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The Influence of Information Overload on the Development of Trust and Purchase Intention Based on Online Product Reviews in a Mobile vs. Web Environment: A Research Proposal

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Abstract: Information overload has been studied extensively by decision science researchers, particularly in the context of task-based optimization decisions. Media selection research has similarly investigated the extent to which task characteristics influence media choice and use. This paper outlines a proposed study, which would compare the effectiveness of web-based online product review systems in facilitation trust and purchase intention to those of mobile product review systems. We propose that since web-based systems are more effective in fostering focus and are less prone to navigation frustration, information overload is less likely influence the extent to which a consumer trusts an online product review.

Keywords: Mobile Reviews, Mobile Commerce, Word of Mouth, Information Overload

1. INTRODUCTION

According to both Dellarocas et al.[1], Lee et al.[2] and a number of other e-commerce studies, online consumer reviews serve as one of the most influential information sources for consumers considering making an online purchase. Consumers view online consumer reviews as more trustworthy than information provided by the retailer, as it is more likely to be objective, less one-dimensional and more likely to evaluate the failure of the product to meet expectations in a wide range of usage circumstances[3]. Consequentially, a substantial degree of research into the characteristics of online reviews that influence purchase intention has been conducted[4, 5]. Interestingly, researchers have found that while consumers trust the information contained online reviews more than that provided by the seller of the product or service, that trust is not absolute. As Kugler[6] suggests, open online review systems facilitate review manipulation by individuals who are not simply consumers of the products or services that are being reviewed. The reviewer might be the product's manufacturer, a retailer or even a competitor, and may paint the product or service in a positive or negative light in order to encourage or discourage consumers.

Given the prevalence of 'fake' reviews in online review systems[7], trust can be viewed as a proxy for the consumer's assessment of the veracity of the review[8]. Since online consumers rely on online product reviews to make purchase decisions and because trust is central to their assessment of those reviews, understanding how trust in reviewers is paramount to electronic Word-Of-Mouth (eWOM) researchers[4, 9]. The development of trust in reviewers has been positively associated with purchase intention in a number of studies[e.g. 4, 10]. We propose a study which 1) investigates in influence of a previously unstudied review characteristic, information overload; and 2) compares the effect of information overload across web-based and mobile product review systems.

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Information overload has long been described by researchers as a phenomena in which a decision maker becomes overwhelmed by the information which they are attempting to process in order to make a decision[11]. Information overload has been tied to a number of negative decision outcomes, including lower decision quality, less confidence in the decision and longer time needed to make the decision[12]. Generally speaking, when a decision maker has very little information available, decision outcomes tend to be quite poor, when they have an appropriate degree of information available, decision outcomes improve, but as information becomes excessive, decision outcomes tend to drop again, yielding an inverted U shape relationship between information quality and decision outcomes[13, 14]. Information overload has been used extensively by marketing researchers investigating the influence of excessive information on consumer purchase decisions[15], consistent with our research objectives.

In this proposed study, we extend the literature on the influence of review characteristics on trust development and purchase intention by examining the effect of information overload. Further, we extend the extensive literature related to information overload by comparing the effects of information overload between two different media – web-based online product review systems and mobile-based online product review systems. Our research questions are as follows:

RQ1: To what extent does Information Overload influence trust formation and purchase intention in online product review systems?

RQ2: Does the influence of Information Overload on trust formation and purchase intention in online product review systems differ in a mobile product review system?

To answer our research questions, we outline a proposed study in which scenario-based experiments are used to test the relationships between format (web-based vs. mobile), review length and information content, trust and purchase intention. In the following section, relevant literature related to information overload, online word of mouth and mobile vs web computing are reviewed. Next, hypotheses are developed and the proposed model is outlined. The proposed research methodology is then presented. Summarizing remarks including a discussion of potential contributions and limitations conclude the paper.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Malhorta[15] reviews research related to online consumer behavior, and models how consumers must decide among multiple competing products. While consumers generally have a good understanding of their needs, they must contend with uncertainty related to how effective any give product will be in meeting their needs. From this perspective, product selection in an electronic commerce setting becomes an optimization task in the face of substantial uncertainty.

