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TikTok Vs. Instagram: Algorithm Comparison

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ABSTRACT

TikTok and Instagram are two of the most popular social media platforms on the market. They do, however, have one important distinguishing factor: TikTok is a video-sharing platform and Instagram is a photo-sharing platform. With fundamentally different functions, the algorithms are bound to be different. This study focuses on which algorithm between the two social media platforms does better at sending out content made to an interested audience. To see which algorithm performs better, two accounts were created on TikTok and Instagram respectively, and there were ten posts made on each account, with each post on one account being focused on the same subject as a corresponding post on the other (ie. A video post of a flower on TikTok will have a corresponding photo post of the same flower on Instagram). A set of posts would be uploaded at the same time and any given set of posts' statistics would be recorded and reviewed after one week of being uploaded. Using a comparison of the results garnered from each post on both platforms, including individual views and total views, it is concluded that the algorithm TikTok uses is superior in regards to showing specifically tagged content to potentially interested users. The number of both individual views and total views of the TikTok posts were much higher than the ones for Instagram, with TikTok's numbers reaching the hundreds and Instagram never breaking into double digits.

Introduction

Social media as it is known today is very new, and it has a variety of uses. There is the everyday person that shares their daily life, the users that post online to become famous, the businesses that use social media for marketing, there is no limit to who uses social media. While vastly different, these groups utilize social media for the same reason- to have others notice them and their posts. These groups want to share their ideas with an audience, and they use social media to help achieve that goal. Focusing on businesses specifically, both large and small, they create social media accounts to get more people to purchase from them. With a wide variety of social media platforms to choose from, however, it can be challenging to know which one is the best choice. While companies could just open multiple accounts, they would have to handle multiple online presences and possibly pay more for social media representatives. It would be more convenient for them, and for anyone at all, to only have to handle one account. Some platforms are video-based, some are photo-based, and some are text-based; all are used very differently. The two platforms of focus in this research are Instagram and TikTok. With Instagram being used mainly to post photos and TikTok being used to post videos, the two platforms are very diverse at their cores. With each platform having distinct foundations, there are a lot of benefits to see how different the algorithms are, and figure out which one is better for sending out content to other people. With the research that will be conducted, the goal is to figure out if Instagram, a photo-based social media, or TikTok, a video-based social media, has a better algorithm for sending out specifically nature-related posts.

The results of the research will benefit multiple groups of people, but will mostly benefit businesses, especially small businesses. Knowing which social media platform sends out content better than the other without having to pay for ad space will help save a lot of time, money, and resources alike. Knowing this is beneficial to businesses that are just starting up or simply do not have the funds to buy ads just yet. It will also help increase the general

knowledge of how social media algorithms work on a basic user level. It will show people just how important algorithms are in general, starting with social media. It could possibly even inspire people that use social media often, like younger people, to participate in learning about technology and computers.

Lit Review

The word algorithm has no set definition as it can be used in multiple different ways, but the definition that will be referred to in regards to this research is "...[a] set of rules a machine...follows to achieve a particular goal" (Merriam-Webster). Algorithms are everywhere, both on and off the internet. Whether it be in search engines, websites, advertisements, or even used to determine credit scores (Kerstetter), algorithms are used to find out more about the user. The same can be said for social media, which heavily relies on algorithms. Both popular social media platforms and older social media platforms utilize algorithms to push out posts to users. The photo-sharing application Instagram has a "private algorithm" (Park et al.) that it uses to determine if a post is doing well by analyzing engagement. YouTube, the video-sharing platform owned by Google, has an algorithm that takes behaviors from users and applies it to recommend new videos to them to watch (Airoldi et al.). Facebook, the parent company of Instagram, relies so much on algorithms in fact that its users got upset when its algorithm changed (Cornia et al. 7). Algorithms play an important role in social media platforms that rely on consumers finding new accounts and posts. Different platforms recommend content to users in different ways, but two examples of platforms that use information from consumers to recommend similar content are Instagram and TikTok.

TikTok is a social media platform that utilizes short videos. The videos on the app can contain background music and can be up to fifteen seconds long if the music is copyrighted (Omar et al. 121). The main way users receive content to watch on TikTok is through the "For You" page (Guinaudeau et al. 9), an endless page of user-submitted content for users to scroll through. This "For You" page can provide any user hours upon hours of short videos to watch. The TikTok algorithm favors videos that have longer watch time (Bresnick, 7). Watch time is how long, on average, people spend watching a video. The longer a viewer watches a video, the better that video will do in the algorithm, and the more people that will see it. TikTok's algorithm recognizes what the user likes and dislikes based on different inputs from the user, including watch time, and provides content on the "For You" page based on that information (Serrano et al.). TikTok remembers videos that were liked, shared, commented on, etc, and provides the consumer videos that are similar. TikTok allows content creators to tag their videos with words or phrases that are relevant to their videos. If a user prefers content under a certain tag, then TikTok will recommend and consequently provide more videos under said tag.

