An Empirical Study on the Application of Short Video Platforms in Chinese Public Libraries: Based on the Evidence from Douyin (TikTok)

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Abstract. This study explored the current characteristics and use of Douyin (TikTok) application by Chinese public libraries by adopting the city-tier classification. 213 accounts were analyzed using statistical and content analysis. The results indicated that the application has been gaining popularity since 2018, majority of accounts that have been created are of public libraries from less developed regions, instead of libraries from metropolises with resources and financial advantages. The contents released by public libraries from different city-tiers have their own characteristics. The most popular content was posted by the libraries from second-tier cities. This paper also provides insight into the positive and negative factors affecting the development of these libraries, especially those libraries that desire to engage with users on short video platforms.

Keywords: China, public libraries, short video platforms, Douyin, TikTok, empirical study

1. Introduction

In recent years, China has been committed to the development of the digital economy. The "13th Five-Year Plan for National Economic and Social Development (2016–2020)" clearly stated that China "will accelerate the development of emerging industries such as online audio, video and mobile multimedia" [1]. Nowadays, short video platforms are very popular, as they help people in adapting themselves to the quick pace of the modern lifestyle. According to the 48th Statistical Report on Internet Development in China, the number of online video users in China is 944 million, of which 888 million short video users account for 87.8% of the total Internet users. The per capita single-day use of short video platforms was 125 minutes, that was 27 min higher than that of long video platforms. This gap is increasing day by day, as 53.5% of short video users watch such video content every day; this is 17.2% higher than the percentage of users of long video platforms [2]. Short videos have become a cultural phenomenon, and a window for Chinese people to showcase their colorful lives.

ByteDance launched a short music video app "A.me" in September 2016. It was renamed as "Douyin" (meaning "shaking sound" or "vibrato") only three months later. In May 2017, the international version of "TikTok" was launched. Their logos and functions are exactly the same, but data isolated since the beginning. With a series of successful business practices, Douyin has rapidly grown into China's most popular short video platform, as of August 2020, the number of daily active users of Douyin exceeded 600 million [3].

A market research report shows that short video platform users not only use the platform for entertainment, but also for "obtaining information and increasing their insights" reached 54.4% [4]. Douyin claims that it has become an important platform for knowledge dissemination. In 2021, pan-knowledge content accounted for 20% of the platform's total broadcast volume, a year-on-year increase of 74%. It is one of the most favorable content [5]. At present, Douyin is being used by many government departments, popular science organizations, and educational institutions. As a public knowledge service department, the library is responsible for the important functions of disseminating knowledge, incorporate differential culture and creating community harmony. The short video platform such as Douyin, provides libraries with new opportunities for promoting and strengthening connections with the users.

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2. Review

Social media has been an important means for promotion of libraries. Ninety-six percent of public libraries in the US use social media platforms like Facebook, Twitter, YouTube, and Instagram as channels of communication [6]. Before Douyin or TikTok, the libraries had already established some short video platforms such as Twitter Vine, Sina Miaopai, and Tencent Weishi in China [7-8]. Although these platforms were either discontinued or are no longer popular, the previous experience of the libraries can be utilized for maintaining their accounts on similar platforms like short video platforms [9], benefiting from the opportunity to employ a new tool for user engagement [10]. The content push driven by the Douyin algorithm broke through the closed social network model in the past, which makes it unique from other social media platforms that are modeled around following and followers. A Douyin video from a user with absolutely no followers can quickly attract audience, as it appears in other users' "For you" feeds.

Douyin has rapidly gained popularity, but the Chinese library community has been focusing its attention toward it since the past three years. Xin compared six Chinese short video platforms and found that the public library accounts on Douyin were far more than those on other platforms and were also more active [11]. Guan found that nearly 80% of Douyin library accounts were created by public libraries, which means that public libraries are more concerned about their social visibility than their academic peers [12]. Zhang and his team conducted a survey in China to examine the status of 70 public libraries accounts [13]. This was followed by similar works, mainly focusing on large-scale provincial public libraries [14-17].

