

A study on the influencing factors of social platforms and dissemination of trending topics

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Abstract. With the rapid development of Internet technology, social platforms have become important channels for information dissemination and public discussion. This paper aims to explore the influencing factors of topic dissemination effects on social platforms and provide theoretical support and practical guidance for the formulation of information dissemination strategies. Based on the sampling method, comments under the representative posts are selected to explore in-depth the attitudes of netizens towards the hot topics as well as the popularity of topics by utilizing the sentiment analysis function of HanLP. Additionally, combining the characteristics of user engagement and preference on different platforms, the paper analyses how emotional expression, news media speech, and contextual differences affect the spreading speed of trending topics on different social platforms. The findings of this study emphasize the need to consider a variety of factors when communicating effectively on social platforms and the results are of great value to social media operators, brand marketers, and public relations professionals when formulating communication strategies.

1 Introduction

1.1 Research background

In contemporary society, characterized by the rapid development of Internet technology, social media platforms have become an indispensable part of people's daily lives. This is attributed to the fact that those platforms have revolutionized the way of information dissemination and greatly changed people's social ways, thinking habits, and lifestyles, such as reshaping the way the public receives and processes information. In addition, as an important carrier of information dissemination, social platforms have specific interactivity and immediacy as well as the unique social atmosphere of different platforms. While the atmosphere of social platforms has an impact on the spread of online information, dissemination presents a multipoint-to-multipoint network-like structure, which greatly improves the visibility and influence of information. Therefore, it is of great theoretical

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significance and practical application value to study the influencing factors of social platforms and topic dissemination effects. The social platforms in this article refer to the platforms that have mobile short video--mobile short video refers to short and long videos that are suitable for watching in a mobile state and short leisure state [1].

1.2 Literature review

The study by Cao Bolin explained that social media is an interactive community built on Internet technologies, especially Web 2.0, whose most important feature is empowering everyone to create and disseminate content [2]. Also, it is a medium for social interaction, which is a way of socializing through communication tools. Besides, it can give the users a great participation space, not only to meet the needs of Internet users to store basic personal information but more importantly, to meet the users' 'discovered' and 'worshiped' psychological feeling of the need. In this way, the users' "relationship building" and "influence" needs can be satisfied to some extent. Also, social media can mix and match pictures, videos, texts, and traditional content, and interact with them to build "connections" and generate "meaning" [2].

The literature on the social media aspect of factors influencing information dissemination provides a multifaceted understanding. However, the research mainly starts from the aspects of the users' social relationship and illustrates the influence of information dissemination from the network structure factor. Since the research on the factors influencing the information dissemination of network public opinion is still incomplete, it needs to be studied in depth from more perspectives and with more methods of mining data.

1.3 Research objection and research framework

This paper focuses on the characteristics of different social media platforms, including user activity and habits, and the linguistic uniqueness of the trending topic, analyzing the contextual difference to explore the factors affecting information dissemination regarding popular topics.

The remaining part of the paper proceeds as follows. To begin with, the paper will briefly summarise the main content of two selected trending cases and the reasons for choosing, as well as the data sources and sample sizes. In the next section, the paper concludes the factors affecting information dissemination through sentiment analysis, comparisons of the characteristics of different social media platforms, and contextual difference analysis. In addition, another part worth mentioning is the summary at the end of the paper, including the limitations of this research and the envisaged future research.

2 Case descriptions and research methodology

The paper seeks to explore the influencing factors of social media platforms and information dissemination effects, including how different social platform atmospheres affect the spread of trending topics.

2.1 Case description

2.1.1 An interview takes place between the students at Peking University and Chizoko Ueno

In Peking University’s boarding house - The interview happened in February 2023 and the video of the interview was posted by an up-loader in Bilibili. The content involved a discussion about feminism. After the video was uploaded. It quickly became widespread and stimulated discussion on the Internet. The reason for choosing this topic is to explore how news media or comments from different social media change and influence the social media atmosphere and the speed of information dissemination. Because all the conversations are around feminism, love issues, mother-daughter conflicts, and other sensitive topics, it quickly gained widespread participation and discussion on the internet.

