

Analysis of Algorithm Recommendation Mechanism of TikTok

Zhiling Chen, Chen Shi*

Anhui University of Finance and Economics, Anhui Province, China

Abstract: Algorithmic recommendation technology is used in all walks of life, among which the application in the news media industry has achieved great development. As a major mainstream mode of content distribution, algorithmic recommendation is well applied to the TikTok, enabling it to accurately and efficiently push video content that users are interested in. As algorithmic recommendation gradually becomes an indispensable part of content operation, analyzing the algorithmic recommendation mechanism will help the platform to better attract and serve users, so that users can get a better experience and videos can get better dissemination effects.

Keywords: TikTok, Algorithm recommendation, Short video.

1. Introduction

On February 25, 2022, the China Internet Network Information Center (CNNIC) released the 49th "Statistical Report on the Development of China's Internet" in Beijing. The "Report" shows that as of December 2021, the number of netizens in my country reached 1.032 billion, an increase of 42.96 million compared with December 2020, and the Internet penetration rate reached 73.0%.[1] Gao Xinmin, member of the Advisory Committee of the Internet Society of China, said that one billion users have access to the Internet, forming a global scale The largest digital society with the strongest application penetration, the extensive penetration of Internet applications and services has built a new form of digital society: 888 million people watch short videos and 638 million people watch live broadcasts. Short videos and live broadcasts are becoming a new way of life for the whole people.[2] The TikTok short video platform is deeply loved by men, women and children for its "decentralization" advantages. The reason behind its success is inseparable from algorithmic recommendation technology. This paper analyzes and studies the content operation process and algorithmic recommendation mechanism of TikTok APP. After familiarizing with the content operation process of TikTok APP, we can have a deeper understanding of the role of algorithmic recommendation technology in TikTok.

2. Analysis of the Content Operation Process of TikTok APP

The TikTok short video platform can stand out among many short video apps, in large part because of its simple video production process. Analysis of the process from production to dissemination of its video content can be divided into four levels: content source, content review, content push, and user interaction and feedback. The two levels of content push and user interaction and feedback are related to algorithm recommendation technology. have a close relationship.

2.1. Content Source - UGC+PGC

UGC, or User Generated Content, refers to user-generated content. "Record life on TikTok, become a recorder of life,

and freeze the beauty of the world." TikTok's slogan means that it encourages users to produce video content. One of the reasons for TikTok's popularity is its convenience. The user is easy to operate and easy to use. Open the TikTok APP to take pictures, add music, edit text, etc., and publish video content with one click. Producing content is no longer something that only traditional mainstream media and professionals can do. More and more individual users are pouring into the TikTok to become self-media content creators. These users do not necessarily have professional news production capabilities, nor do they have relevant experience in the news industry, nor do they necessarily pursue the high traffic of their works. The content they publish mainly comes from their own interests and records of life. The content produced by self-media content producers is also the main content source of the TikTok.

PGC (Professional Generated Content) refers to the content produced by a professional team. It is a targeted output of authoritative and well-made content by professional individuals or teams. For example, traditional media video accounts such as CCTV News and People's Daily, or some Internet celebrities who have signed up with professional MCN companies. The flexibility of its content creation is often weaker than UGC, but the addition of many PGCs in the TikTok makes the quality of video content on the TikTok more guaranteed.

In terms of content production, UGC and PGC each have their own characteristics. UGC has fast production and diverse creative themes, which can meet various needs of users; PGC is well produced, with higher content quality at the professional level, and high-quality video content is rich and worth watching. Combining UGC and PGC can achieve the effect of "1+1>2" for the development of TikTok short videos.

2.2. Content Review - Machine + Manual

Whether it is UGC or PGC content, it must go through strict auditing. The video content published by the user will be pushed to the audience only after the review is completed. The content review mechanism includes two methods: machine review and manual review. Machine review is the main method, and manual review is supplemented.