However, the author believe that in-depth review of these studies needs to be conducted with regard to their scope, as China is a vast country, and its economic disparity results in significant imbalance in the development of public libraries in different regions; the libraries thriving in cities and core metropolitan areas are likely to receive far more resources and financial support than those in less developed regions. As far as their social impact is concerned, it is beyond the former. Whether such realities are also reflected on Douyin is still unclear, and the author believes that it is inappropriate to ignore such small-middle scale libraries, which might be overshadowed by the popular ones.

3. Method

3.1. Multi-tier Classification of Cities in China

The cities in China are characterized by diversity. There are not only international metropolitans such as Beijing and Shanghai, but a large number of small cities that might be facing financial constraints as well. The disparity in available financial support has a direct impact on the functioning of public libraries. The Rising Lab from Yicai Media Group has been publishing an annual report "The ranking of cities' business attractiveness in China" since 2016. The report assesses 337 Chinese cities based on the concentration of commercial resources, urban hubs, urban residents' activities, lifestyle diversity, and future predictability. Currently, the classification system on the above mentioned parameters has been widely adopted in China and worldwide. Based on the latest report in 2021 [18], this article places the public libraries into four groups for further analysis. The details are given below:

- First-tier group: Public libraries from four first-tier premier cities, including Beijing (the capital of China), Shanghai (the biggest city), Guangzhou, and Shenzhen (both from Guangdong, which is the most developed province in China).

- New first-tier group: Public libraries located in 15 influential cities and nine provincial capitals, in addition to the two municipalities.

- Second-tier group: Public libraries from 30 large regional cities, among which 11 are capital cities of the provinces.

- Third-tier and lower group: Public libraries located in other cities that have not been mentioned above are mainly distributed in the inland provinces and are in the less developed areas such as China's great-west. Accordingly, their size and influence are relatively small.

3.2. Data Collection

A survey of the public library accounts was conducted on Douyin between November and December 2021; the steps have been enumerated below:

Step 1: The keyword "library" was used to search on the Douyin and was limited to "certified accounts." A total of 260 accounts were found that were manually checked to exclude non-public libraries and accounts without content. Finally, 213 accounts were selected.

Step 2: The basic information of the accounts was analyzed, including profile images and brief introductions, along with the available data, such as the number of likes, followers, and videos.

Step 3: The accounts were backtracked to confirm the update status within 90 days and the dates on which they became operative.

Step 4: The videos of selected accounts were browsed one by one, and the contents were categorized.

4. Findings and Discussion

4.1. Number of Accounts and the Operating Entities

In China, due to the economic and demographic advantages of first-tier and new first-tier cities, public libraries in these cities have assumed the role of activists in marketing activities. However, as shown in Figure 1, among the 213 accounts available for analysis, a large proportion (58.2%) were from the third-tier and lower group, while the second-tier group accounted for 20.2% accounts, which was almost equal to the combined accounts of first-tier and new first-tier groups (21.6%). This result showed that the major players in library marketing on Douyin were small and medium-sized libraries that were easily overlooked. Due to limited resources and financial support, it was difficult for this group to make its existence felt. But now these libraries also have a chance at equal participation and opportunities in the decentralized visual platform provided by Douyin.
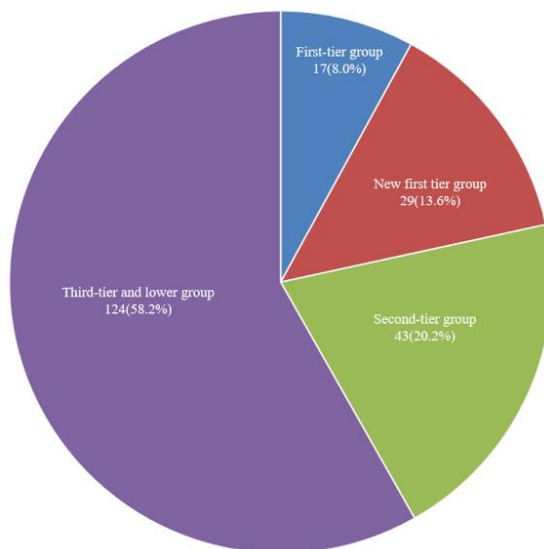

