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DATA-DRIVEN CUSTOMIZATION: EXPLORING ADVANCED PERSONALIZED MARKETING TECHNIQUES IN THE DIGITAL AGE

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Abstract: The advent of the digital era has ushered in a transformative wave of big data technology, revolutionizing operations across various sectors, with a profound impact on the business landscape. In particular, big data technology has reshaped the operational logic of enterprises and transformed the dynamics of market competition. Personalized product marketing, a pivotal component of modern marketing strategy, revolves around the precise identification and fulfillment of unique consumer needs to optimize marketing effectiveness and enhance user satisfaction. However, achieving this objective hinge on the in-depth mining and accurate analysis of consumer characteristics. This paper delves into the pivotal role of big data technology in driving innovation in personalized product marketing. By providing unprecedented access to vast consumer datasets, big data technology empowers companies to glean valuable insights and conduct granular analysis of consumer behavior and preferences. Leveraging advanced analytics techniques, businesses can uncover actionable intelligence and tailor marketing strategies to individual consumer profiles, thereby enhancing engagement and fostering brand loyalty. Drawing upon insights from contemporary literature and empirical studies, this paper elucidates the transformative potential of big data technology in personalized product marketing. It explores key strategies and methodologies for leveraging big data analytics to deliver targeted and relevant marketing messages, personalized recommendations, and customized product offerings. Furthermore, the paper examines the implications of big data technology for consumer privacy, ethical considerations, and regulatory compliance. By embracing big data technology responsibly, businesses can unlock new opportunities for innovation, differentiation, and competitive advantage in the dynamic marketplace.

Keywords: Big data technology, Personalized product marketing, Consumer behavior analysis, Data analytics, Marketing effectiveness

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1. Introduction

In the wave of the digital era, big data technology, like a powerful force, has profoundly influenced the way of operation in all fields of society, especially in the business field, which has reshaped the operation logic of enterprises and the dynamics of market competition. Personalised product marketing, as an important part of modern marketing strategy, is centred on accurately identifying and satisfying unique needs of consumers in order to optimise marketing effectiveness and increase user satisfaction.[1] However, the achievement of this goal is highly dependent on in-depth mining and accurate analysis of consumer characteristics. It is the rise of big data technology that enables companies to access, process and analyse huge consumer data sets in an unprecedented way, paving the way for the innovative of personalised product marketing.

2. Application of Big Data in Personalised Product Marketing

2.1 Definition and Characteristics of Big Data

Big data refers to a collection of huge data volume, diverse sources and fast processing beyond the capability of traditional data processing tools. Big data is characterised by large data volumes, fast processing speeds, multiple data types and low value density. Big data involves complex data types and fast data flow, not only the size of massive data. At the same time, the value of big data is often hidden the massive data, which needs to be professionally processed and analysed in order to find out where value of big data lies. These characteristics make big data an important basis for business decision-making today and a source of competitive advantage for organisational decision-making.[2]

2.2 Advantages of Big Data Driven Personalised Product Marketing

The application value of big data in marketing is self-evident. First of all, the use of big data technology enables enterprises to collect and analyse consumer data with unprecedented breadth and depth, dig deep into consumers' behavioural trajectories, preferences and purchasing records, and provide tailor-made product recommendations and marketing services for each customer. By exploring and analysing huge amounts of data, companies are able to gain insights into the real needs of consumers, subtle changes in the market and the dynamic strategies of competitors. This insight enables companies to create sharper, more targeted marketing strategies, so that product design and market positioning are more in line with consumer expectations. [3]This not only improves sales efficiency and wins customer satisfaction and trust, but also enables companies to achieve more precise and efficient market expansion while reducing marketing costs. More importantly, it is to win valuable advantages and broader development space for enterprises in the fierce market competition.

3. Big Data-Driven Personalised Product Marketing Strategy Development

3.1 Market Segmentation Strategy Based on Consumer Profile

In the big data-driven personalised product marketing strategy, the market segmentation strategy based on consumer profiles plays a pivotal role. This strategy makes full use of the powerful analytical capability of big data technology to deeply explore and analyse multi-dimensional information of consumers, including but not limited to purchase history, browsing behaviour and social media interaction, so as to construct accurate and detailed consumer profiles. These profiles not only reflect consumers' explicit needs, but also reveal their potential needs and preferences. Based on these accurate portraits, enterprises can more accurately divide the market into different user groups, and tailor-made personalised product marketing strategies to meet the unique needs and characteristics of each group.(See Table 1)

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Table 1 Consumer Portrait Content Overview Chart

