

Answerers' Strategies to Provide Credible Information in Question Answering Community

지식검색 커뮤니티에서 신뢰성 있는 답변을 제공하기 위한 답변자들의 전략

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ABSTRACT

The popularity of question answering communities such as Yahoo! Answers and Naver Knowledge-iN and increasing doubts about the competence of lay information providers prompted this study to explore answerers' strategies to provide a credible answer in a question answering community. Forty-four active answerers in Yahoo! Answers were included in this study, and interviews were conducted through email, chat, and over the telephone. This study identified a set of information sources the answerers used, an array of important strategies to provide a credible answer, and their perception of self-claimed expertise. Implications of results were discussed in the context of user instruction.

초 록

야후 앤서(Yahoo! Answers)와 네이버 지식인과 같은 지식 검색 커뮤니티가 활성화되면서 전문가가 아닌 일반인이 제공하는 정보에 대한 신뢰성이 끊임없이 제기되어 왔지만 일반인 답변자들의 신뢰성 있는 정보 제공 노력에 대한 연구는 미흡한 실정이다. 이에 본 연구는 야후 앤서에서 활동하는 44명의 일반인 답변자들과의 이메일, 채팅, 전화 인터뷰를 통해 그들이 이용하는 정보원, 신뢰성 있는 정보 제공을 위한 전략, 그리고 자칭 전문성(self-claimed expertise)에 대한 인식을 알아보았다. 본 연구의 결과는, 일반인을 효과적인 정보제공자로 교육시키는 이용자 교육 측면에서 활용될 수 있다.

Keywords: credibility, question answering community, Yahoo! Answers, answerers
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1. Introduction

As one of Web 2.0's applications, question answering communities such as Yahoo! Answers and Naver Knowledge-iN (KiN) are growing as a viable method to find information by allowing users to ask and answer questions of one another. According to a Hitwise report (Hitwise 2008), U.S. visits to question answering sites have increased almost nine-fold between February 2006 and February 2008. In Korea, Naver KiN handles over 77% of all Web searches, well ahead of Google (Choe 2007). Several reasons can explain the huge success of question answering communities (Bernhard and Gurevych 2008): (1) people can receive tailored answers to questions from humans instead of browsing numerous web pages presented by a search engine; (2) users can ask or answer anonymously; and (3) the answers are usually instantaneous and numerous due to the heavy traffic of the sites. Despite the ever-increasing popularity of question answering communities, some people are opposed to using them for precisely the same reason: Lay people, not professional information specialists, answer questions anonymously and thus, the credibility of information would be called into question.

Aside from the general critique of the absence of quality control systems and the incompetence of lay people as information providers in question answering communities (e.g., Leibenluft 2007), there is a lack of empirical studies on answerers' underlying behaviors to ensure the credibility of information they provide to fellow users. To fill this gap, this

study explores answerers' strategies to provide credible information in Yahoo! Answers. More specifically, this study addresses the following questions:

How do answerers seek information to provide answers? How do they establish credentials when providing information? What are answerers' perceptions of self-claimed expertise? What are the most important strategies in providing credible information?

2. Theoretical Background

2.1 Answerers in Question Answering Community

In question answering communities, there are three types of users: users who ask, users who answer, and users who do both (Adamic et al. 2008). Among these users, answerers are participants whose primary mode of interaction is the voluntary provision of information to other members' questions (Welser, Gleave, Fisher, and Smith 2007) and they are of great importance to the success of the communities because they create a repository of the public-domain knowledge by answering others' questions, thus drawing more questioners.

While much of the existing literature on answerers is concerned with their motivations to help others without direct monetary reward or a promise of return in online communities (e.g., Yu, Jiang, and Chan 2007), only a paucity of studies exist about answerers' general behavior and strategies in a question answer-

ing community. Adamic et al. (2008) tracked answer patterns across topics in Yahoo! Answers, drawing on 433,402 unique answerers and 495,144 unique askers. One of their findings is that many users answer questions about familiar topics such as Family & Relationships, but users who answer in specialized categories such as Car Maintenance & Repair seldom ask questions in other categories. Put differently, a few active individuals predominantly supply answers in specialized categories while many users occupy both answerer's and questioner's roles in less specialized categories.

