An Empirical Study on User Involvement: A PLS Approach

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Abstract

This paper presents the results of an empirical study that investigates the relationship of user involvement toward user satisfaction of a commercial Website. This study adopts categorization of Website design factors into motivating factors and hygiene factors. This categorization is used to determine what design factors contribute to user satisfaction and dissatisfaction. A laboratory experiment was conducted with the help of undergraduate students. This study shows that (1) motivating factors contribute to user involvement, whilst hygiene factors show no significant influence on user involvement; (2) user involvement has a positive effect on user satisfaction, and (3) motivating factors and hygiene factors affect user satisfaction positively.

Keywords: web design features, motivating factor, hygiene factor, user involvement, satisfaction, experiment.

1. Introduction

Many studies have been conducted to identify Web design factors that can be used to attract more users to visit or revisit Websites. They emphasized on different aspect of Website design that make things more confusing rather than giving an exact direction, or at least a promising clue, on what factors should be considered when one designs a Website. It has been realized that there are several types of Websites (Ginige and Murugesan, 2001). To make thing worse, one Website may fall into more than one category. Zhang and Dran (2000) identified the need for Web designers to pay more “attention on the affective and motivational aspects of the Web environment, aspects of increasing importance to differentiate those Websites that please users from those that turn people off” (p. 1253).

Several Website design factors may decrease or increase personal relevance and involvement of that Website (Pham, 1992) which in turn could influence their satisfaction on the Website (Zaickowsky, 1985). This study is conducted to investigate how Web design factors affect user involvement and their satisfaction.

2. User Involvement

User involvement has been defined conceptually and operationalized in a variety of ways e.g. Ives and Olson (1984), Barki and Hartwick (1989), Baroudi et al. (1986), and Tait and Vassey (1988). They can be grouped in terms of two general themes being addressed: (1)
participation in the development of the system by a member or members of the target user group (Ives and Olson, 1984), (2) the psychological state of the individual user in terms of the importance that the user attaches to a given system (Barki and Hartwick 1989). Basically, the former relates to the process of producing a particular system, whilst the latter relates to the product itself. Because of the term “participation” in (1), Barki and Hartwick (1989) prefer to use user participation in accordance with it. User involvement is “based on inherent needs, values and interests that motivate one toward the object” (Zaickowsky 1985, p. 342). Given our interest in assessing how users are involved with the system, we follow the definition given by Barki and Hartwick (1989).

In an attempt to differentiate between involvement and attitude, Laurent and Kapferer (1985) employed four antecedents of involvement, in which two of them are pleasure and importance. Pleasure reflects an affect that is a traditional measure of attitude (Fishbein and Ajzen, 1975). On the other hand, importance corresponds to traditional measures of involvement (Barki and Hartwick, 1989). These two antecedents of involvement load distinctly differently (Laurent and Kapferer, 1985). This shows that involvement and attitude are two different things, although they are significantly related (Barki and Hartwick, 1989). As such, in order to measure involvement, the evaluative part (i.e. attitude) should be excluded (Barki and Hartwick 1994). Zaikowsky (1985) has provided 20-item of involvement, along with their strong evidence of reliability and validity, using a semantic differential scale. In general, these items are scored from 1 (representing low involvement) to 7 (representing high involvement). Because any object or event can be rated with the scale, Barki and Hartwick (1987) have called this measurement as a context-free measure of involvement. Since Zaikowsky (1985) items measure importance, personal relevance, as well as evaluation, those who want to employ these measures should be careful in adapting these instruments.

Involvement can also be differentiated based on user activity. Based on the user activity, Langer (1975) differentiates between active and passive involvement. Individuals are considered to be having an active involvement when they are engaging in physical activity that requires any mental activity necessary to complete that physical activity during task execution. Individuals are passively involved when they are engaging in a purely mental activity during task execution. Navigating a Website is considered an active involvement since it is comprises of physical and mental activity, i.e. decision making (Jul and Furnas 1997). This activity requires individuals to carry out three different tasks concurrently: navigation task, informational task, and task management (Kim and Hirtle, 1995).

