

# ***Guiding Role of the Five Pre-crisis Predictions for Crisis Response Decision-making in Educational Online Public Opinion Crises: an Approach that Incorporates Integrated Learning***

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**Abstract:** When facing complex and sudden crisis events, personnel in the field of public management face higher levels of requirements. In order to effectively respond to online public opinion, a comprehensive and systematic approach is needed to analyze relevant information. From the perspectives of communication and psychology, this article introduces ensemble learning theory and constructs a systematic evaluation system, evaluation standards, and evaluation methods to solve the problems of model parameter selection and weight calculation in the process of crisis response decision-making strategy selection. By exploring how to establish an efficient and feasible emergency rescue command platform and mechanism for crisis events, it provided a reference basis for the government to formulate corresponding measures. This article tested the mechanism of the model, and the test results showed that the sensitivity of the model to real crisis situations was 0.94 or above; the correct judgment rate for non crisis situations was 96% or above, and it has good classification ability.

## **1. Introduction**

Crisis public relations refers to the comprehensive control of public issues by the government, media, and the public through information dissemination, in order to maintain social stability and resolve them within a low impact range. However, there are various types of voices on the internet, including negative news such as rumors, rumors, and suspicions. Improper response measures and non-standard handling of negative public opinion can also trigger public opinion crises.

Researchers from various countries have conducted extensive research on online public opinion

crises, mostly focusing on analyzing and explaining their concepts, characteristics, and types at the macro level. Some scholars have proposed the "three network integration" model, believing that the network, as an open system, is closely related to relevant government departments. At the same time, they also pointed out the characteristics of fast and unstable dissemination of online information, as well as high requirements for efficiency in handling public opinion events [1-2]. In addition, some scholars have concluded through collecting and organizing a large amount of domestic and foreign literature that after a crisis occurs, information dissemination speed is fast and public participation is high. Some scholars have also used Weibo platforms for data analysis and found that Chinese internet users pay more attention to social hot events and government responses, and engage in more interaction with other media [3-4]. This article studies crisis response decision-making based on ensemble learning methods.

However, currently there is relatively little research on online public opinion in China, especially in various fields of public opinion research. Therefore, this article analyzed and summarized the current development trend of internet public opinion in China, and proposed corresponding measures and suggestions. It is necessary to have a deep understanding of the shortcomings when facing various forms and types of public opinion, and to think about how to better utilize opportunities to meet challenges, in order to establish an efficient response mechanism. Before clarifying the basic concepts of online public opinion, it is also necessary to have a deep understanding of the relevant factors when a crisis occurs, in order to make more accurate and effective decision-making and handling.

## **2. Discussion on the Crisis of Education Network Public Opinion**

### **2.1. Subject of Crisis Events**

Before the crisis occurred, people had a certain level of understanding of the event, but they did not fully realize the possibilities brought about by public opinion crises. When the public has some understanding of information and the state of affairs, they are more inclined to accept positive public opinion. When a crisis erupts, disseminators become the main body of public opinion. Online public opinion, with its powerful educational function, enables the public to identify, screen, and analyze information, thereby forming personal opinions and viewpoints [5-6]. These opinions and viewpoints are often widely disseminated and followed on the internet: firstly, information is quickly released; secondly, after an event occurs, it would be pushed by messages; finally, netizens actively participate in discussions, comments, and reposting other individuals' Weibo accounts, thereby triggering a public opinion crisis. Therefore, everyone has the potential to become an opinion maker in the internet and improve their discourse power by participating in activities such as information dissemination and message transmission, thereby making correct judgments and reactions to events. Figure 1 shows the mechanism of online public opinion.

Due to the explosive and uncertain nature of the internet, it is difficult for people to directly or indirectly participate in the political, economic, and cultural life of the online society. Therefore, the government needs to actively guide and report on crisis events through the media to effectively control the direction of the situation. There are many uncertain factors in the process of information dissemination, such as sudden public safety events (such as major infectious diseases and natural disasters), which often cause social panic. In addition, the lack of effective explanations or responses to the public may lead to obstructed or delayed information transmission [7-8]. In order to respond to the crisis and properly handle aftermath affairs, the subject must promptly understand the development status of the situation and the potential threat and impact of the relevant situation, and take corresponding measures. This subject should include netizens, university scholars, and media in the dissemination of educational online public opinion. However, due to the openness and

interactivity of the Internet, as well as its fast information transmission speed and difficulty in copying and tampering, it is unable to directly set agendas for the public and guide public opinion. At the same time, the anonymization of the internet also allows netizens to express their opinions freely, but this can also lead to unclear identity of the main body of public opinion crisis events, difficulty in unifying opinions, and even conflicting situations [9-10].