Oh, Oh, and Shah (2008) investigated the types of information sources answerers use when providing information in Yahoo! Answers through content analysis of the 'Source' field in 101,985 answers. Interestingly, human was the most frequently cited type of sources (e.g., personal experience) followed by the Internet (e.g., Wikipedia).

Nam, Ackerman, and Adamic (2009) examined user participation behavior in Naver KiN through the statistical analysis of over 2.6 million question/answer pairs and phone interviews of 26 users. In particular, the qualitative interviews uncovered interesting answering behaviors related to this study. Answerers in Naver KiN tended to answer questions for which either they already knew the answer or they had to look up only minor additional information. Furthermore, answerers evaluated the quality of previous answers and corrected false information.

Despite anecdotal evidence from the work above that answerers are aware of the credibility concept and try to present credible information, more research

is needed to better understand answerers' various strategies to enhance the credibility of information.

2.2 Credibility of Information in Question Answering Community

Credibility is a complex and multifaceted concept encompassing various dimensions such as believability, trust, reliability, accuracy, objectivity, and more (Self 1996). With no consensus on what dimensions are included in the construct of credibility, researchers generally agree that two key dimensions are trustworthiness and expertise. Expertise refers to a source's perceived ability to provide information that is accurate and valid while trustworthiness refers to a source's perceived willingness to provide accurate information (Danielson 2005). When evaluating credibility, a user should recognize and assess both trustworthiness and expertise to reach a conclusion.

Since credibility is a subjective value perceived by individual users, many empirical studies have been conducted to understand information seekers' credibility judgments with different user groups: scholars and students in academic environments (e.g., Liu 2004; Metzger, Flanagin, and Zwarun 2003; Rieh 2002), health information seekers (e.g., Robins, Holemes, and Stansbury 2009), the general public with various types of websites such as e-commerce and news (e.g., Flanagin and Metzger 2008; Fogg et al. 2003).

As for question answering communities, however, many researchers have examined the broader concept of 'quality' instead of credibility in particular.

The quality of answers in question answering communities in aggregate is reported as surpassing or matching the level of services found in traditional digital reference services or AskA services (Shachaf 2009; Harper, Raban, Konstan, and Rafaeli 2008). This is because a collaborative question and answering process results in fast and accurate answers by synthesizing the knowledge of all community members (Shachaf 2009), although the quality of individual answers extremely varies depending on the answerer's expertise.

Regarding the evaluation of individual answers' quality within a question answering community site, Kim and Oh (2009) identified 23 criteria questioners use when they select the best answers among many answers given by fellow users in Yahoo! Answers. Drawing on 2,140 comments questioners left on the best answers, they found users used socio-emotional criteria in addition to content-, utility-, and information sources-related criteria (e.g., author's expertise, external links). Gazan (2006), who studied Answerbag, noted that questioners generally ranked higher those answerers who did not claim expertise, but provided links to external sources, than those who provided information based on their expertise without a reference. Even though these researchers did not examine credibility precisely, it is obvious that the users relied on credibility cues such as author's expertise and links when selecting the best answers.

Although these studies provide valuable theoretical input for this study, they view credibility from an information seeker's perspective. The other side of the credibility issue that should get more attention

is that information providers would like their information to be selected, or acted upon, and to do that, they try to make their information credible.

3. Research Method

3.1 Yahoo! Answers

Yahoo! Answers was selected as a research setting for this study because of its dominant position in the question answering community market. It has attracted 25 million users with 237 million answers in the U.S. and 135 million users with 500 million answers worldwide (McGee 2008).

Due to its superior status, Yahoo! Answers' question and answering interface is now regarded as the de facto standard for other question and answering communities. The process of asking and answering through the interface is very simple. A user (questioner) posts a question under a relevant topic category and the question remains open to receive answers. Any user (answerer) can answer the question. When one or multiple answers are given, the questioner can select the best answer among them or let the community vote for the best answer. When a best answer is chosen either way, the question becomes a resolved question and remains in the repository for future browsing and searching.

