User Perspective on Information Credibility Evaluation in Social Q&A Communities: A Postprint

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Abstract

[Purpose/Significance] From a user perspective, this study investigates information credibility assessment, analyzes user credibility evaluation behaviors, and explores user credibility evaluation indicator systems, which holds significant theoretical importance for information credibility assessment research. [Method/Process] Employing grounded theory methodology, this study codes user information credibility comments within question-and-answer community contexts across three dimensions: information source, information content and structure, and medium, to analyze users' credibility evaluation decisions in authentic contexts. [Results/Conclusions] Users demonstrate a greater tendency to utilize evaluation indicators from the information content dimension when assessing information credibility. The individual indicators with relatively high usage frequency are accuracy, logicality, and objectivity; the combined indicators are accuracy-objectivity and accuracy-reasonableness. Professional knowledge background influences the depth of users' credibility evaluations—the higher the relevance between professional background and topic, the greater the influence of credibility comments.

Full Text

Research on Information Credibility Evaluation in Social Q&A Communities from a User Perspective

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Abstract

Purpose/Significance
From a user perspective, this study investigates information credibility eval-

uation by analyzing user credibility assessment behaviors and exploring user credibility evaluation indicator systems, which holds important theoretical significance for information credibility evaluation research.

Method/Process
Using grounded theory methodology, this paper codes user information credibility comments in Q&A community contexts across three dimensions: information source, information content and structure, and medium. It analyzes users' credibility evaluation decision-making in authentic situations.

Results/Conclusions
Users tend to rely more heavily on information content dimension indicators to evaluate information credibility. The most frequently used single indicators are accuracy, logicality, and objectivity, while the most common joint indicators are accuracy-objectivity and accuracy-rationality. Professional knowledge background influences the depth of users' credibility evaluations—the higher the relevance between professional background and topic, the greater the influence of credibility comments.

Keywords: Q&A community; information credibility; evaluation indicators

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1 Theoretical Research on Network Information Credibility Evaluation

1.1 Conceptual Definition of Information Credibility The concept of credibility originates from mass communication research, with studies on information credibility dating back to the 1950s. C. Hovland and colleagues defined credibility as expertise and trustworthiness, where expertise refers to a communicator's ability or qualification to understand the true state of a subject, and trustworthiness refers to the tendency or motivation to tell the truth [**?**]. Credibility is also considered a perceptual function, including perceptions of trustworthiness and expertise regarding people and things [**?**]. Wang Yihua argues that information credibility refers to people's recognition of the believability of information, which initially focused on the credibility of the communicator [**?**]. This paper posits that information credibility is a judgment based on the receiver, encompassing both subjective perception of information credibility and subjective judgment of media credibility. C. J. Chung et al. maintain that credibility research primarily unfolds across three aspects: source credibility, information credibility, and media credibility [**?**]. Source credibility relates to the credibility of the message originator, information credibility focuses on information characteristics, and media credibility refers to the channel for processing and transmitting information [**?**]. Therefore, this study examines network information credibility evaluation across three dimensions: source credibility, information structure and content credibility, and media credibility, with each dimension further subdivided into specific indicators.

1.2 Literature Review on Network Information Credibility Evaluation

1.2.1 Foreign Research on Network Information Credibility Evaluation

Numerous foreign scholars have studied network information credibility. R. Li et al. established a new theoretical model based on the "elaboration likelihood model" to predict information credibility on social media platforms [**?**]. T. Lucassen et al. constructed a 3S model to guide users' information trust judgments [**?**]. Q. V. Liao et al. found that when users judge the credibility of online health information, the main criteria include information content, contextual website features, and user comments [**?**]. B. J. Fogg et al.'s research indicates that website design appearance, information structure, information focus, and underlying motivation are the four primary factors people consider when evaluating website credibility [**?**]. P. Borah shows that hyperlinks increase information credibility [**?**]. S. Hussain et al. argue that source credibility is an important prerequisite for user information adoption [**?**]. Y. Ikegami et al. propose an automatic method for evaluating information credibility based on topic and opinion classification that does not require users to possess domain knowledge [**?**].

