Why Some Wikis are More Credible than Others: Structural Attributes of Collaborative Websites as Credibility Cues

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Abstract

Recent technological advancements have given rise to a variety of websites offering user-generated content through collaborative efforts. This study used focus groups to identify what features might influence the credibility assessment of such websites. The findings reveal that editing features, discussion boards, presence of reviewers and the ability to create an account were the main features affecting the credibility judgment of collaborative websites. The presence of references was also seen as an important factor helping to enhance a website's credibility. This study also examined how the level of involvement may affect credibility judgment. In addition to source cues, respondents who were more involved with the message topic identified a variety of message characteristics as factors that affected their credibility assessments, as suggested by the Heuristic-Systematic Model. There were some perceived advantages of collaborative features identified, such as unbiased and more up-to-date information. In contrast, there were also some concerns about possible vandalism and inaccuracy of information. The findings suggest that people may be embracing the idea of collaborative websites, especially if there is an editorial team to help vet the information.

1. Introduction

Over the last twenty years the Internet has become an invaluable source of information for millions of people despite criticisms of online credibility (Aspden & Katz, 2001; Tang & Lee, 2006). A recent survey showed that 89% of Internet users have gone online to find information ("Internet Activities", 2008). Given the unique characteristics of the Internet, it remains to be seen if such trust is placed appropriately. Lacking distinguishable voices of authority (Lankes, 2007), the Internet allows a more level playing field than traditional media, where there is filtering and gatekeeping. Developments in Internet communication technology have resulted in the proliferation of online sites and applications that offer users a greater deal of interactivity. With less centralized control, any user can now access, edit and publish content, highlighting the issue of credibility of online information (Metzger, Flanagin, & Zwarun, 2003).

With more people seeking information online and an increase in the number of decentralized websites that encourage content contribution by users, it is crucial to understand the assessment of credibility of these

emerging websites. Many studies have compared different kinds of centralized websites where information is provided by one main source (Flanagin & Metzger, 2007b; Hong, 2006; Kim & Stephens, 2003) but very few have examined wikis and collaborative content to centralized websites (Giles, 2005; Poorisat et al., 2009). In this study, focus groups were conducted to explore the factors contributing to credibility judgment of collaborative websites. Users' characteristics, namely level of involvement with message content, were also included to get a clearer understanding of the credibility assessment.

2. Literature Review

Emergence of collaborative websites

The Internet was initially used as a mean of communication and resource sharing among different governmental organizations and universities. It was later developed into a platform connecting people around the world through an enormous network called the World Wide Web. Today, anyone can search and look for information online. It was not easy for the average user to contribute online until the development of wikis, a type of website which allows users, not just the website's owner, to edit the Web page. With the aim of promoting knowledge proliferation through collaborative efforts, websites such as Wikipedia have incorporated a user-friendly interface allowing any logged-in user to edit, contribute or link web pages. As of early June 2009, Wikipedia had more than 75,000 active contributors and approximately 13 million articles in many different languages ("Wikipedia", 2009), and tens of millions of users in the US alone (Rainie and Tancer, 2007). The growth and high level of usage are a testament to the growing acceptance of collaborative content among users.

Collaborative websites can be defined as websites in which most of the content is contributed and consolidated by independent users who volunteer to help. In order to post the material online, users are often required to create an account or register. Users can choose to use any name or remain anonymous as the registration is not intended to identify the contributor, but rather to track and record the number of users. In many cases, the most accurate cue regarding the author is the Internet Protocol (IP) address.

There are many different collaborative websites today. Some sites allow users to post and edit their own material, and comment on material posted by others (e.g., YouTube.com, forums, Facebook), while others allow users to post and edit the content posted by other users as well (e.g., Wikipedia, wikiHow). The purpose of each website is slightly different. Those which allow users to post but not edit content are generally entertainment or social networking sites. The use of the term "collaborative website" in this

study will refer specifically to a wiki, or website which allows people access to edit and contribute content with the intention of building a library of resources for those seeking accurate information.

Researchers have found that most people tend to have less concern regarding credibility when the purpose is entertainment or social networking (Rieh & Hilligoss, 2007) but the importance of credibility is heightened when it comes to looking for information which concerns long term goals such as health and academic achievement and in making crucial decisions (Xie, 2000). This study focuses on collaborative websites which aim to provide accurate information contributed by individual users.

