



# How Social Media Can Solve the Problem of “Filter Bubbles” Under the NewMedia Algorithm Recommendation Mechanism the Example of Tik Tok

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**Abstract.** In the age of new media, social media platforms have attempted to deliver accurate information to users through algorithmic recommendation technology. While this has helped reduce the problem of information overload, it has also led to the formation of “Filter Bubbles.” This article explores the concept and root cause of “Filter Bubbles” in the context of algorithmic recommendation mechanisms, using Tik Tok as a case study. The purpose is to gain a deeper understanding of “Filter Bubbles” from an algorithmic perspective and to provide suggestions for breaking these “Filter Bubbles” in the future, promoting better management and operation of social media.

**Keywords:** Filter bubble · algorithmic recommendation mechanism · new media · Tik Tok · social media

## 1 Introduction

The widespread use of mobile devices and internet technology has transformed social media into a crucial aspect of daily life. In the new media era, social media platforms have leveraged algorithmic recommendations to provide more accurate information to users, reduce the time cost, and increase user engagement. However, this approach has also led to the phenomenon of “Filter Bubbles” and “group polarization.”

The “Filter Bubble” concept, introduced by Eli Pariser in 2011 [1], refers to the way computer systems use information collected from a user’s online search and browsing history to infer their preferences and then provide personalized recommendations. While this personalized bubble can meet the user’s needs, it can also limit exposure to a wider range of information and lead to biased or stereotypical viewpoints. The objective of this article is to examine the “Filter Bubble” in Tik Tok short videos, analyzing its causes, effects, and potential solutions within the context of algorithmic recommendations. By doing so, the article aims to better understand the “Filter Bubble” phenomenon and provide recommendations for social media platforms to improve their management and operations in the future.

## **2 The “Filter Bubble” in the Algorithmic Recommendation Mechanism in the New Media Era**

The great algorithmic recommendation mechanism of the new media era enables precise distribution of highly concentrated information and vivid and engaging content to the audience, which increases user retention and reduces data collection cost for users. However, this has led to the phenomenon of “Filter Bubbles,” where users receive singular and personalized messages based on their behavior, resulting in a confined information environment [1]. The Filter Bubble is created through the three technological components of data collection, data analysis, and algorithmic recommendation. The data collection process, facilitated by the increased use of mobile devices and the significance of social media, is the primary cause of Filter Bubbles, as it provides a large amount of data for analysis. Data analysis of the abundance of unstructured data from social media determines user preferences and behavior, becoming increasingly important as data generation and storage become easier [2]. Business models such as Tik Tok, Facebook, and Google rely on user data analysis and targeted content delivery to increase user retention [3]. The automated operations in the algorithmic recommendation mechanism technology create the Filter Bubble through outlining, replication, filtering out irrelevant data, and providing information that matches audience preferences [6]. The term “Filter Bubble” in the algorithmic recommendation mechanism technology refers to this feedback process.

## **3 Basis for the Formation of ‘Filter Bubbles’ on the TikTok Short Video Platform**

### **3.1 Based on Basic User Information**

The prevalent “Filter Bubble” phenomenon is based on a content recommendation system that utilizes basic user data. To effectively match content with users, the algorithm must have a comprehensive understanding of demographic information such as gender, age, and location. The algorithm then analyzes the user’s interest patterns and group characteristics, searches for users who share similar data, and recommends content that is popular among these similar users and content that the user may find appealing [4]. This allows for personalized information retrieval and filtering tools, allowing the recommendation system to analyze users’ preferred content based on factors such as identity, social information, location, and browsing history [5].

### **3.2 Based on Users’ Social Behavior**

The TikTok platform uses various user activities, including browsing, liking, commenting, and retweeting, to evaluate user preferences. This interaction with video content allows users to provide feedback, improving the algorithm’s suggestion system. TikTok then presents related content sequentially based on the user’s interests, fueling their curiosity and engagement [7]. Additionally, TikTok categorizes users based on their interactions with each other. This includes interactions with friends, likes, comments, and mentions. With more interactions, the algorithm determines the strength of social

bonds between users. This precise segmentation of the domain helps users rediscover their group affiliation and enhances their sense of group identity when they come together with similar interests.

### **3.3 Based on Network Media Technology**

TikTok has become a hub for users to express their individuality and showcase their thoughts and emotions. With its easy-to-use video creation tools, users are able to transition from being mere consumers of content to become active producers and disseminators. The rich and diverse information-sharing environment on TikTok allows the platform to accurately profile users and tailor content recommendations based on their interests. These recommendations are continuously refined through user feedback. The platform's lively and engaging features have transformed the way people interact, offering them great flexibility in terms of time and location. This makes TikTok an ideal breeding ground for the growth of "Filter Bubbles," as users can effortlessly connect with like-minded individuals and strengthen their personal perspectives and preferences.

