



# User involvement and user satisfaction with information-seeking activity

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**Abstract**

This paper presents the result of an empirical study that investigates user involvement and user satisfaction in the context of information-seeking activity. This study adopts the definition of user involvement as the psychological state of the importance and personal relevance that users attach to a given system. Following Celsi and Olson, intrinsic and situational motivators were considered as two antecedents of user involvement. These two types of motivator were treated as formative exogenous variables, while user involvement and user satisfaction were treated as reflective mediating endogenous variable and final endogenous variable, respectively. Five hypotheses were proposed, and all were supported by the data from a laboratory experiment. This paper also reports two other interesting findings. First, intrinsic motivators have a stronger positive effect on user involvement than situational motivators have. Second, situational motivators have a stronger positive effect on user satisfaction than intrinsic motivators have. The discussion part explains these interesting findings.

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**Introduction**

Studies have identified the importance of individuals interacting with product information, which is widely available in the Internet, which may influence individuals' willingness to purchase online (e.g. Jahng *et al.*, 2002). However, the ever-increasing amount of information on the Internet creates problems for individuals who try to find information on the Internet. The lack of system implementation and system integration has been identified as to severely limit the individuals' search efficiency (Fisher, 1999; Öörni, 2003). Another problem comes from the fact that Web search engines are designed to support only one type of information-seeking strategy, which is specifying queries by using terms to select documents from the database (Xie, 2000). The ineffectiveness of search engines' filtering system causes users to rely heavily on browsing (Hsieh-Yee, 1998). This situation creates uncertainty and forces individuals to gamble on their choice of location to start looking for the information of interest (Blackshaw & Fischhoff, 1988). In light of this situation, many empirical studies on information seeking have been devoted to studying different behavior of experienced and novice users (e.g. Navarro-Prieto *et al.*, 1999; Bilal & Kirby, 2002). On the other hand, the number of empirical studies on the Website design factors affecting user involvement with information-seeking activity is scarce.

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In human computer interaction (HCI), user involvement is considered as an outcome of user interacting with a system (Griffith *et al.*, 2001). The intensity of the interaction depends on what the user sees and feels during his interaction with the system (Houston and Rothschild in Muncy & Hunt, 1984). This is to say that the system's interface has a significant influence on user involvement (Sproull *et al.*, 1996). On the other hand, user satisfaction has been used as a surrogate of system success (e.g. Amoako-Gyampah & White, 1993; Palanisamy & Sushil, 2001). One type of user satisfaction with information system is called material satisfaction that can be associated with an information system's performance (Bruce, 1998). This performance can be traced back to the system's design factors, including information presentation (Hoque & Lohse, 1999), download time (Pitkow & Kehoe, 1996; Zhang, 2000), link colors and menu positions (Pearson & van Schaik, 2003).

This study is conducted to investigate factors affecting user involvement and satisfaction with information-seeking activity. It emphasizes different types of motivator, that is, intrinsic and situational motivators, operationalized as the Web design factors that users perceive during their information-seeking activity. It adopts several categories of the two-factor model of Web design factors (Zhang & von Dran, 2000; Zhang *et al.*, 2000).

The paper is organized as follows: Following this introduction, the literature review is presented, followed by the research model and hypotheses. Subsequently, we present the empirical study, followed by the data analysis and the outcome of the hypotheses testing. The data analysis was conducted using PLS-Graph, in which intrinsic and situational motivators were treated as formative exogenous latent variables, and user involvement and user satisfaction were treated as reflective endogenous latent variables. We conclude this paper with a discussion and contribution of this paper in terms of its theoretical and practical implications.

## Literature review

### User involvement

User involvement has been defined conceptually and operationalized in a variety of ways (e.g. Ives & Olson, 1984; Baroudi *et al.*, 1986; Tait & Vessey, 1988; Barki & Hartwick, 1989). They can be grouped in terms of two general themes being addressed: (1) participation in system development by a member or members of the target user group (Ives & Olson, 1984), and (2) the psychological state of an individual user in terms of the importance that he attaches to a given system (Barki & Hartwick, 1989). Basically, the former relates to the process of producing a particular system, while the latter relates to the product itself. Given our interest in assessing how users are involved with an information-seeking activity, we follow the definition of user involvement given by Barki & Hartwick (1989).