Instagram is a social media platform that focuses on promoting photos. The platform allows creators to apply filters to photos if so desired (Hu et al. 595). Instagram has a page called the "explore page", where users can find new content tailored to their interests. The explore page is laid out with minimized versions of posts from different creators. The user can tap on any image to enlarge it and see the whole post, along with others beneath it that can be accessed by scrolling down. Instagram did not always use an algorithm, though. Instagram used to show posts to users chronologically instead of algorithmically (Daalhuizen). Changes were made, however, to implement algorithms on the platform. Instagram now uses the tags on a post and the interaction a post gets to give the consumer what they want to see (Agung et al. 744). The more interaction a post has, the more it gets promoted, and the tags on the post tell Instagram to whom to show the post. This system is more up-to-date with other platforms that use the exact same method and was a necessary change due to the constantly growing user base of the platform.

Tiktok has more to compute in its algorithm, like watch time, so the Tiktok algorithm is presumably a lot more complex than the Instagram algorithm. From gathered research, Tiktok and Instagram's algorithms do in fact include very similar components for consideration: tags telling the algorithm what the video is about and interaction, such as likes and comments.

There is little to no bias whatsoever when talking about algorithms of social media platforms since there is no opinion to be had in them. Algorithms are something that is a topic of discussion not because of disagreements in

different communities, but rather because of the mystery behind what they do and how they work. Of course, an algorithm is not something someone can directly look at and analyze; the only understanding most sources have of algorithms is what is learned through experimentation and educated guesses.

Solving the mystery of how an algorithm works has different benefits for different crowds. An example of one would be for marketing. Being able to advertise without having to pay for ad space is an ideal situation since it saves a lot of resources for a company that can be put into other places. Finding out which platform pushes content out better is essential to deciding where more effort should be focused. The question proposed by the algorithms TikTok and Instagram is how do they compete in practice? While they are very similar, the TikTok algorithm is a lot more complex than the Instagram algorithm. The two platforms focus on different forms of content, one being photos and the other being videos. Speaking about a theory regarding two algorithms and seeing the algorithms in action are two separate things. These two ideas can be either very alike or very different. Algorithms cover a range of many different topics, so in an attempt to narrow down the options in order to make researching and finding data more specific, the question raised is how does the TikTok algorithm compete with the Instagram algorithm when sending out nature-related content to an audience?

A formed hypothesis based on the information provided from multiple sources is that the TikTok algorithm will do better. With the “For You” page being the main source of content to the user, and most of that content being from creators that the user does not follow, TikTok will most likely be better at pushing out videos to people.

Methodology

To analyze and compare the algorithms of both Instagram and TikTok, 4 steps were created and followed. First, videos had to be recorded and photos had to be taken. Next, the videos and photos had to be uploaded simultaneously corresponding to which ones had similar subjects. Also, one week had to pass since posting before any data could be collected. Finally, the data was examined and compared.

A brand new account had to be created for each platform to post from, so both were created at the same time with the same brand new email address. The accounts had different but similar names, with the names consisting of 3 random lowercase letters followed by 4 random numbers. This way, it would not be immediately apparent to people that the accounts are connected, and therefore would not cause the viewers that may have enjoyed the posts from one platform to view the posts on the other platform and falsify the data. Having both accounts being created with the same email and being named with 3 letters and 4 numbers made it so neither account had an unfair advantage over the other. The TikTok account was a “Pro Account” and the Instagram account was a “Professional Account”, so more in-depth data could be collected for each individual post. 20 videos and photos were collected in total, and there were 10 posts on each platform. All photos and videos were taken on the same day. There were 10 photos taken of different things in nature, such as bushes, trees, and flowers. Then, a corresponding video was taken of the same subject of the photo just taken. For example, if there was a photo of a tree already taken, a video of that same tree would be taken as well. The videos were recorded directly on TikTok, so they could be added to the drafts feature and saved for a later uploading date. The draft feature on TikTok allows videos to be edited and uploaded at a later time for convenience. To make sure every video was the same technical-wise, each video had the same “sound”, or audio attached to it, and each video recorded was the same roughly 15-second length. Once everything was recorded, it was time to upload.

