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CONSUMERS’ ACCEPTANCE OF ELECTRONIC WORD-OF-MOUTH RECOMMENDATIONS: EFFECTS OF MULTIPLE COMMUNICATION ELEMENTS AND PROCESSING MOTIVATION

Human-Computer Interaction

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Abstract

We present an on-going project that explores how consumers process electronic word-of-mouth (EWOM) recommendations from electronic word-of-mouth systems (EWOMS). Conceptualizing EWOMS as an informant-mediated persuasive environment that comprises of many communication elements and drawing on the accessibility-diagnosticity model and the elaboration likelihood model, we identify the critical roles of EWOM information diagnosticity and EWOM informant credibility and their antecedents in influencing consumers’ acceptance/rejection of the EWOMS recommendation. It also examines the effects of unique EWOMS mechanisms such as helpfulness indicators and informant status indicators. Taking consumer heterogeneity into consideration, the paper discusses the moderating effects of consumers’ processing motivation on the influence of information and informant characteristics and the EWOMS mechanisms. An experiment is formulated to validate our propositions.

Keywords: Electronic word-of-mouth, diagnosticity, online recommendation acceptance

Introduction

Consumers extensively utilize product information obtained from word-of-mouth (WOM) communications when making consumption decisions. The rapid penetration of computer networks into business and human communications has recently extended WOM communications that have traditionally embedded in an individual’s direct social network to the Internet, resulting in the electronic word-of-mouth phenomenon (EWOM) (Dellarocas 2003). The major technological underpinning of EWOM is electronic word-of-mouth systems (EWOMS), defined as Web-based information systems that allow consumers to exchange consumption information electronically on the Internet. It is evident that EWOM is able to exert enormous impacts on both online and offline consumption behavior (DoubleClick 2004, Godes and Mayzlin 2004, Riller 1999). To leverage on the ability of EWOM in alleviating major constraints caused by the lack of contact in online transactions, practitioners such as eBay, ePinions.com, Amazon.com, Venere.com, etc. have notably incorporated EWOMS into their electronic commerce platforms.

Current studies related to EWOMS focus mainly on its impacts on the trust between exchange partners and on overall sales (Ba and Pavlou 2003, Godes and Mayzlin 2004) and are far from showing the full-range influence of EWOMS on consumer behavior. Through publishing consumption information, i.e., product features and attributes and the associated feelings that unfold in the process of actual consumer product interactions, which is particularly crucial for experiential products, EWOMS also has great potential to help consumers develop in-depth
understanding of products and services, formulate consideration sets, and eventually make consumption decisions. However, theoretical research has yet to develop insight into consumers’ usage of EWOMS information.

Viewing consumers’ usage of EWOMS information as an informant-mediated indirect product experience process, this study examines how the characteristics of both EWOM information and informant and the EWOMS artifacts affect consumers’ acceptance of EWOMS recommendations. Moreover, we investigate how the heterogeneity in consumer information processing motivation would add variation to the suggested propositions.

**Theoretical Development**

As depicted in Figure 1, the EWOMS represent an informant mediated persuasive environment that comprises of many communication elements. These elements receive varying levels of cognitive processing from the consumer and consequently contribute differently to the consumer’s attitude toward the product. Specifically, in a typical EWOMS such as ePinions.com and Amazon.com, the communication elements include (1) the EWOM product experience information in the form of product review and evaluation, (2) the EWOM informant, i.e., the review and evaluation provider, (3) the system indicator reflecting the information usefulness based on information users’ evaluations, and (4) the system indicator reflecting informants’ status and expertise. These communication elements fall into two categories. One category, including EWOM information and informant, is essential and integral to the communicated product information. The other category of elements, involving system artifacts such as information usefulness indicators and information provider status indicators, is peripheral to the communicated experience information in the sense that the communication is still complete when these elements are absent. Figure 2 presents an example of some EWOMS communication elements. Our research model (Figure 3) examines the influences of the above communication elements by drawing on the accessibility-diagnosticity theory (Herr et al.. 1991) and the elaboration likelihood model (Petty and Cacioppo 1986).