Consumer Profile	Content	Note
Basic Attribute Information	age, gender, occupation, level of education, family status	static data for initial characterisation of social context and demographics.
Consumer behaviour and preferences	Purchase history, purchase frequency, purchase amount, brand choice, product preference	Dynamic data with insights into consumer habits, brand loyalty and product demand.
Lifestyle & Hobbies	daily activities, recreation, exercise habits, travelling preferences	Comprehensive understanding of the state of life and value orientation, providing reference for product development and market positioning.
Social Networking and Influence	Social media interaction behaviour, social circles, sphere of influence	Reflecting status and influence in social networks has important implications for social media marketing and word-of-mouth communication strategies.
Psychological characteristics and values (deepest level)	speech and behaviour analysis, evaluative feedback, behavioural decision-making process	Insights into psychological needs, values and decision-making motivations are critical to building emotional connections and enhancing brand identity.

3.2 Personalised Product Recommendation Strategy

In the face of massive product choices, information overload has become the norm in today's digital age, and consumers are often confused. Based on the in-depth mining and analysis of multi-dimensional data such as consumers' historical behaviour, preferences and needs, the personalized product recommendation strategy, which is dedicated to providing consumers with tailor-made product recommendation services to effectively solve this problem, has emerged(Sun Zehong,2023).[4] The core of this strategy lies in the accurate construction of consumer profiles, and the recommendation is achieved in two main ways: one is to focus on the historical choices and behavioural patterns of consumers, and recommend similar or related products for them in terms of content recommendation; the other is collaborative filtering recommendation, which makes use of the similarity between the consumer groups to recommend the products, such as the products that are preferred by other members of the

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group, based on the similar purchasing records, ratings, feedback and other information recommended to the current consumers(Liu Yi,et.al.,2023).[3] Personalised product recommendation strategy is an indispensable and important marketing tool for enterprises in the digital era, which has shown significant application value for the improvement of user experience, sales performance and the enhancement of enterprise competitiveness.

3.3 Precision Advertising Strategy

Precision advertising strategy makes use of the powerful ability of big data technology, and is committed to accurately and efficiently placing advertisements in front of target users, so as to optimize the marketing effect and reduce unnecessary advertising expenditure. In order to achieve this goal, precision advertising strategy not only needs to accurately identify the target user groups, but also must be flexibly adjusted according to the immediate behaviour, preferences and needs of the users, to ensure that the advertisements displayed closely match the interests and actual needs of the users.

Precise advertising strategy has a wide range of application scenarios, covering almost all areas of advertising and marketing. On e-commerce platforms, through in-depth analysis of users' purchase history and browsing behaviour, we can accurately recommend relevant products and provide personalised promotional offers to users, which can effectively increase the purchase conversion rate and order value. Meanwhile, social media platforms make use of data such as users' interests, geographic locations and social behaviours to accurately deliver highly relevant advertisements to target user groups, significantly increasing the click rate and interaction rate of advertisements. In addition, search engines, through precise advertising strategies, accurately display ads to users searching for relevant keywords, significantly increasing the exposure rate and click-through rate of ads. Video platforms are not lagging behind either. They insert advertisements closely related to the target user groups into videos based on data such as users' viewing history and interests and preferences, effectively increasing the viewing rate and brand recognition of advertisements. These application scenarios fully prove the importance and effectiveness of precise advertising strategy. Therefore, for enterprises wishing to improve advertising effectiveness and achieve high precision placement, the active adoption of precision advertising strategy will become the key to their competitive advantage.

3.4 Customer Relationship Management Strategy

In the study of big data-driven personalised product marketing strategies, customer relationship management (CRM) is regarded as the core method of maintaining and deepening customer relationships (Gong Hongen,2022). [5] With the advanced analysis capability of big data, enterprises can deeply explore the actual needs of customers, refine and polish the customer experience, and then effectively enhance customer satisfaction and brand loyalty, laying a solid foundation for the success of marketing activities.

The core essence of CRM strategy is to adhere to the principle of customer-centricity, and through the use of big data technology to systematically collect, integrate and deeply analyse multi-dimensional data of customers, such as basic information, transaction history and behavioural preferences, etc., with the aim of comprehensively revealing and understanding the real needs and behavioural patterns of customers. Based on these detailed data insights, enterprises are able to build detailed customer profiles covering key aspects such as customers' interests, purchasing power and consumption habits, laying a solid foundation for subsequent precision marketing. Further, through the dynamic interaction between customer profiles and real-time behavioural data, enterprises can

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provide highly personalized product recommendations and excellent service experiences for customers, thus effectively meeting their unique needs and deepening the relationship between customers and enterprises.

In summary, by using big data technology to collect and analyse customer data, enterprises are able to more accurately understand customer needs and behavioural patterns, and thus provide personalised product and service recommendations. This customer relationship management strategy not only enhances the connection and trust between customers and enterprises, but also brings more business opportunities and competitive advantages to enterprises.

