# Zero-To-One Innovation and Ecosystem Construction of Platform-Based Products: A Case Study of Tiktok

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**Abstract.** The rapid rise of the digital platform economy has changed the competitive landscape of the digital industry, and short video applications have become the main mode of social media interaction. TikTok is a typical example, achieving unprecedented growth in a short period of time. This article discusses TikTok's innovation path from zero to one, and how this innovation promotes the development of its ecosystem. Analysis shows that TikTok's growth can be attributed to algorithm-driven personalization, accurate early market positioning and effective cold start strategy. Its strategy focuses on the global market, which is characterized by local content adaptation and strategic partnership, so that international expansion can be achieved quickly. Ecosystem analysis further shows that the combination of creator motivation and integrated e-commerce functions enhances the network effect and maintains the vitality of the platform. This article draws on more than 20 academic papers. Taking TikTok as an example, it explains the innovation trajectory and ecosystem construction mechanism of platform-based products, and emphasizes its role as an example of digital platform growth and change.

**Keywords:** TikTok, digital platforms, zero-to-one innovation, cold start mechanism, ecosystem governance.

## 1. Introduction

The digital platform economy has grown massively, defining a new global industry, expanding value parameters and exchange characteristics. TikTok is one of these platforms, since it represents the highest global growth in the history of short videos and the greatest disruption of the market [1]. This development trajectory raises some important questions: How can a platform achieve the transformation from zero to one in such a short time? What mechanisms enable it to overcome the cold start problem, build a sustainable user base and promote ecosystem growth? Existing studies focus on TikTok's recommendation system, creator motivation and localization strategy [2], but most of the studies are still fragmented, usually focusing on algorithms, user behavior or culture in isolation. Systematic analysis is still needed to link innovation theory, ecosystem construction and platform governance. Therefore, this study explores TikTok's innovation path and ecosystem development through case analysis. Theoretically speaking, it extends the innovative perspective to the context of digital platforms and emphasizes the recursive relationship between cold-start mechanisms and ecosystem governance. From a practical point of view, this article provides entrepreneurs, managers and decision-makers with lessons learned to reduce barriers to entry into the platform economy, coordinate incentives and maintain their growth. This article is organized as follows: Section 2 reviews relevant literature, Section 3 analyzes TikTok's innovation trajectory, Section 4 summarizes its limitations, Section 5 summarizes the research results and looks forward to the future research direction.

## 2. Literature Review

### 2.1. Digital Platforms

Digital platforms have three basic features: they use technology as a medium to support the interaction between user groups and allow these user groups to perform given tasks [3,4].

The digital revolution is evolving, and its achievements include computers, the Internet and billions of mobile devices and sensors around the world. Together, these digital achievements have given rise to a ubiquitous technology society, and continuous data collection provides unprecedented possibilities [4]. Therefore, digital platform products can become the focus of economic research. Unlike traditional linear business models, platformization can be understood as a dynamic phenomenon that unfolds globally. Digital platforms are promoting the evolution of the digital economy and mixed reality [5]. The core feature of the digital platform is the network effect, that is, the externality of the network, which reflects the interaction between the two parties in the market: as the number of participants on one side increases, the value obtained by the other party will also increase accordingly [6]. Social challenges are essentially open and cross-border. They are continuous and uncertain, usually involving value judgment and subjective evaluation [7]. Therefore, digital platforms often fall into the "chicken and egg" paradox in the early stage of development: the effective operation of the platform requires the two-way participation of complementary parties and consumers, but due to the insufficient number of users on one side, the other party is usually reluctant to enter, resulting in cold start-up difficulties [6]. The platform economy represents the fundamental reorganization of economic activities, and digital platforms are increasingly involved in the creation, capture and distribution of value. As Kenny and Zisman said, platforms are becoming the core of today's digital economy, profoundly reshaping work, markets and social interactions, just like factories did during the Industrial Revolution [8].

