Factors influencing the intended use of web portals

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Abstract

Purpose – A lack of differentiation in the function and appearance of web portals has led to fierce competition; attracting users' attention is no doubt the most important factor for portal success. This study aims to combine rational assessment factors and non-rational assessment factors to examine their impact on the intended use of portals.

Design/methodology/approach – The research participants were individuals who have experience using web portals. A total of 215 valid questionnaires were collected. Structural equation modelling was used to test the research hypothesis.

Findings – This study is based on the technology acceptance model (TAM), a significant model in MIS research. The results show that all assessment factors have an impact on the intended use of web portals.

Research limitations/implications – TAM emphasised perceived usefulness as the key determinant of user acceptance of technology. This study finds, however, that in the portal context, non-rational assessment factors such as perceived playfulness and habit have more significant effects on users' intention than perceived usefulness.

Practical implications – The paper concludes that non-rational assessment factors are important boundary conditions to the validity of the technology acceptance model. To attract users, web site designers should be more aware of aesthetics and the hedonic nature of web users.

Originality/value – This study has contributed to the original TAM by incorporating non-rational assessment factors. It also validates this empirical model. The results of this study can help practitioners create a more successful business model and help researchers better understand user behaviour on the internet.

Keywords Electronic commerce, Portals, Web site design, Perception

Paper type Research paper

Introduction

As the internet becomes a more integral and routine component of our daily lives, web portals are competing to provide internet users with access to the resources and services they desire. A portal is an internet-based application that acts as an entry
point or gateway between users and a range of different services (Akram et al., 2005). A portal offers a broad array of resources and services to web users, such as e-mail, search engines, forums, and online shopping malls (Webopedia, 2010). Portals such as Yahoo! offer users a single point of access to a wide variety of services (Russell et al., 2006). The portal is the most accessed type of web site (Outing, 2000). It relies on advertising as its main source of revenue (Ha, 2003). As more users visit the portal, more income is generated (Spreng and Olshavsky, 1993).

While web portals have attempted to provide a full range of functions, the dissimilarity among portals has significantly decreased. The lack of differentiation has led to fierce competition among portals. Attracting the most “eyeballs” is undoubtedly the most important factor in portal success. The effectiveness of providing attractive and playful web sites in order to retain users is gaining the attention of researchers and practitioners. Unlike other information technologies the portal may offer users entertainment. For this reason perceived usefulness may not fully address the portal user’s motives, necessitating a search for additional emotional factors such as attractiveness, playfulness and psychic cost perceptions. The visual attractiveness of the web portal refers to its visual elements, most notably the colour scheme and its overall layout (van der Heijden, 2003). Playfulness is regarded as an individual state, because an individual can feel playful during a visit to a web portal (Lin et al., 2005). Psychic cost perceptions are defined as users’ negative affective reactions to a web portal and its environment (Baker et al., 2002). Environmental cues (e.g. aesthetics) could influence consumers’ criteria for choosing a web portal (e.g. psychic cost perceptions, usefulness and playfulness) and in turn influence patronage intentions (Baker et al., 2002; van der Heijden, 2003). Additionally according to previous studies habit is a significant predictor of the future use of an information technology (Gefen, 2003; Liao et al., 2006; Limayem and Hirt, 2003; Limayem et al., 2007). Habit reflects automatic behaviour tendencies developed during the past history of the individual (Limayem and Hirt, 2003). When behaviour is repeated and becomes habitual, it is guided by automated cognitive processes, rather than by elaborate decision processes (Aarts et al., 1998). Hence examining the effect of habit on continuance behaviour can enhance our understanding of web portal adoption.

The reasons why a particular user chooses to continue visiting a specific portal are many. Aside from usefulness (van der Heijden, 2003; Lin et al., 2005) it could also be the fact that the layout or colours of the portal are attractive to the user. The pleasant layout could reduce the psychic cost perceptions and increase usage intention. Thus non-rational factors such as the perception of the portal’s aesthetics, playfulness, and pleasantness could also influence usage intention (Agarwal and Karahanna, 2000; van der Heijden, 2003; Liao et al., 2007; Lin et al., 2005; Moon and Kim, 2001). Many users choose a specific portal as their homepage once they have become accustomed to it (Gefen, 2003; Limayem and Hirt, 2003). Setting a specific web portal as a homepage is a kind of habit. Habit becomes an important driver of users’ subsequent online behaviour.

