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User consumption behavior of interactive video platform - A reflective study of Douyin as an E-commerce Platform

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ABSTRACT (MAX. 200 WORDS):

Because of the versatility of technological influence and the rapid development of digitalization, interactive social media, such as Tik Tok and Douyin, have brought more consumption possibilities to the market. These social media are merging to innovate some new consumption behaviors by using interactive content to save costs and give users more value. Tik Tok and Douyin also satisfy user-centric individual preferences. Digital interaction is used in the interactive video production, content distribution and commercialization to help interactive video expand its consumption scope. This thesis advocates technology to serve content, and it takes Douyin as the forerunner in the field of interactive video consumption, launches a model-based market analysis and adds corresponding research methods. Outside of China, Douyin has a sibling product known as TikTok. Both platforms are developed by the company Bytedance, however, they differ when it comes to their features. This thesis investigates Douyin's e-

commerce feature and sees the potential expansion it can have on other interactive platforms such as TikTok. This study provides results on consumption behavior by exploring the impacting factors and prediction of interactive models on the consumption patterns in the context of information systems.

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Writing a thesis is a journey that isn't easy and straight forward. We took a lot of turns before being able to find an area to focus on. We started with different topics that we wanted to explore but it took time before deciding on one. We knew that we wanted to work on something groundbreaking and new.

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1. Introduction

In the era of Internet economy, users are consumers whilst acquiring an extensive amount of information (Ritzer, 2010). This leads to consumer behaviors in the e-commerce platform becoming more diversified (Petter et al., 2011). With the advancements in science and information technology, the people of today have less patience to listen to a full song or watch a complete movie. People have built a habit of consuming fragmented content and they like to watch shorter and more interesting contents. This makes consumers' motives for using media more extensive (Whiting & Williams, 2013). On the other hand, the usage of internet, social media, mobile applications and other digital communication technologies has become a daily activity for billions of people around the globe (Stephen, 2016). This is evident as more than fifty percent of the population worldwide uses social media (Datareportal, 2021; Tankovska, 2021). It is estimated that YouTube had over a trillion views of videos in 2012, this translates to 140 views for every person on the planet (Clothier, 2013). More than 3 million global YouTube creators receive some level of remuneration from their uploaded content (Cunningham et al., 2019) and every minute, 10 hours of content was uploaded to the video sharing platform YouTube (Kaplan & Haenlein, 2010).

From this stance, we can see that the future of consumer market will mostly be carried in digital environments (Stephen, 2016). In the face of so many digital experiences, business choices and rich consumption processes, interactive video's advantages have never been widely exploited until today. The occurrence of interactive videos mainly comes from its commercial value (Grijalva & Izaguirre, 2014). It builds a more personalized consumption model, which includes subscription, tipping, likes etc. by interaction with users in a few seconds or minutes. Precisely speaking, interactive videos are another upgrade following the digital consumption trend that pictures have brought to users. Different from pictures, videos are spatial expressions, and the resulting consumer network and platform knowledge are more complicated.

There isn't much research on visual content in the context of information systems and the ongoing research is mainly about improving the techniques of the platform and data visualizations or the visual content in the context of information systems. In other words, the problem with organizational structure and consumption models of cooperation between platforms is not widely explored. Therefore, the authors have decided to focus on the operation of social media platforms from a business standpoint, specifically business models.

The focus of this thesis is to study user consumption behaviors by characterizing the data structure distributed by the interactive video platform Douyin. We set up a spatial model and envisage the generation of new methods to understand Douyin's model of consumption value through different variables, such as consumption, consumption behavior, advertisement, and influence. Similar to an aggregation, elements are interconnected as independent variables to understand the broader platform. Hence, models of interactive forms are developed, and correlations are used to strengthen the interactive context. We hope that the models we propose can help digital media managers to provide better service and consumption experience to users by looking into consumption, consumption behavior, advertisement, and influence. It is also our hope that this research will help to set a basis for future studies of interactive videos and its consumption features.

1.1. Background

The main aim of the thesis is to study the relationship between information and consumption, especially consumption behaviors with other variables in an interactive video platform that is also a type of social media, and here we take Douyin as the study object. In an environment where most of the population has access to the Internet, finding reliable social sources of information that assist and reduce purchasing risks is at an all-time high, influencers who suggest different products can get significant returns. This can be defined as Social Information that breeds the social media transformation process (Direction, 2016). Instead of merely retrieving information such as in the early stage of the World Wide Web, consumers can now both create and consume information. These newer interactive applications and websites provide a richer context to users by means of user-friendly interfaces that encourage and facilitate participation (Fuchs, 2008). With such developments and possibilities, it can be said that consumers have more motivations to use social media. This helps the social media marketing landscape evolve, even though social media is no longer new.

Here we use the definition from Kaplan and Haenlein (2010) of social media as a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0 that allow the creation and exchange of user generated content. By using these applications, people can create, share, and exchange information in a virtual community. Quinton (2013) suggested that with the advent of social media, the linear, relational exchange-based partnership model of business-customer interaction needs to be replaced by a more interactional orientation

with a focus on multi-layered and multi-faceted interactions that cross venues and media and emphasizes multifaceted relationships.

Meanwhile, the acceleration of technical innovations transformed the consumption behaviors of individuals and organization as well as the market's structures. It is true that consumers, especially the digital native who are more connected to the Internet, transformed the way they select, buy, and consume products and services (Henriette et al., 2016) actively or passively. For example, YouTube, Facebook and Twitter are essentially vehicles for carrying content. This content is presented in the form of words, text, pictures, and videos and is generated by millions of consumers around the world and from a marketer's perspective can indeed be inspired to create value (Muñiz & Schau, 2011). By collecting large amounts of consumption behavioral data, these media companies can also personalize users' needs and match global advertisers with local consumers, while still providing their users with the illusion of free choice (Appelgren, 2017). As a matter of fact, this illusion comes from the factor that users are put into a fixed space to make choices and these choices are misleading.

Compared with the previous marketing model formed by the relationship between platforms, customers, social media, etc., the current model is different. We notice that as the core of future research, digital technology is used in a wide range of areas (including AI, platforms, machine learning, big data, different digital analytic and visualization tools). These areas are quickly developing in the increasing pace of the B2B digital landscape and social media marketing. This poses a challenge to theory verification and building different types of digital technologies to influence marketing sub-domains and empirical contexts (industries) in different ways (Reid & Plank, 2000). This is also fully reflected in consumption behaviors. Järvinen & Taiminen (2016) found out that if a brand can support consumer experience with digital content, then it can create a potential to influence future digital consumption intention in multiple digital media outlets. For an interactive short video production and distribution media company, it is overwhelmingly attractive to the consumers (Kietzman et al., 2011). These new types of social media help the democratization of knowledge and information, making the individuals become content producers instead of just content consumers (Kaplan & Haenlein, 2010). Due to the introduction of new technologies in these applications, consumption as a social behavior is forced to make changes. Under certain circumstances, it has undergone fundamental changes in form.

Before we go to the research topic about consumption behavior in interactive video platform directly, we would like to give a short introduction about the relation between two of the most popular interactive video platforms that we are going to study, i.e., Douyin and TikTok. They

are two popular interactive video applications inside China and outside China, and both are owned by the company ByteDance. According to Sensor Tower (Chapple, 2020) data, TikTok has become one of the most popular apps in the world (Mou, 2020). It has accumulated more than 500 million active users, which is bigger than the total population of the United States, Mexico, and Canada. It covers 155 countries in 75 languages and regions (Mou, 2020) and is one of the most downloaded applications in the world. The total number of downloads on Google Play and Apple Store has exceeded 1.9 billion, and the number of monthly active users has exceeded 800 million (Mohsin, 2020). TikTok was downloaded 113 million times in February 2020 alone and has surpassed the engagement rate of Instagram and Twitter (Marketing Hub, 2020). Under the pressure of TikTok's rapid growth, Facebook tried to publish a similar short video application called Lasso to compete with it in December 2018, but this ended in failure (Mohsin, 2020). The Douyin app is one of the most popular apps used in China, it has 250, 320, 400, 600 million daily active users by January of 2019, July of 2019, January of 2020, and August of 2020 respectively (Weixin, 2019). It has a unique and successful feature that is not contained in TikTok, which is online interactive streaming for product promotion.

Right now, TikTok has obtained amazing income with its unique business proposition. In 2019, TikTok's revenue was about 176.9 million U.S. dollars (Business of Apps, 2020). Despite such a high amount of revenue, its monetization methods are not yet mature, and it is still trying various models and ways to gain revenue ((Business of Apps,2020, Ma & Hu, 2021).

TikTok is simply a social media with the main function to create and share user-centric videos. In order to get more business success, it is expanding its service area (Shutsko, 2020) through the integration of interactive social media with E-commerce. However, there is already competition in the European market on social media that contains E-commerce services, such as Facebook and Instagram. There are also companies that are only e-commerce based. Furthermore, TikTok has neither the advantage of cultural belonging nor the experience of a mature e-commerce model, how can it stand out in the European market (Shutsko, 2020)? The proposal from the authors of this thesis is to borrow the successful E-commerce experience from TikTok's counterpart Douyin.

In this thesis, we try to summarize a model that demonstrates Douyin as an interactive e-commerce platform to show its commercial value through analyzing users' consumption behaviors with quantitative analysis methods. We try to provide TikTok with recommendations on developing their social media strategies through the research of success factors in Douyin from an information system's point of view. Not considering the legal and regulatory factors

and the algorithms and technical backgrounds, our contribution is to create a model that will hopefully help the expansion of TikTok application with an e-commerce function.

1.2. Research purpose

Excluding the technical and regulatory affairs, our purpose is to present an ideal monetization platform model by studying consumption behavior correlation of Douyin. Since the authors have no deep understanding of the currently used models, our research learns from previous research on Douyin and tries to build a consumption model.

1.3. Research question

How does Douyin as an interactive video e-commerce platform impact consumption behavior and other related factors in the Chinese Market from an information system point of view?

1.4. Delimitations and limitations

Delimitation

On delimitations, we build the model under the assumption that there are no human management issues happening in the business environment. Besides, we did not consider the influence of technical knowledge. The local culture, laws and regulations have a certain influence but are not within the scope of this discussion. One delimitation is that the e-commerce feature only exists in Douyin which means that the research can't be made outside of China. Also, due to the limited time and resources of this study, we couldn't conduct a survey with many users.

Limitation

We collected data from the mainland of China. The source of these data is based on a survey of Chinese Douyin consumption behaviors, which is somewhat different from the market in Western countries. So, we tried to avoid conflicts caused by this difference when designing the questions. One of the authors is from China, therefore more acquainted with the Chinese language, culture and trends whilst the other isn't. This made information, data transferring and translation more challenging.

1.5. Definitions

- **Interaction**

The concept of interaction emphasizes communication and feedback between the sender and the receiver when the information content is sent in a specific system. Interactive communication refers to a communication procedure. In such procedure, the sender influences the receiver by sending communication content and the receiver influences the sender by sending feedback. They stimulate and push each other and impact the environment around. With the adoption of new technologies, bi-directional or even multi-directional communication mode can be widely utilized in the practical procedure of information communication. (Snijders et al., 2015)

- **Interactive video**

Interactive video is a digitally enriched form of the original raw video sequence, it allows viewers with an attractive and powerful interactivity form and provides navigational possibilities (Hammoud, 2006). The last decade has seen innovations that make video recording, manipulation, storage and sharing easier than ever before, thus impacting many areas of life (Lokoč et al., 2018). Meaning the absence of a clear definition of interactive video makes different people define it in different ways. If you Google it: there are around 45 million results right now (Bozovic, 2017) defining interactive video. The authors chose a definition that was in line with the intent of this thesis, i.e., interactive video is a digitally enriched form of the original raw video sequence that allows viewers with attractive and powerful interactivity forms and navigational possibilities (Hammoud, 2006).

- **Consumption**

Consumption is described/understood as a process whereby agents engage in appropriation and appreciation, whether for utilitarian, expressive or contemplative purposes, of goods, services, performances, information, or ambience, whether purchased or not, over which the agent has some degree of discretion (Warde, 2005). This study will focus on consumption of Douyin's e-commerce feature.

