

Research on the application of AIGC Technology in E-commerce Platforms Advertising

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Abstract

On the basis of the current status of generative artificial intelligence-generated content (AIGC) technology in the field of e-commerce advertising, this study adopts a mixed research methodology, combining sentiment analysis and topic modelling techniques, to systematically explore consumer attitudes, the path of technological practice, and the challenges of industry development. By crawling 679 user comments on the Weibo platform, the study revealed that (1) 56% of the comments presented negative sentiment tendencies, which mainly stemmed from concerns about the credibility of the technology (e.g., the authenticity of the generated content) and ethical risks; (2) thematic analysis revealed that users' concerns were focused on the "efficacy of AI technology" (e.g., the application of large models); and (2) thematic analysis revealed that users' concerns focused on the dimensions of "AI technology effectiveness" (e.g., big model application), "content generation form" (e.g., video advertisement creativity), and "tool suitability" (e.g., DeepSeek tool). The study further combines case studies to validate the practical value of AIGC in content production efficiency (e.g., a 4.2-fold improvement in ad material generation time efficiency) and user experience optimization (e.g., a 19.8% improvement in the conversion rate of virtual try-on scenes). Moreover, this paper reveals the four-dimensional challenges faced by AIGC technology-legal risk (e.g., copyright disputes), ethical bias (e.g., training data bias), quality control (e.g., logical flaws in generated content) and operational thresholds (e.g., differences in engineering capabilities) and advances the construction of multisource data training, standardized prompt frameworks and other coping strategies. This study provides a theoretical basis and practical paradigm for the deep integration of AIGC technology and e-commerce advertising, with both methodological innovation and industrial guidance value.

Keywords

e-commerce advertising, sentiment analysis, topic modelling, consumer cognitive bias, generative artificial intelligence (AIGC)

1. Introduction

Breakthroughs in artificial intelligence-generated content (AIGC) technology are reshaping the paradigm of e-commerce advertising content production and distribution. On the basis of deep learning frameworks (such as transformers and GANs), AIGC technology has realized the automated generation of text, images and videos, significantly reducing the cost of content creation and increasing the accuracy of advertisements. According to the “2025 White Paper on the Intelligent Development of Global E-commerce”, the average advertising conversion rate of platforms deploying AIGC technology has increased by 17.8%, and the efficiency of content production has increased by 4.2 times compared with the traditional mode, marking the e-commerce industry's formal entry into a new era of “intelligent content generation”. However, the rapid iteration of the technology has also triggered a double controversy between academia and industry: how acceptable is AIGC advertising to consumers? Is technology-driven innovation accompanied by ethical risks and governance challenges?

Existing research has focused mostly on the technical implementation path of AIGC or the application effect of a single scenario, but the systematic analysis of consumer attitudes is still insufficient. In particular, the differences in user perceptions in cross-platform and cross-cultural contexts have not yet been clarified, and there is a lack of theoretical support for the technology adaptation mechanism of small- and medium-sized e-commerce platforms. In addition, the lag between the speed of technological iteration and the construction of regulatory frameworks exacerbates ethical controversies, such as the ambiguous copyright attribution of AI-generated content and discriminatory outputs due to bias in training data, which urgently needs to be resolved.

This study aims to fill the following academic gaps: (1) to reveal consumers' cognitive characteristics and affective tendencies toward AIGC advertisements through empirical analyses; (2) to construct a framework for AIGC application in e-commerce advertisements from the dimensions of technological appropriateness, ethical compliance, and commercial value; and (3) to propose a strategy system that takes into account both technological innovation and risk regulation. This study adopts a mixed research method that combines sentiment analysis and topic modelling of microblog comments and selects typical cases for technoeconomic analysis to provide industry participants with decision-making references with both theoretical depth and practical validity.

2. Methodology

2.1 Sentiment Analysis

Using natural language processing technology, the sentiment tendency of the collected comment content is analysed, the comments are classified into positive and negative categories, and the percentage of each type of sentiment is calculated. To understand the overall attitude of users towards the application of AIGC in e-commerce advertising and to determine whether users generally approve of it or have some concerns and dissatisfaction, enterprises and developers can target improvement and optimization. A total of 679 comments were crawled on the Weibo platform, and Python was used for data cleaning and data visualization. A pie chart is formed to analyse the positive and negative attitudes of users toward the application of AIGC in e-commerce advertising.

