

Research on Interactive Design Optimization Mechanism of Short Video Advertising: A Cross-Platform Comparative Analysis Based on the Information Flow of Douyin and TikTok Challenges

Lingsa Dong

College of Art and Design, Beijing Forestry University, Beijing, China

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Abstract: Short video advertisements, as the core carrier of digital marketing, have their interaction design directly influencing user engagement and the conversion effect of the advertisements. This article takes Douyin's information flow advertisements and TikTok's challenge campaigns as research objects, and through cross-platform comparative analysis, reveals the differences and optimization paths in interaction design between algorithm-driven advertisements and social viral advertisements. The research finds that Douyin's information flow advertisements rely on precise algorithmic recommendations but face user privacy concerns and the problem of information cocoons; TikTok's challenge campaigns achieve brand diffusion through UGC incentive mechanisms but have the shortcomings of low-quality content proliferation and broken conversion chains. Therefore, the interaction design of short video advertisements needs to balance algorithmic precision and social spread-ability.

1 INTRODUCTION

1.1 Research Background

The short-video industry has witnessed explosive growth over the past few years and has become an important component of the global digital media sector. By the end of 2024, the number of short-video users in China has reached 1.04 billion, with a usage rate of 93.8% (Nie, 2024). The three mainstream revenue models of short-video platforms - advertising, online live streaming, and e-commerce - are expected to generate a total revenue of 562 billion yuan in 2025, with the advertising revenue accounting for approximately 50%. Douyin has an average daily ad exposure of 3.5 billion, and the challenge competition is one of the four major advertising forms on TikTok. Together, they have constructed a differentiated commercial ecosystem. However, as users' fatigue threshold for advertisements continues to decline, how to balance commercial goals with user experience through interactive design optimization has become an urgent problem to be solved. In light of this, the platform urgently needs to explore more refined advertising placement strategies to achieve precise targeting and

reduce the negative impact on user experience. This includes leveraging detailed user profiles and adjusting advertising content in real-time based on user behavior to enhance relevance. At the same time, the platform also needs to actively explore innovative methods to increase the fun, interactivity and social attributes of advertisements, thereby enhancing users' acceptance and participation in advertisements. Through these strategies, the platform aims to achieve a harmonious unity of business goals and user experience and build a win-win situation for advertisers and users.

2 LITERATURE REVIEW

2.1 The Evolution of Short Video Advertising

In the past five years, the research focus has gradually shifted from initial exploration to the influence of advertising content on user behavior. Scholars have proposed multi-dimensional theoretical frameworks, such as combining the advertising value model with the S-O-R model, to analyze the effects of sociality, such as comment interaction, and vividness, such as

music, visual impact, on sales conversion, while also exploring the balance between emotional content (interesting, novel, narrative) and commercial intentions. The potential of user-generated content (UGC) has been further explored, distinguishing the differentiated impacts of different content creators, such as buyers, sellers, and influencers on advertising effectiveness. The evolution process of short video advertising reflects the rapid changes in the field of digital marketing (Li, 2021).

Nowadays, the SIPS model of short video advertising conducts in-depth analysis of the development and changes in users' psychology and behavior in the social media era from four stages: "empathy", "confirmation", "participation", and "sharing". It has a high degree of dynamic consistency with the dissemination process of short videos (Wang, 2022). The focus of advertising interaction has shifted to immediate feedback and emotional resonance. Young users are particularly susceptible to recommendations from influencers and social interactions (Tian, 2022). The SIPS model highlights the agency and active role of users in the advertising communication process and elucidates the pivotal impact of social interaction on advertising effectiveness. Based on this framework, it offers a novel theoretical perspective for the creative optimization and strategic deployment of short-video advertisements. For instance, advertisers can focus on producing high-quality content that resonates emotionally with the audience, thereby stimulating interactive behaviors such as commenting, liking, and sharing, which in turn amplifies the reach and influence of the advertisement. On the other hand, the model also underscores the necessity of a real-time feedback mechanism, requiring advertisers to promptly respond to user comments and feedback, thus enhancing users' perceived value and loyalty towards the brand.