The machine review has extremely high efficiency and

accuracy. It matches the video text, music and picture content with the interception library through algorithm calculation. If there is suspected illegal content, it can identify the illegal text or picture in the copywriting and works. will be intercepted by the machine. But with nearly one million pieces of video content being produced every day, there are many content with blurred boundaries that cannot be judged by artificial intelligence technology. Although the machine algorithm program is advanced, there are still errors in its sensitivity to content and judgment standards. For those fields that are prone to illegal works, the role of manual review is particularly important, and its value judgment affects the quality of platform content. This kind of "recheck" often cannot be ignored.

On the TikTok, both the "trial first and then issue" system and "first issue and then trial" system exist. "Review before release" is a relatively common mode of review. Content uploaded by users must be reviewed before being allowed to be published. It will increase the time for users to upload content and affect the user's experience of uploading video content. "Review first and then review" is mostly used in TikTok live broadcasts. Due to the interactive, sudden and real-time nature of live broadcasts, it is impossible to achieve "first review and then review". In addition, when the posted video is reported by multiple people, the TikTok will re-review the video. "Human-machine linkage" is the main review method currently adopted by video platforms. The complementary method of machine review and manual review is used to check the content uploaded by users, which can more accurately and efficiently maintain a healthy network environment.

2.3. Content Push - Algorithm Recommendation

Since the 1990s, personalized recommendation systems have become an important means to provide users with information retrieval and information filtering. In the process of information distribution, the personalized recommendation system can analyze the user's most interesting content in the system based on the user's identity information, social information, geographic location, historical browsing traces, etc. before. [3] What video content is pushed to which part of the user is an algorithm Recommended core role.

Algorithmic recommendation is essentially a reasonable match between users and content. On the one hand, it is to understand and classify the pushed content, and to organize and classify the video content uploaded by the user, that is, to "tag" each video content. This kind of tag can also be defined by the user. Adding a topic on the video publishing page is a process of "tagging". Or the classification is performed by a machine, and the video is classified by extracting the keywords in the video content. On the other hand, users are classified. The algorithm will "tag" users according to their usual video usage records and habits, geographic environment, occupation, etc. For example, if users usually like to watch beauty videos, then the algorithm will Recommend more beauty-related videos to users; the platform will push videos from the same city to users. When the user's geographic environment changes, the corresponding city videos pushed by the platform will also change.

2.4. User Interaction and Feedback

When the video content is pushed to the user, the user can make a series of interactions and feedback on the content. At

the same time, this interaction and feedback can also allow the algorithmic recommendation system to improve. For a video, users can like, comment, favorite, and forward. If you are interested in the pushed video content, you will stay on this page for a long time, and then you can make interaction and feedback; if you are not interested, you can press and hold the video to select not interested, and the platform will display "The operation is successful and will reduce Recommendations for such videos". At the same time, the action of "reporting" can trigger a second review of the content. These operations can reflect the user's interests and preferences, and as time goes by, the data about the user's preferences will become more and more, and the algorithm system's judgment on the user's preferences will become more and more accurate.

The algorithm system records the user's behavior for analysis and mining to form a user portrait. In turn, the content is recommended to matching users according to the user portrait, and based on the user's feedback, it is decided whether to continue the recommendation in the next stage and expand the scope of the recommendation. When the platform recommends a video to users who may be interested, if it gets better feedback, the video will continue to be pushed to more users with similar preferences.

3. Research on Recommendation Mechanism of TikTok APP Algorithm

The core of algorithm recommendation is to achieve efficient connection between users and information. In front of the users it is interested in, the algorithm recommendation achieves a win-win situation for users and content producers to a certain extent.[4] The recommendation mechanism of TikTok is summarized and analyzed, mainly including the following three: basic collaborative filtering based on user information, precise recommendation based on user social relations, and overlay recommendation based on content traffic pool.

3.1. Basic Collaborative Filtering Based on User Information

User-based collaborative filtering is the most widely used and simplest method in algorithmic recommendation. It starts from the interests and preferences of similar users, predicts the interests and preferences of target users, and makes recommendations for target users. The algorithm assumes that if the behavior similarity of two users is high, the interest similarity between them is also high, and the core idea is to recommend the content that other users with similar interests like to the target user. This method is common in e-commerce platforms, such as Taobao, Amazon and other platforms. Users fill in basic information such as age, gender, occupation, and city in these platforms, and the algorithm analyzes and judges the user's consumption level and the consumption tendency of similar target groups based on this information, and then recommends content that may be of interest to users.