A video and a photo was uploaded every other day. A photo of a bush, for example, would be uploaded to Instagram first, then a video of the same bush would be uploaded to TikTok within 1 or 2 minutes. A day would pass where nothing was uploaded, and the next day would consist of a post on both platforms once again. The original idea was for an entire week to pass by before posting another set of photos and videos, but there simply was not enough time for the posts to be spaced out as planned. The posting would happen from 4:30 p.m. to 5:30 p.m. to ensure time would not factor into the algorithm and why it sent out the posts to more or fewer people. The posts were not always posted at the exact same time, however, at some points due to human error and others so the accounts did not seem as

if they were fake or robots. The time itself was not chosen for a specific reason, only to retain consistency. This continued until all content was posted to their respective platforms.

Before data was collected, a week had been waited before any analytics were viewed. This was to ensure that the post had run its course in the algorithm and was no longer being sent out to users. Even if the post was still going out to people, it would provide an equal timestamp that each post was analyzed from, so no post had a better chance than another at being sent out to more users. Once a week had passed since a post had been made, the analytics of the post were reviewed. The posts stayed up, but no new information was listed or included in the data collection if the posts got any more attention. As previously stated, both accounts allowed an in-depth view of how the post performed, which includes new individuals that viewed the post. This particular statistic would prove to be very important to this research and deciding which algorithm performed better. The data collection phase continued until all posts had been analyzed and recorded.

With all the data collected, the analyzing process was very simple. Each post showed how many individual accounts saw each post. It is important not to mix this number up with how many views a post got, because the view count shows how many times a post has been seen in general, and it is very likely that someone may have looked at the same post more than once. By comparing the number of individual views between each corresponding TikTok and Instagram post, it can be concluded which algorithm did better with sending posts out to other users.

Of course, every experiment comes with flaws. The process taken to conduct the research was not perfect in the slightest. A number of factors were ignored, such as the number of active users each app has and how many views each tag used on each post has. If paid attention to, these factors could have possibly allowed more accurate or different results and possibly even required an entirely different method of approach. There was also a problem that occurred during the research portion. When uploading one of many videos to TikTok, the audio that was meant to be added to keep it similar to the other videos did not get added. As a result, the statistics from that video and its corresponding Instagram post could not be added to the final pool of data. The possibility of the video doing better or worse than the other videos because of that factor was too big of a risk to take, the amount of bias in this research was meant to be as minimal as possible. Luckily, there were 18 other photos and videos with usable data, so the experiment and data analysis could continue. There also may have been benefits from creating and posting more videos for a larger supply of data. While it is entirely possible, the 18 posts the researcher created are more than enough to answer the question and prove a point well. While there were quite a few limitations to the research process, they did not have an overall impact on the final results, which are still accurate.

With no other research being done on comparing different forms of social media algorithms, this research is a good beginning point to get a conversation started. While simple, the direct comparison of individual viewers is an effective way to see which platform sends out content to more people. While there are a couple of drawbacks and issues, the research conducted is a good introduction to the idea of comparing and therefore using social media to benefit all kinds of different people.

Results

The purpose of the results of this research is to find if the Instagram algorithm or the TikTok algorithm does better at sending out specifically nature-related posts. To do this, what had to be done was to figure out what parts of the analytics were important to answering the question at hand, and what parts were additional and unneeded information. To find the most accurate results, unnecessary factors of the analyzation process had to be excluded. Information such as where a user that saw the posted content was from or how many followers an account gained after a post was viewed were not included in the final results. The factors that were included and focused on were the individual views and total views each post got. These elements are necessary in showing how well the algorithm did in sending content out to different users.

Table 1 provides both the individual views and total views nine of the ten Instagram posts received. This table shows the individual views and total views of each Instagram post side by side for direct comparison. The seventh

post was excluded from the data analysis process. Each post was analyzed exactly one week after being posted and was put in a chart so the analytics of that post were not checked again. Out of the nine Instagram posts reviewed, the highest number of individual views a post got was 6. There were two posts that matched with 6 individual views, which were the first two. The lowest number of individual views a post got was 1. There were also two posts that only received one individual view, which were posts 4 and 9.

Table 1

Instagram Analytics		
	Individual Views	Total Views
Photo 1	6	6
Photo 2	6	6
Photo 3	2	2
Photo 4	1	1
Photo 5	3	3
Photo 6	3	3
Photo 8	2	2
Photo 9	1	1
Photo 10	2	2

Table 2 provides the individual and total views for nine of the videos posted on TikTok, excluding the seventh one. This table also contains the individual and total views each TikTok post got side by side for convenience. The highest number of individual views a TikTok got was 310, with a total number of views of 322. The lowest number of individual views a video got was 134, with a total number of views of 145. No posts received the same amount of individual or total views, unlike the Instagram posts, which had that happen with every single post.

Table 2

TikTok Analytics		
	Individual Views	Total Views
Video 1	310	322
Video 2	298	307

Video 3	148	154
Video 4	149	156
Video 5	166	178
Video 6	150	157
Video 8	148	162
Video 9	134	145
Video 10	148	151

The videos on TikTok gained at least 130 more individual views than its corresponding Instagram photos on every post. The peak of this difference was with the first corresponding video and photo, with the TikTok post having over 300 more individual views than the Instagram post. The TikTok post had 310 individual views and the Instagram post only had 6.