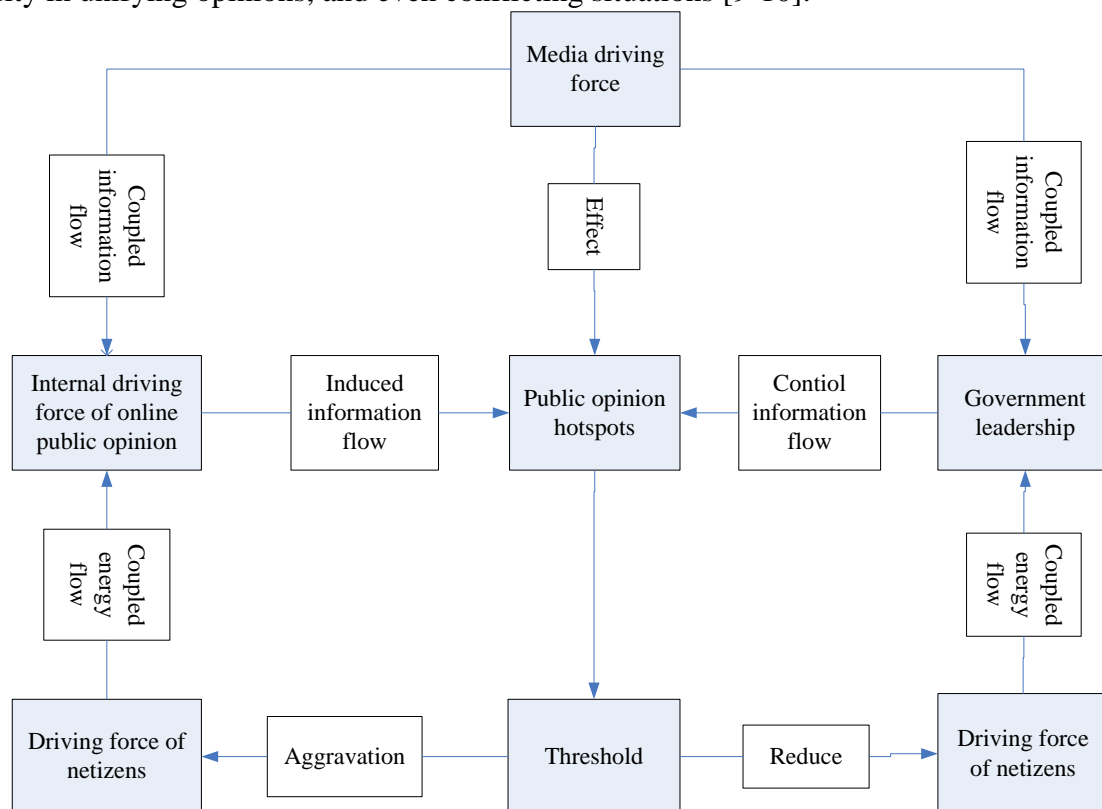


Figure 1. Function mechanism of network public opinion

## 2.2. Response Measures for Network Public Opinion Crisis

(1) Enhance crisis management awareness and establish a crisis public relations concept: in the field of public relations, it is necessary to hold the correct attitude and values. Online public opinion is a special group behavior pattern formed and maintained through internet communication platforms, characterized by discourse power, public opinion leaders, and government authority. It reflects the public's attention and discussion of a certain fact or phenomenon, and provides more opportunities for speaking and a platform for expressing opinions. However, online public opinion can also reflect the shortcomings of the petitioner's own values and whether government departments have forward-looking awareness [11-12].

