THE EFFECTS OF PERCEIVED QUALITY AND USEFULNESS OF CONSUMER REVIEWS ON REVIEW READING AND PURCHASE INTENTION

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ABSTRACT

Online customer reviews are peer-generated product evaluations posted on company or third party websites. Many retailers offer consumers opportunities to participate in product reviews and share their experiences and opinions with other consumers on their online store websites. This study identifies factors that generate negative perceptions of information quality in online reviews. In addition, the influential role of negative perceptions of consumer reviews and perceived usefulness of online reviews on reading of online reviews and purchase intentions in online stores hosting the reviews are examined. Using a survey, data were collected from 312 male and female university undergraduate students with experience purchasing products online and reading reviews online. Hypotheses were tested using measurement and structural equation models. Four information quality elements (irrelevancy, incredibility, exaggeration, and untimeliness) were developed as measures of negative perceptions of review quality. Based on the results of the research model, researchers found consumers' negative perceptions of review quality decreased online purchase intentions by deterring the reading behavior of reviews while consumers' positive perceptions of the usefulness of reviews increased reading activity. This study highlights the importance of consumer review reading behavior and its effect on purchase intention in online stores. Creating supportive systems to enhance the quality of online reviews will allow consumers to make better purchase decisions.

Keywords: Consumer, online, reviews, negative, usefulness, purchase intention

INTRODUCTION

The Internet has allowed consumers to share and obtain information concerning products from a wide social network that goes far beyond one's immediate friends, family, and acquaintances. Through virtual opinion platforms, consumers are engaging in word-of-mouth in unprecedented ways where they are able to share a plethora of information and articulate their experiences about their consumption activity with people to whom they are linked solely by a particular product, brand, or company. As the traditional word-of-mouth has been recognized as having a major role in influencing consumer decision making (e.g., Arndt, 1967; Engel, Kegerris, & Blackwell, 1969; Richins, 1983), the influential role of eWOM (electronic word-of-mouth) has been magnified through various forms of online communities and social media such as online discussion forums, newsgroups, blogs, Facebook, and Twitter. As such, companies are looking to support their sales and customers by offering a virtual platform that hosts information sharing among consumers within their own websites.

Online customer reviews are defined as "peer-generated product evaluation posted on company or third party websites" (Mudambi & Schuff, 2010, p. 186). Many retailers encourage consumers to participate in product reviews and share their experiences and opinions with other consumers on their online store websites. While some review sites are structured for consumers to rate a product using a predetermined rating scale, most review sites are open-ended for consumers to freely input their own comments offering more context to their reviews. Depending on the retailer's website, a few to hundreds of review postings from other consumers are available for reading. The consumer reviews can offer a wide variety of information that range from descriptions of product quality and usage to emotional reviews that reflect consumers delight or disappointment with the product or retailer. Prospective buyers will browse through the reviews in search of information to use to more confidently narrow down their choices and make a purchase decision.

Online consumer reviews are recognized as a valuable feature of a business–to-consumer website (Kumar & Bebasat, 2006). Several studies provide empirical evidence that consumer reviews can give consumers a sense of personal connection with the website and improve the transactional aspect of online retailing (Bickart & Schindler, 2001; Brown, Tilton, & Woodside, 2002; Kumar & Bebasat, 2006, Ho & Tam, 2005). Furthermore, it is commonly recognized that consumer ratings are predictors of sales and several studies have documented these findings (Clemons, Gao, & Hitt, 2006; Dellarocas, 2003; Chevalier & Mayzlin, 2006). For example, Clemons et al. (2006) found mean ratings of premium products to be good predictors of sales growth. Similarly, Dellarocas (2003) found ratings to be predictors of ticket sales for movies and Chevalier and Mayzlin (2006) found higher ratings to be associated with higher book sales. Prior research on consumer reviews and consumer ratings do not offer understanding of how the quality of information as expressed in the reviews adds value to the consumer and influence subsequent behavior.

Assessing information quality with appropriate measures is essential for organizations to improve the quality of information offered. In particular, for retailers, the perceived quality of information from consumer reviews should be a top concern since online reviews can be considered a valuable source of information that offers a first-hand account of post purchase experience and satisfaction. In particular, negative perceptions of online reviews by consumers not only make online reviews a counterproductive tool, but detract consumers from making effective decisions that lead to product purchase. For example, Schindler and Bickart (2005) found that consumers questioned the validity of reviews based on wording used in the post comments. In support of previous research, this study offers a different viewpoint to assessing review quality by examining the effects of negative characteristics of online reviews that influence perceptions of information quality and usage of online reviews. The purpose of this study is 1) to identify factors that generate negative perceptions of information quality in online reviews and 2) to examine how negative perceptions of information quality and perceived usefulness of online reviews influence reading activity of online reviews and subsequently purchase intentions in online stores hosting the reviews.

CONCEPTUAL BACKGROUND AND HYPOTHESES

Information quality

Information quality examines what information characteristics are suitable for consumers. Negash et al. (2003) defines information quality as "a function of the value of the output produced by a system as perceived by the user" (p.758). Wang and Strong (1996) adopt the consumer oriented view of "fitness-for-use" in testing attributes of data quality to consumers. In applying information quality to online reviews, information quality can be understood as a function of the degree to which consumers value and highly regard the information and how well it meets individual needs.

Recognized as a complex concept, quality has been conceptualized and measured in various ways by researchers depending on the research context (Reeves & Benar, 1994). Lee et al. (2002) notes that efforts to measure and improve information quality has resulted in piece-meal and non-generalizable techniques. Past studies have assessed the information quality of various information technologies and studies are found where determinants of information quality are studied as single concepts (e.g., credibility, accessibility, usefulness) or within a multidimensional framework in which multiple aspects of information are described by a set of features. Earlier studies by Ahituv (1980), Gallagher (1974) and Swanson (1974) incorporate information characteristics to measure information value. DeLone and McLean (1982) summarized studies that use empirical measures of information quality (e.g., Bailey & Pearson, 1983; King & Epstein, 1983, Miller & Doyle, 1987). More recently, Zhu and Gauch (2000) assessed the information quality of a Web page by examining six information dimensions: currency, availability, information-to noise ratio, authority, popularity, and cohesiveness. Chae and Kim (2001) proposed a four-dimensional informational quality framework (connection quality, content quality, interaction quality, and contextual quality) for assessing the information quality of a mobile Internet service and found all the dimensions to help increase customer satisfaction and loyalty. Knight and Burn (2005) prioritized informational quality dimensions in terms of cost, urgency, and importance to exclude less effective dimensions. Burgess, Gray, and Fiddian (2007) proposed a flexible model where informational quality frameworks are personalized based on the user. In their literature review, using four dimensions originally reported in Wang and Strong's (1996) study, Lee et al. (2002) examined several academic studies on information quality (e.g., Ballou & Pazer, 1995; Delone & McLean, 1992; Goodhue, 1995; Wang & Strong, 1996; Wand & Wang, 1996; Zmud, 1978) and derived four information quality dimensions important to consumers: intrinsic, contextual, representational, and accessibility. Intrinsic quality addresses the basic integrity of the information such as its believability, reputation, accuracy, and objectivity. Contextual quality examines whether the information is within the proper context with such information characteristics such as completeness, relevancy, timeliness, completeness, and currency. Representational and accessibility information quality refers to how effective the information is presented and are described with characteristics such as concise representation, representational consistency, interpretability, ease of understanding, accessibility, and security. Lee et al. (2002) concludes the four dimensions offer a strong basis for measuring and assessing how information quality can be improved.