2.1.2. city no city

This event is about a foreign blogger named Baobaoxiong who posted a video on Douyin while traveling in China. During the traveling, he asked “City no city” in an interesting tone every time with his sister. The meme quickly went viral.

One of the considerable issues to explore is how the news media or the users of different social media comments changed and influenced the atmosphere in social media and the speed of information dissemination. So at least two cases were needed to compare with to get reliable results. Case “City no city” is not only suitable to analyze the relationship between the attitudes held by netizens and the scope of the information spread, but also to explore the change brought by news media which have a huge amount of followers to the public opinions. What’s more, from a linguistic point of view, the case of “city no city”, due to the mixing of Chinese and English, creates a contextual difference. As a result, it is worthwhile to study how the contextual difference attracts the attention of netizens to improve the dissemination of information.

2.2 Data sources and sample size

The data for the research in aspects of the volume of searches and views of two selected hot topics was constructed from publicly available social media datasets, including the Baidu index and three major social media platforms, Douyin, Weibo, and Zhihu.

Table 1. Comparison of the platforms and their functions[2]

Platform	Function
Douyin	Trill as a short video-sharing platform, since its launch, with its rich content, convenient way of communication, and large user groups, quickly attracted a large number of users to participate in the creation, dissemination, and interaction [3]. Has become a network of public opinion to fermentation and transmission channels [3]. The platform of network and feeling spread has spread extremely fast, with content-rich variety, and the characteristics of the user interaction [3].
Zhihu	Chinese Internet high-quality question and answer community and creators gather original content platform

Weibo	Weibo mainly meets users' demand for interesting information and is an important platform for users to obtain and share news hot topics, interesting content, professional knowledge, and public opinion guidance [4]. It is precisely because of the large number of users of Weibo that it has become the main force of online public opinion communication [4]. Both the public opinion generated by the platform and the communication mechanism formed by it have an impact on the entire online public opinion communication [4].
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As shown in Table 1, there are three different platforms with three different functions. Douyin is a short video social platform and a social entertainment platform that provides users with a way to create, share, and discover short videos. There are more than 900 million users and 600-800 million daily active users in Douyin. At the same time, Zhihu is a Chinese internet with high-quality questions and the community and creators gather original content platforms. Meanwhile, Weibo is a broadcast-style social media network platform that is based on user relationship information sharing, dissemination, and acquisition through the following mechanism to share short real-time information [2]. Baidu Search Index shows the changes in the degree of attention paid by Internet users to keyword searches. The algorithm is based on the data of Internet users' searches in Baidu, with keywords as the statistical objects, scientifically analyzing and calculating the weighting of the search frequency of each keyword in Baidu web searches. According to the different data sources, the search Index is divided into the PC Search Index and the Mobile Search Index [2].

The data set on the case “Peking University (PKU) Dormitory Chat with Chizuko Ueno” spans the period from 12th December to 14th July 2024 while the sample selection is based on sampling methods, collecting 144 comments from three major social media platforms for the further completion of sentiment analysis, contributing to the research of how different platforms influence the dissemination of information on the same trending topic.

In addition, to ensure the representative and statistical effectiveness of the results, the data set on the case “city no city” spans the period from 20th June to 14th July 2024 while the sample selection is based on sampling methods as well. At the same time, three hot and representative Weibo posts are selected, which are. 1) “What is the city? No city?” posted by @Cover News on 24 June 2024 and 2) “Foreign Ministry responds to the city not city goes viral. China is here, Welcome everyone.” posted by @CCTV News and @CCTV Finance on 4 July 2024. Besides, 57 hot comments below the three posts were collected for implementing the sentiment analysis in depth.