Fig. 1: Number of accounts on Douyin of public libraries

4.2. Creation of Library Accounts and Impact of Coronavirus Disease 2019

In the second quarter of 2018, the first batch of the three pioneers, Hangzhou Library (new first-tier), Linyi Library (second-tier), and Shuozhou Library (third-tier), appeared on Douyin, showing a bottom-up move 12 months ahead of the leading public library, The National Library of China. Figure 2 illustrates that public libraries have regularities in creating accounts for Douyin. First, the data presents a clear distribution of accounts' launch time on an annual basis, which indicates that accounts of public libraries should be planned rather than allowing creation of random accounts. Since the long Chinese New Year holiday usually falls in February as per the Gregorian calendar, the librarians and citizens are on vacation during this period, so the accounts are often opened in the second quarter of each year. Second, twin peaks appeared in early 2020 and 2021 that were unusual, and

many libraries considered launching their accounts during these periods. This was greatly impacted by the coronavirus disease 2019 (COVID-19 pandemic).

At the end of January 2020, China urgently closed almost all public places to contain the spread of the virus and the Internet become the only channel for continued interaction between the libraries and communities. Twenty-two public libraries responded immediately and opened their accounts in the first quarter. Among them, the third-tier and lower group was (n= 14) the most active, and accounted for 63.6% of the total accounts. Subsequently, a large number of public libraries began to join and support anti-epidemic activities in the second quarter, which led to the first rush hour. The second peak appeared in the first quarter of 2021, one year after the outbreak of the pandemic. Accounts of 35 public libraries became operative with content that focused on collecting reviews on events. The number of valid accounts launched in each period is listed in Table 1.
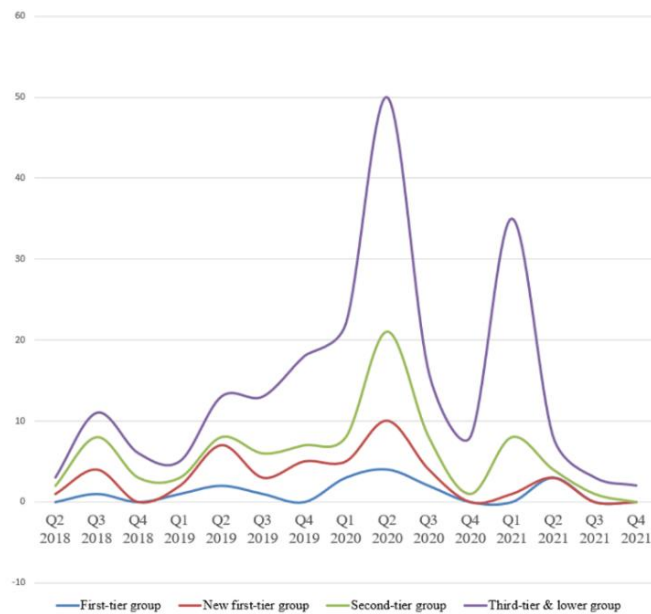

Fig. 2: Stacked line of date of creation on Douyin of public libraries, 2018-2021

Table 1: Number of accounts launched for the public libraries between 2018 and 2021

Launch time	First-tier group	New first-tier group	Second-tier group	Third-tier and lower group	In Total
Q2 2018	0	1	1	1	3
Q3 2018	1	3	4	3	11
Q4 2018	0	0	3	3	6
Q1 2019	1	1	1	2	5
Q2 2019	2	5	1	5	13
Q3 2019	1	2	3	7	13
Q4 2019	0	5	2	11	18
Q1 2020	3	2	3	14	22
Q2 2020	4	6	11	29	50
Q3 2020	2	2	4	8	16
Q4 2020	0	0	1	7	8
Q1 2021	0	1	7	27	35
Q2 2021	3	0	1	4	8
Q3 2021	0	0	1	2	3
Q4 2021	0	0	0	2	2

4.3. Number of Videos

The number of videos comprises the basic data that can be used to determine the productivity of an account. Table 2 indicates that more than half of the videos (53.2%) were contributed by public libraries from the third-tier and lower group. With respect to the output capacity of each unit, first-tier and new first-tier groups performed better, with the average number of videos released by them being approximately 30% and 45% higher, respectively, than those released by the others. It can be seen from the coefficient of variation (cv) that the dispersion of video numbers of the new first-tier group was significantly less than that of the other types, which can be attributed to the status of the administrative region of the new first-tier group: it basically include provincial-level libraries, characterized by consistent staffing, government support, and provision of other resources, and contribute toward promotion of reading and city services; hence, their accounts have similar outputs.