**EWOM Information Characteristics and Recommendation Acceptance**

**Effects of Information Diagnosticity**

Prior to making consumption choices, consumers often need to collect certain amounts of information to develop product knowledge and form product attitude. However, product information acquired from various sources has differential effects on consumer decision making. The accessibility-diagnosticity model, which describes how product information contributes to consumers’ consumption decisions, identifies the important role of information diagnosticity (Herr et al. 1991).

![Figure 1. Informant-Mediated Indirect Product Experience Process](image-url)
Information diagnosticity, defined as the perceived ability of communicated product information to predict actual product performance, together with information content, constitutes the major aspect of experience information collected through various consumer-product interactions. Diagnosticity effect occurs when the consumer feels that the received product information allows for a better judgment of the product and uses the information as an input for product attitude formation (Kempf and Smith 1998). Conversely, product information with low diagnosticity has limited ability to shape attitude. Empirically, Kempf and Smith (1998), Jiang and Benbasat (2005) and Suh and Lee (2005) explicate the effect of perceived diagnosticity on product learning and consumption decision in product trial process and virtual shopping environments.
EWOMS, bridging the interaction gap between potential consumers and products and services that cannot be virtually presented in electronic settings due to constraints in product characteristics and vendor computing capabilities, allows informants to transfer their product experience information to other consumers. Although unable to interact with products directly or virtually, information seekers still can develop an understanding of product features and performance as well as perceive the feelings the product evokes through reading EWOMS product information. The product experience information from EWOMS not only delivers a detailed description (the content) of consumer-product interactions, but it also possesses diagnosticity property. The perceived ability of the EWOM information to help evaluate the product of interest is expected to determine if the consumer would use the recommendation to make decision. Extending the findings in direct and virtual product interactions, we conjecture a similar effect of information diagnosticity in the EWOM context.

H1: The perceived information diagnosticity of the product information from EWOMS will have a positive effect on the acceptance of the EWOMS recommendation.

The Antecedent of EWOM Information Diagnosticity – Need-Information Congruence

Consumptive behavior is guided by the desire to satisfy personal needs (Stanton and Lowenhar 1974). Prior to considering a product and searching for relevant information, the consumer tends to have a cognitive structure arising from her consumptive needs. When evaluating a product, the consumer relates the product information to personal needs cognitively. The performance of a product in the areas that pertain to the consumer’s needs constitutes an important focus of attention when the consumer processes the product experience information. If the product information regarding the needs is available, the consumer would be able to evaluate the product as to...
whether it satisfies her needs. Thus the product information is diagnostic and poses low ambiguity. Contrarily, information diagnosticity is low if the information does not contain any elaborations on the product’s attributes that concern the consumer.

Consumers’ needs are heterogeneous, and there is possibly a mismatch in product needs between the informant and the information seeker. What a product concerns the information seeker most may not be among the important product features from the information provider’s perspective and thus may not be included in the product experience description submitted to the EWOMS. As diagnosticity assessment is task specific (Gershoff et al. 2001), the product information that is unable to facilitate the consumer in gaining the needed knowledge would be deemed to have low diagnosticity.

We expect that when the EWOMS recommendation contains product information that is congruent with the information seeker’s informational needs, the seeker will perceive the information to be diagnostic and will be willing to take the recommendation. Conversely, the incongruence between the seeker’s need and the EWOMS product information may result in low diagnosticity assessment and low recommendation acceptance.

**H2:** EWOM information that is congruent with the consumer’s informational needs will lead to (a) high information diagnosticity, and (b) high acceptance of EWOMS recommendation.