Current research on collaborative websites

Wikipedia, a collaborative website has been a popular choice for research. A number of studies have focused on contributors to the sites and their findings suggest that the majority of users were motivated by a good cause such as contributing knowledge to the community (Famiglietti, 2008; Munk, 2008), while others cited self-efficacy and self-esteem as their motivation (Anthony, Smith, & Williamson, 2005; Cho & Chen, 2008; Munk, 2008; Schroer & Hertel, 2007). Anthony et al. (2005) found that high quality content was often provided by casual users or what they termed as "Good Samaritans", as well as committed individuals. These findings contribute to the idea that the concept of an open editing system can result in a highly credible information source.

Another approach to studying collaborative websites is to examine the output of collaborative efforts. Giles (2005) investigated the quality of the work by assessing the accuracy of science entries in Wikipedia and comparing it to Britannica, an established online encyclopedia. There were 123 and 162 errors (e.g., factual errors, omissions, and misleading statements) in Britannica and Wikipedia, respectively. Among these, each encyclopedia contained four serious factual errors such as wrong interpretations of key concepts. The comparable accuracy of Wikipedia and Britannica suggests that collaborative websites are reasonably reliable references, but there is little evidence to illustrate that people regard such websites as credible.

McGuiness et al. (2006) designed an extensive trust framework for Wikipedia which can assist users in their judgments of site trustworthiness. Their approach was useful in discovering potential cues which may improve the credibility of collaborative websites but the framework's utility will be limited without understanding the effects of basic collaborative features (e.g., edit buttons, discussion pages) on potential users. It is crucial to address the possible advantages and disadvantages of these cues if one is aiming to generate higher acceptance of collaborative websites.

Few studies have examined the perceived credibility of collaborative websites and the knowledge to be drawn from existing research is limited. Previous researchers examined the motivations and social dynamics of the contributors and information accuracy and the technical aspects of wiki software (Ayers, 2006), but they have yet to explore what users actually perceive. In addition, many of the past studies took Wikipedia as a case study from which the generalization of the findings is limited. Therefore, it is crucial to explore other collaborative websites to avoid idiosyncratic findings and to achieve more generalizable results.

Collaborative websites and credibility

Flanagin and Metzger (2007a) noted the rise of emergent credibility, a type of credibility that develops when a receiver acknowledges that the information is drawn from many different sources. However, why information posted by more than one user could lead to higher credibility was not fully explained. For example, people may feel that having a decentralized editing system and loose connection between collaborators could diminish the quality of the work.

Collaborative websites create an environment in which people have more direct access to information and rely less on an authority who serves as a gatekeeper or maintains quality control. Lankes (2007) suggested that decentralized control allows more room for participation and open communication, a more powerful tool than one-way information dissemination, but he did not examine why two-way communication would lead to higher credibility or discuss its potential issues. Given the lack of a rigorous editorial process and a large number of unknown contributors, most people, especially those with low literacy may face problems when trying to assess the credibility of information from these kinds of websites.

Another issue users of collaborative websites may face is that as more information is added, there becomes a point where the quantity of material is so great that it is difficult to discover errors (Calvert, 2001). This viewpoint implies that contributors are only likely to add new information to the Web page but not change or overwrite the existing one. However, a positive relationship between the content quality and the number of contributors suggests that besides sharing new information, contributors will also improve the accuracy of the existing content (Anthony et al., 2005). It remains to be seen whether the collaborative effort and the editing feature in collaborative websites will be considered by its users as a good checking system. Users may interpret this feature as a mechanism which increases the chances of discovering mistakes and rectifying them. It is also possible that they will associate the decentralized

editing system with the idea of low accountability for mistakes and expect the information to be of poor quality (Gorman, 2007). The perception that the Internet offers an anonymous environment might also influence credibility. Rains (2007) studied anonymity in electronic meeting systems and found that credibility decreased when the source was unidentified. Applying this in the context of collaborative websites, users may think that anonymity diminishes the integrity of information and may regard collaborative websites as not credible. Contributors who believe they are anonymous may act inappropriately, something they might not have done if they were identifiable (Townsend, Aalberts, & Gibson, 2000).

Collaborative websites typically do not allow complete anonymity; a user who wishes to contribute to the content is required to register and can be identified by a username. This is termed "pseudonymity," and defined as a state in which a person is not using a real name to enter the system but is identifiable to some extent (Johnson & Miller, 1998; Pfitzmann & Köhntopp, 2001). In collaborative websites a contributor can be identified by both their username and their contributions. Examining the quantity and quality of information accepted and posted by a specific contributor leads to an estimate of how authoritative that contributor is on a particular subject (Nikolaos, Poulos, & Bokos, 2006).

