

Algorithmic Advertising Delivery and User Behavior on Short-Video Platforms: Evidence from Douyin

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Abstract. As the mobile internet technology evolves rapidly, the migration of media consumption habits of users is going online, and in this context, short-video platforms are slowly gaining prominence as an element of the modern social media ecosystem. This paper uses the Douyin platform as an illustration to understand the rigidity between the mechanism of advertisement placement of short-video tools and its impact on user behaviors. This paper is founded on Stimulus-Organism-Response (S-O-R) theoretical framework. It takes the specificity of advertising content and the process of recommendations based on algorithmic requirements as external stimuli, examining their impact on internal psychological conditions of users, thus further determining the behavior expectations of the users. Regarding research methods, the paper will be a literature review followed by a qualitative case study of Tik Toks advertisement practices. The outcome of the research shows that advertising placement mechanism of Douyin has the capability of contributing to the advertising effect by increasing the relevance of the content, enhancing the emotional resonance and immersive experience, and makes users embrace more positive interactive behaviors. Nonetheless, with a high degree of targeting of the advertisement, or with a particularly high exposure frequency, the users might develop advertisement fatigue, which subsequently triggers avoidance behavior, even their judgment of the entire experience and level of trust in the platform. This paper contributes to the comprehension of the balance problem between commercial and user experiences by revealing the dual impact.

Keywords: Short-video platforms, algorithmic advertising delivery, user behavior, S–O–R theory, Douyin

1. Introduction

In recent years, with the continuous development of mobile internet technology and the widespread use of smart terminals, the way users obtain information and use media has undergone significant changes. Short-video platforms, due to their intuitive content, compact rhythm and strong interactivity, have gradually integrated into people's daily lives and occupied an important position in the contemporary social media ecosystem. Against this backdrop, advertising, as an important means of platform commercialization, has also presented new forms. Different from traditional advertisements that are mainly characterized by display and interruption, the advertisements on

short-video platforms appear more in a content-based and native manner, and the boundary between the advertisement and the ordinary content is becoming increasingly blurred.

Among the hundreds of existing short-video platforms, Douyin has become a typical example of analyzing the advertising placement mechanism of short videos thanks to its business model, which is based on algorithmic recommendations, and its developed business model. The system constantly processes user behavior data (browsing, likes, and comments) to realize individual push with advertising content, whereby business information is shown in a format that is as close to regular short video as possible. Such way of placing advertisement can not only increase the efficiency of spread and commercial conversion but can also evoke the discussion of the changes in the user experience: On the one hand, such precise recommendations can help to increase the relevance and attractiveness of the advertisements; on the other hand, the numerous occurrences of the advertisements can make users weary or even avoid them.

Earlier researches have resulted into detailed studies on the effects of dissemination by the short-video adverts on areas like the nature of the content by the advert, the sentiment of the users, and desired buying behaviors. They have pointed out that entertainment value, information value, and emotional resonance play significant roles in influencing users' behaviors. However, in comparison, attention paid to the advertising placement mechanism itself is still insufficient. In general, the importance of the use of algorithms in presenting and user response towards the advert is not yet analyzed closely. One can continue discussing the way the advertisement content is shown to individuals based on the platform algorithms filtering process and mechanisms of strengthening the algorithms, as well as the impact of the process on psychological perception and behavioral decisions of users.

In the light of the background, this paper chooses the Douyin platform as a subject of research and presents the Stimulus-Organism-Response (S-O-R) conceptual framework to examine the advertising placement process of the short-video platform and its effects towards the user behavior. The paper considers the advertising content properties and the algorithm recommendation system as exogenous factors, and the effects of these factors on the psychological aspects of user trust, advertising attitude, and immersive experience that determine the participation behavior of the user and an intention to purchase are viewed as the results of the paper.

The paper will disclose the operation logic of the advertising placement system on short-video-hosting platforms via a literature review and a qualitative case study of TikTok advertising patterns to demonstrate that they both impact the behaviors of users. The corresponding research conclusions can not only enhance the conception of the short-video advertising effect mechanism, but also offer the platform the chance to explore a more moderate developmental direction between the cost of commercial profit and user experience.

