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Seong-No Yoon

University of Nebraska - Lincoln

Zoonky Lee

Yonsei University

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The Impact of the Web-Based Product Recommendation System from Previous Buyers on Consumers' Purchasing Behavior

Seong-No Yoon

University of Nebraska - Lincoln
Syoon81@unlserve.unl.edu

Zoonky Lee

Yonsei University
Graduate School of Information
zlee@yonsei.ac.kr

ABSTRACT

This research addresses issues of the messages posted by unknown or anonymous previous customers in P2P (person to person) web-based recommendation systems, and investigates how the potential customers are influenced by the messages. Drawing on the Elaboration Likelihood Model, persuasion theory and previous reference influence theories, we examine how the product category, display format and other peripheral information affect the behaviors of the potential customers. Upon completion of this study, we expect to provide further understanding on social influence process in the cyberspace.

Keywords

P2P web-based recommendation systems, reference influence, elaboration likelihood method, social influence

INTRODUCTION

We first view the Internet as a cyberspace environment where different people get together, exchange ideas and influence each other. In this space, the identity and the credibility of others are only guessed, and the social involvement of communication is very limited. Theories in social influence and persuasion predict that without monitoring social pressure and information about sources, the primary type of influence is only through information itself. In other words, people judge only based on their perceived validity of the information. These perceptions, however, are usually a result of various cues and affection. Today's advanced information technologies not only provide a space to collect unprecedented amounts of information from various unknown people, but such technologies also provide new ways of displaying information. In this study we will investigate how the Internet as a source of person-to-person information began to emerge, and how the new displaying and organizing information mechanisms provide various affective cues. Our discussion revolves around one of the most popular information exchange places in the Internet - person-to-person (P2P) web-based recommendation systems.

P2P Web-based Recommendation Systems

P2P web-based recommendation systems are review or evaluation systems for certain products, buyers, sellers or services offered on the Internet, in which individuals who have previously used the products or services (hereafter, previous buyers), provide their opinions, such as their experiences with the products, assessments of quality of the products or services, evaluations or recommendations¹. Usually Internet merchants collect, organize and disseminate information as part of their commerce (e.g., Amazon.com), trust building mechanism (e.g., feedback on sellers in eBay.com) and sometimes as their business models (e.g., cnet.com, bizrate.com). Online feedback systems on sellers and buyers in electronic markets as trust building technology, not only lead to price premiums, but affect also in shaping buyer's trust in seller's credibility depending on the positive or negative ratings the seller has (Ba and Pavlou 2002). Negative ratings and the number of them in the same negative rate (e.g., two negative ratings out of total 100 ratings and one negative one out of total 50 ratings) have greater impacts on shaping buyers' trust than positive ones and the number of negative ratings (Ba and Pavlou 2002; Lee et al. 2000).

P2P web-based recommendation systems are very similar to word-of-mouth (WOM) in the physical world in that both provide person-to-person recommendations. People seek information from various others to reduce uncertainty in decision-making. However, there are also notable differences between the two. First, there is a difference in the identity of

¹ There are many expert-based recommendation systems in the Internet, but they are excluded in our discussion.

information sources. For information sources in the physical world, people can see and judge validity of sources in terms of expertise, credibility and closeness to information recipient. On the other hand, information sources on the Internet are usually not well known. The second difference comes from the amount of information available. For popular products in web-based recommendations, there may be several hundred reviews for one produce, while the availability of review type information in the real world is limited and only centered on the social boundaries of individuals. Finally, unlike the physical world, the large amount of information necessitates new ways of formatting, structuring and displaying information to recipients. We assume those differences will produce different effects on consumer purchase decision-making behaviors.

CONCEPTUAL FRAMEWORK

Types of Information That Impacts on Evaluation of Recommendation

Do people pay more attention to specific types of information? Studies in WOM have found that people are more concerned with negative information (Lutz 1975). When individuals receive negative information for a product, customers completely rejected the product, ignored inconsistent information, or depreciated the product value (Jaccard and Wood 1988; Ross Jr. and Creyer 1992). In addition, customers feel that a negative message has detrimental effects on uncertain products (Webster and Sundaram 1998).