Many service providers build and operate the portal from the administrator’s or designer’s perspective, and fail to consider the feelings and expectations of people using the portal. However user demand can only be met by understanding those feelings and expectations. This paper proposes a model from the user’s perspective to predict and explain the intended use of portals by internet users. The model provides
five factors influencing the sustainable usage intention of web portals, including perceived usefulness, perceived playfulness, perceived attractiveness, psychic cost perceptions and habit.

**Theoretical background and conceptual framework**

*Portals*

A portal is the user’s gateway to the internet: the place where the user starts to browse the internet (Cohen, 1999). From the portal the user can connect to other web sites, or stay to make use of the various functions the portal provides. Web portals include corporate, government, educational and general portals. A general portal is targeted at all internet users. It is often the kind of web site that incorporates a search engine, e-mail mailbox, chat rooms and other services (Dunlap and Wong, 1998). Typical general portals include Yahoo!, Excite, Lycos and Infoseek. The purpose of this paper is to understand the intended use of these general portals.

*Conceptual framework*

Two streams of research have been conducted regarding online usage behaviour (Gefen, 2003; Serenko and Turel, 2005; Smith and Sharma, 2002; To et al., 2007). One stream, exploring usage behaviour from the rational perspective, measures whether or not benefits are acquired from the usage, or whether a task is completed efficiently during usage. The other stream explores the irrational perspective. Studies of online usage from the irrational perspective seek to evaluate experience and emotion. One could say that rational factors are goal-oriented and irrational factors are experiential or emotion-oriented.

Previous studies have indicated that perceived usefulness is the user’s rational reaction when they select to use a web site (Gefen, 2003). Habit, however, cannot be accounted for rationally (Gefen, 2003; Walters and Bergiel, 1989). Habit is an example of irrational behaviour because an individual continues to do what they are habitually used to doing without applying rational analysis to the behaviour. While rational factors emphasise utilitarian benefits such as efficiency and productivity, irrational factors often emphasise emotions such as aesthetics and hedonic emotions (Ha et al., 2007; Smith and Sharma, 2002). Individual aesthetics, which is related to perceived attractiveness, is a personal arbitrary construct resulting from deep-rooted tendencies devoid of a rational basis. Individual aesthetics is an irrational behaviour (Machan, 1977). Psychic cost perceptions are viewed as users’ negative emotions (Baker et al., 2002). Serenko and Turel (2005) pointed out that playfulness is an intensely irrational, spontaneous, and personal activity. Taken together, perceived usefulness could be regarded as a rational factor; and habit, perceived attractiveness, perceived playfulness and psychic cost perceptions could be regarded as irrational factors.

Studies exploring web site usage behaviour have mostly examined the rational perspective, viewing perceived usefulness as a predictor of behaviour. Therefore little research has focused on irrational factors in information systems (IS) literature. Web portals however are not only tools to enhance work/learning performance, but also venues for entertainment. Today when people use portals they focus more on their emotional needs. For this reason providing an attractive and playful web site has gained the attention of portal marketers. This study examines the factors that are derived from both rational and irrational perspectives that influence the intended use
of portals. Aside from perceived usefulness, which is associated with the rational perspective, this paper also includes the irrational factors of habit, perceived attractiveness, perceived playfulness, and psychic cost perceptions. These are shown in Figure 1.

Technology acceptance model

Davis (1989) developed the technology acceptance model (TAM) theory to explain and predict the adoption of IS by users. Davis (1989) proposed that perceived ease of use and perceived usefulness are two key factors influencing the intended use of an information system, although the perceived ease of use often has an insignificant impact on the intended use of experienced users. However perceived usefulness can have a significant impact on the intended use of both inexperienced and experienced users (Bhattacherjee, 2001; Karahanna et al., 1999; Taylor and Todd, 1995).

Karahanna et al. (1999, p. 200) observed that as “users gain experience with the system, ease of use concerns seem to be resolved and displaced by more instrumental considerations involving the efficiency of the innovation to increase one’s job performance (i.e., perceived usefulness)” In keeping with these observations perceived usefulness is expected to be the most salient post expectation influencing experienced users’ intended use of IS (Bhattacherjee, 2001). However perceived ease of use usually has an insignificant impact on the intended use of experienced users (Bhattacherjee, 2001; Karahanna et al., 1999; Taylor and Todd, 1995). Perceived ease of use is often an important predictor for potential adopters of IS because it reflects users’ computer self-efficacy when they adopt a new IS (Davis, 1989). When users gain experience the effect of perceived ease of use is eliminated and users pay more attention to enhanced job performance from continued use (Karahanna et al., 1999). As this study explores experienced users’ continued behaviour, only the perceived usefulness construct is considered.

