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# Video Consumption, Social Networking, and Influence

REVENUE FROM CHINA's online entertainment market reached approximately \$200 billion this year.<sup>a</sup> It is not surprising that China's video market is comparable to the U.S.,<sup>b,c</sup> in fact the number of online video users in China is 2.5 times more than that of the U.S. (that is, 212 million U.S.-based users<sup>d</sup> compared to 579 million users in China).<sup>e</sup> Due to advancements in broadband and mobile technology, online video is the fastest growing area for China's Internet, with a growth of around 50% over the past five years.<sup>f</sup>

a Statista; <https://www.statista.com/statistics/237772/value-of-the-chinese-entertainment-and-media-market/>

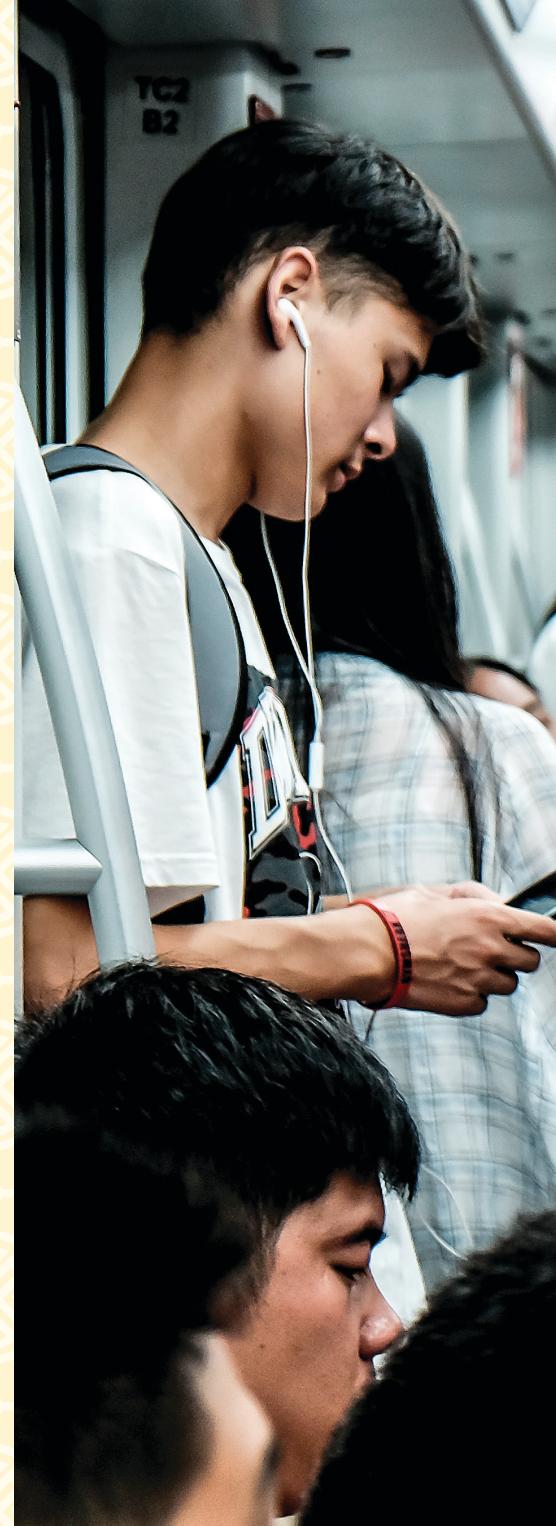
b Statista; <https://www.statista.com/statistics/278574/revenue-of-chinese-online-video-industry/>

c Statista; <https://www.statista.com/statistics/459396/digital-video-revenue-digital-market-outlook-usa/>

d Statista; <https://www.statista.com/topics/1137/online-video/>

e Statista; <https://www.statista.com/statistics/279537/number-of-online-video-users-in-china/>

f Revenue Growth of China's Online Video Industry; [http://www.iresearchchina.com/content/details7\\_44334.html](http://www.iresearchchina.com/content/details7_44334.html)



The landscape of China's online video industry has as many similarities as differences with the U.S., presenting extremely interesting observations and insights. This article provides an overview of the market, dominant players, and business models, as well as presents intriguing product nuances and technical advances in this area.