- **Platform**

Platform plays an important role throughout the economy, as they minimize transactions' costs between different markets (Hagiu, 2009; Ghazawneh & Henfridsson, 2015). Tiwana et al. (2010) defined digital platforms as “software-based external platforms consisting of the extensible

codebase of a software-based system that provides core functionality shared by the modules that interoperate with it and the interfaces through which they interoperate”.

- **E-commerce Platform**

E-commerce platform is one type of digital platform, like sharing platforms, search engines. It contains a payment system that allows currency to flow (Laudon & Traver, 2013). Such platforms ecosystems are currently transforming entire industries and types of socio-economic activity leading to them becoming drivers of economic growth, innovation and competition (Geliskhanov et al., 2018).

- **User Generated Content (UGC)**

UGC refers to media content that is created or produced by the general public rather than by paid professionals and is primarily distributed on the Internet. This includes online content such as digital video, blogging, podcasting, photography, wikis, and user forum posts, among others. (Daugherty et al., 2008)

- **Social networking service (SNS)**

SNS represents an online vehicle for creating relationships with other people who share an interest, background, or real relationship (Zheng, 2009). Social networking service users create a profile with personal information and photos and form connections with other profiles (Zheng, 2009).

2. Theoretical background

Asking people from China if they want to download the Douyin app is like asking if people want to use one limited place of a wall at home to hang a picture or a TV. With the rapid development of digital multimedia, there are more and more short video platforms that support indirect or direct consumption, and these platforms are rich in interaction, which is also an embodiment of user-centered design. In the background section, we hope to use basic theoretical models to find models and theories that are suitable for the Douyin model and that affect consumer behavior thus developing an updated interactive structural model. This thesis is different from science technology, logistics, law or even social culture, because the authors are focusing more on Douyin's economics and data aspects.

The way of obtaining all the literature information of this thesis is described as below:

A literature review was conducted through search and thorough collection and selection of material related to the research method section from Google Scholar, Lund University's LUBsearch library and books. The following key keywords were used: interactive platform, interactive video, platform, consumption, Douyin, consumption behaviors, social media consumption, user consumption, E-commerce, etc. The authors also comprehensively studied the quantitative research literature of famous authors such as Robson and McCartan (2016) and Saunders et al. (2009;2012).

2.1. Interaction ritual chains

All the interactions between humans happen under specific circumstance and include at least the encounter of two people (Goffman, 1961). The continuous interaction between humans under specific circumstances form an interaction network relation like chains. The core scheme of interaction ritual chains is mutual concern and emotional connection. The interaction rituals between individuals can form a momentarily empathy. Interactive videos have the potential to activate user participation and lead to more engagement and better retention (Schneider & Bertolli, 2019). From the point of view of interaction ritual chains, the platform of Douyin is an encounter space for the members of the community. The term encounter refers to the interaction between individuals under a specific circumstance, and the interaction is sequential and with feedback. This definition implies that the Douyin community is full of all kinds of encounters

that record different moments and interests of humanity. Recording (shooting), sharing (uploading), comments and forwarding are the basic tools of interaction between members of the community (Drakou et al., 2015). Interaction ritual chains do not come from vain, instead, it relies on the emotional connections and sharing of several humans in a specific space, which build the focus on the same topic and group and lead to wider range or large scales interaction behaviors. Commitment is defined as the perception of belonging and being involved in an SNS (Van den Hooff & De Ridder, 2004). If someone drops off from the group, then he/she will feel isolated and helpless.

2.2. E-commence on interactive video

As early as the last century, someone had proposed that the arrival of interactive video would be heralded as the next Revolution in Communication technology (Singh, 1986). First, it was introduced as “quintessentially a communication concept” by (Rafaeli, 1988). During that time, interactive video was defined as video content that users could choose independently. In other words, interactivity meant that the user controls the program, according to Parsloe (1983), it provides people with such a scene that they can immerse in through interaction, but at the same time maintain a relatively independent observability, which gives users a calm standard of judgment. This bond engages the viewers into the scene and brings a unique viewing experience to them (Hammoud, 2006). Nowadays, interactive video offers a very flexible medium which, as its name implies, has the potential of being highly interactive (Singh, 1986). With the increase of bandwidth, most parts of the world will have the option to use 5G soon and the deployment of interactive videos will get a variety of applications. Secondly, interactive video is very different from print media, such as newspapers and magazines, because it is a digital experiment, and its utilitarianism and sense of value will be highlighted in some cases (Adcock et al., 2008). News organizations must do more to pull users in, offering something not only more useful, informative, compelling, and gratifying than their competition, but also more engaging (Ksiazek et al., 2016). In the context of massive production of user-centered industrial models, it must be emphasized universality and sociality. Interaction Video raises social interaction rituals to a higher level because social interaction rituals are the basis of video interaction, they are dramatic, and they are deeply immersive (Miller, 2019). This is evident as the audience can weigh in and make a difference (Gitner, 2015). For example, the concept of field was brought out by French sociologist Pierre Bourdieu (1984), and the social interaction methods created by

interactive videos can be seen as a group behavior. Most of the time, this becomes a special social support, and many companies use the interaction produced by groups to build commercial models, because social support is defined as “information leading the subject to believe that he (or she) is cared for and loved, esteemed, and a member of a network of mutual obligations” (Cobb, 1976; Yoo & Essex, 2004).

Interactive video as a new format of social media has great potential for e-commerce (Hammoud, 2006). It has a new way to influence the user by issuing a new format of online advertisements. It also shapes the users' habit /consumption behavior by their social connections. These properties make it possible for interactive video to create unlimited potential for consumption value. Douyin is a typical representative of interactive video, and automatically inherits these properties (Mohsin, 2020).

2.3. The advertising value of interaction in E-commerce platforms

As mentioned, interactive video can create a new format of online advertisement. This is something that is still under exploration and the question is how to make interactive e-commerce platform fit consumption behavior (Mou, 2020). To understand the application of interactive video in a platform (program), this study contributes to the value of interactive video in a program/platform and therefore the service factors that are needed by interactive video in the program/platform, especially in retail environments, since interactive systems are dramatically in the rise (Bergman et al., 1990) and the sales were firstly from the revenue of advertisement. Interactive video is a form of advertisement, for example, skipping advertisement in YouTube is a primitive form of interactive video. We can expand this notion by viewing an audience as the market. By looking at Figure 1, attention and awareness are mutually reinforcing market performance and therefore impact consumption behavior in interactive systems. Hence, we can consider interactive videos as a method to visualize the information. As interactive visualizations take a larger role in information systems, designers must know what tasks, visual representations, and interaction techniques are available and how they work in together to facilitate analytical reasoning (Sandouka, 2019). Besides, interactivity is mainly based on the concept of control. For example, Bezjian-Avery et al. (1998) explained that: “Whereas in traditional advertising, the presentation is linear, and the consumer is passively exposed to product information, for interactive advertising, the consumer instead actively traverses and

shares the information”. This means that with such E-commerce platforms there are endless possibilities.

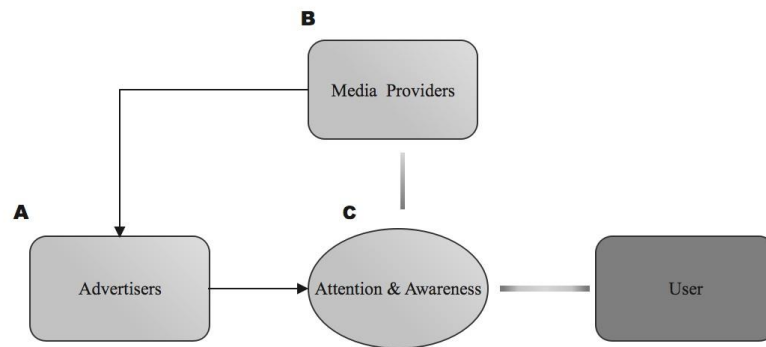


Figure 1: Audience market adopted by Napoli (2011)

2.4. Consumption behavior on E-commerce platforms

Consumption remains a vibrant and varied topic of sociological significance (Edgell & Hetherington, 1997; Lee and Munro, 2001; Wheeler & Glucksmann, 2015). The authors understand consumption as a process whereby agents engage in appropriation and appreciation, whether for utilitarian, expressive or contemplative purposes, of goods, services, performances, information, or ambience, whether purchased or not, over which the agent has some degree of discretion (Warde, 2005). Consumption is reduced to ‘shopping decisions’ and ‘consumer behavior’ that aggregate consumer choices and send signals to the marketplace (Evans, 2019), It is used principally as a way to talk about production (Evans, 2019). The development of E-commerce platforms is closely linked to the transformation of the information (Lagsten et al., 2015), and one of the most urgent challenges for people working in the media industry today is to understand the processes of structural change that are currently taking place (Hultén et al., 2010). Basic models give us a clue of what the future system of E-commerce, platforms, media consumption, and video content will look like (Nygren & Wadbring, 2013).

2.4.1. Consumption behaviors basic models

The pieces of information a consumer sees depends on where the consumer wants to go (Bezjian-Avery et al.,1998). This leads to intelligent recommendation algorithms, control of big data, and analysis of consumption behavior preferences can appropriately radiate marketing content that matches the characteristics of the audience to target consumers, even reach non-fan groups, and promote spontaneous consumption, and increase profitability (Elish & Boyd, 2018). In addition, major media platforms have a large amount of user data. By analyzing the interactive model and interactive data of a targeted user, for example, platforms providers can find content with high frequency levels of interaction (such as likes, forwarding, sharing, and other behaviors of the content). Therefore, locating the needs of potential users and monitoring the accurate delivery of content by the media. Here is a theoretical model that explains the thoughts previously presented:

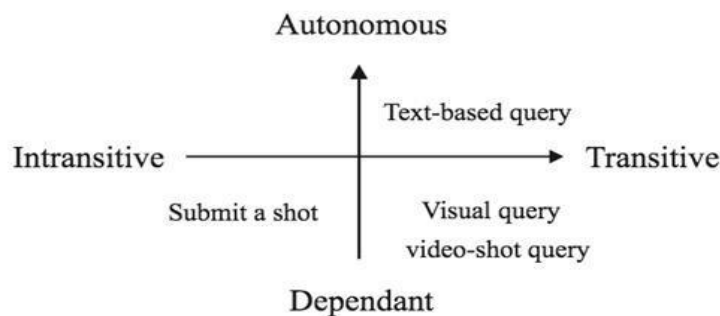


Figure 2: User-interested behaviors from Vrochiis, Kompatsiaris & Patras (2010)

In this model, consumption behavior is reflected in terms of activeness, and activeness depends on the user's interest in specific content. Originally, users have different usage methods of expressing different interests: their consumption content meets their need for information, entertainment or emotional management, and they participate through interactions with other users in the platform to enhance social connections. Producing their own content for increased independence and self-realization (Shao, 2009). This comprehensive approach can make users

more dependent on the platform (Shao, 2009). In other words, consumption behavior can be influenced by one or a series of domesticated procedural means, he or she can transition from independent thinking to being led by the target content guided by an enterprise (Shao, 2009).

2.4.2. Information sharing when using interactive E-commerce platform

It is easy to conclude from the model below that every detail forms some sort of cycle. The more interaction, the more information generated, thus the increase in consumption. Users consume content generated by others owing to their interest in information. An increase in content can lead to an increase in usage because users are more likely to find information of interest (Stigler, 1961). Hence, we consider a model of information search for content of heterogeneous quality (Ahn, Duan & Mela, 2011). This means creating affection to annotate content with deep semantics results in an ability to establish semantical relationships between the form and the function in the media, thus for the first-time enabling user access to stored media not only in predicted manner but also in unforeseeable ways of navigating and accessing media elements (Hammoud, 2006).