4. Huawei Mall Case Study

Huawei Mall(VMALL), as the official e-commerce platform of China's Huawei, provides Huawei's full range of all-scene smart life products and services, and has successfully stood out in the highly competitive e-commerce market by virtue of its strategic application of consumer profiling, personalised product recommendation, precise advertising and customer relationship management.

4.1 Application of Market Segmentation Strategies Based on Consumer Portraits

VMALL has carefully constructed a multi-dimensional, high-precision consumer portrait, using in-depth mining and analysis of consumer purchase history, browsing behaviour, search keywords and other multifaceted data. Based on these detailed profiles, the mall has successfully subdivided the large and complex market of technology enthusiasts, business elites, and students into multiple distinctive user groups. VMALL aims to achieve a high degree of compatibility with various user groups by adopting customised product display strategies, differentiated promotional activities, and personalised shopping experience design to address the unique needs of different market segments. For example, Huawei Mall, for tech enthusiasts, pays special attention to displaying the latest tech products and supporting technical information in order to stimulate their desire to buy and enhance brand loyalty. This comprehensive process covers the following important steps:

4.1.1 Information Collection Phase

Data collectors extensively collect information about consumers' registrations on VMALL's platform, browsing history from diversified channels - including, but not limited to, social media platforms, online shopping sites, and customer relationship management systems, purchase history, basic information (such as age level, gender distribution, geographic location, etc.), psychological characteristics (such as values, lifestyle, etc.), and their behavioural data (such as browsing preferences, transaction records, and feedback ratings, etc.) on the VMALL platform.

4.1.2 Data Preprocessing and Integration

The huge data set collected is subjected to a fine-grained cleansing process to eliminate redundant, invalid or erroneous data entries and ensure the accuracy and consistency of the information. Subsequently, these filtered data are integrated from different sources into a unified management platform or database for subsequent analysis and exploitation.

4.1.3 Key feature extraction and classification and labelling

With the help of advanced data mining technology and machine learning algorithms, marketers can extract key elements that can accurately portray consumer characteristics from the integrated data, and carry out classification and labelling processes on them. For example, marketers can classify consumers as 'high-frequency purchasing group', 'high price sensitivity group' or 'strong environmental awareness group'.

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4.1.4 Final portrait construction

This work is carried out on the solid foundation of the previous steps. The marketer carefully classifies consumers who display similar characteristics and labels into different market segments. For each of these segments, a typical consumer profile is constructed in depth, which enables the enterprise to understand the needs and characteristics of each market segment more precisely, so as to design a more relevant and targeted marketing strategy, and effectively improve the market response rate and marketing effectiveness.

4.2 Application of personalised product recommendation strategy

In the current e-commerce environment, personalised product recommendation has become an important means to improve user satisfaction and purchase conversion rate. VMALL as the official e-commerce platform of Huawei, has achieved remarkable results in personalised product recommendation by virtue of its advanced recommendation algorithm and big data analysis technology.VMALL's recommendation system is built on the basis of real-time user behaviour and historical data. By collecting and analysing user behavioural data such as browsing, searching, purchasing, and evaluating on the platform, as well as basic user information such as gender, age, and geography, VMALL is able to build accurate user profiles. These portraits not only reflect the static characteristics of users, but also capture their dynamic interests and changing needs. In practice, Huawei Mall's recommendation algorithms are able to recommend personalised products for users based on their current behaviour and historical data. For example, when a user browses VMALL, the recommendation system analyses his or her preferences and needs based on his or her historical purchase history and browsing behaviour, and then shows him or her products that may be of interest. This real-time recommendation based on user behaviour not only improves product exposure, but also greatly increases the likelihood of a user's purchase. In summary, VMALL has successfully achieved the in-depth application of personalised product recommendation by using advanced recommendation algorithms and big data analysis technology. This not only improves the shopping experience and satisfaction of users, but also brings considerable sales growth to VMALL.

4.3 Application of Precise Advertising Strategy

VMALL accurately targets user groups through big data analysis of user profiling technology and customizes personalized advertising content based on their interests, needs, and behavioural characteristics. Using real-time bidding technology and intelligent advertisement placement systems, Huawei Mall accurately reaches and effectively converts target users across multiple channels and platforms. At the same time, based on real-time monitoring and evaluation of advertisement effects, VMALL timely adjusts the placement strategy and optimises the advertisement content to increase the click rate and conversion rate of advertisements.