3. A Two-Factor Model for Website Design
Based on Herzberg’s Motivation-Hygiene theory (1966), Zhang and Dran (2000) proposed a two-factor model for Website design and evaluation. They divided design factors into two groups of factors, namely motivating factors and hygienic factors. Motivating factors are those factors contributing to user satisfaction; hence they are often called satisfiers. The presence of such factors will enhance user satisfaction with the Website, while their absence will not necessarily contribute to user dissatisfaction. A possible example of this factor would be background music when user arrives at one particular webpage. Hygiene factors are those factors contributing to user dissatisfaction when these factors are absence; hence they are often called dissatisfiers. The presence of these factors makes a Website useful and serviceable.
Both motivating and hygiene factors are grouped into several categories, and each category contains one or more features. Cognitive outcomes, enjoyment, credibility, visual appearance, user empowerment, and organization of information are those categories that fall into motivating factors; whilst technical aspects, navigation, privacy and security, surfing activity, impartiality and information content are those categories that fall into hygiene factors.

User satisfaction with a Website is one ultimate goal Web designers want to achieve. Therefore, they need to strive to develop design factors that “can help attract users to a Website, maintain their interest in the Website, and encourage them to return to the Website again” (Zhang and Dran, 2000, p. 1253). In other word, Web designers need to bring users up to the state where their “felt involvement” is realized. For the purpose of this study, user involvement is defined as the user’s perceived involvement with the Website he is working with. Therefore, finding answers for the following research questions are the main purpose of conducting this study:

RQ1: How do motivating factors and hygiene factors influence user involvement?
RQ2: How does user involvement affect user satisfaction?

In order to answer the above research questions, a research model as depicted in Figure 1 is proposed. The direct links from motivating factors to user satisfaction and from hygiene factors to user satisfaction also can be used to confirm the two-factor model proposed by Zhang and Dran (2000).

4. Hypotheses Development

ISO 9241-11 defines satisfaction as the user’s comfort with and positive attitude towards the use of the system. Satisfied users may spend a longer time at a Website, revisit it, and may recommend it to others (Hoffman and Novak, 1996). Hence, as stated earlier, user satisfaction with a Website is a highly desirable Web design goal. According to Zahedi et al (2001) one antecedent of overall satisfaction with the Web design is Website usability, which can be measured based on its perceived usefulness and perceived ease of use (Davis et al., 1989). Perceived usefulness relates to the enhancement of user ability to perform their job,
whereas ease-of-use relates to the format and friendliness of the system (Doll and Torkzadeh, 1998). Zahedi et al. (2001) stated that “overall satisfaction (with the Web design) could be elicited by questions such as whether readers would be willing to read such a document again and would recommend it to others: whether the process was enjoyable and satisfactory, and whether the outcome met readers’ expectations” (p. 95).

When a user interacts with a system, he is forced to perceive two different environments simultaneously: (1) the physical environment in which he is present, and (2) a virtual environment created in the context of the material presented through the medium (Steuer, 1992), in this case the Internet and a Website. Further, Steuer (1992) stated that when interface involvement is high, one becomes more engaged in and concerned about the material presented (i.e. virtual environment). On the other hand, where interface involvement is low, one maintains his concern with the physical environment more than he does to the material presented. So, it is very important to provide the user with a richer and more human-like interface to have a better influence on user involvement with the content presented (Sproull et al., 1996).

A system is called a user-friendly system if it provides the user with an interface that can facilitate an interface involvement. As such, the level of user involvement in the content presented on the Website is one outcome of the interaction between user and the system (Griffith et al., 2001). The intensity of the interaction between user and the system depends on what the user sees and feels during his interaction with the system. Then, it is argued that both motivating factors and hygiene factors would have an impact on user involvement, which in turn affects user satisfaction. As such, the following hypotheses are stated:

- **H1a.** Motivating factors will affect user involvement positively.
- **H1b.** Motivating factors will affect user satisfaction positively.
- **H2a.** Hygiene factors will affect user involvement positively.
- **H2b.** Hygiene factors will affect user satisfaction positively.

