiple markets by using data analysis to compare conversion funnel characteristics for their markets (e.g., prioritize page load times and return/exchange instructions) to provide user experiences consistent with how users access product/service information [9].

4.5. Establishing a Marketing Performance Tracking Mechanism to Support Dynamic Strategy Adjustments

SME owners make investments to analyze costs of employing big data in marketing strategy, however struggle with measuring success of outputs. There are reasons, but primarily due to lack of established method for measuring effectiveness and data collection anchor points prior to launching marketing activities. Establishing tracking indicators prior to promotional activities will assist in defining success. Tracking indicators might include: traffic that converts to a purchase based on channels, cost to acquire a customer, or frequency of repeat purchases. Once established, these indicators can be compared with daily data to create a scorecard that follows advertising process through interaction and will help create a base of measurement of

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effectiveness through conversion and retention. The effectiveness of measurement is only as good as the benchmarks used as reference. Business owners must account for and distinguish between seasonal variations, short-term pulses from promotional activities versus long-term changes from new strategy, to avoid incorrect conclusions as a result of attributional bias. Evaluation findings from each point in process are circulated back to front end (product selection, pricing, and where product will be deployed) where actions impact success. This will allow enterprises to pinpoint which strategy combinations provide higher adaptability for markets and which links generate resource waste. A data verification process will allow for optimization, and adjustments will be made to marketing investment [10].

5. Conclusion

Big data is profoundly rewriting the competition rules of the cross-border e-commerce industry. SMEs following traditional marketing thinking paths will find it difficult to cope with the multiple challenges brought by the dataization of consumer decision-making behavior, fragmented communication channels, and intelligent competitive foundations. The key to solving the dilemma is not to confront large enterprises head-on in terms of data scale, but to find a lightweight and highly elastic data-driven marketing path that matches their own resource endowment. From building basic data capabilities to precise product selection and delivery, to channel collaboration and improving localized experiences, every step requires SMEs to face their own capability boundaries and make practical choices. By reshaping marketing logic with data thinking, cross-border e-commerce SMEs can gradually accumulate differentiated advantages in global competition.

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