2. Background

The swift progress in the mobile Internet technology and the shift in the information consumption patterns of the users of the particular technology in the modern society have contributed to making short-video platforms a significant component of the modern social media ecosystem over time. Compared with traditional graphic and text advertisements and long video content on TV as the means of communication, short videos, with their fast pace, intense emotional stimulation, and high immersion, along with the feature of personalized and precise advertising push, make it easier to attract users' attention and prolong their time spent on the platform. Through these features, short-video platforms have emerged and reinforced a business model that revolves around content-based,

and highly-integrated picturesque on users to consume the contents of their content consumption mindset [1].

Being one of the most representative short-video platforms in China, Douyin has observed a change in how it presents advertisements, where initial brands display adverts have evolved into what is currently known as highly native and content-oriented advertisements. The ads are no longer presented in a very distinguished form but instead incorporated into the browsing experience by the users via information flow in short videos or content partnerships with influencers. This change in the nature of advertisements has demolished the boundary between advertisements and standard content which has weakened the psychological safeguards against users and increased their ease of tolerating adverts [2]. According to existing studies, Douyin is not simply a content distribution system but has progressively become a mediator system between the brands, content makers and the consumers. Using its automated suggestions system, the platform highly personalizes advertising materials to the target potential groups of users to maximize business [3]. Thus, just as information dissemination platform Douyin advertising, it is a somewhat complex phenomenon that is not only rooted in the depths of the platform ecosystem, but also in the everyday life of users.

3. Analysis

Why is it that Douyin has a very high native and immersive advertising? This is due to the nature of the central element of the advertising placement mechanism, namely the very personalized recommendation system. Douyin gathers the search, browsing, likes, comment, forwards, and the amount of time the user spends on the site and based on those data, Douyin creates a user interest profile. The backend can then identify the target audience of the various advertising content, frequency of placement and mode of presentation after a series of algorithm processes. The logic of recommendation with user behavior information is able to generate a personalized advertisement placement at any time thus amplifying the click through rate and conversion rate [3,4].

The recommendation system of Douyin identifies more importance on the matching level between the content and the interests of the users as compared to the traditional advertising paradigm. In addition, the material is typically very similar in the form used compared to short videos that are ordinary. The advertising content gives users a better immersion, by use of emotional narration, scenes, and lively expressions. This is the mechanism that will destroy the impression of abruptness of the advertisement, thus enhancing the acceptability of the advertisement [5]. Nevertheless, such an individualized recommendation system does not only enhance the efficiency of the ad to its potential users, but also affects the information landscape of the users on a tremendous scale. The platform in the context of the process of constant optimization of advertising in accordance with efficiency may contribute to increasing the dependence of users on certain content and their preferences in consumption, which can influence the capacity of users to make their independent decisions and patterns of use of media. Wang [3] indicated that Douyin slowly developed a mechanism of data-based intermediary in the process of commercialization. This is not only a way of linking the supply and demand side but it also transforms the decision-making path of the users in consumption.

The researchers usually use the stipulated formula of stimulus - organism - response (S-O-R) to study the effect of advertisements on Douyin users when the study is conducted. Basically, the internal reasoning of this theory is that it is an external content of the advertisement and the mode of dissemination that primarily affects the psychological state of the user, thus, altering their behavioral response [6]. In Douyin, both the nature of advertisements and the algorithmic recommendations make up the stimulus that the users interact with.

In the research, the overall effect of attractiveness of short-video advertisements, the information value they convey, and their relevance to the preferences of the users is very beneficial in influencing the perception users attribute to the advertisements (trust, attitude, and feelings). Of them, the level of trust of users to the advertisements has become the most crucial - it is one of the major bridges between the advertisement stimulus and the eventual purchase intention. As long as the users feel that the products outlined in the advertisement are true, plausible, and applicable to their needs, then, their psychological barriers will be lowered and they will be more likely to accept the advertisements in question and will be more open to communication [6].

Moreover, the customized recommendations initiated by Douyin can capture additional levels of immersion and social sense of users towards short video content, as well as increase users in terms of paying attention and engagement to advertisements. Nevertheless, when the solutions of the advertisements are excessive and excessive, they can work against them and the users will learn to avoid and even dislike adverts. According to the study conducted by Feng and Liao, as much as immersive experience can enhance the participation of users, it is also possible that when repeated the user becomes tired of ads and will either skip or disregard ads [7].