**EWOM Informant Characteristics and Recommendation Acceptance**

**Effects of Informant Credibility**

Research on commercial communications that involve communicators consistently reveals that the communicator’s characteristics have tremendous effects on the recipient’s information assimilation (Gershoff et al. 2003, O’Keefe 2002, West and Broniarczyk 1998). Communicator credibility has been a major construct among many informant characteristics, and two broad dimensions have commonly emerged. One is the expertise dimension, which reflects the extent to which the communicator is in a position to know the truth. An expert informant is expected to have needed knowledge background that enables her to develop an accurate product evaluation formula, give a thorough examination on the product, and provide objective illustration of the product and useful recommendation. The other is the trustworthiness dimension, which assesses whether the communicator will likely be inclined to tell the truth as she sees it (O’Keefe 2002). A trustworthy informant is expected to have no intention to mislead the information recipient and therefore tell the truth of a product. When both expertise and trustworthiness are present, the informant will be perceived to be credible and her opinion will be highly relied upon. Substantial empirical studies have provided evidence to support the contribution of expertise and trustworthiness to a communicator’s credibility, which in turn determines if the information recipient gives due consideration to the information provided by the communicator (e.g. Andrews and Shimp 1990).

Given the importance of informant credibility, we contend the information seeker using EWOMS will attempt to form a credibility evaluation of an information provider from various sources and cues. When she feels the informant is credible, she will devote significant cognitive resources to process the informant’s product review and in the meantime generate virtually no skepticism. Thus, the information from a credible informant is expected to shape the information seeker’s attitude toward the product profoundly.

**H3:** The perceived informant credibility will have a positive effect on the acceptance of the EWOMS recommendation.

**The Antecedent of EWOM Informant Credibility – Concentration of Information Provision History**

Generally everyone can provide information to EWOMS after registration. This openness gives rise to concerns about the accuracy and validity of information in EWOMS. First, EWOM informants have differential level of expertise and knowledge bias, which may then affect their EWOM recommendation quality. (Eagly et al. 1978). Writing product descriptions for EWOMS will activate the informant’s knowledge structure. Experienced consumers tend to have a well-established product knowledge structure that comprehensively covers the important features and attributes that may be of interest to a typical consumer (Murphy and Wright 1984). Product descriptions from these experienced informants hence would have less neglect of product features and attributes than those from novice consumers who lack a grasp of the essential attribute structure of the product. The information seeker thus needs to identify the informant’s expertise before embracing the recommendation. Second, the absence of informant identity verification and the powerfulness of EWOM information in guiding consumption may entice merchants and vendors to manipulate the system to mislead consumers (Dellarocas 2004, Miller, Resnick, and Zeckhauser 2005). Therefore, it is crucial to ensure that the information in the EWOMS is from a trustworthy informant.
All the above concerns highlight that the information seeker needs to analyze the informant’s credibility before accepting recommendations from EWOMS. While weak social ties in EWOMS constrain the direct accessibility of an informant’s background, the ability of EWOMS databases to identify and accumulate an informant’s information contribution history would assist the information seekers in gauging the informant’s expertise and trustworthiness.

Specifically, the concentration of product information from an informant on a particular product category would indicate she could be quite experienced and have an in-depth understanding of the product category, and knowledge bias is thus low. Meanwhile, an informant’s descriptions of different products of the same category could demonstrate that she has no strong intention to promote a particular product, indicating low reporting bias.

\[ H_4: \text{High concentration of an informant’s information contribution history on the focal product category will lead to (a) high informant credibility and (b) high acceptance of EWOMS recommendation.} \]

**EWOMS Decision Aid Indicators and Recommendation Acceptance**

In practice, EWOMS often deploy additional communication components to assist information seekers. One notable set of components involves various indicators pertinent to recommendations and informants. We focus on two types of decision aid indicators, namely information helpfulness and informant status, and conjecture that they also exert some direct influences on diagnosticity and credibility judgment and recommendation acceptance.

