EXPLORING CONSUMERS' PERCEIVED INFORMATION OVERLOAD IN ONLINE SHOPPING ENVIRONMENTS

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ABSTRACT

Borrowing from the concepts of communication theory and the communication model, this study investigates the antecedents of perceived information overload, including information characteristics, information source, system interface, and information recipients. The results indicate that complexity and ambiguity of information characteristics, number of brand alternatives offered by the information source, and system interface all positively impact consumers' perceived information overload. Besides, information recipients' motivation toward using online shopping websites not only negatively influences consumers' perceived information overload, but also moderates the relationship between the number of brand alternative and consumers' perceived information overload.

INTRODUCTION

According to Miller [6], individuals have a limited capability to manage information— too much information at one time can lead to an overload. Jacoby et al. [7] defined information overload as a state induced by a level of information exceeding an individual's ability to assimilate or process during a given unit of time. Marketing researchers have traditionally used counts of the number of alternatives (i.e. brands) and attributes (such as calories) in a choice set to measure the loading of product information [7, 8]. Other researchers have incorporated additional factors, including quality of information, variability of attributes, similarity of alternatives and distribution of attribute levels across alternatives [9-11]. They assume that more alternatives mean more information, and thus use the term "choice load" to represent the amount of information provided to consumers. However, in an online environment, consumer overload may not be limited to "choice". Based on communication theory [12] and Berlo's (1960) communication model, information overload may also result due to the information source (online vendor), channel (website system interface), receiver (online consumer), and message (information characteristics). As such, this study uses "information overload," instead of "choice overload," to explore consumers' information loading.

Different decision approaches have various impacts on information overload [17]. While some studies

have attempted to uncover the antecedents of information overload, most were restricted to the amount of information [7, 10, 18-20] or used the characteristics of information to represent information overload [9, 15, 21-23]. Jackson and Farzaneh [24] further argue that research to date has not systematically identified or analyzed the attributes of information overload. Borrowing from the concept of communication theory [12] and [25] communication model, this study investigates the antecedents of perceived information overload in an online shopping environment, and focuses on the information source, system interface (channel), information recipients (receiver), and information characteristics (message). In addition, the moderating role of the information recipients for the influences of the information source, and the system interface on perceived information overload is also explored. Further, the aforementioned gaps in the literature are addressed through the presentation of a theoretical model that explores perceived information overload in online shopping environments.

THE ANTECEDENTS OF PERCEIVED INFORMATION OVERLOAD

Since information overload is determined by the combined effects of information processing capacity (IPC) and information processing requirements (IPR), this study regards information characteristics as one of the antecedents of information overload. This study adopts complexity, novelty, and ambiguity to represent information characteristics. Complexity refers to the number of different elements or features of the information [29]. The complexity and similarity between choices increases the number of available options, leading to the loading of an individual's working memory and cognitive capacity [30]. When information is unfamiliar, complex, or presented more rapidly than the receiver can process it, information overload may occur [31]. Novelty involves unexpected, surprising, new, or unfamiliar aspects associated with the information [15]. When presented with novel information, customers may have no established schema to interpret it, leading to ill-structured or non-routine problems [21]. Finally, ambiguity refers to the possibility that the same information can be interpreted in different ways [21]. Customers often feel uncomfortable when information is ambiguous or incongruent [32]. Unclear information thereby increases consumers' information load. Thus,

H_1 Information complexity has a positive influence on consumer perceived information overload.

H_2 Information novelty has a positive influence on consumer perceived information overload.

H_3 Information ambiguity has a positive influence on consumer perceived information overload.

Several previous studies have advocated that the volume of information available has a direct impact on information overload [7, 9, 10, 20, 26, 33, 34]. These researchers argue that increasing the amount of information available also increases the probability of information overload occurs. This study adopts the number of brand alternatives and the number of product attributes to represent the volume of information from various information sources. A large volume of information has both advantages and

disadvantages for consumers. On one hand, consumers have access to more alternatives, and their needs are more likely to be satisfied. In addition, consumers may enjoy browsing the increased variety of products [30]. On the other hand, as the amount of information increases, consumers need to spend more time and effort processing the information or comparing the alternatives before making a purchase.

H_4 As the number of brand alternatives from an information source increases, the possibility for consumer information overload increases.

H_5 As the number of product attributes from an information source increases, the possibility for consumer information overload increases.

