# *How Do Network Effects Influence Users on Social Media Platforms Like TikTok?*

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*Abstract.* The short video business has started to grow due to the rapid development of the Internet in the modern world. The primary goal of this research is to examine how network interests influence user behaviour on platforms like TikTok. We carried out this kind of research since most studies on the Internet have concentrated on the overall consequences of network effects on the platform rather than the particular behavioural effects they have on individuals. The data presented in this paper indicates that as more people sign up for TikTok, more works will be posted there, leading to a significant increase in user communication and platform consumption. The literature review method is used in this study first, and two analysis techniques are then used to examine the history of network effects on platform expansion. Using descriptive data analysis as the first method, we will assess network effects that impact customer acquisition and retention through empirical means. Secondly, we employed predictive analytics to create a time series model, find specific changes in platform data over time, and ensure the prediction model accounts for various scenarios and clientele. In the end, we discovered that network advantages greatly impacted how users behave on the platform. Platforms can become more competitive by better-developing user acquisition and retention strategies and knowing how network effects impact user growth.

*Keywords:* Network Effects, Social Media Platforms, TikTok, User Behavior, Perceived Risk

## 1. Introduction

The short video industry has been growing along with the Rapid expansion of the Internet in today's world. Using China as an example, the China Internet Network Information Centre (CNNIC) published the 52nd Statistical Report on the Development of the Internet in China, which states that as of June 2023, there were 1.079 billion netizens in China and a 76.4% Internet penetration rate. In China, there were 1.026 billion consumers of short videos, with a 95.2% user utilisation rate. In addition, the China Internet Network Information Center (CNNIC) published the 54th Statistical Report on the Development of the Internet in China, which states that as of June 2024, there were

nearly 1.1 billion (1.09967 million) Internet users in China, up 7.42 million from December 2023, and that the country's Internet penetration rate was 78.0%. Throughout the first half of the year, China's Internet sector proliferated. The Internet's fundamental resources provided a solid basis for growth, domestic demand was stimulated by digital consumption, the vitality of innovation was unleashed by digital applications, and more people gained access to the Internet, spreading the benefits and conveniences of the digital age. The phrase "no video, no network" describes how Internet users and users of short videos have practically become synonymous. With so many celebrities on the Internet, TikTok has progressively emerged as the industry leader in short video software. Users of TikTok can submit movies and photos and record videos for 15 seconds to one minute, three minutes, or longer. In contrast to video websites that select their material through menus, TikTok leverages algorithms to understand user behaviour and recommend content to users automatically. After checking in and selecting their preferred settings, users can still look for exciting and relevant video and music channels. You can make money by sharing your life with others. Network benefits are essential to the ongoing evolution of platforms such as TikTok; that is, the platform's value increases with the growth of its user base. The impact of network advantages on platforms has been the focus of much of the writing on network benefits on the Internet. As a result, this research will focus on network advantages and a deeper analysis of the relationship between network benefits and user activity. Such limited research directions and topics are desperately needed in today's world. This adds to the significance of our content.

The primary focus of this article is to examine the impact of network benefits on user behaviour on platforms like TikTok. We mostly use the literature review method for a more thorough and accurate investigation. To effectively support our theoretical framework during this process, we study the literature regarding the advantages of networks on the Internet. Finding information in these already published works and summarising it takes more work. From this, we may deduce that network advantages significantly impact how users behave on the platform. For instance, as more real users sign up for TikTok, more creative works will be posted there due to emerging network benefits. This will encourage user communication and increase consumption on the TikTok platform. To create a positive feedback loop, the social network among network users will grow, leading to an increase in users and the consumption of goods and works.

We conduct this type of research since most studies on the Internet concentrate on how network effects affect the platform as a whole rather than how they specifically influence the behaviours of platform users. We can close the current research gap and the gap caused by the current research limitations.

Additionally, it can be used to compile more valuable and applicable theoretical information for future platforms operating on networks. The paper is organised into four sections: the introduction, the literature review, the methodology, and the conclusion. The first section is written first.

