Improving Marketing Strategies through Big Data: Analysis and Countermeasures

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Abstract: The rapid development of big data technology in recent years has profoundly impacted all industries, including the marketing sector. As the internet has become increasingly ubiquitous, consumer behavior is being increasingly recorded digitally. The critical role of marketing in enterprise development is accentuated by the emergence of big data as a driving force in contemporary societal progression. To optimize marketing strategies, enterprises must analyze their operations within the context of big data, identify the associated opportunities and challenges, and formulate effective marketing approaches. This, in turn, will promote the implementation of strategic marketing plans, laying a robust foundation for sustainable enterprise growth.

Keywords: marketing strategies, big data, analysis, and countermeasures

1.   Introduction

The advent of big data technology has equipped various industries with the tools to capture and process vast quantities of information rapidly, subsequently enhancing organizational data processing efficiency. In marketing, applying big data technology has catalyzed innovation, enabling the examination of current market data to yield actionable insights that guide marketing efforts.

Despite the overall analysis of big data's impact on marketing, most scholars focus on the positive implications, often overlooking the potential challenges. This study aims to address this imbalance by examining the ramifications and opportunities of big data within marketing, contributing to understanding emerging technologies influence and guiding the effective utilization of big data in marketing. The main body of the paper is organized into two sections: Chapter 2 explores the impact of big data on marketing, while Chapter 3 offers specific mitigation strategies and solutions.

2.   Literature Review

Big data technology has been integrated into the daily operations of most industries, becoming a vital catalyst for enterprise development. Organizations can obtain pertinent information through big data and employ it to devise scientifically grounded development strategies. Marketing, a crucial aspect of enterprise management, has similarly benefited from this technological revolution. MacAfee and Brynjolfsson contend that, from a business management perspective, big data constitutes an intelligent management activity capable of extracting knowledge from data and converting it into competitive advantages [1]. Li posits that the significant data era has created enhanced opportunities for

precision marketing while simultaneously introducing numerous challenges. In response, enterprises should refine their precision marketing strategies by focusing on accurate customer targeting, precise customer communication, tailored products, and value-added services for customers [2].

Drawing from the literature review, it is evident that research on applying big data in marketing has investigated both the positive and negative aspects of this technology. Building upon the foundation established by previous studies, this research delves further into analyzing big data's impact on marketing and proposes specific, actionable solutions.

3. Performance of Big Data on Marketing Impact

3.1. Significant Cost in Marketing Channel and Strategy Selection

In the era of big data, marketing has become more complex than pre-big data, leading to an evolution in marketing models. Novel online sales platforms offer customers a more comprehensive range of choices and enable more efficient shopping experiences [3].

Enterprises have access to more market opportunities and marketing channel choices in this context. However, implementing any marketing strategy is closely tied to cost considerations. As enterprises obtain more data references through e-commerce platforms, the costs associated with e-commerce operations, event participation, and promotional activities also increase. Some enterprises have successfully integrated online and offline marketing models, achieving outstanding results. Nevertheless, enterprises need to pay more attention to data analysis and research, blindly emulating successful enterprises' marketing strategies, or else they may face substantial operational risks.

3.2. Difficulty in Data Security and Consumer Lack of A Sense of Security

Big data technology can efficiently and rapidly process massive amounts of data. However, much of this information is of considerable importance to consumers, such as phone numbers, household information, and email addresses. Although big data technology can effectively map consumers' interests and preferences, it inevitably exposes information consumers prefer to keep private. If enterprises or online platforms cannot adequately protect consumer information, the occurrence of private information leakage or illegal resale is likely to cause damage to consumers.

A similar incident occurred at JD.com. In 2016, JD. com's official WeChat account published a statement addressing reported data security issues, acknowledging that data leaks had occurred due to system vulnerabilities, resulting in the resale of tens of millions of consumer records, including phone numbers, emails, passwords, identification numbers, and addresses [4]. The appearance of such security issues makes network users need more confidence in data security. Under this background, conducting big data market marketing, enterprise customers will question the enterprise's data sources, leading to distrust in market marketing work and affecting the quality improvement of enterprise marketing work.

3.3. Insufficiency in Professional Data Management

As big data technology advances, the massive increase in data volume poses significant challenges to data management in contemporary enterprises. Data's rich, diverse, and complex nature complicates scientific processing, affecting market analysis quality. The rapid growth of data volume poses a severe challenge to data storage methods, processing technology, energy consumption, etc.

3.4. Shortage of Big Data Marketing Talent

Traditional marketing methods often involve face-to-face or telephonic interactions to understand customer needs and develop marketing strategies. With the rising adoption of big data technologies,

marketing requires more sophisticated techniques for efficient market outreach [5]. Consequently, enterprises need skilled big data professionals to ensure the effectiveness of data analysis, which currently needs more high-quality talent, affecting overall marketing quality.

