Study on Detection of Public Opinion and Its Methods in We Media

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Abstract. In the era of We Media, the timely and comprehensive monitoring of online public opinion by means of computer technology has become an urgent necessity. The paper first discusses the new changes of online public opinion brought by We Media, then proposes strategies for monitoring and managing online public opinion, and finally introduces the design idea of the online public opinion monitoring system based on Web Crawler and Lucene.

1. Introduction
Online public opinion is the product of the rapid development of the Internet, while the Internet serves as a channel for people to understand the world, obtain information, show their wants, and express their opinions. In the web 2.0 era, the Internet not only promotes the rapid sharing and dissemination of information and other positive effects to improve the sense of well-being, but also brings a variety of false public opinion. Online platforms and media have low barriers to entry, inadequate censorship mechanisms, untimely detection and handling, and even the circulation of rumors on online platforms to discredit the image of the police force. Under these circumstances, police organs at all levels have paid great attention to public opinion on the Internet, and have proposed guidelines for discovering public opinion quickly, guiding it and dealing with it proactively.

2. New Changes to Online Public Opinion Brought by We Media

2.1. Rapid transmission of information to generate massive data
The law of emergency information transmission in the era of We Media has changed from the initial golden 24 hours to golden 2 hours. After an incident happens, the related news occurs after two hours and is disclosed on the Internet with tip-offs, posts and phone calls; 6 hours later when relevant details begin to disseminate, reposts, comments and follow-up posts start circulating; 12 hours later when the first peak of circulation is formed, the incident becomes an hot topic online and offline and draws attention at home and abroad; 24 hours later, public opinion reaches its first climax.

2.2. Dissemination is not limited by time and space, and quickly forms a storm of public opinion
Hot events coupled with emotional opinions can become the fuse that ignites public opinion. Public dissatisfaction with the reality and the lack of appropriate outlet for such dissatisfaction has allowed emotional public opinions to widely spread across the web. Online public opinion itself is irrational and radical and may not necessarily be correct; in addition to its wide coverage and rapid dissemination, it will cause anxiety among the public, threaten social stability, and may even form a "storm of public opinion" under certain circumstances.
The high volume, interactive nature, and the ability to gather and group people in network communication make it possible to overcome the limitation of time and space, narrow the distance of information dissemination, and speed up the formation of public opinion. Anyone can rely on the Internet to receive and capture the news focus as soon as it occurs, and to express their position and opinion by posting. A representative post can be repeatedly followed and reposted in the BBS, generating interactions and spreading at an alarming rate from 1 to 10 to 100 and so on. An opinion will be transmitted exponentially fast, from small to large, and its appeal and influence will not be inferior to any kind of mass media.

2.3 Online public opinions are prone to be ignited
With the advent of the era of We Media, various events are exposed through the network, continuously heating up and giving rise to hot events on the network, and some even develop into mass disturbances. There are several examples of such events as misinterpretation of "oral vaccine", "textbook law enforcement" conducted by Shanghai police, "a police officer in Taizhou, Zhejiang, who was arrested for snapping pictures of his immediate superior in the act of adultery, and refused to accept punishment and sued the public security bureau" and so on. Several events with public outcry have shown that there are driving forces behind hyping those events up by either those involved in the incident or the so-called "human rights activists", or some KOLs with ulterior motives, or even hostile organizations at home and abroad. They are skilled at stirring up the society and the "agitation" of the network, vigorously inciting the crowds and spreading rumors for troubles. At the same time, some senior netizens have acted as "opinion leaders". Due to the numerous identities of "opinion leaders", some of their comments are very destructive. These network agitators or network hype companies have also disturbed the network order and destroyed social harmony.

2.4 Eye-catching effect and opinions flooding effect are interconnected with each other, giving rise to the media hype of police-related incidents
In recent years, most of the public-outcry events originated from an ordinary public event. However, some online media tend to "label" the events disclosed on the Internet in order to have eye-catching news, and deliberately blind themselves to the details of the case presented in the public security organ’s bulletin. They make rumors and wait for opportunities to maliciously stir up contradiction, and some media exaggerate the event into "police brutality". Once the online news has such wordings as "beating", "arresting" and "killing" by the police, it will set off a strong reaction in the public opinion, often easily leading public opinion to the confrontation between the police and the public. For example, "Guangdong Chaozhou Traffic Police Law Enforcement Video" that caused public outcry against police brutality, the Chaozhou Traffic Police Law Enforcement Rumor is a series of twists and turns. Before and after refuting the rumor, some people kept spreading edited video clips claiming that the traffic police killed people. Finally, Xinhua News Agency was forced to clarify this issue.