In research, consumer attitudes toward positive traits are commonly assessed where traits with lower participant ratings can be assumed to be traits in which strengths do not exist. Although very few studies directly examine negative information quality traits, a few studies report on the

influential role of these traits. For example, Mudambi and Schuff (2010) found for experience goods, extremely low or high ratings were considered to be less helpful than reviews with moderate star ratings. Also, Kim and Gupta (2012) note that negative emotional expressions tend to decrease the reviews' informative value but do not impact consumers' product evaluation as much because the negative emotional expressions are attributed to the review writer's predisposition. Schindler and Bickart (2005) report readers use wording cues and usage of inexpressive words to judge the credibility of the writer. As such, we see evidence that impressions of negative and positive information quality do not influence consumer perceptions of the website or products in the same way. Our study measures consumers' negative perceptions of information quality within the context of consumer reviews using items representing Lee et al.'s (2002) dimensions. Information characteristics from three dimensions of negative information quality were studied: Intrinsic (e.g. incredibility, inaccuracy, unreliability, lack of objectivity), contextual (e.g. irrelevancy, untimeliness, incompleteness), and representational (e.g. exaggeration, inflation, partialness). Our study measures negative characteristics traits and examines how negative perceptions of information quality from online review sites influence consumer tendencies to read reviews and purchase from the sites.

Information quality, usefulness, and user intentions

Using an information technology context where workers use a particular system to improve their productivity, Davis (1989) defines perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance" (p. 320). In turn, usefulness of online consumer reviews can be defined as the degree to which a person believes online reviews assist with product evaluation and decision-making. Although usefulness of information can be considered an information quality characteristic, studies highlight usefulness of information as being distinctively important in determining user behavior (e.g., Robey, 1979; Schultz & Slevin, 1975).

Scholars have offered theoretical frameworks and empirical evidence for explaining the influential roles of information quality and usefulness in determining user intentions (e.g., Davis, 1989; DeLone & McLean, 1992). DeLone and McLean's (1992) information system (I/S) success model offers an integrative view of information system success. Recognizing that there are many measures of success in the literature, DeLong and McLean (1992) broadly summarize indicators of success of the information systems to be system use, user satisfaction, individual impact, and organizational impact. Their categorizations are similar to an earlier study by Zmud (1979) in which categories of MIS success were classified as user performance, MIS usage, and user satisfaction. Davis (1989) and Davis, Bagozzi, and Warshaw (1989) highlight the importance of usefulness in determining technology usage behavior. The technology acceptance model (TAM) proposed by Davis (1989) has been widely tested by many researchers and proven to be a robust model. The relationship between perceived usefulness of the technology system and behavioral intentions to use the system has been confirmed in numerous studies (e.g., Mathieson, 1991; Subramanian, 1994; Szajna, 1996; Hu et al., 1999; Taylor & Todd, 1995; Venkatesh & Davis, 1996; 2000; Venkatesh & Morris, 2000).

The current study applies negative information quality characteristics within the context of the technology acceptance model (Davis, 1989) and DeLone and McLean's (1992) information system (I/S) success

model. Figures 1 and 2 illustrate how negative information quality characteristics are integrated with information usefulness and system usage. The relationships among the variables represent the hypotheses concurrently tested in the study. In the model, we examine how consumers' negative perceptions of information quality of consumer reviews may influence their review reading activity and intentions to purchase from an online store site. Many online store sites offer after-purchase feedback from consumers for product items. The marketing literature shows presence of consumer reviews to influence product sales and information quality has shown to influence information system usage. Hypothesis 1 and Hypothesis 2 examine how negative perceptions of the quality of consumer reviews may influence review reading behavior (i.e., information system usage) and intentions to purchase products in an online store. Hypothesis 3 and Hypothesis 4 test the relationships between usefulness of online reviews (i.e., information usefulness) and reading of reviews (i.e., information system use) and purchase intentions (i.e., online shopping system use). Also, the relationship between usefulness and use intent (e.g., Dash & Saji, 2010; Gefen et al., 2003) have been confirmed by the studies on adoption of online shopping/online stores as well as information system (Legris, Ingham, & Collerette, 2003). Finally, the technology acceptance model (TAM) explains that users' future acceptance intention of technology is associated with actual system use experience. The process of reading of reviews online leading to purchase intentions parallels the TAM which is shown in Hypothesis 5.

H1: Negative perceptions of the quality of consumer reviews negatively influences review reading behavior in online stores.

H2: Negative perceptions of the quality of consumer reviews negatively influences future intentions to purchase from online stores.

H3: Perceived usefulness of consumer reviews positively influences review reading in online stores.

H4: Perceived usefulness of consumer reviews positively influences future intentions to buy products in online stores.

H5: There is a positive relationship between consumer reading of product reviews posted in online stores and intentions to purchase from online stores.

RESEARCH METHOD

Measurement

Negative perception of review quality is operationally defined as consumers' perceptions of low information quality in online reviews for reasons in which the review content may be irrelevant, exaggerated, untimely, and not credible. Items measuring negative perceptions of review quality were adapted from previous studies on information quality (Cheung et al., 2008; Lee et al, 2002; Wang & Strong, 1996*)*. *Perceived usefulness of reviews* refers to consumers' perceptions that the reviews offer support in making the online shopping experience productive and effective. It is the expectation of consumers that the online reviews will allow consumers to more easily accomplish their shopping goal. The measurement items for perceived usefulness of reviews were adapted and modified from previous studies on information technology acceptance (Davis, 1989; Legris et al., 2003). Items for *review reading activity* were developed by researchers and measure the frequency, quantity and activity level of consumers reading online reviews. *Purchase intention* was measured by items asking respondents whether they plan, expect, and intend to buy products in online stores.