The prospect theory describes loss as being represented as a convex curve and gain as a concave curve: For the same amount of stimuli, people respond more to loss than gain (Kahneman and Tversky 1979). So we can infer that for the same average rating, a smaller number of negative customer ratings are preferred to a larger number of ratings. This leads to the following hypothesis:

H1: Consumers will evaluate an alternative with a smaller number of negative ratings more favorably than an alternative with a larger number of negative ratings when the ratio of negative ratings to the total ratings is the same.

Sources of peripheral routes in the P2P based recommendation systems

The Elaboration Likelihood Model (ELM) by (Petty and Cacioppo 1986) clarified the difference between content and other related to cues in determining the credibility of messages. The ELM argued that persuasion in a communication can be achieved via one of two routes: a central route and a peripheral route. The central route is closely related to delivering strong, valid messages, so it is related to content of information and its deliberate elaboration of cognitively convincing arguments around information content. In the absence of a central route, the peripheral route is used. It is based on social and affective cues rather than on the basis of message context. The examples of peripheral routes are the social relationship to the source and the social context.

What a source identity is to the real world, an e-mail address is to the Internet (Douglas and McGarty 2001). E-mail addresses, however, do not mean exposure of a communicator's real identity such as his/her name because users can have multiple e-mail addresses and use nicknames instead of their real names. However, e-mail addresses can induce information receivers to make inferences regarding characteristics of the information source. First, e-mail addresses themselves can be used as identification in cyberspace (Douglas and McGarty 2001). Second, through the domain names or suffixes of e-mail addresses users can make guesses regarding the information source's organization or his/her social status. Third, e-mail addresses provide a venue to allow contact of the information providers at any time. Therefore, we hypothesize that people will develop more trustworthy on recommendations when they are exposed to source e-mail addresses.

H2: When a reviewer's e-mail address is given with his/her recommendation, consumer's credibility about his/her recommendation will increase.

Social psychology literature on persuasion finds that subjective confidence in one's views is influenced by the degree of similar others' agreement with those views. The theory of referent informational influence supports this idea. It posits that, "for all judgments, regardless of their manifestation in physical reality, the subjective validity of one's views is a function of the extent to which similar others agree with those views. (Fleming and Petty 2000)" On the basis of this theory, we can infer that since information seekers have a common characteristic of expectation of reducing uncertainty related to decision-making, if some of them agree with one's reviews or recommendations, then people will gain subjective validity that those reviews will be correct, and in turn, credibility will be increased.

H3: When others' evaluations about previous consumers' reviews are added, consumer's credibility about the previous consumers' reviews will increase.

Design issues for Web-Based Recommendation Systems on product categories

We believe that the product categories of search/experience will play an important role in Internet recommendations, since the category is related to information richness. Experience products are products whose quality can be assessed only after use, while search products are products whose quality can be assessed before use (Nelson 1970). Previous studies have reported problems of selling experience products such as clothes and shoes on the web, since often the description of products was not enough, and potential buyers valued “touch and feel” which cannot be explicitly displayed. For experience products people tend to rely on others’ opinions more because others’ opinions provide indirect experience that cannot be perceived by tangible attributes (West and Broniarczyk 1998).

Since search products are evaluated for each attribute, individuals will give more credit to evaluations based on attributes. On the other hand, individuals will value the experiences of previous consumers for experience products. Various P2P web-based recommendation systems currently maintain different methods for posting reviews. *Amazon.com*, for example, uses a style of combinations of overall ratings and comments in a limited space. And, *cnet.com* takes the format: combinations of ratings for predefined attributes and comments. However, the differences in formats are not for different product categories but for different websites, and we expect that by providing different format for different product categories, consumers’ credibility will increase.