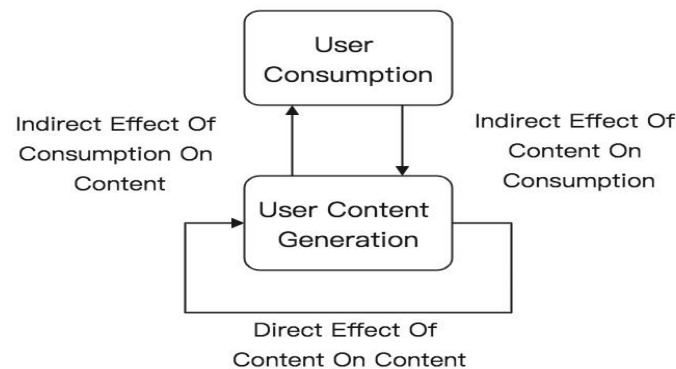


Figure 3: Model overview: an equilibrium model of user generated content from Ahn et al. (2011)

In order to reach the standard of combining interactive elements and interactive processes perfectly, it was necessary to look into some literature and various data, it is known, already from the beginning of the last century, that exposure of interactive media identity is dependent on the diversity of content influence (Khan, 2017). From an economic perspective, this includes a sustainable and innovative relationship. The generation of user content promotes user

consumption. Due to the diversity of user content, it ensures that users have a high degree of choice. Moreover, once users rely on the platform, they make it a habit.

Subsequent Scandinavian research in the 1970s argued in favor of broadening audience–media figure research to include PSI (Program Special Information), identification and “capture” (where the viewer both interacts and identifies with the figure), integrating these functions into more general “media interaction” (Nordlund, 1978). In order to achieve an interactive effect at any time is itself complicated (Abercrombie & Longhurst, 1998). So, Schmitz & Joyce (2009) suggests the Internet offers unique opportunities for interactivity because it allows for a closer relationship with the audience; a shortened social space between media producer and consumer (Schmitz & Joyce, 2009). The notion of information flow and social interaction is common to all the theories (Chahine et al., 2018).

2.5. Douyin as an E-commerce platform

Douyin is a platform with interactive video as its main function. At first, Douyin could not integrate all business elements into one platform, so it had to cooperate with several largescale online business companies, such as Taobao and JD (The two largest e-commerce websites in China). It slowly trained its users to use their products, at the same time, it acquired consumption data, and used these data to make more attractive products to users. Later, it created its own e-commerce industry. This trust was established gradually. (Zhang, 2020)

On one hand, as for the platform itself, the incomes of Douyin are heavily dependent on venture capital and advertising (Zhang, 2020). On the other hand, consumers use mainly virtual currency. Even so, Bytedance made a lot of advertising before it entered the overseas market, which was for the product itself, and did not make users realize that this was a business marketing method. Consequently, it could only rely on the popular local e-commerce platforms to test the user’s consumption hobbies and collect data for analysis later on. However, it still hoped to manage all users and businesses on a unified platform. For instance, users could directly reward the videos that they were satisfied with, which is equivalent to editing SMS messages and voting for their favorite programs. Through virtual currency, individuals can earn part of their income, and they can also reward their favorite video content as shown in Figure 4. In addition to virtual gifts, Douyin also includes shopping cart and consignment product functions. The consignment product function is embedded below the product introduction homepage, and the shopping cart function allows streaming viewers to click the button to

directly purchase the product, thereby generating revenue through live broadcasting. The promotion of live broadcast products is like the popular online TV shopping in the early years. The live broadcast staff advertised multiple products sold by the brand in a live broadcast. This effectively turned the audience into buyers and enabled users to fully understand the items during the display of their performance and other details.

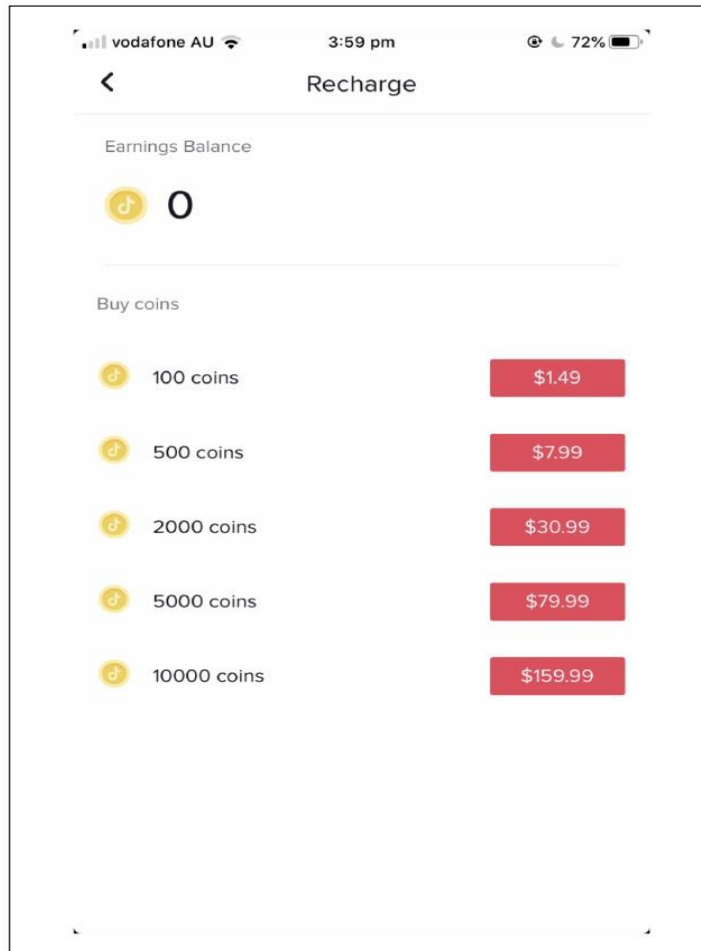


Figure 4: Douyin virtual currency page.

2.5.1. Douyin video user content push system

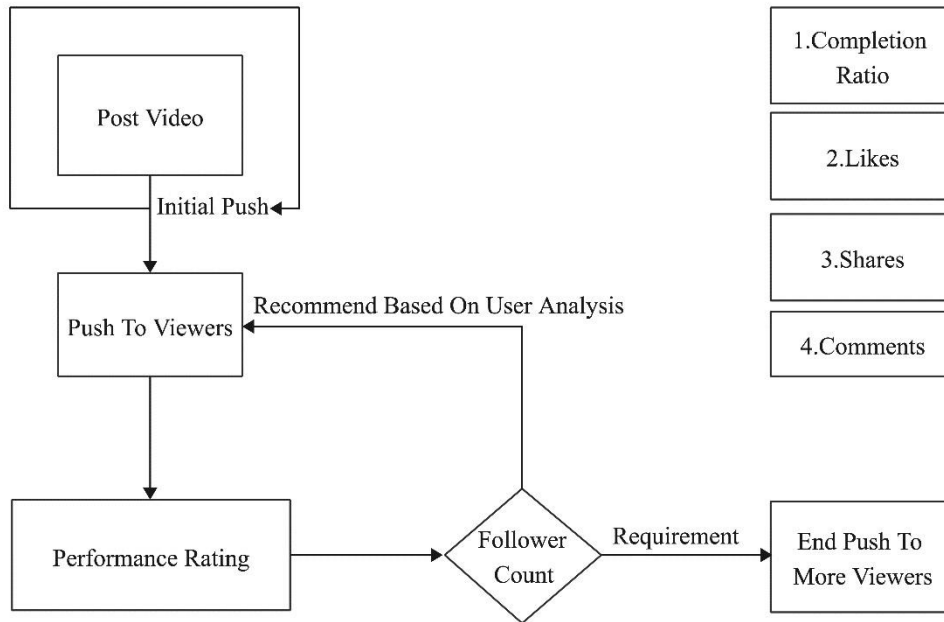


Figure 5: Douyin video user content push system adapted from Omar & Dequan (2020)

As many large social medias, Douyin has a strategy to select user content. Its strategy is extreme, which is shown when it collects data. The strategy goes as the following: when a user sends a video, it will be watched by people in the same area, and after reaching a certain amount of threshold, it will be pushed to a larger database resource. In other words, it has requirements on wide range circulation. By doing this, it saves costs and improves efficiency, and videos in higher level resource databases will be consumed by global traffic. This is shown in Figure 5.

2.5.2. Comparison of other products of the same type in the market

When studying Douyin, it is also necessary to research products that offer the same service. This is summarized in Table 1. Where we can see other social media platforms such as Twitter, Facebook, and YouTube, which have a unique architecture, norms, and culture (Smith & Yongjian, 2012). YouTube has a strong influence on brand. Marketers rely on YouTube for promotions and customer feedback (De Kloet et al., 2019). Nowadays, many users are accustomed to Google/YouTube to search for songs and shows, including some knowledge browsing. Because YouTube has videos with diversified subjects, people can search for useful

information on the platform as much as possible (De Kloet et al., 2019). Users have the possibility to subscribe to certain programs which they can follow according to their own interest (De Kloet et al., 2019). Users interact through the comment area below the video (Khan, 2017). This principle is used on the well-known Chinese website Bilibili, and users have the choice to interact directly on a live video. For example, at the left side of the Figure 6, users are given with two options, option A is No, and option B is Yes. Users can click each button based on their decision. In the following frame, the correct answer is shown as at the right side of the Figure 6.



Figure 6: Interactive video with options and answer from Bilibili.

Table 1 Other products' styles

Names	Styles
<p>YouTube</p>	<p>It is regarded as a platform where elements of traditional choices of television, film, and music converge with the interactive elements of digital media (Shao, 2009). It is owned by Google, which helps and facilitates display rankings and advertisements on Google (De Kloet et al., 2019). YouTube has been exploring a feature where you can pay a monthly subscription for exclusive content. Besides Pay-per view payments and monthly subscription for ad free usage.</p>

Twitter	Sharing information to the greatest extent as possible (Shi, 2014). It has a whole campaign type focused on boosting app installation. Hashtags # are a key tool on Twitter which help users have more followers. This is originated from blogs (Shi, 2014).
Instagram	Instagram is a visual social media platform that is totally based on photos and videos sharing. It attracts the younger generation. (Bresnick, 2019)
Facebook	Uses social graphs and activities to pinpoint the demographics of potential buyers, which makes Facebook Ads extremely effective (Parsons, 2013). Facebook has a feature where you can reward a person that you are watching live.

2.6. Scoping consumption and its novelty

First, there is a user centric space when the platform communicates with its users, it also communicates with other platforms. The trend that the dicentric market of media networks are dominated by consumers indicates that the public media is decided by its receipts and receipts are diversified (Belanche et al., 2020). More often, this diversification has a unique social support, and many businesses use the interactive form between groups to build profit models. Because Social Support is defined as information leading the subject to believe that he [or she] is cared for and loved, esteemed, and a member of a network of mutual obligations (Cobb, 1976). The social interaction generated by interaction videos in Douyin can be considered a group behavior (Yoon et al., 2008). Group behavior means deeper connection and interaction (Goffman, 1961). Douyin because of its special features, it should attract more consumers to the platform for shopping goals and achieving a unique experience.

Therefore, when designing problems, the authors mainly consider the applicability, ease of use and accuracy of the model presented (Jackson et al., 1997). All these steps start with the user as the center (UGC), and our principle is to serve users (SNS). Our hypothesis is that there is some

connection between consumption behavior and the content consumed, but whether there is a correlation between these elements needs further validation.

We designed a questionnaire that contains five categories: Users background information such as gender and income, AD effort expectancy, User habits, Video content influence, and Consumption value. A detailed reference for each category is shown in table 2. As shown in figure 7, by using quantitative research method, we will encode users' behavior, and provide data on how consumption behavior can impact consumption to later show what kind of correlation exists between those categories.

Table 2 Questionnaire references

Category	Description	References
Section I: AD Effort Expectancy	Looking at how advertisements impact purchasing.	(Bezjian-Avery et al.,1998); (Riffe et al.,2019); (Appelgren, 2017); (Avery, 2000); (Zhang, 2020).
Section II: User Habits	The pattern of usage of Douyin as an e-commerce platform.	(Hammoud, 2006); (De Kloet et al., 2019); (Shao, 2009); (Jackson, 1997).
Section III: Video Content Influence	Content satisfaction, product interest and motivation to make own content.	(Stigler, 1961); (Jackson, 1997); (Avery, 2000); (Shutsko, 2020); (Cho & Huh, 2010); (Järvinen and Taiminen, 2016); (Khan,2017).

Section IV: Consumption Value	Factors that lead users to trust Douyin as an e-commerce platform.	(Avery, 2000); (De Kloet et al., 2019); (Zhang, 2020); (Ba and Pavlou, 2002);
		(Stephen, 2016); (Parsons, 2013).

