

# Developing a Theoretical Framework for Web Credibility Assessment—A Case of Social Q&A Sites: Preliminary Findings

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**Abstract.** As part of a larger study, this poster reports on preliminary findings of efforts to develop a theoretical framework for assessing the credibility of information on social question-and-answer (Q&A) sites. A literature analysis was conducted to identify relevant criteria for assessing web credibility on social Q&A sites, which were then mapped to an existing framework of web credibility assessment [1]. Specifically, 21 criteria identified by the literature analysis were categorized into one of six types of web credibility assessments—operator (author) trustworthiness, operator (author) expertise, content trustworthiness, content expertise, design trustworthiness, and design expertise—to develop an information platform type-specific framework of information credibility. Results show that existing criteria used in the literature have focused primarily on content-related attributes (e.g., evidence-based, structural completeness, and semantic clarity and comprehensiveness), but less on operator (author)-related attributes (e.g., credentials) or design features (e.g., interactive design, appropriateness of design, ease of use). Implications of the findings and future research directions are discussed.

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

## 1 Introduction

As of 2021, 72% of American adults aged 18 years or older use social media [2]. Social question-and-answer (Q&A) sites are a type of social media that allow users to “ask and answer questions, evaluate content submitted by others, and view the community’s aggregate assessment of which questions, answers, and users are best” [3, p. 2302]. Social Q&A sites are characterized by their content-focused and collaborative nature, which is distinct from other types of social media such as profile-focused sites (e.g., Facebook, LinkedIn) or those focused on broadcasting personal updates to followers (e.g., Twitter, Instagram) [4]. Therefore, in the context of online information seeking, social Q&A sites are a web platform where information seekers can express their

information needs as questions in natural language, as opposed to using keywords to create search queries, and obtain answers that are based on the community's collective knowledge [5].

Despite the popularity of social media and the potential of social Q&A sites as an online information source, relatively less research has focused on web credibility issues in social Q&A sites, especially at the theoretical level, when compared to the literature on a related yet distinct concept: information quality [6]. Credibility assessment of online information (i.e., web credibility assessment) refers to indirect evaluation of the quality of online information, grounded in the perceived trustworthiness and expertise of the source [1,7,8]. Information credibility can be also seen as an additional layer of evaluation of information, facilitating the user's selection of an information object from a pool of information objects that are presumed to be of high quality [9]. Research shows that web credibility assessments can influence different aspects of people's online information behavior, such as the selection of a source over alternatives, perceptions of accuracy of the presented information, attitudes toward the website, and intention to adopt the information [10]. Although some previous studies have explored user criteria for judging information credibility in social Q&A sites [e.g., 11, 12], more research is needed to develop an integrated theoretical framework that accommodates the context of social Q&A sites in terms of operator (author), content, and design. The present poster introduces an ongoing study aiming to fill this gap in the literature.

## **2 Theoretical Background**

### **2.1 Conceptualization of Credibility**

Although there is no common consensus on the definition of credibility, most researchers agree that credibility is based on subjective human perceptions rather than objective measurements and is multifaceted rather than unidimensional [1]. Among various conceptualization models of credibility, Hovland et al.'s [7] two-factor model identifying trustworthiness and expertise as key underlying dimensions of credibility has been widely accepted by researchers. Trustworthiness refers to the perceived willingness of the source to provide valid information, whereas expertise refers to the perceived ability to provide valid information. Based on the two-factor model, credibility sits in the intersection of trustworthiness and expertise. That is, if either dimension is absent, there is no credibility. In the context of online information seeking, users perceive a certain website as a credible online source when they perceive the site as having both the intent and ability to provide information on a given topic.

### **2.2 Operationalization of Credibility in the Web Context**

Fogg's [8] web credibility framework categorizes various elements influencing people's perceptions of web credibility into three types—operator, content, and design. The operator category includes source-related elements, such as the reputation of the organization that runs the site. In social media, in which user-generated content is freely

produced, reproduced, and circulated, the operator category may include the attributes of individual authors, such as the reputation of an answerer in a social Q&A community. The second category, content, includes the attributes of the content on the site (e.g., the currency of information). The third category design is defined as “how the site is put together—specifically, the integration of four key design elements: information, technical, aesthetic, and interaction” [8, p. 174]. Per this definition, design regards the organization and presentation of a page or the whole website (i.e., information design), efficiency and stability of the site at the system level (i.e., technical design), look and feel of the interface (i.e., aesthetic design), and usability and interactivity of the site (i.e., interaction design). This framework is useful to identify elements derived from different layers of web-based information objects, which can be used as measures of the two dimensions of credibility in the web context.

### 2.3 An Extended Typology of Web Credibility

Based on the two theoretical frameworks [7, 8], Choi and Stvilia [1] proposed an extended typology of web credibility. Specifically, they extended the two dimensions of credibility (trustworthiness and expertise), which were originally derived from the interpersonal communication context, to the web context by cross-mapping them to the three sources of web credibility cues (operator, content, and design). The cross-mapping exercise yielded six types of web credibility—operator trustworthiness, operator expertise, content trustworthiness, content expertise, design trustworthiness, and design expertise. The extended typology has been used in empirical investigations on web credibility assessments—for example, older adults’ credibility assessment of online health information [13].