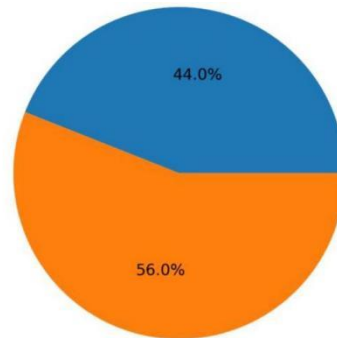
2.2 Thematic Analysis

Through text mining technology, we extract the topic information in the comments and identify the main topics that users are concerned about, such as the technical effect of AIGC, its impact on e-commerce business, and its comparison with traditional advertising methods. This helps to grasp users' concerns and interests in the application of AIGC in e-commerce advertising and provides direction for further product development and marketing. The collected comments are processed via word segmentation to extract key words, and the size and color of the words in the word cloud are determined according to the frequency of their appearance; the higher the frequency is, the larger the number of words displayed and the more prominent the color.

3. Results of In-depth Analysis of Sentiment Tendencies and Themes on the Basis of Weibo Comments

After sentiment analysis technology was used to count 679 Weibo comments related to AIGC, 56% of the comments had negative behavioral intentions, whereas only 44% of the comments had positive behavioral intentions. These data vividly reflect that within the scope covered by these Weibo comments, many users have concerns, dissatisfaction, or negative attitudes toward the application of AIGC in relevant scenarios such as e-commerce advertising and internship recruitment. To explore the root causes of this negative sentiment in depth, we need to conduct an analysis from multiple dimensions to investigate whether it is due to defects in the technology itself, the application effects not meeting expectations, or other factors at play.

Figure 1: Chart of the proportions of positive and negative emotions



From the word cloud map generated by thematic analysis, multiple key themes can be identified. Behind these themes lies rich market information and the causes of users' attitudes. By combining specific cases and data, we can gain a more thorough understanding of the actual situation of AIGC applications in e-commerce advertising.

High attention to the core of technology: Words such as “large model”, “AI”, and “AIGC” stand out significantly in the word cloud map, indicating that Weibo comments revolve closely around the application of AI large model technology in the AIGC field. The technical foundation has become the core point of public discussion, and people pay great attention to its impact on e-commerce advertising. Take JD.com as an example. It introduced a certain AI large model to provide intelligent product selection and recommendation services for merchants. According to statistics, among the merchants using this service, approximately 30% reported that the degree of matching between the recommended results and the actual market demand was not high. For example, within a certain period, for the recommendations for home furnishing merchants, many merchants were concentrated on a few popular styles while ignoring consumers' demands for personalized and niche products, resulting in some merchants missing sales opportunities. This directly affected the merchants' confidence in the application of AIGC technology in e-commerce, becoming one of the important reasons for the generation of negative comments.

The application focuses on video creative generation: Words such as “video”, “advertisement”, “creativity”, and “generation” appear frequently, indicating that the application of AIGC in e-commerce advertising focuses mainly on the creative generation of video content. For example, when promoting new products, Perfect Diary uses AIGC technology to produce a series of advertising videos. These videos gained high exposure on social media. However, according to the user feedback data, approximately 20% of the users believed that the video content placed too much emphasis on special effects and visual effects and that the display of the actual product usage effects was not real or comprehensive enough. After purchasing the products, some users found that there was a gap between the actual effect and the advertisement, resulting in a 10% increase in the product return rate compared with the traditional advertising model. This phenomenon reflects that although AIGC has advantages in the creative generation of advertising videos, there are still deficiencies in the real presentation of products, triggering negative evaluations from consumers.

Particular tools are concerned: Specific AI tools or models such as “DeepSeek” are mentioned, indicating that they are concerned with the AIGC applications of e-commerce advertising, possibly because of their

quality craftsmanship and classic designs, meeting the goals of the quality and style of the target customer group. In terms of detail page display, AIGC truly shines, being able to generate ultrarealistic 3D product models and dynamic display effects. Vertical e-commerce companies have strengthened scene adaptability through AIGC technology, with typical examples such as the virtual make-up trial function of beauty platforms (conversion rate increased by 25%) and 3D rendering generation of home furnishing platforms (COLLOV case)(Zhu,2025).This immersive experience enables consumers to move beyond a superficial understanding of the product and greatly stimulates their interest. The transformation brought about by this technology gives consumers a greater sense of participation during the shopping process and a deeper understanding of the product, thus increasing the likelihood of purchase.

