Machine Learning, Startup, Data Science

The inescapable AI algorithm: TikTok

Describing a progressive recommendation system used by TikTok to keep its users hooked!

From Tka4enko via Dribble

If you haven't been paying attention to TikTok, you haven't been paying attention at all.

Content Table:-

What is TikTok?

TikTok is one of the most popular and most interesting social media apps. Apart from lip-syncing it also caters to short dance, comedy, and talent videos. A closer analogy would be **Vine**, Twitter's still sorely missed short-form video app whose content lives on as YouTube compilations.

TikTok is owned by **ByteDance**, a Beijing based technology company found in 2012. **ByteDance** first launched **Douyin** for the China market, then it was gradually launched for the market outside China. ByteDance owns two social media platforms:- TikTok(Duoyin) for

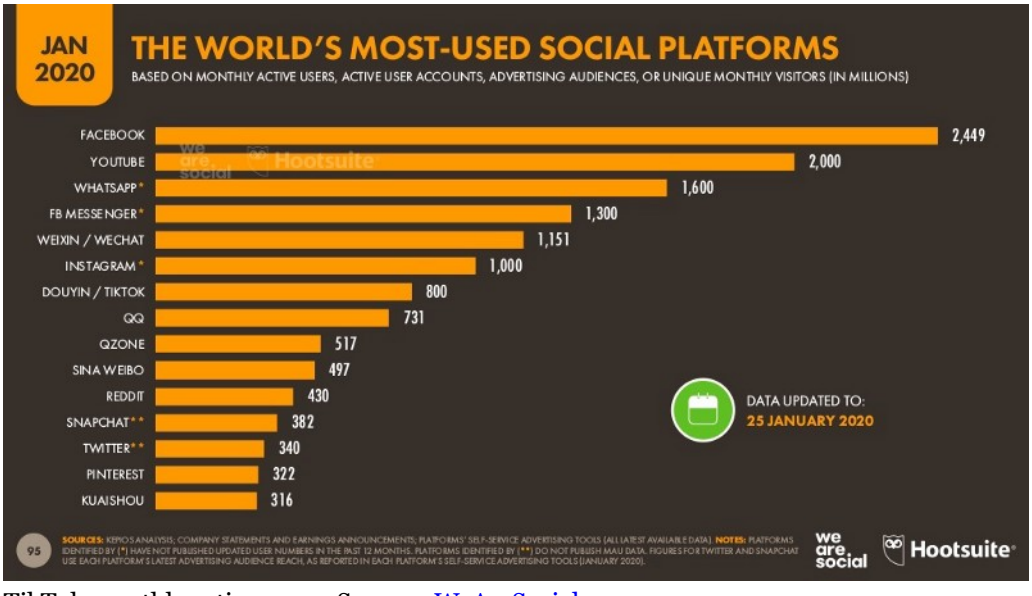
China(censored by their protocols), and a TikTok for the rest of the world. Later, TikTok merged with Musical.ly, the venture grown enormously and it was one of the most downloaded apps in the US for Q3 2018.

ByteDance is the world's most successful startup with a valuation of $100 Billion in private markets. The linchpin can be regarded as AI, the company uses powerful AI tools that are more extreme to any competitor in the west. It also developed an AI tool that can read news from 5000 sources and can generate a custom article of 400 words in 2 seconds. The company holds a firm grip over AI and have great potential to replace other social media platforms.

What makes TikTok unique from other Social Media Platforms?

From Susan Wojcicki to Mark Zuckerberg, all have expressed their concern over the market snatched by TikTok in recent years and are crazed by the success, it is achieving amongst users, ranging from elders to teenagers.

But that explains only a part of the unprecedented success story of TikTok. It went from a "lip-syncing" feature in a small fan base to a viral feature in 2020 with almost 800 million active monthly users in less than 2 years. Within such a short period, it is comparable to old-guard social medial platforms with over 10 years in the market!