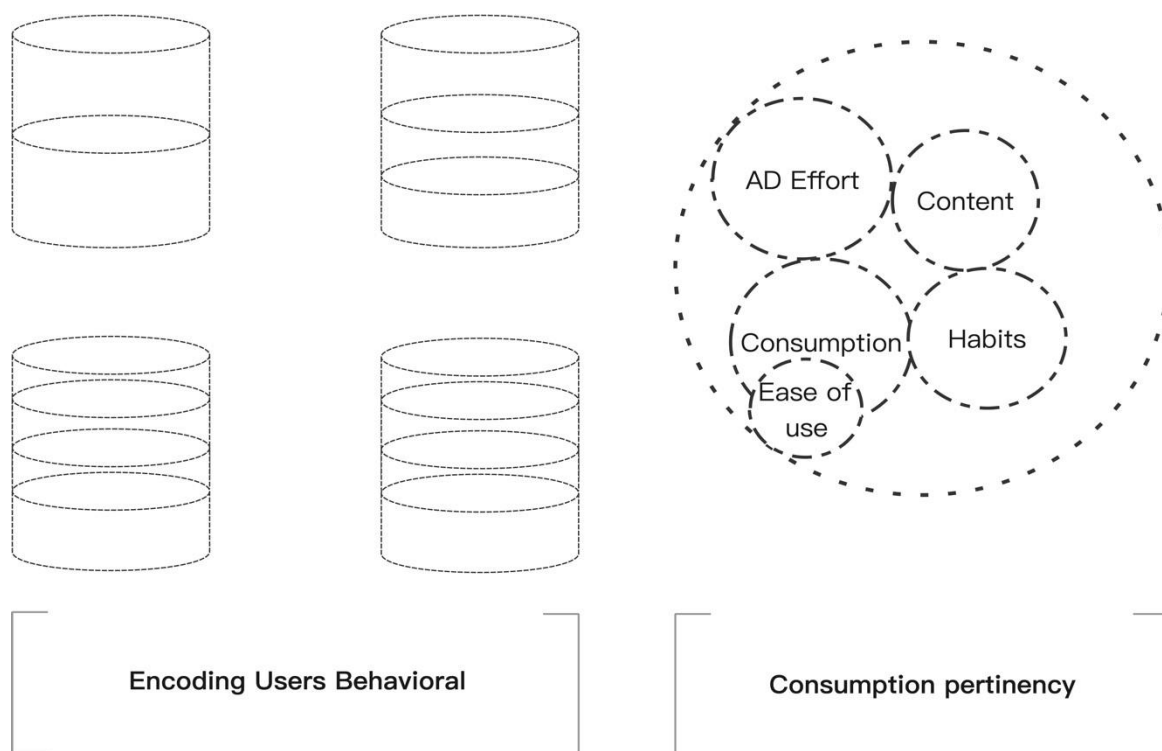


Figure 7: Consumption behavior affect consumption adapted from Jackson (1997)

Early research has found out that consumption behaviors will impact the consumption on the platform, however, no further detailed investigation has been done on which consumption behaviors will have this impact, and if these behaviors are correlated. Consumption behaviors have their values, and we utilize digital measurement to present their values. The measuring tool we use is quantitative data analysis, and the background theory we adopted for all the equations, including sample design and survey estimation, cross-tabulation, correlation analysis, etc. We use a qualitative method to explain the collected data to the equations to determine if there is any correlation between the aforementioned four parts, and what are the detailed elements of this correlation. The most important thing is to understand the relation between the variables thoroughly whilst keeping the generality.

3. Research approach and methodology

Businesses are affected by research directly or indirectly (Dawson, 1984). The study of business research methods can help different organizations become more efficient, whether one becomes a producer or consumer of research (Dawson, 1984). This echoes Benbasat's (1985) recommendation that the choice of a research approach depends on "the characteristics of the problem being researched "What we need to do when planning a research plan is to master the characteristics of the research environment and choose a basic paradigm and strategy accordingly (Bell et al., 2018). Besides, the process of research is a process of inference and definition, which includes assumptions and judgments (Sreejesh et al., 2012). And the assumptions and theories of inference are what drive the process of data collection (Merton, 1967). A well thought-out and consistent set of assumptions will constitute a credible research philosophy, which will underpin your methodological choice, research strategy and data collection techniques and analysis procedures (Saunders, 2012). An additional important feature of inference is that the operation of the concept needs to be able to measure the facts, usually a quantitative number. (Tracy et al., 2006) also points that compared with complex interactive project business research, quantitative research strategy can clarify the problem. During the process of clarifying, inductive method and deductive method are considered as a trend instead of a constant element (Bellnet al., 2018). For this study an inductive method was chosen because according to the point of view of pragmatism, a big amount of data is helpful to construct an opinion (Sreejesh et al., 2012). In practical implementation, it is efficient and flexible, and is suitable for our research problem. For the testing part, a questionnaire was chosen to both achieve and convert back to our theoretical construction.

A clear philosophy assumption shapes the practice of theoretical conclusion of research. On the second part, it was planned to use this ontology because of its two stands, i.e., Objectivism and constructionism. On the other hand, the authors believe that it is necessary to adopt the correctness of positivism which analyzes the data first to later start the theoretical test. According to positivism, these philosophy concepts are not constant nor contradictory, so they can be fully utilized and applied in practical research. The continuous cycle from theory to data is the accumulation of knowledge (Kathleen, 1989) the basis of design means the product is more normative.

3.1. Interactive video consumption behavior with Douyin

Our research is not based on a single overall theoretical perspective, but it shows a single philosophical meaning (Bhattacharjee, 2012). Some philosophical assumptions can provide evidence for studying the relationship between information technology personnel and organizations. In Research approaches and assumption, Orlikowski (1991) proposed the importance of expandability and critical: The philosophical ideas involved in research methods have a large number of thoughts in different disciplines, and their research phenomenon are very complex, but on the other hand, they provide the probability to explore the phenomena from different perspectives, so that people can make research plans more comprehensively and carefully, and therefore get closer to the essence of object (Culnan, 1986). This is specifically established in five research categories for different topics in information systems, including research foundations, autonomous methods of information systems, and so on. The ones that this study focuses on are:

1. Belief in the research phenomenon or object.
2. Beliefs in the concept of knowledge.
3. Beliefs in the relationship between knowledge and experience in the world (Culnan, 1986).
This theoretical knowledge, with the combination of research, will play a role in helping this study become more enriched.

A deductive method attaches great importance to the field of scientific research (Saunders et al. 2009), because its purpose is to introduce theories from the collected data (Recker, 2013). An interpretive approach encourages an exploration of users' involvement in systems development and uses the data from the users' perspective, one which focuses on their concerns, concepts, meaning structures, priorities, and that attempts to capture ongoing rules and relations that characterize their perceptions, activities, and experiences (Orlikowski & Baroudi, 1989). Insight into the social and cognitive world of users may assist our understanding of user involvement in, and experience with, IS implementation and use. (Orlikowski & Baroudi, 1989). Furthermore, this can be summarized as: the focus of explanatory research is to explain the interaction between concepts (Bhattacharjee, 2012). Therefore, these theories fit our research process, as well as our assumptions. In short, case studies belong to the paradigm of critical realism, suitable for business research and are essentially an inductive way of theoretical construction studies. However, it also acknowledges that “facts and theories (induction and

deduction) are essential for each other's value” (Emory & Cooper, 1991). This adds to the fact that validity and reliability should be addressed (Heale & Twycross, 2015).

3.2. Empirical context:

This research extends the recent research on China's digital space to the construction of platform-based theory (De Kloet et al., 2019). Douyin and TikTok have the same standard procedure for users to create and publish videos. The users from both platforms can create titles for their videos, tags and use @ to mention other users (De Kloet et al., 2019). They can select different privacy settings and then release the videos. Douyin gets income from AD by attracting users to watch the released videos, but it doesn't insert AD videos. Furthermore, these two platforms can display other social media platforms, and users can share their videos to these platforms. The interactive short video market has a long gestation period in China (Wang & Lobato, 2019). This is reflected as Douyin has a wider selecting range in monetization. In addition to virtual gifts, Douyin also includes a function called "product consignment", which embeds icons with links to products into real-time streams. Live broadcast viewers can click on the live broadcast icon to purchase products, thereby generating income for the hosts of live broadcast. "Consignment sales" allows live broadcasters to promote multiple products sold by multiple brands in one live broadcast. Taobao and Mogu are two representatives of online shopping platforms that can merchandise promotion. This model has effectively turned viewers into buyers. Now other international social media platforms (such as YouTube and Instagram) have integrated similar functions (Yeung, 2019). It can be said that Chinese users have become accustomed to real-time streaming and virtual gifts (Cunningham et al., 2019). Douyin also makes it easier to search and find live streams through its dedicated live streaming section, this helps the platform to be considered as an e-commerce interactive media.



Figure 8: Screenshot of live broadcasting on Douyin.

3.3. Data collection method

For this research, the strategy was to use a combination of questionnaires and semi-interviews. Empirical data was crucial to the research method of this thesis. Surveys work best with standardized questions where it is possible to be confident that the questions mean the same thing to different respondents (Kinnear et al., 2004). Questionnaire surveys are conducted for explanatory and descriptive research, and to collect samples for quantitative analysis (Saunders et al., 2009). Specifically, in this research, a self-administered Internet-based questionnaire was used. As implied, this type of questionnaire is managed electronically and filled out by respondents. As we already learned from the research method, semi-structured interviews are the basis of research tools. We launched a user-centered behavior questionnaire in China for the Chinese-based App Douyin. Our logic was to prove our final model by drawing survey results from Douyin that already has these functions and extend these results to TikTok that may have these functions in the future, this can be considered as the practical contribution of this thesis. We chose the Tencent questionnaire, which is very conducive to dissemination.

According to the reputation ranking, this online questionnaire platform has a high reputation and transparency, and it is efficient and malleable. It is also proved that the questionnaire also performed quite well in the subsequent data import. The reason that we didn't select Google Forms is that it was banned in China, and users don't have access to it. We didn't select Microsoft Forms for another reason, which is related with the high price of the Microsoft product, and that not all the users have access to it. We received 389 fully completed questionnaire answers from our social network within one weekend. To ensure consistency, we translated the questions into Chinese for the Chinese questionnaire. After receiving the data, we translated it back to English again.

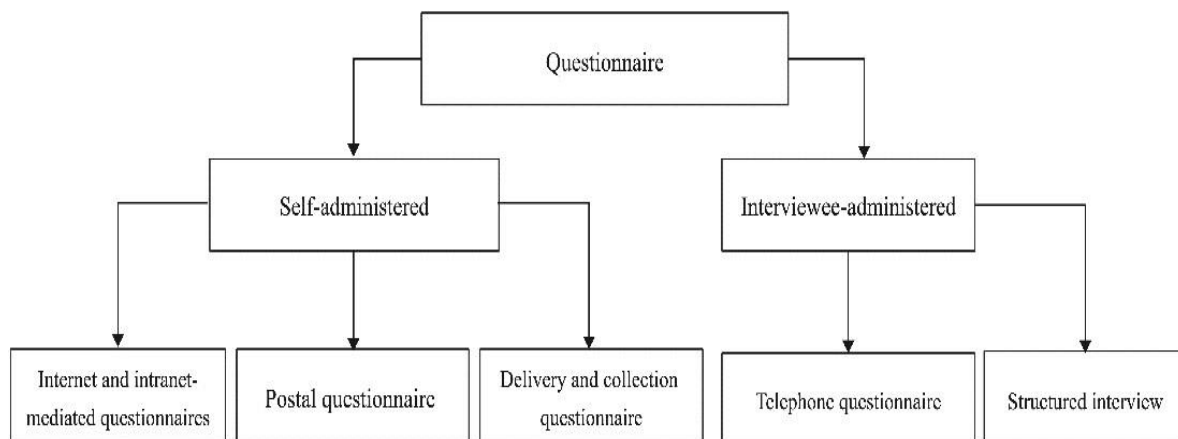


Figure 9: Types of questionnaire by Saunder et al (2012)

3.4. Sampling strategy

Sampling is an important aspect of life in general and enquiry in particular (Kinner et al., 2004). Due to the large population of our users, it is unrealistic to investigate everyone (Saunders et al., 2009). Leslie kish (Lavrakas, 2008) has said that researchers must first consider the design effect and variables before issuing the questionnaire, because the target population of a questionnaire does not involve special social groups and stratification. Therefore, we selected a small group of people, besides, selecting a small part of the target population for sampling has the advantage that it reduces the cost and time frame of data collection, improves research efficiency, improves data accuracy, and makes many target populations easy to manage (Easterby-Smith, 2015). In

this study, the target population is Chinese. Our data sampling range cover the whole of China, we believe that an extensive sample size will reduce sampling errors, and the sample size depends on the sampling method and the expected response rate (Kinnear et al., 2004). In this study, non-probabilistic sampling was performed and self-selection meant that the survey was conducted through Chinese social media networks.