1.2.2 Domestic Research on Network Information Credibility Evaluation

Feng Xiaoshuo identifies the following main indicators for information credibility evaluation: relevance, objectivity, accuracy, innovativeness, influence, authority, timeliness, verifiability, and universality [**?**]. X. Wu et al. propose ensuring information reliability by detecting puppet users [**?**]. Wang Yihua notes that most information credibility evaluation methods use automatic assessment, primarily selecting user characteristics, text features, and information dissemination features [**?**]. Jiang Shengyi et al. state that existing microblog information credibility analysis methods mainly include classification learning methods and ranking methods, and propose improvement recommendations for existing methods' problems [**?**].

1.2.3 Research Review

Foreign research on network information credibility evaluation primarily examines three dimensions: source credibility, information credibility, and media credibility. However, studies on information credibility have not integrated evaluation indicators, focusing mainly on information content evaluation with less attention to information structure, and lacking comprehensive analysis of credibility concepts without distinguishing between reliability and credibility. Domestic research concentrates on constructing information content quality evaluation indicator systems with relatively single evaluation dimensions, resulting in large, dispersed, and unsystematic indicator sets. Theoretical research dominates while empirical studies are scarce, lacking feasibility and practicality. Therefore, this paper aims to construct an information credibility evaluation indicator system from the user perspective.

2 Research Design

2.1 Selection of Network Information Credibility Evaluation Indicators Network information credibility evaluation analysis includes three major dimensions: source credibility, information structure and content credibility, and media credibility.

(1) Source Credibility is an important dimensional characteristic of information credibility. Information sources include institutions and individuals, which distinguishes it from reliability evaluation that typically only considers author authority. Wang Ping and Cheng Qikai point out that information source credibility primarily exists at institutional and individual levels [**?**]. T. Lucassen et al. construct the 3S model through information source characteristics, information characteristics, and medium characteristics to guide users' information judgment [**?**]. M. J. Metzger et al. propose that users often use reputation heuristics when judging information credibility, namely the reputation or recognition of online information websites [**?**]. Thus, at the source credibility level, institutions and individuals are the main evaluation criteria.

(2) Information Structure and Content constitute another important evaluation dimension. B. J. Fogg and five other researchers note that website design, information structure, and information focus are the top three factors people consider when evaluating website credibility [**?**]. Online information credibility evaluation typically includes five criteria: accuracy, authority, objectivity, timeliness, and coverage [**?**]. P. Borah uses five dimensions: fairness, completeness, bias, accuracy, and trustworthiness [**?**]. C. N. Wathen et al. consider information content professionalism, timeliness, accuracy, and relevance as important evaluation indicators [**?**].

(3) Media Credibility is also an indispensable evaluation dimension. R. Li identifies five factors of information credibility: media credibility, media dependency, interactivity, transparency, and message credibility, showing that media interactivity and transparency affect information credibility [**?**]. Media credibility main indicators include source credibility, information credibility, and media credibility, typically considered a multidimensional concept [**?**].

In summary, this paper constructs a network information credibility evaluation indicator system comprising 3 dimensions and 26 indicators, detailed in Table 1 .

2.2 Research Methods 2.2.1 Grounded Theory
This paper uses grounded theory to conduct qualitative analysis and identification of network information credibility evaluation indicators. Unlike quantitative research, grounded theory develops inductive theory in a field through data collection and statistical analysis. Data coding is the most important procedure in grounded theory, including three levels: first-level coding (open coding), second-level coding (associative or axial coding), and third-level coding (core or selective coding).

(1) First-level Coding: Screening Data and Assigning Concepts
Collected materials are placed in a documentation record, with key information screened out and conceptually labeled. The data contains 54,021 comment entries, of which 29,096 involve information credibility evaluation. For example, "The answer author should be a professional, actually I also have questions. Most content I've seen about GMOs is ridicule" is conceptually labeled as author identity. During open coding, the original state of the materials is preserved to ensure integrity, with new codes extracted promptly when discovered.

(2) Second-level Coding: Identifying Relationships Between Concepts
This involves extracting evaluation indicators used by users, determining concept category levels, and establishing a network information credibility evaluation indicator coding system. Concepts affecting social Q&A community information credibility evaluation are processed, merged for duplicates, and integrated into relevant concepts for reprocessing. Here, A11-A25, B11-B31, C1-C3 represent categories, totaling 26 evaluation indicators, as detailed in Table 2 .