3.2 Data Collection and Analysis

Exploratory in nature, the larger project used con-

venient sampling techniques to recruit participants into this study between November 2008 and April 2009. During the period, a solicitation email was sent to 750 Yahoo! Answers users (30 users from each of 25 top-level topic categories), who asked/answered a question most recently in each topic category. The participants were initially given four options of interviewing: phone, email, chat, and face-to-face. By allowing the participants to select an option they felt comfortable with, this study sought to minimize the inherent limitations of each option. Two types of semi-structured interviews were designed to gather information about questioners' and answerers' behaviors. This study reports only on the interviews with answerers, which included the following questions:

- 1) What questions they answered recently in the site
- 2) Why they selected a particular question to answer
- 3) Where they looked for to find the answers and why
- 4) How they tried to establish their credentials when providing the answers
- 5) What they think of the self-claimed expertise
- 6) What skills/strategies are generally important when providing credible information

Additionally, an answerer's experience with the site, frequency of use, and demographic information were solicited at the end of the interview. Of the 750 samples, 44 interviews were held with answerers: 19 interviews held via email, 13 through Internet

chat (Chatmaker and Yahoo! Messenger), and 12 over the telephone. Each chat or phone interview took approximately 30 minutes to 1.5 hours. The chat session transcripts were electronically saved and the telephone interviews were audio-taped and transcribed later.

The obtained data was analyzed using the constant-comparison method of content analysis (Lincoln and Guba 1985). The researcher read all of the transcripts carefully to identify topics from them. Throughout the process, the new data was compared with existing data and categories until themes inductively formed guided by the interview questions. For the analysis of answerers' strategies to provide credible answers, the author and one library science graduate student coded the transcripts independently. After the initial coding, the coders discussed the outcomes and resolved discrepancies, resulting in a codebook. A codebook is a document containing list of codes that categorize narrative data into themes. Final codes for the strategies are listed in Table 3. Using the codebook, the coders went through two more rounds of coding and inter-coder reliability was calculated using Cohen's kappa. The value of Cohen's kappa was 0.79 in this study. According to Landis and Koch (1977), a value between 0.61 and 0.80 indicates substantial agreement. Therefore, the codebook used was valid according to the suggested rates of inter-coder reliability.

3.3 Participant Characteristics

The participants ranged widely in age from 18

to 67 with half of them in their 20s and 30s (Table 1). There were 31 male (70%) and 13 female (30%) participants. Most participants (75%, n=33) had used the site for over 1 year as of the time of interviewing. With respect to the frequency of using the site, one-fourth of the participants (25%, n=11) reported using the site 3 - 4 times a week and another one-fourth (27%, n=12) used it occasionally. About the half of the participants (47%, n=21) were heavy users who used the site everyday. Most participants had ever asked a question in the site, but identified themselves as answerers because they had spent time mostly on monitoring and answering questions rather than asking questions.

4. Findings

4.1 Information Searching

It is typical that answerers seek information on behalf of questioners without being asked to do so, but two answerers were asked to look at a specific

question as requested by one of their contacts:

This particular person is one of my contacts so the Yahoo! just automatically notified me of the question being asked to have a look. P(43)

A contact is a person an answerer adds into her Answers Network, which allows users to connect to people whose knowledge they trust in topics of interest. A user can invite Yahoo! Answers members or non-members to join his Answers Network. The act of requesting via Answers Network is evidence that people build social ties with other people through the process of question asking and answering in the site.

To answer questions, the answerers used either one's own knowledge/experience (77%, n=34) or Web-based sources (7%, n=3) or a combination of the two (16%, n=7). The prevalence of one's knowledge as an information source is mainly due to the fact that the answerers selected a question that they already knew enough about to answer correctly. Seven answerers backed up their personal knowledge

<Table 1> Participant demographics (n = 44)

types	N	%
Gender		
Female	13	30
Male	31	70
Ages		
18-19	4	9
20-29	10	23
30-39	12	27
40-49	6	14
50-59	6	14
60-69	6	14

with respected websites to increase the verifiability of their answers. Those participants who relied on one's own knowledge felt pretty confident in the credibility of answers they provided. Otherwise, they would not have posted them.