User involvement with information presented to him is a key driver of his responses. Higher levels of involvement stimulate users to be more attentive to the information presented to them (Petty and Cacioppo, 1979; Petty et al., 1983). As such, user involvement has several consequences on attitude (e.g. Andrews and Shimp, 1990; Petty et al., 1983), evaluation (e.g. Andrews and Shimp, 1990), intention (e.g. Swinyard, 1993), satisfaction (e.g. Amoako-Gyampah and White, 1993; Hwang and Thorn, 1999; and 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 and Vessey (1988), Doll and Torkzadeh (1988), and Blili et al. (1998). Therefore, we argue that

- **H3.** User involvement will have a positive effect on user satisfaction.

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 and Dran, 2000, p. 1255). A motivating system makes the users’ job easier (Markus and Keil, 1994). This implies that certain Web design factors can motivate users to prolong its usage. Gill (1996) suggests that through intrinsic motivational factors, user satisfaction with a system could be enhanced. Visual appearance, e.g. graphical design (Moeller, 1997), organization of information (e.g. Ozok and Zalvendy,
Hygiene factors are those factors that may cause user dissatisfaction if these factors are not present explicitly or the users do not perceive their presence. For example, privacy and security (e.g. Ranganathan and Ganapathy, 2002), navigation efficiency (e.g. Nielsen, 1999; Turban and Gehrke, 2000), and informativeness (e.g. Wan, 2000) may not be easily felt or perceived by the users until they are using it for a period of time. The download speed could also be one factor that may cause users avoid a particular Website. Therefore the following hypotheses are stated:

H4a. Motivating factors will have a stronger effect on user involvement than hygiene factors will have.
H4b. Motivating factors will have a stronger effect on user satisfaction than hygiene factors will have.

5. Methodology

5.1 Subjects and Activities
A laboratory experiment was conducted with the help of undergraduate students. A total of 235 students, 120 male students and 115 female students, from 6 different faculties, participated in this study. They include first year to fourth year undergraduate students. The tasks given to them were to find information about certain product using www.amazon.com. In total, they were asked to find information about four products, three of which were predetermined products, and the other a product of their interest. After they have finished with the above tasks, they were asked to fill in a post experiment questionnaires. The questionnaires are presented in Appendix A.

5.2 Operationalization and Measurements
This study used four constructs, i.e. perceived motivating factors, perceived hygiene factors, user involvement, and user satisfaction. These four constructs were operationalized as follow:

- Perceived motivating factors are those Web design factors that their presence contributes to user satisfaction (Zhang and Dran, 2000).
- Perceived hygiene factors are those Web design factors contributing to user dissatisfaction when these factors are absence (Zhang and Dran, 2000).
- User involvement is defined as the degree to which a user feels involve with the Website he is working with (modified from Peter and Olson, 1996).
- User satisfaction is defined as the degree to which the user feels comfort with the Web design resembling an online store (modified from ISO 1988).

Question items used to measure perceived motivating factors and perceived hygiene factors were adopted from the list of features presented in Zhang and Dran (2000). They were measured using 7-point Likert scale stating their disagreement or agreement on the propositions related to the above mentioned features, where 1 means strongly disagree and 7 means strongly agree. This 7-point scale is also used to measured user satisfaction in which its items were adopted from Lee at al. (2003) and Teo et al. (2003).

Items to measure user involvement were adopted from Barki and Hartwick (1994) and Koufaris et al. (2001). These items were assessed on 7-point semantic differential scale,
where 1 and 7 point to opposite extreme sides, e.g. extremely essential and extremely non-essential.

6. Result
Hypothesis testings were conducted using partial least square (PLS) analysis. Barclay et al. (1995) suggested a guideline for data analysis using PLS where PLS consists of two submodels: (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.

6.1 Assessment of Measurement Model
Assessment of measurement model concerns with construct validity or “the extent to which the manifest indicators reflect their underlying constructs” (Hanlon, 2004). This construct validity includes the assessment of convergent validity and discriminant validity.