Johnson and Miller (1998) explained that if authors know they can be identified, they will likely act more responsibly, leading to more accountability. This implies that in collaborative websites, even though the author can only be identified by username, he or she is likely to act responsibly. Depending on whether users regard their collaborative efforts as pseudonymous or anonymous, collaborative websites may be perceived as more credible or less credible.

Heuristic-Systematic Model and Credibility Assessment

The Heuristic-Systematic Model (HSM) can be used to understand the features of collaborative websites and credibility assessments of users with different levels of involvement. The model differentiates two paths of processing: heuristic and systematic (Chaiken, 1980). Heuristic processing is likely to be observed when the level of involvement with the topic or information being presented is low. Heuristic processing requires the use of simple cognitive "rules of thumb" or mental shortcuts, such as experts are credible or expensive products are better or polls are credible, before conclusions about message are drawn. In contrast to systematic processing, this process requires less cognitive effort and happens automatically (Chaiken, 1980; Chaiken, 1987; Chaiken, Liberman, & Eagly, 1989).

Systematic processing occurs when information is carefully assessed and scrutinized. This route is taken when the level of involvement is high as it offers a higher level of confidence in a messages' validity. Given certain situational factors such as time constraints, lack of ability to systematically process the information or ambiguous messages, heuristic processing is predicted to co-occur (Chaiken & Eagly, 1983). For example, besides relying on their own evaluative judgment about the message content, an individual may also turn to certain source cues in order to obtain the level of confidence that they desire.

The influence of involvement in assessing credibility of collaborative websites was illustrated in a study by Chesney (2006). Articles from Wikipedia were given to people that were either related or unrelated to their areas of expertise, and they were asked to rate Wikipedia's site credibility and the credibility of the articles. Despite the fact that all articles were drawn from the same source, there were significantly higher credibility ratings among those who reviewed articles in their area of expertise compared to those who received random articles. Relating this to the HSM, it can be deduced that those with higher involvement with the topic may have employed systematic processing in their credibility assessment and critically evaluated the message quality. This may have lead to higher ratings, whereas those with lower involvement may have evaluated the site heuristically, resulting in lower confidence of its credibility.

Past studies suggest that people frequently pay more attention to superficial structural cues of a website than its content when assessing its credibility (Fogg et al., 2002; Warnick, 2004). There is a large body of literature regarding cues to credibility in non-collaborative websites (e.g., Eysenbach & Kohler, 2002; Flanagin & Metzger, 2007b; Fogg et al., 2001), but not for collaborative websites, which leads to the questions of what features affect credibility judgment and how. Using focus group discussions, this study explored the role different site features and user's level of involvement have in credibility assessment.

3. Focus Groups

3.1. Focus Group One

The aim of Focus Group One was to investigate whether users adopt different criteria when assessing the credibility of collaborative websites and non-collaborative websites. The study attempted to identify and compare the attributes users regard as influential in credibility evaluation for these two types of websites. According to the HSM, users with different levels of involvement may process information differently; for example, source cues may have more influence than message cues for those with lower personal

relevance. The degree of involvement is also taken into consideration when trying to understand how these cues are perceived and interpreted in each type of website under different levels of involvement. The following two research questions were formulated for Focus Group One:

RQ1: What attributes of collaborative websites and non-collaborative websites influence perceived site credibility?

RQ2: How does involvement affect the perception and influence of cues to credibility in collaborative and non-collaborative websites?

Method

Four sessions of focus groups were conducted using the multiple category group design during the second week of December 2007. Twenty-nine Internet users (17 males and 12 females) aged 18-29 years were recruited through electronic public folder announcements and snowball sampling.

Prior to the sessions the respondents were screened according to their interests on a number of topics. Those indicating that they were less motivated and interested to look for information related to pets and more motivated to look for information related to health were recruited. During the discussions, each respondent was put into two different situations to vary their levels of involvement to the topics. For example, to induce the low-involvement condition, they were asked to imagine searching for information on a new kind of vaccination for dogs. To induce the high-involvement condition, the information-seeking goal was to find articles about diabetes because a close relative had the disease. The respondents were subsequently asked which type of websites they would choose in the respective situations and which features would help them in assessing the credibility of the website they chose.