3.5. Questionnaire design

To obtain diversified answers and involve every factor as much as possible, our question design fully considered the principles of each model in the second part of the thesis and includes the connection between each model. From a UGC perspective, consider users behavior as the main aspect. Three or four questions are raised on each model, and then a total of 14 questions are applied. The original number of questions was 20. Because we considered the patience and interest of the tested people, we hoped to engage sincere and effective answers, that meant keeping the questions short and simple, so the data wouldn't appear perfunctory or ignored invalid data. Finally, we set 14 questions which contain a text descriptive question at the end. Our hope was to reflect the characteristics of covering a wide range and considering the diversity of factors. On some issues, we assumed that this phenomenon is true and verified the correctness of the theory through observation.

Table 3 The questionnaire items

Ad Effort Expectancy	User Habits
I like to receive ad prompts with product information on Douyin.	Which activities do I frequently engage on Douyin? *Multiple Choices a. Likes b. Shares c. Reward d. Shopping e. Comments f. All the above g. None of the above

I noticed ads by watching videos on Douyin.	I perceive that using Douyin to buy and sell has become a daily habit.
Video Content Influence	Consumption Value
I trust the interactive videos content therefore I am willing to consume on Douyin.	I think shopping on Douyin is very affordable.
I perceive that watching videos on Douyin gave me the desire to shop.	
Seeing people make money from interactive videos on Douyin gives me the motivation to upload my own videos.	I think it's very easy to buy and sell on Douyin.
Having celebrities stream live commerce videos can influence my shopping decision.	I think it is easy to have my own income by creating videos on Douyin.

My age:	My average monthly consumption on Douyin:
a. Less than 18 years old	a. No spending
b. More than 18 years and less than 40 years old	b. Less than 1000 RMB
c. More than 40 years old	c. More than RMB 1,000 and less than 10,000 RMB
	d. More than 10000RMB

We also have an optional descriptive question---- Why would you like to shop on Douyin?

The answer to this question was made as an explanatory description in the quantitative analysis. Our aim is to learn more about the idea, thus confirming our previous accord with the theory or not.

For the related ethic problem, we have got permission from the responders to use the data for research purpose, and we have removed sensitive information and made all the data anonymous.

3.6. Data analysis strategy

On April 18, 2021, we strategically joined WeChat groups that are popular among Chinese users. WeChat is the dominant communication application in China and has penetrated the daily lives of many Chinese people. As the deadline for the methodology part is getting closer and sufficient answers have been acquired, the survey was scheduled to end on April 28, 2021. China's large population and its extensive use of social media makes it easy to collect many answers. By the end of the questionnaire, 391 answers had been collected.

In the previous stage, our concept was conceived as a research question. Our strategy was to select an appropriate sample, investigate, and create a set of variables and combine them into a scale to represent the concepts that researchers are interested in. Then we considered the probability distribution on the category of the estimated dependent variable of the conditional

probability distribution and calculated separately for each category of the independent variable. Here special attention was paid to using this concept to determine the direction to the percentage table. Another important concept that was used, was the concept of statistical control (Treiman, 2014). It is also known as control or keeping constant confounding variable to determine whether the relationship is within the category of control variable. To highlight the various methods of tables with more than two variables, the logic of multivariate analysis which focuses on generality was considered.

Because there are several types of variables: univariate with one variable, such as age or income, bivariate with two variables, such as user habits, consumption value and content influence. This kind of combination is accompanied with multiple variables, such as user age, income, user habits, etc. In this study, a bivariate analysis was chosen. Since we wanted to explain the relationship between individual factors and user consumption behavior individually and the influence of interactive short videos content on user habits, the expected performance of users' consumption behavior, etc.

3.7. Validity and reliability

3.7.1. Descriptive analysis

Descriptive research is usually the first step in most research projects (Nardi, 2018), and it is also the main goal of some research projects. We decided to use descriptive data statistics to clarify the basis of the items' distribution in the questionnaire and the range of answers, and also use it as a support tool to analyze certain characteristics of the interviewees such as age, income, etc.

3.7.2. Reliability analysis

General reason says that it is crucial to have reliable measurements in content analysis no matter which research method is used. If people don't trust the metrics, then they will not trust any analysis results from them. If the concepts of these settings are simple and easy to apply, then reliability is easier to achieve, content analysis will be more extensive. Furthermore, reliability

is even easier to achieve when a concept is expressed more clearly, so it is very important to define a clear concept here. The issue of reliability is in a sense correlated to concepts and logic, but it is worth noting that Krippendorff (1980) warns against using associations to improve reliability, because associations are not necessarily correlated. However, if the consistency and accuracy of the measurement are determined separately, this is not a problem. Furthermore, we have brought variables and data from definitions and formulas, which is also one of our methods to test the reliability. In addition, after the logic and procedures of the investigation content have been determined, the factors analysis has also become simpler. We encountered two problems. Firstly, the expression was not clear when we set variables. The reason is that the concepts are not clearly understood. Secondly, the problem of wrong categorization may be due to the basic ambiguity or complexity of the categorization. Later, it was found that the easiest way to solve such problems is by modifying some of the definitions and abandoning some confusing statements. If these modifications cannot eliminate the root of ambiguity, then the attention must be turned to basic category definitions. Finally, according to Saunders et al. (2009), considering the reproducibility of research results, the transparency of data is also one of the research purposes. Therefore, the authors presented how the analyzes, data collection, data process and the proof of these possibilities were categorized. Although, some problems were faced, this study has good reliability.

To strengthen the reliability of the study, Cronbach's alpha test was adopted, which is the most common test score reliability coefficient for single administration. The result of the Cronbach's alpha test was 0.8848, which is higher than 0.7. This means that the reliability of the factors studied are acceptable.

3.7.3. Validity analysis

Content validity is one the biggest concerns of the study, especially the content validity of the questionnaire items. Because according to Sanders et al. (2009) validity is criterion for pursuing the credibility of research. Validity describes "whether these findings are really relevant to what they look". Effectiveness means that the data collection method can accurately measure the purpose and extent, as well as the claimed research results. Effectiveness is usually measured by content effectiveness, universality, and sociality. It is divided into two parts: internal effectiveness and external effectiveness. (Campbell & Stanley, 1963) Internal effectiveness is the ability of research and investigation to clarify effective causality, and external effectiveness

is highlighted through internal effectiveness. Internal validity is a necessary condition for external validity (Riffe et al., 1998). In this research, important literature references are used to enhance the effectiveness of the content. In addition, it is believed that the effectiveness of content form is also very important. For example, advertising is very important for consumer behavior in the market (Avery, 2000). Especially in interactive content, our research valuable for practitioners, and the significance it produces may affect the decision-making of corporate managers in this industry. It is also because the flexibility and ease of communication that the models bring about content changes which are also a manifestation of effectiveness.

3.8. Research ethics

Recker (2013) talked about the ethics problems when conducting the research, which should define if the behaviors is acceptable or not, right or wrong, and good or bad, so it is important to follow these ethical principles during research.

An important factor of ethics in information system is that the researchers are responsible to make sure that they can get consent from the participants of the research. At the beginning of the investigation (Walsham, 2006), it is normally useful to tell the participants clearly what the purpose of the research project is, what kind of information of participants will be collected, how this information will be stored, processed, published, etc. Another factor is that the participant is volunteer to attend the investigation, and their sensitive information, such as name, age, address, income, gender, etc., should not be disclosed to the reader of the research by any ways. Participants should also be informed that they have the right to quit the investigation and withdraw their information at any time. All these requirements are also aligned with the GDPR requirement of EU (GDPR, 2018).

In our study, we used online survey to get statistical information about the consumers' behavior on Douyin as an interactive video platform. At the beginning of the survey, we clearly stated our topic of the study, what kind of information we need. Since the survey was published on a website that is well-known and trustful to Chinese responders, the information from the responders will expire in a specific time, which greatly alleviated the burden of the authors to clarify about the storage of this information. The exported survey report only contained very limited information about the responders, which simplified the processing efforts and also complied GDPR.

Some more general requirements about the publication of a thesis also include the transparency of research finding (Bhattacharjee, 2012), proper referencing, avoid plagiarism, etc., which we have fulfilled in this study.

4. Findings

Based on the analysis of survey data, the authors believe that in 5 to 10 years, the main consumption group at the current time will become a generation with the most potential. This is because they will have established a long relation with brands and thus having a great chance to trust these brands, which can also prove the point made by Tuten et al. (2004): Because social media is such a new area, marketers are still figuring out how to use them and to what extent they should rely on these platforms when they identify their target markets and try to communicate with them (Tracy et al, 2006).

4.1. Descriptive statistics

We collected 391 valid questionnaire answers, 389 of them were fully completed. A link of the questionnaire was sent to friends in WeChat moments. Because the function of WeChat moments is reflected in a network structure, we couldn't know exactly how many people had seen the questionnaire. The questionnaire included descriptive questions such as age, income as well as suggestions for video products. 26% of participants did not like Douyin and considered it as an addictive app. They claimed that to resist the addiction and time wasting, they decided to delete the App permanently. This is an interesting discovery.

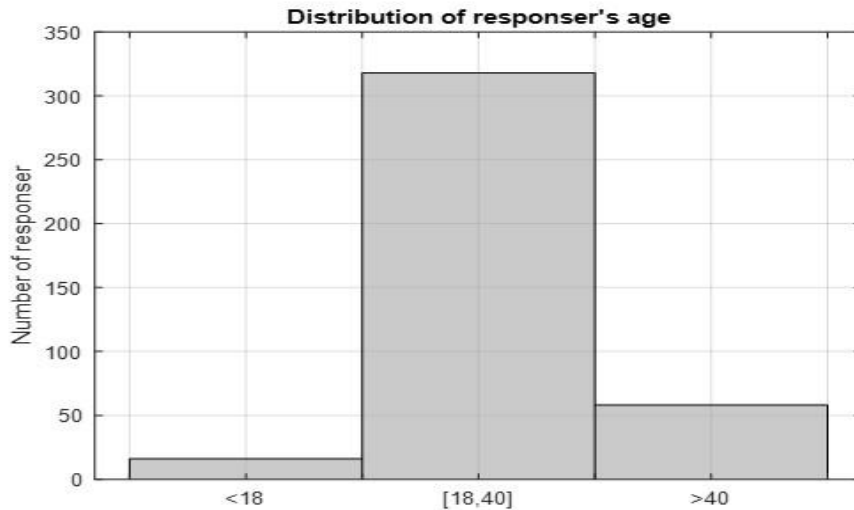


Figure 10: Age distribution

The above figure shows the distribution of responders' age. We can see from the figure that the number of responders younger than 18, between 18 and 40, and older than 40 are 16, 318 and 58 respectively, which equates to 4.09%, 81.33% and 14.83% of the total responders. It means that most of the users of Douyin are young people, on our setting. It will be interesting to compare the distribution of users' age of Douyin with that of TikTok, but unfortunately, we don't have the number from TikTok.