Based on previous studies using the extended typology, we have modified the definitions of the web credibility types to meet the characteristics of social Q&A sites. Operator (author) trustworthiness refers to the characteristics of the operator of the site or an individual author (e.g., answerers) that affect the user’s perception of the site or the information object posted on the site (e.g., answers) as having the *intent* to provide high quality information. Operator (author) expertise is distinct from operator (author) trustworthiness by its emphasis on the operator’s or author’s *ability* rather than intent to provide high quality information. The same rule applies to defining the other four types of web credibility: content trustworthiness and content expertise refer to the semantic and structural attributes of the content that affect the user’s perception of the site or information object as having the intent (i.e., trustworthiness) or ability (i.e., expertise) to provide high quality information; design trustworthiness and design expertise refer to the structural, technical, aesthetic, and interaction design features that affect the user’s perception of the site or information object as having the intent or ability to provide high quality information.

### 3 Study Design

The purpose of this study was to develop a framework for web credibility assessments in social Q&A sites. The design of the study consisted of three phases. Phase 1 aimed to understand how previous studies on social Q&A sites or similar peer knowledge production communities have conceptualized and operationalized the credibility of information on such sites by reviewing the literature. Based on the findings of Phase 1, Phase 2 intended to create a conceptual framework for web credibility assessments of social Q&A sites. In particular, the extended typology of web credibility assessments [1] served as the baseline model to build an information system (platform) type-specific framework. In Phase 3, the conceptual framework developed in Phase 2 will be used to guide the descriptive analyses of two specific cases—the Stack Exchange network of Q&A sites and Wikipedia Reference Desk—to test and revise the framework. The current poster reports on preliminary findings of the first two phases.

### 4 Preliminary Findings

The extended typology of web credibility assessments [1] was revised for social Q&A sites. Modifications made to the typology include (a) updating labels of criteria (e.g., from “commercial implication” to “no conflict of interest or benevolence”); (b) splitting a criterion into two or more criteria (e.g., from “intrinsic quality” to “structural completeness” and “semantic clarity and comprehensiveness”); and (c) adding new criteria that were commonly used in the previous studies but missing in the web credibility typology (“accuracy,” “novelty,” and “usefulness”—highlighted in Fig. 1). As a result, 21 criteria for web credibility assessment of social Q&A sites have been identified. The first column in Fig. 1 shows 21 included criteria, which are mapped to relevant criteria used in the literature in the following columns.

Choi & Stvilia [1]	Kim [11]	Savolainen [12]	Fu & Oh [14]	Kang [15]
No conflict of interest/ benevolence	NA	• Non-persuasive intent	NA	NA
Integrity	NA	• Honesty in argumentation • Fairness in interpretation • Unbiased approach to an issue	NA	NA
Transparency	NA	• Author identification	NA	• Transparent
Decency	• Answerer's attitude	NA	• Answerer's attitude • Answerer's effort	• Passionate
Reputation	• Known answerer	• Author reputation	NA	• Influential
Credentials	• Self-claimed expertise or qualification • Expertise based on the answerer's profile • Expertise based on the answer	• Expertise of the author	• Answerer's expertise • Answerer's experience	• Knowledgeable
Unbiasedness	NA	• Objectivity of information • Variety of information	• Objectivity	• Fair
Social validation	• Ratings on the answer	• Similarity to receiver beliefs	• Agreement	• Popular
Consistency	NA	• Trustworthiness of information • Reliability of information	NA	• Consistent • Reliable
Currency/Recency	NA	• Currency of information	• Quickness	• Timely
Reference to external sources	• Reference to external sources	• Reference to external sources	• Reference to external sources • Available alternatives	NA
Evidence-based	• Verifiability • Fact	• Scholarliness of information • Provision of evidence • Factuality of information	• External verification	NA
Structural completeness	• Spelling and grammar • Tone of writing	• Presentation qualities	• Writing style	NA
Semantic clarity and comprehensiveness	• Clarity • Completeness • Logic • Detail • Length	• Plausibility of arguments • Comprehensiveness of information	• Clarity • Rationality • Completeness • Understandability • Length	• Insightful
Reinforcement of content	NA	NA	NA	NA
Accuracy	• Accuracy	• Correctness of information • Validity of information	• Accuracy	• Accurate
Novelty	• Novelty	• Novelty of information	• Novelty	• Authentic
Usefulness	• Topicality • Usefulness	• Specificity of information • Usefulness of information • Official nature of information • Trustworthiness of information	• Specificity • Effectiveness • Solution feasibility	• Informative • Focused
Interactive design	NA	NA	NA	NA
Ease of use	• Layout	NA	NA	NA
Appropriateness of design	NA	NA	NA	NA

**Fig. 1.** Mapping of criteria used in the literature to the web credibility framework for social Q&A sites. Newly added criteria are highlighted.