Each session lasted approximately 90 minutes and was audio taped for purposes of reporting and analyses. The discussions were then transcribed and analyzed using a long-table approach[1].

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[1] Answers were organized by research question. Similar responses were categorized under the same theme.

Findings

The first round of focus groups was conducted to explore the different cues people use to assess the credibility of collaborative and non-collaborative websites. Initially, most focus group respondents did not associate the term "collaborative website" with editing features, but related it instead to the concept underlying forums and discussion boards. There were at least two respondents in each focus group session who pointed out that collaborative websites allow editing of content. Once Wikipedia was given as an example of a collaborative website, most respondents associated the distinct concept of "open for editing" with such websites. A number of attributes associated with the editing features (history, discussion, date of modification and status of an article) were reported as being useful for evaluation of the website's credibility. For non-collaborative websites respondents mainly discussed the nature of website ownership as important in establishing its credibility.

Credibility markers in collaborative websites

The top four credibility cues discussed by respondents in both high- and low- involvement conditions were the presence of references, author information, links to other websites and comments in the discussion section. Other cues cited by respondents are listed in table 1 along with what respondents said each attribute infers.

Most of these cues were said to lead to higher perceived credibility for collaborative websites, except for the editing feature. Respondents in both the high and low-involvement groups feared the possibility of vandalism since this function allows anyone to make any changes. Respondents in low-involvement groups additionally reported that with the editing feature contributors who are not experts might provide erroneous information. This was countered by some respondents, especially those in the high-involvement condition who argued that the editing feature could lead to higher information accuracy, as it increases the chance of mistakes being spotted and corrected.

Credibility markers in non-collaborative websites

Similar to collaborative websites, the presence of references and information about the authors were cited extensively as important credibility markers in non-collaborative websites. The presence of references

played an important role in determining website credibility as respondents said that even if they knew the credentials of the author, they would want to know where the information came from. In comparison to collaborative websites, respondents tended to emphasize the importance of website ownership more. The domain type (.org, .gov, .edu) was said to be one of the primary determinants of credibility. Respondents believed that information in non-collaborative websites comes primarily from only one source and therefore bias was possible. Certain domain types such as .org or .edu were believed to be more credible than .com. In addition to references and website ownership, other important cues which respondents said may be used when assessing the credibility of a non-collaborative website were depth of information, date of last modification, links to related information, overall layout and whether the website catered to a specific topic. Refer to table 2 for the attributes and what respondents said each attribute infers.

Table 1. Summary of Findings for Collaborative Websites in Focus Group One

	Positive roles in credibility assessment		Negative roles in credibility assessment	
	Low involvement	High involvement	Low involvement	High involvement
Features				
'Discussion' tab	Others' comments will influence user's opinion on believability, usefulness and relevance of article	More open communication and discussion, less one-way information		
'History' tab	Identity of author editing or writing content known	Ability to track what changes have been made to article		
Editing feature		Possibility of mistakes being spotted and corrected	Possibility of vandalism and contributing author not being an expert	Possibility of vandalism
Source cues				
Owner of the website	Reputable owner leads to higher credibility			
Contact information of authors	Avenue for enquiries and feedback	Ability to detect potential bias based on background of author		
Reviewers of articles and their credentials	Ability to verify accuracy of information based on background of reviewers			

	Low involvement	High involvement	Low involvement	High involvement
Reputation of website		Higher reputation leads to higher credibility		

Message cues				
References	Supporting evidence for information			
Date of last modification	Information is up-to-date			
Number of readers of article	Ability to track how many people read the article			
Article status	Approved articles have been verified by experts			
Pictures in article		Information in article is supported with evidence		
Depth of information		Detailed information is more credible		
Consistency of information		Information is consistent with that from other websites		
Statistics		Information in article is supported with evidence		
Language used in article		Professional language leads to higher credibility		

Table 2. Summary of Findings for Non-Collaborative Websites (Focus Group One)

	Positive roles in credibility assessment		Negative roles in credibility assessment	
	Low involvement	High involvement	Low involvement	High involvement
Source cues				
Owner of the website and domain name	Official sites have more authority			
Reputation and credentials of author	Authors who are experts in the topic are more credible			
Reputation of owner of website		Reputed owner means less bias		