H4: Consumer’s credibility about previous consumers’ reviews will increase for attribute-based information for search products, and experience-based information for experience products.

RESEARCH METHOD

A lab experiment using computer programs will be conducted to test the hypotheses with student subjects. Since the degree of the subjects’ perceptions on the informational influence of others can depend on their preference levels for the information (West and Broniarczyk 1998), the subjects’ preference levels for the product will be measured prior to treatment application. To measure the subjects’ preference level, a web-based conjoint analysis, a marketing technique in which customers evaluate alternatives from a list of systematically displayed products by indicating their preference for each alternative (Best 2000), was conducted.

CD-writers with four attributes and new brand of golf clubs will be used for searchable and experience products, respectively. First subjects will be presented with 9 product cards, and choose their preference of products based on values in attributes. Second, based on the conjoint analysis, their preference in terms of weighted scores for each attribute is calculated. Then, a virtual P2P website of a web-based recommendation system will be presented to the subjects to display other customer reviews for an imaginary product. Overall product rating and text format reviews for the experiment product will be given as negative, neutral, or positive, based on each subject’s preference level. We will generate two imaginary products with higher preference levels than the subject’s, but with different numbers of negative rating under the same ratio (H1). The subjects then will be asked to select a favorable alternative. For H2 and H3 we do not provide overall rating information for the product in order to control the effect of it on each text-format review. The e-mail addresses of previous buyers and others’ ratings will be added to some of their reviews on the imaginary product. Then the subjects will be asked to evaluate the overall message credibility of the previous buyers’ reviews. For H4, two different screen formats (one with attribute-based information and one with experience-based information) per each product category (search and experience) will be designed to measure the degree of satisfaction on the reviews provided.

Current Status

To empirically test the hypotheses, we developed a web-based system (See Figure 1) program using Active Server Pages (ASP 3.0) and Oracle (Ver. 8.1.2), and designed a virtual online shop with a web-based recommendation system similar to those found at *amazon.com* or *cnet.com*. We have finished the pilot test. Figure 1 shows the initial screen for the conjoint analysis, and Figure 2 shows the result of the conjoint analysis showing the ranks and scores of different products for a subject.

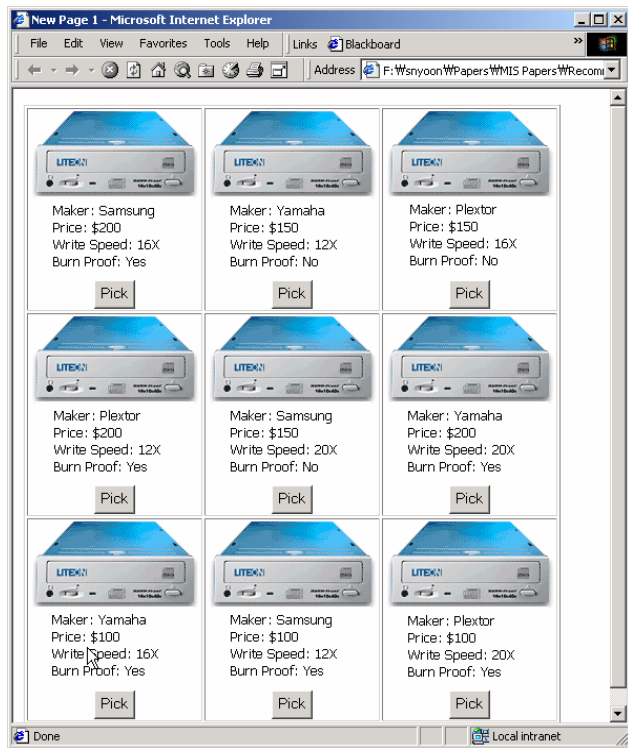


Figure 1. Initial Screen for the Conjoint Analysis

STUD_ID	ATTRIBUTE_NAME	LEVEL_NAME	PART_WORTH
1	maker	samsung	.71
1	maker	yamaha	.79
1	maker	plextor	.43
1	price	100	0
1	price	150	1
1	price	200	.93
1	write speed	12	.57
1	write speed	16	.93
1	write speed	20	.43
1	burn proof	Y	.46
1	burn proof	N	1

