



Danmaku and High User Retention Rate: A Case Study on Bilibili

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Abstract. By overlaying comments on videos, danmaku creates a fantastic movie-watching experience for users, giving them the social feeling of watching movies together. Through case study, this paper explains how Bilibili, the largest danmaku video platform in China, achieves high user retention through a series of interaction methods based on danmaku technology. The results show that Bilibili's unique PUGC content production model enables users to form a natural interest-based clique. In addition, the fun and connectivity of the danmaku technology improves users' satisfaction with the movie-watching experience, thus enhancing their sense of belonging to the platform and improving user retention. This paper reveals the positive impact of danmaku on high customer retention and provides management insights for video platforms.

Keywords: Danmaku · User Retention Rate · Bilibili

1 Introduction

On June 26, 2009, influenced by Niconico (N station) in Japan and Acfun (A station) in China, A crude ACG danmaku website Mikufans started operation. Mikufans officially changed its name to Bilibili in January 2010, beginning its growth. During this period, China's video website industry was undergoing earth-shaking changes, such as the merger of Youku Tudou, Sogou Video's purchase of 56.com, Tencent Video, iQiyi and other companies grew rapidly with the help of capital. While other video platforms are competing for TV drama rights and big-budget movie resources, Bilibili is clearly taking a very niche path, positioning itself as personalized culture and subculture. Bilibili is also the first video platform in China to use danmaku technology. The novel viewing experience greatly enhances interactivity and user engagement.

In the early stage of Bilibili's operation, users needed to pass a set of tests to become members. People with similar backgrounds and hobbies gradually formed interest circles, which also brought excellent word-of-mouth effect to Bilibili. By the end of 2014, Bilibili had grown into the largest UGC video community in China, with highly active user interaction and a large uploader ecosystem [1].

In March 2018, Bilibili was listed on NASDAQ Stock Exchange in the United States, becoming the first Subculture video platform listed overseas in China, which also proves that Bilibili has officially gained recognition in the world capital market. Bilibili's listing

also set off a frenzy on the Chinese Internet, with live streaming of the listing pestering 5.3 million online viewers [1].

Bilibili is the first video platform in China to use danmaku technology, and it has higher membership activity and user retention than other video platforms that do not use danmaku technology. This paper makes an in-depth analysis of the reasons why Bilibili has grown into the first danmaku video platform in China, providing managerial insights for video platform on achieving high user retention rate by danmaku.

2 Literature Review

2.1 The Danmaku and Related Studies

Danmaku is a unique feature that allows viewers of online videos to enter real-time comments in an overlay of video content. Simply put, the comments will appear on the video like a bullet. Different from YouTube and other traditional video comments, Danmaku allows users to watch and interact at the same time, which makes the whole community more open and interactive and promotes the formation of interest groups.

Danmaku was first introduced in Nico Nico Douga in December 2006. The novel interactive form allows users to share their viewing experience virtually. Nico Nico Douga is a gathering platform of subcultures, including ACG and fan creation, and this subculture spreading widely in East Asia has rapidly popularized the function of danmaku outside Japan [2]. Afun is the forerunner of Chinese Danmaku video platform. Its good ecology soon attracted the attention of a group of ACG fans and UGC uploader. Scholars believe that the use of danmaku has turned simple video watching into a new social experience. Danmaku form a benign social interaction, making content producers more willing to upload content. The danmaku appears in the video in chronological order, which creates a kind of magic body for watching the film together [3]. When users watch videos, the appearance of danmaku visually enhances users' reaction to the video content and enables users to share their current feelings, which positively promotes the prosperity of the whole danmaku ecology [4]. From the perspective of interaction mode, the characteristics of video interaction are obviously different from those based on computer text, creating a new interaction paradigm [5].

2.2 Interactivity and High Retention Rate

For an online community, user belonging, and retention rate are very important evaluation indicators. Research shows that users develop a sense of community through sharing, expressing their will, and interactive comments. Through the comparison of two online community marketing strategies, it is found that the sense of belonging positively affects the intention to continue using. Compared with traditional streaming media video platforms, danmaku video sharing platform is obviously a smaller circle of interest. A study comparing the size of online communities found that members of smaller communities had higher levels of community loyalty and belonging. A group of users with similar interests is the key point of online community in terms of the formation process of danmaku video sharing platform. The unique culture of the community attracts

the interaction of countless like-minded users, which further increases the influence of the community culture and helps to strengthen the boundaries of the community and the sense of belonging of users. Many previous studies have emphasized the role of user belonging in promoting continuous use. Guo (2016) points out that the sense of belonging is the key factor for users' continuous use, and social media platforms should provide cultivation of users' sense of belonging to motivate users to continue to use the platform [6].