User involvement is 'based on inherent needs, values and interests that motivate one toward the object' (Zaichkowsky 1985, pp. 342). That is, a user's 'level of involvement with an object, situation, or action is determined by the degree to which he perceives that concept to be personally relevant' (p. 211).

Muncy & Hunt (1984) proposed a definition of communication involvement. It refers to the type of involvement that occurs during the course of a communication. It happened in a specific time, making it transitory and situationally specific. It does not happen before the communication starts and it ends when the communication stops. With this unique conceptual definition, communication involvement is relevant in research on consumer information processing. Communication involvement is externally motivated (Park & Young, 1986). Its presence, or absence, is completely determined by a person's reaction to a particular situation. It is more likely to result in a goal-directed behavior (Hoffman & Novak, 1996). The level of involvement will have an impact on an individual's processing of communication, for example information search (Krugman, 1965).

The concept of communication involvement is similar to the concept of felt involvement. According to Celsi & Olson (1988), felt involvement refers to a user's subjective feelings of personal relevance. It is a motivational state that affects the extent and focus of a consumer's attention and comprehension processes. It only occurs at certain times and in certain situations. Further, Celsi and Olson stated that there are two antecedents of felt involvement, that is, situational and intrinsic sources.

Involvement can be differentiated based on user activity, that is, active and passive involvement (Langer, 1975). Individuals are considered to be having an active involvement when they are engaging in a physical activity that requires some mental activity during task execution. Individuals are passively involved when they are engaged in a purely mental activity during task execution. Involvement with information-seeking activity is considered an active involvement since it comprises physical and mental activities, that is, decision-making (Jul & Furnas, 1997). This activity requires individuals to carry out three different tasks concurrently: navigation task, informational task, and task management (Kim & Hirtle, 1995).

In an attempt to differentiate involvement from attitude, Laurent & Kapferer (1985) employed four constructs; two of them were pleasure and importance. Pleasure reflects an affect that is a traditional measure of attitude (Fishbein & Ajzen, 1975), while importance corresponds to the traditional measures of involvement (Barki & Hartwick, 1989). These two constructs load distinctly differently (Laurent & Kapferer, 1985). This shows that involvement and attitude are two different concepts, although they are significantly related (Barki & Hartwick, 1989). Barki & Hartwick (1994) stated, 'A system may be seen to be useful, but not necessarily

important or personally relevant' (p. 62). As such, they suggested that in order to measure involvement, the evaluative part (i.e. attitude) should be excluded. They distinguished importance subscales from personal relevance subscales.

### User satisfaction

Bruce (1999) defines satisfaction as a state of mind that represents the composite of a user's emotional and material responses to a particular activity, such as information seeking. User will emotionally be satisfied when the outcomes match their requirements, expectations, task orientation and goal determination (Waern, 1989; Applegate, 1993). Users will materially be satisfied as a result of their experience associated with system usage. Satisfied users may prolong their website usage, revisit it, and may recommend it to others (Zhang & von Dran, 2000). Hence, user satisfaction is a highly desirable Web design goal.

User satisfaction, as one measure of the Website success factors (e.g. Zhang & von Dran, 2000), is influenced by download time, navigability, and its content (Palmer, 2002). Rose *et al.* (1999) defines download time as 'the amount of time it takes for a Web client machine to receive and display a data file submitted by a Web server after that file was requested by the client' (p. 11). Slow download time is the main source of user frustration (Pitkow & Kehoe, 1996) that could distract information seekers from their main objectives (Zhang, 2000). Navigability is defined as 'the sequencing of pages, well-organized layout, and consistency of navigation protocols' (Palmer, 2002; pp. 155); while content refers to any information presented in the Website, including text, graphics, images, audio and video. In other words, it contains multimedia (Rumpradit & Donnell, 1999).