Similar rumors are commonplace. A mass incident occurred in Huahong Special Steel Co., Ltd. in Xinyi City, Jiangsu Province, with rumors claiming that the police are corrupt, the special police is dispatched to arrest people on sight. A traffic accident occurred near a primary school in Daoxian County, Yongzhou City, Hunan Province, where the driver was rumored to be head of government and, in order to cover up the facts, the police were dispatched to forcibly rob the body and beat the relatives of the victim. Frequent rumors are targeting at the police, which were later proved to be groundless, causing some public opinions to worry about whether there are network organizations intentionally spreading rumors to smear the police and confuse the public. However, in the public opinion battlefield without smoke, the fight against rumors still needs to address the root cause and resolute actions are required.

3. Research on Monitoring and Management of Online Public Opinion in We Media Era
In the context of We Media, the popularization of social media has facilitated citizens to speak out and defend their rights, and has concurrently exaggerated the act of the people’s police. In We Media era,
the police's public relations ability in response to social media-based public opinion needs to be improved. Social media-based police-related public opinions are a double-edged sword to public security work. Public security organs should focus on grasping the opportunities and make full use of the advantages of the We Media. Efforts should be made to improve the police efficiency by exploring the law of information dissemination, strengthening the guidance of citizens' public opinion, and using the online public opinion to serve the people. At the same time, equal emphasis should also be given to find means and methods to deal with various unfavorable factors in the course of improving the network management and control technology, regulating the public opinion processing process, and maintaining the image of the police force.

3.1 Explore the law of information dissemination, monitor the development trend, and appropriately guide public opinion

From the perspective of data flow, the process of online public opinion management is a process integrating data collection, data integration, data extraction/refining, data mining, data analysis, situation judgment, data security monitoring and crisis discovery. Compared with the traditional online public opinion management process, the biggest change in We Media era is that the online public opinion management decision-making process changes from "passive response" after the occurrence of a crisis to proactive "prediction" before the occurrence of a crisis. The workflow of online public opinion (as shown in Fig. 3) is a process featuring discovering public opinion, recording public opinion, analyzing public opinion, and guiding public opinion. Specifically, responsive decision making is a kind of "reverse" thinking, which is embodied in the process of "sudden incident occurrence - logical analysis - finding causal relationship - implementing emergency decision-making". Predictive decision-making is a kind of "forward" thinking, which is reflected in the process of "mining data – conducting quantitative analysis - finding interrelations - implementing emergency prediction decision-making". The online public opinion monitoring system can provide effective public opinion information extraction and analysis methods for the study of online public opinion and security assessment, and realize comprehensive analysis and accurate judgment of emergency news reports and network information. Meanwhile, the system can be interfaced with the national public security information database to classify, rank and estimate various online public opinions, identify, track, and monitor identity information. It can also collect and reorganize data, discover sensitive topics, extract, analyze and predict the public opinion trends, as well as optimize, process and channel the information.

3.2 Respond quickly and methodically, and enhance cooperation and coordination to comprehensively strengthen online public opinion management

In order to strengthen the management of online public opinions, a public opinion monitoring team can be set up to be responsible for monitoring, screening, and studying and judging public opinions. The public opinion monitoring system can be employed to search for sudden public opinion, and public opinion trends should be provided in a timely manner every day, so as to achieve early detection of public opinions and early exchange of information. At the same time, it is necessary to clearly define the responsibilities in handling issues and formulate a work plan for handling online public opinion emergencies.

In general, when hot events or major events occur, online public opinion will follow. The government and relevant administrative departments should respond quickly, strengthen the management principle of putting "speed first", make accurate and rapid responses, integrate and analyze various online comments, and scientifically study and judge the development trend. At the same time, it is necessary to establish a sound interconnected mechanism, actively establish and implement a rapid and coordinated response mechanism to work with the publicity department, network management office, stability maintenance office and telecom operators, so that negative public opinion can be detected, guided and controlled in the first place, ensuring that the official channels can give a credible explanation on such events.
In order to effectively deal with online public opinions, the public security organs can build the internet monitoring center into a fully policing management platform that integrates monitoring and inspection, online law enforcement, field investigation, public opinion handling and guidance, etc. Making full use of the police digital platforms such as public security Weibo account, police service WeChat public account and online police station to enhance the functions of online intelligence discovery, public opinion handling and investigation and combating, so as to minimize and eliminate negative impacts and safeguard the image and credibility of the government and relevant administrative departments.

3.3 Improve the big data collection system and strengthen the analysis and judgment of online public opinions

In the face of massive information on the Internet, the analysis and evaluation of public opinion on the Internet can be strengthened by the application of big data to effectively prevent the occurrence of emergencies. With the development of the Internet+, people's social activities, big or small, all generating a large amount of data. Social data is an important feature in big data development. The more comprehensive the sources of big data available to the public security organs for big data analysis and application development, the more accurate the analysis of public opinion will be. Therefore, the public security organs may establish data monitoring systems on specific topics. The data collected and analyzed can form accurate, predictive intelligence targeted on specific groups, periods, and events. While speeding up the research and development of data mining technology, it is necessary to enhance cooperation with major websites, obtain key backstage data through cooperative models, improve the mechanism of historical data accumulation for online public opinion information, categorize and store important and critical online public opinion data, apply big data technology for multiple value development, establish and improve the working mechanism on public opinion, formulate a working system towards big data on public opinion, improve the way of acquiring public opinion data, and broaden the channels of acquiring big data.