Thus, the advertisement push mechanism of Douyin has a paradoxical effect on its users on the one hand, it can lead to the increased coverage and commercial efficiency of advertisements on the other hand, it might also cause the disruption of user experience and evoke negative feelings. This twofold influence forms a very important base on our further case works and elaborate discussions.

4. Case analysis

4.1. The delivery of advertising in Douyin: in-feed advertising

The advertising placement model in the Douyin platform is marked with the concept of content as advertisement, and the high form and narrative compatibility of the advertisement content and the regular short videos. At present, Douyin primarily takes the types of information flow advertisement, influencer collaboration advertisement and brand-tailored short video, and infiltrating the commercial content into content consumption situations of users. The ad pattern deprives the explicit interference aspect of conventional adverts, which lets the user experience the commercial information subconsciously [2].

In information flow advertisement, the videos of the advertisement are normally offered in the same format as normal content and users can scroll through swiping up and down. In visual and interactive features, there is practically nothing in the difference between advertisement and non-advertisement material. This design will lessen the user's resistance towards advertisements, and turn the advertisement into part of the content flow as opposed to a separate marketing unit [5]. Simultaneously, the influencer collaboration advertisements incorporate the brand information into the everyday life situation by the personality style and story-telling of influencers or content creators, which promotes the authenticity and credibility of the advertisement.

It has been already mentioned in past research that in Douyin, there is no one-directional advertising placement, involving passionate advertisement placement on the platform, but continuously subjecting users through algorithm provisions and fine-tuning the effect of adverts exposure to achieve the best user actions and commercial turnover. This process slowly changes Douyin into a data-driven commercial intermediary system that links the advertisers and the users and also plays a key role in shaping the process of consumption decision-making in the user [3].

4.2. Advertising content and user responses: influencer collaboration advertising

In the advertising placement mechanism of the Douyin platform, the algorithmic recommendation not only determines the audience for the advertisement but also to some extent shapes the presentation form of the advertisement content. To increase the acceptance of advertisements among users, the advertisement content often emphasizes entertainment, emotional nature and contextual narrative, attracting users' attention through a relaxed, humorous or emotionally resonant approach [8,9]. This content characteristic makes the advertisement more similar in form to the short-video content that users consume daily, thereby reducing users' recognition and defense of the advertisement.

Research shows that the congruence between the advertisement content and user interests is an important factor affecting the effectiveness of the advertisement. When the theme, style of the advertisement and the user's interest preferences are highly matched, users are more likely to have a positive attitude towards the advertisement and higher participation [5]. The Douyin algorithm continuously analyzes user behavior data to precisely match the advertisement content, making the advertisement present highly personalized characteristics in the content level.

In addition, short-video advertisements usually adopt strong emotion-driven expression methods, such as exaggerated performances, emotional narratives or reproduction of life-like scenes. This content characteristic can stimulate users' emotional responses in a short period of time, thereby enhancing the memory and dissemination effect of the advertisement. Xiao et al. and Meng et al. pointed out that emotional content has a significant impact on user behavior in short-video advertisements, especially more likely to trigger interaction and imitation behaviors among young user groups [8,9].

5. Discussion

In the above case analysis, the various platform-level stimulation forms such as the information push advertisements on Douyin, the cooperation advertisements with influencers, and the algorithm-driven native advertisements were discussed. The fact that the users had reported psychological reactions including the perceived trust, their attitude towards the advertisement and the feeling of immersion contributed organically to the mediating stimuli into behavioral consequences (including engagement, purchase intention and avoidance behavior). According to this, one can successfully explain the impact that the advertising mechanism of Douyin has on the behavior of users with the help of the stimulus - organism - response (S-O-R) framework. The properties of the advertising message and introspective recommendation system are the elements of the external stimulus in the Douyin setting, which, along with the impact on the psychologically of the user (perceived trust, advertising attitude and immersive experience) leads to the behavior of the user and the formation of buying intentions [6,8,9]. In comparison to conventional advertisement, the algorithmic system of recommendations of Douyin modifies the process of placement of advertisements to display the features of continuity and dynamic adaptation of the advertisement on the cognition and behavior of the user, which only increases the impact of the advertisement on the user [2,4].