The two-factor model of Website design factors (Zhang & von Dran, 2000; Zhang *et al.*, 2000), because it was based on Herzberg's (1966) work, treated satisfaction and dissatisfaction as bipolar concepts. As such, they try to rigidly categorized Web design factors into motivators that lead to satisfaction and hygiene factors that may lead to dissatisfaction. However, at the end of their paper, they stated that the inclusion of particular Web design factors into one category might change over time. In other word, Web design factors that in the first place were categorized as motivators could become hygiene factors later, or vice versa. On the other hand, although Soliman (1970) has also based his central premise on Herzberg's theory, his empirical evidence showed that the concept of satisfaction/dissatisfaction was unipolar. Thus, both motivators and hygiene factors can be sources of satisfaction and dissatisfaction.

### Research model and hypotheses

Intrinsic and situational motivators have been considered as two antecedents of (felt) involvement (Celsi & Olson, 1988). Intrinsic motivation is 'an internal process that creates and maintains the desire to move toward goals'

(<http://www.psychadvantage.com/glossary.html>). It is 'one of the major individual level variables that determine productivity' (Zhang & von Dran, 2000, pp. 1255). Theoretically, research in psychology suggests that a higher level of intrinsic motivation increases user willingness to spend more time on the task (Deci, 1975). Perceived enjoyment is a conceptualization of a system-specific intrinsic motivation (Venkatesh, 2000). Learning on an Internet skill or specific domain knowledge has also been identified as intrinsic motivation (Hwang & Yi, 2002; Makkonen, 2003). We, then, argue that Website design factors that can promote enjoyment and learning, that is, intrinsic motivators, would influence user involvement and user satisfaction with information-seeking activity. As such, the following hypotheses are stated:

**H1a:** Intrinsic motivators would have a positive effect on user involvement with information-seeking activity.

**H1b:** Intrinsic motivators would have a positive effect on user satisfaction with information-seeking activity.

Situational motivators of involvement come from a wide variety of specific stimuli and cues of the intermediate environment (Celsi & Olson, 1988), that is Website design. Web design factors include download speed, navigation structure, interactivity, friendliness, presentation style, multimedia capability, content, and visual appearance (Moeller, 1997; Misić & Johnson, 1999; Huizingh, 2000; Turban & Gehrke, 2000; Wan, 2000; Pearson & van Schaik, 2003). These factors are situational motivators as no two Websites are designed exactly the same, and they may change over time. The above factors have also been considered to influence user satisfaction (e.g. Palmer, 2002). As such, the following hypotheses are stated:

**H2a:** Situational motivators would have a positive effect on user involvement with information-seeking activity.

**H2b:** Situational motivators would have a positive effect on user satisfaction with information-seeking activity.

User involvement with information presented to users is a key driver of their responses. Higher level of involvement stimulates users to be more attentive to the information presented to them (Petty *et al.*, 1983). As such, user involvement has several consequences on attitude (e.g. Petty *et al.*, 1983; Andrews & Shimp, 1990), evaluation (e.g. Andrews & Shimp, 1990), intention (e.g. Swinyard, 1993), satisfaction (e.g. Amoako-Gyampah & White, 1993; Hwang & Thorn, 1999; Mahmood *et al.*, 2000), pleasure and arousal (Pham, 1992). Impacts of user involvement toward system success and user satisfaction, as a surrogate of system success, have also been reported by Tait & Vessey (1988), Doll & Torkzadeh (1988), and Blili *et al.* (1998). Therefore, we hypothesize that:

**H3:** User involvement would have a positive effect on user satisfaction with information-seeking activity.

We summarize the above hypotheses as a research model depicted in Figure 1.

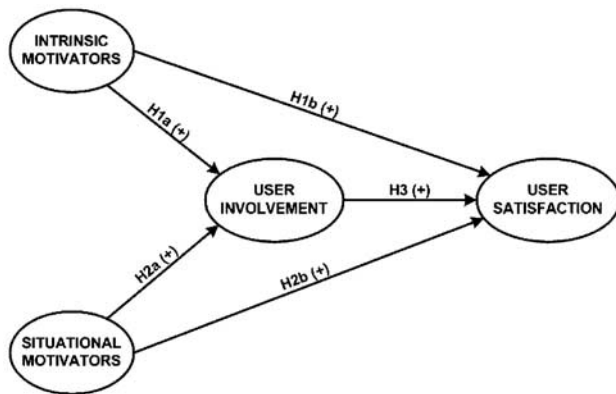


Figure 1 Research model. methodology.

