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# Consumer Motivations to Search E-Health Information

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## **ABSTRACT**

E-health information has become an important resource for people seeking health information. Even though many studies have been conducted to examine the quality of e-health information, only a few studies have explored the effects of e-health information seekers' motivations on perceived quality of e-health information. There is even less information about repeated search for e-health information after users' initial 'experience' of e-health information use. Using an online survey of information seekers, 252 e-health information users' responses were collected. The research examines the relationship between motivation, perceived quality, satisfaction and intention to repeat-search e-health information. The results identify motivations to search e-health information, and confirm the relationship between motivation, perceived quality dimensions, satisfaction and intention to repeat-search for e-health information.

## **Keywords**

E-health information, motivation, perceived information quality, satisfaction, intention to repeat-search

## **INTRODUCTION**

The higher the quality of life becomes, the more consumers are interested in health care. People can manage their own and others' health without constraint by time or place with the Internet. The development of information technologies makes it possible for health-related knowledge to be transferred from health professionals to the general public (Benigeri and Pluye, 2003). The Pew Internet and American Life project (2005) reported that about 80% of American Internet users have searched online for health-related information. That is about 95 million Americans.

There is no doubt that the Internet has great potential to provide accurate and appropriate e-health information to patients when they need it and to improve the quality of the health care industry. However, it is difficult to separate the accurate and appropriate information that is needed from the large amount of information that is available (Allain, Schuck, Beaufils, Zekri, Ganilsy and Allain, 1998; Coiera, 1996; Kim, Eng, Deering and Maxfield, 1999; Silberg, Lundberg, and Musacchio, 1997; Sonnenberg, 1997; Wyatt, 1997). Even with its uncertainty of quality, e-health information has become an important resource for people seeking health information, with the quality of this information being critical in potentially affecting health outcomes for many information users (Sellitto, 2002; Haddow, 2003). Much research was conducted to evaluate the quality of e-health information due to the potential for harm from misleading and inaccurate health information (Jadad and Gagliardi, 1998; Pealer and Dorman, 1997).

Although studies on the quality of e-health information were conducted, the empirical explorations of information users' satisfaction and intention to repeat-search are very limited. Moreover research which is related to the relationships between the motivation to search e-health information, perceived information quality, satisfaction and intention to repeat-search of e-health information has not been actively studied yet as a united chain of process. Thus, the purpose of this study is to examine how motivation is related to four dimensions of perceived quality on e-health information and how these in turn influence satisfaction and intention to repeat-search for e-health information. The major contribution of this research is the inclusion of motivation into the satisfaction model and the adoption of this model for e-health information.

## LITERATURE REVIEW

### E-Health Information

Consumers use the Internet when searching for information and the dependence on the Internet as a primary information source will increase in the future (Peterson and Merino, 2003). Consumers search online information when they want specific product or service information in anticipation of a purchase as well as when they want to obtain general information about a brand or product or service category (e.g., Breitenbach and Van Doren, 1998; Shim, Eastlick, Lotz and Warrington, 2001). E-health information has also become an important resource for people seeking health information (Sellitto, 2002; Haddow, 2003).