The total views the TikTok posts received were higher than the total views the Instagram posts received compared to the individual views. The ratio for the individual views to total views for the Instagram posts was 1:1, with there being no difference between the two for each post. For both the Instagram and TikTok analytics however, there was no large difference between the individual views and the total views. While the videos on TikTok got more total views than individual views while Instagram did not, the total views for TikTok never exceeded 14.

Discussion

The difference between the number of individual views the TikTok and Instagram posts received were drastic and very surprising. Posts made on Instagram received views remained within one digit, never breaking 10. On the other hand, posts made on TikTok gained views in the hundreds, with the highest number of views breaking 300. Such a large difference between the views of the posts on the two platforms shows that the TikTok algorithm is superior to the Instagram algorithm in sending content out to its users.

To reiterate, the hypothesis for this research was that the TikTok algorithm would do better than the Instagram algorithm. This hypothesis proved to be correct, with the large difference in individual views between the posts on the platforms confirming it. The results of this research imply that there are a couple of different reasons on why the TikTok algorithm may have done better than the Instagram algorithm, but arguably the biggest reason is replay value. The Instagram posts had the same amount of individual views as they did total views. No user looked at the same post twice. It would be quite strange for an Instagram user to look at the same post twice, since once an Instagram user would look at one post with a nice photo or two, they would just scroll past the post and forget about it. It was a different story with TikTok, however. The TikTok videos received more total views than individual views every time. On TikTok, it is very easy for a user to rewatch a video, since the video automatically replays after it ends, adding another view to the video's total view count. The replay of the videos could have been an indication to the algorithm that people liked the content and therefore pushed it to more like-minded users.

These results imply that the algorithms of video-based platforms do better than the algorithms of photo based algorithms, especially with TikTok. With TikTok's "For You" page, its endless scroll of videos (Guinaudeau et al. 9) being the first thing that comes up when the app is opened, TikTok users are more likely to see new content more often than Instagram users. The Instagram "explore page" is a page that users can open, but it is not the first page that appears when the app opens. A different page appears, showing the user posts from accounts they follow rather than

posts directly from new users or users they have never seen content from. This could be another reason that the TikTok algorithm did better than the Instagram algorithm; because of the higher exposure to new content TikTok provides to its users compared to Instagram. TikTok users had a higher chance of seeing the content posted for this research compared to Instagram users.

Some suggestions for improving this particular research would be to pay more attention to smaller details that were not focused on in this research already. If focused on more, these details could provide even better results. As an example, focusing on TikTok and Instagram's user base, seeing how many people use each platform daily, could have been a possible reason for the results to have come out the way they did. Also looking at the views each tag has on its respective platform and seeing its relevance to what is being posted would be another good thing to pay more attention to.

This research is a good first step for further research on this topic. With the lack of algorithm comparisons from other researchers in the field and researchers in general, there is a plethora of ways research of this topic can be taken. Different social media platforms could be compared for example. The algorithms of two different video-based platforms such as TikTok and Youtube could be compared, seeing as video-based platforms have already been shown to have superior algorithms. A comparison of two photo-based platforms could also be made, like Instagram and Twitter. These new comparisons do not have to include the social media platforms that were used in this research, however. They could be separate platforms entirely, there are no limitations to these comparisons. Another possibility is comparing other algorithms entirely. Social media platforms are only the beginning for algorithm uses on the internet. A different comparison that could be made could be search engine algorithms, maybe comparing the algorithm of Google Chrome to the algorithms Firefox or Bing.

Ultimately, this research and its results reveal that the TikTok algorithm has a better algorithm than Instagram for sending out nature-related posts. The hundreds of views that TikTok achieved over the few Instagram did are a clear indication that the TikTok algorithm pushes out content more effectively than the Instagram algorithm does. While it is entirely possible that Instagram may do better at pushing out other content to users, such as art or photos of people, the massive difference in views makes that prospect seem extremely unlikely. With this newfound information, the general public can now understand a bit of how algorithms work and use them to their advantage. Small businesses, for example, can utilize the fact that TikTok has a superior algorithm to Instagram, and post promotions for their business using a free pro account and save money on ad space. These results also allow the everyday person to understand algorithms better, and see how they are applied to some of their favorite things, like social media. This research may even get a social media addicted teen or out-of-touch influencer interested in technology. These algorithms that social media platforms utilize are made to be engaging and addicting; they want users to stay on their apps as long as possible. With the results of this research, it seems that TikTok does this job, and does it well.

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