### Subjects

A laboratory experiment was conducted with the help of undergraduate students. A total of 235 students, 121 male students and 114 female students, from six different faculties, participated in this study. They included first year to fourth year undergraduate students. One of the subjects was 18 years old, while the rest were between 18 and 26 years old. They participated in the study voluntarily after they were sent an invitation email. Their experience with the Internet was measured using three 7-point Likert scale items, in which '1' means 'no experience,' and '7' means 'extensive experience.' The data show that the mean for the subjects' experience with the Internet is 5.24 (SD = 1.012).

### The experiments

Due to the laboratory capacity that can handle the maximum of 49 seats at one time, the experiment was conducted in six sessions. Each student chose his/her time slot freely when s/he voluntarily registers to participate in this experiment.

Before the real-experiment session, a practice session, about 15 min, was conducted to familiarize the subjects with the experiment procedures and the Website they would use in the real experiment. In this practice section, subjects were given a sheet of paper containing the task that they had to perform. The task was to find a digital camera according to the given specifications written in the task sheet. As soon as subjects found the intended product, they were asked to write the name of the product and all related information in the task sheet. All the instructions were written in the task sheet. The Website used in this experiment was [www.amazon.com](http://www.amazon.com).

The real-experiment session was similar to the practice session. This time, subjects were asked to find four different products, in which three of them were predetermined, and the fourth was a product of their interest, but must be an electronic equipment or computer/PDA. The three predetermined products were sprinkler, hammock, and decorative lamp. As with the practice session, each of these three products had its own

specification written in the task sheet. The real experiment was for about 1 h. After they finished their tasks, subjects were asked to complete a post-experiment questionnaire (see Appendix A).

### Constructs operationalization and measurements

This study used four constructs, that is, intrinsic motivators, situational motivators, user involvement, and user satisfaction. These four constructs were operationalized as follow:

- Intrinsic motivators (IntMot) are defined as the perceived Web design factors that intrinsically motivate users during information-seeking activity. Five items were used to measure intrinsic motivators. These items were adopted and modified from the two categories of motivators in Zhang *et al.* (2000), that is, cognitive outcome and enjoyment.
- Situational motivators (SitMot) are defined as the perceived Web design factors that are situational during the information-seeking activity. Eight items were used to measure situational motivators, were adopted from the three categories of hygiene factors in Zhang *et al.* (2000), that is, technical aspect, navigation, and visual appearance.
- User involvement (UINV) is defined as the degree to which a user feels that the interaction with the Website during information-seeking activity is both important and personally relevant (modified from Barki & Hartwick (1989)). Seven items were used to measure user involvement. The first five items were used to measure importance, and the other two were used to measure relevance.
- User satisfaction (USAT) is defined as the overall user feeling with the Website for conducting an information-seeking activity. User satisfaction was measured using three items that were adopted from Lee *et al.* (2003) and Teo *et al.* (2003).

Items in the above variables, except those in user involvement, were measured using 7-point Likert scale, where '1' means strongly disagree, and '7' means strongly agree. Items in user involvement were measured using 7-point semantic differential scale.

### Formative latent variable

Formative indicators are 'viewed as the cause variables that provide the condition under which the latent variables (LV) they are connected to is formed' (Chin 1998b, pp. 306). These indicators are not assumed to be correlated, nor are they supposed to measure the same underlying dimension. Bagozzi (1994) stated that, 'under formative indicators, the latent variable is defined as a function of measurements' (p. 332). It is 'merely thought as a summary index of observed variables' (Bagozzi & Baumgartner 1994, pp. 389). Conceptually, intrinsic and situational motivators were formed from several items. As such these two motivators were considered as formative latent variables.