E-health information has many benefits to consumers. Since the Internet makes it possible to access health information in remote areas and in other under-served populations (LaPerrière, Edwards, Romeder and Maxwell-Young, 1998; McGrath, 1997), it can offer greater equality in access to health information (Morris, Guard, Marine, Schick, Haag, Tsipis, Kaya and Shoemaker, 1997). The interactivity of the Internet (Pereria and Bruera, 1998; McMillan, 1999) promotes tailoring of messages and facilitates interpersonal interaction. Therefore, in contrast to traditional sources of health information, e-health information can offer the potential for more customized messages in a variety of formats (Robinson, Patrick, Eng and Gustafson, 1998). Consumers can choose websites, links and specific messages based on knowledge, educational or language level, need, and preferences for format and learning style (Pereira and Bruera, 1998). At the same time, e-health information can provide traditional health information and patient education materials inexpensively (Richards, Colman and Hollingsworth, 1998). However, the rapid development of e-health information raises the issue of its quality (Impicciatore, Pandolfini, Casella and Bonati, 1997) and of potential dangers related to its erroneous or unsuitable use (Allain et al., 1998; Coiera, 1996; Kim et al., 1999; Silberg et al., 1997; Sonnenberg, 1997; Wyatt, 1997). Much research was conducted to evaluate the quality of e-health information due to these potential dangers (Jadad and Gagliardi, 1998; Pealer and Dorman, 1997). Studies on e-health information quality are contradictory. Some researchers consider that the quality of e-health information to be poor (Doupi and Van der Lei, 1999; Latthe, Latthe and Charlton, 2000). However, others concluded that it is of equal value to information provided by other media (Sandvik, 1999; Hellowell, Turner, Le Monnier and Brewster, 2000). The large number and variety of sources for e-health information may cause these contradictory results. Because of this problem, dimensions for evaluating e-health information quality have been developed by previous studies. According to Benigeri and Pluye (2003), these dimensions include website content (quality, reliability, accuracy, scope, etc.), form (design, aesthetics, interactivity, use of media, etc.), accessibility (fee for access, navigability, functionality, etc.), credibility of sources, and confidentiality policy (Kim et al., 1999). However, the impact of these dimensions on website design has been relatively weak because they are subject to the good will of website designers (Benigeri and Pluye, 2003). Accordingly, this study focused on perceived information quality dimensions not on website characteristics themselves such as design, aesthetics, loading time, etc.

### Value-Driven Motivation to Search

Various motivations provoke user behavior (Hui, Tan and Goh, 2006). For example, in economic literature, it is assumed that people make consumption choices based on utilitarian criteria (i.e., monetary gain or time saving). However, psychology literature focused on how needs affect human decisions (Maslow, 1970). The marketing literature suggests that consumer behavior is motivated by both utilitarian and psychological value (Babin, Darben and Griffin, 1994; Dhar and Wertenbroch, 2000). Because perceived value has proven to be a difficult concept to define and measure (Zeithaml, 1988; Holbrook, 1994; Woodruff, 1997), there have been various definitions of value by many researchers.

Zeithaml (1988) considered value to be the customer's overall assessment of the utility of a product based on the perception of what is received and given. Butz and Goodstein (1996) defined value as the emotional bond established between a customer and a producer after the customer has used a salient product or service produced by that supplier. Woodruff (1997) defined customer value as a customer-perceived preference for, and evaluation of, product attributes, attribute performances, and consequences in terms of the customer's goals and purposes.

Hoffman and Novak (1996) explained the differences between a specific information search and a general information search both of which are characterized by six dimensions. A specific information search was characterized as being extrinsically motivated, having an instrumental orientation, reflecting situational involvement, seeking utilitarian benefits, consisting of directed search, and focusing on goal-directed choices. When people are extrinsically motivated, they seek benefits for the purpose of accomplishing other goals (Davis, Bagozzi and Warshaw, 1992; Hilliard, 1950; Holbrook, 1999). Online information seekers might search e-health information with a specific goal. For example, seekers search e-health information for active coping when they have a certain disease. A general information search was characterized as being intrinsically motivated, having a ritualized orientation, reflecting enduring involvement, seeking hedonic benefits, consisting of nondirected search, and focusing on navigational choices (Hoffman and Novak, 1996). When people are intrinsically motivated, they seek the consumption experience as an end in itself (Davis et al., 1992; Holbrook, 1999). For example, online users may seek out the epistemic experiences provided by some websites. In this case, the benefits (epistemic experiences) provide direct consumption values to people.

According to Hirschman and Holbrook (1982), customers were described as either “problem solvers” or in terms of customers seeking “fun, fantasy, arousal, sensory stimulation, and enjoyment.” This dichotomy has been represented in the retail context by the themes of shopping with utilitarian value (Childers, Carr, Peck and Carson, 2001; Fischer and Arnold 1990; Sherry, McGrath, and Levy, 1993) versus shopping with hedonic value (Babin et al., 1994; Bloch and Bruce, 1984; Childers et al., 2001; Sherry, 1990). In the shopping context, intrinsic motivation is considered hedonic motivation. People might also search e-health information as a general information search. It is difficult to say consumers have fun when they search e-health information. However, consumers do get emotional or psychological motivation through getting knowledge. For example, they can search it to improve their knowledge even though they do not have a disease or concern about their health. Therefore, this study examined epistemic value as intrinsic motivation to general information search.