Like the U.S., there are two major categories of services for online video: the head and the tail. The heads are the premium players that stream



copyrighted shows and movies. They are the Netflixes and Hulus of China. The tails present professionally generated content (PGC) and user-generated content (UGC) for different market segments. They are the YouTubes and Snapchats of China.

### The Head: Premium Video Platforms

The top three players in premium online video are iQiyi, Tencent Video, and Youku. These companies are affiliated with Baidu, Tencent, and

Alibaba, respectively. Statistics from QuestMobile, China's big data services provider, shows that both Tencent Video and iQiyi recorded around 500 million monthly active users by the end of 2017, and around 300 million for Youku. The iQiyi video platform, that went public on NASDAQ last March, also leads in total watch hours.<sup>g</sup>

Unlike the premium video services in the U.S., the major players in China

all started with free services supported by advertising. Total ad revenue for online video was approximately \$10 billion, catching up to ad revenue generated by commercial television.

However, we have seen a huge take off in subscriptions over the past two years, when users started gravitating toward (and paying for) platforms that were ad-free and offered additional features such as access to higher-quality video and member-only original content. iQiyi counted 60 million subscribers as of Feb.

<sup>g</sup> Prospectus iQIYI Inc; <https://bit.ly/2ouHhzO>

## Due to the prevalence and popularity of video streaming, both infrastructure and application companies in China have invested heavily in video technology.

2018, and Tencent Video has over 40 million. By comparison, Netflix had about 55 million U.S. subscribers and 63 million international subscribers as of January 2018.<sup>h</sup>

Payment practices have been forming rapidly among the middle-class and young Internet users in China over the past few years. The major driving forces behind this movement include a concerted crackdown on pirated content, affordable prices, and, most importantly, the ease of online payment.<sup>i</sup> The monthly subscription price is between 20 RMB (\$3.16) to 40 RMB (\$6.32) for each of the three services. The total market size of Internet video subscription services has increased dramatically, from about \$63 million in 2012, to \$2.1 billion in 2016, and an estimated \$11.5 billion in 2022.

Unlike premium content distributions in the U.S., many of the TV dramas and movies are non-exclusive, available on all three major services and elsewhere once they aired on TV or in movie theaters. Exclusive content is usually far more costly. All services invest heavily in copyrighted movies and TV shows, resulting in very high production prices for this content. Platforms often must make a calculated bet on what shows will prove popular, and make an offer before production. According to its prospectus, iQiyi's annual content cost is about \$1.9 billion, while the other two platforms spent nearly double that. These purchases are far beyond subscription fees and advertising income. According to its public filing, iQiyi lost \$169 million Q1 2018,<sup>j</sup> and the other two services also lost similar sums.<sup>k</sup> This situation will continue for the next few years.

To reduce costs, and to stand out among their peers, all three premium services have started to make origi-

nal content exclusive on their own platform.<sup>l</sup> The lead player for original shows is iQiyi, although all three had different hits. Unlike U.S. platforms where TV dramas tend to reign supreme, variety shows garner a greater audience in China. According to a recent *Wall Street Journal* article,<sup>m</sup> "The Rap of China," a 12-episode hip-hop rap competition reality series created and shown by iQiyi targeting younger audience, has become "China's most popular entertainment program in 2017." The show attracted 2.7 billion views during its run from late June to early September. Short videos clips gleaned from the show were watched eight billion times on the social media platform Weibo.

Another fact about China's premium online video services that differs from their U.S. counterparts is that they all participate in PCG and UGC short video markets. But, as we will discuss, other emerging players are increasingly dominating these segments.

### The Tail: UGC and PGC Video Platforms

With more than 100 players and 400 million users in 2017, the short video landscape in China is hugely dynamic, and far from settling down. The user base is huge, fast growing, and extremely active. There are several major players, and most of them came into prominence over the last year or two.