The advertising placement mechanism of Douyin has a unique twofold effect in terms of the user experience aspect. On the one hand, the similarity between the advertisement and the interests of the user is improved, which increases user interest in the advert, as the latter is personalized and adheres to the native design [8]. However, with the rise in the accuracy and frequency of ad exposure, a number of users may become ad fatigued and perhaps develop ad avoidance behavior thus undermining the overall user experience [7]. This tendency implies that although algorithms

enhance the efficiency of the ads, they can also make the users more preoccupied with commercial information, which generates a tension between the level of efficiency and experience.

The advertising placement system of Douyin does not only promote the efficiency of advertising distribution but also has indirect and varied effects on the behavior of the users. We may begin with the positive impacts. Personalized suggestions and content nativization are both based on the design that the personalization of the recommendations and the display of the content contribute to the high level of engagement among users of the advertising material in Douyin. Once users feel that the advertising content is interesting and relevant to them, they are likely to watch the entire advertisement, like it, or even click on the links to the products thus boosting their purchase intention [8].

Meanwhile, the advertisements provided by Douyin promote the levels of participation behavior among the users by increasing the immersive experience and social presence. Yan et al. indicated that digital reliance of users on the interaction mechanism of short video platforms and continuous streams of content can increase the smooth acceptance of the advertisements as they are used by users every day [10]. To some level, this mechanism increases the time in which the users stay on the platform and encourages the constant exposure of advertising material.

The advertising placement mechanism of Douyin, however, has certain areas of potential negative impact as well. As an illustration, as the advertisement recommendations get more personalized the accuracy and frequency also grow exponentially. Other users are likely to have advertising exhaustion and pay attention to other similar short videos or simply ignore them, or they will consume less of the platform, etc. In their study, Feng and Liao mentioned that the immersive experience that short video platforms produce indeed can boost the degree of engagement of users but as a result of the overwhelming focus that is put on the platform or because of the lack of diversification can lead to increased tendency among users to avoid adverts [7].

Thus, based on the analysis of this case, it is possible to note the obvious duality of the influence of the advertising placement mechanism implemented by Douyin on users. Positively, the platform has the capacity of enhancing the effectiveness of the advertisement by using algorithms to recommend advertisements as well as optimizing content. But conversely, over commercialization and the very individualized advertising space can also harm the experience of short video platforms users. Such a contradiction offers a significant ground upon which further deliberations on the reasonability and sustainability of the advertisement mechanism in Douyin can be made.

6. Conclusion

To conclude, it can be stated that, based on the analysis, Douyin has built the advertising placement mechanism largely on two closely connected properties, which are the personalization of the algorithm and the native quality of the promoted product. These two features combine to create the display of ads in the browsing experience in the short-video application. The study findings also support that such a mechanism will result into a noteworthy dual user behavior pattern. The advertisement should also match the interest of the short-video users, and should casually mix with the short-video contents, then users have high chances of getting other option to watch continuously, attend to, or buy related products. Quite the contrary, in case a user receives an overly repetitive or overly clumped advertisement exposure, the user is likely to become exhausted and adopt an avoidance behavior and eventually weaken the overall platform experience and erode user trust.

The implications of these findings on the sphere of academic research and platform practice are great. Conceptually, the study elucidates how the features of platform level placement can be seen as a form of mediating the relationship between the advertisement exposure and psychological states

and observable behavior particularly in media where the regulatory system is run by algorithms. On the practical level, the findings of the research indicate that trade-offs in the context of the short-video platforms are irreconcilable in the context where the placement intensity is not regulated strictly. Personalization could also have an adverse impact on the user experience, owing to the efficiency improvement that it achieves. Hence, exposure control, enhancing content variety, and designing products user-friendly have to be the key to achieving sustainable impact on the advertisement on short-video platforms. These will help minimize repetitive material and hold the sense of control of the user during browsing.

Further investigation will focus in this direction: to test how user behavior varies with the intensity of exposure, the type of content and patterns of use; to find out how the governance decisions taken by the platform are influencing long-term trust and long-term participation. The methods that can directly test the mechanisms of this paper are empirical ones like questionnaire surveys, in-depth interviews, or experiments. Lastly, it can be ensured that this dual model is still applicable under varied recommendation systems and commercial approaches by comparison studies across different short-video platforms.

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