Table 1. Convergent Validity of Measurement Model.

<table>
<thead>
<tr>
<th>Latent Variable</th>
<th>Manifest Variable</th>
<th>Item Reliability ($\lambda$)</th>
<th>Internal Consistency ($\rho_e$)</th>
<th>*Cronbach’s Alpha Standardized</th>
</tr>
</thead>
<tbody>
<tr>
<td>MF ($\xi_1$)</td>
<td>MF1</td>
<td>0.544</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MF2</td>
<td>0.572</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MF3</td>
<td>0.828</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MF4</td>
<td>0.851</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MF5</td>
<td>0.513</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MF6</td>
<td>0.711</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MF7</td>
<td>0.717</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HF ($\xi_2$)</td>
<td>HF4</td>
<td>0.886</td>
<td>0.875</td>
<td>0.713</td>
</tr>
<tr>
<td></td>
<td>HF5</td>
<td>0.902</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HF6</td>
<td>0.607</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INV ($\eta_1$)</td>
<td>INV1</td>
<td>0.818</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>INV2</td>
<td>0.717</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>INV3</td>
<td>0.778</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>INV4</td>
<td>0.812</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>INV5</td>
<td>0.840</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>INV6</td>
<td>0.751</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>INV7</td>
<td>0.706</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAT ($\eta_2$)</td>
<td>SAT1</td>
<td>0.889</td>
<td>0.925</td>
<td>0.901</td>
</tr>
<tr>
<td></td>
<td>SAT2</td>
<td>0.728</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SAT3</td>
<td>0.920</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SAT4</td>
<td>0.930</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* For comparison purpose only.

6.1.1 Convergent Validity
Convergent validity consists of individual item reliability and its internal consistency. Item reliability can be assessed by examining the manifests (indicators) loadings to their corresponding latent constructs. Fornell et al. (1982) (in Hanlon, 2004) suggested that the item reliability is judged to be adequate if the item’s loading to its latent construct is equal or greater than 0.70 ($\lambda \geq 0.70$). Appendix A shows the item reliability obtained with PLS.
Following Fornell et al. (1982), manifest variables HF1 to HF3 in latent variable HF were dropped from further analysis because their loading are less than 0.50. We keep those manifest variables with reliability less than 0.70 but higher than 0.50 because those items were newly developed (Hanlon, 2004).

Internal consistency (\(\rho_\xi\)), or construct reliability, is the second reliability measure to evaluate the measurement model. It can be calculated from \(\left(\sum \lambda_i^2\right) / \left(\sum \lambda_i^2 + \sum (1 - \lambda_i^2)\right)\) (Gefen et al., 2000), where \(\lambda_i\) is an individual manifest variable loading to its latent variable. It can be seen from Table 1 that internal consistency for every latent variable is very high. Thus, every latent variable is deemed reliable. As a comparison, Cronbach’s Alpha scores for every construct also shown in Table 1.