Message cues		
Depth of information	Detailed information is more credible	
Date of last modification	Information is up-to-date	
Hyperlinks to related information	Possible to verify information	
References	Possible to verify information	
Catering to a specific topic		Websites specialized in one topic will be more credible
Overall layout	Professional layout leads to higher credibility	
Presence of advertisement		Commercial

Influence of involvement on credibility assessment of collaborative websites

When asked to think of different task scenarios (high- versus low- involvement conditions), although similar features and cues (the discussion around the article content, history and the editing feature) were mentioned, their roles in credibility assessment among respondents with low and high involvement were different. Less motivated respondents said they would decide whether the information was believable, useful and relevant based on others' judgment posted on the discussion board. Respondents who were more interested in the topic said the open communication facilitated by the discussion section could lead to higher quality of information, because there would be discussion to weed out the incorrect information. They tended to favor the idea of open editing as they felt this would allow people to collaborate and spot and correct mistakes. As one respondent said, editing is a "continuous process" in collaborative websites, if somebody finds something wrong in the article, they will simply correct it.

The "History" page, which documents the changes and edits to the article overtime, was also viewed as a cue to credibility. Low involvement respondents said they would use this feature to see "who" had been editing the article. These respondents were particularly concerned about the identity and credentials of the author. In contrast, respondents with higher involvement with the topic said they would use the "History" page to find out more about the changes made to the article than information about the contributor.

Website reputation, author identity and credentials were important to respondents from both high and low-involvement conditions but respondents with low involvement gave more importance to author identity. One respondent said that people editing the article may not be as qualified as the author of the original article and may create inaccuracies. Respondents with low involvement also mentioned that they would use author contact information as a channel for clarifying questions and for feedback. In contrast, respondents with high involvement thought author contact information was a means to check and detect any potential bias, based on their assessment of the author's background. Respondents with high involvement also relied on their own ability to assess potential bias, in addition to the website's reputation, which may be associated with the contributor's reputation. Author reputation was another important factor in helping evaluate website credibility for these respondents.

A clear distinction between respondents with high and low involvement can be observed in the findings regarding the message cues. Besides the presence of references and the date of last modification of the article, pictures, statistics, depth and consistency of the information, and the nature of the language used in the articles were also reported as crucial markers of credibility for respondents with high involvement. Those with low involvement, on the other hand, relied only on the number of views and a message clarifying the status of the article (e.g., approved versus non-approved). This suggests that high-involvement respondents are likely to rely heavily on the quality of the message itself rather than simple heuristic rules such as others' opinions about the article.

Influence of involvement on credibility assessment of non-collaborative websites

Respondents with both low and high involvement said that they would look at the website's ownership, credentials of the author, and presence of ads when assessing website credibility. Respondents with high involvement said that the reputation of the website's owner would help them gauge the potential bias. A few respondents said that domain names would help them evaluate credibility better; as one respondent mentioned, "…if it ends with .org or .edu, I will trust it, but if it ends with .com, I will not trust it so much." As for message cues, depth of information and date of modification were both reported as important. In addition to these two features, hyperlinks to related information, website layout and references were also mentioned by those with low involvement but none of these were mentioned during the high task-importance scenario. If the respondents had to retrieve important information, they said they would prefer to go to a website that is specialized in that particular field. One respondent said that when she had to find some health-related information on the Internet, she would believe a website if it was specifically

dedicated to the topic. In line with findings for collaborative websites, these findings suggest that the discussion for high-involvement respondents was centered on the quality of the message being presented and not additional features in the website.

Discussion

Focus Group One was conducted to explore the different attributes respondents are likely to use to assess the credibility of collaborative websites. In order to provide a better understanding of how people assess these websites, the discussion also covered the assessment of non-collaborative websites. The results from Focus Group One show that source cues were viewed differently in collaborative and non-collaborative websites. Due to the nature of collaborative websites, "source" was further differentiated into layers, such as the author and the source of the information itself. In non-collaborative websites, "source" was associated more with the owner of the website and factors such as the website owner's reputation and author's credentials were more emphasized. In terms of the number and the role of the cues mentioned, the results from the first focus group show that, in general, both low- and high-involvement respondents are likely to attend to similar cues but the roles these cues play in credibility assessment tend to vary.