(3) Third-level Coding: Further Refinement
Core categories occupy central positions and associate with other categories, with second-level codes further refined in open coding to ultimately form third-level codes. The second-level coding process yields 26 categories affecting social Q&A community information credibility evaluation, which undergo core category identification, reorganization, and classification to obtain 3 main categories: source credibility, information structure and content credibility, and media credibility.

2.2.2 Data Collection

Empirical data originates from the Zhihu Q&A community. Zhihu connects users from all walks of life, primarily young people, mostly urban white-collar workers and college students with good educational backgrounds. After analyzing Zhihu topics, this study selected two major topics: genetically modified food and blood donation, because these topics generate many concentrated comments. Using web crawler tools from November 15-23, 2017, the study collected target data from the network platform. Based on Zhihu's featured content, the top 60 answers under each topic in featured dynamics were selected, collecting 54,021 comments total: 26,603 comments on "genetically modified food" and 27,418 comments on "blood donation." User-related information was also collected for analysis.

2.2.3 Data Processing

During coding, some comment information is easily categorized conceptually, but disagreements may arise regarding conceptual categories for some comments, requiring multiple discussions on evaluation indicator definitions and information conceptual categories. For example, "Actually I used to be very opposed to blood donation, but seeing your message, I feel positive energy"—some members believed it should be coded as B21 (accuracy), while others believed it was B31 (rationality). After discussion, it was decided to code as B31 (rationality). This study adopted a two-person coding team consisting of two li-

brary and information science students for indicator coding. When both coders agreed, the code was determined as correct; when disagreements occurred, a third student recoded to reach consensus. To clarify information attribution, this paper attached example explanations for each evaluation indicator. Since some evaluation indicators were not used by users, such as institution URL and media interactivity, these two indicators lack corresponding original materials, with specific explanations in Table 2.

3 Results Analysis

3.1 Analysis of Credibility Comment Behavior The number of indicators containing credibility evaluations is 29,096. Statistics were compiled for each topic answer as shown in Table 3 :

Table 3 Basic Statistical Data of Topic Answers

Statistical Item	"Genetically Modified Food"	"Blood Donation"
Total Answers		
Number of Comments		
Number of Commenters		
Total Credibility Evaluations		
Number of Likes		

Mean values are important indicators characterizing data basic features. Based on statistical data in Table 3 , four means were obtained: number of comments, number of commenters, credibility evaluation frequency, and number of likes. These means reflect Zhihu users' comment attitudes and basic interaction conditions, as shown in Table 4 :

Table 4 Average Statistical Data per Answer

Mean Item	"Genetically Modified Food"	"Blood Donation"
Number of Comments		
Number of Commenters		
Credibility Evaluation Frequency		
Number of Likes		

Tables 3 and 4 show that the average number of likes per answer exceeds the average number of comments. This indicates that most users on Zhihu engage in shallow interactions such as liking, with only a minority making credibility evaluations. User liking behavior significantly exceeds credibility evaluation behavior. Additionally, only a small number of users made multiple comments on a particular answer. Overall, Zhihu users' credibility evaluation behavior and deep interaction behavior between users are relatively weak.

3.2 Comparative Analysis of User Evaluation Indicators vs. Conceptual Indicators Based on coding results, statistical analysis was conducted on credibility evaluation indicators (see Table 5 and Table 6). The overall usage frequency of different indicator types is: single indicators (77%), dual indicators (22%), and multiple indicators (1%). Among single indicators, the most frequently used are accuracy, logicality, and objectivity, with accuracy reaching 57%, indicating that information content is the most critical factor in user information credibility evaluation. Institution URL and media interactivity indicators were not used, suggesting users focus more on information essence and that institution URL and media interactivity indicators cannot serve as bases for information credibility evaluation.

Table 5 Overall Frequency Statistics of Different Indicator Types

Indicator Type	Usage Frequency	Overall Frequency (%)
Single Indicator		77.0
Dual Indicators		22.0
Multiple Indicators		1.0

Table 6 Statistics of Single Evaluation Indicator Quantities

Figure 1 [Figure 1: see original paper] shows credibility indicators with evaluation frequencies exceeding 300 across all credibility comments. Information content more easily stimulates users to generate credibility evaluation behaviors. The accuracy indicator is used far more than other indicators. Therefore, the key issue in evaluating network information content lies in how to evaluate information content credibility.