New users who have just registered on the TikTok have no traces of usage and browsing records, so the algorithm cannot push relevant content based on user interests. When users register an account with a mobile phone number, they need to set information such as gender, birthday, region and personal introduction, or use a third-party account to log in. The TikTok will obtain the public information registered by the

user on the third-party platform, including avatar and nickname. and other authorized information. The algorithm will look for other users with similar data to the target user, and recommend the favorite content received by other users to the target user. At the same time, users will also receive head content recommendations from the traffic pool.

3.2. Precise Recommendation Based on User Social Relations

Precise recommendations based on user social relationships can be divided into two categories: one is based on strong relationship recommendations based on the graph of social friend relationships; the other is weak relationships based on user forwarding, commenting, and liking of unfamiliar user content types. recommend.[5]

The strong recommendation based on the social friend relationship graph is to authorize the TikTok APP to use the user's address book, or the relatives and friends who follow and follow each other on the TikTok will be constructed as a social friend relationship graph. Interactions with friends, including likes, comments, and @mentions will be recorded. The more interactions, the stronger the social relationship between you will be determined by the algorithm. Therefore, the video content that your friends are interested in, interacted with, and published will be more likely to be pushed to you.

The weak relationship recommendation based on user social relationship is analyzed according to the content type of unfamiliar users forwarded, commented, and liked. The TikTok will record the user's usage behavior, including clicks, comments, attention, likes, favorites, searches, browsing, sharing, etc. When new users use TikTok, they receive content from the traffic pool, which often has high likes and various types. Watch videos by swiping up and down, and staying on the page for a short time indicates that you are not interested in such content. Staying for a long time or a series of interactive behaviors such as following, liking, and commenting will make such video content more likely to be recommended again. Increase. This recommendation is equivalent to "labeling" users and content, and the algorithm then matches users with content.

3.3. Overlay Recommendation Based on Content Traffic Pool

When a user newly registers on the TikTok APP, the number of likes and comments on the videos are tens of thousands, and these videos are superimposed recommendations from the content traffic pool. The overlay recommendation based on the content traffic pool takes the comprehensive weight of the content as the evaluation indicator. A certain order of magnitude can be included in the head content, and then recommended to the appropriate target group according to the intelligent algorithm. [5] After the user publishes a new video on the TikTok, he enters the first round of recommendations based on the copywriting, topic, location, etc., and then calculates whether the work base has reached

the completion rate, likes, comments, and reposts of the video. Recommendation base, to determine whether this video can enter the next round of recommendation. If the feedback is good and the content is popular, the video will be pushed to more users and get more traffic.

This is why there are some videos that can explode overnight, because these videos performed well in the first round of recommendations and entered the ranks of stacked recommendations. If you want to get better feedback in the first round of recommendation, then you need to improve the quality of video content and increase the recommendation weight. Although not all high-quality videos can be recommended by the algorithm, the videos with good data are often creative and interesting, so as to attract users' attention in the first round of recommendation. This superimposed recommendation can not only improve the efficiency of content distribution, but also make more accurate personalized recommendations based on user preferences and behaviors.

4. Conclusion

This paper analyzes and studies the content operation process and algorithm recommendation mechanism of TikTok APP, so that users can produce better works after familiarizing themselves with the rules, and better operate and manage TikTok accounts. Algorithmic recommendation technology has brought great convenience to all walks of life, including the short video industry, and is constantly being improved and changed. At present, according to the cognition and consensus of academia and industry, there are various types of algorithmic recommendation systems, but the TikTok APP mainly uses basic collaborative filtering based on user information, accurate recommendation based on user social relations, and content traffic pool-based. These three are recommended for stacking. These three algorithms have different operating principles and advantages and disadvantages, but they complement each other to give users a better experience and help the TikTok to develop better.

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