The system interface of the website is regarded as a channel to connect information senders and receivers. Meyer [27] argued that the interplay of the technology supply and information-based demands leads to information overload problems. Eppler and Mengis [26] noted that information overload causes fall into one of five categories: information characteristics, task and process parameters, personal factors, organizational design, and information technology. Karr-Wisniewski and Lu [16] and MacDonald et al. [28] suggested that technology- mediated information has exponentially increased the propensity for information overload. This study adopts the number of advertisements, soft upgrade requests, complex procedures, security concerns and speed of access to represent the characteristics of system interface. Consumers who face constant interruptions such as advertisements, software upgrade requests, or slow access while browsing websites, may decide not to proceed with a transaction.

H_6 The system interface characteristics have positive influences on perceived information overload.

Consumers are the information recipients in the online shopping environment. Not all information offered can be observed or used by the recipient [7, 27]. Although consumers are exposed to the same stimuli, they may make different decisions due to differences in their motivations and experiences. Recipients with higher levels of motivation tend to be more willing to accept knowledge from external sources [37]. In a similar vein, when consumers are highly motivated to buy products, they are more willing to understand the information provided by online vendors. Accordingly,

H_7 Consumers who are strongly motivated toward using online shopping websites are less likely to experience information overload.

A contingency perspective argues that "universal truths," the optimal method for managing every situation, seldom hold true. Based on this rationale, consumers' information processing capabilities are reliant on the interactive effects between consumer internal variables and external variables. Hunter [39] proposed that the internal variables include need for cognition, level of product involvement, and time usage, while external variables include background noise, time constraints and frame of mind. Yeoh [38] further suggested that social cognition (or learning theory) attempts to explain an individual's behavior

as it is shaped by the person-environment interaction. To realistically predict customers' perceived information overload, the moderating effect of information recipients is considered.

H_8 The motivation level of information recipients weakens the positive influence of the number of brand alternatives on perceived information overload.
H_9 The motivation level of information recipients weakens the positive influence of the number of product attributes on perceived information overload.
H_{10} The motivation level of information recipients weakens the positive influence of system interface on perceived information overload.

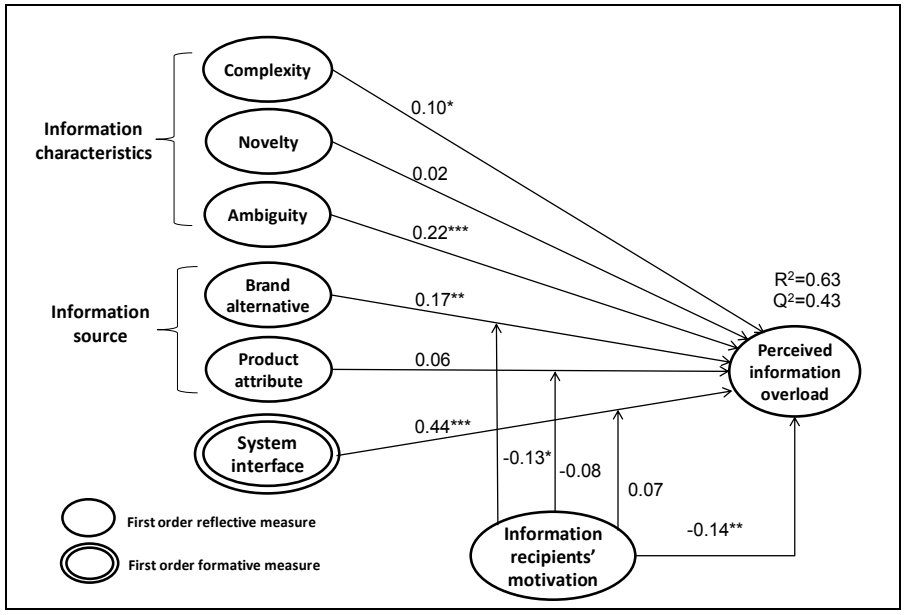
METHODOLOGY

The measures were adapted primarily and whenever possible from previously validated questionnaires. The scale purification process was conducted based on studies by Churchill [46, 47]. A 7-point Likert scale was employed for all items, with anchors ranging from *strongly disagree* (1) to *strongly agree* (7). The unit of analysis in this study is individual customers of an online shopping store (PChome Online). Established in Taiwan in 2000, PChome is the earliest and the most widely used online shopping store in Taiwan. A banner with a hyperlink connected to our web survey was published on a number of bulletin board systems (BBS), chat rooms and virtual communities, inviting individuals with online shopping experience with PChome to participate in the survey. Among the 301 completed questionnaires, 35 were incomplete or included invalid responses (i.e., responses containing ambiguous expressions or unclear data), leaving 256 valid questionnaires. The final sample was comprised of 46% men; further, approximately 62% of the respondents were aged between 20 and 34 years of age. Nearly 78% had graduated from university, and 25% reported having completed post-graduate studies. Approximately 40% had more than four years of online shopping experience, while 38% reported spending an average of US$15-$35 each time they purchased an item from an online auction.