3.3 Comparison of Credibility Evaluation Indicators Across Different Topics To compare indicator differences in credibility evaluation across topics, this paper statistically analyzed credibility indicators with evaluation quantities exceeding 100 in both topics (see Figure 2 [Figure 2: see original paper]). In genetically modified food topic credibility discussions, 10 indicators had evaluation frequencies exceeding 100, including both single and joint indicators. Accuracy has the highest usage frequency, followed by logicality indicators. Joint indicators include accuracy-objectivity and accuracy-expertise. Accuracy remains the primary evaluation indicator for the blood donation topic, followed by rationality indicators. This shows accuracy is frequently used across different topics. Comparison reveals differences in credibility evaluation indicators used for different topics, with blood donation topic indicators being more concentrated, involving only accuracy and rationality. This may be because different information content stimulates users to engage in credibility evaluation behaviors to varying degrees, employing different information credibility evaluation angles.

3.4 Joint Indicator Usage Analysis Beyond single indicators, users often employ joint indicators to evaluate information credibility, such as "First, viruses are not complete biological forms; there is no life or death. Second, it seems you didn't learn high school biology well." This comment clearly evaluates from both accuracy and expertise perspectives. To analyze Zhihu users' joint indicator usage, this study statistically analyzed joint indicators with evaluation frequencies exceeding 100 across all credibility comments (see Figure 3 [Figure 3: see original paper]).

As Figure 3 shows, users mostly employ dual indicators for credibility evaluation, with less use of multiple evaluation indicators. The accuracy-objectivity indicator combination has the highest joint usage frequency, followed by accuracy-rationality and accuracy-expertise, with accuracy appearing in almost all joint indicators. This indicates accuracy is also the most frequently used indicator in joint evaluations.

3.5 Analysis of Information Credibility Evaluation Based on Commenter Knowledge Background User knowledge background significantly influences information credibility evaluation. To study this impact, this paper statistically analyzed user quantities, credibility comment quantities, and credibility comment likes for both topics. Genetically modified food topic results are shown in Table 7 .

Table 7 User Quantity Statistics for Genetically Modified Food Topic

Industry	All Comment Users	Information Credibility Evaluation Users	User Credibility Comment Likes

Under the genetically modified food topic, users from internet, computer software, and bioengineering industries rank high in all three metrics. Internet and computer software industry user groups are large, enjoy exploring non-professional fields, possess proficient online interaction skills, and their published content more easily gains other users' approval. As genetically modified food falls within biological research scope, bioengineering industry users' credibility comment quantity and likes reach 395 and 881 respectively, demonstrating that professional knowledge influences other users' perceptions of credibility comments.

Table 8 User Quantity Statistics for Blood Donation Topic

Industry	All Comment Users	Information Credibility Evaluation Users	User Credibility Comment Likes

Taking all comment users on the blood donation topic as research subjects, statistics were compiled for six industries (see Table 8). Under the blood donation topic, internet, computer software, and clinical medical industry users rank high in quantity, credibility comment quantity, and credibility comment likes. Internet and computer software industry findings are consistent with previous results. As blood donation involves medical knowledge, clinical medical industry users' credibility comment quantity and likes rank first, again proving the importance of professional knowledge in user information credibility evaluation.

Second, this paper analyzed credibility indicators for high-like industries, counting credibility evaluation indicators for civil aviation and electronic gaming industry users (see Figure 4 [Figure 4: see original paper] and Figure 5 [Figure 5: see original paper]). Results show high-like credibility comments extensively use joint indicators, indicating that more comprehensive information in credibility comments yields higher influence. Accuracy indicator usage frequency is highest, followed by expertise and other key indicators, showing that information content credibility evaluation is not only users' first choice but also more easily gains other users' approval, satisfying other industry users' credibility evaluation needs and potentially triggering liking behavior.

3.6 Influence Analysis of Credibility Comments To analyze credibility evaluation influence, user credibility comment likes were counted, with more likes indicating higher influence. First, to analyze the impact of user knowledge background on credibility comments, this paper statistically analyzed user quantities, credibility comment quantities, and credibility comment likes for both topics.