Another three answerers used the Web exclusively because they did not know the answer, but knew where the answer would be located on the Web. A list of the web-based sources the answerers consulted includes the Census Bureau website, NBC, Wikipedia, talkorigins.org, and more. All of the answerers who used websites said they considered the credibility of the websites, but they had divergent opinions on what sources were credible. More specifically, dissimilar reactions were expressed toward Wikipedia: two answerers who used Wikipedia thought highly of the source's authority while one criticized it for its lack of accuracy and did not use it.

4.2 Strategies to Establish One's Credentials

Half of the answerers (50%, n=22) used a range of strategies to establish their credentials. The most frequently used strategy (45%, n=10) was to explain one's educational background, work experience, age, place of living, or other attributes that would qualify

the answerer for answering the given question (Table 2). For example, when a questioner was asking about how to deal with a specific disease, P2 emphasized the fact that she had the same problem:

I kind of prefaced it with saying um, my age, the onset of my problems, when I started getting treatment and medications I had tried, and different things just kind of what I had gone through kind of, giving her the background and so she knew that I wasn't just someone with no experiences with the issue at hand. (P2)

Aside from the self-explaining qualification in the answer section, two answerers provided more details about their personal history and/or a link to a personal website in the User Profile section just in case a questioner looks up the profile to know more about the answerer (9%, n=2).

Another strategy was to list a link to the website that supported the answerer's claim to indicate the information source (18%, n=4).

Some answerers (27%, n=6) thought that the content of the answer speaks for itself in that regard so they tried to ensure credibility with their writing:

<Table 2> Strategies used to establish credentials (n = 22)

Strategies	N	%
Explain one's qualification	10	45
Answer with no spelling/grammatical errors	6	27
Provide a link/citation	4	18
Provide a link to one's website	2	9

I tried to make sure that I answered completely, without spelling or grammatical problems. I feel that such problems do affect my credibility. (P32)

they are an expert in the field, however, I think that if a person said that, it would be fairly reliable. (P15)

The other half of the total answerers (50%, n=22) did not attempt to establish credentials because they did not see a reason to do it or they were skeptical about the self-claimed expertise in the site.

These answerers think people who claim expertise are truthful and are willing to take their word for it. The other answerers (32%, n=14) were more cautious, stating that the truthfulness of the self-claimed expertise depends on what they claim and how they write the answer. They believe that when somebody claims to have expertise in a specific discipline, his answer should exhibit knowledge in line with the claim:

4.3 Perceived Credibility of Self-Claimed Expertise

Despite the popularity of the self-explanation of qualification as a strategy to ensure credibility, many answerers (59%, n=26) showed plenty of sarcasm towards others' self-claimed expertise:

It really depends on how they wrote their answer. A doctor would have to use good grammar and sound knowledgeable, for example. (P7)

I could go on there right now and claim I'm a talking pet rock. You know, you can be anything you want to be on the Internet because you're protected by anonymity. (P11)

Furthermore, they would not believe anyone who claims to be a doctor or a lawyer in particular because those professionals were considered unlikely to answer for free in the site:

There was no relationship between those who actually provided the self-claimed expertise in the answers and those who did not trust others' self-claimed expertise. In other words, even those who did not trust others' self-claimed expertise listed their expertise/qualification in the answers to make them look more credible.

I'm wondering my doctor would be on Yahoo! Answers. Also, I have quite a bit of experience with doctors, which makes me tend to be a little more skeptical, at least for doctors. For engineers, I have no doubt that engineers answer a lot of questions. It just depends; it kind of depends on what they claim. (P42)

On the contrary, several answerers (9%, n=4) gave a positive opinion on self-claimed expertise:

I have yet to see an answerer who says that

The perceived credibility of self-claimed expertise was found to be linked to the perceived credibility

of the entire site. While some people thought the site was not credible at all because of abundant false information and fake self-claimed expertise, others trusted the site unconditionally.