### 2.2. The concept of innovation

In order to answer the question of what is zero-to-one innovation, it is necessary to first clarify the meaning of innovation and pay attention to its evolving nature. Schumpet emphasized "creative destruction" and described innovation as a fundamental change that breaks the existing balance through new products, new production methods, new markets or organizational restructuring [9]. In contrast, Kirzner believes that innovation is usually gradual and achieved through cumulative adjustments, which gradually bring the market to balance [10]. In addition, Christensen recently proposed the concept of "subversive innovation", which explains how low-cost entrants ultimately meet mainstream needs and replace existing companies. Once disruptive products reach the minimum threshold expected by consumers, price competition will accelerate their market expansion, often leading to the decline of existing companies [2,11]. We analyze that incremental innovation reflects cumulative improvement, while radical innovation describes the disruptive transformation of the existing structure. The concept of "from zero to one" emphasizes the creation of a new value logic. Unlike expanding existing content, zero-to-one innovation emphasizes breakthrough progress, which can open up new markets or change user participation in an unprecedented way [12]. This view is especially important for digital platforms: TikTok is not the first short video service, but by introducing algorithm-driven immersive models, it avoids the cold start challenges often faced by digital platforms, fundamentally subverts the industry, and achieves a leap from zero to one. This review will take incremental innovation and radical innovation as the framework, and analyze why TikTok can avoid cold start and subvert traditional short video companies based on Thiel's "from zero to one" concept.

### 2.3. Governance and Incentive Structures in Platform Ecosystems

Digital platforms should not be simply understood as markets, but as social technology ecosystems in which users, content providers, advertisers and platform operators constantly interact [10]. Effective ecosystem governance involves establishing rules of participation, designing incentives and coordinating value-sharing mechanisms to balance the interests of multiple stakeholders [11]. Without governance, the platform may collapse due to free riding, speculative behavior or content quality decline.

Scholars emphasized the importance of the triangular relationship between users, creators and the platform itself. Users consume and participate in content. Creators provide and adjust content according to algorithmic signals, and the platform coordinates these exchanges through recommendation systems and monetization models [12]. This triangular relationship is particularly important in the culture and entertainment industry, because their continuous growth depends on the continuous cycle of user participation, content creation and platform governance. Therefore, the platform ecosystem should be conceptualized as a constantly evolving structure, and its stability depends on the coordination of adaptive governance and incentive mechanisms [10].

### 2.4. Cold Start Mechanisms

One of the main challenges facing emerging platforms is the cold start problem, also known as the "chicken and egg" dilemma. The platform requires consumers and complements to create value together, but neither side is willing to participate in the absence of the other party [2]. This reflects the inherent interdependence of multi-sided platforms, and their survival depends on the simultaneous achievement of critical mass in multiple aspects [9].

The study puts forward several strategies to overcome cold start-up. Platforms usually provide subsidies or incentives to one side of the market, use cross-side network effects to accelerate adoption, and design technical features to reduce entry barriers [2]. For example, algorithmic recommendation systems can reduce dependence on existing social networks by creating value for new users immediately, while creator incentive programs can attract early contributors. These mechanisms help to generate the initial momentum needed to establish a positive feedback loop between user participation and content creation, and ultimately achieve sustainable platform growth [11].

## 3. Findings / Analysis

### 3.1. TikTok's Strategies for Overcoming the Cold Start Problem

#### 3.1.1 Algorithmic Personalization of Users

The difference between TikTok and early short video platforms is that it minimizes dependence on existing social networks. The platform's recommendation algorithm no longer requires users to establish a friend list or follow creators. On the contrary, from the moment each new user registers, it carefully plans personalized content push notifications for them [2]. This greatly reduces the entry threshold for users, because users can experience the value of the platform without establishing a connection in advance. By analyzing micro-interactions (such as viewing time, likes, sharing and replays), the algorithm continuously optimizes user preferences and pushes highly relevant content [9]. In this way, TikTok reduces initial friction and provides instant satisfaction, which is crucial to attracting and retaining new users.

