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Trust of Information on Social Media: An Elaboration Likelihood Model

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Abstract

Social media such as Twitter and Facebook are increasingly being used as a source of information in critical situations such as natural disasters and civil unrests. However, false information exists on social media and trusting false information not only leads users to make wrong decisions but can also have dire impact on the society. This research-in-progress examines how individuals process information on social media to determine whether or not to trust the information. Based on the elaboration likelihood model, a research model elucidating the effects of information quality, source credibility, and majority influence on users' trust of information on social media is proposed. Further, the moderating effects of personal involvement and users' prior knowledge are investigated. Results from a pilot survey indicate that majority influence has a stronger effect on trust than source credibility for social media users and they are likely to rely on information quality as well as source credibility and majority influence when their personal involvement is high.

Keywords

Social Media, Elaboration Likelihood Model, and Trust

1. Introduction

Social media such as Twitter and Facebook have become effective means for sharing and disseminating up-to-date information on the Internet. It has been shown that any retweets (i.e., messages that are reposted) on Twitter reach an average of 1000 users regardless of the number of followers in the original message and can be read by people who are four degrees of separation away from the source within minutes (Kwak, Lee, Park, & Moon, 2010). Other than sharing personal thoughts and experiences, social media are increasingly being used in critical situations such as natural disasters and civil unrests (e.g., street riot, political reform). For example, the United States' State Department used Twitter to distribute information about how Japanese residents in the United States could contact their families in Japan after the Great East Japan Earthquake. Social media were also used as a source of first-hand news in the Arab Spring political reform by many mainstream media such as television. However, social media are crammed with both valuable information and rumors (Mendoza, Poblete, & Castillo, 2010) and it remains uncertain whether social media should be used in critical situations. Many users have also expressed concerns about the difficulty of distinguishing between true and false information on social media (Acar & Muraki, 2011). Trusting false information not only leads users to make wrong decisions but can also have dire impact on the society. For example, in the 2011 England Riots, it was widely believed that rumors spread on social media such as Twitter and Facebook triggered the mass unrest (Grimmer, 2011). It is

therefore important to understand how users form trust of information on social media.

This research-in-progress seeks to understand how users process information on social media to determine whether or not to trust the information. Although research on social media is beginning to recognize trust as an important factor influencing individuals' use of information on social media in purchases (Golbeck & Hendler, 2006), personal health management (Eysenbach, 2008), and at work (DiMicco et al., 2008), there is yet any empirical study on *how* trust perception is formed on social media. This study aims to address the gap by applying the elaboration likelihood model (ELM; Petty & Cacioppo, 1986) to examine the characteristics of information, information source, user, and social context. This study can potentially contribute to research on social media by explaining the formation of trust perception in the context based on the theoretical model of ELM. ELM allows us to consider the role of social influence which is particularly relevant to social media. For practitioners, the findings may offer insights into ways for effectively publicizing useful information on social media and limiting the impact of false information by increasing users' motivation and ability to process information.

2. Elaboration Likelihood Model and Social Media

ELM posits that information can change individuals' attitude towards an issue through central or peripheral routes of information processing (Petty & Cacioppo, 1986). The *central* route of information processing involves scrutinizing the content of information to determine its inherent merits prior to forming an attitude. That is, information quality is the main determinant of individuals' attitude. The *peripheral* route involves the use of peripheral cues (e.g., characteristics of the information source) or heuristics (e.g., agreeing with the opinion of the majority (Diane, 1987)) to form an attitude and it therefore requires less cognitive effort than the central route. The extent to which individuals use information quality, peripheral cues, and heuristics to process information depends on their elaboration likelihood, which refers to individuals' motivation and ability to evaluate information. In summary, ELM proposes that individuals with strong motivation and ability are likely to expend more cognitive resources to evaluate the quality of information and rely less on peripheral cues and heuristics in information processing and attitude formation. In this study, we focus on the attitude of *trust* (Komiak & Benbasat, 2006), which refers to the extent to which one feels secure and comfortable about relying on the information on social media.