### **Perceived Information Quality**

The research explores information quality rather than the technological aspects of health-related websites. Thus, the perceived quality dimensions of e-health information were measured for this study. Even though Perceived Information Quality (PIQ) has been studied in various fields for a long time, there has been disagreement about the dimensions of PIQ in the literature (Maltz, 2000). However, it is clear that PIQ is a multi-dimensional construct (Machlup and Mansfield, 1983; Glazier, 1991; Moenaart and Souder, 1996; Maltz, 2000). Maltz (2000) suggested four dimensions of PIQ: credibility, comprehensibility, relevance, and timeliness on the basis of extant research.

Moenaart and Souder (1996) defined credibility in terms of the degree of perceived distortion. Maltz (2000) defined credibility as the degree to which information is perceived by the receiver as a reliable reflection of the truth. The comprehensibility was suggested as a second dimension of information quality by Maltz (2000). He defined it as the perceived clarity of the information received. Accordingly, this dimension is about the understandability of the information. Next, relevance refers to the degree to which the information is appropriate for the user’s task or application (Maltz and Kohli, 1996; Maltz, 2000). Last, timeliness is about the degree of current and actionable information (Maltz, 2000).

### **Satisfaction and Intension to Repeat-Search**

User satisfaction has been considered a comparison between the expectation of value in the pre-consumption stage and the perceived post-consumption value after the purchase or after usage of service or products (Parasuraman, 1997; Ravald and Grönroos, 1996). Satisfaction is typically modeled as a function of prior expectations or desires, perceived performance and disconfirmation of the standard expectations (Cadotte, Woodruff and Jenkins, 1987; Churchill and Surprenant, 1982; Oliver, 1980; Spreng, MacKenzie and Olshavsky, 1996). It is universally accepted that satisfaction is a post-consumption evaluation (Hunt, 1977; Oliver, 1981). The relationship between user satisfaction and intention to repeat-use has been identified (Bearden and Teel, 1983; Oliver, 1980). Increasing user satisfaction and retention leads to improved profits, positive word-of-mouth, and lower marketing expenditures (Reichheld, 1996; Heskett, Sasser and Schlesinger, 1997).

### **CONCEPTUAL MODEL AND HYPOTHESES**

Perceived value occurs at different stages of the purchasing process, including the pre-consumption stage (Woodruff, 1997). However, it is clear that consumer behavior is motivated by value, which is shaped by both utility-related and psychological factors (Babin et al., 1994; Dhar and Wertenbroch, 2000). Therefore, this study examined perceived values as motivations to search e-health information.

*Hypothesis 1a:* The utilitarian motivation to search e-health information has an influence on each of the quality dimensions of e-health information.

*Hypothesis 1b:* The epistemic motivation to search e-health information has an influence on each of the quality dimensions of e-health information.

The first determinant of overall customer satisfaction is perceived quality (Fornell, Johnson, Anderson, Cha and Bryabt, 1996). Yang, Peterson and Huang (2001) conducted a qualitative study of online pharmacy patrons and found a relationship between website quality attributes and customer satisfaction. Based on these studies, we proposed that each dimension of consumers' perceived information quality would influence their satisfaction with e-health information.

*Hypothesis 2a:* Relevance of e-health information has a positive influence on satisfaction with e-health information.

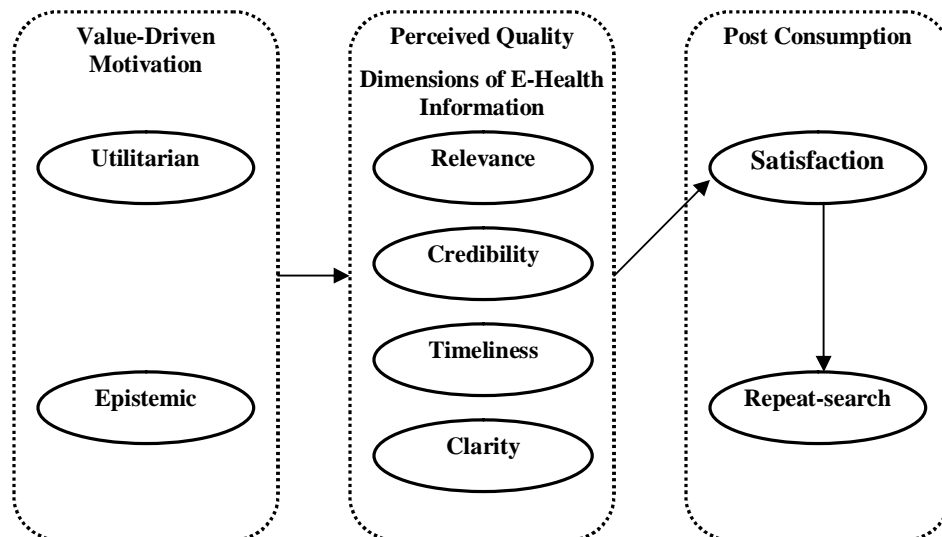
*Hypothesis 2b:* Credibility of e-health information has a positive influence on satisfaction with e-health information.