People with low involvement tend to use collaborative features (e.g., discussion, history and editing features) with simple heuristic rules to infer the credibility of the authors involved in writing the article. The findings suggest that if people are not highly involved with the topic, the author's identity will play a dominant role when assessing credibility. The message cues they would attend to are presence of references and date of last modification. If there is no information about the contributors, respondents with low involvement would check if reviewers monitor what is uploaded and their credentials, and the reputation of the website's owner. In addition to source information, they may also rely on others' opinions by looking at the number of times the article has been viewed and/or the comments from the discussion board (i.e., tabulated credibility).

Respondents with high involvement are more likely to use collaborative cues (discussion, history and editing features) in relation more to the message quality than to the source. The importance of message cues among high-involvement respondents is also supported by the number of content cues cited as credibility markers in the high-task importance scenario. People with low-involvement will simply reach a conclusion about website credibility after heuristically looking at what they perceive as reliable credibility markers, while those highly involved will invest more cognitive efforts to evaluate the information provided by the different cues. For example, instead of simply agreeing with others' judgment about the article like

those with low involvement, those with high involvement would use comments in the discussion board to examine the different viewpoints and perspectives, and form their own judgment about the credibility of the website. As predicted by the HSM, the result of their final evaluation will depend largely on the process of their own thinking.

The date of the last modification and references were two other factors that influenced the credibility of collaborative websites. Respondents with both low and high involvement said that it provided an assurance of the quality of information and how up-to-date the information was. Although the date of the last modification is not unique to collaborative websites, it has become more important in credibility assessment in collaborative websites because of their nature of allowing continuous change of information. This suggests that the same cues available in non-collaborative websites may play different roles in collaborative websites.

In non-collaborative websites, there is not much distinction between respondents with high and low involvement in terms of the roles the different features play in online credibility assessment. The source that respondents reported as important was the reputation of the site, which they determined based on the credentials of the author and owner of the website. This is referred to as reputed credibility (Flanagin & Metzger, 2007a). An analysis of this observation under the HSM framework would suggest that this type of credibility may serve as a reliable heuristic cue to provide a high level of confidence. Once the accuracy is assured by the reputation of the site, there is no need to further scrutinize the information presented.

3.2. Focus Group Two

The second round of focus groups was conducted to identify the features in collaborative websites that are likely to be noticed and how they affect the credibility assessment given the different level of involvement. The research questions for Focus Groups Two were as follows:

> RQ1: What features of collaborative websites are noticed by users with low involvement, compared to those with high involvement?
> RQ2: What role do the features identified play in the assessment of credibility of collaborative websites by people with high and low involvement?

Method

Four sessions of focus groups were conducted using the multiple category design approach during the last week of January and the first week of February 2008. Twenty-five Internet users (10 males and 15 females) were recruited as respondents through convenient sampling.

The respondents were screened with a set of questions about websites that allowed them to edit, comment and contribute to the content posted and how many times they had visited such sites in the last month. Other questions such as the amount of time they spent browsing for information in the topics of health, travel, pets and technology, motivation and interest in the topics, and hours spent looking for information online were also asked.

Based on the information obtained from the questionnaires, the respondents were categorized into four discussion groups, two for high involvement in the topics of travel and health, and two for low involvement in the topics of travel and health. There were 12 respondents in the high involvement group and 13 respondents in the low involvement group.

Similar discussion guides were used to examine the two groups, with a difference in the information-seeking scenario that lead to different levels of involvement. To avoid the influence of Wikipedia, respondents were asked to explore three collaborative websites, WikiHow, Citizenpedium and Wikia. These three websites possess the basic characteristics of collaborative websites discussed in Focus Group One (the "Edit" button, the "Discussion" tab and the "History" tab). The three websites are free encyclopedias providing information on a variety of topics. Respondents in the low-involvement groups were asked to search for random topics, while the respondents in the high-involvement groups were asked to search for topics that they were very interested in and would be motivated to read. Subsequently, respondents were asked to evaluate the credibility of the websites they browsed based on the features they noticed in those websites, and explain how these features helped them in credibility evaluation. Each session lasted approximately 100 minutes and was audio taped for purposes of reporting and analyses. Each session was then transcribed and analyzed using a long-table approach.

Findings

The editing function of collaborative websites was the most noticed across the four focus group sessions (high and low involvement). The second most cited feature was the "Discussion" tab, the commenting feature in collaborative websites. Although not noticed at first, the "Create account" button, the article's

status (approved or draft) and the list of references were identified as important factors which affect the credibility assessment of collaborative websites. Other cues noticed were the "History" tab, the date of last modification, the list of contributors and descriptions of how collaborative websites work. Table 3 summarizes the findings from Focus Group Two.

