



# Research on the ByteDance's Approach to Develop TikTok

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**Abstract.** TikTok has become the hottest application around the world in recent years, and its revenue has surpassed YouTube in the App Store, becoming the highest revenue application in the video category [1]. This dissertation is to demonstrate its success through theories, models, and reasonings behind its success. The research question is how ByteDance cultivates TikTok and other applications through innovation. There are two questions needed to be answered. The first is why ByteDance is able to develop a large number of applications and the quality of the applications is also excellent. The second question is why TikTok become the core business line today and what happens to the first core business. To answer those questions, this dissertation applies the literature research method as the guiding principle to explore these questions. This method requires analogy and inference to explain the research question. The research conclusion is that ByteDance deploys an emergent strategy and bottom-up innovation model to develop a large number of quality applications in a short time. The rise of TikTok is due to combined factors of macro market trends and the creation of The Second Curve.

**Keywords:** Bottom-up Innovation · The Second Curve · Emergent Strategy · TikTok · ByteDance Applications

## 1 Introduction

ByteDance, the parenting company of TikTok, is to be valued at 400 billion USD in 2022, despite the recent negative publicity, such as the largest scale of layoffs [2]. The 400 billion valuations according to Hurun Press is even greater than Space X, valued at 100 billion USD [2]. The rapid success of ByteDance attracts the attention and alert of other technology companies in China, such as Tencent and Alibaba, both direct competitors. Therefore, it is imperative to understand the innovation factors that contribute to the success of the company. This dissertation explores how ByteDance incubates TikTok and other applications through innovation. There are some scholars and business leaders who have already done research on the subjects of its innovation strategies, but those papers are fragmented, each documentation only explains one or two points of its innovative success. For example, Professor Cui from Fudan University explains ByteDance's emergent strategy that leads to innovation in mobile application development. However,

it does mention how innovation as the catalyst to the emergent strategy that shortens the road to success. Furthermore, business leader, Li Shanyou, discusses the “bottom-up” innovation model that many technology firms apply through their business development, but he does not analyze the application of the model in the case of ByteDance [1]. In addition, some of the theory books that can explain the innovation process and logics of ByteDance were written before the establishment of the company, so there is no case study about the company in those books. Therefore, a combined research of applied theories and case analysis is essential for the field of innovation. This dissertation will explore the theories and models that founder uses as the foundation of thinking process to incubate TikTok and other mobile applications. The main study method is literature research, and the research materials include but not limited to books, dissertations, and speeches, which would help readers understand the ByteDance’ innovation model from different perspectives. The purpose of this dissertation is to provide readers with a clearer view of the success of TikTok and the company as a whole and to better understand the theories behind the scene.

## 2 Methodology

### 2.1 Theoretical Basis

There are four main theories related to innovation that are used to explain the rapid growth of ByteDance: The Second Curve by Charles Handy, Emergent Strategy by Henry Mintzberg, Theory of Biological Evolution (Darwinism) by Darwin, and Bottom-up Innovation.

#### 2.1.1 The Second Curve

The Second Curve, which is also the name of the book introduced by Charles Handy, is a chance to rectify the shortcomings of the previous curve (The First Curve) and to learn from that experience in order to build a better future, a “paradigm shift,” as described by Thomas Kuhn [3]. The Second Curve’s main takeaway is also that, in order to advance in many aspects of life, it is occasionally essential to alter drastically, pursue a new path that diverges from the one we are currently on, and demand a whole new perspective on the issues that companies confront.

The fundamental issue is that the shift must start whereas the first curve is still in play. This means that individuals who were in charge during the first curve must begin to think about the future differently or, more likely, assist others in advance in the new curve, which is difficult. As a philosopher, Handy discusses the issues and raises potential solutions rather than proposing fixes.

One example to further explain the theory can be Netflix. At an early age, Netflix is a company that offers DVD rental services, so the first curve is the DVD rental business. During the course of development, the founder, Reed Hastings, identified the future trend of entertainment, so he pivoted the company from DVD rental to on-demand streaming. Therefore, The Second Curve of Netflix is the on-demand streaming business. Today, Netflix becomes a content production company, and its second curve alters again as the content production business.

### 2.1.2 Emergent Strategy

The concept of Emergent Strategy first appears in the paper, *Of Strategies, Deliberate and Emergent*, and the author, Henry Mintzberg, points out the definition of Emergent Strategy is a business strategy that evolves over a period of time as a firm adapts and balances its outcomes with changing environment [4]. These tactics appear once a company does a series of tasks frequently to establish a pattern in its behaviours. The main difference between deliberate strategy and emergent strategy is that emergent strategy is unintended from the start [7]. An emergent strategy could be the natural consequence of a business establishing procedures to deal with shifting conditions. Instead of relying on a predetermined corporate strategy to drive its goals, businesses that embrace emergent strategy may harness the power of change.