Table 2: Number of videos posted for public libraries

Group	No.	%	Mean	Coefficient of variation (cv)
First-tier group	2,226	9.7	130.9	1.2
New first-tier group	3,993	17.4	137.7	0.8
Second-tier group	4,502	19.7	104.7	1.2
Third-tier and lower group	12,164	53.2	98.1	1.5
All	22,885	100.0	107.4	1.3

4.4. Number of Likes, Followers, and Like-follower Ratio

The results in Table 3 and Table 4 show that the second-tier group occupied the top-most position in these categories (maximum likes and followers). As a simple number comparison does not reflect the attractiveness precisely, the like-follower ratio is commonly used by rating agencies to evaluate the performance of short video platforms. A good work not only receives likes from followers, but is also able to obtain a large number of likes from the non-followers, in case it goes viral. Therefore, the larger the ratio, the more it is appreciated. The availability of abundant resources to the public libraries that comprise the first-tier group is expected to contribute immensely to the likes-to-follower ratio, but the result reflects that this group came bottom with at ratio 6.78, indicating that for readers living in highly developed metropolises, the usual library marketing content does not have enough impact on the audience. The results of the like-follower ratio (17.68) further confirmed the lead of the second-tier group (Table 5). It is noteworthy that the cv value of this group was also the highest, and some members had found the key to success in creation of videos that are likely to become popular, while others still suffer from lack of inspiration.

After checking all the videos posted by the top five libraries with the highest like-follower ratio in the second-tier group, the author found that video series having humorous components or displaying events/incidences reflecting a sense of patriotism (e.g., major national events) had the maximum like-follower ratio. The results reveal that such kind of content is likely to be appreciated and produce emotional resonance in the Chinese (Table 6).

Table 3: Number of likes for public libraries

Group	No.	%	Mean	Coefficient of variation (cv)
First-tier group	1,736,191	10.1	102,128.9	3.2
New first-tier group	3,845,326	22.4	132,597.4	4.3
Second-tier group	10,717,448	62.4	249,243.0	5.5
Third-tier and lower group	874,122	5.1	7,049.4	3.3
All	17,173,087	100.0	80,624.8	8.2

Table 4: Number of followers for public libraries

Group	No.	%	Mean	Coefficient of variation (cv)
First-tier group	256,101	18.8	15,064.8	2.3
New first-tier group	378,783	27.8	13,061.5	3.8
Second-tier group	606,182	44.6	14,097.3	4.8

Third-tier and lower group	119,210	8.8	961.4	2.1
All	1,360,276	100.0	6,386.3	5.9

Table 5: Like-follower ratio for public libraries

Group	Likes	Followers	Ratio
First-tier group	1,736,191	256,101	6.8
New first-tier group	3,845,326	378,783	10.2
Second-tier group	10,717,448	606,182	17.7
Third-tier and lower group	874,122	119,210	7.3
All	17,173,087	1360,276	12.6

Table 6: Most-liked videos of top five public libraries with the highest like-follower ratio in the second-tier group

Library	Like-follower ratio	Most liked videos	Contents
Jilin Library	33.83	Readers in the library involved in the National Mourning Day for COVID-19 victims.	Local events /Interact with readers
Jiangxi Library	20.25	Dairy life of two robots Wang-bao and Tu-tu in the library.	Entertainment
Shaoxing Library	15.66	Interest things about Li zhaode, a famous chancellor of Tang dynasty who always argued with people.	Popularization of culture, history, art, and STEM
Linyi Library	14.05	A funeral of a local armed police officer who died in line of duty.	Local events
Nantong Library	9.53	Nantong city in Qingming festival.	Local events /Popularization of culture, history, art, and STEM