ELM has mostly been assessed in social psychology and marketing research and is increasingly being applied in information systems (IS) research (Bhattacharjee & Sanford, 2006). The model has been adapted to explain how individuals form attitudes towards IS which in turn influence their adoption of IS (e.g., Angst & Agarwal, 2009) and intention to continue using IS (e.g., Kim et al., 2007). It has also served as the basis for understanding the factors influencing individuals' acceptance and use of information accessed through information technologies such as expert systems (Dijkstra, 1999; Mak et al., 1997) and websites (Tam & Ho, 2005). This indicates that ELM can potentially offer insights into individuals' trust of information on social media. ELM has also identified the opinion of others as an important heuristic (Petty & Cacioppo, 1986) for processing information and forming attitude. However, the effect of this heuristic has been largely overlooked in prior IS studies applying ELM. Opinion of others represents social influence and is especially relevant in the context of social media whose key feature is enabling socialization. This study conceptualizes

opinion of others in terms of majority influence and seeks to extend prior IS research that applied ELM by examining the effect of the heuristic.

It is interesting to study the formation of trust of information on social media because social media have some peculiarities that distinguish it from other media such as television, newspaper, and online news. The source of information on social media is often more varied, as anyone with a valid account and Internet access can upload information. Information on social media also does not undergo any editorial or verification process to ensure information quality before they reach the public. Unlike other media, social media have functionalities that support instant social interactions. These differences may influence the process of trust formation on social media.

3. Research Model and Hypotheses

In ELM, motivation is conceptualized in terms of *personal involvement* and ability is based on one's *prior knowledge* (Petty & Cacioppo, 1986). Similarly, prior IS studies have conceptualized motivation and ability in terms of these constructs (Angst & Agarwal, 2009; Bhattacharjee & Sanford, 2006). Other than information quality, individuals may rely on the peripheral cue of *source credibility* (Bhattacharjee & Sanford, 2006; Petty & Cacioppo, 1986) and the heuristic of *majority influence* (Erb, Bohner, Schmilzle, & Rank, 1998; Nemeth, 1986) to form attitudes. Based on the rationale of the central route of information processing proposed in ELM, we hypothesize that the effect of information quality on individuals' trust of information on social media is stronger when their personal involvement and prior knowledge are strong. Corresponding to the peripheral route of information processing, we hypothesize that the effects of source credibility and majority influence are stronger when personal involvement and prior knowledge are weak (see Figure 1). The extraneous effects of age, experience with the Internet, experience with social media, attitude towards mainstream media, and risk aversion are controlled for. The hypotheses are explained in more detail below.

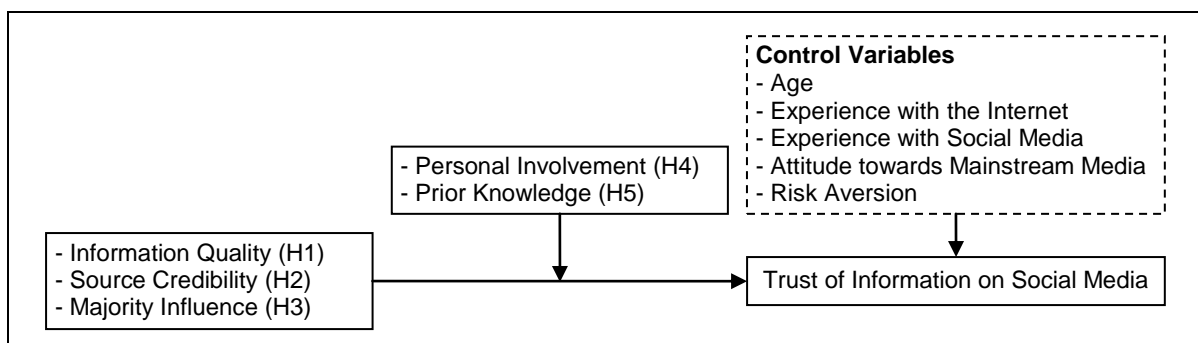


Figure 1: Social Media Information Credibility Model

Information quality refers to the extent to which information is accurate, complete, current, objective, and understandable (Lee, Strong, Kahn, & Wang, 2002; Rieh, 2002). High-quality information is more likely to be trusted because it can better support sense-making and lead to more correct decisions (O'Reilly, 1982). In line with this, it has been shown that high-quality information is important for building trust of information on Internet health portals (Luo & Najdawi, 2004). Accordingly, we hypothesize that:

H1: Information quality is positively related to individuals' trust of information on social media.