4.4 Strategies to Provide a Credible Answer in General

When asked to list up to 3 of the most important

strategies to ensure a credible answer in Yahoo! Answers, the answerers suggested a wide array of strategies. In total, 19 strategies were identified and they were categorized into four groups: Content, Source, Attitude, and Others (Table 3).

Many answerers stressed the importance of credible content by providing a logical, accurate, clear, complete, detailed, relevant, or useful answer. These specific aspects of content such as accuracy, clarity, and

<Table 3> Strategies to provide a credible answer

Strategies	No. of mentions
Content	
Spell correctly	10
Provide personal experience	6
Provide a logical answer	6
Provide an accurate answer	5
Provide a relevant answer	5
Provide a clear answer	5
Provide a detailed answer	5
Provide a complete answer	2
Provide a useful answer	1
Provide a brief answer	1
Subtotal	46
Source	
Answer what an answerer knows	15
Provide a citation/link of a source	14
Be honest	4
Consult reliable websites	2
Acknowledge it is only one person's opinion/knowledge	2
Subtotal	37
Attitude	
Show good attitude/empathy	7
Do not be emotional or judgmental	2
Subtotal	9
Others	
Consider the type of questions	3
Provide an answer quickly	1
Subtotal	4
Total	96

relevance are aligned with various dimensions involved in the concept of credibility, reflecting what the answerers think constitutes credibility of an answer. In the category of content-related strategies, the most frequently mentioned is proper spelling and grammar because it represents an answerer's intelligence. The second biggest category is source. The most frequently mentioned strategy in this category and as a whole is to answer questions the answerer knows well.

Using a reliable website and presenting its citation/URL are regarded as good strategies to make an answer credible as P2 stated:

I think it [Yahoo! Answers] is kind of like Wikipedia in that if you can cite references, it does make you more credible and it makes people trust your answers.

On the other hand, only four participants regarded being honest or truthfulness as important, despite the fact it is a key dimension of credibility. Presumably, it is because in a community-based Q&A context, it is hard to estimate one's willingness to provide truthful information.

An answerer's attitude is thought to influence credibility as well. While being nice and showing seriousness or empathy for the questioner positively influences credibility, especially for such sensitive topics such as health, being judgmental, insulting, or letting inappropriate emotion negatively influences.

In addition, a few answerers called for answering depending on the type of questions:

Having the correct facts helps for fact-based questions. For opinion/advice questions, backing your statements with reasons is important. (P7)

5. Discussion

Consistent with previous research (Nam et al. 2009; Oh et al. 2008), an answerer's typical behavior found in this study is characterized by reliance on one's knowledge as an information source and a limited use of external sources for answering a question they already know the answer for. A concern that arises in the answerers' behavior is the credibility of the websites they consulted may be low, as evidenced in the use of Wikipedia. This finding points out that to become competent lay information providers, answerers should become competent information seekers first by developing a correct perception of credibility and obtaining appropriate information evaluation skills.

When it comes to the strategies answerers use to establish credentials when providing answers, the most frequently used strategy was to explain one's expertise, followed by creating credible content, and providing a link to a website. On the surface, the prevalence of self-claimed expertise is attributed to the fact that the answerers selected questions for which they already knew and a main information source is one's knowledge. Going deeper, the anonymous environment makes it extremely difficult to prove one's trustworthiness, which is one of two key dimensions of credibility. Answerers are thus

compelled to prove the other key dimension of credibility, expertise. Although most of the participants were skeptical about others' self-claimed expertise, many provided their own self-claimed expertise because they felt it would give their answer more credibility and therefore more thumbs up and a higher chance of being picked as the best answer. A problem is that questioners prefer those answerers who do not claim expertise, but provide links to external sources because links allow for the verification of given information (Gazan 2006). Noting the discrepancies between the strategies the answerers actually used to establish credentials and the strategies they think are important in general, the answerers are surely aware of the importance of citing a source, but unfortunately, they often fail to do it.