*Hypothesis 2c:* Timeliness of e-health information has a positive influence on satisfaction with e-health information.

*Hypothesis 2d:* Clarity of e-health information has a positive influence on satisfaction with e-health information.

This study did not focus on a certain website, so we did not examine loyalty to a certain website. Instead, we examined intention to repeat-search e-health information. According to the previous studies, it was proved that customer satisfaction influences repeated usage intentions (Yi, 1990). Accordingly, we proposed that consumers' satisfaction with e-health information would influence their intention to repeat-search e-health information.

*Hypothesis 3:* Satisfaction with e-health information has a positive influence on intention to repeat-search e-health information.



**Figure 1. Proposed Model for Consumer Value Driven E-Health Information Search**

## METHOD

To accomplish the research objective, an empirical investigation was conducted to test the conceptual model. To allow for generalizations beyond a certain website and to enhance the model's validity, the questionnaire was developed for general e-health information. Using an online survey of information seekers, 252 e-health information users' responses were collected for this quantitative research.

## Measures

We measured the model's constructs using a structured questionnaire. The measures in this study were adapted from previous studies and were further refined. As shown in Table 1, the questionnaire consists of motivations (utilitarian value, epistemic value), perceived information quality dimensions, satisfaction and intention to repeat-search. The reliability was checked and proved to have high coefficients. The questionnaire also includes whether respondents have seen the e-health information, whether they have searched the e-health information actively, and demographics.

### Reliability and Construct Validity

In this research, internal consistency reliability is measured by adopting Cronbach's alpha values for all individual scales and the overall measure. All multiple-item measures included in the study demonstrated acceptable reliability, as measured by coefficient alphas ranging from .72 to .94, thus confirming the internal consistency and reliability of the scales. Scale reliabilities for each scale item are reported in Table 1.

Variable		Cronbach's Alpha
Motivation	Utilitarian Value	.86
	Epistemic Value	.93
Perceived Information Quality	Credibility	.76
	Relevance	.85
	Clarity	.87
	Timeliness	.72
Satisfaction		.86
Intention to Repeated Usage		.94

**Table 1. Reliability**

### Sample Characteristics

The average age of the sample was about 42 years old. Females were 61%, and males were 39%. About 37% of the sample had a college degree, and about 27% of them had some advanced education. About 60% of the sample had more than \$40,000 household income. The majority of them (81.7%) were Caucasian. More than half (56.0%) were married (Table 2).

Variable		Frequency	Percentage
Age	20 – 29	62	24.6
	30 – 39	63	25.0
	40 – 49	51	20.2
	50 – 59	43	17.1
	Over 60	33	13.1
Gender	Male	98	38.9
	Female	154	61.1
Education	Elementary school	.	.
	High school or equivalent	15	6.0
	Vocational/Technical school	10	4.0
	Some college	65	25.8
	College graduate (4 year)	93	36.9
	Master's degree (MS)	47	18.7
	Doctoral degree (PhD)	16	6.3
Professional degree	6	2.4	
Household	Under \$10,000	17	6.7

