

Developing a Theoretical Framework for Web Credibility Assessment on Social Q&A Sites: Preliminary Findings

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Abstract. As part of a large study on developing a theoretical framework for web credibility assessment, this poster presents the preliminary findings on web credibility assessment on social question-and-answer (Q&A) sites using survey data collected through Amazon Mechanical Turk (MTurk), an online crowdsourcing platform. The online survey questionnaire used in the study is designed to examine social Q&A users' perceptions of 21 criteria categorized into six types of credibility markers (operator trustworthiness, operator expertise, content trustworthiness, content expertise, design trustworthiness, and design expertise). The results showed that the majority of the participants (n=152; 87.9%) have been using social Q&A sites for more than 3 years and evaluating posts on social Q&A sites was the more frequently performed activity than answering or asking questions. Furthermore, at the credibility criterion level, the top five most valued credibility criteria were all associated with the attributes of content (e.g., accuracy, evidence-based) rather than the characteristics of the author (e.g., transparency, reputation) or the site's design (e.g., appropriate design, moderation). At the credibility-type level, however, design expertise, which is regarding the appropriateness and usability of the site, was perceived as the most important factor in assessing information credibility on social Q&A sites. Implications of the results and future directions are discussed.

Keywords: Information Credibility, Web Credibility, Credibility Assessment, Social Q&A.

1 Introduction

Social media is reported to be used by almost 50 % of U.S. adults as a source to get news [1]. Its influence raised awareness of misinformation during the COVID-19 pandemic signaling the importance of assessing information credibility on social media [2]. A social question-and-answer (Q&A) site is a type of social media that allows users to ask, answer, and evaluate user-generated content in natural language on various topics [3,4]. As general

users, who are not necessarily experts in a given topic, are the main contributors on social Q&A sites, it is crucial to identify credible information among the answers.

Previous studies have paid attention to information quality on social Q&A sites examining user criteria in identifying characteristics of high-quality answers on the sites [5-7]. Compared to information quality research, there is a lack of research specifically focusing on information credibility in the social Q&A context. This study, to bridge this gap, is a part of a larger project developing a theoretical framework of web credibility assessment on social Q&A sites. As an effort to validate the conceptual framework, this preliminary study investigates social Q&A usages and six credibility markers.

2 Theoretical Background

Choi and Stvilia's [8] extended typology of web credibility is structured by incorporating a two-factor model of credibility by Hovland et al. [9] and the web credibility framework by Fogg [10]. Hovland et al. [9] conceptualized the key dimensions of credibility as trustworthiness and expertise. They noted that the perceived trustworthiness and expertness of the communicator influence the receiver in judging the credibility of the received information. Fogg [10] categorized web credibility measures into three main categories: operator, content, and design. The extended typology of web credibility [8] integrated these two models developing a framework consisting of six types of web credibility markers: Operator trustworthiness (OT), Operator expertise (OE), Content trustworthiness (CT), Content expertise (CE), Design trustworthiness (DT), and Design expertise (DE). As this framework captures essential elements in relation to web credibility assessment, the framework of web credibility assessment on social Q&A sites is further refined to reflect the characteristics of social Q&A [11].

The conceptual framework of web credibility assessment on social Q&A sites includes 21 criteria for web credibility assessments in the social Q&A context (see Fig. 1). Trustworthiness is the perceived intention of the site or the information object on social Q&A sites as providing valid information. Expertise is the perceived ability of the site or the information object on social Q&A sites to provide valid information. In the social Q&A site context, the operator refers to the author of the content or the operator of a site as one of the markers affecting the user's perception. Content trustworthiness and expertise refer to semantic and structural elements of content on social Q&A sites affecting users' perception in assessing web credibility. Design trustworthiness and expertise refer to the structural, technical, aesthetic, and interaction design elements of social Q&A sites affecting users' perception in assessing web credibility.

	Trustworthiness	Expertise
Operator (Author)	<ul style="list-style-type: none"> ▪ Decency ▪ No-conflict of interest/Benevolence ▪ Transparency 	<ul style="list-style-type: none"> ▪ Credentials ▪ Reputation
Content	<ul style="list-style-type: none"> ▪ Citing Sources ▪ Consistency ▪ Currency ▪ Social Validation ▪ Unbiasedness 	<ul style="list-style-type: none"> ▪ Accuracy ▪ Evidence-based ▪ Novelty ▪ Pertinence ▪ Reinforcement ▪ Semantic Completeness ▪ Structural Completeness
Design	<ul style="list-style-type: none"> ▪ Engaging Design ▪ Moderation 	<ul style="list-style-type: none"> ▪ Appropriate Design ▪ Ease of Use

Fig. 1. A typology of web credibility on social Q&A sites

3 Research Method

3.1 Survey Design

The survey consists of five main sections: social Q&A use and experience, credibility assessment, the outcome of assessment, proficiency in information technology, and demographic background. Questions in the credibility assessment section were developed based on the framework for social Q&A sites [11]. Therefore, this section asks user's perception on the characteristics of the operator or author, content, and design on social Q&A sites. The participants were asked to rate their perception using a 5-point Likert scale (1=not at all important to 5=extremely important). For example, a question on social validation is phrased as follows:

How does each of the following elements affect your perception of information credibility on a social Q&A site?