Purchase intentions items were adapted from previous studies (Kim, Ferrin, & Rao, 2008; Choi & Lee, 2003). All scaled items were scored on a 7-point Likert scale with end points "strongly disagree" and "strongly agree". Demographic information (e.g., age, gender) and online shopping information were also collected

Data collection and respondent characteristics

An online survey was completed by students attending a university in the north eastern region of the United States. Respondents were asked to list one product for which they recently read customer reviews when shopping online and answered questions within the context of this particular product. In addition, information on consumer experience with online shopping and reading consumer reviews about products were also collected.

A convenience sampling of 312 male and female students who had experience with purchasing products online and reading reviews on a regular basis participated in the survey. The participants for the study were mostly female (76.6%) and between the ages of 18 and 22 years old (94%). All respondents had online shopping experience and 71.1% of respondents responded positively to the question on whether they engaged in frequent online shopping (strongly agree 16.3%, agree 26.3%, somewhat agree 28.5%). In addition, all respondents had experience reading customer reviews and 79.8% responded positively to frequently reading reviews (strongly agree 22.1%, agree 28.5%, somewhat agree 28.2%). The product items which respondents listed on the survey included textile and apparel products (clothing 38.5%, shoes 13.1%, fashion accessories and home textile products 3.8%), books (14.7%), and computer related products (9.3%).

RESULTS

Validity and reliability of research variables

For data analysis, SPSS 18.0 and AMOS 18.0 were used. First, exploratory principal components factor analysis (varimax rotation, extracting factors with eigen values above 1.0) was conducted on the measurement items. Four factors were identified: Negative perception of review quality, perceived usefulness of reviews, reading of reviews, purchase intent in online stores. Four factors explained 66.922% of total variance. When conducting principal components factor analysis, several items were removed due to high loading values on non-related variables or low communality scores. Table 1 presents all items that show loading values at 0.634 and above. For all items in Table 1, loading values posed on non-related variables showed 0.302 and below. Cronbach's alphas for most variables were higher than 0.85. Therefore, the internal reliabilities of all variables were confirmed.

TABLE 1
Explanatory Factor Analysis of Research Variables

Variables	Items		Loading Values	Means (S.D)	Reliability /explained variance
Negative perception of review quality *(When reading consumer reviews for this type of product, I am worried ...)*	NEG 1	Consumer reviews posted on online stores may not be reliable.	.773	4.923 (1.324)	.899[a] 5.500[b] (27.498%)
	NEG 2	Consumer reviews posted on online stores may not provide a fair impartial view.	.763	4.760 (1.230)	
	NEG 3	Consumer reviews posted on online stores may be inaccurate.	.754	4.940 (1.274)	
	NEG 4	Consumer reviews posted on online stores may not be appropriate for evaluating the product.	.737	4.467 (1.390)	
	NEG 5	Consumer reviews posted on online stores may not be up-to-date.	.711	4.657 (1.375)	
	NEG 6	Consumer reviews posted on online stores may not be timely.	.698	4.373 (1.306)	
	NEG 7	Consumer reviews posted on online stores may not be necessary for my shopping.	.697	4.473 (1.435)	
	NEG 8	Consumer reviews posted on online store may be inflated in favor of the product.	.660	4.790 (1.389)	
	NEG 9	Consumer reviews posted on online stores may not be relevant to my needs.	.652	4.855 (1.273)	
	NEG 10	Consumer reviews posted on online stores may be only focused on the good points.	.644	4.613 (1.533)	
	NEG 11	Consumer reviews posted on online stores may not be credible.	.634	4.865 (1.287)	
Perceived usefulness of using reviews	USE1	Using consumer reviews posted on online stores increases my online shopping productivity.	.854	5.057 (1.248)	.868 2.605 (13.028%)
	USE2	Using consumer reviews posted on online stores enhances my effectiveness in online shopping.	.841	5.153 (1.231)	
	USE3	Using consumer reviews posted on online stores enables me to accomplish my shopping goals easier.	.799	5.180 (1.217)	
Review reading activity	REA1	I frequently read consumer reviews posted on online stores for this type of product	.917	4.586 (1.723)	.931 2.654 (13.270%)
	REA2	I am active in reading consumer reviews posted on online stores for this type of product	.912	4.227 (1.718)	
	REA3	I have a lot of experience reading consumer reviews posted on online stores for this type of product.	.871	4.602 (1.630)	
Purchase intention in online stores	PIN1	I expect to purchase this type of product from online stores in the future.	.936	5.553 (1.352)	.917 2.625 (13.126%)
	PIN2	I intend to buy this type of product from online stores in the future	.915	5.573 (1.292)	
	PIN3	I plan to purchase this type of product from online stores within the next year.	.897	5.257 (1.544)	

[a] Cronbach's alpha [b] Variance of rotated factors (%), Cumulative variance: 66.922%

Two measurement models including the final items were constructed and analyzed by confirmatory factor analysis. Measurement model 1 (first order model) maintains the same structure from the exploratory factor analysis (see Table 2). From the measurement model 1, several fit indices (GFI=0.867, AGFI=0.830, RMSEA=0.078, TLI=.0.904, CFI=.917, NFI=.880, PCFI= .792, PNFI= .759) and $\chi 2$ value of 476.580 (d.f.=164, p=0.000) were produced. The relative chi-square value ($\chi 2$/df=2.906) was larger than the recommended value of 2.0 for good fit of a model (Tabachnick & Fidell, 2007). The RMSEA point estimate was 0.078, the lower bound of the 90% interval was 0.070, and the upper bound of the 90% interval was 0.087. However, the probability value (p=.000) associated with the test of close fit was lower than 0.05 which is a recommended value confirming that the model fits the data well.