2.3 Research methods

A multilingual NLP library for researchers and companies, built on PyTorch and TensorFlow 2.x, to advance the state-of-the-art in deep learning for academia and industry. HanLP was designed from the ground up to be efficient, user-friendly, and scalable. It comes with pre-trained models for a variety of human languages, including English, Chinese, Japanese, and many others. The goal of sentiment analysis is to determine the sentiment polarity of a text. Sentiment polarity is a value between [-1, 1], where positive and negative values represent positive and negative emotions, and values close to 0 indicate neutral emotions. Also, the absolute value represents the intensity of the emotion while the larger the absolute value of the affective index, the stronger the emotional tendency.[5] The method of sentiment analysis is utilized in this research to determine the emotional polarity of a piece of text. After identifying the points in time when search volume fluctuated significantly, the average of the sentiment indices of randomly selected comments under the posts was calculated for the analysis of how the rhetoric of news media with large followings influences shifts in public attitudes and contributes to the dissemination of information. At the same time, the average

sentiment index of the comments and paragraphs captured for the case "Peking University (PKU) Dormitory chat with Chizuko Ueno" on different social media platforms is also calculated in order to examine how the social atmosphere of different platforms affects the dissemination of information.

3 Analysis of results

3.1 Analysis of Peking University dormitory and Chizuko Ueno

Table 2. "Ueno Chiheko Peking University Dormitory Interview Incident" on different platforms [5]

Platform	Monthly User Engagement (up to a certain Time-frame)	Topic Page View Statistics	Popularity Index (Page Views per Month of User Activity)
Douyin	Approximately 800 million (December 2023)	48,883,459	0.0000061
Weibo	Approximately 588 million (Q1 2024)	592 million	1.006
Zhihu	Approximately 89 million (Q1 2024)	26.636 million	0.2993

As shown in Table 2, through statistical calculation and comparison of the topic "Ueno Chiheko Peking University Dormitory Interview Incident", the case has the fastest information transmission speed on the Weibo platform, followed by Zhihu, and the popularity of the Douyin platform is relatively low. Douyin users are more inclined to short video content and interactive topics, and the Douyin platform mainly presents a large and diversified atmosphere of topics. This case is mainly related to feminism, and no hot topics have been formed on the Douyin platform, resulting in a slow transmission speed. Zhihu users generally have high cultural literacy and moral levels, and the platform mainly presents an atmosphere of rational discussion and inclusive understanding with relatively few topics, which makes the event more prominent and has more page views than Douyin, and the information transmission speed is faster. Weibo users generally pay a lot of attention to current events and new cultural trends, and the platform atmosphere is mainly diversified and interactive. Therefore, this event has become a hot topic on the Weibo platform, and has obtained a high degree of discussion, and the information spread quickly. In summary, the atmosphere of social platforms has a significant impact on the speed of information dissemination.

3.2 Analysis of city no city

3.2.1 poor cross-language context

The main reason why the topic "city no city" has become popular on various social platforms is the "poor cross-language context". There is a definition of "context difference": context difference is the imbalance between the elements of context, which is an important factor restricting the effect of information transmission [6]. Traditional rhetoric generally occurs within a certain language, but the media of the Internet enables the network language to break the boundary between languages, and different languages can be mixed and expressed in the virtual space to form new rhetoric. This imbalance in the language is called the cross-language context difference [7].

In addition, it also conveyed the positive attitude that China is committed to optimizing the facilitation measures for personnel exchanges and promoting international exchanges. By using this phrase, users can demonstrate their cultural identity and sense of belonging on social platforms. At the same time, it has also become a cultural symbol, helping users to better integrate into the multicultural atmosphere of social platforms. The popularity of city, not city reflects the communication and integration between different cultures in the context of globalization. This cross-language expression breaks the geographical and cultural restrictions, making it easier for users from different countries and regions to understand and communicate.

1) Activity and diversification of social platforms

The popularity of "city no city" has triggered a lot of discussion and imitation among netizens, which makes the popularity of relevant topics on social platforms not only attract the attention of more users but also promote the generation and dissemination of more relevant content. In the process of imitation and creation, users constantly give new meanings and usage of "city no city", which makes this expression more colorful. This diversified way of expression not only meets the personalized expression needs of users but also enriches the overall atmosphere of the social platform.

2) Social interaction

The popularity of "city no city" facilitates the interaction and communication between users on social platforms. Users can express their views, attitudes, and emotions through this phrase, thus triggering more discussions and responses. This interaction not only enhances the connections and relationships between users but also increases user engagement and activity on social platforms.