For danmaku video platforms, the synchronization between comments and video content will improve users' satisfaction with the platform, further promote new user-generated content, increase users' entertainment value, and thus enhance their sense of belonging to the platform [7]. The willingness of users to post videos on the site largely stems from the sense of belonging and emotional value to the community, and the reason to watch videos is that the community can provide emotional value. In addition, the content quality and interactivity of bullet subtitles can have a positive impact on users' perceived value.

From the perspective of interaction, interaction can be divided into social interactivity and machine interactivity [8]. Liu, Suh and Wagner (2016) pointed out that increased interaction can promote user satisfaction and thus improve users' willingness to continue using. In the communication environment of danmaku video platform, the fun brought by danmaku comments can narrow the distance between communicators [9]. The interactive form of danmaku can make users feel interesting and significantly improve user satisfaction. The sense of connection brought by danmaku also positively promotes user satisfaction. Danmaku simulates the scene of offline collective movie-watching, fully realizes offline elements, and enhances the sense of belonging of online community members [10]. In general, diverse forms of interaction improve users' satisfaction with danmaku video platform, and thus improve users' sense of belonging and willingness to continue using it.

3 Case Analysis of Bilibili

3.1 Overview of Bilibili

Bilibili originated from the ACG content community. Since its launch in 2011, Bilibili has experienced rapid user growth and successfully cultivated a community of high activity, high interaction, high user engagement and sense of belonging.

Bilibili is a leading video community for young people in China. According to the 2020 report of IResearch, more than 80% of Bilibili's users are born in the 1990s, and the proportion of young people exceeds that of other mainstream video platforms in China. Bilibili provides a lot of rich content to meet the diverse interests of young people, and the strong community atmosphere makes users more willing to watch, comment on and share content in the community. The essential difference between Bilibili and the mainstream video platforms in China lies in its PUGV (Professional User-generated video) nature, which motivates users to continue to create quality content through a series of incentive programs. In addition, danmaku is designed to give users a feeling of watching the movie, encouraging them to like, favorites and forward the video, which further encourages video creators to produce new content [11].

Table 1. Bilibili's operating performance from HKEX [12]

	Year 2018	Year 2019	Year 2020
Average MAUs	87.0 million	117.5 million	185.8 million
Monthly Payment Account	3.4 million	7.2 million	14.8 million
Pay User Rate (%)	3.9%	6.1%	8.0%
Average Time Spent of Single Active User (in minutes)	Above 75 min	Above 80 min	Above 80 min

As can be seen from the core business indicators, Bilibili's users continue to grow, the proportion of payment is also rising, and the activity and commercialization of the whole community are developing in a positive direction.

As China's leading video community, Bilibili has developed a strong emotional connection with its users. According to iResearch's report, Bilibili was the most popular video platform among Gen Z users in 2020. According to the user profile, Bilibili's users are a group of young people with high aspirations for cultural life, who are willing to engage in interaction and pay for quality content. Generation Z are generally well-educated and have a strong demand for high-quality content and self-sharing. They recognize high-quality content and devote more and more to the production, sharing and promotion of content. Generation Z has become the main force of Chinese consumption and drives the development of video trend.

Bilibili leads the development of danmaku video platforms in China. Users can watch other users' comments at the same time on the playing interface, bringing a virtual experience of watching movies together and connecting users more closely.

Bilibili's primary goal is to create a community of high engagement and a strong sense of belonging among users. Within the Bilibili community, there are sub-communities based on various interests, and users form emotional bonds through similar interests. Statistically speaking, the time spent by a single active user per day on an APP in 2020 remained at more than 80 min, much higher than the industry average of 50 min, as can be shown in Table 1 [12]. Bilibili also designed a unique membership exam system to ensure strong interest and strong connection with the platform, thereby increasing user loyalty to the platform. Unlike other video platforms, which require only a subscription to become a member, becoming a Bilibili member requires users to take an exam based on community video content. Such membership system design has greatly raised the threshold of becoming a member, and at the same time enhanced the similarity among members, increasing their sense of belonging to the platform. For full members who have visited the platform every month since 2019, their 12-month retention rate is over 80%, showing that members genuinely love the platform and are engaged in the community for a long time (see Fig. 1) [12].