Several IS researchers have tested the relationship between perceived usefulness and behavioural intention regarding various information technologies. For example Lu et al. (2003) found relationships between perceived usefulness and intention to use wireless internet via mobile devices. In addition Lee (2006) found that perceived usefulness has a positive effect on the intention of users to accept an e-learning system. Recently Bigné-Alcañiz et al. (2008) indicated that the perceived usefulness of online shopping influences future shopping intention. Perceived usefulness has been

Figure 1.
Research model
extensively investigated by other researchers using different samples and has generally been confirmed as an important factor affecting usage intention of a system. Thus we can postulate that perceived usefulness is positively related to the user’s intention to utilise a portal.

**H1.** Perceived usefulness has a positive impact on the intention to use a web portal.

*Playfulness*

Ideas regarding the state of playfulness are primarily based on Csikszentmihalyi’s (1975) “flow theory”. The study defined flow as “the holistic sensation that people feel when they act with total involvement” (Csikszentmihalyi, 1975, p. 36). Flow consists of four components: control, attention, curiosity, and intrinsic interest. Hoffman and Novak (1996), applying flow theory to the act of navigating the web, conceptualised flow as a cognitive state involving:

- high levels of skill and control;
- high levels of challenge and arousal;
- focused attention; and
- feelings of enhancement caused by interactivity and telepresence.

Later Novak *et al.* (2000) developed a structural model based on their previous conceptual model for measuring flow empirically.

In recent years hedonic-oriented online content has been growing at a dramatic pace (Chu and Lu, 2007). Some studies have focused on perceived enjoyment (van der Heijden, 2003; Pikkarainen *et al.*, 2004) and perceived playfulness (Ahn *et al.*, 2007; Cheong and Park, 2005; Chu and Lu, 2007; Moon and Kim, 2001). Ahn *et al.* (2007) investigated the effect of playfulness on user acceptance of online retailing and tested the relationship between web quality factors and user acceptance behaviour. Their study enhanced our knowledge of the effect of playfulness, which should help practitioners and researchers better understand consumer behaviour in e-commerce. Playfulness represents a relatively enduring tendency, while being playful represents a temporary state at some specific time (Barnett, 1991; Lieberman, 1977; Moon and Kim, 2001). Playfulness has three dimensions: concentration, curiosity and enjoyment (Csikszentmihalyi, 1975; Deci, 1975; Moon and Kim, 2001). Concentration refers to the degree that an individual’s attention is limited to a narrow stimulus. Curiosity refers to the degree that an individual’s sensory or cognitive curiosity is aroused. Enjoyment refers to the degree that an individual is involved in the activity for pleasure rather than for some extrinsic reward (Csikszentmihalyi, 1975; Malone, 1981; Moon and Kim, 2001). Moon and Kim (2001) consider playfulness as an intrinsic belief or motive, which is shaped from the individual’s experiences with the environment. Applied to an individual’s use of a web portal, playfulness is an intrinsic belief that is formed from the individual’s subjective experience with the portal. Individuals who have positive playfulness belief in the web portal should view its interactions more positively. Thus perceived playfulness should be an important factor influencing the intended use of portals:

**H2.** Perceived playfulness has a positive impact on the intention to use a web portal.
Habit

Habit has received scant attention in the IS literature (Limayem et al., 2007). However it is a critical factor in the e-commerce environment. Limayem et al. (2007) discussed prior work on habit in general with a special focus on the nature of habit and its relationship to intention and actual behaviour in the context of continued IS usage. Habit is the inclination for behaviour (Ouellette and Wood, 1998) and it represents current behavioural preference instead of future intended behaviour. Gefen (2003) defined a consumer’s habit of transacting on a certain B2C web site as their previous pattern of tendency and preference towards using a specific B2C web site. Recently Limayem et al. (2007, p. 709) defined “habit in the context of IS usage as the extent to which people tend to perform behaviours (use IS) automatically because of learning.” Habit also involves motivation and provides continuity of experience and behaviour. Habitual behaviour happens only when a similar decision was made in the past, and the individual was satisfied with the result; therefore one would automatically make the same decision again when the same issue emerged (Walters and Bergiel, 1989). In the scenario of web portals, users may spontaneously set a specific portal as their homepage or consistently use the same portal out of habit without thinking about or rationally analysing why they have chosen a specific web portal. In time however the habitual usage of a certain web portal is likely to encourage the recognition of the perceived usefulness of that portal:

H3. Usage habit has a positive impact on the intention to use a web portal.
H4. Usage habit has a positive impact on the perceived usefulness of a web portal.