Source credibility is the extent to which sources of information are perceived to be competent, trustworthy, and reputable (Bhattacharjee & Sanford, 2006; Pornpitakpan, 2004). We expect source credibility to influence users' trust of information on social media because it can generate inferences or expectancies about the probable validity of information (Chaiken & Maheswaran, 1994). For example, it has been observed that social media users have more confidence in the information from established and reputable sources even before reading them (Zhao & Rosson, 2009). Therefore, we hypothesize that:

H2: Source credibility is positively related to individuals' trust of information on social media.

Majority influence refers to the extent to which most people in a social group hold similar view about an issue (Nemeth, 1986). On social media, majority influence may manifest in terms of the extent of agreement (e.g., number of tweets supporting an opinion on Twitter) or the spread of the information among different users (e.g., number of retweets of a piece of information on Twitter). We expect that individuals are more likely to trust information on social media when there is majority consensus because the information is likely to be perceived as being endorsed by many people and therefore more valid (Chaiken & Maheswaran, 1994). This is in line with the concept of social proof, where individuals facing uncertainties determine what is correct based on what others think is correct (Cialdini, 1993).

H3: Majority influence is positively related to individuals' trust of information on social media.

Personal involvement is the extent to which an issue is expected to have significant consequences on one's life (Apsler & Sears, 1968). ELM suggests that when personal involvement is strong, individuals are likely to be more motivated to allocate cognitive resources to evaluate information quality and rely less on peripheral cues and heuristics such as source credibility and majority influence because the consequences of being incorrect are greater (Petty & Cacioppo, 1986). Therefore, we hypothesize that:

H4a: When personal involvement is strong, the effect of information quality on individuals' trust of information on social media is stronger.

H4b: When personal involvement is strong, the effect of source credibility on individuals' trust of information on social media is weaker.

H4c: When personal involvement is strong, the effect of majority influence on individuals' trust of information on social media is weaker.

Prior knowledge refers to one's familiarity, expertise, and experience with an issue (Kerstetter & Cho, 2004). When individuals have strong prior knowledge about an issue, they are better able to scrutinize the content of information and there is therefore less need to revert to peripheral cues and heuristics (Bhattacharjee & Sanford, 2006). In contrast, individuals with little prior knowledge lack the ability to process information critically and they are therefore forced to rely on peripheral cues and heuristics (Petty & Cacioppo, 1986). Accordingly, we hypothesize that:

H5a: When individuals have strong prior knowledge, the effect of information quality on their trust of information on social media is stronger.

H5b: When individuals have strong prior knowledge, the effect of source credibility on their trust of information on social media is weaker.

H5c: When individuals have strong prior knowledge, the effect of majority influence on their trust of information on social media is weaker.

4. Research Method

We are currently collecting data through a survey to assess the proposed research model. The target population is individuals who seek information on social media. We survey a sample of individuals who seek information related to nuclear radiation on social media. Following the damage of Fukushima Daiichi nuclear power plant caused by the Great East Japan Earthquake on March 11, 2011, there has been fear within Japan as well as in neighboring countries over the health impacts of nuclear radiation. Many people around the world have used social media as a source of up-to-date information about the extent and effects of radiation in air and food (Acar & Muraki, 2011). This therefore offers a recent context for our study that can help to minimize recall error. Invitations for participating in the survey have been posted in online forums that discuss topics related to nuclear radiation in Japan. Users of Twitter are invited to complete an English web-based survey. The survey is not limited to Japanese users to ensure that there is variance in personal involvement, which is one of the constructs of interest of this study.