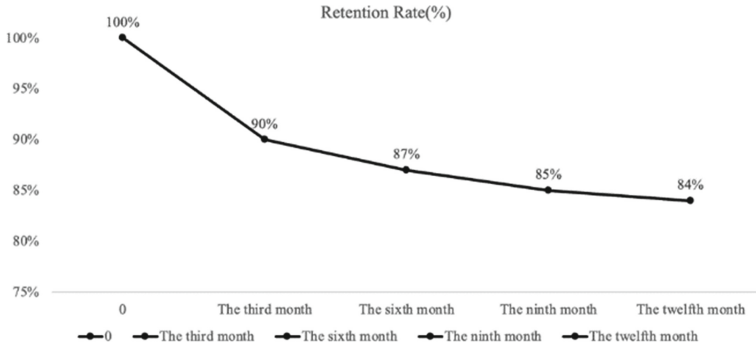


Fig. 1. Retention Rate from HKEX [12]

3.2 Interactivity in Bilibili Community

Bilibili’s high user engagement is based on diverse content and open user interaction. Users’ interactions on the platform revolve around content, and the platform also provides users with a range of social interaction features.

The most typical interactive feature of Bilibili is the “danmaku”, in which comments sent by users fly like bullets across the screen. This novel form of comment is very popular among young Chinese. In the Bilibili community, only full members who have passed the membership exam can send danmaku comments on the platform. The interesting point of danmaku is that the audience watching the same content can see the danmaku sent by others at the same time, forming a new type of interaction. The danmaku function completely subverts the form of video watching, transforming the original one-way input content mode into a new interactive model, enabling users to share their views with other users watching the same video and providing positive emotional value [13].

Bilibili has also designed ways for users to interact with the community. Including like, follow, interact with fans, share, and communicate, etc. The multi-dimensional interaction enables users to make real-time and long-term comments on videos. Users can share their immediate feelings with uploaders and write down their opinions in the comments section after watching the movies [14]. This forms multi-level interaction with uploaders and positively promotes creators to produce new content. The support of network technology provides interactive scenes and various interactive ways for virtual identity in cyberspace, breaking the boundaries of time and space.

Various interactive ways through collective feelings, collective symbols to enhance user loyalty. In a variety of interactions and situations, uploaders’ interaction with the audience creates a sense of community. Users with the same experience express their ideas through danmaku at the same time, which forms the identification of identity attributes among users. Through continuous emotional and time investment, members of the group constantly generate emotional resonance, which further enhances the group’s sense of identity and unity. Through the interaction between anchors and users, the Bilibili community generates a lot of collective symbols. These symbols, which only Bilibili users can understand, strengthen the boundaries of the community, and further enhance the sense of belonging and pride within the community [15]. Collective symbols

appear repeatedly in the long-term interaction, recognized, and shared by users, and evolve in the process of sharing, so that users give it unique emotional significance and functional value. Collective symbols become the emotional link between users and the community, enhancing users' sense of identity to the community.

In fact, Bilibili's unique model of content production predisposes to its unique approach to interaction. Unlike the OGC (Organization Generates Content) model of other video sites, 90% of Bilibili's content is PUGC. Based on this content production mode, Bilibili's interaction model is characterized by high matching degree between users, strong emotional value between users and high stickiness among users.

Bilibili's content producers are mostly ordinary people, whose educational background, social relations, and so on constitute members' virtual identities in the community. Uploader typically makes videos based on content that a person is good at, which makes them relevant to real life. Based on the principle of maximizing personal emotional value, users will choose small groups that conform to their interests, preferences, and values. Users who like to play games will follow game anchors, while those who like ACG culture will follow the subculture uploader. Users with the same experience and interest are more likely to pay attention to the same type of focus uploader. In the follow-up interaction process, they are more likely to generate emotional resonance and stimulate the identity of the community, which further promotes the willingness of users to stay in the community.

The high user engagement also comes from the constant interaction between users and hosts. The Bilibili community enhances the interaction between anchors and users in a variety of ways. For uploader, they can harvest the emotional recognition of users in the process of interaction. With a certain user base, uploader also can receive advertising from brands and obtain capital support. For ordinary users, they can also interact with the host through live streaming, while the Bilibili community will award fans Medal for long-term interaction [16]. Anchors and users transfer emotional value to each other in the process of interaction, which enhances anchors' willingness to continue uploading content on the platform and users' willingness to stay in the community.