Generation of Personalized Advertising Creativity: E-commerce platforms have a large user base and a wide variety of products, and achieving personalized advertising placement has become the key to success. Through in-depth mining and analysis of multidimensional information such as user behavior data, interest preferences, and past purchase records, AIGC technology can tailor exclusive advertising creativity for each user. Imagine a user who frequently browses sports equipment and has recently searched for running shoes. AIGC can quickly integrate information and generate highly targeted advertising content. It not only includes the latest running shoes of the user's favourite brand but also provides personalized recommendations such as "Designed specifically for you who love running, to enhance your athletic performance," and it can also match images or short videos that suit the user's aesthetic style according to their daily browsing preferences, attracting the user's attention from all aspects. Moreover, in the generation of dynamic advertising creativity, the advantages of AIGC are even more prominent. Like a keen market observer, it is able to capture key information such as current hot topics, seasonal changes, and various promotional activities in real time and adjust advertising creativity accordingly. When a certain celebrity endorses a product and becomes a hot topic, relevant e-commerce advertisements can incorporate celebrity elements in a timely manner, accurately attracting the attention of fans. This rapid response to market changes keeps the advertisements fresh and appealing, continuously stimulating consumers' purchasing desires, greatly improving the advertising effect, and increasing business opportunities for e-commerce platforms and merchants.

Creation of Virtual Brand Ambassadors: Virtual brand ambassadors are gradually emerging as a new and powerful force that cannot be ignored in the field of e-commerce advertising, and AIGC technology is undoubtedly the core driving force behind it. With the deep integration of computer graphics and artificial intelligence technology, AIGC can create virtual brand ambassadors with realistic images and diverse styles. These virtual brand ambassadors not only have unique appearances and distinct personalities but can also vividly simulate human voices, movements, and expressions, interacting naturally and smoothly with consumers. Take the beauty e-commerce industry as an example. Virtual brand ambassadors can personally demonstrate different makeup effects, explain in detail how to use cosmetics, and provide accurate and effective suggestions for consumers' personalized issues such as skin types and skin tones. Compared with traditional celebrity endorsements, virtual brand ambassadors have obvious advantages. Brands have absolute control over their images and behaviors, completely avoiding the risk of brand image damage caused by the negative events of celebrities. Moreover, virtual brand ambassadors can work around the clock throughout the year, responding to consumers' needs at any time without the trouble of schedule conflicts. More importantly, virtual brand ambassadors generated by AIGC can quickly complete localization adaptation in terms of language, culture, etc., according to the brand's global market layout. For example, virtual brand ambassadors launched by an international beauty brand in different countries can skillfully communicate with consumers in the local language and cleverly incorporate local cultural elements, greatly enhancing the brand's affinity and sense of identity in the local market. This makes it easier for consumers to accept and get closer to the brand emotionally, effectively increasing brand awareness and product sales.

Production of advertising videos: Video advertisements occupy a pivotal position in the e-commerce marketing system. However, traditional video production methods are costly and involve a cumbersome and complex process, discouraging many e-commerce enterprises. The emergence of AIGC technology is like a ray of dawn, greatly simplifying this process and significantly reducing the production threshold and costs. AIGC can quickly generate high-quality video footage based on a given text script and automatically match appropriate music, sound effects, and transition effects. Simple product introduction videos that used to take hours or even days to complete can now be easily handled by AIGC in just a few minutes. Even more

remarkably, AIGC can achieve batch generation and personalized customization of video content. E-commerce platforms can use AIGC to generate various versions of video advertisements according to the characteristics of different products and the needs of different target audiences. For example, for high-end electronic products, videos emphasizing quality and a sense of technology can be produced. Through exquisite images and professional narration, the high-end positioning of the products can be highlighted. For baby products, warm and life-like videos can be made to contact consumers with emotional resonance. This series of changes allows e-commerce enterprises to produce more attractive advertising videos at a lower cost and higher efficiency, seizing the initiative in fierce market competition and bringing consumers a richer and more targeted shopping experience.