Bollen & Lennox (1991), and Diamantopoulos & Winklhofer (2001) provide several characteristics of formative indicators, including (1) the correlations among formative indicators are not explained by the measurement model, (2) omitting an indicator is omitting a part of the construct, (3) specific pattern of signs or magnitudes do not characterize the correlations among formative indicators, and (4) formative indicators do not have error terms.

The use of loading for formative indicators is misleading (Chin, 1998a). For formative indicators, 'internal consistency is of minimal importance because two variables that might even be negatively related can both serve as meaningful indicators of a construct' (Nunnally & Bernstein, 1994, pp. 489). Instead, indicators' weight is used. The weights provide information about the relative importance of the formative indicators toward the creation/formation of the corresponding latent variable. Because of this reason, the data analysis presented below, especially in the measurement model, is for reflective variables only. The weights for each formative indicator are presented in Appendix A.

## Result

Since the research model involves both formative and reflective indicators, hypothesis testing was conducted using PLS-Graph version 3.0. Barclay *et al.* (1995) suggested two steps for data analysis using PLS: (1) a measurement model describing the relationship between latent constructs and their manifest indicators, and (2) a structural model describing the relationship between latent constructs.

## Assessment of the measurement model

Assessment of the measurement model concerns with construct validity or 'the extent to which the manifest indicators reflect their underlying constructs' (Hanlon, 2001). This construct validity includes the assessment of convergent validity and discriminant validity.

Convergent validity consists of individual item reliability and its internal consistency. Item reliability can be assessed by examining its loading to its corresponding latent construct. Fornell *et al.* (1982) suggested that the item reliability is judged to be adequate if the item's loading to its latent construct is equal or greater than 0.7 ( $\lambda \geq 0.7$ ). Table 1 shows the item reliability for user involvement and user satisfaction obtained with PLS. It can be seen that all items have loadings greater than 0.7. As such, all items were deemed reliable.

Internal consistency ( $\rho_{\xi}$ ), or construct reliability, is the second reliability measure to evaluate the measurement model. PLS-Graph version 3.0 provides internal consistency score for every latent variable. It can be seen from Table 1 that internal consistency for every reflective latent variable is very high. Thus, every reflective latent variable is deemed reliable. For comparison purpose, Cronbach's alpha score for every latent variable is also shown in Table 1.

**Table 1 Convergent validity of measurement model**

Latent variable	Manifest variable	Item reliability ( $\lambda$ )	Internal consistency ( $\rho_{\xi}$ )	<sup>a</sup> Cronbach's alpha
UINV ( $\eta_1$ )	INV1	0.817	0.914	0.889
	INV2	0.713		
	INV3	0.779		
	INV4	0.813		
	INV5	0.842		
	INV6	0.755		
	INV7	0.705		
USAT ( $\eta_2$ )	SAT1	0.899	0.950	0.921
	SAT2	0.938		
	SAT3	0.949		

<sup>a</sup>For comparison purpose only.

**Table 2 Loading and cross-loading matrix**

Construct	Item	Latent construct	
		UINV ( $\eta_1$ )	USAT ( $\eta_2$ )
User involvement (UINV)	INV1	0.817 <sup>a</sup>	0.406
	INV2	0.713 <sup>a</sup>	0.336
	INV3	0.779 <sup>a</sup>	0.341
	INV4	0.813 <sup>a</sup>	0.370
	INV5	0.842 <sup>a</sup>	0.381
	INV6	0.755 <sup>a</sup>	0.311
	INV7	0.705 <sup>a</sup>	0.401
User satisfaction (USAT)	SAT1	0.448	0.899 <sup>a</sup>
	SAT2	0.408	0.938 <sup>a</sup>
	SAT3	0.461	0.949 <sup>a</sup>

<sup>a</sup>Significant at the 0.01 level.

Discriminant validity is also checked at both the indicator and construct level. At the indicator level, Barclay *et al.* (1995) suggest that no manifest variable should load higher on other constructs than on the construct it intends to measure. Table 2 shows that all manifest variables load higher on their respective intended latent variable compared to other latent variables. Thus, discriminant validity at the indicator level is adequate.