4 Conclusion

Bilibili, as the pioneer of Chinese danmaku video platforms, has a unique way of interaction compared with other video platforms. Based on the characteristics of danmaku, this paper illustrates the positive impact of the interestingness and connectivity of danmaku on user satisfaction, and then shows that user satisfaction can enhance the sense of belonging and retention of users. Based on the case of Bilibili, this paper expounds that multiple interaction methods based on bullet screen can provide positive emotional value for users and uploader, promote their continuous interaction in the community, and thus improve the sense of belonging of users and the willingness to continue to use the community. This paper provides management insights and practical methods to improve user retention rate by danmaku for video platform.

Authors' Contributions

This paper is independently completed by Qianxi Zhu.

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References

1. S. SONG, What is Bilibili? A look into one of China's largest online video platforms - WalktheChat. [online] WalktheChat, 2019. Available at: <https://walkthechat.com/what-is-bilibili-a-look-into-one-of-chinas-largest-online-video-platforms/>.
2. S.V. Poulsen, and G. Kvåle, Studying social media as semiotic technology: a social semiotic multimodal framework. *Social Semiotics*, 2018: 28(5), pp.700–717.
3. E. Djonov, and T. Van Leeuwen, Social media as semiotic technology and social practice: the case of ResearchGate's design and its potential to transform social practice. *Social Semiotics*, 2018:28(5), pp.641–664.
4. Y. Yang, Danmaku subtitling: An exploratory study of a new grassroots translation practice on Chinese video-sharing websites. *Translation Studies*, 2019a, pp.1–17.
5. F. Benevenuto, T. Rodrigues, et al. Video interactions in online video social networks. *ACM Transactions on Multimedia Computing, Communications, and Applications*, 2009:5(4), pp.1–25.
6. J. Guo, Z. Liu, and Y. Liu, Key success factors for the launch of government social media platform: Identifying the formation mechanism of continuance intention. *Computers in Human Behavior*, 2016, 55, pp.750–763.
7. L. Wu, Website interactivity may compensate for consumers' reduced control in E-Commerce. *Journal of Retailing and Consumer Services*, [online] 2019, 49, pp.253–266.
8. D.L. Hoffman, and T.P. Novak, Marketing in Hypermedia Computer-Mediated Environments: Conceptual Foundations. *Journal of Marketing*, 1996: 60(3), pp.50–68.
9. L. Liu, A. Suh, and C. Wagner, Watching online videos interactively: the impact of media capabilities in Chinese Danmaku video sites. *Chinese Journal of Communication*, 2016:9(3), pp.283–303. doi:<https://doi.org/10.1080/17544750.2016.1202853>.
10. L. Zhao, and Y. Lu, Enhancing perceived interactivity through network externalities: An empirical study on micro-blogging service satisfaction and continuance intention. *Decision Support Systems*, 2012: 53(4), pp.825–834. doi:<https://doi.org/10.1016/j.dss.2012.05.019>.
11. Y. Chen, Q. Gao, and P. L. P. Rau, Watching a Movie Alone yet Together: Understanding Reasons for Watching Danmaku Videos. *International Journal of Human-Computer Interaction*, 2017:33(9), pp.731–743.
12. HKEX. HKEX Filing of Bilibili, 2021. Available at: <https://ir.bilibili.com/financial-information/hkex-filings> [Accessed May 2022].
13. C. C. Chang, Examining users' intention to continue using social network games: A flow experience perspective. *Telematics and Informatics*, 2013: 30(4), pp.311–321.
14. J. Fang, L. Chen, C. Wen, and V.R. Prybutok, Co-viewing Experience in Video Websites: The Effect of Social Presence on E-Loyalty. *International Journal of Electronic Commerce*, 2018: 22(3), pp.446–476.
15. Y. Yang, The danmaku interface on Bilibili and the recontextualised translation practice: a semiotic technology perspective. *Social Semiotics*, 2019b:30(2), pp.254–273.
16. X. L. Jin, M.K.O. Lee, and C.M.K. Cheung, Predicting continuance in online communities: model development and empirical test. *Behaviour & Information Technology*, 2010: 29(4), pp.383–394. doi:<https://doi.org/10.1080/01449290903398190>.

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