(2) Timely response and communication: In the face of online public opinion crises, formal statements should be issued in a timely manner to respond to public concerns and provide transparent information to reduce unnecessary speculation and rumors. Effective communication with the public and answering their questions and concerns is needed to increase transparency and trust. Online public opinion is a two-way communication process. On the one hand, the government can keep abreast of the development of the situation in a timely manner; on the other hand, enterprises can also quickly understand their own environment in order to make corresponding adjustment measures to cope with the sudden impact of crises. These adjustments include the

handling of crisis information to avoid the occurrence of negative public opinion and the spread and outbreak of negative emotions, thereby avoiding serious consequences and harm to the public interest [13-14].

(3) Listening and Understanding: After a crisis erupts, it is necessary to actively listen to and understand the opinions and opinions of the public, understand their concerns and demands. By timely adjusting strategies and actions to respond to public expectations, it can increase public understanding and identification with the organization. At the beginning of the outbreak of public opinion, the public and opinion leaders should be informed of the progress of the event, as well as the potential problems and solutions that may arise during the government's handling process [15-16]. The crisis public relations department can publish relevant information through online platforms, so that more people can understand the truth of the news and eliminate doubts about work.

(4) Utilizing the influence of media: Various media channels, including self media platforms and news media, can be reasonably utilized to actively disseminate measures and relevant information taken by organizations in public opinion crises, thereby expanding the influence of positive voices. In the process of dealing with crisis events, the media plays a very important role. It conveys information to the audience by conveying it to the public. Therefore, public opinion disseminators should make full use of online platforms for effective public opinion guidance, and need to strengthen the construction and management of the media environment. Secondly, it is necessary to strengthen the communication and collaboration capabilities between government functional departments and news media, enhance the awareness of coordination and cooperation and guide the public to pay attention to key issues. Finally, it is necessary to establish a sound crisis response mechanism and early warning system in order to respond to media concerns in a timely manner, thereby avoiding the escalation of the situation and preventing serious consequences or even tragic events from occurring in public opinion crises.

(5) Strengthen cooperation and linkage: In the process of responding to online public opinion crises, it is necessary to actively cooperate and linkage with relevant stakeholders, industry associations, professional institutions, and government departments to jointly respond to the crisis and form an integrated crisis response mechanism. In the process of crisis response, public opinion disseminators and participants in online public opinion events need to strengthen cooperation in communication and exchange, because only in this way can one better solve practical problems such as information asymmetry and conflicts in sudden situations [17-18]. Meanwhile, due to the rapid development and widespread popularity of internet technology, netizens have a high level of participation in it. Therefore, the government should make full use of this platform to enhance its influence and credibility, which can attract more groups to participate in crisis governance and provide the public with the right to know, thereby creating a good public opinion environment and social communication channels to promote the transformation of events in the right direction.

### **3. Experimental Process of Crisis Response Decision-making Model for Ensemble Learning**

#### **3.1. Construction of an Integrated Learning Network Public Opinion Crisis Warning Model**

Before a crisis event occurs, a crisis warning model should be established to model and analyze the evolution of network public opinion, and use simulation technology for prediction. The construction of this model is based on ensemble learning theory, using a relational database with multiple perspectives, nonlinear mapping, and multi-level integration. This method combines neural weights and node weights to form a complete and clear architecture. At the same time, expert scoring mechanisms and related knowledge bases have been introduced into the system. Finally, based on the evolution map of online public opinion, crisis events are predicted and the warning

level is calculated using this model. Under this framework, multi-dimensional, wide-ranging, and high-level warning indicators have also been established to achieve information sharing by recombining and integrating existing resources and means. At the same time, different levels of online public opinion crisis events can be utilized to transform them into a new way or method to improve decision-making efficiency and reduce risk levels [19-20]. This model would perform collaborative response on different nodes, and the threshold can be calculated using the following formula.

$$\alpha = \frac{(\lambda_{PN} - \lambda_{BN})}{(\lambda_{PN} - \lambda_{BN}) + (\lambda_{BP} - \lambda_{PP})} \quad (1)$$

$$\beta = \frac{(\lambda_{BN} - \lambda_{NN})}{(\lambda_{BN} - \lambda_{NN}) + (\lambda_{NP} - \lambda_{BP})} \quad (2)$$

$$\gamma = \frac{(\lambda_{PN} - \lambda_{NN})}{(\lambda_{PN} - \lambda_{NN}) + (\lambda_{NP} - \lambda_{PP})} \quad (3)$$