Emergent strategies may be unpredictable, but they may provide businesses the chance to better serve customer requirements and adapt to changing circumstances. There are three unanticipated situations that may require emergent tactics [5]. The first is market changes, in which a corporation may develop emergent strategies as it attempts to adapt to unanticipated changes in its industry or market, such as an unanticipated rise in demand. The second situation is economic shifts. The third situation is when new concepts are developed within organizations. For example, in some circumstances, an employee's suggestion of a novel process might lead to an emerging strategy.

### 2.1.3 Darwinism

The important theories all come from the most important and fundamental subjects. Darwinism or Theory of Biological Evolution, can be regarded as a philosophy, is the foundation of the Bottom-up Innovation Model [6]. Charles Darwin, an English naturalist, developed the Darwinism or Theory of Biological Evolution, which holds that all lifeforms emerge and develop through the natural selection, and inherited variations improve the individual's capacity for competition, survival, and reproduction [8].

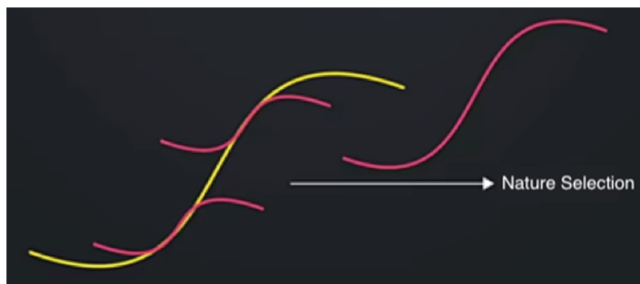
There are two main pillars in his theory which are natural selection and inherited variations. Natural selection and inherited/genetic variations can be explained through The Second Curve [7]. According to Fig. 1, the yellow curve represents the heredity, and the pink curves represent the variations. Figure 2 shows that natural selection would choose one of the variations and take it out as The Second Curve. This could explain why some of the fish developed feet and evolved into inland animals. It is also the same as companies selecting one of the most promising minor business lines and growing it to the main business. For instance, as Netflix provides as an on-demand streaming service, the CEO selected a minor business line, content product, as The Second Curve, and now it becomes the main business within the company.

### 2.1.4 Bottom-Up Innovation

Contrary to top-down innovation, which is driven by a compelling vision, frequently held by the company's founder, bottom-up innovation is powered by a number of ideas proposed by employees [6]. Bottom-up innovation leaders frequently possess these eight characteristics and are entrepreneurial, encouraged by management's emphasis on creativity and a can-do culture. The numerous ideas generated by employees are what



**Fig. 1.** Heredity and Variations



**Fig. 2.** Natural Selection

drive bottom-up innovation, as demonstrated by Google and the prototypical 3M Company. Entrepreneurs are its main proponents, while senior management has emphasised inventiveness and the growth of a can-do mentality.

## 2.2 Research Design

The main methodology of this dissertation is the literature research method. The first step is to explore and select the appropriate kinds of literature that are applicable to the research question and the general background information of the company studied to depict an overall situation of the external environment. The appropriate kinds of literature include but not limited to The Second Curve and Emergent Strategy. Furthermore, to better understand the theories from the literature, this dissertation introduces basic scientific subjects such as biology to help readers digest the theories from a friendlier perspective. For example, Darwinism, Theory of Biological Evolution is the scientific foundation for the Bottom-up Innovation model, Darwinism is also a philosophy that can be extracted as a mental model and used to create innovation. The second step is to apply the theories and frameworks to the company studied. The purpose of this step is to explain the cause and effect relationships through theories and frameworks, demonstrating logical reasoning. In this way, readers are able to understand how the decisions are made and what foundations they are based on. The third step is to review

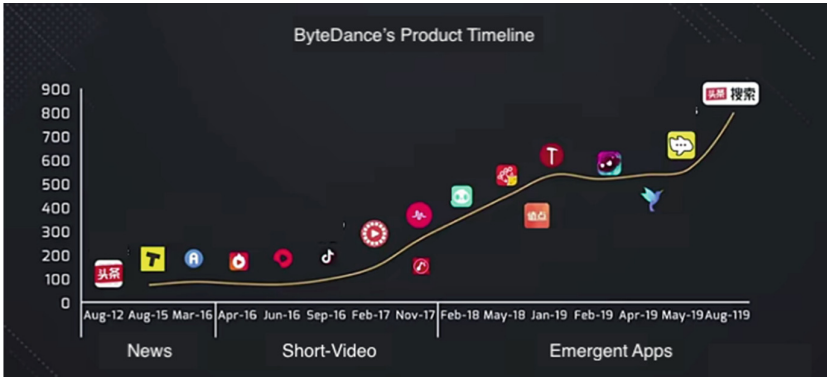


Fig. 3. ByteDance Product Timeline

the logical reasoning process to check whether any step is incorrect and make appreciate adjustment.

