

How does TikTok's algorithm work?

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Online Desk: The algorithm behind TikTok's content recommendations has once again drawn mainstream attention following the recent US ruling for ByteDance, its Chinese owner, to divest its US assets or risk a nationwide ban of the app. As such, this algorithm has sparked more debate compared to those utilised by its competitors like Meta's Instagram, Google's YouTube, and Snapchat. Here is a breakdown of how it operates and why it is generating so much discussion recently.

Importance of the algorithms

The algorithms are deemed core to ByteDance's overall operations, and ByteDance would rather shut down the app than sell it, Reuters reported citing sources.

China made changes to its export laws in 2020 that give it approval rights over any export of algorithms and source codes, adding a layer of complexity to any effort to sell the app.

Academics and former company staff said that it is not just the algorithms, but also how it works with the short video format, that has made TikTok so successful globally.

Social interests

Before the emergence of TikTok, many had believed that technology connecting a user's social connections was the secret sauce to a successful social media app, given the popularity of Meta's Facebook and Instagram.

But TikTok showed that an algorithm, driven by the understanding of a user's interest, could be more powerful. Rather than building their algorithm on a "social graph" like Meta has, TikTok executives including CEO Shou Zi Chew have said that their algorithm is based on "interest signals".

While rivals have similar interest-based algorithms, TikTok can turbocharge the algorithm's effectiveness with the short video format, said Catalina Goanta, an associate professor at Utrecht University. "Their recommender system is very common. But what really distinguishes TikTok as an app is the design and the content," she said.

The short video format enables TikTok's algorithm to become much more dynamic and even capable of tracking changes in users' preferences and interests across time, going as granular as what a user may like during a certain period during the day.

Rapid data collection

In addition, the short video format allows TikTok to learn about user preferences at a much faster rate, said Jason Fung, former head of TikTok's gaming unit.

"Because it's in bite-size format, it is a short video, you're able to collect data about a user's preference a lot faster than YouTube, where maybe the average video is just less than 10 minutes long," he said, "Imagine you're collecting data about a user on average every 10 minutes versus every couple seconds."

The positioning of TikTok as an app built for mobile devices from the beginning also gave it an advantage over rival platforms that had to adapt their interfaces from computer screens.

TikTok's early entry into the short video market also gave the company a big early-mover advantage. Instagram did not launch Reels until 2020 while YouTube launched Shorts in 2021, both of which lag TikTok in years of data and product development experience.

Allowing exploration

TikTok also regularly recommends content that falls outside of users' interest, which the company's management has repeatedly said is essential to TikTok's user experience.

A study, which researchers from the US and Germany published last month, found TikTok's algorithm "exploits the user interests in 30% to 50% of the recommendation videos" after examining data from 347 TikTok users and five automated bots.

"This finding indicates that the TikTok algorithm opts to recommend a large number of explore videos in an attempt to either infer better the user interests or maximise user retention by recommending many videos that are outside of the user's (known) interests", the researchers wrote in the paper named "TikTok and the Art of Personalization".

Mobilising users into groups

Ari Lightman, a professor at Carnegie Mellon University, said that another effective tactic TikTok has employed is to encourage its users to form groups publicly via hashtags.

By encouraging users to form public groups, TikTok can more effectively learn about its users' behaviour, interest, alignment and ideology, he said.

If TikTok ends up getting banned in the US, Lightman said that while the US tech giants certainly can replicate TikTok with their own products, replicating the user culture enabled by TikTok might be the bigger task.

Chinese advantage

TikTok's recommendation algorithm was also in large part taken from its Chinese sister app Douyin which was released in 2016. Although ByteDance often stresses that TikTok and Douyin are separate apps, one source with direct knowledge of the matter said the two algorithms remain similar to this day.

In turn, Douyin's AI was supercharged by the company's ability to leverage low labour costs in China which saw it hire many content annotators to painstakingly tag all the content and users on the platform.

"Around 2018 and 2019, Douyin worked on having tags on every user. So they would tag every video clip manually. Then they would tag their users based on the video that they have watched," said Yikai Li, a manager at ad agency Nativex and a former director at ByteDance. "Then they also applied this tactic on TikTok."

While hiring annotators to tag data is now a common and important practice for AI companies, ByteDance was early in adopting this strategy.

"It's a lot of work sorting out these tags. It's very laborious," he said, "So Chinese companies have an advantage here. You can afford a lot more people. The cost is cheaper than it is for North American companies."