Unlike the U.S. market, the initial dominant short video platforms were the premium players, like iQiyi and Youku. For example, Youku claims to have invested approximately \$1.6 billion in user-generated content since 2015.<sup>n</sup> They are modeled after YouTube and had a large number of viewers watching a mixture of premium and UGC content. Their short-form videos include movie clips and music videos as well as free-form user-created content, and they provide channels created for professional content producers.

<sup>h</sup> Recode: Netflix now has nearly 118 million streaming subscribers globally; <https://www.recode.net/2018/1/22/16920150/netflix-q4-2017-earnings-subscribers>

<sup>i</sup> CNN: China's big streaming shift: Paying instead of pirating; <http://money.cnn.com/2018/01/24/technology/china-streaming-music-video/index.html>

<sup>j</sup> iQiyi First Quarter Financial Results; <https://bit.ly/2LfxGRK>

<sup>k</sup> Forbes; <https://bit.ly/2KOHQ9v>

<sup>l</sup> iResearch: 2017 Report on Original Video Productions in China; [http://report.iresearch.cn/report\\_pdf.aspx?id=3088](http://report.iresearch.cn/report_pdf.aspx?id=3088)

<sup>m</sup> *WallStreetJournal*; <https://on.wsj.com/2hGe7Nk>  
<sup>n</sup> Youku making \$1.6 billion investment in UGC; [http://www.chinadaily.com.cn/business/2015-08/07/content\\_21525850.htm](http://www.chinadaily.com.cn/business/2015-08/07/content_21525850.htm)

However, in the past two years, we have witnessed the phenomenal growth of several mobile short video apps not associated with the premium players. Thanks to their ease of use, these apps became super popular and prevalent, penetrating a huge number of users in massive areas of China (see Figure 1). We saw a 311% increase in short video traffic in Q3 2017 compared to one year earlier.<sup>o</sup> Analysts labeled the China Internet era of 2017 as “the year of short videos.”

New popular short video services include Kuaishou, Huoshan, Xigua, Douyin, Miaopai, Meipai, Weishi, and many more. The most popular of them have monthly active users in the 100 million–200 million range. The app experience is mostly a flow of mobile video feeds, with videos running seconds to minutes long. The app provides good tools for users to shoot, edit, beautify, and add special effects to the videos. These video apps can be divided into two categories: those more like the “dubsmash” mobile app, where users can record their own video dubbing over music, and those more like Snapchat with free-form videos. All video apps provide strong discovery and follow functionalities, encouraging interaction and social connections among users.

More specifically, videos in Xigua are mainly PGC content and video clips running 1–5 minutes long. Content in both Huoshan and Kuaishou are short UGC videos of about 15 seconds. Many everyday users, especially those in the rural area and small cities, record short videos and share them via these apps.<sup>p</sup> The apps provide a method for users to present themselves, compete to gain fans and eyeballs, and eventually profit from the viewership. Kuaishou, with daily active users of close to 100 million, is the current leader in this category. Using a slightly different format, Douyin has recently received considerable attention and gained a significant user base, claiming more than 150 million monthly active users.

<sup>o</sup> Short Video Report from iFeng; [http://tech.ifeng.com/a/20180104/44831545\\_0.shtml](http://tech.ifeng.com/a/20180104/44831545_0.shtml)

<sup>p</sup> QuestMobile: China Lower Tier City Post-90s' Mobile Life; [https://www.questmobile.com.cn/blog/en/blog\\_138.html](https://www.questmobile.com.cn/blog/en/blog_138.html)

Douyin, as well as competing apps like Weishi, allows users to create and share short music videos using provided templates.

Another large set of online video services focuses on end user live-streaming: they provide live-broadcasting capabilities for consumers, popular pop idols, and the general public. According to Pandaily, eight live-streaming platforms in China raised approximately \$11.6 billion in the first half of 2018. The leading platforms—Huya Inc. and Douyu TV—account for nearly 70% of the total.<sup>q</sup>

Just like all premium players provide UGC, all short-video players also work on live streaming. The situation is highly dynamic; the landscape was quite different several months ago, and it is likely to be very different a few months from now.