The popularity of "city no city" reflects the openness and inclusiveness of the social platform atmosphere. This cross-language expression breaks the constraints and restrictions of traditional languages, enabling users to express their views and feelings more freely. At the same time, it also promotes the communication and integration of different cultures, making the social platform a more diverse and inclusive community.

"city no city" has a broader understanding for high-context people. The popularity of the phrase encourages innovation and creativity among high-contextual user groups on social platforms. Users can try different ways of expression and create new Internet hits and topics, thus promoting the enrichment and diversification of content on social platforms. This innovation and creativity not only improves the competitiveness of social platforms but also brings richer and more interesting social experiences to users.

It was subsequently found that the user sentiment changed significantly with the positive response of the official media.

3.2.2 Sentiment Analysis

According to the average calculation, the sentiment value before the response of the Ministry of Foreign Affairs was -0.0047, while the average sentiment value after the response was 0.7775. Emotional values are usually used to measure and express people's emotional states. Positive emotional values represent positive emotional states, which are usually associated with positive experiences such as pleasure, satisfaction, happiness, and excitement, and negative emotional values represent negative emotional states, which are usually associated with negative experiences such as sadness, anger, fear, anxiety, and depression. -0.0047 is less than 0, which is a negative value, while 0.7775 after the response is greater than 0, which is a positive value [4]. It can be seen that after the response of the Ministry of Foreign Affairs, the emotional expression of individuals on the platform on this topic generally changes from negative to positive.

Combining the data of the Micro Index and Baidu Index [8], the topic's popularity peaked on June 28 and July 4 (see Fig. 1). It is concluded that mainstream ideological communication is a communication activity mediated by media [9]. The formation and development of personal ideology interact with the social media atmosphere and have a significant impact on information dissemination. ('Ideology' refers to the consciousness that precedes but influences the individual, and this consciousness drives or guides the behavior of the individual[10].)

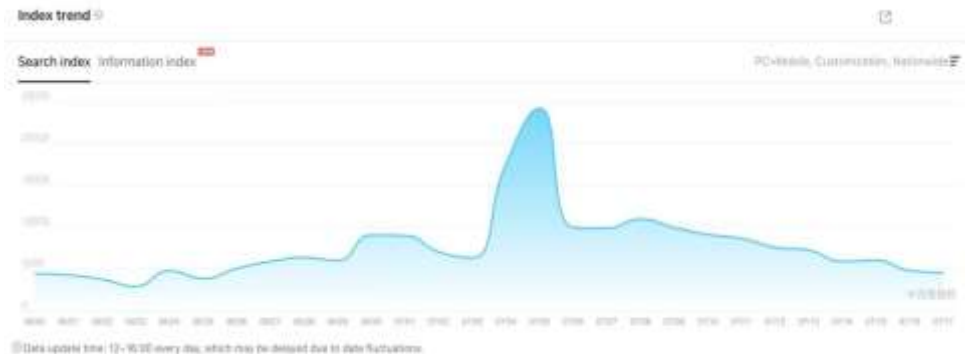


Fig. 1. The trend of “city no city” in the Baidu index [8]

4 Conclusion

This study delves into the influencing factors of information dissemination in the aspect of trending topics on social platforms, revealing the complexity and dynamics of information dissemination in the digital age. By analyzing the content and comment sections of two cases, the research finds that the attractiveness of the information content, platform user engagement, and user preferences have an impact on the spreading effect. The significance of this research is to provide operators of social platforms, brand marketers, and public relations professionals with a theoretical basis and practical guidance for the development of effective communication strategies. As a result, this can help optimize the process of information dissemination and improve the efficiency and influence of information dissemination. However, this study also has certain limitations. The study is mainly based on current popular social platforms, which may not fully cover the communication characteristics of emerging platforms. In addition, there is a lack of comprehensiveness in data collection. In addition, future research can further explore the communication differences in different cultural contexts and the impact of emerging technologies and algorithms on information dissemination, providing a more comprehensive understanding of this field.

Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

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