Uncertainty reduction theory[16] contends that individuals engage in either passive (observation) or active (information seeking) strategies to reduce uncertainty. Online review systems facilitate passive uncertainty reduction, as potential consumers may ‘observe’ the effectiveness of a product meeting another consumer (the reviewer)’s needs without actually contacting and inquiring of the consumer. Indeed, online product reviews have been heralded as the most influential information source for online consumers[2, 5]. While these reviews may assist in uncertainty reduction, a few new phenomena emerge. First, the needs of the reviewer may not be consistent with the needs of the potential consumer, and assessing the needs of the reviewer may be difficult for the consumer, as feedback channels may be absent. Indeed, the objectives of the reviewer may be substantially divergent from those of the potential consumer when the reviewer has a stake in the success or failure of a given product or service. Online review systems facilitate unscrupulous manufacturers, retailers even competitors posing as consumers, and providing potential consumers with false information about the ability of a product to satisfy a consumer’s potential needs[7].

e-Commerce researchers widely refer to the study of online product reviews as Electronic Word-of-Mouth (eWOM). Before e-commerce, traditional Word-of-Mouth research focused on the dynamics involved when a consumer told their acquaintances about their experiences with a product. While the influence of an individual's WOM was limited to their relatively small network of acquaintances, researchers and brand managers alike stressed the importance of developing positive WOM[e.g. 17]. From the consumer's point of view, traditional WOM was an effective tool for uncertainty reduction because: 1) the potential consumer had a rich communication channel with the person conveying the WOM, as they generally spoke face to face, and the potential consumer had the ability to ask questions and assess the confluence between her/his needs and that of the person who had used the product before 2) the potential consumer had a pre-existing relationship with the person conveying the WOM, and thus had existing attitudes about that person's trustability, reputation, expertise and competence (Hu et al.[9] would refer to the last two as reviewer exposure). Finally 3) the potential consumer was not inundated with a number of opinions related to the product or service, as s/he was constrained by the limited size of her/his own acquaintance network.

The study of eWOM has largely focused on review and reviewer characteristics and their influence on the development of trust and purchase intention[18]. A substantial amount of research has been directed at the effect of aggregate ratings[e.g. 19, 20] and the number or reviews[e.g. 20, 21], while individual review characteristics have received moderate attention. Common individual review characteristics which are tied to trust formation and purchase intention include argument quality, valence[5] (positive or negative) and sidedness[3] (one-sided reviews only indicate either positive or negative arguments, two-sided reviews discuss both positive and negative aspects of the product). In addition to individual review characteristics, reviewer characteristics have been shown to influence trust formation and purchase intention in eWOM. For instance Hu et al.[9] provide evidence that several characteristics of online reviews influence product sales. Specifically, they find that reviewer reputation, reviewer exposure, product coverage (similar to argument quality) and temporal effects increase product sales when reviews are positive in valence.

With one notable exception[i.e. 13], eWOM research has focused on the factors that influence consumers' decision making in a vacuum, ignoring the ancillary cognitive pressures that may be influencing the consumers' rationality while they read online reviews. In this study, we introduce once such factor, information overload.

Information overload has long been studied by researchers in a variety of disciplines. The underlying mechanics of the construct are simple: as decision makers are presented with too much information, their capacity to process that information is exceeded, leading to negative decision outcomes[22]. Similar constructs include communication overload[23], sensory overload[24], cognitive overload[25] and information fatigue syndrome[26]. The inverted u-shape relationship between decision outcomes and information load has been thoroughly documented by researchers across disciplines, and seems to indicate that both information insufficiency and information overload lead to reduced decision outcomes, while a moderate amount of information leads to better outcomes.

Early information systems researchers have been using the construct since the 1960s[e.g. 27] among other things, to espouse the benefits of effectively formatting and presenting data to managers. Decision processing researchers tested the impact of the construct extensively on a variety of decision outcomes by using decision making tasks and manipulating choices the number of potential choices, irrelevant information, relevant information and contextual information[22].

Consumer behavior researchers have also been using the construct for decades. Specifically, Jacoby et al.[14] provided evidence for an inverted u-shaped relationship between information load and their outcomes (performance accuracy, performance speed and 'subjective states' or feelings of satisfaction, perceptions of risk, confidence, etc.). Jacoby et al. presented a group of 192 housewives with a shopping scenario (for rice and

prepared dinners) with varying degrees of information about various brands, manipulating their information load with regard to the number of brands to consider and the amount of information provided about each brand. After the manipulation, subjects were asked to rate each brand in terms of the extent to which they 'liked' the brand. Their results indicated a u-shaped relationship between information load and: performance accuracy (inverted u-shape), speed, and positive subjective states (inverted u-shape).

