Research and Development of Network Security and Risk Management

Qingfeng Zhang¹*, Yaping Ma² and Shuya Bai³
School of Safety Science and Emergency Management, Wuhan University of Technology, Wuhan Hubei 430070, China.
Email: 794989576@qq.com

Abstract. With the advent of the 21st century, China is in a period of social transformation and is in the stage of deepening reform. Social contradictions are complex, hot events are frequent, and public opinion is active. Under the conditions of the Internet, especially in the context of the prosperous media, the public opinion pattern has undergone new changes. With the popularity of the Internet and the increasing number of Internet users, the Internet has become a large social place. After a hot event occurs, it often causes heated discussion, and overheated public opinion or embarrassing grievances will also form corresponding events. Improper handling often results in “secondary disasters”. In recent years, the concept of lyricism has been frequently used, and public opinion analysis has been promoted at the same time in both theoretical research and practical application. The related network risk management has also received increasing attention. Various situations have shown that lyric research is heating up. Based on this status quo, this paper sorts out and comments, summarizes the research status at home and abroad, and focuses on the rational situation of the situation of public opinion research.

1. Introduction
China is currently in a period of social transformation and is undergoing unprecedented changes. Although economic development has made great achievements, with the development of the economy, China's economy and society have entered a very important transition period, and at the same time, it faces the high risk of profound changes in social structure and the most intensification of social conflicts. The imperfections of supporting mechanisms and the imbalance of wealth distribution have become more and more prominent, which has led to conflicts and frictions between various interest groups in society. Conflicts of interest continue, and mass incidents occur frequently. China has entered and will remain in the long-term. Risk society. In this "risk society", the frequent occurrence of emergencies will no longer be incidents, but will become the new normal of society. Many emergencies continue to challenge our government and the media.

At the same time, the Internet has changed our traditional social life. The unprecedented speed of communication and unparalleled power transmission of the Internet and mobile phones have made some seemingly ordinary social events rapidly interspersed in cyberspace and real space, and quickly intertwined to form hot spots. The Internet has many characteristics, such as various expressions, high degree of freedom, and quick release. These characteristics make the network public opinion faster and more socially influential than the traditional public opinion. At the same time, emergencies are more likely to attract the attention of netizens. After being reported by online media or netizens, they can often be reprinted and spread quickly in a short period of time, thus forming an emergency network sensation. The dissemination of information by netizens is very random and will not verify the authenticity of information like professional news reporters. In online public opinion, there are
more emotional theories. Many people do not know the truth, preconceived, exaggerated facts, easily tempted by posters, and even used and manipulated by people with ulterior motives, it is easy to form a one-sided paradox situation. Before the truth is published, often some sensational information is more likely to satisfy people's curiosity, which encourages people. In an untrue network information environment, false and one-sided information often causes people's cognitive bias and has serious impact. [1] It will take a lot of effort to go back and forth. Therefore, the impact of sudden online grievances on social stability and harmony has emerged.

2. Network Public Opinion Basic Research

2.1. Network Public Opinion and Related Concepts

Lyricism can be said to be a relatively "Chinese character" concept. The concept of lyrics has undergone different stages of expansion and innovation. Early lyric research generally defines grievances as public social political positions, that is, in social activities, around the emergence, development, and evolution of certain social events, as the subject of the public to the social managers as objects and their The social and political position generated and held by political attitudes.