The system can use this method for crisis warning analysis. It determines the weights of various elements in the system based on their relationships and the strength of their forces. It quantifies the amount of information resources and converts them into output to a database. Finally, it establishes a corresponding indicator system and utilizes integrated learning technology to input these data into the network platform in a certain way. This system provides a comprehensive evaluation and analysis of the occurrence, current handling, and subsequent disposal of public emergencies. On this basis, corresponding response strategies and methods are determined by adjusting the feedback results at different levels. Decision makers respond based on feedback information and promptly reflect relevant opinions and suggestions during the information transmission process, thereby determining the connection between negative information and all elements in the system. Secondly, it is necessary to establish a correlation matrix and select appropriate weight values to transform it into a vector to form a complete function. The final step is to conduct risk response evaluation and decision-making, ultimately achieving the goal of comprehensive evaluation results. By organizing, summarizing, and summarizing content related to news facts, other data, and knowledge through online media, hot topics and dynamic news that already exist or are about to emerge in current society can be identified. At the same time, based on this information, analyzing, categorizing, and building appropriate models, it is possible to predict the possible risks.

### 3.2. Calculation of Evaluation Index Weights for Integrated Learning

The evaluation index system of integrated learning mainly covers three aspects: knowledge, skills, and attitude. Evaluation indicators are synthesized within a system by integrating a certain amount of information to obtain corresponding weights. Network public opinion crisis events occur frequently in various industries, with numerous uncertain factors and complex data. In addition, it is difficult to accurately define and quantify the relevant content, and it is not possible to conduct specific analysis and make qualitative judgments on each issue. Therefore, ensemble learning theory can solve the above problems by comprehensively considering the importance of multiple indicators and constructing a highly intensive evaluation system. Table 1 shows the indicator weights.

Table 1. The index system

Level 1 indicators	Level 2 indicators
Public opinion event destructive power	Force, sensitivity, and diffusivity
Internet users driving force	Emotional intensity, behavioral intensity, and number of reports
Media impetus	Report quality
Government regulation	The level of guidance

In the evaluation system of integrated learning, capability represents the amount of information resources contained in the system, which can help managers make quick and accurate decisions on crisis events. Skills refer to the ability to transform complex and difficult to handle problems into simple but easy to understand and effectively control the direction of development. Emotional experience is the purpose or process of comforting the victim's emotions by perceiving others' feelings and actively taking action. When there is a problem at a certain level (such as an emergency), immediate measures should be taken and timely feedback information should be provided to relevant departments to respond to the crisis public relations handling situation. On the contrary, corresponding strategies are adopted for evaluation and decision-making based on changes in indicators such as the serious consequences or scope of impact caused by crisis events. As a new method and technology, ensemble learning introduces many other factors as weight values, thereby improving the comprehensive ability of the system.

### 3.3. Empirical Results and Model Testing

In the process of database management, a large amount of information is involved, which objectively exists. Therefore, it is necessary to process these data. In order to better understand the emergence, development, and response strategies of public opinion crises, this paper aimed to study these issues in order to better understand the causes of events and their impact on crisis response decisions. Then, appropriate methods can be selected based on the actual situation, transforming the research results into effective measures, and ultimately implementing them. On the basis of determining relevant indicators, it is also necessary to consider whether it meets the criteria for evaluating the intensity of crisis events. At the same time, it is necessary to estimate the selected indicators and calculate the corresponding weight coefficients. Among them, the determination of these weight coefficients is based on the comprehensive consideration of expert experience judgment and is not solely dependent on the actual situation. Therefore, when conducting data analysis, it is necessary to choose appropriate methods to combine these factors to accurately reflect the essence and laws of the problem.

## 4. Experiment on the Crisis Response Decision Model of Integrated Learning

The definition of sensitivity refers to the proportion of positive cases correctly judged by the model among all positive cases. This indicator reflects the model's ability to identify real crisis situations. The validity, authenticity, and reliability of data play a crucial role in evaluating the effectiveness of crisis triggered information. However, in public opinion crises, the complexity and impact of the post outbreak dissemination process cannot be avoided. By testing and analyzing online releases that may have negative news, hidden or undisclosed factors can be revealed. Different sample sizes can lead to different results: when the data volume is small and linearly distributed, the propagation speed is slower; when the amount of data is large and non-linear, the accuracy and reliability of information would decrease. According to the data in Figure 2, the sensitivity of this model to real crisis situations was 0.94 or above.