The editing feature played an important but varied role in respondents' assessment of credibility. For topics like health and travel, both groups of respondents (high and low involvement) felt that having the editing feature ensured up-to-date information but also meant the possibility of vandalism. Respondents with low involvement generally had positive opinions on the editing feature. Many of them believed that having an open editing system would allow for peer review which may lead to high quality content. The notion of "free flow of information" was favored by these respondents. They also valued information derived from personal experience.

Respondents who were motivated to process the information also agreed that the editing feature would 'enrich' the information because, as mentioned by one respondent, in the case of health, she would believe a collaborative website because "…sometimes, the public know more about certain topics." Some respondents with high involvement also said they were concerned about the risk of inaccurate information seeping in because authors may not necessarily be experts on the topic. The editing feature, as mentioned by one respondent, reduced the credibility of the collaborative website because it was "…too easy for anyone to edit." The possibility of a non-expert contributing to information also meant reduced credibility of collaborative websites for some respondents in high involvement. These respondents reported that they would not visit collaborative websites if they needed important factual information like health related topics.

Similar to the first round of focus groups, the comments in the discussion board found more prominence in the low involvement group than in the high involvement group. It was said to enhance the credibility of the collaborative website because they could see other users' opinions on the credibility of the article. They felt that having comments from other users about the credibility of the article could help them form judgments about the credibility of the website. Among those in the high-involvement groups, only one respondent noticed the "Discussion" tab. None pointed it out as a cue they would rely on for credibility assessment.

Table 3. Summary Findings for Collaborative Websites in Focus Group Two

	Positive roles in credibility assessment		Negative roles in credibility assessment	
	Low involvement	High involvement	Low involvement	High involvement
Features Noticed				
Editing feature	Up-to-date	Up-to-date		
	Peer review	For some topics, public know more		
	Personal experience important in topics like travel			Risk of inaccuracies because contributor may not be experts
		Vandalism		
Gatekeeping (Create Account); (Reviewer)	Only interested people will create accounts to edit, so their information can be believed			
	+ Administrative team to review the articles			
Gatekeeping (Reviewer);Article's status (Approved/ Draft)		Administrative team to review the articles		
		More credible if it's approved		
References	Supporting evidence			
Discussion	Other comments will help judge if article is believable, useful and relevant.			
Other Features				
Hyperlink to related terms and articles			More credible with hyperlinks	
Date last modified		Currency of the information		
List of contributors			Usernames do not affect credibility assessment	
'History' tab			Reduce websites' credibility if edited many times	

Respondents, especially those in the low-involvement groups, frequently mentioned that the presence of gatekeepers in the website (e.g., an editor or site administrator), which constantly monitor the information posted on and remove incorrect information from collaborative websites, could increase credibility. A few respondents believed that there is some form of gatekeeping attached to the "Create account" feature. Some felt that only interested individuals would create an account and edit, therefore the information provided should be credible. Some said they wanted the "Create account" option to be only available to experts. Others said they would trust the website if there was a team reviewing contributions or screening the members who contribute: "If it's approved, it's good because the 'big' people approve it… the article is so accurate that you can just use it." Most respondents, irrespective of the degree of involvement, agreed that having administrators checking information would significantly increase the credibility of the websites. Compared to other collaborative websites that he had just seen, one participant said that he "trust[s] Wikipedia because there is a statement at the top of every page that says someone controls it." In the high-involvement groups too, a few people said that the editing feature would mean more credibility for the collaborative website only if there was some "expert checking the information put in."

Having references, even though not a unique feature of collaborative websites, was agreed upon by more than half of the respondents of all groups as a cue that increases credibility. Respondents felt that having references gave the information a sense of accuracy, as it was "not just cooked up." They said that having references in the article meant that the information was substantially supported by facts and could therefore be trusted.

The "History" tab that allows users to track the edits made to an article was mentioned by only two respondents from the low-involvement groups. One said the website would be less credible if it was edited too many times, while the other said this function did not affect perceived site credibility. Unlike those in low-involvement groups, respondents in high-involvement groups tended to place more emphasis on content cues such as date of last modification and hyperlinks to related terms and articles. To them, websites that could provide up-to-date and in-depth information were likely to be perceived as more credible.