4.2 Consumers' Attitudes Toward the Application of AIGC in E-commerce Advertising

From a positive perspective, many consumers show a high degree of acceptance and recognition of the e-commerce advertising content generated by AIGC. In the era of information explosion, consumers are bombarded with a massive amount of advertising information every day. With its powerful data processing and analysis capabilities, AIGC technology can achieve personalized customization of advertising content. For example, by deeply mining multidimensional data such as consumers' browsing history, purchase preferences, and search records, AIGC can accurately push product advertisements that match consumers' interests. Take a consumer who is enthusiastic about outdoor sports as an example. The advertisements generated by the AIGC may precisely recommend the latest outdoor equipment, ranging from professional mountaineering shoes to high-performance sports backpacks. The advertising copy not only elaborately introduces the functional features of the products but also, by combining with similar products that the consumer has purchased in the past, provides personalized reasons for the recommendation. For example, "This pair of mountaineering shoes has further optimized the grip of the sole on the basis of the brand you previously paid attention to, making it more suitable for the complex mountain road conditions you often go to." Such precise and considerate recommendations greatly enhance the relevance and resonance between consumers and advertisements, saving consumers' time costs in screening products. This makes it easier for them to pay attention to products that meet their own needs, thus increasing their willingness to buy.

The innovation and appeal of the content generated by AIGC are also important factors that attract consumers. In an increasingly competitive e-commerce advertising environment, traditional advertising forms are gradually finding it difficult to capture consumers' attention. AIGC technology, on the other hand, brings brand-new inspiration and perspectives to advertising creation and is able to generate highly creative and attractive content. For example, some e-commerce platforms use AIGC technology to produce advertisements featuring virtual brand ambassadors. Owing to their realistic images, vivid expressions, and unique personalities, these advertisements have successfully attracted the attention of many consumers. These virtual brand ambassadors can not only showcase products in novel ways but also interact with consumers, such as by answering consumers' questions about products and sharing their experiences of using the products. The virtual brand ambassador launched by a certain beauty brand is taken as an example. It demonstrates the product usage process through live streaming and interacts with consumers watching the live stream in real time, answering their questions about products suitable for different skin types. This highly interactive and creative advertising format significantly enhances consumers' sense of participation. In practical observations, the number of viewers in live broadcast rooms of such virtual brand ambassador advertisements often far exceeds that of live broadcasts in traditional advertising formats, and consumers also stay in live broadcast rooms for a significantly longer period of time. Many consumers have said that this novel and interesting advertising format has made them more interested in the brand and its products, thus influencing their purchasing decisions.

However, consumers are not entirely optimistic about the application of content generated by AIGC in e-commerce advertising, and there are also many concerns and misgivings. Among them, the authenticity and reliability of the content are the key issues that consumers focus on. Since AIGC generates content on the basis of algorithms and data, some consumers are worried that the advertising information it generates may contain exaggerated or false elements. For example, in some food advertisements generated by AIGC, the appearance, taste, or nutritional value of the products may be overly beautified, and there is a certain gap between the actual products and the advertising promotion. This information asymmetry is likely to mislead

consumers and harm their rights and interests. Therefore, although AIGC technology has advantages in advertising creativity and personalization, it will be difficult to gain the long-term trust of consumers if the issue of content authenticity cannot be effectively addressed.

Moreover, consumers have significant concerns about the privacy protection of the content generated by AIGC. The prerequisite for AIGC technology to achieve personalized advertising is the collection and analysis of a large amount of consumer data. During this process, consumers are worried that the security of their personal information cannot be effectively guaranteed. Once these data are leaked or misused, they may cause many problems for consumers, such as frequently receiving harassing phone calls and spam emails and even facing the risk of their personal information being used in illegal activities. In real life, there have already been some consumer privacy security incidents caused by data breaches, which have further intensified consumers' concerns. For example, once an e-commerce platform has data security vulnerability, it results in the leakage of some consumers' personal information, including sensitive information such as names, contact information, and purchase records. These pieces of information are exploited by criminals to send many fraudulent text messages and make phone calls to consumers. This incident triggered a crisis of trust among consumers toward the platform and made more consumers wary of the data collection and usage behind AIGC technology. In such a situation, consumers often have a negative attitude toward AIGC e-commerce advertisements that collect excessive data and may even give up shopping on related platforms as a result.