The content provides information accepted by the community (e.g., "up-votes," "likes").

3.2 Data Collection and Analysis

The survey questionnaire was distributed through Amazon Mechanical Turk (MTurk), a crowdsourcing marketplace allowing researchers to find suitable individuals to complete given tasks virtually to collect data. The data collection was done in July 2022. To be eligible for this study, the participants were required to meet the three criteria: (a) 18 years or older, (b) residing in the United States, and (c) experience in using a social Q&A site in the

past 6 months. Among 185 responses collected, a total of 173 responses were used after removing incomplete responses. Table 1 presents the descriptive statistics of the demographic data of the participants.

Table 1. Demographic data ($N = 173$)

	n	%
Age		
18–29 years old	7	4.0
30–49 years old	117	67.6
50–64 years old	42	24.3
65+ years old	6	3.5
Prefer not to answer	1	0.6
Gender		
Female	83	48.0
Male	88	50.9
Nonbinary or prefer not to answer	2	1.1
Education		
Less than a high school diploma	1	0.6
High school graduate (or equivalent including GED)	18	10.4
Some college but no degree	32	18.5
Associate degree in college	30	17.3
Bachelor's degree in college	71	41.0
Master's degree	15	8.7
Doctoral degree	5	2.9
Professional degree (JD, MD)	1	0.6
Race		
Asian	6	3.5
Black or African American	13	7.5
White	139	80.3
Multiracial	10	5.8
Other	3	1.7
Prefer not to answer	2	1.2

4 Findings

4.1 Social Q&A usage

Table 2 reports the participants' use of social Q&A sites. Among 173 participants, around 88 % (n=152) of participants indicated that they have used social Q&A sites for more than three years. Approximately 26% (n=46) of participants used social Q&A sites daily, while about 41% (n=71) used social Q&A sites weekly. Moreover, there was a variance in participants' actions on social Q&A sites. Only about 3 % (n=5) of the participants reported having asked more than 40 questions, and about 9 % (n=15) reported having answered more than 40 questions over the last 6 months. On evaluating questions, however, about 36% (n=62) reported having evaluated 40 questions or more over the last 6 months, indicating that the participants were more active in evaluating questions than asking or answering them.

Table 2. Descriptive statistics social Q&A sites usage ($N = 173$)

	n	%
Duration of social Q&A site use		
Less than 6 months	5	2.9
6 months or more but less than 1 year	5	2.9
1 year or more but less than 3 years	11	6.3
3 years or more but less than 5 years	37	21.4
5 years or more	115	66.5
Frequency of social Q&A site use		
Daily	46	26.6
Weekly	71	41.0
Monthly	43	24.9
Yearly	11	6.3
Less often than yearly	2	1.2
Questions asked over the last 6 months		
None	23	13.3
1-10 questions	97	56.1
11-20 questions	32	18.5
21-30 questions	13	7.5

31-40 questions	3	1.7
More than 40 questions	5	2.9
Questions answered over the last 6 months		
None	55	31.8
1-10 questions	64	37.0
11-20 questions	21	12.1
21-30 questions	12	6.9
31-40 questions	6	3.5
More than 40 questions	15	8.7
Questions evaluated over the last 6 months		
None	20	11.6
1-10 questions	40	23.1
11-20 questions	26	15.0
21-30 questions	18	10.4
31-40 questions	7	4.0
More than 40 questions	62	35.8

4.2 Credibility markers on social Q&A sites

The mean value of the ratings on the 39 survey question items associated with the credibility criteria ranged from 4.71 (SD=0.61) to 2.64 (SD=1.22), where 5.00 indicates extremely important and 1.00 indicates not at all important in evaluating information credibility on social Q&A sites. The top five most valued credibility criteria were accuracy (M=4.71, SD=0.61), pertinence (M=4.46, SD=0.72), evidence-based (M=4.44, SD=0.68), currency (M=4.39, SD=0.80), and semantic completeness (M=4.32, SD=0.79), where all the credibility criteria are associated with the content and four of which are associated with CE. Appropriate design (M=4.31, SD=0.72), ease of use (M=4.31, SD=0.75; M=4.30, SD=0.75), moderation (M=4.31, SD=0.96), and no conflict of interest/benevolence (M=4.30, SD=0.78) followed the next valued credibility criteria. Among them, four survey questions are associated with design criteria, while three of them are associated with DE. The least valued credibility criterion was transparency (M=2.64, SD=1.22; M=2.68, SD=1.26) which is associated with OT. In the credibility type level, DE (M=4.27, SD=0.59) showed the highest mean value, followed by CE (M=3.99, SD=0.58) and OE (M=3.92, SD=0.64). The participants seem to regard expertise related markers highly compared to trustworthiness markers in assessing information credibility. Although the top five credibility criteria were related

to the questions on content criteria, the overall ratings showed that the participants valued DE higher than CT and CE.