6.1.2 Discriminant Validity

Discriminant validity is also conducted for both the indicator and construct level. For 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.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item</th>
<th>MF ((\xi_1))</th>
<th>HF ((\xi_2))</th>
<th>INV ((\eta_1))</th>
<th>SAT ((\eta_2))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivating Factors (MF)</td>
<td>MF1</td>
<td>0.544**</td>
<td>0.230</td>
<td>0.287</td>
<td>0.290</td>
</tr>
<tr>
<td></td>
<td>MF2</td>
<td>0.572**</td>
<td>0.249</td>
<td>0.219</td>
<td>0.256</td>
</tr>
<tr>
<td></td>
<td>MF3</td>
<td>0.828**</td>
<td>0.384</td>
<td>0.412</td>
<td>0.468</td>
</tr>
<tr>
<td></td>
<td>MF4</td>
<td>0.851**</td>
<td>0.402</td>
<td>0.455</td>
<td>0.524</td>
</tr>
<tr>
<td></td>
<td>MF5</td>
<td>0.513**</td>
<td>0.200</td>
<td>0.326</td>
<td>0.327</td>
</tr>
<tr>
<td></td>
<td>MF8</td>
<td>0.711**</td>
<td>0.396</td>
<td>0.277</td>
<td>0.474</td>
</tr>
<tr>
<td></td>
<td>MF9</td>
<td>0.717**</td>
<td>0.393</td>
<td>0.331</td>
<td>0.463</td>
</tr>
<tr>
<td>Hygiene Factors (HF)</td>
<td>HF4</td>
<td>0.457</td>
<td>0.886**</td>
<td>0.333</td>
<td>0.532</td>
</tr>
<tr>
<td></td>
<td>HF5</td>
<td>0.433</td>
<td>0.902**</td>
<td>0.277</td>
<td>0.460</td>
</tr>
<tr>
<td></td>
<td>HF6</td>
<td>0.222</td>
<td>0.607**</td>
<td>0.103</td>
<td>0.255</td>
</tr>
<tr>
<td>User Involvement (INV)</td>
<td>INV1</td>
<td>0.465</td>
<td>0.232</td>
<td>0.818**</td>
<td>0.397</td>
</tr>
<tr>
<td></td>
<td>INV2</td>
<td>0.355</td>
<td>0.279</td>
<td>0.717**</td>
<td>0.348</td>
</tr>
<tr>
<td></td>
<td>INV3</td>
<td>0.365</td>
<td>0.261</td>
<td>0.778**</td>
<td>0.347</td>
</tr>
<tr>
<td></td>
<td>INV4</td>
<td>0.348</td>
<td>0.225</td>
<td>0.812**</td>
<td>0.356</td>
</tr>
<tr>
<td></td>
<td>INV5</td>
<td>0.350</td>
<td>0.230</td>
<td>0.840**</td>
<td>0.363</td>
</tr>
<tr>
<td></td>
<td>INV6</td>
<td>0.287</td>
<td>0.151</td>
<td>0.751**</td>
<td>0.292</td>
</tr>
<tr>
<td></td>
<td>INV7</td>
<td>0.444</td>
<td>0.324</td>
<td>0.708**</td>
<td>0.399</td>
</tr>
<tr>
<td>User Satisfaction (SAT)</td>
<td>SAT1</td>
<td>0.575</td>
<td>0.501</td>
<td>0.449</td>
<td>0.889**</td>
</tr>
<tr>
<td></td>
<td>SAT2</td>
<td>0.356</td>
<td>0.459</td>
<td>0.282</td>
<td>0.728**</td>
</tr>
<tr>
<td></td>
<td>SAT3</td>
<td>0.555</td>
<td>0.448</td>
<td>0.409</td>
<td>0.920**</td>
</tr>
<tr>
<td></td>
<td>SAT4</td>
<td>0.572</td>
<td>0.476</td>
<td>0.461</td>
<td>0.930**</td>
</tr>
</tbody>
</table>

** Significant at the 0.01 level

At the construct level, discriminant validity can be assessed by comparing a 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. PLS does not calculate AVE automatically. It can be calculated from $\Sigma \lambda_i^2 / (\Sigma \lambda_i^2 + \Sigma (1 - \lambda_i^2))$ (Gefen et al., 2000). If “Unit Variance” option is selected in PLS, the AVE formula is simplified to $\sum \lambda_i^2 / n$ where $n$ is the number of manifest variables of the latent variable. Table 3 shows that AVE for every latent variable exceeds 0.5, and greater than the correlation between that latent variable with the other latent variables. Therefore every latent variable is deemed to be adequate on its convergent validity. As such, the model exhibits acceptable discriminant validity (Barclay et al., 1995).