Wang Laihua believes that "sentimentality" refers to the social and political stance generated by the public under the stimulation of certain social issues, while online public opinion mainly refers to the social and political stance of those who use the Internet, also known as netizens. Zhang Kesheng believes that public opinion is a social objective situation that is inevitable in the decision-making activities of the state decision-making body, the public life (the public sentiment), the social production (the people's power) and the knowledge and intelligence (the people's wisdom) in the people, and the public is recognizing On the basis of knowledge, emotion and will, the social and political attitudes towards the objective situation of the society and the state decision-making, that is, social conditions and public opinion. Internet public opinion is the reflection of this political attitude, that is, social conditions and public opinion on the Internet. Its core is to add a "network" to limit it before the public opinion. [2] Zeng Runxi believes that online public opinion is a collection of all cognitions, attitudes, emotions, and behavioral tendencies that are generated by various social events and transmitted through the Internet. Liu Yi believes that online public opinion is the sum of the various emotions, attitudes and opinions held by various public organizations that are concerned with or closely related to their own interests in a certain social space. Internet public opinion is a subset of the lyric concept and falls within the category of lyricism.

This paper believes that online public opinion is the sum of various emotions, attitudes and opinions held by various public organizations and individuals in various public organizations. Public affairs include social events, social hot issues, social conflicts, Social activities, etc., also include what public figures say and do.

2.2. Anonymity and Virtuality of Online Public Opinion

The biggest difference between the form of online public opinion and traditional public opinion is the anonymity and virtuality of its subject. In the traditional form, the formation process is the direct participation of the publisher, although it does not force it to indicate its true identity, but in any case can not achieve complete anonymity and virtual existence. Since it is impossible to achieve complete anonymity, it is necessary to scrutinize the possible consequences, and the publisher cannot express his own speech without any scruples. [3] Therefore, his freedom of speech will naturally be restricted to a certain extent, and sometimes it is difficult to form sensation. The Internet public opinion is generated in the virtual space of cyberspace. The publisher is different from the general public, but also different from the social group and the social organization. Instead, it appears in the cyberspace with an anonymous, virtual ID identity. Others do not. Learn about the real identity in real life. A person can have only one ID identity, or multiple IDs at the same time. Compared to traditional forms, this anonymous, virtual identity gives publishers a more free "right to speak," and they can express their opinions directly to social hotspots without hesitation. Regardless of whether their views can be supported by everyone, the publisher is always in an anonymous state, without worrying about other factors.
2.3. Difficulties and Rapidity of Online Public Opinion

The uncontrollable and rapid nature of the online public opinion process is also an important feature that distinguishes traditional lyrics. Due to the strict restrictions and related defects of the relevant laws, regulations and policies, the traditional media needs a certain time or even a long wait. The Internet is a highly open space, and anyone can be the publisher and leader of public opinion. For a large number of network users, it is impossible for us to check every statement published in the cyberspace, and it is even less likely to make an accurate evaluation of it in the first place, which makes the network public opinion process control complicated and difficult to control. With the help of the rapid spread of the network, time-space, resource sharing and other advantages, often a public opinion topic has just been proposed. Below, there are constantly netizens who post comments and can accumulate a lot of heat in a relatively short period of time. The speed is so fast that traditional media can't match it. No wonder some people sigh: In the traditional media era, what happens in the morning can only be seen from the traditional media at night. Now, we often have the feeling that the world will change when we wake up.[4]

2.4. Equality and Emotionality of Online Public Opinion

In cyberspace, the anonymity of the screen name in the speech and the virtuality of its identity have made the exchanges between netizens unprecedentedly equal. No matter who they are, whether they are from different culture levels, from different regions and from different occupations, they can express their different views on social hotspots. In cyberspace, everyone involved in the discussion is not limited to a theoretical equal position, nor is it merely providing a fair and open communication platform in form, but truly feeling from the hearts of netizens.[5] To this equality, we also agree with this equality. While enjoying this opportunity for equal communication, netizens are also more convenient to use cyberspace to vent their emotions accumulated in the real space, or to express their own subjective and strong comments, so the speech has a strong emotional. We are sure that the relaxed network environment is more favorable.

Freedom of expression in the public, to a certain extent, acts as a social "reducing valve", but this sentiment has a strong appeal and negative influence. [6] Once spread in cyberspace, it is easy to obtain the approval of netizens who share the same mentality. It is highly probable that a strong social mobilization effect will result, leading to public action in the real world, directly jeopardizing the stability of social order.