Discussion

As the importance of cues may have been overemphasized by the design of Focus Group One, the second round of focus groups was conducted with the aim of finding out what features in collaborative websites

were noticed by users and what role these features played in their evaluation of credibility. Findings from Focus Group Two show that the presence of references and an indication of some kind of gatekeeping mechanism served as reliable indicators of website credibility for most respondents with high and low involvement, possibly due to the concern over vandalism.

Many respondents felt that the editing feature would increase credibility of the collaborative website, as the information would be constantly updated by other users and would become more accurate. Some of them felt that the public knows more about certain topics and would correct any incorrect information that had been posted. The underlying theme was that respondents believed the editing feature enabled other users to act as a check and balance of information through constantly editing, reviewing and adding information, making the website accurate and up-to-date. These findings help to explain how emergent credibility may be established for collaborative websites.

The editing feature brought out concerns among respondents about the possibility of vandalism and bias. These concerns were heightened when the authors were only known by their registered usernames or IP addresses. Although this pseudonymity might make the contributors feel more obligated to maintain a high standard of quality (Townsend et al., 2000), none of the respondents expected this type of identification to induce accountability. Usernames may serve as a cue indicating authoritativeness among the community of contributors (Nikolaos et al., 2006), but not for the end users.

Unlike Johnson and Miller (1998) who see usernames as leading to pseudonymity, which may prompt users to be more responsible in their editing, most respondents viewed usernames as allowing total anonymity. If information retrievers see that contributors cannot be identified by their real names, they will think the contributors are unlikely to try to maintain accuracy and be bias-free. Respondents felt that usernames and IP addresses were not of much use in credibility assessment.

As compared to those in Focus Group One, highly-involved respondents from round two seemed to place more emphasis on source expertise as the risk of an unqualified source providing erroneous information was cited by only the high involvement group. The low involvement group, on the other hand, expressed less concern over unqualified authors. Instead, their focus was on a simpler heuristic cue, namely, the "Create Account" function which implied that they were likely to believe anyone who had devoted their time to register and contribute. Such contradictions may have been contributed by different procedures used between the two rounds of focus group. That is, the responses from the first round of focus groups could have been affected by the discussion of Wikipedia, whereas the responses of the second round of focus groups may have been affected by the exposure to the collaborative websites presented at the beginning of the session. Both findings still corroborate with previous studies on HSM, that is, people who

are pursuing an important information-seeking task will be more selective about their heuristic-based evaluation.

Another difference between the two rounds of focus groups lies in the number of cues. Fewer credibility markers were reported in Focus Group Two. Certain cues, such as date of modification, history tab, discussion boards, and website ownership, that were frequently mentioned and discussed in Focus Group One were not emphasized or sometimes left out in Focus Group Two. This discrepancy may have stemmed from the difference in procedures employed. In Focus Group One respondents were asked to share with the moderator all kinds of attributes they might resort to when determining the credibility of a website. This approach may have induced the respondents to be mindful of their responses. It seems unlikely that people would be able to give their attention to all the cues mentioned in the first round. This apparent demand characteristic was likely to be minimized or eliminated by the design of Focus Group Two (i.e., exposure to particular collaborative websites at the outset of the study).

4. Conclusion

Findings from this study suggest that people do not simply reject the information provided by anonymous individuals on collaborative websites. In general, respondents seemed to recognize the advantages of up-to-date and unbiased information that the editing features in collaborative websites enabled. Neither of these two positive qualities discussed in the focus groups have been addressed by previous research.

Some of the drawbacks of wikis mentioned by participants correspond with those identified in previous research. The lack of availability of author information and the absence of an administrative vetting process could potentially lead to concerns of vandalism (Gorman, 2007), making users more reluctant to believe information from collaborative websites. This may have led to the increased importance of other cues such as comments on discussion boards, references and the date of the last modification in collaborative websites, which are likely to be less important in non-collaborative websites. To further enhance the credibility of collaborative websites the presence of an editorial team might be necessary.

This study explored the different attributes that affected credibility judgment of a collaborative website but it is yet to be seen how much influence each cue has on credibility assessment in different contexts. To gain better insight on the role each cue plays and how different levels of user involvement may influence credibility assessment, future research could also focus on specific topics and selected group of users, even though generalizibility may be compromised. In addition, studies using qualitative methods such as interviews and focus group discussions could identify ways to detect and ensure that the findings collected

are not exaggerated due to social desirability. Examination using quantitative methods such as experiments could help to confirm the findings from this study.

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