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# CONSUMERS' SATISFACTION WITH ONLINE INFORMATION QUALITY: THE MODERATING ROLES OF CONSUMER DECISION-MAKING STYLE, GENDER AND PRODUCT INVOLVEMENT

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## Abstract

*In the absence of an opportunity to physically interact with products in the online environment, online information plays a critical role in enabling e-Commerce consumers' purchase decisions. Thus, it is critical to understand what leads to consumer satisfaction with online information quality. However, despite the rapidly increasing number of consumers who use websites to gather pre-purchase product information, very little is known about how to increase consumers' satisfaction with online product information quality in different contexts. This research-in-progress study proposes a comprehensive model to investigate the impacts of perceived verbal information, nonverbal information and decision support tools qualities on consumers' satisfaction with information quality within e-Commerce websites. Further, we also plan to investigate how the relations between the constructs in the proposed model might vary by factors such as gender, decision making style, and product involvement. A survey-based methodology is outlined to empirically validate the proposed research model using structural equation modelling techniques.*

*Keywords: e-Commerce, Verbal and Nonverbal Product Information, Decision Support Tools, Satisfaction, Decision-Making Style, Gender, Product Involvement.*

# 1    Introduction

A main goal for marketers is to keep consumers satisfied with their shopping experiences as customer satisfaction has a strong impact on consumers' purchase intention, loyalty, and repeat purchases (Rodgers et al., 2005). Information quality (IQ) plays a critical role in enabling online consumers' purchase decisions in the absence of an opportunity to physically interact with products in the online environment (Wixom & Todd, 2005; Kim & Lennon, 2008). As such, IQ has been identified as one of the main factors contributing to online consumer satisfaction (DeLone & McLean, 1992; McKinney et al. 2002; DeLone & McLean, 2003; Wixom & Todd, 2005; Lin, 2007; Liu et al. 2008). Thus, it is critical to understand what leads to higher levels of consumer satisfaction with website information quality.

Within an e-Commerce context, verbal and nonverbal information (VI, NVI) play an important role in supporting consumers in their decision making (Kim & Lennon, 2008). In addition, and as there is an abundance of available online information often making it difficult and time consuming to evaluate products, decision support (DS) tools such as product comparison matrices and agents also help consumers to make better decisions (Park & Gretzel, 2010). As the use of such DS tools provides consumers with additional information, we argue that they also contribute to their perceptions regarding the IQ provided by an online vendor. Hence, in trying to understand what leads to consumer satisfaction with online IQ, it is important to discern the role of customer perceptions regarding the qualities of VI, NVI and DS tools within an e-Commerce website.

Consumer expectations regarding the qualities of VI, NVI and DS tools may vary by individual factors and product involvement. For example, consumers are thought to approach shopping with different decision-making traits or styles (Park & Gretzel, 2010). Decision-making style (DMS) is an important individual difference that may play a role in shaping consumers' expectations regarding the different types of information found on e-Commerce websites. In addition, several studies have demonstrated the role of gender in influencing the consumer online experience where men and women have been shown to perceive web-sites differently (e.g. Rodgers & Harris, 2003; Cyr & Bonanni, 2005; Cyr et al. 2007). Finally, product involvement has also been shown to influence consumer online shopping experiences (Lian & Lin, 2008). Thus, product involvement may influence consumers' satisfaction with IQ. Hence, there is a need to understand how the contributions of consumers' perceptions regarding the quality of VI, NVI and DS tools to their overall satisfaction with IQ in e-Commerce websites may vary by such individual factors and product involvement.

While the relationship between IQ and consumer satisfaction has been tested by some researchers (Wixom & Todd, 2005; Liu et al. 2008), the practitioner community may have not embraced this as it does not fully explain why a website is perceived as having a high IQ. Thus in this paper we attempt to tackle this gap by proposing VI, NVI and DS tools as factors that could potentially influence consumer overall satisfaction with the IQ of a website. This is in line with Benbasat and Barki's (2007) call for researchers to advance IS studies to the next level by evaluating core constructs such that they have a richer meaning to both practitioners and academics. Further, we explore how the relations between the above factors might vary by individual factors such as gender, DMS and product involvement which have not been examined in prior literature.