We anticipate that consumers reading web-based online reviews will experience a similar phenomenon. Consistent with uncertainty reduction theory, consumers will attempt to access the reviewer's exposure and product coverage[9] by seeking information from the review, and in those cases where that information is not forthcoming, consumers will develop low levels of trust (and consequentially low levels of purchase intention) based on those reviews. However, when adequate information is available in the review and consumers are able to assess the reviewer's exposure and product coverage, they will be better able to develop trusting beliefs about the reviewer, and consequentially report higher levels of purchase intention. Finally, when information is extensive, search costs will start to outweigh the benefits of uncertainty reduction, and trust formation and purchase intention will decrease, however not likely as low as when information is minimal.

H1a: There is an inverted u-shaped relationship between information quality and trust formation, such that minimal information results in lower levels of trust, moderate information results in higher levels of trust, and excessive information results in moderate levels of trust in web-based product review systems.

H1b: There is an inverted u-shaped relationship between information quality and purchase intention, such that minimal information results in lower levels of PI, moderate information results in higher levels of PI, and excessive information results in moderate levels of PI in web-based product review systems.

A shift toward mobile computing and away from desktop computing has been proceeding for over a decade[28], as continually more individuals, and specifically more consumers are engaged using mobile devices such as smart phones rather than desktop computers to achieve their information processing objectives[29]. While mobile devices are becoming more and more powerful and improvements in mobile bandwidth continue to reduce latency, a number of important differences exist between mobile and desktop-based computing[30, 31]. While both web and mobile consumers are able to access the same sets of reviews, we expect the consumer's ability to seek information for the purpose of uncertainty reduction will be constrained in the mobile environment, exposing mobile users to the effects of information overload at lower levels of information load than web users. Specifically, we postulate that limits on dexterity and focus will lead to information overload in mobile review systems.

Vicente[32] defines dexterity as the ability to accomplish tasks using one's hands, and Lee and Benbasat[28] point out that mobile devices are far less effective at facilitating navigation, leaving users feeling like they have less control than with desktop interfaces. This is because the controls on mobile devices tend to be closer together, leading developers to design more simple interfaces to minimize the instance of input errors[33]. The degree of cumbersomeness of navigation and the frustration associated with navigation errors increase the search cost for consumers in a mobile environment, and as such we predict that their perception of the costs and benefits of uncertainty reduction by reading extensive reviews will lead them to be more likely abandon their active search before trusting intentions and purchase intentions can be formed.

Similarly, web-based interfaces are far better at fostering focus than are mobile interfaces[34]. Csikszentmihalyi[35] defines focus as the ability to center one's attention and other cognitive resources on completing a specific task within a limited stimulus field. Generally desktop users are able to focus their attention on specific tasks, and 'tune out' distractions[36]. This is generally not the case in mobile computing, as users are often engaged in other tasks, such as participating in meetings, talking, walking or even driving. Even if the mobile consumer is able to tune out distractions, the limited stimulus field provided by the small

smartphone screen will not be as effective at facilitation focus on reviews with extensive information as a desktop/web based system would, making information processing more difficult, and increasing the consumer's search cost for uncertainty reduction. This will lead to information overload faster (in the presence of less information) making the formation of trusting intentions and purchase intentions more difficult.

In summary, since mobile devices are less effective at fostering focus and dexterity, we argue that consumers reading product reviews on a mobile device will experience the effects of information overload in the presence of less information, and as a result will be less effective in their active uncertainty reduction strategies as per uncertainty reduction theory, and will thus report lower levels of trust and purchase intention than web-based consumers.

H2a: The influence of excessive information will lead to a more substantial decrease in trust formation in a mobile online review system than in a web-based online review system.

H2b: The influence of excessive information will lead to a more substantial decrease in purchase intention in a mobile online review system than in a web-based online review system.

Our proposed model is illustrated in Figure 1. In the following section, we outline our proposed methodology.

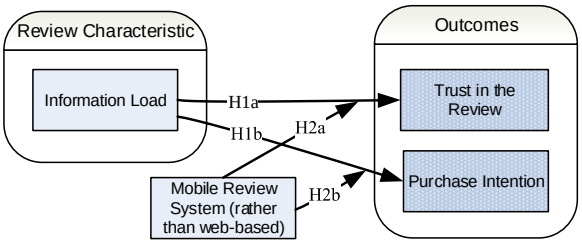

Figure 1: Proposed Model

3. METHODS

In order to test our hypotheses, we propose a scenario-based experiment. Such a method of testing hypotheses is particularly useful when exploring research questions where researchers need to control for variations which may occur in field studies. The scenarios used in this proposed collection follow the protocol established by Potts[37], in that we have incorporated characteristic elements of setting, agents and actors, and goals. It is the manipulation of the information load of the review which will allow us to evaluate and document variations in outcomes[38].

