

Research on the innovative strategy of e-commerce marketing model under the background of artificial intelligence

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Abstract

With the rapid development of artificial intelligence, its application in e-commerce marketing models has become an important force to promote economic growth and enterprise transformation and upgrading. This paper delves into the development of artificial intelligence e-commerce, analyzes the problems existing in the current e-commerce marketing model, and focuses on the strategic methods of optimizing and innovating the e-commerce marketing model in the context of artificial intelligence.

Keywords

Artificial intelligence; e-commerce; marketing model; Innovative Strategy

Introduction

Under digital transformation, artificial intelligence technology has become an important force in promoting the development of various industries, which can analyze and mine massive e-commerce data, so as to gain an in-depth understanding of consumer needs and behavior patterns, and provide more accurate and personalized services for e-commerce marketing; As an important part of the digital economy, e-commerce is also showing a booming trend on a global scale. To this end, the integration of artificial intelligence and e-commerce has also brought new development opportunities to the industry, which not only helps to improve consumers' shopping experience, but also improves the marketing efficiency and effectiveness of enterprises and enhances their market competitiveness.

1. Development of artificial intelligence and e-commerce

1.1. Overview of the development of artificial intelligence technology

Artificial intelligence is a branch of computer science that aims to develop a new intelligent machine that can respond in a similar way to human intelligence. Since the mid-20th century, the field of artificial intelligence has opened a number of key waves of development, from the beginning with relatively basic algorithms such as symbolic logic and decision trees as the core, to the gradual rise of machine learning and deep learning. For the first time, the machine has the ability to learn independently and continuously optimize[1].

With the continuous optimization of machine learning algorithms, deep learning models have shown strong performance in areas such as image recognition, speech recognition, and natural language processing. For example, in the field of image recognition, convolutional neural networks can accurately classify and recognize various complex images, its accuracy even surpasses the human level in some specific tasks; In the two major fields of natural language processing and speech recognition, significant breakthroughs have been made in technology, and the level of translation technology is close to the level of human translation. Ability to understand and generate natural language, Implement various functions such as conversational interaction, text generation, and translation. This provides strong support for applications such as intelligent customer service and intelligent writing[2].

1.2. Development trends and characteristics of e-commerce

E-commerce is a business activity of commodity exchange and service through network information technology, which is based on the Internet, and through the online platform buyers and sellers carry out various business activities without meeting each other to realize a series of business operations such as online shopping of consumers, online transactions between merchants and online electronic payment. E-commerce has evolved rapidly over the past few decades, from its early days as a simple online shopping platform to today's complex ecosystem that encompasses multiple business models and technologies.

In recent years, e-commerce has shown the following business trends and characteristics: the convenience of mobile shopping, anytime and anywhere, and rich interactive experience meet consumers' shopping needs in the fast-paced life; The integration of social media and e-commerce increases user engagement and purchase conversions; The continuous growth of cross-border e-commerce has brought broader market space and development opportunities to enterprises; Retailers have begun to shift to online and offline channel models to realize the interoperability of goods, inventory, membership and other data, and provide consumers with omni-channel retail services.

2. The current situation of e-commerce marketing model

2.1. Analysis of traditional e-commerce marketing model

There are many problems in the operation of the traditional e-commerce model, which are intertwined and jointly restrict the development efficiency of enterprises and the expansion space of the market. The methods used in consumer behavior prediction are generally relatively simple, most of which rely on simple statistics on historical purchase data, and fail to carry out comprehensive analysis and in-depth mining from multiple dimensions such as consumer interest changes, daily browsing trajectories, and social media interactions. It often happens that consumers continue to push similar products to them just because they have purchased a certain type of goods in the past, completely ignoring the objective fact that consumer interest may have changed, which not only makes it difficult for enterprises' marketing activities to accurately target customers, but also invisibly reduces marketing efficiency and causes unnecessary waste of a large amount of marketing resources.

At the same time, some traditional e-commerce companies also have obvious limitations in the layout of marketing channels. For example, sales and promotion work is overly concentrated in a few places such as Taobao and JD.com. Mainstream e-commerce platforms lack enough attention to emerging social platforms such as Douyin and Xiaohongshu that have risen rapidly in recent years. But it's actually different. The activity of consumer groups on various platforms shows significant differences, especially young consumers are more willing to discover their favorite products and complete purchases on novel social platforms. This single channel strategy makes it difficult for enterprises to reach diverse consumer groups in all aspects, which in turn hinders the process of market expansion[3].