3.4 Strengthen data security, timely respond to events and questions, and guide the positive development of online public opinion

Data security remains the biggest challenge to the development of the Internet. In the era of We Media, data are the most important wealth. The government should strengthen efforts to protect data security, formulate a legal system on big data suitable for the national conditions, establish a data encryption and risk management mechanism, specify the operation specifications at such stages as data collection, storage, transmission, use and transaction, and tighten the penalties for damaging data servers and storage equipment. Moreover, it is required to make laws and regulations on personal privacy protection and crack down on illegal trading of personal information and other data crimes [5].

Netizens are allowed to use the Internet to question the "problematic officials" and ask for an explanation. Due to the open nature of network platform, online accountability can often quickly form strong online public opinion. In this regard, we should give full play to the professional advantages of the traditional media, report the development trend of events in a timely manner, remedy the shortcomings of the spontaneous dissemination of online adverse events, promote the formation of correct public opinion, and guide the positive development of online public opinion, so that we can achieve timely accountability, rectification, deficiency detection, and prevention of their recurrence.

4. Design of Online Public Opinion Monitoring System

In the era of big data, it is a burdensome and unrealistic task to manually identify every opinion in major news websites, BBSs, WeChat Moments and Weibo posts and classify and count them. Only by automatically analyzing and sorting out the semantics of online public opinion through computer technology can we establish a comprehensive, effective and rapid early warning mechanism in response to online public opinion.
The "Online Public Opinion Monitoring System" is a computerized monitoring system for the collection of views and opinions expressed by netizens in cyberspace that focuses on the occurrence and changes of various real social events. The system carries out 24-hour monitoring on websites or software with a high concentration of hot events, and uses information capture technology such as web crawlers, word segmentation systems or meta-searching technology to download the latest news, comments, opinions and other public opinion data from the Internet, and then stores them in the public opinion data storage system, that is, parallel database or cloud data. In the intelligent analysis of hot issues, the information captured is firstly classified, clustered and thematically summarized in accordance with its content on the basis of the traditional vector space feature analysis technology, and the information is preliminarily processed. Semantic analysis of public opinion, affective computing, trend prediction, etc. are then conducted under the guidance of the monitoring database, and the final analysis results are saved into the public opinion results database. Finally, the platform will display the processed data information in the public opinion result database through data push and visual analysis technology, and display the results of public opinion monitoring to the system client with text and pictures, so that staff can browse real-time public opinion information through the public opinion service platform or website.

The core components of the online public opinion monitoring system designed in this paper are Web Crawler and Lucene. Web Crawler is used to crawl HTML pages, and Lucene index is used to retrieve massive data efficiently. Its workflow is to obtain public opinion data sources from major news websites, BBSs, WeChat Moments, Post Bar (Baidu Tieba), search engines and other information sources on the Internet through distributed web crawlers, store unstructured data in local databases, create incremental indexes by Lucene, and then carry out later query, analysis and statistical operations on public opinion data. The structure of the public opinion monitoring system is shown in Figure 1.

Our data sources are selected to be read directly from MongoDB in accordance with the specified query conditions, and the code for processing interaction with MongoDB is packed into the code for processing indexes and implemented through internal classes.

MongoDB architecture in unstructured data cloud storage platform is shown in Figure 2, and its functions are as follows:

- Client: contains interfaces to access MongoDB and maintains cache data to speed up data access, such as location information of data set.
Coordinated services: ensure that there is only one master control node for the entire system cluster, which can store addressing entries for all data sets, monitor the status of collection services (data set services) in real time, and send the status information of collection services (data set services) to the master control node in real time; store and manage MongoDB schema/pattern information, including what data sets there are and what documents each set has.

Control nodes: allocate space for data sets, responsible for load balancing of metadata storage; carry out failover when disabled data nodes are found; handle useless/junk file recycling and schema update requests on MongoDB.

Data set services: data I/O requests; automatic fragmentation of massive data sets.

In the era of We Media, positive or negative online public opinions should be detected as soon as possible. Efforts should be made to monitor and crack down on police-related information published by social media, create a sound cyberspace, and maintain the image of the public security forces. Public security organs should not only seize the opportunities and advantages of the We Media era, and enhance policing efficiency by exploring the law of information dissemination, strengthening the guidance of public opinion, and using online public opinion to serve the people, but also find approaches to deal with various challenges in the course of improving network management and control technology, regulating public opinion processing flows, and maintaining the image of the public security forces.

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