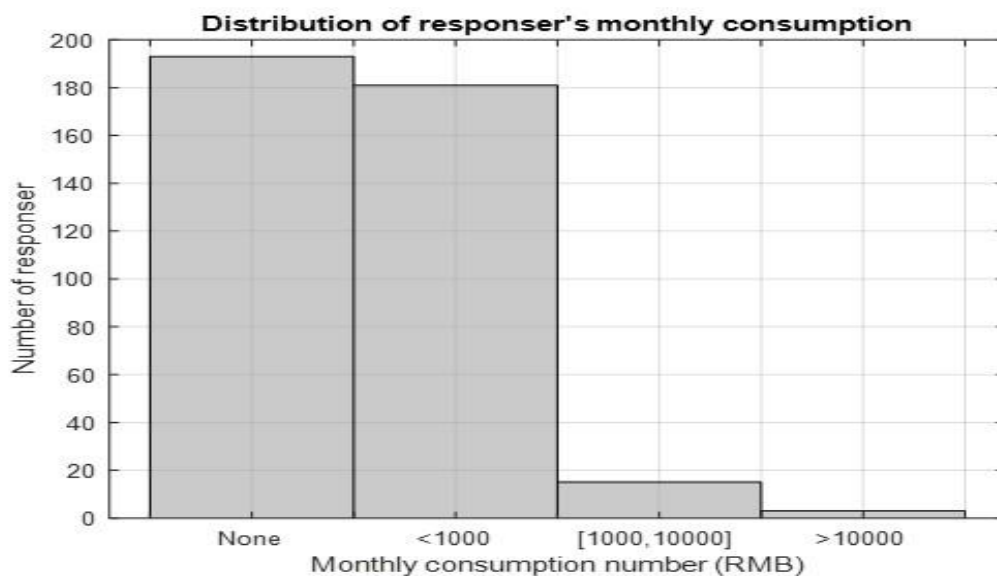


Figure 11: Monthly consumption distribution

This figure shows the distribution of responder's monthly consumption. The number of responders without consumption, have a consumption of less than 1000 RMB per month,

between 1000 and 10,000 RMB, and over 10,000 RMB, this translates to 193, 181, 13, and 5 respectively, which accounts for 49.36%, 46.29%, 3.84% and 0.77% of total responders. We can conclude that the number of users that have monthly consumption is more than 50%, which is an impressive number and means that most of users trust the Douyin platform and would spend money on it. On the other hand, it is also worth noticing that most of the people in the platform spend less than 1,000 RMB per month, so it will be a challenge for the platform to improve this number.

In addition, the questionnaire participants came from 40 different cities of the Chinese provinces. The main answers came from national central cities and economically developed coastal areas, such as the capital Beijing in the north, Shanghai in the east and Guangzhou in the south. These responses, covering all parts of the country and a large number of cities, provide a diverse sample for this study.

4.2. Correlations among various user consumption factors

The following sections provide an analytical result of correlations between (i) Consumption value and others; (ii) video content influence and others; (iii) user habits and others; (iv) ad effort expectancy.

4.2.1. Consumption behavior and its correlation with other factors

The authors sought to study the correlation between (I) Consumption value and others; (II) Video content influence and others; (III) User habits and others; (IV) Ad effort expectancy.

- I. Consumption value and others are factors that lead users to trust Douyin as an ecommerce platform. The factors positively correlate with consumption value as it will be present below
- II. Video content influence and others: Content satisfaction, product interest and motivation to make own content. Focusing on what makes users stay active in Douyin with the effect of other factors.

-
- III. User habits and others: The usage habits of Douyin as an e-commerce platform. Studying what keep consumers attention in correlation with other factors.
 - IV. Ad effort expectancy: The way advertisements impact purchasing. What behaviors does advertisement awaken in relation to other factors.

The most important part is the consumption value, which we shortly summarize the data results here. Among 392 responders, there are 199 responders that have monthly consumption in the Douyin platform, which is a relatively high number accounts more than 50% of the total responders. Among the 199 responders that have monthly consumption, 181 of them have consumption value lower than 1000 RMB, which accounts 94.27% of the total responders having monthly consumption. It is still interesting that 5.73% of people spend more than 1000 RMB in Douyin because this is a relative high amount.

The authors used the relevance of the four variables that are the focus of this thesis (User habits, Consumption value, Ad effort expectancy and Video content influence) to help direct the creation of a model. To verify our assumption, the first step was to convert the Likert scales into digital numbers. In our case, the scale had Strongly Disagree, Disagree Neither Agree or Disagree, Agree and Strongly Agree which were represented by 1, 3, 5, 7 and 9 separately.

The mean value of one responder's answers to the questions belonging to the consumption group was calculated, and then the results of all the responders were separated into 5 groups evenly according to their mean value. The corresponding answers to Ad Effort Expectancy, User habits(experiences) and Video Content Influence belonging to each group were processed individually. The next step was to move the mean value of all the answers to Ad Effort Expectancy belonging to each group calculated after the same calculation procedure is applied to User Habits(experiences) and Video Content Influence.

In the figures below we can see a separate variable (on your right) in correlation with the remaining three types of data (on the left) in order to observe their trends and changes. The mean points of each part are also shown in the Figures. In the figure, consumption value is divided into 5 groups ranging from 1 to 5, and each group contains 27, 97, 159, 85, and 24 responders, corresponding mean points for AD effort expectancy is 2.44, 4.42, 5.22, 5.81 and 7.5, corresponding mean points for user habits is 1.07, 2.44, 3.71, 5.63 and 7.41, and corresponding video content influence is 2.24, 4.08, 4.90, 5.56 and 6.63. As we can see from the figure and results, the consumption value has positive correlation to all the other factors such as video content influence, user habits, and AD effort expectancy.

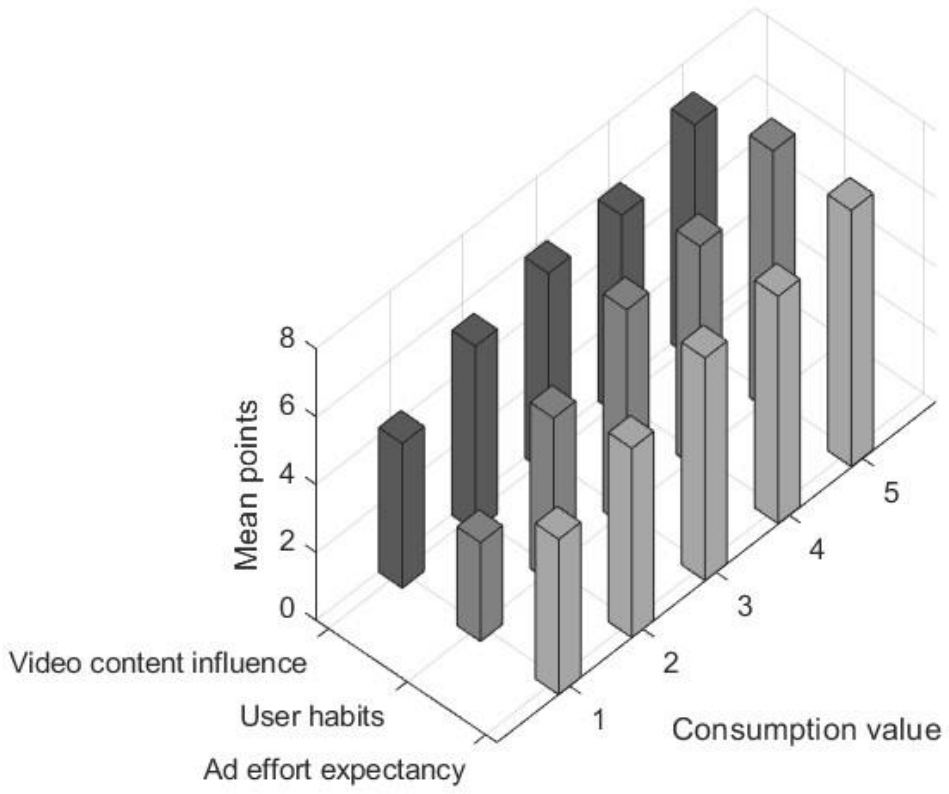


Figure 12: The correlation between consumption value and others

4.2.2. Video contents correlation with other factors

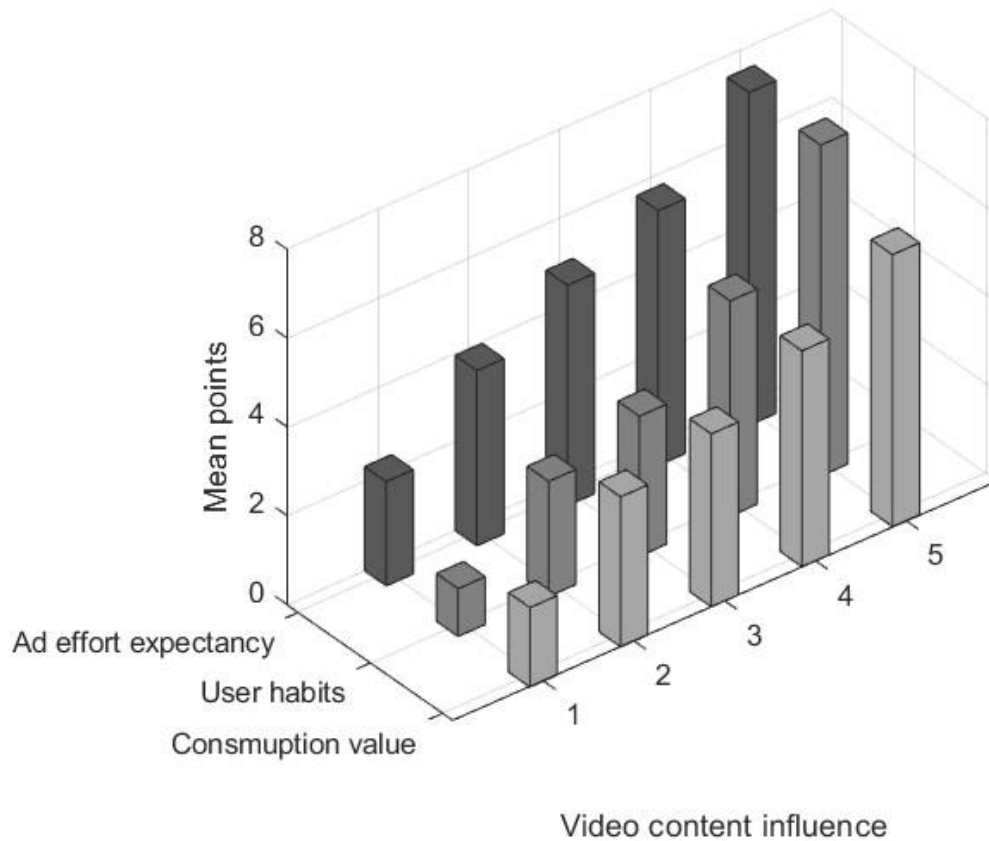


Figure 13: The correlation between video content and others

The figure shows the correlation between video content influence and AD effort expectancy, user habits, consumption value. In the figure, video content influence is spitted into 5 groups ranging from 1 to 5, and each group contains 26, 56, 130, 158, and 22 responders, corresponding mean points for AD effort expectancy is 2.34, 3.94, 4.96, 5.74 and 7.5, corresponding mean points for user habits is 1.07, 2.58, 3.15, 4.84 and 7.45, and corresponding consumption value is 1.78, 3.37, 3.89, 4.86 and 6.12. As we can see from the figure and results, the video content influence has positive correlation to all the other factors such as consumption value, user habits, and AD effort expectancy.