#### 3.1.2 Incentives and Tools for Creators

In terms of supply, TikTok solves the cold start problem by making content creation accessible and rewarding. The platform provides creators with convenient editing tools, music libraries and filters, lowering the technical threshold of video production [1]. Even amateur users can easily create beautiful videos, which encourages users to try new things and expand their participation. More importantly, TikTok's algorithm rewards early creators by promoting their content to audiences outside the fan base. This design provides an opportunity for relatively unknown creators to "go popular". Unlike YouTube or Instagram, the historical exposure of YouTube or Instagram has always been concentrated on well-known influencers [11]. By lowering the entry threshold and providing fair exposure, TikTok has stimulated large-scale content creation to ensure the stable flow of content to its ecosystem.

#### 3.1.3 Feedback Loop and Critical Mass

The algorithm provides users with personalization and motivation for creators to form a self-reinforcing feedback loop. As more and more creators upload videos, TikTok has accumulated richer data sets, which improves the accuracy of its recommendations. The proposed improvement improves user participation, which in turn provides a stronger incentive for creators to produce high-quality content. This cyclical process enables the platform to quickly reach critical quality, and both sides of the market - users and creators - actively participate and continue to grow [2]. In this sense, TikTok shows how digital platforms can turn cold-start dilemmas into growth engines by embedding personalization and participation into complementary dynamics [12].

## 3.2. Building Sustainable Growth through Ecosystem Governance Since 2018

### 3.2.1 User Governance and Engagement

For the users TikTok is significantly reliant on algorithm governance to protect the quality and relevance of content. The recommendation system of TikTok actively eliminates spam and low-value content, and actively shows users videos that are fitting to the interests of the user, which enables the platform to keep users highly engaged [10]. TikTok has brought a continuous supply of entertainment and user-centric content, which is a great way to build user loyalty and reduce user churn. The governance mechanism also effectively prevents free riding, and opportunistic behaviors which can often plague open digital platforms [11]. TikTok has demonstrated the sustainability of the ecosystem starts with gaining users' trust through a seamless algorithm review and experience.

### 3.2.2 Incentives and Opportunities for Creators

As far as motivating creators goes, TikTok has created a strong incentive mechanism, not only for increased visibility. There are creator funds, different ways to share income, and monetizing through live videos, all of which provide real financial returns [11]. At the same time, the algorithm amplification effect enables creators without a fixed fan base to reach a wider audience, thus democratizing the potential for exposure and success. This is in stark contrast to YouTube and other platforms. The algorithms of YouTube and other platforms have always been inclined to mature channels [1]. By reducing entry barriers and providing tangible economic incentives, TikTok has cultivated a diverse and active community of creators to ensure a stable supply of high-quality content in the platform ecosystem.

### 3.2.3 Commercial Integration and Advertiser Value

For advertisers and business partners, TikTok has established a comprehensive marketing infrastructure that organically combines commercial interests with cultural content. Through data-driven positioning and seamless integration of brand content, advertisers can connect with highly participating audiences by organically integrating with the platform experience [10]. This not only creates a sustainable source of income for TikTok, but also strengthens its ecosystem by combining cultural creation with economic incentives. The result is a balanced system. Users can enjoy relevant content, creators get monetization opportunities, and advertisers get valuable audiences. By coordinating this triple relationship, TikTok has evolved from a social media application to a global platform economic participant [12].

## 3.3. From Global Diffusion to Local Adaptation: TikTok’s Expansion Strategies

After overcoming the challenge of early cold start from 2016 to 2018, TikTok entered a new stage: global expansion. Unlike the early focus on achieving critical quality, the main challenge after 2018 is how to adapt to different cultural, economic and regulatory environments while expanding internationally [2]. This dual strategy - combining global communication with local adaptation - has become the key to the rapid rise of TikTok as a global platform.