At the construct level, discriminant validity can be assessed by comparing the square root of average variance extracted (AVE) with the correlation of that construct with all other constructs. AVE is the amount of variance captured by the construct in relation to the amount of variance attributable to measurement error. As with internal consistency, PLS-Graph version 3.0 also provides the AVE score. Table 3 shows that the square rooted AVE for every latent variable (diagonal elements) is greater than the correlation between that latent variable with the other latent variables. Therefore, the measurement shows

adequate convergent validity. As such, the model exhibits acceptable discriminant validity (Barclay *et al.*, 1995).

### Assessment of the structural model

The structural model comprises the hypothesized relationship between latent constructs in the research model. By using Bootstrap or Jackknife sampling, we can obtain path coefficient and its *t*-value. With these values, we can assess statistical conclusion validity by testing the null hypothesis for each path coefficient.

Table 4 shows the coefficient of each hypothesized path and its corresponding *t*-value obtained from 100-sample Bootstrap procedure in PLS. It can be seen from this table that all path coefficients are significant, providing the support for all hypotheses.

The explanatory power of the proposed model, or nomological validity, can be assessed by observing the  $R^2$  of endogenous constructs in the structural model estimation. Figure 2 shows the  $R^2$  values for user involvement and user satisfaction. Falk & Miller (1992) recommend that  $R^2$  must be at least 0.10 in order for the latent construct to be judged adequate. All of the  $R^2$  values satisfy this recommendation. As such, the nomological validity was satisfactory. Figure 2 shows the proposed model explains about 28% of the total variability of user involvement and about 48% of the total variability of user satisfaction. Overall, Table 5 presents the outcome of the hypotheses test.

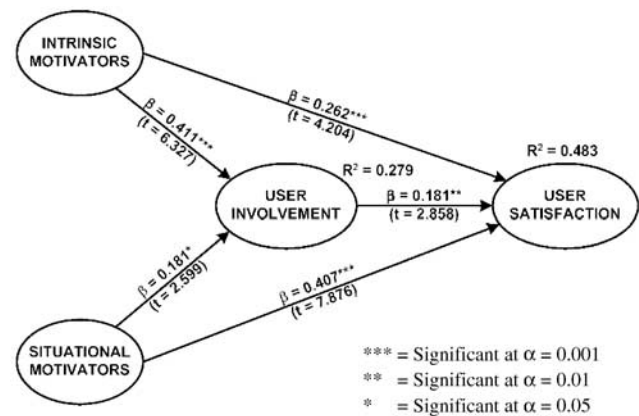
**Table 3 The square rooted AVE and correlation among reflective constructs**

Construct	INV	SAT
INV	0.777	
SAT	0.473	0.929

### Discussion

User involvement and user satisfaction with information-seeking activity, with the emphasis on the users' interaction with a Website, have been the focus of this paper. Five hypotheses were tested in this study and the data support all of these hypotheses. Both intrinsic and situational motivators affect user involvement positively. This finding is consistent with Celsi & Olson (1988).

Intrinsic motivators and situational motivators, respectively, also affect user satisfaction positively. This finding is also consistent with previous empirical studies. In Herzberg's (1966) dual-theory of job satisfaction, which was adopted by Zhang & von Dran (2000) with their two-factor model of Website design factors, (intrinsic) motivators are the source of employee (or user) satisfaction. On the other hand, situational motivators, comprising technical aspect, navigation and visual experience, have been identified as Web success factors (e.g. Turban & Gehrke, 2000; Palmer, 2002). User satisfaction has often



**Figure 2 Structural model estimation.**

**Table 4 Path coefficients and their *t*-values**

Hypothesis	Path		Path coefficient ( $\beta$ )	<i>t</i> -value	Significance (two-tailed)
	From	To			
H1a	IntMot	UINV	0.411	6.327	$P < 1$
H1b	IntMot	USAT	0.262	4.204	$P < 0.001$
H2a	SitMot	UINV	0.181	2.599	$P < 0.05$
H2b	SitMot	USAT	0.407	7.876	$P < 0.001$
H3	UINV	USAT	0.181	2.858	$P < 0.01$