The helpfulness indicator presented along with the EWOMS recommendation represents an endorsement. The indicator may trigger a heuristic rule that “as the product information is useful to other information seekers, it must be useful to me.” Indeed, the heuristic rule is confirmed by the social influence theory (Asch 1966, Cialdini 1993) that predicts that people have the tendency to align their thoughts and behaviors with similar others. Therefore the information seeker will use a shortcut to form a judgment of the information diagnosticity and decide whether to accept the recommendation.

\[ H_5: \text{The information helpfulness indicator in EWOMS will increase (a) the perceived information diagnosticity and (b) the acceptance of the recommendation.} \]

Status indicators such as product advisor officially certify an informant’s knowledge and achievements. Similarly, they activate the information seeker’s heuristic rule that “since the informant is an advisor, she must be experienced and knowledgeable” and lead to a high credibility perception and recommendation acceptance.

\[ H_6: \text{The informant status indicator in EWOMS will increase (a) the perceived informant credibility and (b) the acceptance of the recommendation.} \]

**The Moderating Effects of Processing Motivation**

Consumers are expected to optimize their decisions with EWOMS recommendations on the basis of the characteristics of core communication elements such as the product information and the informant. Such a process demands tremendous cognitive elaborations. For example, judging information diagnosticity involves such cognitive activities as activating personal consumption needs, processing the product experience description to understand the product performance, and relating the description to personal needs to ensure attention congruity. Assessing informant credibility involves cognitive operations such as recognizing the potential knowledge and reporting biases in EWOMS information and paying attention to and deriving implications from the informant’s information provision history. However, in reality, consumer cognitive resources are not always guaranteed. Limited cognitive resources will result in variations in the effects of various EWOMS communication elements. We employ the elaboration likelihood model (ELM) to examine the variation patterns.

ELM (Petty and Cacioppo 1986) identifies two distinct routes toward attitude formation and change. One is the central route, along which the individual forms and changes her attitude on the basis of cognitive elaboration on the communicated information. Individuals who take the central route scrutinize all available information, generate thoughts about the information, and integrate the thoughts into their pre-existing attitude structures. The other is the peripheral route, along which individuals engage in less thoughtful processing of the information and attitudinal changes are triggered by some cues associated with the information.

In EWOMS, the consumer follows a central route when she carefully scrutinizes the EWOMS message and forms her own product attitude based on the merit and quality of the message. A similar central route is taken when the consumer processes the informant’s characteristics for credibility judgment. A peripheral route will be followed when the consumer develops product attitude by simply attending to the system cues.
The individual’s information processing motivation is suggested to determine which route is taken (Petty and Cacioppo 1986). The central route occurs when motivation to scrutinize issue-relevant information is relatively high. Consequently, attitudinal changes are affected primarily by the strength of the persuasive message. When the individual lacks motivation to assess the true merits of the persuasive message, the ELM assumes a high probability of following the peripheral route and predicts an attenuated effect of the strength of the persuasive message.

Based on ELM, we expect the congruence between the information seeker’s needs and the informant’s description to operate differently when processing motivation varies. The information seeker with high motivation responds to EWOMS recommendations according to the true merit of the information. She is more likely to realize that the product experience information from the EWOMS cannot address her information needs pertaining to the product and to purposefully reject the recommendation when there is need-information incongruence than is the information seeker with low motivation, who may not identify the incongruence and factor that in information and product evaluation. Therefore, EWOMS recommendations containing information that is incongruent with the information seeker’s need will receive lower acceptance from high motivated individuals than from low motivated individuals, resulting in the effect of need-information congruence on diagnosticity and recommendation acceptance more polarized under the high processing motivation condition.

H7: The effect of need-information congruence on the perceived information diagnosticity is stronger under the high processing motivation condition than under the low processing motivation condition.

Likewise, processing motivation is expected to moderate the effect of information provision history on informant credibility judgment and recommendation acceptance. Information seekers under high motivation conditions are more inclined to optimize their consumption decisions and to reduce the risks that may result in negative consumption experience. Studies indicate that individuals who are more risk averse conduct a more thorough analysis of the available information prior to decision making (Grewal et al. 1994). Highly motivated information seekers will therefore engage in high-effort scrutiny of the informant’s characteristics. The informant’s information provision history that is not concentrated on the focal product category but instead on an irrelevant category would lead the information seeker to be uncertain about the informant’s expertise. The concentration of the information provision history on the focal product category, on the other hand, enables the information seeker to infer that the informant could be experienced and promotes recommendation adoption. Therefore, the variation in past information provision concentration will result in sharp differences in the perceived informant’s credibility and EWOMS recommendation acceptance.