## 2. Literature review

The proliferation of social media platforms such as TikTok has had a significant impact on the behaviour of users on these platforms. The behaviour of viewers of short videos, the theoretical and practical consequences of network effects on these platforms, and the impact of perceived risk on user interaction and content creation are all examined in this literature review. Platforms like TikTok have become extremely popular and successful due mainly to network effects. Garcia-Swartz et al. claim that platforms serve as middlemen who encourage user interactions and generate profit from those interactions [1]. Network effects are the idea that a platform's value grows as more people utilise it [2]. TikTok's ascent to prominence as a worldwide social media platform proves that this

impact may propel a platform's quick expansion and market dominance. In this section, I can thoroughly understand network effects thanks to Parker et al.'s research. For instance, as the platform's user base grows, so does the online product platform's value. This allows us to investigate further how TikTok advances the platform's development and reaps additional benefits while growing its user base.

The platform also fosters creativity by providing the opportunity to introduce new goods and raise the calibre of services. Zsolt Katona etal. state that the platform facilitates experimentation and iteration, accelerating platform development [3]. In addition to enabling TikTok to develop, this capacity will add new features and increase the platform's user base. Both global and microelements influence user behaviour on short video sites like TikTok. According to Wang , multidisciplinary informatics studies can offer a more profound comprehension of user interaction and communication on these platforms [4]. The study demonstrates the particular elements and internal behaviours that users employ to extract and choose information from brief movies when seen from a micro perspective.

Furthermore, new study approaches that concentrate on comprehending the rules governing these behaviours have emerged due to the interaction between platform content and user behaviour [4]). In order to fully capture the intricacy of user behaviour within the confines of a brief movie, this study emphasises the necessity of a multi-perspective strategy that integrates qualitative and quantitative methodologies. While Wang offered theoretical backing for our examination of TikTok user behaviour, it lacked more empirical evidence [4].

One of the main things influencing user behaviour on social media platforms is perceived risk. In the 1960s, Bauer coined the term "perceived risk" to describe the unpredictability and possible discomfort in making decisions [4]. Users of platforms with short videos perceive hazards to their privacy and information security. Users' cognitive risk on the platform will rise with frequent information security incidents, making them less likely to divulge personal information [5]. This perceived risk is especially significant in the experience economy, where user experience is a primary source of value. More and more people are producing and sharing content as the obstacles to doing so are being removed, but this also raises the risks they may encounter [5]. For instance, the emergence of Chinese influencers in rural areas demonstrates the possibilities and hazards of short video marketing, wherein the perceived risks of content sharing are balanced against the financial returns [6].

In order to grow its user base and boost its market share, Tiktok leverages network effects. The platform's value rises as more and more users produce short videos; this phenomenon, known as the "network effect," feeds a self-reinforcing cycle of invention and expansion. However, there are drawbacks, like user reliance and rivalry in the market. According to Zsolt Katona et al., platform lock-in lessens innovation and competition, which causes market stagnation [3]. Furthermore, platforms must tackle ethical and regulatory issues regarding user protection and data privacy [7]. The long-term viability of platforms like TikTok, which significantly depends on the overall number of users and the online content they produce, depends on striking a balance between innovation and appropriate regulation.

The significant influence of network effects on the development and innovation of social media platforms like TikTok is the main topic of this section. It also draws attention to the intricate interactions between platform dynamics, perceived danger, and user behaviour. These links should be further investigated in future studies, particularly as they relate to the impact of changing platform tactics on user behaviour and market results. To fully capture the extent of these processes, a multi-perspective research approach combining qualitative and quantitative methodologies is

necessary. Our research on user behaviours on TikTok is theoretically supported by this literature, which uses quantitative analysis to explain various user behaviours on network platforms.

Platforms on the Web can frequently grow by adding more users. This is the situation with TikTok; as more video content is added to the network platform and as the caliber of the videos improves, Tiktok can draw in more potential viewers and so create a cycle of growth that will only get stronger as it moves forward. On TikTok, sharing or recommending personal networks can exponentially increase the impact of network effects. These we-media platforms become interconnected due to user interaction, which reinforces TikTok's dominant position in the social media market. In particular, the authors discovered that users' location and a few demographic factors from throughout the network were reliable indicators of adoption. In a similar vein, the average demographics and global network position of adopted individuals also predict their influence over their neighbors. The conclusion that an individual's average influence decreases with an increase in total connections is an intriguing contradictory one. These findings have applications in viral marketing as more and more tech platforms try to take advantage of the connectivity patterns that their users disclose. Predicting the upcoming wave of adopters is an area where the model excels [3].