**Table 5 Outcome of the hypotheses test**

Hypothesis	Outcome
H1a	Intrinsic motivators would have a positive effect on user involvement with information-seeking activity. Supported
H1b	Intrinsic motivators would have a positive effect on user satisfaction with information-seeking activity. Supported
H2a	Situational motivators would have a positive effect on user involvement with information-seeking activity. Supported
H2b	Situational motivators would have a positive effect on user satisfaction with information-seeking activity. Supported
H3	User involvement would have a positive effect on user satisfaction with information-seeking activity. Supported

been used as a surrogate of Web (or system) success. As such, the fact that situational motivation affects user satisfaction is consistent with the previous studies as well.

Another supported hypothesis that is also consistent with previous studies is that user involvement has a positive effect on user satisfaction. This finding is also inline with Zaichkowsky (1985), and Celsi & Olson (1988), in which user involvement is viewed as a conceptualization of motivation.

Two interesting findings are also evident from Figure 2. First, intrinsic motivators have a stronger positive effect on user involvement than situational motivators have. According to Celsi & Olson (1988), situational motivators are dynamic and changeable. Since user involvement is the result of user interacting with a system (Griffith *et al.*, 2001), that is, Website, the dynamic nature of situational motivators may influence the level of user involvement. For example, when the Internet download speed decreases, users may start to get frustrated that may lead them to abandon their activity. The same situation happens when a Website is very hard to navigate, or when users come across broken links, or links that direct them to the wrong targets. On the other hand, intrinsic motivators 'are relatively stable, enduring structures of personally relevant knowledge, derived from past experience and stored in long-term memory' (Celsi & Olson, 1988, pp. 212). As such, although the Internet download speed may be slowing down, since users are very keen on learning something from their information-seeking activity, they will maintain their interaction with the Website. For novice users, who tend to browse than to do systematic search (e.g. Navarro-Prieto *et al.*, 1999; Bilal & Kirby, 2002), the change in visual appearance, for example, may even challenge them to browse even further. This situation helps to explain why intrinsic motivators have a stronger effect on user involvement than situational motivators have.

The second interesting finding as shown in Figure 2 is the fact that intrinsic motivators have weaker positive direct and total effects on user satisfaction compared to situational motivators, that is, the direct and total effect of intrinsic motivators to user satisfaction is 0.262 and 0.336, respectively. The direct and total effect of situational motivators to user satisfaction is 0.407 and 0.440, respectively. This finding can be traced back to the two types of satisfaction as stated by Bruce (1999), that is, material and emotional satisfaction. Material satisfaction relates to the various factors that enhance the system's performance. In the experiment, download speed was not a problem, since it was quite fast. Users perceived that navigating the Website was quite easy, although there was no indication on where the subjects were in one particular time relative to the 'home' position. Visual appearance was also very appealing. As such, situational motivators will surely influence material satisfaction. On the other hand, emotional satisfaction is influenced by user requirements, expectations, task orientation, and goal determination (Waern, 1989; Applegate, 1993).

These aspects can be related to intrinsic motivators. When subjects visited the Website used in this experiment, they might expect to find the intended information quickly. However, due to the huge volume of information, although the navigation was easy, subjects might not find the intended information quickly, or worse, they could not find it at all. As such, their goal might be a failure. In term of enjoyment, since the subjects had to deal with the huge volume of information, their visit to the Website to search for information might not be too enjoyable. This is a plausible explanation about why intrinsic motivators have a weaker effect on user satisfaction than situational motivators have.

### Theoretical implication

This study borrows the two antecedents of user involvement, that is, intrinsic and situational motivators, from Celsi & Olson (1988). These two types of motivator were then applied in the context of information-seeking activity with the emphasis on the interaction between a Website and its users. The result of this study confirms that both intrinsic and situational motivators influence user involvement positively. As such, the theory that separates intrinsic motivators from situational motivators can also be applied to the HCI field.