Consumers also have expectations regarding the emotional connection and humanistic care of the content generated by AIGC. Although AIGC can generate seemingly perfect advertising content, some consumers believe that it lacks the emotions and warmth bestowed by human creators. In traditional advertising creation, human creators can, on the basis of a profound understanding of consumers' emotional needs, create advertising works that evoke emotional resonance. However, the AIGC still has a certain gap in this regard. For example, in some festival promotion advertisements, traditional advertising copies may touch consumers' hearts and trigger their emotional resonance through warm stories and sincere emotional expressions, thereby enhancing consumers' favourability toward the brand. While the advertising copies generated by AIGC may be equally fluent in language expression, they often find it difficult to convey such delicate emotions. According to a consumer feedback survey, approximately 28% of consumers indicate that they prefer advertisements that can convey humanistic care and trigger emotional resonance, believing that such advertisements are more capable of touching them. There is still much room for improvement for the advertisements generated by AIGC in this respect.

Consumers' attitudes toward the application of content generated by AIGC in e-commerce advertising present a complex situation where both positive and negative aspects coexist. While making full use of the advantages of AIGC technology, the e-commerce industry must attach great importance to consumers' concerns and demands. Through measures such as strengthening content review, improving the data security protection mechanism, and enhancing the emotional expression ability of AIGC content, the application of content generated by AIGC in e-commerce advertising should be continuously optimized to win consumers' trust and support and achieve win-win development between the e-commerce industry and consumers.

4.3 Challenges and Strategies of AIGC in the E-commerce Industry

(1) Facing challenges

Legal Risks: Currently, the application of AI ghostwriting is extremely widespread. Since AI tools can generate the writing style that people desire, many individuals or enterprises use AI for writing, saving time and effort. However, this type of AI ghostwriting is based on grabbing and piecing together a large amount of data, which may lead to copyright infringement. When AI replicates and disseminates such similar or identical content, it is very likely to resemble the work of others and be deemed infringement. This poses a significant legal risk. Moreover, to some extent, it weakens the subjectivity and innovativeness of designers and reduces their ability to develop new things (Wang, 2024). Therefore, when creating advertisements, we should also pay attention to the issue of infringement caused by AI ghostwriting.

Ethical Dilemmas: On the one hand, the data generated by AIGC may contain certain specific biases and discriminations. This is because the dataset it is trained on itself has biases, which make these incorrect biases spread more widely and mislead people. For example, inaccurate facts may be included in the dataset used for training the model. On the other hand, many countries restrict their citizens from using AI under the pretext of protecting personal privacy and other reasons. Big data may involve some sensitive information during the training process, and this information related to the military and business may be leaked. This is an issue that we need to continue to improve.

Quality Control Challenges: Currently, AI drawing is not very mature. In many cases, the generated images are not the desired advertising images, which are far from the description and unrealistic. In addition, developing very realistic top-level text-to-drawing models requires a large amount of resources, which is unaffordable for researchers with limited resources. This has become a major obstacle to the quality of content generated by AIGC. It may also sometimes lead to mistakes in text generation. For example, logical errors may occur when solving puzzles, which may lead to misunderstandings. Moreover, some low-quality content-generated advertising words also need to be clearly identified.

Input Threshold and Consistency of Effect: Text input prompts need to provide clear and precise execution tasks and output conditions, as well as some hints to help the AI correctly understand the required content. Only in this way can we obtain AI output results that meet our expectations. Moreover, owing to the different input levels of various creative personnel, the quality of the advertisements produced also varies greatly. Some creative personnel are limited by their weak prompting ability. Despite investing a great deal of time and effort, the output results are often poor, which in turn leads to project cycle delays and cost increases. In the long run, it is feared that some advertisers resist AIGC technology, which in turn limits the pace of innovation and development in the industry (Lin, 2024).