Simultaneously, an indirect network effect is another type that causes products' values to rise in tandem with the number of complementary products, significantly impacting the network platform. In TikTok's case, as more and more makers of short videos sign up and post their creations, the platform's user base grows, which draws in more sponsors to run advertisements. As a result of this interaction, more high-quality work is produced, creating a positive feedback loop. When companies and marketers join the online platform, users automatically have access to a wealth of creative opportunities, which significantly raises user engagement. Marketers are primarily interested in indirect network effects since they impact new product software availability and the expansion and success of hardware sales [8].

## 3. Methodology / analytical framework

This study used two analytical methods to analyze the history of network effects on platform growth. The first is data descriptive analysis, which compares platform data from different periods, explicitly differentiating between the periods before and after active network effects. We aim to empirically measure network effects that affect customer acquisition and retention. Therefore, the focus is on carefully distinguishing the factors that influence customer inflow or outflow. This difference is crucial because same-side network effects tend to be harmful due to user competition, while horizontal effects tend to be positive. In previous research, horizontal network effects, such as increased sellers, have positively affected buyer acquisition. By reviewing these changes, we can better understand how network effects contribute to growth. Finally, we will also use predictive analytics to predict the platform's future growth patterns. Considering factors such as competition between buyers and sellers and external influences such as changes in market regulations, we will improve the accuracy of future forecasts and simulate various scenarios of network effects by processing historical data of the platform over different periods. So, this article will explain several different market models.

## 3.1. Descriptive analysis

In this process, we mainly focus on analyzing the literature on different platforms, especially the data before and after the emergence of network effects, so that we will be able to observe the critical

role of network effects on platforms, that is, to reveal the positive impact of network effects on platform user growth and engagement over different periods. The data analysis includes metrics such as user growth rate, engagement, platform revenue, and retention.

In the early stage of the development of the short video platform, although users have begun to participate in the platform, due to the lack of a mature algorithm recommendation system and low user stickiness, the content dissemination scope of the platform is relatively limited, and the interaction between users is less [4]. Currently, the platform's content producers mainly rely on users' active search and sharing to disseminate content [9]. As the number of platform users increases, especially when the number of platform users reaches a critical point, the network effect begins to show. At this point, the platform significantly improves the ability to push content accurately through the optimized, personalized recommendation algorithm. The frequency of interaction between users increases, the social nature of the platform gradually increases, and the activity of user-generated content (UGC) also increases [5].

The data show that with the enhancement of the network effect, users' average daily use time increases significantly. There is an inverted U-shaped relationship between users' continuous use intention and the platform's personalized recommendation algorithm; when the degree of personalization is too high, the user's use intention may decline, and the reverse will help improve user retention [10]. The transversal network effect can explain them, and the same side network effect is very noticeable. Cross-border network effects show that an increase in the number of sellers can attract more buyers, and an increase in the number of buyers will prompt more sellers to join the platform [11]. For example, China's TikTok platform is spending vast sums of money to attract creators from other platforms to move in. There is no doubt that the transfer of these content creators will lead to the arrival of old customer groups on the old platforms and the birth of new fan groups on the new platforms. In the long run, when the user group gradually rises to a height that must be addressed, bloggers who were initially unwilling to transfer to the platform will also be tempted. Therefore, this effect has a significant effect on user market appeal. In contrast, the intersection of new and old users means that competition between the platform's user base, known as the same side network effect, can also negatively affect the activity and retention of existing users in some cases.

Moreover, one significant change brought about by network effects is the continuous optimization of platform algorithms. Due to the increase in user behaviour data, the recommendation system can analyze user preferences more accurately and provide more personalized recommendation content. The optimization of the recommendation algorithm enables users to find the content they are interested in faster and more accurately on the platform, thus improving the platform's user engagement and retention rate. This optimization improves the user experience and drives more users to stay active. The recommendation system achieves a self-reinforcing effect by constantly iterating through a large amount of user data; the more users there are, the brighter the system is, and the more recommended content can meet users' needs [9].