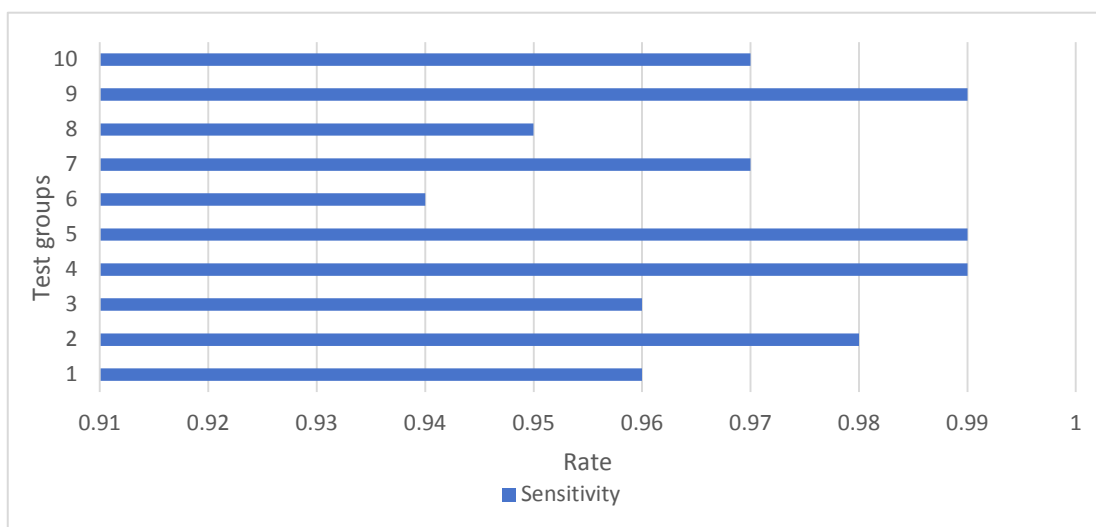


Figure 2. Sensitivity

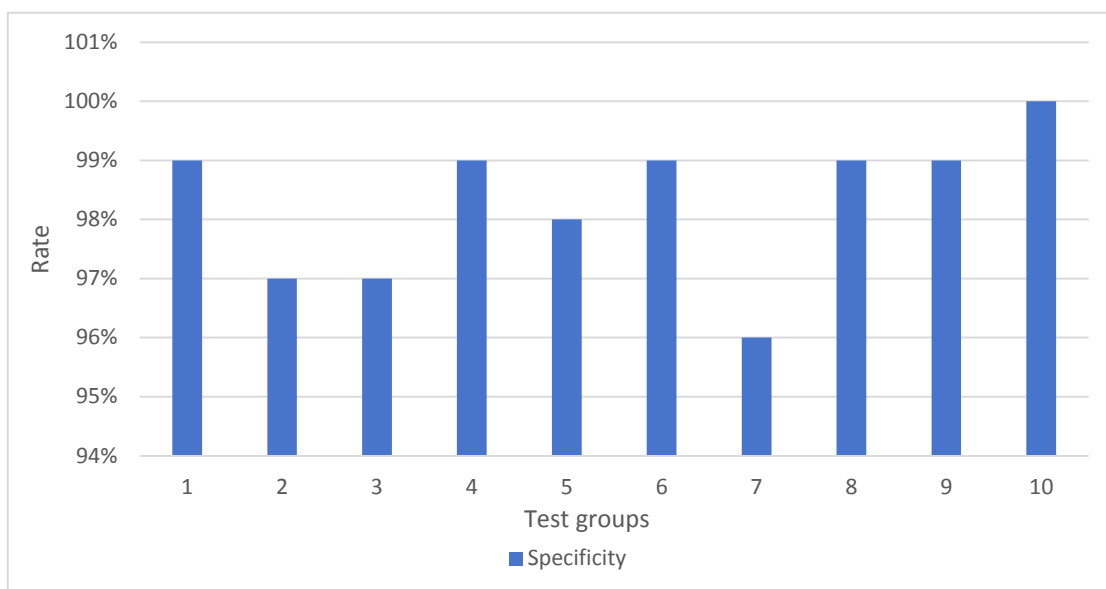


Figure 3. Specificity

Specificity refers to the proportion of negative samples correctly judged by the model among all negative samples. It reflects the model's ability to judge non crisis situations. When a crisis occurs, the application of data mining technology can provide new methods and means for related research. By testing and analyzing the model, it can be determined whether the sample size meets the expected goals. From the extracted feature values, sensitive information can be obtained, which has strong capabilities in predicting the development process, dissemination patterns, and trends of public opinion on the internet. Based on sensitivity indicators for classification, statistics, and analysis, data mining techniques can be applied to establish corresponding models, and relevant theoretical knowledge can be combined to determine whether response measures need to be taken to respond to each public opinion crisis event. From the data in Figure 3, it can be seen that the model had a judgment accuracy of 96% or above for non crisis situations.

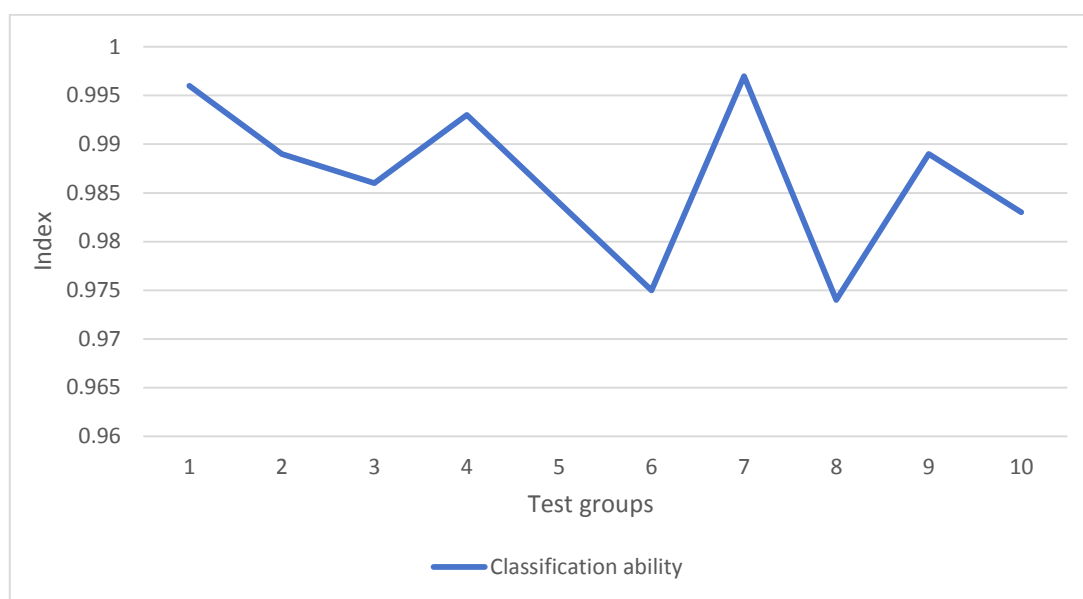


Figure 4. The ability to classify crisis things

When a crisis occurs, public opinion disseminators would classify and process information based on past or personal experience. According to the data in Figure 4, it can be observed that the model's classification ability for crisis events approaches 1, indicating that the model has better classification ability. This study constructed a new model based on ensemble learning theory and information asset pricing mechanism, and established a response and disposal strategy system after the occurrence of online public opinion crisis events. The empirical results in this model indicated that comprehensive analysis and handling of negative news was effective for public opinion crisis events, which provided a scientific decision-making basis for public opinion disseminators.

## 5. Conclusion

The frequent occurrence of online public opinion crises has brought great challenges to governments, enterprises, and citizens. How to deal with this crisis has become a topic worth studying. From the perspective of communication science, this article constructed a framework model based on ensemble learning to analyze the impact of information exchange and communication mechanisms on negative response effects (i.e. positive feedback) after an event occurs. The application of this theory can analyze the corresponding measures taken for crisis response decision-making in the face of sudden public events, which has practical significance and operability research value, and provides reference opinions for governments, enterprises, and citizens.

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## Data Availability

The datasets used during the current study are available from the corresponding author on reasonable request.



## Conflict of Interest

The author states that this article has no conflict of interest.

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