Under low motivation conditions, information seekers engage in low-effort scrutiny. Relatively limited cognitive resources are expended to gauge the informant’s credibility from her information provision history. The unresponsiveness to the suggestive information provision history makes its effects on the informant’s credibility and product recommendation attenuated.

H8: The effect of the concentration of information provision history on the perceived informant credibility will be stronger under the high processing motivation condition than under the low processing motivation condition.

As motivation decreases, peripheral cues presumably become progressively more important determinants of persuasive effects (O’Keefe 2002). When using EWOMS, an information seeker with low processing motivation will be less likely to attend to the information that demands cognitive resources. Instead, peripheral signaling cues such as various information and informant indicators will be relied upon because they help save the information seeker’s cognitive resources. Hence, variations in these signaling cues will have more influences on judgment regarding the information diagnosticity and informant credibility.

H9: The effect of helpfulness indicators on the perceived information diagnosticity is weaker under the high processing motivation condition than under the low processing motivation condition.

H10: The effect of status indicators on the perceived informant credibility is weaker under the high processing motivation condition than under the low processing motivation condition.

Research Methodology

Design

A 2 (need-information congruence) by 2 (concentration of information provision history) by 2 (helpfulness indicator) by 2 (status indicator) by 2 (processing motivation) full factorial experiment is designed. The product used
for empirical testing should satisfy the following three criteria. First, the product category should be relatively familiar to the subjects so that we can better capture how judgments are formed in a naturally occurring environment. Second, we would like to have a product for which consumers often turn to others for information and advice. Third, to ensure realism, we need a product whose information is often obtained through an online channel.

We chose hotels as the study product. The study scenarios are presented as the subject is to travel to another country with a friend and they decide to search a hotel through a hotel booking Web site that has built-in EWOMS. The subject is told of two specific needs they particularly would like the hotel to meet. They are then presented with a hotel recommendation from a reviewer. The recommendation is adapted from real online hotel reviews and describes the performance of the hotel in fives aspects such as location, service, cleanliness, etc.

In the experiment, the subjects are told the study purpose is to explore how a consumer uses the Internet for hotel booking, and the specific investigation focus is not mentioned to minimize the demand effect and increase study validity. After completing a pre-experiment booklet capturing demographic information, subjects are directed to the experimental Web pages that incorporate the various experimental manipulations. After their self-paced exploration of the Web pages, the subjects are required to report their acceptance decision regarding the recommendation and the assessment of the recommendation information and the informant. Care is taken to measure the acceptance decision prior to information and informant assessment so as to minimize the possibility of a demand-induced relationship.

In the need-information congruence condition, among the five aspects of hotel performance the recommendation information contains, two address the areas that are important to the subject and the other three are filler. Under the incongruence condition, none of the five aspects is important to the experimental subject.

In the high concentration of information provision history condition, the system presents that all reviews from the informant are on hotels in the city the subjects will be visiting with his/her friend. In the low concentration condition, the informant’s reviews are all on an irrelevant product category except for one on hotels.

Both the information helpfulness indicator cue and the informant status indicator cue have two manipulation states: presence and absence. The helpfulness indicator, suggesting that the product description is very helpful, is displayed before the product description for presence manipulation. There is no helpfulness indicator in the absence condition. The status of the advisor is displayed next to the informant’s ID for the presence manipulation, but is removed for the absence manipulation.