Tables 7 and 8 show that internet and computer software industries have significantly higher all-comment user quantities and information credibility evaluation user quantities than other industries, possibly because these industry practitioners frequently use networks and possess proficient skills. However, industries related to the topics—bioengineering for genetically modified food and medical services for blood donation—still have relatively high information credibility evaluation user quantities, indicating user professional knowledge influences their topic participation. Moreover, credibility comments from topic-related industries receive the highest likes, demonstrating that author professional knowledge can enhance credibility comment influence. Civil aviation and electronic gaming industries have low topic relevance but are high-like industries; the study found that high-like credibility comments characteristically use joint indicators, indicating that more comprehensive information in credibility comments yields higher influence.

4 Conclusion

This study reveals several key findings:

(1) Differences exist between user-employed credibility evaluation indicators

and conceptual indicators. Users prefer using information content dimension indicators as credibility evaluation bases, while source credibility and media credibility are used less frequently. Some evaluation indicators are basically unused, such as institution URL and media interactivity.

(2) Users employ only a small number of key indicators for credibility evaluation. Data analysis reveals accuracy is the most frequently used indicator, with logicality and objectivity also commonly used. In joint indicator usage, accuracy-objectivity and accuracy-rationality combinations are frequently employed.

(3) Different topics use different credibility evaluation indicators. Comparison across topics shows accuracy is the most frequently used indicator in both, but other indicators differ. This may relate to topic characteristics. For example, the genetically modified food topic is more knowledge-intensive, thus logicality and expertise indicators are used more frequently, while other indicators are used less. The blood donation topic has more universal participation, with information content more likely to resonate with users, thus users prefer multi-level interaction and evaluation indicators are more dispersed.

(4) Single information credibility evaluation indicators are used most frequently. Statistical analysis shows single indicators are used most, followed by dual indicators, with multiple indicators used least, indicating users prefer using single indicators to judge information credibility. Analysis of actual comments shows that when users question information authenticity, they may judge credibility through a single clue or indicator rather than seeking multiple clues. However, when users aim to explain their credibility judgments to others, they prefer joint indicators to increase comment persuasiveness.

(5) Users with different professional knowledge use credibility evaluation indicators differently. Users from industries unrelated to topics, lacking professional knowledge, prefer using rationality single indicators to evaluate information credibility, and comments without credibility evaluations are most numerous. Users with unrelated professional knowledge evaluate information credibility from different angles.

(6) User professional knowledge influences credibility comment influence. Internet and computer software industries have significantly higher all-comment user quantities and information credibility evaluation user quantities than other industries, possibly due to frequent network use and proficient skills. However, topic-related industries—bioengineering for genetically modified food and medical services for blood donation—still have many information credibility evaluation users, indicating user professional knowledge influences topic participation. Credibility comments from topic-related industries receive the most likes, showing author professional knowledge enhances credibility comment influence. Civil

aviation and electronic gaming industries have low topic relevance but are high-like industries; high-like credibility comments characteristically use joint indicators, indicating more comprehensive information yields higher influence.

Limitations

This study uses the social Q&A community Zhihu as the investigation platform; future research should expand to other social Q&A community types. This study examines two topics—"genetically modified food" and "blood donation"—which somewhat limits conclusion generalizability. Subsequent research should address large-scale datasets and analyze user interaction network structures and attribute characteristics to explore underlying motivations, thereby gaining deeper understanding of user credibility comment behavior and constructing richer user comment behavior models.

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Author Contributions

Shen Wang: Responsible for research design, data analysis, and final manuscript revision.
Kang Xiaopu: Responsible for content writing, revision, and data analysis.
Wang Jiaxin: Responsible for data processing and proofreading.
Rao Zeyang: Responsible for data processing.

Research on the Evaluation of Information Credibility of Social Q&A Community Based on Users' Perspective

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Abstract: [Purpose/significance] Based on the user perspective on information credibility evaluation research, analysis of user credibility evaluation behavior and the user credibility evaluation index system, research on information credibility evaluation theory is of great significance. [Method/process] By adopting the method of grounded theory, coding the user information credibility comments from the information source, information content, structure and medium three dimensions in Q&A community, this paper analyzed users' credibility evaluation decision in the real situation. [Result/conclusion] Users are more inclined to use the information content dimension evaluation index to evaluate the credibility of information. The accuracy, logicality and objectivity of the single index are higher. The joint index is accuracy and objectivity, accuracy and rationality. The professional knowledge background influences the depth of credibility evaluation of users. The higher the correlation between professional background and topic, the greater the influence of credibility review.

Keywords: Q&A community; information credibility; evaluation index

Note: Figure translations are in progress. See original paper for figures.