To compare the fitness of the model of one-dimensional factor with multiple items (first order measurement model) with the fitness of the model of one dimensional factor with four sub-dimensions (second order measurement model 2) which is shown in Figure 2, derived from the

TABLE 2
Results of Measurement Model 1 (First Order Model)

Factors/ Variables	Items	Estimate	S.E.	C.R.	Standardized Estimate	Means (S.D.)	Composite Reliability	AVE
Negative perception of review quality	NEG 11	1.000			.794	4.702	.901	.455
	NEG 2	.972	.070	13.788***	.735			
	NEG 1	.947	.064	14.889***	.782			
	NEG 6	.933	.080	11.670***	.640			
	NEG 4	.871	.072	12.101***	.660			
	NEG 3	.848	.063	13.560***	.725			
	NEG 9	.823	.076	10.892***	.603			
	NEG 10	.806	.072	11.170***	.616			
	NEG 5	.775	.067	11.522***	.633			
	NEG 8	.749	.069	10.899***	.603			
	NEG 7	.706	.067	10.492***	.583			
Perceived usefulness of using reviews	USE 1	1.000			.883	5.2578 (1.065)	.872	.695
	USE 2	.980	.054	18.016***	.877			
	USE 3	.810	.055	14.706***	.733			
Review reading activity	REA 1	1.000			.951	4.4714 (1.585)	.932	.820
	REA 2	.947	.035	26.803***	.903			
	REA 3	.856	.036	23.829***	.861			
Purchase intention in online stores	PIN 3	1.000			.841	5.4611 (1.297)	.922	.799
	PIN 1	.970	.046	21.318***	.932			
	PIN 2	.902	.044	20.691***	.906			

*** p< .001
Model 1: $\chi 2$ =476.580(df=164, p=.000), $\chi 2$/df =2.906, RMSEA=.078(LO 90=.070, HI 90=.087, pclose=.000), TLI=.904, CFI=.917, NFI=.880, PNFI=.759, PCFI=.792, GFI=.867, AGFI=.830

EFA. Measurement model 2 was based on the theoretical concept of information quality (Lee et al, 2002; Wang & Strong, 1996) and conceptualizes negative perception of review quality as a second order construct supported by four factors: irrelevancy, incredibility, exaggeration, and untimeliness of review information (see Table 3). With the exception of the $\chi 2$ test ($\chi 2$=319.292, d.f.=160, p=0.000), the model's goodness-of-fit was greater than the recommended limits based on several indices (GFI=0.911, AGFI=0.883, RMSEA=0.057, TLI=0.950, CFI=.958, NFI=.919, PCFI= .807, PNFI= .774). The relative chi-square value ($\chi 2$/df=1.996) was smaller than the recommended value of 2.0 for good fit of a model (Tabachnick & Fidell, 2007). Of the four sub-elements of review quality, perceived irrelevance and exaggeration of reviews were more highly related to negative perception of review quality compared to incredibility and untimeliness of reviews (see Table 3).

TABLE 3
Results of Measurement Model 2 (Second Order Model)

Variables	Items	Estimate	S.E.	C.R.	Standardized Estimate	Means (S.D.)	Composite Reliability	AVE
Negative perception of review quality	Irrelevancy	1.000			.993		.930	.771
	Incredibility	.964	.077	12.591***	.885			
	Exaggeration	.945	.087	10.821***	.900			
	Untimeliness	.787	.079	9.938***	.713			
Irrelevancy of reviews	NEG 4	1.000			.755	4.5983 (1.092)	.698	.443
	NEG 7	.858	.081	10.615***	.627			
	NEG 9	.735	.072	10.237***	.606			
Incredibility of reviews	NEG 1	1.000			.857	4.9093 (1.115)	.831	.624
	NEG 3	.943	.055	17.012***	.840			
	NEG 11	.746	.060	12.398***	.657			
Exaggeration of reviews	NEG 10	1.000			.714	4.7211 (1.159	.783	.546
	NEG 8	.948	.081	11.723***	.747			
	NEG 2	.849	.072	11.830***	.755			
Untimeliness of reviews	NEG 5	1.000			.836	5.2578 (1.065	.809	.680
	NEG 6	.924	.077	12.032***	.813			
Usefulness of using reviews	USE 1	1.000			.883	5.2578 (1.065	.872	.695
	USE 2	.980	.054	17.990***	.877			
	USE_3	.810	.055	14.704***	.733			
Review reading activity	REA 1	1.000			.951	4.4714 (1.585)	.834	.820
	REA 2	.947	.035	26.802***	.903			
	REA_3	.856	.036	23.835***	.861			
Purchase intent in online stores	PIN 3	1.000			.841	5.4611 (1.297)	.922	.799
	PIN 1	.971	.046	21.315***	.932			
	PIN 2	.902	.044	20.688***	.906			

*** p< .001
Model 2: $\chi 2$ =319.292(df=160, p=.000), $\chi 2$/df =1.996, RMSEA=.057(LO 90=.047, HI 90=.066, pclose=.114), TLI=.950, CFI=.958, NFI=.919, PNFI=.774, PCFI=.807, GFI=.911, AGFI=.883

When comparing the indices of the two measurement models, the fit indices of measurement model 2 were higher than measurement model 1. The difference between the $\chi 2$ values of model 1 and model 2 were significant ($^{\triangle}\chi^2$=157.288, $^{\triangle}$d.f.=4, p <0.005). For measurement model 1, the RMSEA point estimate was 0.078, the lower bound of the 90% interval was 0.070, and the upper bound of the 90% interval was 0.087. The probability value associated with the test of close fit was lower than 0.05. These values were not in the range of the recommended values confirming that a model fits the data well. However, the RMSEA value for measurement model 2 was 0.057, with the 90% confidence interval ranging from 0.047 (the lower bound) to 0.066 (the upper bound) and the p value for the close fit was 0.114. Thus, when compared to measurement model 1, measurement model 2 fits the data well because the RMSEA point estimate was less than 0.05 (Browne & Cudeck, 1993), the upper bound of the 90% interval didn't largely exceed 0.06 (Hu & Bentler, 1999), and the probability value associated with the test of close fit was higher than 0.05 as well as the difference in $\chi 2$ values.

On the other hand, construct reliabilities of measurement models 1 and 2 were higher than 0.70. However, the AVE value of negative perception of review quality in of the pooled-second order model (AVE=0.771) was higher than those AVE=0.455) of the pooled-first order model (see Table 2 and 3). The correlation matrix of variables is presented in Table 4. Irrelevant,

incredible, exaggerated, and untimely reviews were significantly and highly correlated to negative perception of overall review quality offering evidence that the variables represent a second order construct. However, the four sub-constructs of negative perception of review quality had non-significant or low relationship with the other main constructs (see Table 4). Thus, convergent validities of all variables in measurement models 1 and 2 were confirmed. All SMC values for each model were found to be lower than AVEs confirming discriminant validity (see Table 5).