Even if some traditional e-commerce companies have accumulated massive customer data in long-term operation, their data analysis capabilities are difficult to keep up with the development needs, and they can only complete basic data processing such as sales statistics and order quantity accounting, and cannot deeply analyze the real customer needs, purchase motivations and behavior patterns hidden behind the data through data. Taking customer evaluation data as an example, it is often difficult for enterprises to accurately extract specific customer demand information for product functions, quality levels and design, which directly leads to the lack of clear direction guidance when improving product performance and optimizing service experience, and it is difficult to effectively meet the personalized needs of customers.

At the level of product recommendation, some traditional e-commerce platforms have not been able to establish a scientific personalized recommendation mechanism, and the recommendation logic mostly revolves around popular products or similar products, which cannot provide in-depth insight into the unique needs and purchase preferences of each customer. This makes the recommended content presented in front of consumers often not fit their own interests when browsing products, which not only increases the time cost of consumers to screen products, but also greatly weakens the shopping experience[4]. In the long run, consumers' satisfaction with the platform will gradually decline, and it is very easy to lose customers, which will

have an extremely adverse impact on enhancing consumer loyalty and ensuring the long-term stable development of enterprises.

2.2. Challenges and problems faced by the current e-commerce marketing model

With the continuous development of artificial intelligence, the competition in the e-commerce market is becoming more and more intense. Consumer demand also continues to iterate. The intertwining effect of the two makes industry marketing face a series of dilemmas that need to be broken through [5]. Consumers' expectations for the shopping experience have long gone beyond standardized products and services. The call for personalized needs is also increasing. However, the lack of the ability of traditional marketing models to accurately capture individual needs will also lead to a disconnect between marketing actions and user expectations, making it difficult to achieve the desired effect.

How to peel off invalid information from these massive data, extract guiding core insights and provide a reliable basis for marketing strategy formulation has become a problem for many e-commerce companies on the way forward.

The innovation of Internet technology has given rise to a diversified channel matrix such as e-commerce platforms, social media, live broadcasts and short videos, and the continuous differentiation of marketing channels has also exacerbated operational challenges. If enterprises want to reach a wider range of target groups, they must carry out and promote work synchronously through multiple channels, which not only greatly increases the complexity and cost investment of marketing management, but also makes it difficult to form a joint force for overall marketing effectiveness such as data inaccessibility and strategy coordination between various channels.

More importantly, the continuous increase in customer lifecycle management costs has pushed up the cost threshold for new customer acquisition due to fierce market competition, and the expansion of consumer choice space has led to a general decrease in customer loyalty, making it difficult to retain old customers. Therefore, enterprises need to continuously invest a lot of resources to attract new customers and maintain old customers, and this high-investment operation model is constantly squeezing the profit margin of enterprises, making it an important factor restricting the sustainable development of the industry.

3. Innovative strategies based on artificial intelligence e-commerce marketing models

3.1. Construction and application of personalized recommendation system

Personalized recommendation systems are one of the most widely used areas of artificial intelligence in e-commerce marketing, which collects and analyzes users' mul-

ti-dimensional data, such as browsing history, purchase history, search behavior, interest preferences, etc., and uses machine learning algorithms to build user profiles, and then accurately recommends products that meet user interests and needs.

When building personalized recommendation systems, commonly used algorithms include collaborative filtering algorithms, content-based recommendation algorithms, and deep learning algorithms. The collaborative filtering algorithm analyzes the similarities between users to find user groups with similar interests to the target users, and then recommends the products that these similar users like to the target users. The content-based recommendation algorithm recommends similar products to users based on the attributes and characteristics of the product, such as the category, brand, description, etc. of the product. Deep learning algorithms can model and analyze complex data, and analyze the potential relationship between users and products by building deep neural network models, thereby achieving more accurate recommendations. As shown in Table 1, the user portrait system is built based on artificial intelligence algorithms.

Table 1. Constructs a user portrait system based on artificial intelligence algorithms

steps	Technical approach	Application scenarios
Collect data	Integrate multi-source data such as e-commerce platforms and social media	Build a user database that covers static attributes (age, gender) and dynamic behavior (real-time interaction data)
Processing data	Natural language processing technology is used to analyze consumer sentiment, and cluster analysis is used to extract keywords	Analyze unstructured text and divide groups with similar behaviors
Construct a portrait	The dynamic label system is used to update consumer interest labels, and the logistic regression model is used to classify consumer groups	Generate user interest maps, spending power ratings, and life cycle value predictions
Precision marketing	Introduce a personalized recommendation system to optimize advertising strategies	Match products according to consumer portraits and accurately push marketing content
Effect evaluation	Comparative testing, conversion rate monitoring, and ROI analysis	Verify the accuracy of the imaging system and evaluate the effectiveness of the analysis model

Take Amazon as an example, its personalized recommendation system provides users with rich product recommendations, and the conversion rate of recommended products is much higher than that of other products. According to statistics, about 35% of Amazon's sales come from orders brought by personalized recommendation systems, and when users browse the Amazon website, the system will display personalized recommended product lists on the homepage, product detail page and other positions according to the user's historical behavior and real-time behavior, which greatly improves the probability of users discovering their favorite products, thereby improving the user's shopping experience and purchase conversion rate.