RESEARCH ANALYSIS AND RESULTS

SmartPLS Version 2.0 was utilized to perform the PLS analyses. In addition, bootstrapping was employed with 500 sub-samples to assess the significance of the indicators and path coefficients. For measurement model, All of the composite reliability (CR) coefficients exceeded .60, indicating that the measurements were reliable. In addition, each average variance extracted (AVE) was greater than the 0.5 threshold, indicating that convergent validity was adequate. To assess the discriminant validity, we compared the root square of the AVEs and all inter-construct correlations [52]. Besides, the square root of the AVEs exceeded all of the inter-construct correlations, indicating sufficient discriminant validity.

The proposed research model indicates strong predictive power with respect to perceived information overload (R^2 = 0.63), explaining a considerable degree of the variance for the endogenous variables. Figure 1 shows that complexity of information characteristics (β = 0.10, p < .05) and ambiguity of information characteristics (β = 0.22, p < .001) exerted positive and significant effects on perceived information overload. However, novelty of information characteristics (β = 0.02, p > .05) did not exert a significant effect on perceived information overload. Thus, H_1 and H_3 are supported, but H_2 is not. Further, the number of brand alternatives exerted a significant effect on perceived information overload (β = 0.17, p < .01), but the number of product attributes did not have a significant effect on perceived information overload (β = 0.06, p > .05). Therefore, H_4 is supported, but H_5 is not. In addition, system interface exerted a positive and significant effect on perceived information overload (β = 0.44, p < .05), while information recipients' motivation toward using online shopping websites exerted a negative and significant effect on perceived information overload (β = -0.14, p < .01). Therefore, H_6 and H_7 are supported. Information recipients' motivation toward using online shopping websites moderated the relationship between the number of brand alternatives and perceived information overload (β =-0.13, p < .05), but did not moderate the relationship between the number of product attributes and perceived information overload (β = -0.08, p > .05), or the relationship between system interface and perceived information overload (β = 0.07, p > .05). Hence, H_8 is supported, but H_9 and H_{10} are not supported.



Note: *p<0.05, **p<0.01 ***p<0.001

Figure 1 PLS Results for the Proposed Model

DISCUSSION AND RECOMMENDATIONS

The online shopping environment is characterized by the absence of or a reduced degree of human interaction, such that online vendors have to use text, audio, and video media to deliver information to customers. Even though online vendors are not able to change information characteristics, they can provide additional descriptions to enhance customers' comprehension. Further, online vendors should provide additional information through FAQs, Q&A sessions or online consultants in an attempt to meet customer needs and answer their questions. With regard to the information source, the number of brand alternatives increases consumers' information processing overload. This result does not mean that online vendors should provide as few brand alternatives as possible to avoid information overload. Instead, they need to understand both their firms' market position and consumers' preferences. The dissimilarities among different brand alternatives should be identified by online vendors to help consumers make decisions.

The characteristics of system interface can interfere with consumers' information processing. Website system interfaces help consumers complete online transactions, but advanced technologies have imposed certain behavioral and psychological burdens on people [14, 57]. From the customer perspective, issues associated with the number of advertisements, soft upgrades requests, complex procedures, security concerns and slow access increase the propensity for information overload. Before launching a new website, online vendors should invite their targeting consumers to test the functionality and friendliness of the website interface. Based on consumers' responses related to the trail, managers may better understand consumers' perceptions of the system interface and decide which interface to display.

Finally, consumers who were motivated with respect to online shopping perceived lower levels of information overload. As suggested by Huang [15], consumers may not only use websites to directly make purchases, but also to simple browse. In other words, consumer motivations to use online shopping websites include desire to explore, hedonic consumption intentions, and utilitarian consumption intentions. Although it is not possible for online vendors to obtain information on consumers' motivations and intentions as part of the purchasing process, vendors can manage customer data and use tracking systems to better understand their browsing records. For instance, if a consumer repeatedly views a specific product, his/her intention to buy the product is likely to be higher, and as such he/she can be regarded as a more-motivated customer. In turn, online vendors can provide them with a number of brand alternatives, since they have more elaborated thinking and cognitive processing capabilities, increasing the probability of filling customers' needs.

References available upon request to author