3. Analysis of the Status Quo of Domestic Network Public Opinion Research

3.1. Development Status of Network Public Opinion Professional Research Institutions

The earliest research institute in China with "sentimentality" as its research goal was the Institute of Public Opinion of Tianjin Academy of Social Sciences, which was founded in October 1999. Since its establishment, the has been committed to the development of the discipline of lyric research, to improve the basic theoretical research work in the field of lyrics, and published a number of high-quality books such as "Introduction to Lyric Research", "National Decision-Making: Mechanisms and Lyrics", "Introduction to Internet Public Opinion Research". The research results have laid a solid foundation for the study of public opinion, and its influence is in a leading position in the research of related fields in China. The People's Daily Public Opinion Monitoring Office has been conducting research on intelligent search engines and online public opinion since 2006. Colleges and universities are also actively participating in public opinion research, setting up or establishing a public opinion laboratory jointly with the company. The research institutes of colleges and universities include Fudan University Public Opinion Research Laboratory, Renmin University New Media Network Public Opinion Technology Laboratory, Nanjing University Gu Niyi Research Laboratory, Shanghai Jiaotong University Public Opinion Research Laboratory, and Beijing Jiaotong University Network Public Opinion Security Research Center. Beijing Institute of Technology Network and Distributed Computing Laboratory. The public opinion laboratories jointly established by universities and enterprises include Tsinghua Unicom's lyrics laboratory, Shandong University's excellent news research center, Jinan-Red Wheat Research Laboratory, and New Media Network Public Opinion
Technology Laboratory. All public opinion research institutions and public opinion laboratories have made different contributions to promoting the development and application of the core technology of China's independent intellectual property network.

3.2. Internet Public Opinion Based on Big Data Research
Domestic scholars have exerted a lot of efforts in big data application research. Scholars in the fields of computer, engineering management and statistics are uniquely positioned in this regard. Lin Lina and Wei Dezhi are committed to the construction of the corresponding model in response to the current hot spot of online public opinion. The model uses relevant factors affecting hot events as evaluation indicators. The relevant data of the indicators are all objective data, which is conducive to the objectivity of model evaluation. In order to solve the model, the entropy weight method is used to determine the weight of the indicators in the model. Then the TOPSIS method and the grey correlation method are combined and calculated in the form of relative closeness to judge the pros and cons of the scheme. This is a partial technology study, which shows that science and engineering scholars use big data to actively participate in social issues research, and their results can be used as reference for journalism communication scholars. In February 2017, Science Magazine published a special article stating that researchers have made some progress in combining human cognition and big data methods to solve complex problems; data-driven predictions and decisions of human behavior and social events will become science. Research frontiers.

3.3. Network Lyric Emotion Analysis
Studying the emotional research done by foreign scholars can give us a broad perspective on lyric-emotional research. Arnold argues that emotion is a tendency toward an experience that is beneficial to the perception of consciousness and that leaves the perception as harmful, and that this tendency to experience is accompanied by a corresponding pattern of physiological change that approaches or retreats. This wise definition has a useful discussion of emotional connotations. American scholar K. T. Stallman's "Emotional Psychology" explores a series of issues such as emotional physiological mechanisms, cognitive and emotional relationships, emotional phenomenology, emotional behavior, emotional development, emotional performance and emotional recognition, and abnormal emotions. The basic framework for the study of emotions is quite systematic.

Scholars from the Department of Psychology at the intersection of science and engineering and liberal arts and sciences, with their professional expertise, focus on the emotions in group/cluster events with skillful computer technology and meticulous thinking, and research topics related to emotions: Negative emotional communication mechanism, negative emotional dynamic mechanism, group emotion monitoring and early warning of emergencies, group emotional cohesion and its production mechanism, and social network group emotion model. These achievements reflect the pursuit and interest of interdisciplinary research, broaden the research horizon and research ideas of sentiment analysis, and are similar to injecting a clear spring for research, and at the same time competing with the netizens' emotions from the perspective of humanities and social sciences.