### Practical implication

Since we are dealing with information seeking within a Website, the practical implication should be directed to the design of such a Website. It is clear from the above discussion that situational motivators have greater influence on user satisfaction. Effective navigation aids is an important design factor, especially for information-seeking activity. This design factor would significantly increase user satisfaction. Attractive appearance and visually appealing interface would also play a significant role in increasing user satisfaction. The other factors, although they may not seem too significant in this study, like loading speed and support for different browsers, cannot be neglected, as they make Websites usable and serviceable.

For intrinsic motivators, it is clear that enjoyment and the users' chance to learn new knowledge from using a Website significantly influence their satisfaction. It is very clear that multimedia presentation would enhance user satisfaction significantly. However, the multimedia feature should not distract users from their main purpose of using a Website for information-seeking activity. In order to fulfill the users' hunger for new knowledge, the Website information can be periodically updated.

### Conclusion

This study investigates how different types of motivator, that is, intrinsic and situational motivators, reflected as the perceived Web design factors, influence user involvement and satisfaction with information-seeking activity. The operationalization of intrinsic and situational motivators borrows several categories in the two-factor model

of Web design factors (Zhang & von Dran, 2000). These two types of motivator were treated as formative exogenous variables. Of the five hypotheses, all are supported by the data. The result also shows that intrinsic motivators have a stronger effect on user involvement than situational motivators have. On the other hand, intrinsic motivators have a weaker effect on user satisfaction than situational motivators have.

Two limitations of this study are worth mentioning. The first limitation can be traced back to the operationalization

of intrinsic and situational motivators. Intrinsic motivators only covered learning and enjoyment, while situational motivators covered technical aspect, navigation, and visual appearance. The second limitation comes from the fact that this study focuses only on the interaction between users and a Website as an information source. As such, in future studies, more intrinsic motivators as well situational motivators should be addressed. It is also interesting to further study the influence of involvement on information-seeking performance.

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## Appendix A

### Loading and weight of manifest variables to their respective latent variable

1.	<i>Intrinsic motivators (1 = strongly disagree; 7 = strongly agree)</i>	<i>Weight</i>
	IM1: I have learned new knowledge from this Website	0.212*
	IM2: I have learned new skills from this Website	−0.103
	IM3: It was fun exploring this Website	0.199
	IM4: I enjoyed exploring this Website	0.600**
	IM5: This Website features a multimedia presentation	0.345***
2.	<i>Situational motivators (1 = strongly disagree; 7 = strongly agree)</i>	<i>Weight</i>
	SM1: This Website gives a very fast response/loading time	0.038
	SM2: This Website supports different browsers	0.005
	SM3: This Website has a loading/processing indicator	0.025
	SM4: This Website provides an effective navigation aids	0.543***
	SM5: This Website provides a clear direction for navigating the Website	0.142
	SM6: This Website gives a clear indication of user location for navigating the Website	−0.027
	SM7: This Website has an attractive appearance	0.263*
	SM8: This Website is visually appealing	0.295*
		*, $P < 0.1$ , **, $P < 0.05$ , ***: $P < 0.001$
3.	<i>User involvement After using this Website, I feel that using this Website (to conduct information seeking) is ...</i>	<i>Loading</i>
	INV1: Extremely essential (1) ... Extremely nonessential (7)	0.817
	INV2: Extremely fundamental (1) ... Extremely trivial (7)	0.713
	INV3: Extremely significant (1) ... Extremely insignificant (7)	0.779
	INV4: Extremely important (1) ... Extremely Unimportant (7)	0.813
	INV5: Extremely needed (1) ... Extremely not needed (7)	0.842
	INV6: Extremely means a lot (1) ... Extremely means nothing (7)	0.755
	INV7: Extremely relevant (1) ... Extremely irrelevant (7)	0.705
4.	<i>User satisfaction (1 = strongly disagree; 7 = strongly agree)</i>	<i>Loading</i>
	SAT1: I feel satisfied with the quality of this Website	0.889
	SAT2: I feel satisfied with my visit to this Website	0.938
	SAT3: I feel pleased with my visit to this Website	0.949