Perceived attractiveness

Perceived attractiveness refers to the degree to which a person believes that the web site is aesthetically pleasing to the eye. Dion et al. (1972) indicated that people tend to associate with physically attractive individuals rather than with physically unattractive ones. Consumer marketing research indicates that attractive products create more favourable attitudes regarding purchasing than unattractive ones (Bloch, 1995). van der Heijden (2003) recognised that aesthetics plays a role in the decision to use an IS and a web site. Tractinsky et al. (2000) demonstrated that perceived aesthetics and usefulness are significantly related, i.e. “what is beautiful is usable”. In addition Ha et al. (2007) found that attractiveness affects attitude and that there is a positive relationship between perceived attractiveness and perceived enjoyment because physical attractiveness may make an individual enjoy the experience. An attractive portal will stimulate users’ curiosity and increase their enjoyment of browsing the web site. An aesthetically pleasing portal could induce the perception of usefulness and enjoyment for the user (van der Heijden, 2003).

H5. Perceived attractiveness has a positive impact on the perceived usefulness of a web portal.
H6. Perceived attractiveness has a positive impact on the perceived playfulness of a web portal.

Psychic cost perceptions

The psychic cost perceptions represent consumers’ mental stress or emotional labour during the shopping experience (Baker et al., 2002). Environmental psychologists
Mehrabian and Russell (1974) have focused on understanding these psychic costs, which could be viewed as users’ negative affective reactions to a portal. Babin and Darden (1996) suggested that negative affect has a stronger impact on consumers. If portal managers reduce the psychic cost perception by reducing the unpleasant and uncomfortable perceptions of the portal, the users’ intentions of continual usage in the future are likely to increase. In addition, an attractive portal would be more likely to decrease the negative emotions of web browsing.

**H7.** Perceived attractiveness has a negative impact on the psychic cost perception of a web portal.

**H8.** Psychic cost perception has a negative impact on intention to use a web portal.

**Research methodology**

**Instrument development**
The questionnaire was derived from previous studies. A pretest was carried out by two researchers and two internet users to check the content validity of the instrument. A sample of 48 graduate students was used for the pilot study. The results of the pilot study showed that the Cronbach’s $\alpha$ value of each construct met the standard of 0.7 suggested by Nunnally (1978). All items in the questionnaires were rated on a seven-point Likert scale, with 1 representing total disagreement and 7 representing total agreement. The scale items for perceived attractiveness and perceived usefulness were adopted from van der Heijden (2003); items for perceived playfulness were adopted from Moon and Kim (2001); items for habit were adopted from Gefen (2003); items for psychic cost perceptions were adopted from Baker et al. (2002); and the items for intended use were adopted from Suh and Han (2003). The operational definitions of the variables are shown in Table I.

**Statistical analysis technique**
Structural equation modelling (SEM) is a multivariate statistical analysis technique (Hair et al., 1998). It consists of two types of models: the measurement model and the structural model. The measurement model defines the constructs that the model will

<table>
<thead>
<tr>
<th>Construct</th>
<th>Operational definition</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived usefulness</td>
<td>The benefit the user perceives from using a certain portal</td>
<td>van der Heijden (2003)</td>
</tr>
<tr>
<td>Habit</td>
<td>The pattern of tendency and preference of using a specific portal in the past</td>
<td>Gefen (2003)</td>
</tr>
<tr>
<td>Perceived attractiveness</td>
<td>The degree to which a person believes that the portal is aesthetically pleasing to the eye</td>
<td>van der Heijden (2003)</td>
</tr>
<tr>
<td>Perceived playfulness</td>
<td>The strength of a user’s belief that interacting with the portal will fulfill their intrinsic motives</td>
<td>Moon and Kim (2001)</td>
</tr>
<tr>
<td>Psychic cost perceptions</td>
<td>Users’ negative affective reactions to the portal</td>
<td>Baker et al. (2002)</td>
</tr>
<tr>
<td>Intended use</td>
<td>The user’s intention to use a specific portal in the future</td>
<td>Suh and Han (2003)</td>
</tr>
</tbody>
</table>

Table I. Operational definitions of constructs
use, and assigns observed items to each. The structural model then defines the causal relationship among these constructs (Gefen et al., 2000). SEM tools are increasingly being used in psychological, social and behavioural science research for the causal modelling of complex, multivariate data sets in which the researcher gathers multiple measures of proposed factors (Hair et al., 1998). This paper explores causal relationships between latent variables through the SEM technique. A two-stage analysis method, using a measurement model and a structural model, was used for data analysis. LISREL 8.52 was used to perform these analyses.