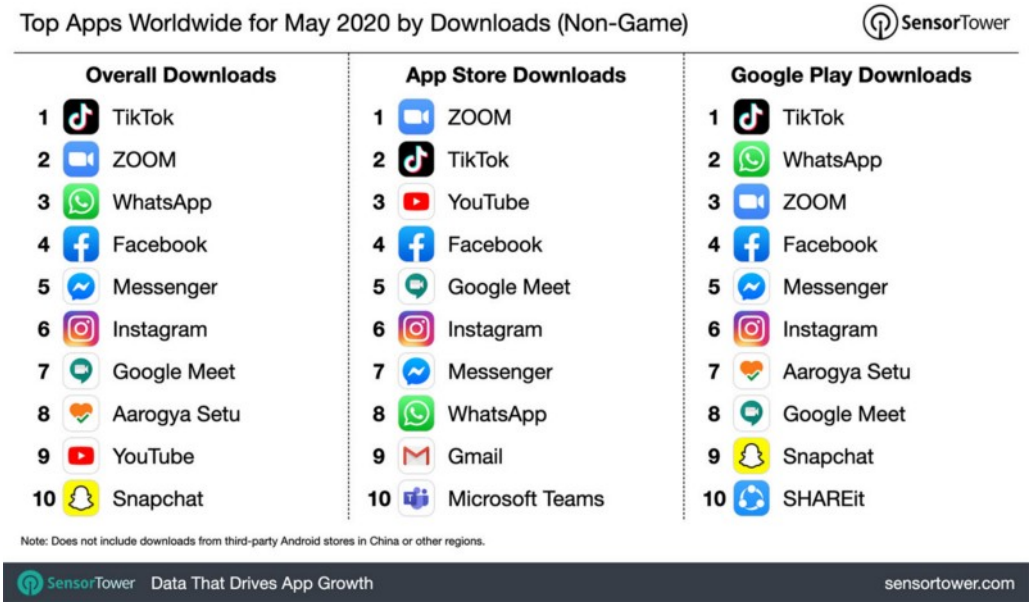


TikTok monthly active users. Source : WeAreSocial

Talking of numbers, TikTok has over 800 million active users worldwide that make TikTok 7th in terms of social network sites, ahead of well-

known platforms such as Twitter, Pinterest, and Snapchat.

Comparing with adversaries, Instagram took six years, Facebook took nearly four years from its launch to gain the same amount of monthly active users that TikTok achieved under three years.



TikTok is the most downloaded app in US for May 2020. (Source: SensorTower)

TikTok is the most downloaded app worldwide (non-game) for May 2020 with more than 111.9 million downloads including China's Douyin, a 2x YOY increase from May 2019.

Jumping back to the question, What makes it unique?

It uses an advanced and cyclic recommendation system, Unlike old schools entertaining platforms like Netflix and YouTube, it doesn't recommend you videos rather it dictates you what to watch?

As quoted by **Connie Chan**, a renowned Chinese investor :

"TikTok is the first mainstream consumer app where artificial intelligence IS the product. It's representative of a broader shift."

Contradictory to Instagram and YouTube, you don't need a single view or followers to be viral. It uses an AI-powered feed that works on the motto "*the more you use it, the more it learns you*".

It heavily relies on the user's personal information(location, characteristic, traits, internet searches) to make the feed more personalized and thus often been part of information leak and misuse

controversies.

The basic aim of any social media platform is to keep its users engaged, and surprisingly, TikTok can engage its average new users up to 10 minutes that is three times the capability of Instagram.

It lowers the barriers of entry and doesn't even require you to sign up, once you install the app it starts tracking you from that moment and starts recommending you videos based on those factors.

For illustration, if you're new on the application and TikTok showed you a video, and you don't watch the entire video, you will get less recommendation of those types of videos and vice-versa.

Furthermore, it allows you to showcase your talent unlike other social media giants that promote status over talent; Anyone can be a creator on TikTok which is it USP!

Several Theories

There is not a lot of transparency about algorithms, but still there are several theories based on user experiences and experts analysis.

Batch Theory :

According to this, when a video is uploaded, it is shown to a pool of batches with different ideologies or in simple words, based on several distinguishing factors such as their watching history, location, personal preferences. The fate of your content is based on those different batches; Re-watching, Liking, Sharing, and comments, these are the little inputs that the algorithm takes to escalate the score of your content.

If your content is liked by the batches then it is pushed to a larger audience of the same thought-process and thus making it viral!

Coping up with this theory, it might take a few days for you to be a celeb.

And a bonus point:- The more you engage yourself in trending challenges, the more it promotes you.

Authority Ranking :

In the light of this principle, your fate of going viral depends upon your first few videos. If those garner some views and likes, then it sets a stage

for you as a creator and your only job will be to engage with the audience as much as possible.

Once you get authority ranking, you will be in limelight and will stand some levels above novice users although you're still a novice.

Delay Momentum :

Following this principle, some users have advised not to delete any piece of content no matter how crap that is!

Some users have experienced that, if their content does no good and they start being less active on the platform, the platform will try to boost their content on its own after a while, thus encouraging them to create more for their audience.