Table 3. AVE and Correlation Among Constructs via PLS Analysis

<table>
<thead>
<tr>
<th>Construct</th>
<th>MF</th>
<th>HF</th>
<th>INV</th>
<th>SAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>MF</td>
<td>0.683</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HF</td>
<td>0.481</td>
<td>0.810</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INV</td>
<td>0.491</td>
<td>0.320</td>
<td>0.776</td>
<td></td>
</tr>
<tr>
<td>SAT</td>
<td>0.600</td>
<td>0.540</td>
<td>0.467</td>
<td>0.870</td>
</tr>
</tbody>
</table>

6.2 Assessment of 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 four coefficients are significant at $\alpha = 0.01$, providing support for hypotheses H1a, H1b, H2b and H3. One path is not significant, showing that hypothesis H2a is not supported. Hygiene factors do not show any significant effect on user involvement. Loehlin (1992) gives two reasons for not deleting non-significant paths: (1) on reflective indicators, the estimates of the structural (path) coefficients are biased downward, and (2) where sample size is small, non-significant paths that were theoretically justified should be retained in exploratory models.

Table 4. Path Coefficients and Their T-value.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Path</th>
<th>Path Coefficient (β)</th>
<th>t-value</th>
<th>Significant (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a</td>
<td>MF</td>
<td>INV</td>
<td>0.438</td>
<td>6.366</td>
</tr>
<tr>
<td>1b</td>
<td>MF</td>
<td>SAT</td>
<td>0.358</td>
<td>6.490</td>
</tr>
<tr>
<td>2a</td>
<td>HF</td>
<td>INV</td>
<td>0.109</td>
<td>1.576</td>
</tr>
<tr>
<td>2b</td>
<td>HF</td>
<td>SAT</td>
<td>0.306</td>
<td>5.520</td>
</tr>
<tr>
<td>3</td>
<td>INV</td>
<td>SAT</td>
<td>0.193</td>
<td>3.288</td>
</tr>
</tbody>
</table>

*ns denotes not significant

The explanatory power of the estimated model, or nomological validity, can be assessed by observing the $R^2$ of endogenous constructs. Table 5 shows the $R^2$ values for User Involvement and User Satisfaction construct. Falk and Miller (1992) recommend that $R^2$ must be at least 0.10 in order for the latent construct to be judged adequate. Table 5 shows that all of the $R^2$ values satisfy this recommendation. As such, nomological validity is satisfactory. Figure 2 shows that the model explains 25 percent of total variability of user involvement.
Table 5. $R^2$ for Endogenous Constructs

<table>
<thead>
<tr>
<th></th>
<th>User Involvement ($\eta_1$)</th>
<th>User Satisfaction ($\eta_2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R^2$</td>
<td>0.250</td>
<td>0.470</td>
</tr>
</tbody>
</table>

* = Significant at $\alpha = 0.01$
** = Not significant

Figure 2. PLS Estimation of the Research Model.

From Figure 2, by comparing path coefficients from MF to involvement ($\beta = 0.438, p < 0.001$) and from HF to involvement ($\beta = 0.109, p = 0.1$), it is seen that MF has a stronger effect on involvement. This supports hypothesis H4a. Hypothesis H4b is also supported by the fact that path coefficient from MF to satisfaction ($\beta = 0.358, p < 0.001$) is greater than the path coefficient from HF ($\beta = 0.306, p < 0.001$). Overall, Table 6 summarizes all the hypotheses and the test results.

Table 6. Outcome of the hypotheses testing.

<table>
<thead>
<tr>
<th>HYPOTHESIS</th>
<th>OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a. Motivating factors will affect user involvement positively</td>
<td>Supported</td>
</tr>
<tr>
<td>1b. Motivating factors will affect user satisfaction positively</td>
<td>Supported</td>
</tr>
<tr>
<td>2a. Hygiene factors will affect user involvement positively</td>
<td>Not supported</td>
</tr>
<tr>
<td>2b. Hygiene factors will affect user satisfaction positively</td>
<td>Supported</td>
</tr>
<tr>
<td>3. User involvement will have a positive effect on user satisfaction</td>
<td>Supported</td>
</tr>
<tr>
<td>4a. Motivating factors will have a stronger effect on user involvement than hygiene factors will have.</td>
<td>Supported</td>
</tr>
<tr>
<td>4b. Motivating factors will have a stronger effect on user satisfaction than hygiene factors will have.</td>
<td>Supported</td>
</tr>
</tbody>
</table>
7. Discussion and Conclusion

User involvement has been the focus of this study. It is a result of users interacting with a system, i.e. a Website. This study utilizes categorization of Web design factors presented by Zhang and Dran (2000) who adopted Herzberg’s Motivation-Hygiene Theory to categorize Web design factors into motivating factors and hygiene factors. A total of seven hypotheses were tested in which six were supported.