TABLE 4
The Correlation Matrix of Variables (N=312)

Variables	IR	IR	ER	UR	NEG	REA	PIN
Irrelevant Reviews(IR)	1.00						
Incredible Reviews(IR)	.651**						
Exaggerated Review(ER)	.642**	.637**					
Untimely Reviews(UR)	.555**	.522**	.503**				
Negative Perception of Overall Review Quality(NEG)	.745**	.725**	.617**	.706**			
Perceived Usefulness of Using Reviews(USE)	.063	.285**	.214**	.026	.117*		
Review Reading Activity (REA)	-.119*	.028	-.017	-.093	-.028	.427**	
Purchase Intention(PIN)	-.036	.084	.041	-.009	.021	.227**	.302**

* p< .05 ** p< .01

TABLE 5
The Comparison of AVE and SMC (N=312)

	Variables	NP	PU	AR	PI
Measurement model 1 including first order constructs	Negative perception of review quality (NEG)	***.455***			
	Perceived usefulness of reading reviews(USE)	.073	***.695***		
	Review reading activity (REA)	.002	.210	***.820***	
	Purchase intention in online stores(PIN)	.001	.057	.099	*.799*
Measurement model 2 including a second order construct	Negative perception of review quality (NEG)	***.771***			
	Perceived usefulness of reading reviews(PIN)	.067	***.695***		
	Review reading activity(REA)	.004	.210	***.820***	
	Purchase intention in online stores(PIN)	.000	.057	.099	***.799***

Hypotheses testing

In order to test the hypotheses using measurement model 2 (second order model), a structural equation model (path model 1) illustrated in Figure 1 was analyzed. Table 6 shows that the model's goodness-of-fit was greater than the recommended limits based on several indices (X2/df =1.996, GFI=0.911, AGFI=0.883, RMSEA=0.057, TLI=0.950, CFI=.958, NFI=.919, PC FI= .807, PN FI= .77) except for the probability value of $\chi 2$ test ($\chi 2$=319.292, d.f.=160, p=0.000). The initially hypothesized model fits the data well in that the RMSEA was less than 0.05 (lower bound of the 90% interval was 0.047, upper bound of the 90% interval was 0.066), which was equal to the cutoff value, and the probability value associated with the test of close fit was 0.114. Therefore, the hypothesized model was accepted. As shown in Table 6, negative perception of review quality (H1) and perceived usefulness of reviews (H3) significantly influenced review reading behavior. However, the direct effects of negative perception of review quality (H2) and perceived usefulness of using reviews(H4) on purchase intention in online stores were not significant. Reading behavior of reviews significantly influenced purchase intention in online stores (H5).

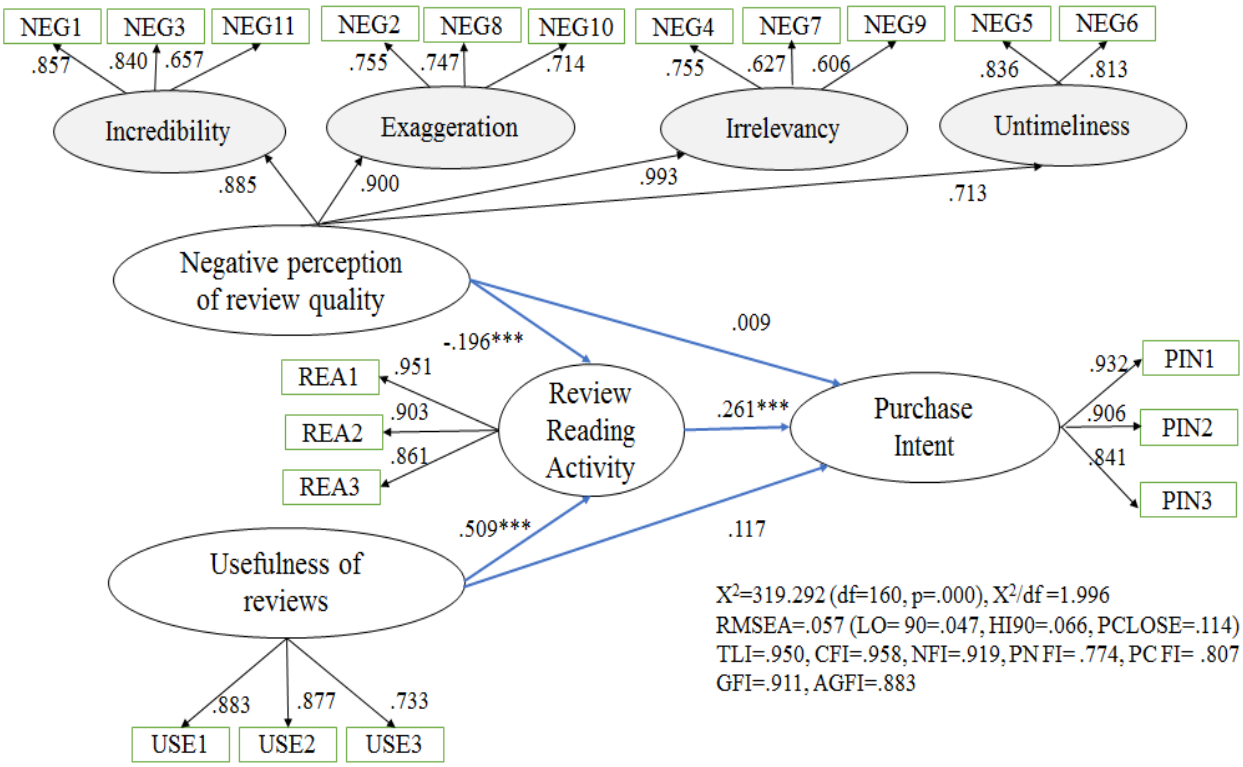
TABLE 6
Results of Path Models and Hypotheses Tests

Research Model		Dependent Variables	Independent Variables	Estimate	S.E	C.R.	P-value	Standardized Estimate
Path model 1 including first order constructs	H1	Review reading activity	Negative perception of review quality	-.300	.094	-3.194	.001	-.187
	H2	Review reading activity	Perceived usefulness of using reviews	.757	.090	8.372	.000	.509
	H3	Purchase intent	Negative perception of review quality	.021	.080	.260	.795	.016
	H4	Purchase intent	Perceived usefulness of using reviews	.135	.086	1.55	.120	.114
	H5	Purchase intent	Review reading activity	.208	.055	3.821	.000	.263
Path model 2 including a second order construct	H1	Review reading activity	Negative perception of review quality	-.308	.094	-3.296	.000	-.196
	H2	Review reading activity	Perceived usefulness of using reviews	.757	.090	8.400	.000	.509
	H3	Purchase intent	Negative perception of review quality	.011	.080	.135	.893	.009
	H4	Purchase intent	Perceived usefulness of using reviews	.138	.086	1.597	.110	.117
	H5	Purchase intent	Review reading activity	.207	.055	3.784	.000	.261

Model 1: $\chi 2$ =476.580(df=164, p=.000), $\chi 2$/df =2.906, RMSEA=.078(LO 90=.070, HI 90=.087, pclose=.000), TLI=.904, CFI=.917, NFI=.880, PNFI=.759, PCFI=.792, GFI=.867, AGFI=.830