Possible TikTok recommendation system

There is no confirmed workflow for the TikTok's algorithm but based on the data posted by the company, and trails found by nerds. I made up the accompanying determination.

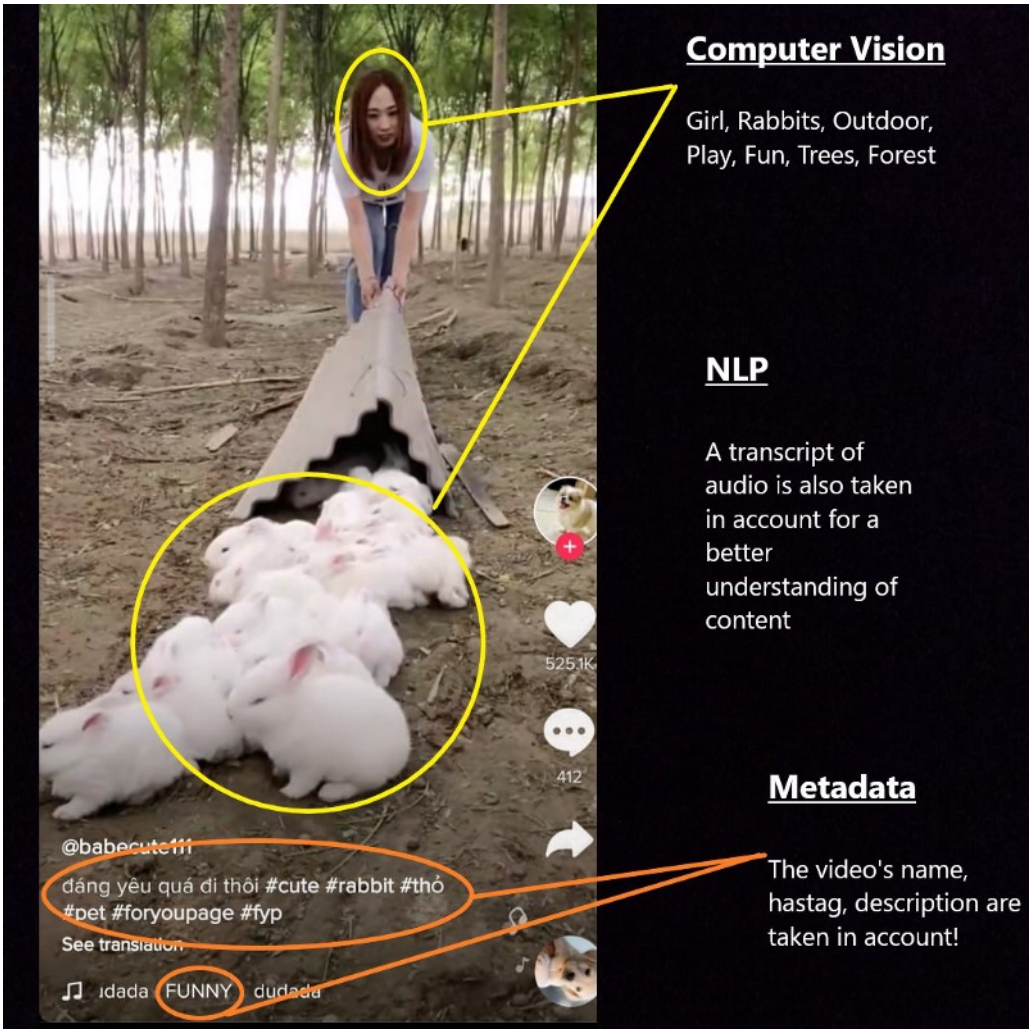
How does the TikTok algorithm work for a content creator?

Once a video is uploaded to TikTok, the highly capable AI algorithm uses NLP and computer vision to analyze the video.

Source

It will analyze every part of your video including audio, captions and metadata(hashtags) to build up an understanding of the content and context of the videos.

> “Artificial intelligence powers all of Bytedance’s content platforms,” the spokesperson says. “We build intelligent machines that are capable of understanding and analyzing text, images and videos using natural language processing and computer vision technology. This enables us to serve users with the content that they find most interesting, and empower creators to share moments that matter in everyday life to a global audience.”