3.4. Research on Network Public Opinion Risk Management
According to the famous British public policy scholar Giddens, contemporary society has entered a risk society. The risk mainly refers to the “risk created by man-made”, which is accompanied by the process of globalization. The risk is deeply rooted in modernity and is the most prominent feature of modern society. The famous German scholar Baker, when talking about the characteristics of risk, believes that the severity of the risk exceeds the ability of early warning detection and post-processing.

Chinese scholar Cheng Boqing studied the risk society and pointed out: "For the basic characteristics of a risk society, we still have a hard time to give a clear grasp, because this social form has just leapt to the horizon, we can only see its rough The outline. But we may wish to use the globalization and individualization of risk for the time being - this does not fully demonstrate the complexity of the risk society, but it should also be reflected in the basic dimensions." The two basic dimensions are proposed, It is good for researchers to think about the risk society. Xu Yong and Xiang
Jiquan believe that in traditional society, people believe that human rational power can control nature and society, and make human society develop in an orderly and regular manner. However, with the development of science and technology and globalization, this "normal" society has become unrecognizable. The uncertainty and unpredictability of society are increasing, and people have to face more risks. More importantly, due to the high level of modern information technology, the sense of fear and distrust caused by risks and disasters will spread rapidly to the whole society through modern means of information.

4. Prospects of Network Public Opinion and Risk Management
From the current situation in China, the research on network public opinion is still in its infancy. Most of them are still accustomed to the traditional research paradigm. They regard the Internet as a purely technical system, ignoring the influence of human activities and activities. It still belongs to the traditional linear and stable state paradigm. Although it has obtained a lot of valuable theoretical and applied results, it enriches the theoretical vision and methodological guidance of network public opinion research, guidance and utilization, but it is open, nonlinear and dynamic. The evolution of complex network giant systems still has limitations. Compared with foreign related research, China has a slight lag in interpreting the Internet with complex adaptive systems, using chaos theory and self-organization principle to interpret the network public opinion mechanism, but in the "butterfly effect" and "long tail theory," The research and application of theories such as "herd theory", "self-organization theory", "mutation theory" and "phase transition theory" are gradually deepening, and relevant theoretical research and case analysis and network public opinion guidance for the application of complex adaptive systems It has opened up broad prospects and put forward many new methods and new ideas for solving problems. Looking forward to the future of network public opinion, first, in the spatial dimension, based on the local and global perspective, we must build a "harmonious world" as the concept and expand the network. Lyric research and guidance have attracted new connotations in depth and breadth. The concept of "harmonious world" is "open-minded thinking, pursuing peace between people, peace between nations, humans and nature." Harmony, the idea of seeking coexistence and win-win through dialogue and cooperation is the core connotation of China's century foreign policy with ideal pursuit and global strategy.

5. Reference
[1] Wang R. Research on information security strategy and risk management for smart grid[C]// China International Conference on Electricity Distribution. 2014.
[2] Boudriga N, Hamdi M. Computer and network security risk management: Theory, challenges, and countermeasures [J]. International Journal of Communication Systems, 2010, 18(8):763-793.
[3] Wu Q, Wang M, Luo J, et al. Research on and Development of Visual Software for Security Risk Management in Shield Tunnel Construction[J]. Modern Tunnelling Technology, 2013.
[4] Sattayaprasert W, Taneerananon P, Hanaoka S, et al. Creating a risk-based network for hazmat logistics by route prioritization with AHP[J]. Iatss Research, 2008, 32(1):74-87.
[5] Yue W T, Ryu Y U, Liu D. Network externalities, layered protection and IT security risk management[J]. Decision Support Systems, 2008, 44(1):1-16.
[6] Roumboutsos A, Nikitakos N, Gritzalis S. Information technology network security risk assessment and management framework for shipping companies [J]. Maritime Policy & Management, 2005, 32(4):421-432.