Model 2: $\chi 2$ =319.292(df=160, p=.000), $\chi 2$/df =1.996, RMSEA=.057(LO 90=.047, HI 90=.066, pclose=.114), TLI=.950, CFI=.958, NFI=.919, PNFI=.774, PCFI=.807, GFI=.911, AGFI=.883

FIGURE 1
The Effects of Consumer Review Quality and Usefulness on Review Reading Activity and Purchase Intention: Path Model 1

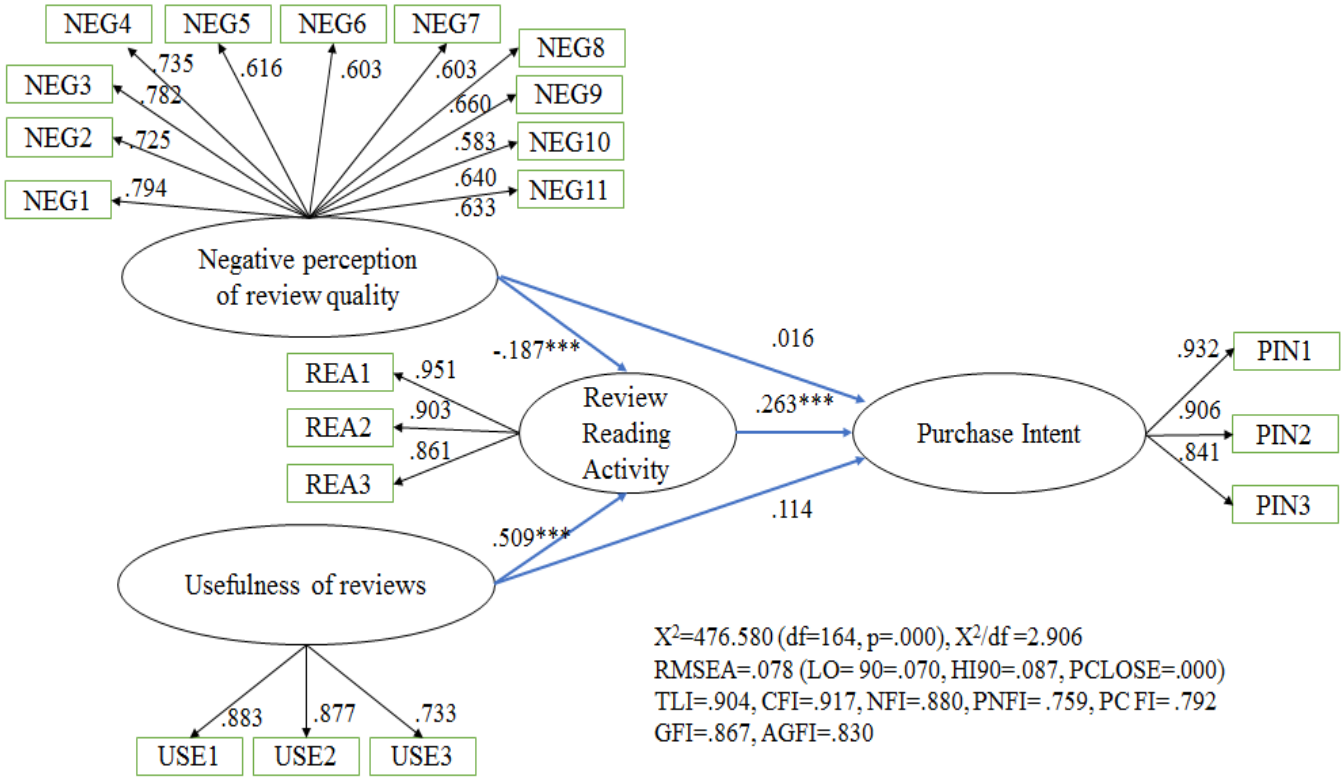


*Note: Negative perception of review quality among four main constructs is a second-order construct which have four first-order constructs with observed variables and the other three main variables are also first-order constructs; numbers indicate standardized coefficients *** p < 0.001*

As a point of reference, we also analyzed the relationship among variables using the measurement model 1 (path model 2). Although, goodness-of-fit of the path model 1 was less than the recommended limits based on several indices ($\chi 2/df=2.906$, TLI=.0.904, CFI=.917, NFI=.880, PC FI= .792, PNFI= .759 GFI=0.867, AGFI=0.830) including RMSEA (RMSEA=0.078, LO 90=0.07, HI 90=0.087, pclose=.000), the test results using the path model 1 were consistent with the test results using the path model 2. The significant or non-significant paths were same in the path models 1 and 2.

Based on the path models, three hypotheses (H1, H3, and H5) were supported and two hypotheses (H2 and H4) were not supported. Consumers' negative perception of review quality negatively influenced review reading activity (H1) while consumers' perceived usefulness of reviews positively influenced review reading activity (H3). Review reading activity has a positive effect on purchase intention in online stores (H5).

FIGURE 2
The Effects of Consumer Review Quality and Usefulness on Review Reading Activity and Purchase Intention: Path Model 2



Note: Negative perception of review quality is a first-order construct which has eleven observed variables and the other three main variables are also first-order constructs; numbers indicate standardized coefficients
*** $p < 0.001$

These findings indicate that negative perceptions of review quality negatively influence purchase intention in the online stores hosting the reviews by discouraging consumer reading of reviews for a purchase event. Perceived usefulness of reviews indirectly affects purchase intention through review reading. Perceived usefulness of reviews indirectly affects purchase intention through review reading. Therefore, we confirmed that review reading behavior mediates the negative perceptions of review quality and perceived usefulness of using reviews on purchase intention in the online stores which host the reviews. When comparing the relationships across variables in the path model, actual behavior of reading reviews explained 26.1% of variance in purchase intent (see standardized estimates in Table 6).

The influence of negative perception of review quality on reading of reviews was relatively low while perceived usefulness of

using reviews had a greater effect on reading reviews.

The indirect effects of negative perception for review quality on the purchase intention in each path model were also determined. As shown in Table 7, the indirect effects of perceived review quality and usefulness on purchase intention were statistically significant in both models. This confirmed that negatively perceived review quality negatively influenced purchase intention of products by decreasing consumers' reading activity in online stores which sold the products, while perceived review usefulness positively influenced purchase intention of products by increasing consumers' reading activity in online stores which sold the products. This result also confirmed the importance of consumers' reading activity as a mediator between consumers' perception of review quality and usefulness and their purchase intention.