The survey instrument was developed based on existing scales (see Table 1). For example, the items measuring information quality were adapted from Lee et al. (2002) and the scale of source credibility was adapted from Bhattacharjee and Sanford (2006). Majority influence, prior knowledge, and trust of information on social media were developed based on their conceptual descriptions. Items measuring information quality and source credibility were scored on semantic-differential scales while the other items were scored on seven-point Likert scales. The reliability and validity of each scale were pretested with data collected in a pilot survey of 100 users. The results based on the analysis of Cronbach's alpha, composite reliability, average variance extracted, and factor analysis indicated that the scales are adequate.

We plan to analyze the data using Partial Least Squares. The preliminary findings based on the pilot survey are briefly discussed in the next section.

5. Preliminary Findings based on the Pilot Survey

The results of our pilot survey show two interesting findings. First, while information quality, source credibility, and majority influence all have significant effects on individuals' trust of information on social media, majority influence has the strongest effect. This indicates that users of social media are more influenced by the majority opinion of others than the credibility of information source. This may reflect the general personality of users who seek information from social media. They may have stronger external locus of control and are therefore more affected by social influences than those who seek information from non-social media.

Second, we found that the effects of source credibility and majority influence (i.e., peripheral cue and heuristic) are not significantly weaker when users have high personal involvement. This contradicts our hypotheses H4b and H4c and the prediction of ELM. This finding indicates that when an issue is perceived to be important, users are likely rely on all aspects of the information provided to judge its credibility. Peripheral cues and heuristics may serve to provide additional assurance to the credibility of information on top of the inherent quality of information.

Construct	Item and Source
Information quality	I think nuclear radiation-related information on Twitter is generally ... 1) subjective/objective; 2) unverifiable/verifiable; 3) has insufficient/sufficient breadth or coverage; 4) has insufficient/sufficient depth or detail; 5) outdated/up-to-date; 6) difficult/easy to understand (Scored on semantic-differential scales; All items adapted from Lee et al., 2002)
Source credibility	I believe the nuclear radiation-related information on Twitter is provided by people who ... 1) have low/high level of expertise; 2) are not knowledgeable/knowledgeable; 3) are not reputable/reputable (Scored on semantic-differential scales; All items adapted from Bhattacharjee & Sanford, 2006; Heesacker, Petty, & Cacioppo, 1983)
Majority influence	1) On Twitter, most people hold largely similar views about the effects of nuclear radiation; 2) On Twitter, most people share consensus about the effects of nuclear radiation; 3) On Twitter, there is general agreement about the effects of nuclear radiation (All items developed based on Martin, Gardikiotis, & Hewstone, 2002).
Personal involvement (formative)	1) There is a high possibility that I will experience the negative effects of nuclear radiation in future; 2) My physical health makes it more likely that I will experience the negative effects of nuclear radiation; 3) My geographic location makes it more likely that I will experience the negative effects of nuclear radiation; 4) My occupation makes it more likely that I will experience the negative effects of nuclear radiation (All items adapted from/developed based on Champion, 1984; Clarke, 1999).
Prior knowledge	1) I have professional expertise in the effects of nuclear radiation; 2) Before using Twitter, I have personally experienced the effects of nuclear radiation; 3) Before using Twitter, I had spent a lot of time reading about the effects of nuclear radiation (All items developed based on Kerstetter & Cho, 2004)
Trust of Information on Social Media	1) In general, I trust nuclear radiation-related information on Twitter; 2) I feel secure using nuclear radiation-related information on Twitter in decision making; 3) I feel comfortable using nuclear radiation-related information on Twitter in decision making (All items developed based on Komiak & Benbasat, 2006)

Table 1. Survey Instrument

In summary, we have proposed a model based on ELM to explain how users process information and form trust perception about information on social media. We have highlighted some interesting findings from the pilot survey and it remains to be seen whether the findings will be replicated in the final survey that is underway. This study can potentially augment our understanding of social media, which has become integral to many aspects of our lives.

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