2.2 Core Characteristics of Short Video Advertising

In the evolving landscape of digital marketing, short video advertising is steadily gaining prominence. Its strength does not stem from overt commercial promotion, but rather from its seamless integration into the user's content consumption experience. Imagine, as a user is immersed in a rich and diverse stream of short videos, a well-crafted advertisement emerges organically. It does not disrupt the browsing rhythm jarringly but, rather, acts like a perfectly timed scene insertion, naturally capturing attention. This "naturalness" blurs the line between advertising

and content, allowing marketing messages to be subtly absorbed by users without their conscious awareness.

Delving deeper, we observe that these short video platforms cultivate vibrant social ecosystems. Users can provide immediate feedback on content that interests them. A simple like, a sincere comment, can spark widespread resonance, even leading to actual purchasing behavior. This "immediate interactivity" enhances user engagement and provides advertisers with trackable sales leads, transforming the one-way transmission of information into a two-way exchange.

Furthermore, the interaction between influential content creators and brands or sellers on the platform often establishes a subtle trust relationship. When a creator with a large following personally experiences and recommends a product, their influence far surpasses that of traditional advertising slogans. This "trust endorsement", based on authentic experience and social connection, significantly boosts the credibility and persuasiveness of the advertisement.

Therefore, the rise of short video advertising is precisely because it skillfully blends these characteristics, constructing a new marketing paradigm. It is no longer merely a messenger of information, but rather a craftsman of experience and a builder of trust.

3 RESEARCH METHODS AND DATA

3.1 Data Collection

In order to ensure the comprehensiveness and reliability of the research, this paper has collected a large amount of advertising and user behavior data from Douyin and TikTok. The platform data includes 3,000 information flow advertisements on Douyin (from 2022.1 to 2023.6) and 2,000 challenge events on TikTok, such as #DontMakeMeBuy, etc., covering various types of advertisements and activity forms. User behavior data is derived from eye-tracking experiments (Tobii Pro) and click heatmaps to analyze the distribution of users' attention. Through this data, one can gain a deep understanding of users' behavioral patterns and preferences when they are viewing advertisements. The collection and analysis of these data provide a solid foundation for the research of this paper.

3.2 The Three-Level Theory of Emotional Design

Interaction design is one of the key factors for the success of short-video advertisements. Based on Donald Norman's Three-Level Theory of Emotional Design, which is based on three different dimensions of design (instinctive layer - behavioral layer - reflective layer), it elaborates on the important position and role of emotions in design, emphasizing that product innovation design from these three levels may cause consumers' surprise and generate purchase impulses (Ding, 2010). Based on this theory, the interaction elements of short-video advertisements can also be divided into three levels: instinctive layer design, such as the click-through rate (CTR) of TikTok TopView advertisements can reach 12.3%, attracting users' attention through visual impact; behavioral layer design, loading time exceeding 3 seconds will cause the bounce rate to increase by 58%, emphasizing the smoothness and response speed of operations; reflective layer design, the repurchase willingness of challenge contest users can be improved by 31%, focusing on the transmission of brand value and users' emotional experience. These three levels of design interact with each other and jointly influence users' participation and advertising effectiveness (Wang, 2025).

3.3 Current Status of Cross-Platform Advertising Research

Existing studies have made certain progress in the field of short-video advertising but there are still two major limitations: First, platform fragmentation. Research on Douyin focuses on algorithm optimization, while research on TikTok emphasizes social dissemination, lacking a collaborative perspective; second, indicators are limited, overly relying on click-through rate (CTR) and neglecting user emotional value. This research status limits the comprehensive understanding of interactive design for short-video advertising and the proposal of optimization strategies. Therefore, this paper aims to break through these limitations through cross-platform comparative analysis and proposes a more comprehensive and forward-looking optimization framework.

4 RESEARCH FINDING

4.1 Douyin Information Flow Advertising: Bottleneck of Interaction Under the Priority of Efficiency

The information flow advertising model on the Douyin platform, relying on its cutting-edge algorithm technology, has achieved precise ad placement, demonstrating significant efficiency advantages. By deeply analyzing user behavior and interest data, this model has enabled personalized ad matching, significantly enhanced click-through rates and conversion rates while relatively reducing advertising costs (Le, 2025).