7.1 The Role of Motivating Factors and Hygiene Factors toward User Involvement

A central focus of this study was to investigate whether Web design motivating factors and hygiene factors have impacts on user involvement. It has been considered that individual perceived personal relevance or felt involvement is a function of situational and intrapersonal determinants (e.g. Zaichkowsky, 1985). According to Celsi and Olson (1988), felt involvement “has two broad sources: (1) physical and social aspects of the immediate environment, and (2) intrinsic characteristics of the individual,” (p. 211). These are situational and intrinsic sources of perceived personal relevance. Situational sources are dynamic and changeable; thus, felt environment may change when situations change. On the other hand, intrinsic sources of personal relevance “are relatively stable, enduring structures of personally relevant knowledge, derived from past experience and stored in long-term memory” (p. 212). The result of this study shows that motivating factors affect user involvement, whilst hygiene factors show no effect on user involvement. These findings can be explained as follow. Two antecedents of personal relevance can be related to those motivating factors and hygiene factors. Physical and social aspects of the environment are represented by hygiene factors and intrinsic characteristics of the individual are related to the motivating factors.

Visual sensory is what the users face when they open a Website. Unfortunately, visually, no two Websites are identical, even for those Websites employing the same information structure. Since practically the Website used on this study might be new to the subjects, and due to the nature of the tasks given the subjects and time constraint to finish all tasks, subjects might not have enough time and all chances needed to perceive that all hygiene factors were there. This explains why several items on hygiene factors load insignificantly to their latent construct.

On the other hand, when subjects navigate even a new Website, they have a chance to enjoy their surfing activity while unconsciously absorbing relevant knowledge and new Web surfing experience. This situation can be understood from the fact that several items on motivating factors load higher than other items on their latent variables.

7.2 User Involvement as a Predictor of User Satisfaction

Zahedi et al. (2001) stated that one important antecedent of overall satisfaction with the Web design is Website usability. IEEE (1990) defines usability as the ease with which a user can learn to operate, prepare inputs for, and interpret outputs of a system or component. A system that is easy to use is often referred to as a (user) friendly system. User involvement is an outcome of the user interacting with the system, in this case a Website (Griffith, 2001). This implies that user involvement affects user satisfaction. Parallel with this, and as predicted, the result of this study shows that there is a positive and significant relationship between user involvement and user satisfaction. As such, it can be concluded that user involvement is an important predictor of user satisfaction.
7.3 Effect of the Two-Factor Model toward User Satisfaction
It has been predicted before that motivating factors and hygiene factors relate to user satisfaction and user dissatisfaction. The perceived existent of motivating factors enhances user satisfaction, while perceived existent of hygiene factors may reduce or enhance user dissatisfaction (Zhang and Dran, 2000). This study did not consider user dissatisfaction on the research design. As such, the relationships between hygiene factors to user dissatisfaction cannot be assessed using the data obtain from this study.

The result of this study reveals that both motivating factors and hygiene factors have positive relationship with user satisfaction with the Website, with motivating factors having slightly stronger effect on user satisfaction than hygiene factors. This supports Zhang and Dran (2000) claim that the presence of motivating factors enhances user satisfaction.

7.4 Limitation and Future Studies
This study used only one Website, and it cannot represent the vast number of commercial Websites currently available. Therefore, the result of this study can not be generalized just yet.

Future studies can be designed to involve more variety of subjects, on different types of Websites, with longer durations so that subjects will have more time to observe the Website more thoroughly and so that they can have a better idea of the presence and absence of the motivating factors and hygiene factors.