DISCUSSION AND CONCLUSION

Several conclusions and implications are drawn from our study that adds new knowledge to e-WOM and e-retailing. Based on our research model, we can conclude that consumers' negative perceptions of review quality decrease online purchase intentions by deterring the reading behavior of reviews (H1 and H5) while consumers' positive perceptions of the usefulness of reviews increase reading activity (H2 and H5). Many previous studies (e.g. Cheung et al., 2008; Cheung, Lee, & Rabjohn, 2009; Kumar & Benbasat, 2006; Sussman & Siegal, 2003) have identified the relationship among word-of-mouth message characteristics, usefulness of information, adoption of information, and website evaluation.

TABLE 7

The Indirect Effects of Perceived Review Quality and Usefulness on the Purchase Behavior

$^{**}p < .01$ $^{***}p < .001$

Model	Indirect paths	Standardized estimate	S.E.
Path Model 1 including a second order construct	Negative perception of review quality → review reading activity → purchase intention	-.051***	.020
	Perceived review usefulness → review reading activity → purchase intention	.133***	.039
Path Model 2 including first order constructs	Negative perception of review quality → review reading activity → purchase intention	-.049**	.020
	Perceived review usefulness → review reading activity → purchase intention	.134***	.038

Our study broadens the research literature by offering knowledge on how negative perceptions of review quality and perceptions of review usefulness indirectly influence the consumer's purchase in online stores through reading review behavior. Our finding contributes to the understanding of how consumer reviews influence their buying behavior in online shopping sites highlighting the importance of review quality as well as review usefulness.

Contrary to our expectation, consumers' negative perceptions of review quality and perceived usefulness of using reviews did not directly affect online purchase. This result may because of the fact most of our respondents (80.8%) bought the product which they listed in the survey. In other words, most respondents of our samples did not negatively perceive the quality of reviews posted on the products which they bought and they may have trusted the reviews to some extent. In future studies, it will be advisable to differentiate respondents who read product reviews but did not purchase the product versus those that purchased the product.

Research directly measuring negative consumer reviews is almost nonexistent except for studies that report consumer doubts about online reviews and their lack of confidence in the quality of information (Schindler & Bickart, 2005). In particular, the main contribution of our study is the development of a measurement for negative perception of review quality, negative perceptions of review quality, as a second-order construct based on four information quality constructs of irrelevancy, incredibility, exaggeration, and untimeliness adapted from previous studies of the information system research field (DeLone & McLean 1992; Lee et al., 2002, Wang & Strong, 1996). In our sample, exploratory analysis generated the sub-elements of review quality as a factor and with high correlations across the sub-constructs. Negative perceptions of review quality were developed as a second order construct with four factors to minimize the problem generated by multi-collinearity across independent variables. In addition, the AVE of negative perceptions of review quality were greater in measuring as a second-order construct compared to the first -order construct. This measurement had relatively good convergent validity and discriminant validity. Thus, future studies identifying the effects of the low and high quality of consumer reviews may be more improved using our measurement items.

The results offer several managerial implications to e-retailers. This study highlights the importance of review reading behavior and its effect on purchase intention in online stores. Encouraging review reading by fostering a sincere, positive and supportive review environment appears to be critical. Creating systems to enhance the quality of reviews and heightening consumer perceptions that reading the reviews have allowed them to make better purchase decisions will go a long way. Although offering a standardized instrument for consumers to rate their purchases would allow managers to tightly control the consumer content, the rich expressive meanings and persuasive communication we customarily find in open ended reviews would be lost. One idea is for online stores to encourage quality reviews by offering incentives or coupons for best rated open-ended reviews.

Several limitations of the study are noted but also offer multiple opportunities for future research. First, our research examined consumers' negative perception related to only four elements of information quality. Other potential characteristics of consumer reviews such as the degree of vividness, comprehensiveness, consistency could be investigated as well. Second, our research focused on the reviews hosted by online

stores which participants recently visited. It is useful to examine whether our results can be reproducible through experimental studies which variously manipulate the levels of incredibility, irrelevancy, exaggeration, and untimeliness of reviews and amount of incredible, irrelevant, exaggerated, and untimely reviews posed in a review board of an online store. Third, our sample is limited to university students who frequently shop online and read online reviews. As such, our data were collected using a convenience sample with narrow demographic representation. Future researchers need to investigate consumers from a broader base in terms of age and gender. Fourth, more research needs to be conducted on how consumer reviews may be an important factor for both online retailers and consumers. Future research could investigate how consumer reviews can contribute to consumers' satisfaction with online stores based on the quality level of consumer reviews hosted by online stores.

REFERENCES

Ahituv, N. (1980, December). A systematic approach toward assessing the value of an information system. *MIS Quarterly*, 4(4), 61-75.

Arndt, J. (1967). Role of product-related conversations in the diffusion of a new product. *Journal of Marketing Research*, 4, 291–295.

Bailey, J. E., & Pearson, S. W. (1983). Development of a tool for measuring and analyzing computer user satisfaction. *Management Science*, *29*(5), 530-545.

Ballou, D. P., & Pazer, H.L. (1995). Designing information systems to optimize the accuracy–timeliness trade off. *Information Systems Research, 6*(1), 51-72.

Bickart, B., & Schindler, R. M. (2001). Internet Forums as Influential Sources of Consumer Information. *Journal of Interactive Marketing, 15*, 31-40.

Brown, S. L., Tilton, A., & Woodside, D. M. (2002). The case for on-line communities. The McKinsey Quarterly, 1(1).

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K.A. Bollen and J. S. Long (Eds), *Testing Structural Equation Models* (pp. 136-162), Beverly Hills, CA: Sage Publications.

Burgess, M. S. E., Gray, W. A., & Fiddian, N. J., (2007). Using quality criteria to assist in information searching. *International Journal of Information Quality, 1*(1), 83-99.

Chae, M., & Kim, J. (2001). Information quality for mobile internet services: A theoretical model with empirical validation. ICIS 2001 Proceedings, 6. https://aisel.aisnet.org/icis2001/6

Cheung, C. M. K., Lee, M. K. O., & Rabjohn, N. (2008). The impact of electronic word-of-mouth. *Internet Research, 18*(3), 229-247. doi:http://dx.doi.org/10.1108/10662240810883290

Cheung, M. Y., Luo, C., Sia, C. L., & Chen, H. (2009). Credibility of electronic word-of-mouth: Informational and normative determinants of on-line consumer recommendations. *International Journal of Electronic Commerce, 13*(4), 9-38.

Chevalier, J. A., & Mayzlin, D. (2006). The effect of word of mouth on sales: Online book reviews. *Journal of Marketing Research, 43*(3), 345-354.

Choi, J., & Lee, K. –H. (2003). Risk perception and e-shopping: A cross cultural study. *Journal of Fashion Marketing and Management, 7*(1), 49-64.