4.2.3. User habits correlation with other factors

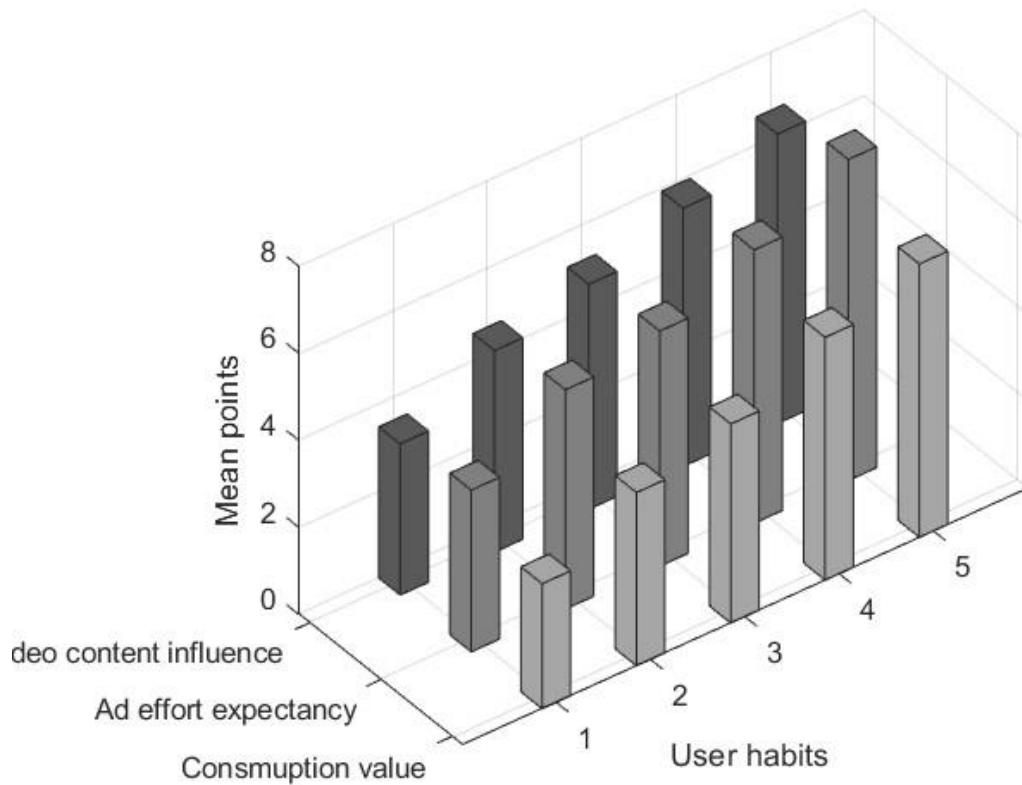


Figure 14: The correlation between user habits and other factors.

The figure shows the correlation between user habits and video content influence, AD effort expectancy, and consumption value. In the figure, user habits are spitted into 5 groups ranging from 1 to 5, and each group contains 88, 133, 102, 53, and 16 responders, corresponding mean points for AD effort expectancy is 3.71, 5.03, 5.40, 6.28 and 7.37, corresponding mean points for video content influence is 3.47, 4.63, 5.16, 5.93 and 6.65, and corresponding consumption value is 2.87, 3.98, 4.57, 5.58, and 6.28. As we can see from the figure and results, the user habits have positive correlation to all the other factors such as consumption value, video content influence and AD effort expectancy.

4.2.4. Ad effort expectancy correlation with other factors

The figure shows the correlation between AD effort expectancy and video content influence, user habits, and consumption value. In the figure, AD effort expectancy is spitted into 5 groups ranging from 1 to 5, and each group contains 35, 89, 109, 130 and 29 responders, corresponding mean points for user habits is 1.82, 3.00, 3.71, 4.63 and 6.03, corresponding mean points for video content influence is 2.85, 4.20, 4.89, 5.21, and 6.34, and corresponding consumption value is 2.51, 3.71, 4.16, 4.68 and 5.64. As we can see from the figure and results, the AD effort expectancy has positive correlation to all the other factors such as consumption value, user habits, and video content influence.

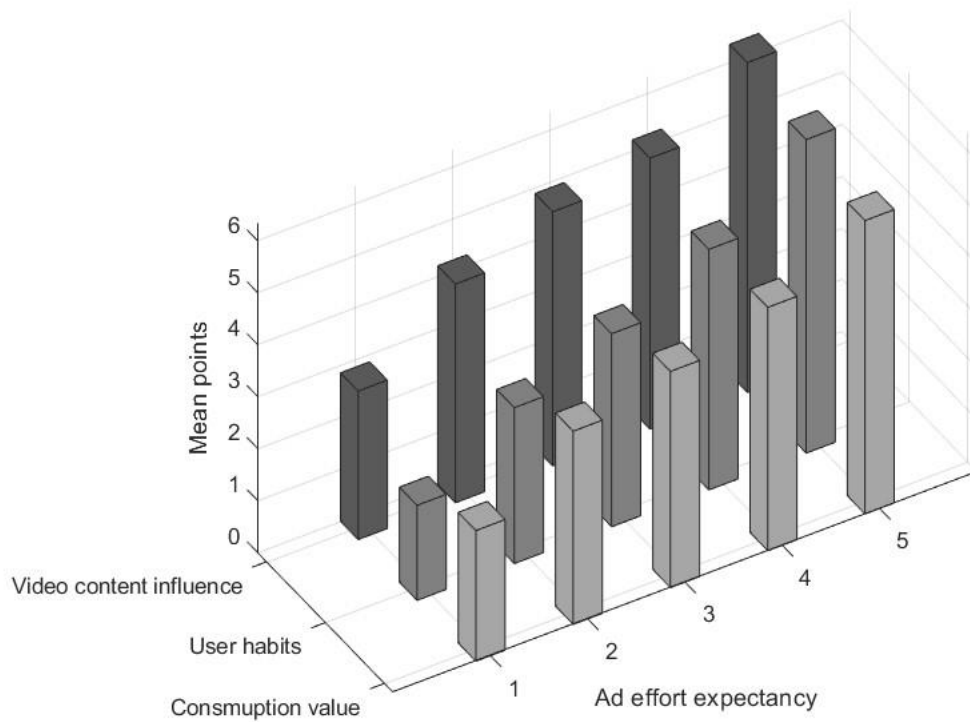


Figure 15: The correlation between Ad effort expectancy and others

4.2.5. Correlation between factors

The regression function in SPSS could have been used to confirm our findings, but after searching literature and we found that there was an exact correlation function formula. So, we chose MATLAB instead of SPSS to display our findings with an algorithm. The purpose of this

choice was because each type of problem reflects the relevance, with the formula, which helps us prove our reliability and authority of our models even more.

Correlation is used to measure the relationship between two sets of variables. In this case the ratio of covariance of two variables to the product of their individual standard deviations.

$$\rho_{X,Y} = \frac{\mathbb{E}[(X - \mu_X)(Y - \mu_Y)]}{\sigma_X \sigma_Y}$$

Here μ_X represents the mean of X , μ_Y represents the mean of Y , σ_X represents the standard deviation of X , σ_Y represents the standard deviation of Y , and \mathbb{E} is the expectation.

The correlation coefficients between 4 groups are shown in the following table. We can see from the table. 3 that video Content Influence and Consumption Value have the highest correlation leading to AD effort expectancy and User habits have the lowest correlation.

Table 4 Quantitative analysis of four correlations

	AD Effort Expectancy	User Habits	Video Content Influence	Consumption Value
AD Effort Expectancy	1	0.505749	0.633355	0.59024
User Habits	0.505749	1	0.66195	0.719646
Video Content Influence	0.633355	0.66195	1	0.767344
Consumption Value	0.59024	0.719646	0.767344	1

4.3. Correlation summary

Once trust is built, smart users will rely on social media to different extents during the whole purchasing procedure (Ma & Hu, 2021), so social media has an upper hand when providing an e-commerce function in the platform. Although TikTok is not mature on monetization, we can see that they are trying different models and various ways to gain revenue (Business of Apps, 2020; Ma & Hu, 2021). It is understood that even though they are not implemented in other countries and regions, online shopping and in-app live purchasing has great potential for interactive platforms.

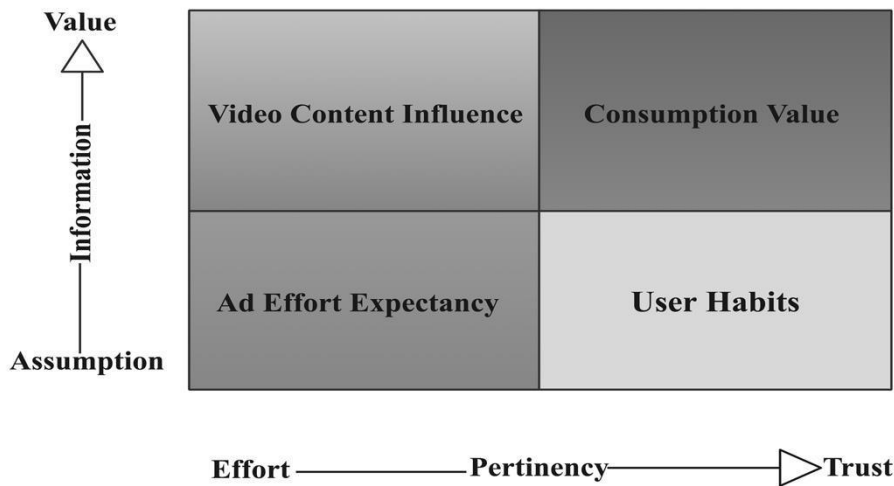


Figure 16: The correlation between the four variables is positively distributed

As shown in Figure 16 in a nutshell, there are two dimensions. One dimension is from AD effort expectancy to video content influence, and the other dimension is from AD effort expectancy to user habits. When users have greater expectations of advertising contributions, the interactive video will have greater value; AD effort expectancy creates assumptions, and based on these assumptions, they provide more information to the users, and consequently increase the consumption value. The same is true if people have greater expectations of advertising, their tendency to use these advertising benefits became a user habit. In such a way that advertisement effort attracts users' pertinency and furtherly converts users' trust. These have caused the number of consumption upgrade to the greatest extent at last.

Based on the data collected we can assume that it is possible to transform an interactive video platform into a consumption platform by cultivating the users' behaviors. By collecting, reading, and processing the users' data, we can conclude that the four factors, video content influence, user habits, AD effort expectancy and consumption value are positively correlated with each other. If enough emphasis is put on these four factors, the users will trust the platform, the probability of an interactive video platform becoming a consumption platform will increase, and the value of the platform will increase.

4.4. Douyin's proposed interactive consumption framework

So far, it has been observed that in the process of cooperating with the platform, brand owners are no longer satisfied with the simple exposure in the form of displaying advertisement, but also hope to use the platform's data insight and content for marketing capabilities to establish deeper content sharing and links with users. TikTok and Douyin can fully utilize its technical advantages and use the conversion rate between platforms to achieve content sharing, collection and searching, and increase awareness and professionalism and authority. For instance, when the video form changes from 2D to 3D, the overall organization of the video content will have richer structured information, it will give online shoppers more perspective and richer detailed information to understand the item, and even invite different people for realtime discussion and analysis.

Therefore, the largest advantage of TikTok in the future is to wake up the silent consumption power in the background by the creation of excellently visualized content from the front end and the precision data technology from the middle platform, which is shown in Figure 17.

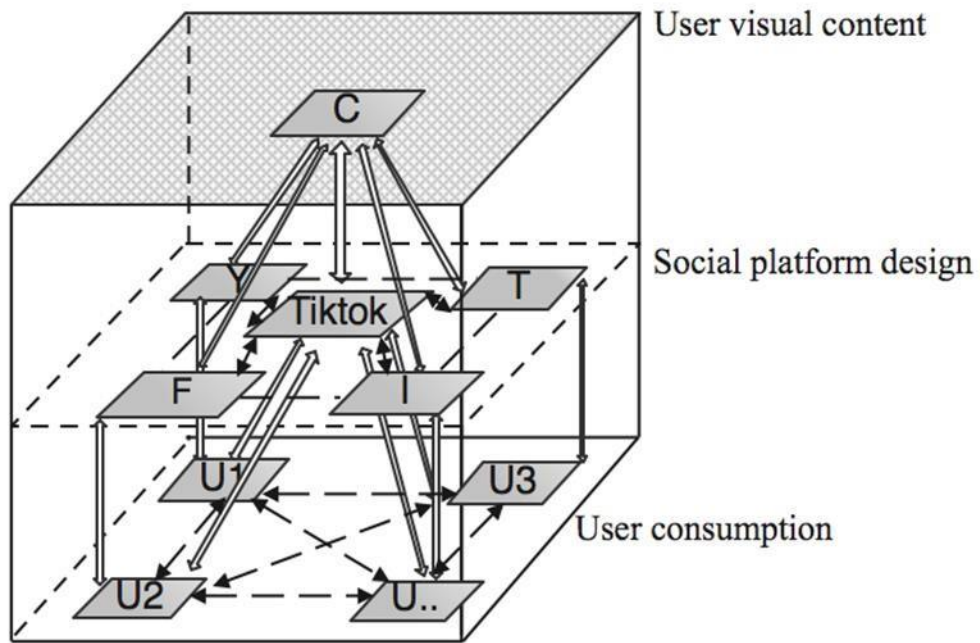


Figure 17: TikTok-style interactive consumption framework.