On a global level, TikTok relies on a consolidated technology infrastructure and algorithmic recommendation engine. This promotes scalability, efficiency, and cross-market consistency; currently, TikTok handles billions of interactions each day and, as the infrastructure grows, the platform is able to enhance personalized services, at scale [10]. The integration of technical infrastructure enables TikTok to quickly replicate its models in different fields without losing most of its organizations.

At the same time, TikTok strictly pursues local localization. The platform actively localizes and promotes content, trends and community norms (preferred local cultural interests). For example, dance challenges and pop music are prominent in Southeast Asia, while comedy sketches and meme culture are flourishing in the Western market [11]. TikTok is also actively adapting to regulatory and political culture, complying with content audit requirements, and investing in local offices and local employees to establish its legitimacy in sensitive local situations [12]. The key is the combination of global unification and local adaptation, which is different from the key of competitors such as YouTube and Instagram, which are slowly pursuing the integration of cultural customs.

Therefore, the global-local strategy represents the second stage of TikTok's growth trajectory: from overcoming cold start through algorithmic personalization and creator motivation, to consolidating its position as a leading platform for the digital economy through local and global expansion [1].

### 3.4. Summary of Research Findings

Our results show that the growth trajectory of TikTok can be explained by two interrelated dimensions. First of all, TikTok's entrepreneurial strategy effectively alleviates the cold start problem through the combination of algorithmic personalization and creator-friendly functions. Secondly, ecosystem governance tools determine long-term sustainability, which combine the interests of users, creators and advertisers with the balance of content quality and platform credibility. Finally, TikTok formulated a global localization strategy and finally positioned it as an adaptive product in many cultural contexts. These expressions of TikTok's trajectory show that this social video platform has achieved rapid growth, but it has also fundamentally reproduced the field of short videos as an example of zero-to-one innovation.

### 3.5. Implications for Other Digital Platforms

The case of TikTok reflects the more important understanding of digital platforms in the platform economy [8]. First of all, in order to solve the cold start problem, personalized recommendations must be combined with short-term creator incentives to reduce entry barriers and provide instant value to users.

Second, long-term sustainability depends on the governance of the ecosystem. The platform requires all stakeholders to have transparent rules, quality standards and fair value distribution; otherwise, the ecosystem is vulnerable to free riding and opportunism [6].

Finally, with the development of TikTok, we have seen a delicate balance between maintaining global infrastructure and local response needs. The new platform will need to use the core technology of the scalable global market, and it can customize the cultural norms and regulatory responses of the market.

## 4. Future Prospects and Development Assessment

Looking to the future, TikTok's growth trajectory will depend on the proper management of balanced behaviors involving regulation, ecosystem and technology. From a regulatory point of view, more and more censorship is entering the game, especially in areas such as the United States or the European Union, which indicates that more data governance policies and transparent content interpretation are needed [10]. This is not to say that if widely adopted by users, the use of these tools will not bring new ways of participation and income, but it may also cause social homogenization and user well-being problems that need to be solved [12]. Overall, TikTok's future will depend on finding a balance with global expansion and local positioning, innovation and ensuring proper regulation, as well as efficiency and sustainability.

## 5. Conclusion

This article studies the innovation path of TikTok as a case study of the transition of the digital platform economy from zero to one. This includes how TikTok manages cold start, builds a lasting ecosystem, and develops global growth through localization strategies. The results of this study show that algorithm-driven personalization, creator motivation and adaptive governance together explain the rapid growth and durability of the platform.

Future research can further determine the popularity of these findings by comparing them with platforms such as YouTube Shorts and Instagram Reels and other competitors across platforms. Facing challenges such as creator fatigue, regulatory review and change in user preferences, vertical research can evaluate the sustainable TikTok ecosystem. In addition, in terms of platforms playing an increasingly important role as cultural intermediaries and economic infrastructure, the research on short videos and e-commerce is worth further study.

In short, TikTok explains how digital platforms have evolved into global infrastructure through the coexistence of innovation, ecosystem development and adaptive governance, and provides theoretical importance and trade experience for the study of platform economy.

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