### 3 Analysis

In the last decade, Alibaba and Tencent were the dominant technology powers, but ByteDance is now China's fastest growing technology company. Figure 3 shows the timeline of ByteDance' product development, and some scholars argue that the products are too diverse, but the founder, Zhang Yiming, confirms that the reason the company developed so fast is that their products share the same growth engine so that they are focused.

#### 3.1 Why ByteDance Can Develop Many Quality Applications

The first major application of ByteDance is Toutiao, a news outlet mobile application considered by the general public. However, Zhang Yiming explains that the application is not a news application but a general information platform with a core growth engine of recommendation system. Figure 4 shows that the platform has three primary functions: to inspire creativity, engage the audience, and distribute information. However, product cannot work properly without the recommendation system. The first reason that the company can cultivate many successful applications in the market is due to its core growth engine, and most importantly, every new application shares the same growth engine. It means that when an existing user of ByteDance downloads a new appellation, the new application automatically syncs the information from the old one, so the user would receive accurate recommended content the first time opens the new application. The most crucial benefits are enhancing customer experience and increasing retention rate. This is the first company in China that possesses this strategy and it helps the company become the fastest growing company.

The second reason for creating several successful applications is to make ByteDance as an application factory rather than a mega application. This thinking model is due to

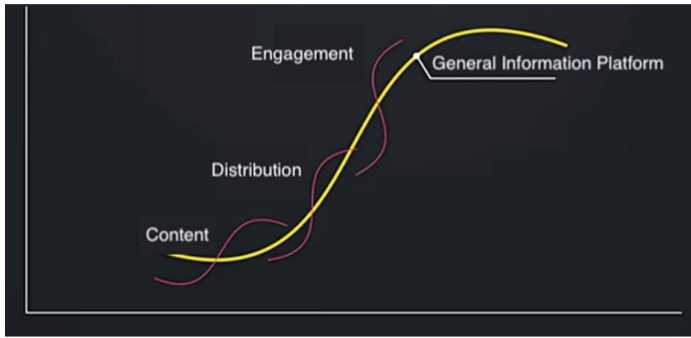


Fig. 4. Toutiao Second Curve

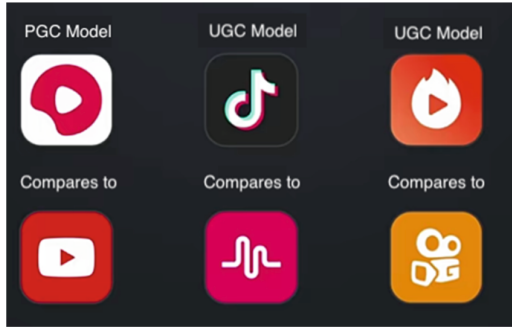
the emergent strategy. Zhang Yiming believes that ByteDance must apply a bottom-up innovation model because the traditional management strategy would not work in the fast pace growing technology company [1]. Furthermore, the premise of the emergent strategy at ByteDance is different from Alibaba because ByteDance's core growth engine is the same for every single application.

The founder explains that the decision to an application factory is inspired by biology. In the book, *Complexity*, the author describes animals would use the least resources to find the most optimal food in nature [9]. Zhang Yiming claims as long as this principle is valid, they would application factory strategy would be correct because the company can test a large number of applications with little resources (human capital, time, money) and some of the applications would present a high potential [1].

### 3.2 Why TikTok Become the Second Curve

The main reasons that TikTok become the second curve, replacing Toutiao as the company's main core business is due to the macro trend in the market and its differentiation strategy. In the first part, the author discusses the reasons that ByteDance can develop plenty of applications at the same time and TikTok is one of them. This part would explain the reasoning behind why TikTok has become the leading application. According to Darwin, he states that any specie can survive not because it is the strongest but the most adaptive [8], and TikTok has all the features that can adapt to the market since 2015.