Overall, generating network effects changes user behaviour patterns and promotes the rapid development of platform data and content ecology. The platform data after the network effect show that the optimized recommendation algorithm and the improved user interaction frequency are the crucial factors driving the continuous use of users.

### 3.2. Predictive analysis

The key to this step is constructing the time series model; we must find the detailed changes in the platform data over time and ensure that the forecast model can cover different situations and specific customer groups. For example, in the process of separate analysis of user inflows and

outflows, to more accurately predict changes in user behaviour in certain situations, significantly when platform features are updated or the market environment is constantly changing, we must focus on historical changes in the number of buyers and sellers, and on this basis forecast user growth in the next few years.

Therefore, we set up multiple scenarios to ensure the accuracy of the prediction. These scenarios will cover different scenarios of high growth patterns, competitive market environments, and changing user needs, which also correspond to different development periods of a platform.

High development scenario: Assuming that the platform benefits from good functions, market growth or policy assistance into a period of rapid development, the popularity becomes more extensive, the platform begins to be welcomed by the market, so the network effect continues to strengthen in the next few years, especially the cross-border impact leads to a large influx of buyers and sellers. In this scenario, the platform continues rapidly expanding its user base and solidifying its market leadership position. User growth will primarily benefit from enhanced cross-edge network effects. An even multiplier effect causes the number of users to explode.

## 3.3. Increased competition scenario

•Assuming market growth is saturated, other competitive platforms are gradually born.
•Ontology functions are no longer welcomed.
•The negative effect of the same side network effect increases.
•The competitive pressure between user groups becomes more significant, resulting in the loss of existing users.

Especially in the case of fierce competition among similar sellers, the market diversity of the platform will decrease, and the user growth will slow down or even decline.

Platform improvement scenario: Suppose that the platform, to maintain good customer growth, adds new features or services based on accumulated experience (such as introducing new acquaintance contact measures or improving the probability of big data recommendation), which may have a significant impact on user acquisition and churn. By simulating the introduction of these features, user acquisition and retention can be promoted, especially in the case of features directly hitting user pain points, which is expected to push the platform into a state of long-term, steady growth. However, it is impossible to accurately predict their impact on the user behaviour of buyers and sellers because the effect on different customer groups under various market conditions is different.

## 4. Results

In other words, the net effect can increase the likelihood that users will stick around, attract more users, and boost platform income. This comparison is, proport, ionate. Specifically, using TikTok as an example, the platform will attract more potential we-media users due to the notable increase in the number of video makers on it, which will also result in a considerable improvement in the quality of the videos on the site. Thus, more users will be drawn to the platform due to the productive business engagement between users. With the network effect, the platform's revenue steadily rises, creating a positive feedback loop that benefits growth.

## 5. Limitation

This essay mainly focuses on reading literature, so more data must be collected to prove this. This limitation means that the conclusions of this paper are primarily based on the analysis and synthesis of existing literature, which may be biased and subjective. Although we tried our best to select representative and authoritative literature for analysis, due to the lack of empirical data support, the conclusions of this paper may only be fully applicable to some situations. In addition, the research methods and data involved in the literature may be different from the actual problem, which may also affect the broad applicability of the conclusions of this paper. Therefore, future research should further validate and extend the findings of this paper through field investigation, experiment or large-scale data analysis based on this paper to enhance its scientific and reliability.

## 6. Conclusion

In this article, we examine the impact of online interests on user behaviour on platforms like TikTok. We conducted a more thorough and accurate investigation mainly using a literature review method, that is, by carefully reading the literature on the advantages of networking on the Internet. Finding information in these published works and summarizing it takes more work. From this, we can infer that network advantages significantly affect user behaviour on the platform. This study further explores the specific impact of network effects on the number of platform users and enriches the existing theories on network effects. Although the importance of network effects in the platform economy is well known, this study reveals how they specifically affect the dynamic changes in the number of users by refining the mechanism of network effects. At the same time, it has a specific guiding significance for platform operators. By understanding how network effects affect user growth, platforms can develop user acquisition and retention strategies more effectively, thereby increasing competitiveness.

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