4. Specific Approaches

4.1. Targeted Investments to Reduce Operational Costs

Big data capabilities enhance corporate performance by lowering costs and increasing profit margins [6]. Cost reduction in big data operations can be achieved through two strategies. First, enterprises can exchange and share information about potential customers by seeking partnerships to share the cost, effectively distributing expenses. Collaboration opportunities extend beyond financial institutions, encompassing e-commerce, social media, banks, and other big data platforms to strengthen competitive advantages mutually [7].

Also, precise targeting and selecting appropriate channel models can significantly minimize management costs. Two primary approaches can be categorized based on the enterprise and the customer: personalized recommendations and bespoke customization. Personalized recommendations can be further divided into PULL and PUSH strategies. The PULL strategy involves enterprises directly publishing information online to attract customers, necessitating that customers discover relevant information, which can prove time-consuming and labor-intensive. Conversely, the PUSH strategy involves transmitting summaries of updated information to customers, permitting them to filter content based on individual preferences. This method boasts the advantages of conserving time and energy [8]. Bespoke customization, an increasingly popular approach in recent years, positions the customer as the information publisher. Sellers create uniquely tailored products according to customer requirements, reflecting individualized demands and comprehensively fulfilling customer needs. Consequently, if marketing focuses on narrow distribution channels, high-quality advertising, and marketing efforts will inevitably lead to wasted time, investment, sales, and missed opportunities. Thus, enterprises must analyze their specific sales and operational situations to tailor marketing channels, including store size, distribution systems, and online sales platforms, to facilitate customer purchasing behavior [9].

4.2. Enhance Data Security

In the era of big data, the value of data is incalculable. In marketing, data collection and utilization may infringe upon customer privacy rights, despite catering to the personalized needs of online shoppers. Balancing data protection and usage presents a conundrum for e-commerce businesses and consumers. Companies must safeguard customer privacy while accommodating intelligent enterprise development demands. They must humanize online shopping experiences while preserving consumer privacy rights. Consequently, a balanced approach to privacy protection is crucial when promoting privacy security infrastructure.

Strengthen data security measures, including implementing encryption keys, firewalls, and regular system updates. Employ cutting-edge privacy protection software and raise privacy awareness among technical personnel. Establish confidentiality agreements to hold individuals legally accountable for malicious data breaches. Multiple strategies ensure consumer information security, encouraging confidence in providing accurate information and reducing uncertainty due to incomplete or inaccurate data. Continuously improve technical security levels and address vulnerabilities, forming a technology-driven counterforce [10].

From a governmental standpoint, clarifying relevant privacy security legislation is essential. Privacy security laws must explicitly define individual information and privacy rights to regulate data

collection and processing principles better, preventing illicit personal information usage. Additionally, these laws should delineate data owners' rights, obligations, and responsibilities, demarcate data users' application scope, and preclude infringement arising from secondary data usage.

4.3. Improve Information Extraction and Analysis Capabilities

Enterprises should utilize data mining methods and tools such as Smartbi and Rapid Miner to extract patterns and trends from the information. For example, Oracle Corporation leverages big data technology to expand its industrial chain, including databases, operating systems, middleware, and application software, building a next-generation massive relational data management platform [11]. Employ big data to classify and analyze market consumers and identify dual market and customer demands, enabling effective forecasting and cost reduction. Big data business models focus on value propositions, enhancing enterprise performance. Uncover latent customer needs, concentrate on niche markets [12], and drive innovation through a more open ecosystem based on big data technology, facilitating the thriving development of business model innovation [13]. Additionally, enterprises can use big data to evaluate product post-sales scientifically, estimate market acceptance, and accurately understand product performance, thus setting data-driven production planning.

4.4. Accelerate the Construction of Big Data Talents

Implementing big data marketing requires personnel proficient in big data technology and marketing. Certified Project Data Analysts (CPDA) are globally recognized professionals specializing in the financial analysis of investment projects. These expert decision-makers adeptly handle extensive industry data, utilizing scientific computational tools and data analysis techniques to scrutinize potential customer behavior patterns within vast datasets. CDPAs provide valuable data-driven support for enterprise strategies by identifying existing customer behavior characteristics.

Enterprises should prioritize talent in the big data era, collaborating with universities to cultivate talent suitable for growth. Establish partnerships with educational institutions to create talent development models such as "order classes," "factory-school integration," and "apprenticeships." Broaden recruitment channels to reserve high-quality, competent, and skilled talent, enhancing the enterprise's competitiveness in facing various market challenges and pressures.

5. Conclusion

This research has examined four crucial facets of big data's impact on marketing: the substantial cost of investment associated with marketing channel and strategy selection, the challenge of ensuring data security, consumer apprehension regarding safety, and the deficiency in professionalism and the scarcity of big data marketing talents within data management. Simultaneously, the study proposes four corresponding resolutions: targeted investment to minimize operational costs, reinforcement of data security measures, augmentation of information extraction and analytical capabilities, and the acceleration of big data talent development.

The investigation conducted in this research primarily adopts a theoretical approach, summarizing and expounding on perspectives without the rigid backing of data models, thus providing reference value only. Nevertheless, as big data technology adoption continues to deepen, analyzing its merits and drawbacks will inevitably become increasingly robust, rendering this study valuable.

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