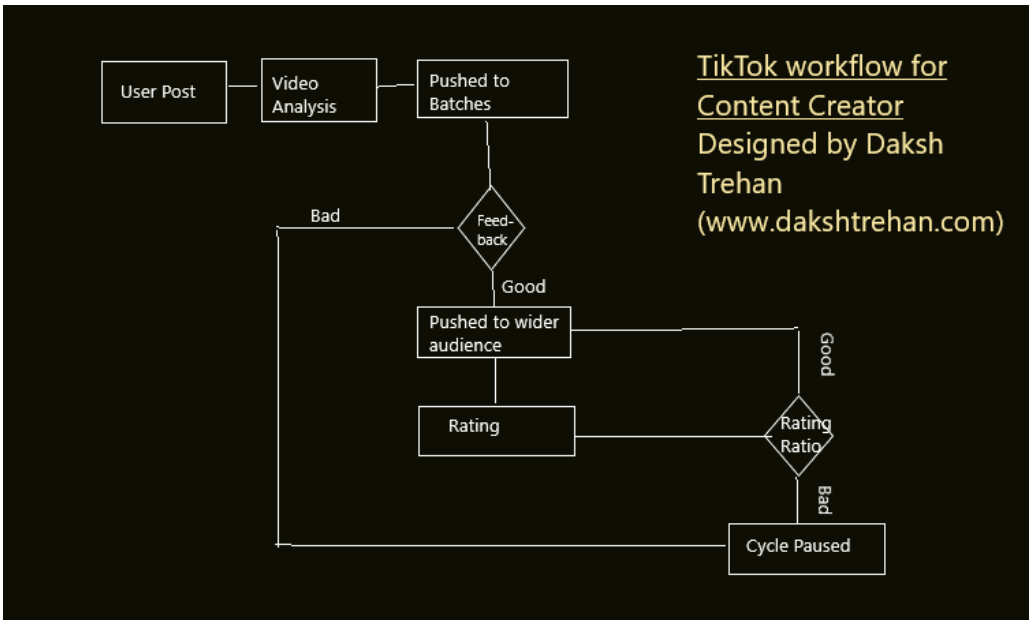
How TikTok uses AI to analyze the content, Created By Daksh Trehan, All Rights Reserved

After being checked upon its rules and regulations, the content will be pushed to a small batch of the audience and, an evaluation will happen based on how the sample set of users reacted to that piece of content. Each metric that is tracked has a possible associated score.

> ***Re-watch rate*** *= 10 Points*
> ***Completion rate*** *= 8 Points*
> ***Shares*** *= 6 Points*
> ***Comments*** *= 4 Points*
> ***Likes*** *= 2 Points*

But looping your video over and again won’t make you viral, because this algorithm can distinguish redundant entries.

Once the aggregate score for your content is decent, it will push it to a wider audience sharing same thoughts and dogma.



TikTok workflow for Content Creators, Designed by Daksh Trehan, All Rights Reserved

And don't be disheartened if your content doesn't go viral, because the cycle isn't ended but rather just paused and according to Delay Momentum theory, it might roll back once you start leaving a shorter footprint on the application.

This is a chain reaction, that will going to continue, engaging more content creators and thus more audience. This is the essence of this platform, that can hooks its users for a long time.

How does TikTok learn about you as a user?

As discussed earlier, TikTok lowers its barrier of entry by not forcing its users to sign up. Rather the app starts learning as much as it can about you. The first sequence of videos you consume helps it to decide your taste.

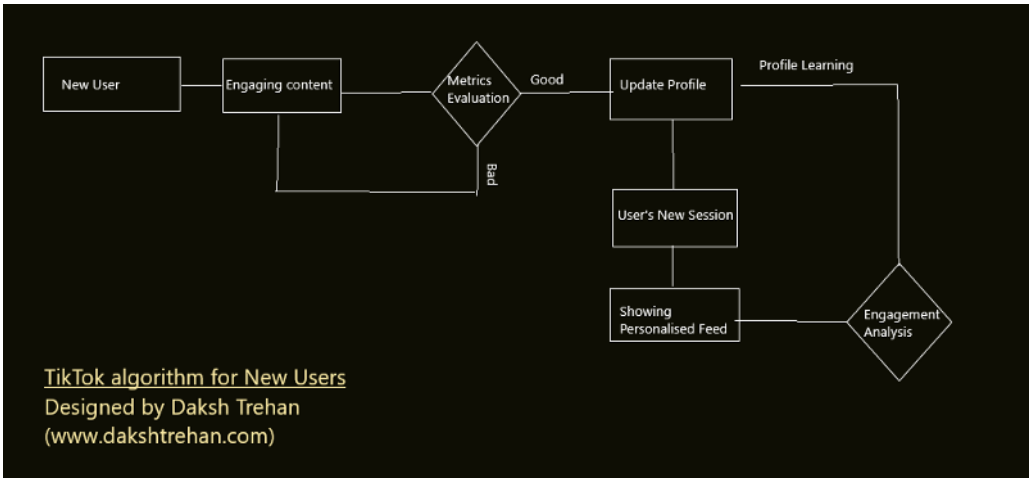
The first task is to keep you in the app for as long as possible. It will only show you videos that are liked by wider range of audience thus trying to keep your exit rate low.