From January to June 2016, video content views on Toutiao increased 300%, with daily average views six times higher than in 2015 [2]. The macro data suggests that the market is under a significant shift, and the founder decided to adjust the product strategy in the same year. As the former CEO of Intel, Andy Grove, said that every 10 times market shift would result in a major strategy shift. Zhang Yiming clearly saw this shift and reacted to it. The market trend indicates a tremendous opportunity for video typed applications in 2016. The market trend is the analogy of Darwin's natural selection, TikTok as the short-video application is selected to be the fittest one within the company.



**Fig. 5.** ByteDance Application Comparison

In 2015, the company introduced three applications comparable to the existing successful applications in the market [1]. As Fig. 5 indicates that the first is Xigua, comparable to YouTube, the second one is TikTok, comparable to Musical.ly, and the third one is Huoshan, comparable to Kuaishou. However, ByteDance experienced several failures from those applications. The challenge of shifting the first curve to the second curve is because their relationship is non-linear, meaning what works on the original business does not work on the new business. In order to successfully create the second curve, companies must complete two things: identify the breaking point and punch through the breaking point. The founder had already identified the breaking point, which is the short-video trend in the market, and he needed to punch through the breaking point. Therefore, he invested 10 times more resources to expand the market.

In 2019, nearly 85% of the users are from short-video applications [2]. One major reason that TikTok becomes the main business unit, or the second curve, is that the application differentiates itself from its competitors. Kuaishou and Huoshan target users in the third and the fourth-tier cities, but TikTok targets the first and the second-tier cities. The changing point occurred in Spring 2018. During Chinese New Year, hundreds of thousands white-collar workers returned to their hometowns. Usually, their hometowns are the third and fourth-tier cities. Therefore, during this time, TikTok was brought to the new market and more people were aware of the application due to the influence of the white-collar workers in the big cities. Then, the daily active users increased to 400 million, and TikTok become the number one short-video application in China, beating Kuaishou and other internal applications [1]. It is at this time, the TikTok officially becomes the second curve, the core business, for ByteDance.

Nevertheless, all of strategies and decision follows ByteDance's mission, to advance creativity and distribution of information. In other words, the company would like to increase the information distribution efficiency. Zhang Yiming states that the essence of other major technology tools such as Baidu Search, Tencent Social, Alibaba E-commerce is all information distribution [1]. The difference is that other technology giants use information searching method, but ByteDance uses the information distribution method, a more efficient way of finding information, enabled by the growth engine of recommendation system/algorithm.

## 4 Conclusion

The research question is how ByteDance cultivates TikTok and other successful applications. The dissertation answers this question from the innovation perspective, using The Second Curve, Emergent Strategy, and Bottom-up Innovation model. In addition, most importantly, the dissertation includes the origin of the thinking process of the founder which is Darwinism and biology in general. It is a critical part of the analysis, because from various interviews, the founder, Zhang Yiming, has expressed the same idea that biology is his foundation for the thinking process. One of the books that inspires him the most is General Biology written by a Peking University professor during his high school.

The reason that there are multiple successful applications is because the company uses the emergent strategy and bottom-up innovation model, meaning all great ideas come from daily operations and lower level employees rather than top executives or overall corporate strategy. The rise of TikTok is explained by the macro market trend and the theory of The Second Curve. The first curve of ByteDance is Toutiao with a core growth engine of a recommendation system. The surge of short-video consumption signifies TikTok must have great potential, and the founder takes the growth engine of recommendation system and information distribution technology to build the success of TikTok, now became the core business of ByteDance. Further analysis could explore what type of application will be the new Second Curve because emergent strategy encourages many more applications to be invented, so the future direction is crucial for the future success of ByteDance. However, there are a few drawbacks which can influence the accuracy of the analysis. The first step of the methodology is to explore the appropriate theories that can explain the question, but there is a fair chance that the theories used in the dissertation are not the optimal ones. Therefore, this potential risk could undermine the quality of the analysis. The second step is to apply the theories and models to the case of ByteDance, explaining the cause and effect relationships. One obvious problem is that the precision of the logical reasoning may not be high, leading to a compromised analysis.

To better polish the dissertation, there can be a qualitative section, in which the author could interview qualified users to explore their opinions towards TikTok and other applications. The purpose is to verify whether the founder makes the correct choice in setting TikTok as the second curve of the company. To better polish the dissertation, there can be a qualitative section, in which the author could interview qualified users to explore their opinions towards TikTok and other applications. The purpose is to verify whether the founder makes the correct choice in setting TikTok as the second curve of the company.

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