Clemons, E. K., Gao, G., & Hitt, L. M. (2006). When online reviews meet hyperdifferentiation: A study of the craft beer industry. *Journal of Management Information Systems, 23*(2), 149-171.

Dash, S., & Saji, K. B. (2007). The role of consumer self-efficacy and website social-presence in customers' adoption of B2C online shopping: An empirical study in the Indian context. *Journal of International Consumer Marketing, 20*(2), 33-48.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science, 35*(8), 982-1003.

Dellarocas, C. (2003). The digitization of word of mouth: Promise and challenges of online feedback mechanisms. *Management Science, 49*(10), 1407-1424.

DeLone, W. H., & McLean, E. R. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research, 3*(1), 60-95.

Engel, J. F., Kegerris, R. J., & Blackwell, R. D. (1969). Word of mouth communication by the innovator. *Journal of Marketing, 33*, 15–19.

Gallagher, C. A. (1974, March). Perceptions of the value of a management information system. *Academy of Management Journal, 17*(1), 46-55.

Gefen, D., Karahanna, E., & Straub, D. W. (2003). Inexperience and experience with online stores: The importance of TAM and trust. IEEE Transactions on Engineering Management, 50(3), 307-321.

Goodhue, D. (1986, Fall/Winter 1988). I/S attitudes: Toward theoretical and definition clarity. *ACM SIGMIS Database: the DATABASE for Advances in Information Systems, 19*(3-4), 6-15.

Ho, S. Y., & Tam K. Y. (2005). An empirical examination of the effects of web personalization at different stages of decision making. *International Journal of Human - Computer Interaction, 19*(1), 95-112.

Hu, L. –T, & Bentler, P. M. (1999). Cut off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1-55.

Hu, P. J., Chau, P. Y. K., Liu Sheng, O. R., & Kar, Y. T. (1999). Examining the technology acceptance model using physician acceptance of telemedicine technology. *Journal of Management Information Systems, 16*(2), 91-112.

Kim, D. J., Ferrin, D. L., & Rao, R. H. (2008). A trust-based consumer decision-making model in electronic commerce: The role of trust, perceived risk, and their antecedents. *Decision Support Systems, 44*(2), 544-564.

Kim, J., & Gupta, P. (2012). Emotional expressions in online user reviews: How they influence consumers' product evaluations. Journal of Business Research, 65(7), 985.

King, W. R., & Epstein, B. J. (1983). Assessing information system value: An experimental study. *Decision Sciences, 14*(1), 34-45.

Knight, S. A., & Burn, J. (2005). Developing a framework for assessing information quality on the world wide web. *Informing Science, 8*, 159–172.

Kumar, N., & Benbasat, I. (2006). The influence of recommendations and consumer reviews on evaluations of websites. *Information Systems Research, 17*(4), 425-441.

Lee, Y. W., Strong, D. M., Kahn, B. K., & Wang, R. Y. (2002). AIMQ: A methodology for information quality assessment. *Information & Management, 40*(2), 133-146.

Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & Management, 40*(3), 191-204.

Mathieson, K. (1991). Predicting user intentions: comparing the technology acceptance model with the theory of planned behavior. *Information Systems Research, 2*(3), 173–191.

Miller, J., & Doyle, B. A. (1987). Measuring the effectiveness of computer-based information system in the financial services sector. *MIS Quarterly, 11*(1), 107-124.

Mudambi, S.M., & Schuff, D. (2010) What makes a helpful review? A study of customer reviews on Amazon. com. *MIS Quarterly, 34*, 185-200.

Negash, S., Ryan, T., & Igbaria, M. (2003). Quality and effectiveness in web-based customer support systems. Information & Management, 40(8), 757-768.

Reeves, C. A., & Bednar, D. A. (1994). Defining quality: Alternatives and implications. Academy of Management. *The Academy* Szajna, B. (1996). Empirical evaluation of the revised technology acceptance model. *Management Science, 42*(1), 85-92. *of Management Review, 19*(3), 419-445.

Richins, M. L. (1983). Negative word-of-mouth by dissatisfied customers: A pilot study. *Journal of Marketing, 47*, 68–78.

Robey, D. (1979). User attitudes and management information system use. *The Academy of Management Journal, 22*(3), 527-538

Robey, D., & Farrow, D. (1982). User involvement in information system development: A conflict model and empirical test. Management Science (Pre-1986), 28(1), 73-85.

Schindler, R. M., & Bickart, B. B. (2005). Published word of mouth: Referable, consumer-generated information on the internet. *Online Consumer Psychology: Understanding and Influencing Consumer Behavior in The Virtual World, 32*, 35-61.

Schultz, R. L., & Slevin, D. P. (1975). Implementation and organizational validity: An empirical investigation, In R. L. Schultz and D. P. Slevin (Eds.), *Implementing Operations Research/Management Science* (pp. 153-182), New York, NY: American Elsevier.

Sussman, S. W., & Wendy, S. S. (2003). Informational influence in organizations: An integrated approach to knowledge adoption. *Information Systems Research, 14*(1), 47-65.

Swanson, E. B. (1974, October). Management information systems: Appreciation and involvement. *Management Science, 21*(2), 178-188.

Subramanian, G. H. (1994). A replication of perceived usefulness and perceived ease of use measurement, *Decision Sciences 25*(5/6), 863–874.

Tabachnick, B. G., & Fidell, L. S. (2007). Using Multivariate Statistics (5th ed.). New York Allyn and Bacon.

Taylor, S., & Todd, P. A. (1995). Understanding information technology usage: A test of competing models. *Information Systems Research, 6*(2), 144-176.

Venkatesh, V., & Davis, F. D. (1996). A model of the antecedents of perceived ease of use: Development and test. *Decision Sciences, 27*(3), 451-481.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46*(2), 186-204.

Venkatesh, V., & Morris, M. G. (2000). Why do not men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *MIS Quarterly, 24*(1), 2000, 115–139.

Wand, Y., &. Wang, R. Y. (1996). Anchoring data quality dimensions in ontological foundations. *Communications of the ACM, 39*(11), 86-95

Wang, R. Y., & Strong, D. M. (1996). Beyond accuracy: What data quality means to data consumers. *Journal of Management Information Systems, 12*(4), 5-33.

Zhu, X., & Gauch, S. (2000). Incorporating quality metrics in centralized/distributed information retrieval on the World Wide Web. Proceedings of the 23rd annual international ACM SIGIR conference on Research and Development in Information Retrieval SIGIR (pp. 288-295). Athens, Greece.

Zmud, R. (1978). Concepts, theories and techniques: An empirical investigation of the dimensionality of the concept of information. *Decision Sciences, 9*(2),187-195.

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