For example, VMALL used the following precise advertising strategies for the launch of the new Mate60 mobile phone:

Target Audience Positioning: Through data analysis, Huawei Mall found that the main potential user groups of the new mobile phone were technology enthusiasts and high-end business people. Therefore, when advertising, it focused on targeting these two user groups. Advertisement content design: For technology enthusiasts, the advertisement content highlights the innovative technology and extreme performance of the new mobile phone, such as the latest chip, full-focus ultra-clear image, etc. For high-end business people, the advertisement content emphasises the business functions and high-end quality of the new mobile phone, such as satellite calls, dual card dual standby, and long battery life.

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To sum up, in the era of digital marketing, the importance of precise advertising strategies for e-commerce platforms is self-evident. Huawei Mall, through the use of advanced data analysis technology and precise advertisement placement system, has successfully achieved efficient reach and conversion of advertisements.

4.4 Application of Customer Relationship Management Strategies

VMALL achieves comprehensive integration of customer data from different channels and touchpoints through a carefully constructed CRM system, forming a unified and detailed view of customers. This view provides a solid foundation for in-depth mining and accurate analysis of customer information. Based on this valuable data and analysis, VMALL has developed a series of highly personalised interaction and service strategies. These strategies are designed to provide customers with a customised shopping experience, from product recommendations to priority delivery services to exclusive promotions, each of which is designed around the customer's needs and preferences (Lyu Jian.2021). [6] The provision of such personalised services not only significantly enhances customer loyalty and satisfaction with Huawei Mall, but also earns VMALL a valuable differentiation advantage in the fiercely competitive marketplace.

VMALL has systematically laid out three core segments in building and optimising customer experience. The first is customer data integration and in-depth analysis, through the establishment of a set of customer information collection and processing systems, convergence of multi-source data and in-depth excavation of customer needs, preferences and potential purchase motives. Secondly, personalised user interaction and service experience, based on the accurate understanding of data, develop customised interaction and service strategies, provide attentive and targeted services, and provide full support through high-quality pre-sales consultation and after-sales service. Finally, we build a customer loyalty system, designing points accumulation, membership level system and privileged preferential activities to enhance customers' sense of belonging and satisfaction, and promote sales growth and word-of-mouth communication. These three major sections support each other and together constitute VMALL's comprehensive strategic layout in terms of customer experience [7].

In summary, Huawei Mall has demonstrated excellent practical results in its product marketing strategy. Its market segmentation strategy based on refined consumer profiles, personalised product recommendation strategy, precise advertising strategy, customer relationship management strategy and other diversified means have not only significantly improved the shopping experience and satisfaction of users, but also achieved sustained growth in sales performance. The in-depth application of these strategies has enabled Huawei Mall to stand out in the fiercely competitive market and solidify its dominant position in the industry.

5. Conclusion

After rigorous research and analysis, this paper draws the following conclusion: in the field of personalised product marketing, big data has significant advantages and application value in personalised product marketing. Marketing strategies that rely on big data, such as refined market segmentation, highly accurate advertising, and optimised customer relationship management, have significantly improved the marketing effectiveness and competitiveness of enterprises in the market. Huawei Mall is a successful example of this strategy, which not only proves the effectiveness of these strategies in practice, but also highlights the economic benefits and brand value it brings to the enterprise. With the continuous innovation of science and technology and the increasing abundance of data resources, the application of big data in personalised product marketing will be more broad and in-depth, breeding more business opportunities and value-added space for enterprises. Therefore, enterprises

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should actively grasp the pulse of the era of big data, and continuously strengthen their data processing and analysis capabilities, in order to develop a more accurate and efficient personalised product marketing strategy.

References

Nick Hajli;Mina Tajvidi;Ayantunji Gbadamosi;Waqar Nadeem.Understanding market agility for new product success with big data analytics [J] .Journal of Business Research.2019:75.

Qi Yudong; Xiao Xu.The Transformation of Enterprise Management in the Digital Economy Era [J] .Managing the World.2020 (06):135-152+250.

Liu Yi; Cui Haitao; Shu Sheng.Research on omnichannel marketing in the context of mobile internet [J] .Journal of Marketing Science. 2023 (01):2-17.

Sun Zehong.Analysis of e-commerce precision marketing based on the advantages of big data technology [J] . Business Economics Research.2023 (07):77-79.

Gong Hongen.Research on the Impact of Precision Marketing on Consumer Brand Attitude and Purchase Intention [J] .Enterprise Technology and Development.2022 (07):182-184.

Lyu Jian.Research on Precision Marketing Strategies for Cross border E-commerce Enterprises in the Era of Big Data [J].Enterprise Technology and Development.2021 (04):199-200.

Zhu Heliang, Guo Kaige, Wang Chunjuan. Research on the influencing factors of digital consumption based on the consumer perspective [J]. Business Research, 2023,65 (1): 143-145.