Table 3. Credibility criteria and markers on social Q&A sites

Types (M, SD)	Survey questions (credibility criteria)	M(SD)
Operator Trustworthi- ness (OT) (3.64, 0.63)	author of the content provides high-quality information rather than for commercial or self-interested purposes (No conflict of interest/benevolence)	4.30(0.78)
	social Q&A community provides high-quality information rather than for commercial or self-interested purposes (No conflict of interest/benevolence)	4.23(0.82)
	author of the content engages in providing high-quality answers (Decency)	4.16(0.84)
	author of the content has a polite and civil attitude (Decency)	3.83(1.06)
	social Q&A community encourages polite and civil attitudes (Decency)	3.65(1.13)
	author of the content makes the profile page available (Transparency)	2.68(1.26)
	author of the content discloses information about themselves (Transparency)	2.64(1.22)
	author of the content has sufficient knowledge and experience (Credentials)	4.29(0.87)
Operator Expertise (OE) (3.92, 0.64)	social Q&A community is reputed to be a reliable source (Reputation)	4.02(0.86)
	social Q&A community is known as an online source that provides expert information (Credentials)	3.80(0.94)
	Author of the content evaluated positively in the community (Reputation)	3.55(0.97)
	provide up-to-date information (Currency)	4.39(0.80)
Content Trustworthi- ness (CT) (3.77, 0.59)	provide unbiased information (Unbiasedness)	4.24(0.90)
	cite the sources of the provided information accurately (Citing sources)	4.12(0.89)
	display references to the original sources of the provided information (Citing sources)	3.98(0.95)
	provide multiple points of view (Unbiasedness)	3.56(0.98)
	use the same terms to convey the same concepts and meanings (Consistency)	3.36(1.01)
	provide information accepted by the community (Social validation)	3.31(1.12)

	cover conflicting views on a controversial topic (Unbiasedness)	3.21(1.07)
Content Expertise (CE) (3.99, 0.58)	provide accurate information (Accuracy)	4.71(0.61)
	provide relevant and applicable information (Pertinence)	4.46(0.72)
	provide information based on valid and verifiable evidence (Evidence-based)	4.44(0.68)
	clear and easy to understand (Semantic completeness)	4.32(0.79)
	reference reliable source (Evidence-based)	4.14(0.88)
	provide information with sufficient breadth and depth (Semantic completeness)	3.97(0.83)
	has concise and uncomplicated sentence structures (Semantic completeness)	3.64(1.13)
	complete in terms of grammar (Structural completeness)	3.64(1.10)
	updated with additional content since its original post (Reinforcement)	3.52(1.12)
	convey original and creative ideas (Novelty)	3.09(1.20)
Design Trustworthiness (DT) (3.86, 0.76)	control malicious activities (Moderation)	4.31(0.96)
	allow users to report malicious activities to the moderator of the site (Moderation)	4.23(1.01)
	provides features that enable users to provide feedback on answers or questions (Engaging design)	3.88(0.95)
	provide features that enable users to interact with other users (Engaging design)	3.67(1.08)
	provide features that allow users to directly contact the operator or moderator of the site (Engaging design)	3.19(1.16)
Design Expertise (DE) (4.27, 0.59)	designed appropriately for users to ask and answer questions (Appropriate design)	4.31(0.72)
	provides features that help users find relevant questions and answers for their information needs (Ease of use)	4.31(0.75)
	organized in a way that makes it easy to follow the threads of questions and answers (Ease of use)	4.30(0.80)
	focused on its main purposes, enabling users to ask questions, answer questions, and evaluate questions and answers (Appropriate design)	4.27(0.81)
	designed appropriately for users to evaluate questions and answers (Appropriate design)	4.15(0.80)

5 Discussion and Conclusion

We found that the participants are more engaged in evaluating posts and comments on social Q&A sites than in other activities. As evaluating includes minor actions such as voting up

or down, liking, or accepting answers, it is likely that evaluating related features are more approachable for users compared to asking or writing answers on social Q&A sites. Fang and Zhang [12] noted that users who are focused on viewing or evaluating contents constitute a large portion of the community in social Q&A sites which signifies that many users are more engaged in evaluating compared to answering and asking questions. Lai and Chen [13] identified that users with this characteristic take reciprocity as the most influential motivation factor in participating social Q&A sites communities. Moreover, the results show that the five most highly rated credibility criteria were all associated with the attributes of content known to influence the perceived expertise of a social Q&A site as a source of information. This finding echoes previous findings that content-related criteria play an influential role in evaluating the information on social Q&A sites [5,14]. In addition, our study shows the necessity of incorporating design features (e.g., engaging design, moderation, appropriateness of design, and ease of use) in the web credibility assessment framework on social Q&A sites. According to the findings, the participants perceived DE as the most important factor in assessing the credibility of social Q&A sites. This result lines with the findings that user interface design has the potential to affect users' perception on the credibility of information source [15]. The preliminary findings provide insights into the perception of social Q&A site users in assessing information credibility, examining the practicability of the conceptual framework for web credibility assessment of social Q&A sites. We will further analyze the data to identify the latent structure of perceptions of web credibility in the social Q&A context and examine the relative impacts of different types of credibility markers on users' evaluations of information credibility and associated outcomes (e.g., accepting an answer) on social Q&A sites.

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