3.2. Precise advertising strategy

Artificial intelligence technology can help e-commerce companies achieve precise

advertising to improve advertising effectiveness and return on investment. Through the analysis of user data, including the user's basic information, interests and behavioral characteristics, users are divided into different segments, and then personalized advertising strategies are formulated for different segments. In the process of advertising, artificial intelligence algorithms are used to monitor the effectiveness of advertising in real time and adjust advertising strategies in a timely manner based on user feedback and behavioral data, such as adjusting the time, place, audience and advertising content of advertising. Taking Real-Time Bidding (RTB) technology as an example, at the moment of ad display, based on the user's characteristics and behavior data, bid for advertising opportunities from many advertisers in real time, and display the most suitable advertisements to users.

In addition, artificial intelligence can also improve the attractiveness and click-through rate of advertisements through the optimization of ad creatives. Technologies such as Generative Adversarial Network (GAN) are used to generate different styles of advertising images and copy, and then A/B testing and other methods are used to find the ad creatives that attract users the most. For example, Alibaba's intelligent marketing platform uses artificial intelligence technology to automatically generate personalized advertising creatives based on different marketing scenarios and target audiences, achieving precise advertising and effectively improving advertising effectiveness and conversion rates.

3.3. Intelligent customer service and customer interaction improvement

Intelligent customer service is another important application of artificial intelligence in the field of e-commerce. Based on natural language processing technology, intelligent customer service can respond to users' inquiries and questions in real time, providing users with fast and accurate answers, and intelligent customer service can be online 24 hours a day, providing services to users at any time, which greatly improves the efficiency and response speed of customer service.

Intelligent customer service can not only answer common questions of users, but also analyze and understand users' problems, and then tap into the potential needs of users, and provide users with personalized product recommendations and solutions. For example, when a user inquires about a product, intelligent customer service can recommend related product accessories, supporting products, or other products that users may be interested in based on the user's questions and historical data.

At the same time, intelligent customer service can also conduct multiple rounds of dialogue with users to understand users' complex intentions and provide more humanized services. Some advanced intelligent customer service systems also have emotion recognition capabilities, which can sense the user's emotional state and give appropriate responses and care during the conversation, which improves user satisfaction. For example, JD.com's intelligent customer service "Jing Xiaozhi" can handle a

large number of user inquiries, effectively reducing manual customer service pressure by 90% and increasing customer satisfaction by 30%, which improves customer service quality and user experience.

3.4. Market forecast and accurate product selection based on artificial intelligence

Artificial intelligence technology can predict market trends and changes in consumer demand by analyzing and mining massive market data, sales data and user data, etc., providing strong support for e-commerce companies to accurately select products. Through machine learning algorithms, historical sales data is analyzed, combined with market dynamics, seasonal factors and fashion trends and other information to predict the sales of different products in the future period to help enterprises reasonably arrange inventory and avoid inventory overstock or shortages. For example, use time series analysis algorithms to predict the sales trend of a certain product to prepare for replenishment or promotion in advance.

At the same time, artificial intelligence can also analyze text data such as social media, industry forums, and consumer reviews and explore potential consumer needs and product feedback to discover new market opportunities and product innovations. For example, through natural language processing technology, consumers can analyze the hot spots and pain points of consumers' discussions about a certain type of product on social media, and companies can develop new products or improve existing products based on this information. In addition, artificial intelligence technology can also be used to analyze competitors' products and marketing strategies, which also helps enterprises formulate differentiated product selection strategies, thereby improving market competitiveness.

4. Conclusion

Artificial intelligence has brought many opportunities to e-commerce marketing, and through innovative strategies such as building personalized recommendation systems, implementing precise advertising, applying intelligent customer service to improve customer interaction, and conducting artificial intelligence market forecasting and accurate product selection, it can effectively solve the current challenges and problems faced by e-commerce marketing, improve marketing efficiency and effectiveness, and enhance consumers' shopping experience and satisfaction. However, the application of artificial intelligence in e-commerce marketing also faces some problems, such as data security and privacy protection issues, and the interpretability of artificial intelligence algorithms. In the future, with the continuous development and improvement of artificial intelligence technology, as well as the establishment and improvement of relevant laws, regulations and industry standards, e-commerce enterprises should actively embrace artificial intelligence technology, constantly explore and innovate marketing models to adapt to market changes and

consumer needs, and gain an advantageous position in the fierce market competition. Jointly promote the sustainable development of the e-commerce industry.

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