Another notable finding is the use of Answers Network for question and answering. As opposed to Nam et al.'s study (2009), which reported no social interaction and no sense of community among Naver KiN users, Yahoo! Answers enables a user to create one's own network by inviting other users who have knowledge on a topic of interest. Answers Network has a significant meaning for what Tseng and Fogg (1999) call 'experienced credibility.' On the answerer's side, it would be easier to gain a reputation (earned credibility) by consistently providing high-quality information in a relatively small network. On the questioner's side, repeated exposures with a positive outcome from a specific answerer/s would allow for identifying authoritative answerers. Ultimately, by building social connections with other people through Answers Network, a user could boost or detect one's

trustworthiness, which is hard to do in a large-size anonymous community. Knowing that the use of Answers Network is not ubiquitous, more guidance should be offered to encourage users to take advantage of that feature.

Related to the social aspect of the community, it should be noted that a user's attitude influences credibility. Since questioning and answering in Yahoo! Answers is a social process that occurs through interpersonal interaction within a cooperative context, one's attitude does matter. In the end, to provide a credible answer, or more accurately speaking, to make questioners believe an answer is credible, an answerer should pay attention not only to the creation of credible content and provision of a reliable source, but the interpersonal communication process itself.

The results of this study shed light on how to educate lay people in a question answering site to make them effective information seekers and providers. It is alarming that some users do not know the danger of accepting online information without credibility judgment and simply accept self-claimed expertise in Yahoo! Answers. This finding stresses a need to educate people how to discern credible information in a question answering community using the site-specific information quality marks or credential clues (e.g., check an answerer's profile including the percentage of best answers).

To educate answerers, the participants in this study suggested providing answers by the type of questions. For fact-finding questions, provide a complete, logical, accurate, detailed, clear, relevant, concise, and useful answer. For self-help questions, provide a via-

ble solution with personal experience. For health- and pets-related questions in particular, be sensitive to the emotions of questioners. For discussion questions, show good manners. In addition, answerers should consult authoritative and reliable sources. An answerer should explain why the source is adequate for the given question if it is not evident immediately or explain how her expertise/background is qualified for answering the question. Most importantly, an answerer should provide a link to a website that supports her claim.

In the absence of a tutorial in Yahoo! Answers, other than a brief procedure of posting a question or answer and general community guidelines such as abuse report, there should be a guideline that could help users learn how to effectively evaluate given answers and provide credible answers. To motivate answerers to follow the guideline, the site could provide rewards. For example, the site's point system could give points to an answerer who provides a link to a website because it is critical for verifying a given answer. Another possibility is that the search system in the site could incorporate the credibility strategies answerers think are important. For example, the system could rank an answer containing a link to an authoritative website with no grammatical errors higher in the search result. Such a system could motivate answerers who are anxious to increase the visibility of their answers to make more efforts to follow the guideline.

To conclude, a broader issue here is that it is time for user instruction practice to embrace the idea of users as information providers as well as in-

formation seekers. Although the library profession has made endeavors to make users effective searchers, in the age of user-generated content and collaboration, user instruction should help users obtain both information searching and providing skills to use in social media.

6. Limitations and Conclusion

As with all qualitative data analysis procedures, this study has several limitations.

First, the sample of participants is a convenience sample and the size of the sample is small. The participants who self-select into this study tend to be active users who have answered plenty of questions for a long time in the site. Supposedly, they are more concerned about credibility than the average answerers of the site. This means that the findings of this study may not be generalizable to a larger population of answerers in the site. Future research should involve a large number of users or a random sampling method to enhance generalizability.

Second, the data was derived from self-report interviews, not from direct observation, which may raise questions about the validity of the answerers' behaviors. Because they know they have to endeavor to provide credible information, they might have exaggerated their actual behaviors in a more socially desirable way. To avoid such errors, a future study could employ a direct observation in tandem with content analysis of answers to cross-check if they actually provided a link to a website.

Finally, this study is limited to a particular question answering community site. The answerers' behaviors are thus constrained by features available in the site. The results of comparative studies of multiple question answering community sites will generalize to other question answering community sites.

Despite these limitations, this exploratory study

provide an important insight into lay information providers' strategies to provide credible information in a question answering community. The findings of this study could be a useful starting point for developing more comprehensive guidelines to educate lay information providers in a broader context of social media.

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