Still experimenting with business models, the new mobile video apps make money through advertising, affiliate marketing to e-commerce, gifting, and other creative methods. The top “VIPs” on these platforms may have millions of fans, and they profit by advertising or selling goods. Brands also start to create channels on these platforms. According to the China's Short Video Industry Report from iResearch, the revenue from the short video arena reached \$860 mil-

<sup>q</sup> Pandaily: 2018 Report on Live-streaming; <https://bit.ly/2mbdhHT>

lion in 2017, and is expected to exceed \$4.5 billion by 2020.<sup>r</sup>

We are just beginning to see the great potential of China's short video market; it will evolve in the coming years. There is a trend of going vertical, with different players specialized in a domain or a demographic. With fierce competition within China, many of these short video apps made their ways overseas, in particular, to other Asian countries. For example, Kuaishou was the Number One video app in the Korean app store in November 2017. According to an April 2018 report from 36kr, almost half of the popular short video apps in Asia were “made in China.”<sup>s</sup>

### Mobile and Social via Video

Large screens, including TV and other OTT television devices, are heavily regulated in China. Due to the high penetration of mobile devices, the usage of online video tilts strongly toward mobile. Even for the premium users, the dominant media preference is mobile and personal computers. According to iQiyi, it has on average 421 million monthly active users (MAU) on mobile and 424 million MAU on PCs in Q4 2017, while TV and OTT devices are negligible. Many short video applications are

<sup>r</sup> iResearch: 2017 China's Short Video Industry Report; <https://bit.ly/2zA2Mac>

<sup>s</sup> 36kr: Made in China; <http://36kr.com/p/5130958.html>

Figure 1. A sample of logos for popular short video apps in China.





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designed for and used exclusively on mobile devices.

Most people using online video—premium or UGC—are quite young. According to iResearch, about 83% of iQiyi's mobile users in August 2017 were younger than 35. The demographic is similar for short videos, with more than 80% of users younger than 35.

A major difference between the premium video products in China and in the U.S. is the emphasis on social features. If you look at the video discovery or display pages carefully, you will find sharing buttons on every page, linking to every possible social network. Excerpts from the longer shows, like songs or jokes, are often very popular clips for users to share. These services also provide interaction such as screen bullets, comments and love buttons, to improve the social experience while watching (Figure 2).

Another type of social interaction for the premium video service is with media stars. iQiyi PaoPao is a place for celebrities to interact with their fans. Hundreds of movie and TV stars have their home pages set there, with 20 million fans following the top stars. iQiyi claims 600 million active users in PaoPao, who are proven to be more sticky, watching 20% more videos on average than other users.

For short video apps, a significant emphasis is on social functions. These short video apps provide many ways for interaction, including discovering people with similar inter-

ests, follows, claps, love, comments, and gifting. The app platforms compete by paying large sums of money to the popular “VIPs,” encouraging them to set up channels on their platform.

For a short video app user, the number of fans defines success, and the top “VIPs” have more than 30 million fans. To become a “VIP,” users compete to create attractive, frequent content, and stimulate excitement with their fans. A slogan popular among the top users is “300 clips a day!”

### Technical Opportunities and Challenges

With the prevalence and popularity of video streaming, both infrastructure and application companies in China have invested heavily in video technology. Generally, a video startup time of less than two seconds is considered “good;” of course, one needs to consider the video quality, device type, network situation, and other factors to make a specific judgment. According to a 2017 report from China Broadband Development Alliance, the average video startup time (VST on broadband) was between 0.6 to 1 second, which is better than the world standard.

What is unique about China's Internet market that fosters technical advancements and innovation? We can call out a few examples: mobile dominance, the huge number of users and available user data, the massive scale of user-generated content, regulatory requirements, ever-changing

**Figure 2. A typical page from the iQiyi website with bullet screen.**



user interests, and extremely fierce competition.