## **4 The Negative Impact of the Formation of "Filter Bubbles" on the Tik Tok Short Video Platform**

### **4.1 The Audience's Perception is Limited**

The "Filter Bubble" is largely shaped by users' interests and search preferences, which can create a narrow information field and restrict access to diverse perspectives. TikTok's pursuit of efficiency and accuracy often leads to the pre-filtering of information, potentially reducing access to high-quality sources. Prolonged immersion in this single-source environment can result in the "echo chamber effect," where users are confined to a limited range of information that aligns with their existing beliefs [4]. This reinforces their perspectives and restricts their exposure to alternative viewpoints, potentially limiting their cognitive perceptions.

### **4.2 Leading to the Phenomenon of Group Polarization**

Stoner coined the term "Group Polarization" in 1961 after observing the phenomenon during group discussions. GP refers to the tendency for individuals to make more extreme decisions in groups compared to when they act alone. This can result in a deviation from the optimal course of action. On Tik Tok, the fast and simple nature of interaction allows users to easily find groups with similar ideologies, leading to the formation of "Filter Bubbles." These bubbles can result in a one-sided understanding of information, as users are only exposed to content that aligns with their interests and beliefs. Through online communication, users reinforce their sense of self-identity and belonging within these like-minded groups. This can lead to a disregard for the authenticity of information and an evaluation of truth based solely on social trust. Differences in values between groups can make it difficult to communicate and aggregate values, resulting in further polarization.

## **5 How to Break the “Filter Bubble” Under the Algorithmic Recommendation Mechanism**

### **5.1 Active Optimization of Media Technology**

To continuously improve the learning function of algorithms and explore new user interests, future algorithms should go beyond analyzing immediate needs and desires and collecting short-term feedback. Such a focus can lead to a “Filter Bubble” dilemma, where users are only exposed to limited information that aligns with their current preferences. The learning function of algorithms should be deepened to better predict user needs, track the evolution of interests over time, and actively seek out new areas of interest. Transparency in algorithm design is crucial to help users understand how the algorithm operates and escape the Filter Bubble. By being aware of the information that is being shown and filtered out, users can adjust their behavior accordingly. For instance, the Bobble browser extension allows users to compare their personalized Google results with those of other users worldwide, thereby providing a wider range of information and helping users escape the Filter Bubble [8].

### **5.2 Diversification of Information Dissemination**

The limitations of the “Filter Bubble” and its effect on producing a one-sided flow of information have been recognized by many experts in the field of new media. To address the problem caused by algorithms, some internet companies have taken action. BuzzFeed, for instance, has introduced the “Outside Your Bubble” feature, which presents a range of opinions and comments from social media platforms after popular articles, breaking the uniformity of personalized recommendations. As stated by Plettenberg et al. [9], one way to promote diversity in information dissemination is to diversify the sources used to tackle the “Filter Bubble” challenge.

### **5.3 Users Should Improve Their Media Literacy**

To reduce the impact of “Filter Bubbles” and broaden the scope of information, it’s important for users to be intentional in their personalization choices. This can be done by including diverse categories of topics in their preferences and actively seeking out different types of information. By creating a diverse information environment, users can enjoy the benefits of the algorithm’s personalized recommendations while also promoting diversity in content. Additionally, users should strive to maintain an impartial and objective stance when using media, and actively participate in exposing and correcting inaccuracies through their reading, browsing, and collection of quality information. Engaging in various online practices and comprehending different types of information will also help to improve their information judgment.

## **6 Conclusion**

In the new media landscape, social media platforms are constantly improving their algorithmic recommendation systems to enhance user engagement and expand their reach. These algorithms use personal information and social behavior to accurately

recommend content to users, but they can also contribute to the phenomenon of “Filter Bubbles,” leading to a homogenization of information and content, and limiting users’ perspectives, often resulting in group polarization. As such, mitigating the negative effects of “Filter Bubbles” should be a priority for new media professionals. To achieve this, we need to continue to optimize media technology, enhance the learning capacity of recommendation algorithms, and increase algorithm transparency. Moreover, we should encourage diversity in information dissemination by improving media literacy, actively seeking out diverse types of information, and consciously creating a varied information environment. This paper proposes solutions to the challenges posed by “Filter Bubbles” in the hope of fostering a positive new media information environment.

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