The remainder of this paper is organized as follows: Section 2 outlines the proposed research model and hypotheses, Section 3 details our proposed research methodology while Section 4 summarizes the potential contributions expected from this research.

# 2    Research Model and Hypotheses

**Satisfaction with Information Quality (IQ)** is defined as an affective state capturing consumers' emotional reaction to the different types of product information available on a website (McKinney et al. 2002). Wixom & Todd (2005) showed that object-based consumer beliefs regarding IQ lead to

object-based consumer attitudes regarding information satisfaction, which ultimately contributes to forming consumer attitudes towards and intention to purchase from a website. As explained in Section 1, in evaluating satisfaction with product IQ within an online environment, consumers may assess the quality of different types of available information (i.e. VI quality, NVI quality, and the quality of DS tools). To examine how such factors influence consumer overall satisfaction with IQ and how such impacts may vary by individual factors (i.e. DMS, gender) and product involvement, we propose the research model shown in Figure 1.
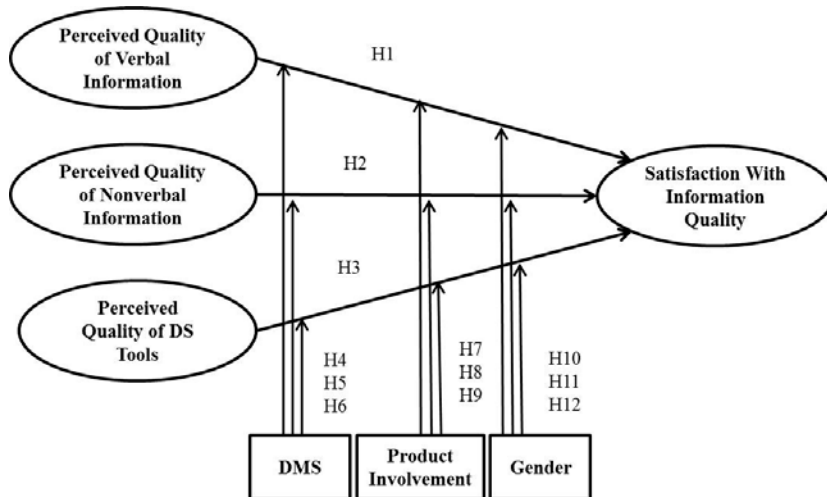


*Figure 1: Proposed Research Model*

**Perceived Quality of Verbal Information (VI)** refers to consumers' assessment of the quality of verbal product information (i.e. textual product descriptions) along such dimensions as completeness, accuracy, format, and whether it is up to date (Nelson et al. 2005; Wixom & Todd, 2005). Kim & Lennon (2008) suggest that VI helps consumers evaluate products, make more informed decisions, and improve their satisfaction with their online shopping experience. In addition, Wixom & Todd (2005), and Bliemel & Hassanein (2007) show the quality of the contents of a website (including VI) as positively influencing consumers' satisfaction with IQ. Thus, we hypothesize

**H1:** *Higher perceived VI quality will positively influence satisfaction with IQ.*

**Perceived Quality of Nonverbal Information (NVI)** refers to the perceived quality of visual presentations of product information (e.g. images of a product) (Chau et al. 2000). Kim & Lennon (2008) suggest that NVI helps consumers evaluate a product and improve their satisfaction with their online shopping experience. Hassanein & Head (2007) show the positive impact of incorporating social presence through human images on apparel websites on consumers' perceived usefulness, trust, enjoyment and attitude towards e-Commerce websites. Thus, we hypothesize

**H2:** *Higher perceived NVI quality will positively influence satisfaction with IQ.*

**Perceived Quality of Decision Support (DS) Tools:** Consumers are increasingly utilizing DS tools in their online shopping to help them navigate the abundance of choices and associated information for products they may be seeking (Park & Gretzel, 2010). Such tools enable product comparisons, finding similar products with the same brand, finding a product's best price and showing product reviews by others. DS tools provide consumers additional verbal and nonverbal product information and, as such, we argue that they would be associated with information in customers' minds. As discussed above, Wixom & Todd (2005), and Bliemel & Hassanein (2007) show that perceived IQ impacts consumers' satisfaction with IQ. Thus we hypothesize