The scenario-based simulations to be used in this experiment require participants to interact with a mock-up of an iPhone display running the TripAdvisor app, and showing reviews of an imaginary hotel in central Paris. The hotel industry was chosen because hospitality services are experiential in nature[39], lack the ability to 'try before you buy' and not returnable[40]. Due to these characterisitcs, the purchases are regarded as 'high risk' by consumers, and as such should require considerable attention when purchasing[41]. This is consistent with current research in the area of eWOM[e.g. 42] in that the intangibility of the experience should enhance the uncertainty for consumers, increasing their motivation for information search and their need to rely on WOM.

3.1 Subjects

The proposed study will include working adults, who are enrolled in a Master of Business Administration program at a large south-eastern U.S. University. A control item about employment will be included to ensure that participants are working adults.

3.2 Procedures

After the standard demographic questions, participants will instructed to act as if they had decided to take a trip to Paris, France, and were considering hotels. Subjects will be divided into two experimental groups. Both groups will read three reviews of the same hotel in Paris. One group will read the reviews using the iPhone/TripAdvisor simulator, the other group will read the reviews using a mock-up of TripAdvisor's webpage. Both groups will respond to the same instrument items, and will take the survey via web-based survey. The only difference is the method in which the reviews are read. The iPhone simulator is high-fidelity, written using HTML5, and allows users to scroll using their computer mouse in a way that simulates the use of an iPhone.

Participants are given three reviews for the same hotel, and after reading each review, they will be required to report the level to which they not only felt they could trust the review (using 3 items), and if they intended to purchase a room. Repeated measures are appropriate for this form of data collection both because of precedence in the field if IS[e.g. 43] but also because it mirrors a topical use case for an individual making a hotel room purchase decision in that individuals typically read more than one review associated with each product or service.

All three scenarios covered the same content areas (duration and dates of stay, location in terms of both distance to tourist attractions and local availability of things to do (restaurants, cafe's, etc.), room size, cost, quality of breakfast, and a comparable value judgment.) in differing levels of detail. The manipulation occurred regarding information quality. The first review was extremely terse, consisting of only 39 words. As such, it could be viewed on the iPhone simulator without scrolling. The second review was considered 'moderate' in terms of information loan, contained 311 words [e.g., 44], and required two full scrolls of the iPhone simulator. The third review was extremely detailed containing 1,256 words and required 8 and a half full scrolls of the iPhone simulator.

3.3 Analysis

To test hypothesis 1a and 1b, an one-way ANOVA f-test will be used to determine if there is a difference in trust (H1a) and purchase intention (H1b) based on the differing levels of information load (as controlled by the three scenario manipulations). At this point, data will be combined in that the responses from the web interface and mobile interface will be analyzed together. This is appropriate since H1a and H1b do not suggest a difference based on the interface. We anticipate that post-hoc pairwise comparisons will show that low information load reviews will be poor at fostering both trust and purchase intention, moderate information load reviews will be good, and that high information load reviews will be moderate in terms of their ability to foster both trust and purchase intention.

To test H2a and H2b, independent t-tests will be used to compare the differences between each of the information load dyads on the dependent variable of interest. For example, a t-test will be conducted on the trust score for low information load review using the web interface vs the trust score for the same review using the mobile interface. This analysis will then be conducted again, using purchase intention as the dependent variable. These two analysis will then be conducted again comparing the moderate information load scenario scores across interface manipulations, and again comparing the high information load scenario scores. This will result in a total of 6 t-tests.

5. CONCLUSION

In this paper, we propose a simulation-based experiment aimed at understanding one difference between information processing in a web-based vs mobile computing environment: information overload. Specifically, we outline a model, founded upon e-commerce, information processing and eWOM research which suggests that consumers reading online reviews will be better able to overcome the limitations associated with information overload when using a web-based review system rather than a mobile review system. This study would extend the emerging yet important mobile information processing paradigm while also bringing e-commerce, particularly eWOM research into the mobile realm.

To this end, we also outline a study aimed at testing our model. Our intention is to test this model in February and March, 2015. Although the study has yet to be carried out, generalizability is likely to be limited by the sample of graduate business at a single university. Still, since the sampling pool will be limited to working adults, we anticipate that our subjects will have adequate experience with online shopping and online review systems.

Besides extending the mobile computing and eWOM paradigms as described above, this study carries implications for review system administrators, as it may suggest that interface sensitive review platforms should prioritize reviews with lower, but not very small, information load for mobile consumers, while providing moderate-high information load reviews to web users.

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