Once you are in their ecosystem, they will track each of your metrics and create a score for your profile for each genre.

Every time you re-watch a video or consume the entire duration of the video, the algorithm takes note suggesting some more videos of similar type for your profile. Here is the detailed possible metrics system:

Re-watch rate *= 10 Points*
Completion rate *= 8 Points*

***Shares** = 6 Points*
***Comments** = 4 Points*
***Likes** = 2 Points*

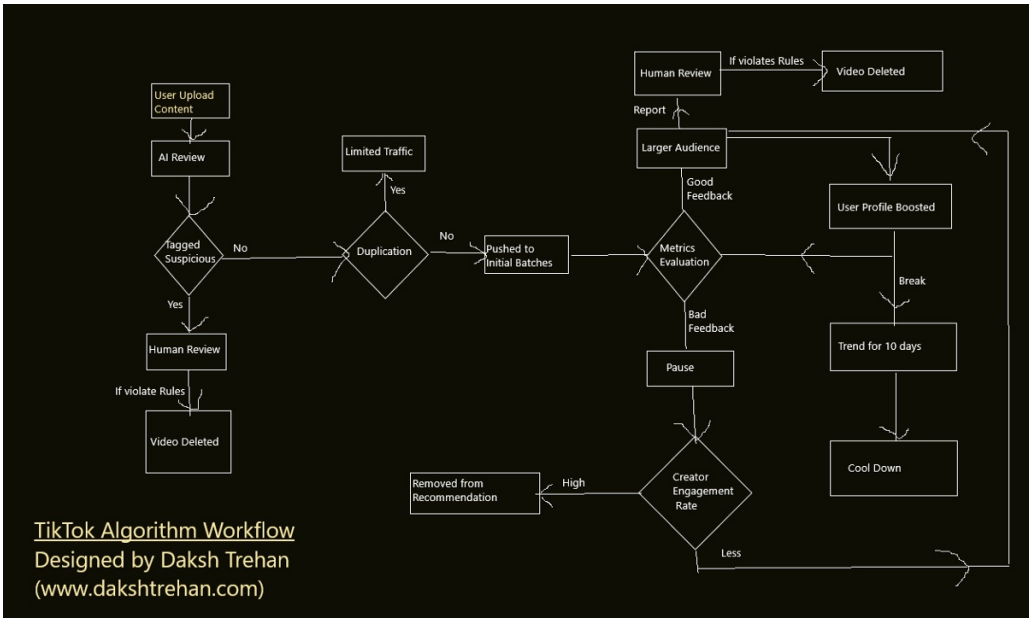


TikTok workflow for New Users, Designed by Daksh Trehan, All Rights Reserved

Along with your metrics data, it will also collect your personal information such as your location, your internet history, your age to create a more accurate personalized feed, thus keeping you in their ecosystem as long as possible.

> The wonder of such algorithm is, it can engage user all around world from different age group with its exceptional content recommendation system!

Recommendation workflow in a Nutshell



TikTok algorithm possible workflow, Designed by Daksh Trehan, All Rights Reserved

At TikTok, there are millions of contents uploaded by users daily. It is not practically possible to monitor each content manually, so a review is done by the machine and if the content is tagged insensitive to company's protocols it is passed for a human review.

After passing human review, the content is checked for duplication, after passing that stage, the content is passed to a small batch of users for initial feedback; based on metrics system the score for the content is evaluated, the score decides the fate of content; if the score is above some threshold then the content is pushed to a wider audience but is cooled down in a week or so, to keep its users experiencing new content.

But if the feedback is low, the cycle doesn't stop right here, but rather it is paused and the application observes user's behavior and its active time, if it experiences a high exit rate then the cycle will become active again and boosting the content thus encouraging the creator to create more and engage more on the platform.

This cycle is the main reason, it makes its users obsessive as doesn't let its users get bored, if you're a user it will keep dictating you and recommending you highly personalized feeds and if you're a creator it will try to distribute you some attention thus keeping your morale high and encouraging to you create more!

Conclusion

Hopefully, this article has given you How TikTok is using AI and how its recommendation workflow can hook its users for a longer time with a low exit rate.

As always, thank you so much for reading, and please share this article if you found it useful! :)

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Cheers!

By Daksh Trehan on June 12, 2020.

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