The processing motivation is manipulated to be either high or low. Petty and Cacioppo (1986) have indicated that increased personal decision responsibility will promote processing motivation. High responsibility dictates that the decision maker must ensure her decision quality, which is achieved by making good use of the information available, and hence guarantees the cognitive resources necessary for central route. If the decision responsibility can be shared with others, social loafing may occur and the individual will be less motivated. We apply this proposition in the manipulation. The subject is told that she assumes the task of finding a hotel for the trip and needs to explain to her friend about her choice in the high motivation scenario. We expect subjects in this scenario to read the EWOMS description carefully and to make the acceptance decision on the characteristics of the information and the informant. In the low motivation scenario, the subject is told that her friend and she are both doing an initial search and she will provide her hotel choice to her friend, who is the one to make final decision. We expect subjects in this condition to make quick decisions. To save cognitive resources, they would make more use of the signaling cues and avoid elaborating on the details of the recommendation information and the informant information provision history.

**Dependent Variables**

The information diagnosticity reflects how well the product experience information from EWOMS conveys the product attribute and features from the information seeker’s perspective. It is measured with a scale adapted from the widely used Kempf and Smith’s diagnosticity scale (1998). The informant credibility reflects the consumer’s perception of the informant’s ability to convey the product attribute and features and is measured with the scale from Andrew and Shimp (1990). The acceptance of recommendation describes the information seeker’s willingness and intention to rely on the EWOMS recommendation and is measured with the scale adapted from Gershoff, Mukherjee, and Mukhopadhyay (2003).

To allow for further analysis, we design the experimental Web pages in such a way that each subject’s clickstream data are captured. The data can be used as additional evidence to confirm the processing route, central or peripheral, that the subject has taken.
The subject’s attitude toward the EWOMS will also be measured and used for analysis of its relationship with information diagnosticity, informant credibility and acceptance of recommendation, though formal discussion and hypotheses are not given here.

**Discussions**

The paper presents an on-going study that explores the consumer’s decision making process in EWOMS recommendation context. The research model, built on the accessibility-diagnosticity model and the elaboration likelihood model, describes the roles of multiple EWOMS communication elements under consumers’ different levels of processing motivation.

The study is expected to make substantial theoretical contributions in the following respects. First, it fills the knowledge gap regarding the consumer’s processing of EWOM information and recommendation, as most current studies on EWOM focus on their effects on sales and trust, and the understanding of the consumer’s usage of EWOM has been scant.

Second, it could enhance the WOM literature by contributing new insights about EWOM. EWOM is a special form of WOM, and EWOMS possesses features and mechanisms that are unavailable in WOM contexts. The understanding of how the features and mechanisms that are unique to EWOMS operate is important for updating our general knowledge about WOM.

Third, drawing on the ELM, the study demonstrates the influence of the information seeker’s motivation on EWOMS recommendation acceptance. Although it has been evident that the individual’s information processing ability has tremendous impacts on her attitude and behavior in a given communication context, studies examining computer-mediated communications have generally failed to take processing ability into consideration. While a very recent study by Tam and Ho (2005) investigates the operation of an individual’s need for cognition in the individual’s processing of personalization information, the present study will draw researchers’ attention to another equally important factor, processing motivation. We anticipate future information system studies to include processing motivation as a moderator to generate more accurate explanations of the studied phenomena.

Fourth, the study could provide theoretical justification and empirical support for the various decision support artifacts. In particular, the findings would provide implications to practitioners operating different recommendation agent systems. Recommendation agents, both human and electronic, have been widely adopted in electronic commerce (Jiang and Benbasat 2005, Wang and Benbasat 2005). While it has been advocated that effective product information presentation is important to enhance consumers’ product learning and promote recommendation acceptance, our study highlights that recommendation agent systems also need to communicate the agent’s characteristics adequately. Extending the propositions provided by the study, recommendation agent systems could reveal the agent’s characteristics such as her expertise domain, the number of recommendations made in different product categories, and rate of successful recommendation to help the consumer decide whether to accept the recommendation.

The study could also demonstrate that by using some peripheral cues, computer systems, including EWOMS, recommendation agent systems, and general electronic commerce systems, are able to shape consumers’ attitudes and decisions in a manipulative way. This finding thus would suggest general education for consumers to caution them against mindlessness when interacting with computer systems.

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