Features more suitable for mobile viewers, like usage scenarios that support watching movies while commuting on public transit, add to the success of these platforms. For example, all premium video platforms provide offline viewing as a default feature, while short video apps provide offline information such as news for people to view while not connected.

All video providers rely on personalized recommendation; it is especially important for short videos as the main method to discover videos of interest. A commercial recommendation system employs large-scale machine learning on real-time streaming data and tries to optimize metrics such as the click-through rate, time spent, and user retention. With the availability of large amounts of data from both first- and third-party vendors, one thing that distinguishes recommendation systems on China's Internet from the rest of the world is its sheer scale: Alibaba claims its machine-learning platform—eXtreme Parameter Server (XPS)—processes 10B samples and 100B features daily,<sup>t</sup> while the Toutiao platform claims tens of billions of features and billions of vectors.<sup>u</sup> By the same token, strong recall technology is developed to select the top few thousand results from millions of potentially low quality or redundant user-generated content.

In general, machine learning is used to annotate, classify, and analyze video content, and to build user profiles based on the user's geographical location and browsing history. It then uses such information to match a user to videos that reflect their interests. Instead of a 'pull' or 'subscribe' model, many of the Chinese short video apps 'pushes' the relevant content to viewers' home pages. Since most Chinese viewers are quite receptive to pushed information, recommendation technology is very effective, and users can indulge in content they like for hours a time.

<sup>t</sup> Alibaba's eXtreme Parameter Server; [http://m.sohu.com/a/210104407\\_473283](http://m.sohu.com/a/210104407_473283)

<sup>u</sup> CSDN: Recommendation System in Toutiao; <https://bit.ly/2NJVS5n>

For short forms, users upload videos to platforms every day, which may contain inappropriate content such as pornography, content that infringes on copyrights, and duplications. Although many of the media companies have thousands of human editors, it is difficult to manually examine all contents in real time. To react quickly to the market, video companies developed adaptive machine models that work together with human editors to prescreen and filter out potentially problematic videos. Necessity also prompted the rise of high-tech providers such as SenseTime that specialize in image and video reviewing technology.<sup>v</sup>

Another important application of AI is to add special effects to user-generated videos. For example, Chinese users often want features such as beautifying faces, adding special costumes, and changing backgrounds. To do so, one needs to detect facial key points and perform highly accurate face and hair segmentation. The related technologies, such as style transfer and object segmentation, are active areas of research in computer vision. Significant progress has been made in recent years using deep learning. In addition, augmented reality (AR) also has a lot of interesting usage on video, like blending fake objects with video backgrounds. These technologies help users create more interesting videos that are better fit for sharing.

To monetize the contents, all video platforms use computational advertising to display ads targeting users based on their personalized interests. In addition, many innovative video technologies are used in video ads, for example, ads overlaid on the videos, ads inserted in live broadcasts, ads on bullet screens, 360 ads integration with direct sell, and more. For example, one video ad service provider—Video++—claims to have more than 9,000 clients using their technology to integrate direct sell ads into streaming video.<sup>w</sup>

Mobile video apps have also presented interesting technical challenges to machine learning and com-

puter vision. Instead of inventing new algorithms, the practical solution was to apply the PC applicable algorithm to mobile. For example, to improve speed, or to use local data, a ML model inference for object recognition may need to be done on a mobile phone. In such circumstances, the size of the ML model must be small enough to fit, and even better, optimized to the phone hardware.

China's streaming video companies continue to explore many other ways to innovate with technology. For example, Tencent tried to use robots to write articles for live news, and Youku tested auto caption translation. Technology is also used to predict user reactions and suggest content investment in media. iQiyi, for example, claimed to have casted actors in their original shows based on AI predictions.

## Summary

Online video, or online media in a larger setting, is one of the best places where technology creatively meets user experience. Through online media, there are infinite ways to connect hundreds of millions of users to billions of pieces of information. This is an exciting time for China's online video market, as it has just realized mass-market adoption. We look forward to the new technological innovations to come.

<sup>w</sup> Buying while watching videos; <https://www.huxiu.com/article/161897.html>

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