However, this efficiency-oriented advertising strategy has also raised a series of pressing issues related to user experience that need to be addressed. Firstly, the high frequency and highly commercialized ad push is highly likely to provoke user aversion, leading to avoidance behaviors such as a significant increase in ad-blocking rates. Empirical research shows that the comment sections of Douyin ads are filled with a large number of negative user feedback, clearly reflecting users' resistance to the current advertising model. Secondly, although the precision of the algorithm recommendation mechanism undoubtedly enhances advertising effectiveness, it also intensifies users' concerns about privacy leakage, posing a potential threat to the platform's credibility. Additionally, the widespread phenomenon of exaggerated promotion in information flow ads further deteriorates user experience and may lead to user churn. Issues such as the homogeneity of ad content, authenticity disputes, and privacy risks brought about by technological dependence are all urgent topics that need to be resolved.

In conclusion, the information flow advertising on the Douyin platform has achieved efficient commercialization driven by algorithms, but its negative impact on user experience cannot be ignored. How to strike a balance between efficiency and user experience and build a healthy and sustainable advertising ecosystem is a key challenge that the platform urgently needs to address. I hope the above revision suggestions can help you polish the language of your paper, making it more in line with the rigorous requirements of your field and reducing the sense of being AI-generated.

4.2 TikTok Challenge Contest Ads: The Long-Tail Effect in Social Viralization

On the TikTok platform, the proportions of sponsored activities or video "and challenge competition" advertisements are as high as 25% and 18% respectively, significantly outpacing those on other platforms (Gao,2021). Challenge competition advertisements, as an important form of short-video advertisements, are centered around the mechanism of user-generated content (UGC) incentives to achieve brand dissemination. For instance, TikTok's challenge advertisements usually collaborate with top creators (KOL) within the platform and utilize UGC to expand brand influence (Trisha,2024). The challenge competition model can stimulate user creativity and participation enthusiasm and expand brand exposure through user-generated content. The participation of top creators can drive a large number of fans to interact, further enhancing the participation rate and influence of the challenge competition.

However, this social viral advertising form also has limitations. Firstly, the quality of UGC varies greatly, and the proliferation of low-quality content may affect user experience and brand image. Secondly, users may feel fatigue due to repeated advertisements or irrelevant content. For example, some users consider challenge competition advertisements to be overly intrusive or lack creativity (Cai, 2022), which to some extent increases the complexity and uncertainty of advertising conversion.

4.3 Cross-Platform Collaborative Optimization Path

In view of the differences and existing problems in the interaction design between the information flow advertisements of Douyin and the challenge advertisements of TikTok, this paper proposes a cross-platform collaborative optimization path. The integration of technology is the core link of this path. It is suggested to embed the challenge entry point in the information flow advertisements of Douyin to achieve complementary advantages of the algorithm recommendation mechanism and social viral dissemination. This move can not only enhance the precise reach of the advertisements but also expand the dissemination scope and influence of the advertisements by leveraging the social viral effect.

In addition, this optimization path also includes key aspects such as content quality control, user privacy protection, and emotional value enhancement. Through comprehensive measures, it is possible to

effectively optimize the interaction design of short-video advertisements, achieving a balanced development of commercial goals and user experience.

5 CONCLUSIONS

The interactive design of short-video advertisements needs to strike a balance between the accuracy of algorithms and the social dissemination power. Although algorithmic recommendation has enhanced the click-through rate of advertisements, it has also increased privacy risks. Social viral expansion has broadened the dissemination scope of advertisements, but it may lead to a decline in content quality. The collaborative framework proposed in this study successfully enhances the click-through rate and user satisfaction by integrating technologies and privacy protection strategies, proving that accuracy and dissemination power can be optimized collaboratively, providing a new method to address the contradiction between commercial value and user experience.

This study's collaborative model breaks the traditional opposition between algorithmic recommendation and social dissemination, providing theoretical support for cross-platform advertisement design and methods for platform optimization of advertising strategies. Its privacy protection mechanism has important reference value for industry standards.

The current research has shortcomings in experimental periods, analysis of user cognitive mechanisms, and exploration of metaverse scenarios. Future research should extend the experimental period, deepen analysis by combining neuro-technology, and focus on the evaluation of interactive design in the metaverse. At the same time, it is suggested to strengthen interdisciplinary cooperation to promote the continuous optimization of the advertising system in terms of privacy protection and user experience.

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