Income	\$10,000 - \$19,999	11	4.4
	\$20,000 - \$29,999	26	10.3
	\$30,000 - \$39,999	21	8.3
	\$40,000 - \$49,999	38	15.1
	\$50,000 - \$74,999	45	17.9
	\$75,000 - \$99,999	40	15.9
	Over \$100,000	54	21.4
Ethnic Background	African-American	7	2.8
	Caucasian	206	81.7
	Hispanic	9	3.6
	Native American	3	1.2
	Asian	18	7.1
	Other	9	3.6
Marital Status	Divorced	20	7.9
	Living with others	23	9.1
	Married	141	56.0
	Separated	3	1.2
	Single	63	25.0
	Widowed	2	.8

**Table 2. Sample Characteristics (N=252)**

## RESULTS

We tested the proposed conceptual model (Figure 1) using structural equation modeling. The empirical estimates for the main-effects model are shown in Table 3 and Table 4. The Chi-square was 925.062 ( $p < .0001$ ). The goodness of fit index was .911, adjusted goodness of fit Index was .817, and RMSEA was .062. Thus overall the data indicate an excellent fit for our conceptual model. The path coefficients are presented in Table 4. The results indicate that utilitarian motivation of e-health information seekers has more influence on the perceived information quality than epistemic motivation. The findings demonstrated that while utilitarian motivation had consistently strong effects on all dimensions of perceived information quality, epistemic motivation had weaker effects than utilitarian motivation.

All dimensions of perceived information except clarity have positive relationships with satisfaction with e-health information. Satisfaction with e-health information has a positive relationship with the intention to repeat-search.

Fit Measures	Fit Guidelines	E-health Proposed Model
$\chi^2$ (p-value)	$p \leq .05$	925.062 ( < .0001)
$X^2/df$	$\leq 3.0$	2.965
GFI	$\geq .90$	.911
AGFI	$\geq .80$	.817
TLI	$\geq .90$	.891
CFI	$\geq .90$	.949
RMSEA	$\leq .08$	.062

Table 3. Fit Measures for Proposed Model

Motivation $\Rightarrow$ Perceived Quality		Coefficient
Utilitarian Value	Relevance	.51**
	Credibility	.61**
	Timeliness	.72**
	Clarity	.68**
Epistemic Value	Relevance	.27**
	Credibility	.32**
	Timeliness	.42**
	Clarity	.41**
Perceived Quality $\Rightarrow$ Satisfaction		
Relevance	Satisfaction	.89**
Credibility		.91*
Timeliness		.25*
Clarity		.50 (n.s)
Satisfaction $\Rightarrow$ Intention to Repeat-Search		.83**

\*\* p<.01, \*p<.05

Table 4. Hypotheses Testing Results

**DISCUSSION**

In this research, we examined the impact of perceived information quality in concert with satisfaction and intention to repeat-search in terms of utilitarian and epistemic motivations to search e-health information. The results presented in the preceding section indicate that the research model fits well. Our findings indicate that perceived information quality lead to satisfaction and the satisfaction leads to intention to repeat-search. These findings justify the efforts to improve quality and satisfaction collectively as a means of improving customers' intention to repeat-search.

While relevance and credibility have strong relationships with satisfaction, timeliness has a relatively weaker impact on satisfaction. In addition, the effect of clarity of information on satisfaction was not significant. Thus the key to customer retention and customer creation appears to be the fostering of customer satisfaction with improved relevant and credible e-health information.



## Limitations

As with most survey research, this study is not without limitations. Since an online survey was used for this study, the respondents might not cover people who have less exposure to the Internet. Specifically, the sample used in our online survey comes from an online panel that is more upscale and technologically sophisticated than the general Internet population.

This research was not a natural experiment such as using actual users to search for e-health information, so we cannot draw conclusions about what people actually encounter when they search for e-health information.

There are various e-health information websites. Furthermore, different users may have different criteria for quality. Accordingly, defining a single quality standard for such a disparate collection of resources is challenging.

## Conclusion

This study was conducted from the consumers' point of view. Accordingly, our contribution lies in the fact that we put motivation, perceived quality dimensions, satisfaction, and intention to repeat-search into our study and examined the relationships. The conceptual model included pre-search and post-search processes. Thus, this study is based on the concrete theories in consumer literature.

This study examined what and how two motivations affect perceived e-health information quality dimensions, and post-consumption. One of the managerial implications is that since e-health information consumers' utilitarian motivation has more influence on their perception about information quality of e-health information, e-health information providers should consider consumers' utilitarian motivation to satisfy them.

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