Table 1 presents a typology of web credibility assessments for social Q&A sites, which categories the 21 criteria (Fig. 1) into six types of web credibility with their definitions.

**Table 1.** An extended typology of web credibility assessments in social Q&A sites

	Trustworthiness	Expertise
Operator (Author)	<p><b>Operator (author) trustworthiness.</b> Characteristics of the operator of the site or an individual author that affect the user's perception of the site or the information object posted on the site as having the <i>intent</i> to provide valid and accurate information.</p> <ul style="list-style-type: none"> <li>• <b>Decency:</b> The extent to which the author is serious and engaged in the information provision with polite and civil attitudes</li> <li>• <b>Integrity:</b> The extent to which the author is honest and fair</li> <li>• <b>Non conflict of interest/Benevolence:</b> The extent to which the author is focused on providing good information to the public rather than commercial or self-interested purposes</li> <li>• <b>Transparency:</b> The extent to which the author discloses information about themselves to the public</li> </ul>	<p><b>Operator (author) expertise.</b> Characteristics of the operator of the site or an individual author that affect the user's perception of the site or the information object posted on the site as having the <i>ability</i> to provide valid and accurate information.</p> <ul style="list-style-type: none"> <li>• <b>Credentials:</b> The extent to which the author has sufficient knowledge and experience regarding the topic</li> <li>• <b>Reputation:</b> The extent to which the author is evaluated positively in a community</li> </ul>
Content	<p><b>Content trustworthiness.</b> Semantic and structure features of content that affect the user's perception of the site or the information object posted on the site as having the <i>intent</i> to provide valid and accurate information.</p> <ul style="list-style-type: none"> <li>• <b>Consistency:</b> The extent to which the information uses the same values and elements to convey the same concepts and meanings</li> <li>• <b>Currency:</b> The extent to which the information is up to date</li> <li>• <b>Citing Sources:</b> The extent to which the information is attributed to the original source, so that it does not mislead as if it's the author's original idea when it's from other sources or as if it's fact when it's the author's opinion</li> <li>• <b>Social Validation.</b> The extent to which the information is accepted by the community</li> <li>• <b>Unbiasedness.</b> The extent to which the information is impartial and unbiased</li> </ul>	<p><b>Content expertise.</b> Semantic and structure features of content that affect the user's perception of the site or the information object posted on the site as having the <i>ability</i> to provide valid and accurate information.</p> <ul style="list-style-type: none"> <li>• <b>Accuracy:</b> The extent to which the information conveys accurate information</li> <li>• <b>Evidence-based:</b> The extent to which the information is supported by valid and verifiable evidence</li> <li>• <b>Novelty:</b> The extent to which the information conveys original and creative ideas</li> <li>• <b>Reinforcement:</b> The extent to which the original information is improved by providing additional content or evidence</li> <li>• <b>Semantic Clarity/Comprehensiveness:</b> The extent to which the information is clear to understand and has sufficient breadth and depth</li> <li>• <b>Structural Completeness:</b> The extent to which the information is</li> </ul>

Design	<p><b>Design trustworthiness.</b> The structural, technical, aesthetic, and interaction design features that affect the user's perception of the site or the information object posted on the site as having the <i>intent</i> to provide valid and accurate information.</p> <ul style="list-style-type: none"> <li>• <b>Responsive Design:</b> The extent to which the site allows the user to interact with the operator/moderator of the site, the author of the content, and other users on the site</li> </ul>	<p>complete in terms of grammar and format</p> <ul style="list-style-type: none"> <li>• <b>Usefulness:</b> The extent to which the information is relevant and applicable in a particular context</li> </ul> <p><b>Design expertise.</b> The structural, technical, aesthetic, and interaction design features that affect the user's perception of the site or the information object posted on the site as having the <i>ability</i> to provide valid and accurate information.</p> <ul style="list-style-type: none"> <li>• <b>Appropriate Design:</b> The extent to which the site is designed to meet the main purpose of the site (e.g., questioning, answering, evaluating)</li> <li>• <b>Ease of Use:</b> The extent to which the site is organized and labeled so that is easy to read and follow the threads of questions and answers</li> </ul>
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## 5 Discussion and Future Research

We found that existing frameworks focus more on content-related attributes (e.g., evidence-based, structural completeness, and semantic clarity and comprehensiveness), but less on operator- or author-related attributes (e.g., credentials). Design-related attributes (e.g., interactive design, appropriateness of design, ease of use) were rarely included in the frameworks, which warrants further investigation on the potential influences of design in terms of information organization and presentation, technical efficiency and stability, aesthetics of the user interface, and interactivity of the site on people's web credibility assessments of social Q&A sites. Our immediate future research directions include refining the web credibility framework for Q&A sites, applying it to specific cases, and expanding or modifying the framework as needed.

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