**H3:** *Higher perceived DS tools quality will positively influence satisfaction with IQ.*

**Decision-making Style (DMS)** is defined as "a mental orientation characterizing a consumer's approach to making choices" (Sproles & Kendall, 1986, p. 268). In their study, Sproles & Kendall

(1986) outlined eight different decision making styles. In the context of our study, we focus on two DMS (perfectionism and impulsiveness) as they are thought to be highly relevant to consumers' expectations regarding online product information (although other DMS such as confusion due to information overload can be relevant but are not included here to maintain the number of treatments in our experimental design within a manageable level). Consumers who are high on perfectionism are expected to shop more carefully, are often not satisfied with limited amounts of product information and prefer to search extensively (Wesley et al. 2006). Therefore, we expect that consumers who are high in perfectionism will prefer to use DS tools for comparing similar products before making their purchasing decisions. On the other hand, impulsive consumers tend to buy products in a short time, without paying much attention to product information (Park & Gretzel, 2010). Further, Sojka & Giese (2001) suggest that visual pictures may appeal more to consumers who make impulse purchases. Thus we hypothesize

**H4:** *DMS will moderate the relationship between perceived quality of VI and satisfaction with IQ such that it will be stronger for consumers who are high on perfectionism compared to those who are high on impulsiveness;*

**H5:** *DMS will moderate the relationship between perceived quality of NVI and satisfaction with IQ such that it will be stronger for consumers who are high on impulsiveness compared to those who are high on perfectionism;*

**H6:** *DMS will moderate the relationship between perceived quality of DS tools and satisfaction with IQ such that it will be stronger for consumers who are high on perfectionism compared to those who are high on impulsiveness.*

**Product Involvement:** Various classifications exist for online products (e.g. tangible/intangible; digital/non-digital). Due to the focus of this research on IQ, we employ the high involvement/low involvement product classification (Reischach et al. 2010). Involvement refers to "a person's motivational state directed toward a goal object for accomplishing a specific goal. The goal object can be a product class, a purchase decision, a specific brand, or an advertisement" (Park & Mittal, 1985). Depending on the product's level of involvement, consumers may differ in their decision process and the extent of their search for product information (Laurent & Kapferer, 1985). Consumers experiencing high product involvement will engage in more extensive information searches compared to consumers experiencing low product involvement (Beatty & Smith, 2012). Thus, for high involvement products (e.g. automobiles, laptops, cameras, and TVs), consumers expect more information while for low involvement products (e.g. light bulbs, pens, and chocolate), they expect less information (Reischach et al. 2010). We also expect that for high involvement products, consumers will put more emphasis on using DS tools to obtain additional product information (e.g. product comparisons) before making their purchasing decisions. Further, Lutz & Lutz (1978) suggest that viewing pictures as opposed to words requires much less involvement or cognitive processing for consumers' perception and comprehension. Thus we hypothesize

**H7:** *Product involvement will moderate the relationship between perceived quality of VI and satisfaction with IQ such that it will be stronger for high involvement products compared to low involvement ones;*

**H8:** *Product involvement will moderate the relationship between perceived quality of NVI and satisfaction with IQ such that it will be stronger for low involvement products compared to high involvement ones;*

**H9:** *Product involvement will moderate the relationship between perceived quality of DS tools and satisfaction with IQ such that it will be stronger for high involvement products compared to low involvement ones.*

**Gender** may also influence consumers' online shopping experiences because men may perceive websites differently than women (Rodgers & Harris, 2003; Cyr & Bonanni, 2005). Previous research suggests that men are more concerned with VI seeking than women who are more interested in a

variety of information types including NVI which they find more engaging (Cyr et al. 2007). Further, according to Everhart et al. (2001), women seem to be better at decoding nonverbal cues and reach quicker interpretations than men. Therefore, we expect that men may put more emphasis on VI and the use of DS tools to compare similar products before making their purchasing decisions. Thus we hypothesize **H10:** *Gender will moderate the relationship between perceived quality of VI and satisfaction with IQ such that it will be stronger for men compared to women;*

 **H11:** *Gender will moderate the relationship between perceived quality of NVI and satisfaction with IQ such that it will be stronger for women compared to men;*