4.5. Contents of the Accounts of Public Libraries

As the total number of videos for all accounts exceeded 22,000, it was difficult to analyze each video completely. The author selected the most followed library in each group (Table 7); a total of 817 videos were viewed and categorized into nine types. Table 8 illustrates the contents of each library account. The common feature among all the samples was display of information pertaining to their rich resources, space, and services. There were 241 videos that were related to "Promotion of resources & services," and presented information of the collection of resources, including e-resources, space, services, equipment, etc.; these were responsible for the vast majority (29.5%). Additionally, 28.8% of the videos pertained to "culture, history, art, and STEM" that included Chinese history, intangible cultural heritage, natural heritage, ancient architecture, folk handicrafts and customs, and STEM videos. This shows that, in addition to promoting their own business, the public libraries are also actively promoting culture, science and technology activities, and thus making efficient and productive use of the short video platforms.

The data revealed that the third-tier and lower group was the only group that included all the elements, while the first-tier group focused on library advocacy, resources, and service promotion activities with less focus on social and local issues, and lacked entertainment videos that usually appeal to the audience. The reason behind this could be that this particular group preferred restricting the contents to those relevant to the library profession, and hence, opted for a more official profile.

Table 7: Most followed public library in each group

Group	Library	Number of followers	Number of videos
First-tier group	Sun yat-sen Library of Guangdong province	141,964	412
New first-tier group	Zhejiang library	276,461	135
Second-tier group	Jiangxi library	442,900	113
Third-tier and lower group	Liu'an library	12,262	157

Table 8: Categorization of contents of the account of the most followed public libraries in each group

Contents	Sun yat-sen Library of Guangdong province	Zhejiang library	Jiangxi library	Liu'an library	In Total	%
Promotion of resources and services	181	18	4	38	241	29.5
Popularization of culture, history, art, and STEM	82	61	66	26	235	28.8
Library advocacy	85	2	5	27	119	14.6
Social events	37	53	0	8	98	12.0
Library's events	19	0	0	23	42	5.1
Entertainment	0	0	32	4	36	4.4
Interaction with readers	0	1	4	25	30	3.7
Local events	0	0	1	3	4	0.5
Others	8	0	1	3	12	1.5

4.6. Status of Video Updates

As in the case of TikTok, Douyin, also displays "For You" feed recommendations on the basis of the videos posted within the last 90 days. Uploading new videos regularly increases the potential to draw maximum users. The update status for 90 days of all the accounts pertaining to our sample was tracked (from September 28, 2021 to December 26, 2021). The first-tier group got the highest score of about 88% for video updates, while the third-tier and lower group contributed most of the videos (Table 9). Only 129 (60.6%) accounts were regularly updated, while the remaining 39.4% lie idle for 90 days. Only two first-tier group libraries posted at least one new video per day: Shanghai Library with 126 new videos and Sun Yat-sen Library of Guangdong Province with 103 new videos.

Table 9: Status of video updates for the last 90 days by the public libraries (between September 28 to December 26, 2021)

Group	Total number	Number of libraries with updates	%	Number of updated videos
First-tier group	17	15	88.2	349
New first-tier group	29	19	65.5	322
Second-tier group	43	30	69.8	234
Third-tier and lower group	124	65	52.4	636
All	213	129	60.6	1,541

4.7. The Account Profile

The samples showed relatively high consistency with respect to choose of profile images: 205 (96.2%) of the public libraries' chose logos, mascots or photos of their buildings; only 8 (3.8%) libraries had landscapes, sculptures, cartoon images, etc. as profile pictures that lacked relevance.

However, the text introduction differed substantially: 135 (63.4%) shared their missions, values, history, service hours, addresses and contact information, while 61 (28.6%) lacked meaningful text. Additionally, profile information of 17 (8%) public libraries was not provided.

The above mentioned results indicate that the public libraries utilize profile images, rather than brief introductions, to establish their visual identity. It is worth noting that five out of the eight (i.e., 62.5%) sampled libraries that used irrelevant pictures as profile images belonged to the third-tier and lower group, and 12 out

of the 17 (i.e., 70.6%) that did not display their profile information also belonged to the same group, reflecting that some small libraries are not cautious of their own image on the Internet.