STUD_ID	ATTRIBUTE_NAME	RATE	PERCENT
1	maker	.36	15
1	price	1	41.67
1	write speed	.5	20.83
1	burn proof	.54	22.5

STUD_ID	PROD_ID	GRADE
1	1	27.27
1	2	26.88
1	3	23.52
1	4	9.56
1	5	15.7
1	6	15.66
1	7	6.54
1	8	3.48
1	9	1.32

Figure 2. the Output of Conjoint Analysis

EXPECTED RESULTS AND IMPLICATIONS

By conference time, we expect to present the complete results of the study. The experiments will be conducted during September and October with around 150 to 200 student subjects. We expect this study to generate important theoretical and practical implications. Theoretically, this study will provide a better understanding on social influence in the cyberspace. For practical implications, the results of the study can help to provide a better design guideline for P2P web-based recommendation systems.

REFERENCES

1. Ba, Sulin and Pavlou, Paul A. (2002) Evidence of the effect of trust building technology in electronic markets: price premiums and buyer behavior, *MIS Quarterly*, 26, 3 243-268.
2. Best, J. Roger (2000) *Market-based Management*, 2nd Ed., Prentice-Hall, Upper Saddle River, NJ, 97-103
3. Carroll, J. D. and Green, P. E. (1995) Psychometric methods in marketing research: Part I, conjoint analysis, *Journal of Marketing Research*, 32, 4, 385-391.
4. Douglas, K. M. and McGarty, C. (2001) Indentifiability and self-presentation: Computer-mediated communication and intergroup interaction, *British Journal of Social Psychology*, 40, 399-416.
5. Fleming, M. A. and Petty, R. E. (2000) Identity and Persuasion: An Elaboration Likelihood Approach. Attitudes, Behavior, and Social Context: the Role of Norms and Group Membership. D. J. Terry and M. A. Hogg. Mahwah, Lawrence Erlbaum Associates, New Jersey, 171-199.
6. Shneiderman, B. (1998) *Designing the User Interface - Strategies for Effective Human-Computer Interaction*, Addison-Wesley.
7. Jaccard, J. and Wood, G. (1998) The Effects of Incomplete Information on the Formation of Attitudes toward Behavioral Alternatives, *Journal of Personality and Social Psychology*, 54, 580-591.

8. Kahneman, D. and Tversky, A. (1979) Prospect Theory: An Analysis of Decisions Under Risk, *Econometrica*, 47, 262-291.
9. Lee, Z., Im, I., and Lee, S.J. (2000) The Effect of Negative Buyer Feedback on Prices in Internet Auction Markets, in proceedings of twenty-first International Conference on Information Systems, Brisbane, Australia, 286-287.
10. Lutz, R. J. (1975) Changing brand attitudes through modification of cognitive structure, *Journal of Consumer Research*, 1, 49-59.
11. Nelson, P. (1970) Information and Customer Behavior, *Journal of Political Economy*, 72, 311-329.
12. Petty, R. E. and Cacioppo, J. T. (1986) Elaboration Likelihood Model, Academic press, San Diego, CA
13. Ross Jr., W. T. and Creyer, E. H. (1992) Making inferences about missing information: The effects of existing information, *Journal of Consumer Research*, 19, 1, 14-25.
14. Webster, C. and Sundaram, D. S. (1998) Service consumption criticality in failure recovery, *Journal of Business Research*, 41, 2, 153-159.
15. West, P. M. and Broniarczyk, S. M. (1998) Integrating multiple opinions: The role of aspiration level on consumer response to critic consensus, *Journal of Consumer Research*, 25, 1, 38-50.