**H12:** *Gender will moderate the relationship between perceived quality of DS tools and satisfaction with IQ such that it will be stronger for men compared to women.*

# 3      Research Methodology

**Experimental Tasks:** Having three exogenous constructs in the proposed research model, eight treatments will be needed to achieve a full factorial design. Thus in this study, eight treatments involving eight different e-Commerce websites will be selected following a $2^3$ full fractional factorial design (Box et al., 1978). These sites will be selected to best reflect relative (high or low) values of the exogenous variables. To ensure that the selected websites are significantly different (high or low) for each of the exogenous variables, we will conduct a pretest study asking 30 online shoppers to rate different website as being high or low in terms of verbal IQ, nonverbal IQ, and DS tools quality. For the main study, the experimental tasks will be designed in such a way to minimize any confounding effects due to brand or design elements that are not related to the manipulated exogenous variables. Participants for this study will be recruited through e-mail and social networks among people who have engaged in e-Commerce in the past.  After reading and signing an initial consent form, each participant will be classified as being predominantly perfectionist or impulsive using the scale from Wickliffe (2004). Participants will then be randomly assigned (while observing demographic and DMS balance) to shop for a high involvement or a low involvement product under one of the eight experimental treatments (e.g. shop for a TV on a website that has low VI quality, high NVI quality and high DS tools quality). An online survey tool, Web-Surveyor™, will be used to link subjects to their assigned website and provide them with their assigned shopping task. They will then be directed to complete the survey instrument.

**Measurement Instrument:** To ensure content validity, measurement scales for most constructs in the model were selected from the extant literature. VI quality and NVI quality will be measured using a 4-item scale adapted from Wixom & Todd (2005). Satisfaction with IQ will also be measured using a 2-item scale from Wixom & Todd (2005). A new multiple-item scale will be developed for measuring the quality of DS tools following the methodology suggested by Lewis et al. (2005). A pilot survey will be conducted to test and refine the measurement instruments and experimental procedures. All the appropriate validity tests will be performed. Common method bias will be examined using the approach outlined by Liang et al. (2007).

**Proposed Model Validation and Sample Size:** Structural Equation Modeling (SEM) will be used to validate the proposed research model. In particular, Partial Least Squares (PLS) will be used as it is applicable to both confirmatory and exploratory research which is appropriate for this study (Chin et al. 2003). ANOVA tests and mean analysis will be used to find if there are significant differences between subjects' perceptions in the various treatment groups. Participants will also be asked to respond to open-ended questions relating to their experiences while completing their assigned online shopping tasks. Their responses will be analyzed using content analysis techniques to identify common themes and meaningful categories in the data. Results from this qualitative analysis will be used to strengthen the quantitative findings through triangulation (Benbasat, Goldstein, & Mead, 1987). The minimum sample size for validating a model in PLS is ten times the larger of: (i) the number of items for the most complex construct; and (ii) the largest number of independent variables

impacting a dependant variable in the model (Gefen, Straub, & Boudreau, 2000). The most complex scale in the proposed model has 4 items, resulting in a minimum sample size of 40. However, to detect a medium effect size at a power of 0.8 and α of .05 for the moderating variables, 51 subjects are required for each combination of the moderating variables (8 treatments in total) for a total of 408 subjects. To account for spoiled surveys, 450 participants will be recruited.

# 4 Potential Contributions

This research promises to make significant contributions to both theory and practice. From a theoretical perspective, and to the best of our knowledge, this is the first study to develop and validate a model to explain the lower level factors (VI, NVI and DS tools) that influence consumers' satisfaction with IQ in eCommerce websites. This is also the first study to develop a construct to assess consumer perceptions regarding the quality of DS tools on e-Commerce Websites. Further, we also investigate how the relations between the constructs in the proposed model might vary by individual factors such as gender, DMS (an important variable that is under-investigated in the IS literature) and product involvement. On the other hand, practitioners can use the results of this research to customize the shopping experiences for their customers to increase their satisfaction, purchase intention, and loyalty. Such customization would incorporate the optimal mix of VI, NVI, and DS tools to best match their customers' information needs based on their gender, decision making style and the type of product they are seeking when such information is available to vendors.

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