5. Conclusion

5.1. Status of Existing Library Accounts on Douyin

The number of public library accounts that exist on Douyin has increased rapidly, the compound annual growth rate was as high as 120%. but there is still plenty of room for development. According to national and regional statistical yearbooks, there are 3,212 public libraries in China, and only 6.6% of them are registered on Douyin. There are 72 large-scale public libraries in four first-tier cities [19] [20] [21], and only 23.6% of them are registered. It has been four years since Douyin gained popularity in China. It can be predicted that with increase in its popularity, more libraries will get registered on the platform.

5.2. The Contents Released by Libraries in Different City-tiers Began to Show Their Own Characteristics

Videos produced by the first-tier and new first-tier groups are more sophisticated than those produced by other groups, possibly because they want to establish a respecTable and decent profile of their profession. The second-tier group paid more attention to reflecting local life and local hot spots. Additionally, they posted content promoting sense of humor, which was absent in the content posted by the first-tier and new first-tier groups. Furthermore, they also released more interactive and friendly videos, such as reader interviews and living libraries, which are generally lacking in large libraries. As for public libraries in third-tier cities, short video platforms have become a new marketing platform, not just for promotional content on the libraries, but also that pertaining to regional cultural and natural heritage. For example, the Gangu Library in Gansu Province, in the northwestern inland region of China, has shared content on the local opera and wood carvings, and other intangible cultural heritage on Douyin; the Pingchuan library, which also belongs to Gansu Province, has provided information pertaining to a site of an ancient city relics 1600-year-old, and aerial footage of a ruined beacon tower 700 years old, about which little was known except for the local residents.

5.3. Libraries in Second-tier Cities Exhibit Better Performance on Douyin

Approximately 259 million people live in 19 first-tier and new first-tier cities, accounting for 18.4% of the total population. These cities have access to large amount of public resources. Some of the largest Chinese public libraries, such as the National Library, the Capital Library, and the Shanghai Library, are all located in these cities. However, according to the data of this survey, their size and the advantages that they have over others does not translate into overwhelming excellence with respect to their operation on Douyin. These libraries did not fare well in garnering likes and followers.

The public libraries of the second-tier cities showed the best performance; they attracted 44.56% followers and received more than 62% of likes in spite of posting only 20% of the total videos. As compared to the well-produced videos of the first-tier and new first-tier groups, the second-tier group mainly had content that reflected local community affairs, as well as some humorous and interesting content, which aligns with the environment that prevails on short video platforms. This shows that, in addition to the amount of resources, the skills to promote libraries in a vivid and optimistic way, make videos catchy and memorable, and the creative ideas of librarians are also crucial factors for successful performance. This is consistent with the views of Jeffrey and Shafawi [22] [23], who state that a library should provide not only professional services but also support and encouragement to its patrons, and thus, have a positive effect on user engagement.

5.4. Presentation and Marketing Skills of Public Libraries are Still Being Polished and Honed

The investigation of library profiles showed that inappropriate behaviors such as casual use of profile images, vague and brief introductions, or even lack of introductions are not the only examples that indicate that only some of the public libraries lack clarity as to how they should present themselves on short video platforms. In terms of content, nearly half (46.5%) accounts had not been updated in the last 90 days, thus hampering their performance in the current circumstances.

As for the topics, The National Library of China launched its Douyin account to mark the 24th World Book and Copyright Day in April 2019. At that time, it hosted a series of activities such as "Douyin Library" to encourage libraries and other user accounts to participate in the event by posting short videos to promote reading and love of books, and awareness regarding publishing and copyright. The most popular topic of library was initiated by libraries from second-tier cities. On February 3, 2020, Taiyuan library posted a creative video that included a combined image of its reader cards and that of the Wuhan Library, in order to encourage the residents and librarians of Wuhan city who were grappling with the COVID-19 epidemic. The hashtags #Fighting together and no reading alone# were responded to by almost all Douyin library accounts. These posted videos have been played more than 800,000 times, and went viral on other social media platforms and library websites, thus turning out to be a successful event in the library society [24].

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