Acknowledgement
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References


Lee, J-N., Pi, S-M., Kwok, R.C. and Huynh, M.H. “The Contribution of Commitment Value


**Appendix A**
Loading of manifest variables to their respective latent variable obtained from PLS for original items.

<table>
<thead>
<tr>
<th>MAIN LATENT VARIABLES</th>
<th>LOADING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Motivating Factor</strong>(^* ) (1 = strongly disagree; 7 = strongly agree)</td>
<td></td>
</tr>
<tr>
<td>MF1: I have learned new knowledge from this Website</td>
<td>0.5441</td>
</tr>
<tr>
<td>MF2: I have learned new skills from this Website</td>
<td>0.5722</td>
</tr>
<tr>
<td>MF3: It was fun exploring this Website</td>
<td>0.8281</td>
</tr>
<tr>
<td>MF4: I enjoyed exploring this Website</td>
<td>0.8508</td>
</tr>
<tr>
<td>MF5: This Website features a multimedia presentation</td>
<td>0.5134</td>
</tr>
<tr>
<td>MF6: This Website has an attractive appearance</td>
<td>0.7106</td>
</tr>
<tr>
<td>MF7: This Website is visually appealing</td>
<td>0.7175</td>
</tr>
<tr>
<td><strong>2. Hygiene Factor</strong>(^* ) (1 = strongly disagree; 7 = strongly agree)</td>
<td></td>
</tr>
<tr>
<td>HF1: This Website gives a very fast response/loading time</td>
<td>0.4278</td>
</tr>
<tr>
<td>HF2: This Website supports different browsers</td>
<td>0.4511</td>
</tr>
<tr>
<td>HF3: This Website has a loading/processing indicator</td>
<td>0.3275</td>
</tr>
<tr>
<td>HF4: This Website provides an effective navigation aids</td>
<td>0.8657</td>
</tr>
<tr>
<td>HF5: This Website provides a clear direction for navigating the Website</td>
<td>0.8579</td>
</tr>
<tr>
<td>HF6: This Website gives a clear indication of user location for navigating the Website</td>
<td>0.5611</td>
</tr>
<tr>
<td><strong>3. User Involvement</strong></td>
<td></td>
</tr>
<tr>
<td>After using this Website, I feel that using this Website is ……</td>
<td></td>
</tr>
<tr>
<td>INV1: Extremely essential (1) … Extremely Non essential (7)</td>
<td>0.8185</td>
</tr>
<tr>
<td>INV2: Extremely fundamental (1) … Extremely Trivial (7)</td>
<td>0.7168</td>
</tr>
<tr>
<td>INV3: Extremely significant (1) … Extremely Insignificant (7)</td>
<td>0.7785</td>
</tr>
<tr>
<td>INV4: Extremely important (1) … Extremely Unimportant (7)</td>
<td>0.8117</td>
</tr>
<tr>
<td>INV5: Extremely needed (1) … Extremely Not needed (7)</td>
<td>0.8389</td>
</tr>
<tr>
<td>INV6: Extremely means a lot (1) … Extremely Means nothing (7)</td>
<td>0.7519</td>
</tr>
<tr>
<td>INV7: Extremely relevant (1) … Extremely Irrelevant (7)</td>
<td>0.7067</td>
</tr>
<tr>
<td><strong>4. User Satisfaction</strong> (1 = strongly disagree; 7 = strongly agree)</td>
<td></td>
</tr>
<tr>
<td>SAT1: I feel satisfied with the quality of this Website</td>
<td>0.890</td>
</tr>
<tr>
<td>SAT2: I had control over what I wanted to do on this Website</td>
<td>0.722</td>
</tr>
<tr>
<td>SAT3: I feel satisfied with my visit to this Website</td>
<td>0.921</td>
</tr>
<tr>
<td>SAT4: I feel pleased with my visit to this Website</td>
<td>0.931</td>
</tr>
</tbody>
</table>