5. Discussion

This study focused on exploring user consumption behavior on the interactive video platform Douyin in the Chinese market and utilized quantitative to investigate the main factors in the user consumption that are highly correlated. From this study, some implications are concluded in the following parts.

5.1. Implications for research

Douyin is a platform where interaction happens in the form of video (Shutsko, 2020). Interaction is the process in which a sender and receiver use content/information to communicate and influence each other (Snijders et al., 2015). It is evident that Douyin's influence is remarkable, and its success is tremendous since the app has become one of the most downloaded apps in China. Therefore, seeing Douyin as the Chinese version of TikTok having a live e-commerce feature makes it an interesting study for e-commerce features in interactive platforms.

Consumption is the act of using something, purchasing, or wasting (Evans, 2019). Douyin is in demand since it has over 600 million users (CNBC, 2020). An interaction ritual chain is what happens when two people interact over something, such as information or content (Goffman, 1961). Interactive videos make people engage more by introducing users to a new interest or providing users with their current interest through content (Schneider & Bertolli, 2019). In the case of the e-commerce feature in Douyin, a user can purchase whatever they want on a live stream, accessories such as clothes, shoes and more. This makes Douyin a software-based platform that minimizes transaction costs and allows currency to flow (Hagiu, 2009; Ghazawneh & Henfridsson, 2015; Tiwana et al., 2010). This makes Douyin not only a User Generated Content platform (Daugherty et al., 2008) but also a Social Networking Service (Zheng, 2009). Even though Douyin has sophisticated software, this thesis shows that a combination of good software with user centric activities, help application usage and translates into a habit. In our study, we have explored the impact of interactive video on the user consumption behavior, and results have shown that the properties of interactive video have introduced a new type of e-commerce, and greatly increased the consumption amount of users.

Bytedance's vision is to build a global creation and interaction platform. At the same time, they believe that consumption in their products needs more creative ways to engage users. In this thesis, we have concluded that even though Douyin and TikTok are currently two of the most influential and widely used social networking platforms in the world, both still have a long way to explore and improve. The interactive model and important variables that we provide could be of useful elements that enterprises need to consider in a commercial deployment. Douyin's user stickiness does exist, and it is divided into different levels according to the types of users. Douyin evaluates the users' preference depending on whether they have watched videos (comments, shares, likes, follows, etc.) completely, and gains user's loyalty by gradually attracting the users with the similar interests and hobbies. Marketing managers should be deeply involved in information management from the beginning, thus undertaking the task of deciding high-level technical architecture that can effectively collect and analyze information. They must investigate tasks such as the cultivating consumption habits, improving services and building up trust (Ba and Pavlou, 2002). They also need to plan an effective social media for marketing communication campaigns by exploring and finding users' insights to set an aim of understanding the target markets' needs, beliefs, and behaviors (Tuten et al., 2004). Finally, for the overseas markets, market managers need to make programs with their own styles based on local culture and establish communication and deploy cooperation.

5.1.1. Implication for consumption behavior

In comparison to existing research, our research shows and agrees with the fact that social media has a lot of potential and that Douyin as an e-commerce platform is at the forefront of that potential. Not only have we seen social media develop from different forms but we are now seeing what can be incorporated with it in the future. As mentioned in the theoretical background, the authors used the definition of interactive video as a digitally enriched form of the original raw video sequence that allows viewers with attractive and powerful interactivity forms and navigational possibilities. When we look at our study with Douyin, we found out that Douyin fits with the definition well. It is a digitally enriched form of video, and it allows users with attractive and powerful interactivity forms.

However, Douyin's successful e-commerce implementation makes it stand out from current existing interactive platforms. With the possibility of live streaming purchasing, Douyin allows its users to interact with the creators and brands of video content in real time. This new feature

gives Douyin a completely new monetizing method. This escalates to Douyin becoming a commercial interactive video platform, by providing a place for video content creators and brands to promote their product, providing loyal video viewers a chance to get products that they are interested in, and providing an easy way to make transactions. Douyin has brought convenience to creators and viewers, and this expanded its commercial success. This success proves there are still unsailed waters when it comes to social media as suggested by current research. As research suggests the companies of today have great tools to study consumption behaviors with large amounts of data. With tools such as big data, AI and algorithms among others, it is easy to predict a consumer's consumption habit. The authors have provided variables that positively correlate with each other in this thesis by focusing on consumption habits. This is something the authors felt was missing in current research regarding interactive video.

5.1.2. Implications for video content influence

Even though the online shopping has already become a daily activity of people, still how to demonstrate a product is a challenge. Douyin provides an interactive video platform that can directly show the product to users, and also give the owner of product a channel to interact with users and answer their questions in real time. The product owner can also invite celebrities to interact with users to enhance their product's credibility or ask models to try their product in real time and show case the effect online, which are all proved to be successful strategies.

5.1.3. Implications for user habits

Now days, the information in the society is bombing with an exponential scale. On one side, it provides people with more choices, on the other side, it also makes people lose their focus and increases the difficulty to find out the right information. As a platform, Douyin tries to keep users stay on their platform as much as possible. We don't want to judge its motivation and consequence here, but as a platform, it has achieved tremendous success at this point. One of the factors that contributes to this success is that Douyin has developed many innovative features such as fancy content in the form of interactive video and efficiency way to distribute these contents. A stick user in Douyin with the habit to use the platform frequently is the basis for its commercial success. All these methods can be learned by other platforms.

5.1.4. Implication for AD effort expectancy

As mentioned earlier traditional advertisement uses a linear and single direction and exposes product information to consumers passively. Even though there have been more explorations on the improvement of advertisement quality and effectiveness in digital era, they are still in a preliminary stage. Interactive video has done much more by creating a new format of online advertisement, which considers a group of audience as a market where consumption behavior gets attention and awareness by mutually reinforcing and visualizing product information with a completely new interactive method. With this new form of advertisement, Douyin has greatly improved the effectiveness of advertisement since it allows the creators of advertisement to reach their potential buyers vividly, directly, and accurately with the help of big data, and allows the users to get more detailed information about product by interacting with the owner of product in real time. It avoids the traditional dilemma of advertisement waste as mentioned by Wanamaker: “Half the money I spend on advertising is wasted; the trouble is I don't know which half”. This new method has reduced the cost of advertisement greatly than traditional method, hence lowered down the overall cost of product, and brought benefits to both sellers and buyers.

5.2. Implications for practice

From the answers received from the descriptive questions, it can be concluded that users spend the pockets of time opening Douyin. They choose to interact with some familiar people or celebrities based on interests and they habitually want to get involved in understanding the living conditions of these people. These are all consumption behaviors. At the same time, the attractiveness of Douyin is that it provides users, especially young people, with a platform to show themselves, fill in pockets of time, and obtain information. Content in Douyin keeps users interests and makes them stay, and the relationship the users have developed with the brands makes them feel comfortable to use the app and purchase other items in the platform.

The correlation between (i) Consumption value and others; (ii) video content influence and others; (iii) user habits and others; (iv) ad effort expectancy is positive, and we can see an interconnection between the variables. It is our hope that the model presented in Figure 17 can be used as a framework for future studies, engagement model or marketing strategies when Douyin investigates engagement and consumption behavior or expansion. A good thing with the model is that other variables can be added depending on the goal of the study.

The goal of a business is eventually to make profit, and TikTok is trying to innovate by finding alternative ways of monetizing, engaging, and gaining more audiences, which is already shown in the live e-commerce feature of Douyin. Although the e-commerce feature in Douyin shows great potential and builds trust among its users as seen on this thesis, there are still many problems that can't be ignored, e.g., destructive competition between products, the risk of monopoly, coexisting of video contents with different qualities that are not regulated, lacking uniform standard, existing unhealthy content, leakage of users' privacy, security of data and more. As mentioned earlier in the thesis there were about 26% of people who deleted Douyin due to its addictive nature. This could be an interesting finding for Douyin because they can then add some kind of usage tracking feature, which shows the usage of the App. This can be displayed weekly, daily or hourly depending on the metrics that are established as addictive.

5.3. Implications for method

When we set questions to investigate the correlation between the chosen variables, we considered using the RFM model analysis method because we first wanted to understand which users were the most valuable, but we realized later that such a fine segmentation and analysis method needs a stronger purpose and therefore sets a higher requirement to our study. Unfortunately, we did not feel that we could meet such requirements. In other words, the questionnaire we prepared did not refine so many user indicators that we are familiar with. We only had one or two variables, like age and consumption monetary.

We also conceived to implement a hypothetical process using a formula to calculate our findings. We considered possible functions to prove relevance and brought the formula for correlation analysis. Meaning that for the sake of convenience, we used MATLAB to visualize the data. The reason is because MATLAB is more rigorous and more effective in data utilization (Choy and Edelman, 2005). It is the same analysis process for data as the SPSS. There are divided in three steps: defining variables, importing data, analyzing statistics, and obtaining results. When defining variables, we first considered the interrelationship between the four types of questions, which were consistent with our initial assumptions. Because we found a formula for pertinence, we chose to bring in the data, measure the gap between the result and the hypothesis, this was

also the reason we chose this data analysis method since it can draw conclusions more authoritatively. Now it must be reiterated here that our purpose was to look at the correlation between the role of advertisements, user enthusiasm (user habits), video content and the consumption value. The authors sought to build a model based on the correlation between variables shown in figure 16. Of course, when studying this topic, we hoped for a positive outcome, and we were aware of our bias. However, the way the research was conducted, with data calculation and formulas, leaves little room for own assessments. This gives more validity to our research we believe.

6. Conclusion

People around the globe habitually open TikTok or Douyin, enter the name of a household appliance that they need in the search bar to see many scenes with ordinary people like them using this appliance. They can observe it from multiple angles to guarantee its authenticity. People can enter the name of a destination that they wish to travel to and see the lifestyles of the local people just as in a real tour. In an environment where more people are using the Internet to find reliable social sources of information to assist them in reducing their purchase risk, interactive video platform can generate significant returns. This can be seen as a kind of social information where a process of social media transformation happens.

This thesis looked at how consumption behavior correlates with other variables and affects consumption in the Chinese version of TikTok (Douyin), which has an e-commerce feature. Trust plays a big role when it comes to relationships between business and consumers and it's the trust that can bring more profits. Because the more people spread the word of a product, the more attention and customers the product can attract. People are only seeing a portion of what we can expect with the development of technology and Douyin is a good example of a disruptive innovation. The potential is enormous, and the possibilities are endless. The e-commerce feature is a good expansion for Douyin and maybe soon for TikTok as well. Many other businesses have similar functions but not with the same approach and popularity as Douyin in China, and this gives them an advantage. As with many ideas and concepts, it is important with the right implementation strategy and timing (besides all the legal and technological processes). As we have seen with the stories such as Nokia, where the touch technology existed but Apple made it available and disrupted the market.

Also, if TikTok decides to launch an e-commerce feature for its consumers, this research can lay the ground on how consumption behavior and other variables play a key role on such decision. For future research a bigger questionnaire can be arranged, we only managed to get 391 answers of the 600 million users of Douyin. Some Douyin users have VR (virtual reality) glasses to enhance its experience. This can be an interesting addition to the application, as Virtual Reality makes its entrance to the market, for the experience to feel more real and adding fun to its users. Furthermore, the usage of interactive videos can be relevant after the Covid 19 pandemic, since many educational institutions have adapted to virtual learning, interactive videos may be a key foundation for students when doing examinations and communicating in the future. We can also see the developments with NFTs and the Facebook Metaverse which will take live e-commerce user consumption to another level. Last but not least, building models from scratch is scary and going into unknown waters sometimes helps people find rarities. There was some theory which helped guide us to the right direction and it helped scoping the focus of the models and of this thesis. We have now laid a foundation that will help decision makers and interactive platforms expand, also how user consumption can change in the digital landscape. It will be interesting to watch this field grow and unlock its opportunities.

Appendix

The left figure shows the start page of the questionnaire using Tencent’s questionnaire system, and the right figure shows the first question’s content, which has five levels.



The following figure shows the responders number, the questionnaire’s ID, created time and modified time.

问卷附件存储空间容量由原单份问卷500M升级为个人所有问卷共享2G，请知悉

Status	Responders number	ID	Created time	Modified time
状态	回收量	ID	创建时间	修改时间
正在回收	389份	8372010	2021-04-24	2021-04-28

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