(2) Coping Strategies

Legal Aspect: I believe that we can use AI more widely, but we should not copy it completely. We can learn from it and absorb its essence. We need to improve the cultural literacy and legal awareness of the whole population. Encourage people to actively use their brains to create things and think positively. At the same time, AI is used as an auxiliary tool and has a strong sense of law to avoid copyright infringement caused by wholesale plagiarism and bring losses to the authors.

Ethical Dimension: Regarding the problem of outputting untrue information, multisource training can be carried out, and diverse data sources can be utilized to improve the generalization ability. We can also regularly clean bad data and remove harmful data with biases. To address the issue of privacy protection, strict data access control and monitoring can be implemented, and privacy protection technologies can also be improved. For example, data anonymization techniques can be adopted to anonymize training data, and differential privacy techniques can be used.

Quality Control Level: During the content creation stage, multiple rational reviews of the generated content are conducted. Multiple scenarios are generated through multiple inputs, and the best text with the highest quality is selected. This requires AI technicians to improve the generalization ability of the model, collect more diverse data, and analyse problems from multiple perspectives to increase the breadth and depth of the generated content.

User operation and application level: We have established a complete prompt training system. Through professional courses and case sharing, we help advertising creative personnel quickly improve their prompt writing skills to fully exploit the advantages of AIGC in advertising creation and promote the industry to a new height.

4.4 Future trends in the Application of AIGC in e-commerce Advertising

(1) Intelligent personalized advertising customization

The AIGC is used to learn about the age, gender, and geographical distribution of the audience for this product and more accurately locate the right target group for advertising. It can help you refine your ideas and suggest aspects you hadn't thought of. One can refine the core theme and generate a complete advertorial

on the basis of the function, quality or emotional value of the product described. This greatly reduces the cost of some businesses to hire a designer, lowering production costs. AI data can also be used to analyse indicators such as the click-through rate, conversion rate, sales, etc., after an advert is placed to provide reasonable suggestions for the next step.

(2) Creation of an immersive shopping experience

With the maturity of VR technology, it has been combined with AIGC to generate a more realistic and realistic 3D goods scene. Therefore, people can feel more sense of use of goods and feel the real value of goods to people. For example, Taobao has the function of an AI trying on clothes; the generated image is similar to real clothes on the body and is very natural, with no sense of contradiction. The phenomenon of users shopping online for fear of buying back inappropriate and refunds should be reduced. Alternatively, one can look at something that does not look good through 3D product information to better understand the product; however, saving the product does not look good, but the function is very good. This immersive experience, which more vividly displays the product, enhances the visual impact of advertising.

(3) Cross-language and cross-cultural content generation

Some ordinary people can also use AI to carry out cross-border e-commerce transactions, such as the hot search Yiwu boss with deep cross-border business. Just need to say “12345” to the camera, can generate more than a dozen languages to introduce the goods of the advertising language. This allows more businessmen to gain more sales opportunities and be promoted to more distant places so that the sales volume of goods soars. Therefore, the emergence of AI is accompanied by some business opportunities.

5. Conclusion

In summary, this thesis first uses sentiment analysis and thematic analysis to analyse the data and then performs a series of systematic studies on the application status quo, technical principles and practices, challenges and future development trends of AIGC in e-commerce advertising applications, which provides strong theoretical support and practical guidance for the innovative development of the e-commerce advertising industry under the drive of AIGC technology. In terms of application status, AIGC systematically outlines the actual application of AIGC in the field of advertising on major e-commerce platforms; in terms of technical principles and practices, AIGC provides an in-depth analysis of how AIGC can create high-quality advertisement content by virtue of cutting-edge technologies such as natural language processing and image generation and effectively applies them to specific scenarios of e-commerce advertisements and presents a series of challenges, such as the challenges of legal, ethical, and quality control of the content, user operation and application. AIGC also provides practical strategies to address the challenges of legal, ethical and content quality control, user operation and application, etc. Moreover, it predicts the future development trend of AIGC in e-commerce advertising, such as more accurate personalized advertisement customization, and immersive advertisement experience brought about by fusion with VR technology. This is of far-reaching significance for promoting the e-commerce advertising industry towards the development of intelligence, efficiency and personalization.

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Conflicts of Interest

The authors declare no conflict of interest.

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