Data analysis and results

Subjects
The data for this study were collected through online questionnaires. Announcements were made on several popular bulletin board systems in Taiwan, such as PTT and Formosa, inviting internet users to participate by filling out the questionnaire. As an incentive a lottery was held for the participants. A total of 227 questionnaires were received. After eliminating the duplicates, incomplete responses and those with other problems, a total of 215 questionnaires were regarded as valid. According to the respondents the most frequently visited portal is Yahoo Taiwan (84.7 percent) and the most widely used service provided by the portal is a free e-mail account (92.1 percent). The proportion of each gender is quite balanced: 47.7 percent of respondents are male, and 52.6 percent are female (see Table II). Around half of the respondents (53.9 percent) are aged 20 to 29 and approximately 80 percent are 20 to 39 years old.

Measurement model
The study uses the methodology suggested by Gerbing and Anderson (1988) to assess the measurement model. First confirmatory factor analysis (CFA) is used to investigate model fitness. The study uses maximum likelihood estimation (MLE) to assess the overall model with goodness-of-fit measures. The recommended level (Hair et al., 1998, pp. 654-61) and calculation of measures are listed in Table III. As shown in Table III the overall model fit indices show that all goodness-of-fit measures are within acceptable levels except for GFI, which is marginally acceptable (Hair et al., 1998).

After the overall model was accepted, each of the constructs was evaluated separately by examining the indicator loadings for statistical significance and assessing the construct’s reliability and variance extracted (Hair et al., 1998). Hair et al. (1998) suggested that all standardised factor loadings should reach a significance level of over 0.6, the composite reliability should be over 0.7, and the construct’s average variance extracted should be over 0.5. The results of the analysis are shown in Table IV. All standardised factor loadings are over 0.6 and significant at the $p = 0.01$ level. Table V shows that the composite reliability ranges from 0.80 to 0.94, the constructs’ average variance extracted (AVE) ranges from 0.55 to 0.83, and the constructs’ AVE of each latent variable is over 0.5, which represents sufficient convergent validity (Hair et al., 1998). Discriminant validity is shown when the square root of each construct’s AVE is larger than its correlations with other constructs. As can be seen in Table V the square root of the AVE is much larger than its correlations with the other constructs, therefore discriminant validity was achieved (Fornell and Larcker, 1981).
After satisfying the requirements of the measurement model, a structural equation analysis was conducted. The analysis of the structural model requires observing the path coefficients and examining model fit. The results of the goodness-of-fit index are

<table>
<thead>
<tr>
<th>Item</th>
<th>Category</th>
<th>No. of people</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>102</td>
<td>47.4</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>113</td>
<td>52.6</td>
</tr>
<tr>
<td>Age</td>
<td>&lt; 20</td>
<td>27</td>
<td>12.6</td>
</tr>
<tr>
<td></td>
<td>20-29</td>
<td>116</td>
<td>53.9</td>
</tr>
<tr>
<td></td>
<td>30-39</td>
<td>54</td>
<td>25.1</td>
</tr>
<tr>
<td></td>
<td>&gt; 40</td>
<td>18</td>
<td>8.4</td>
</tr>
<tr>
<td>History of internet usage (years)</td>
<td>&lt; 3</td>
<td>3</td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td>3-5</td>
<td>26</td>
<td>12.1</td>
</tr>
<tr>
<td></td>
<td>5-7</td>
<td>80</td>
<td>37.2</td>
</tr>
<tr>
<td></td>
<td>&gt; 7</td>
<td>106</td>
<td>49.3</td>
</tr>
<tr>
<td>Most frequently used portal</td>
<td>Yahoo Taiwan (tw.yahoo.com)</td>
<td>182</td>
<td>84.7</td>
</tr>
<tr>
<td></td>
<td>Sina (<a href="http://www.sina.com.tw">www.sina.com.tw</a>)</td>
<td>19</td>
<td>8.8</td>
</tr>
<tr>
<td></td>
<td>Hinet (<a href="http://www.hinet.net">www.hinet.net</a>)</td>
<td>3</td>
<td>1.4</td>
</tr>
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<td></td>
<td>Pchome (<a href="http://www.pchome.com">www.pchome.com</a>)</td>
<td>6</td>
<td>2.8</td>
</tr>
<tr>
<td></td>
<td>Yam (<a href="http://www.yam.com.tw">www.yam.com.tw</a>)</td>
<td>2</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>3</td>
<td>1.4</td>
</tr>
<tr>
<td>History of portal usage (years)</td>
<td>&lt; 3</td>
<td>9</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>3-5</td>
<td>52</td>
<td>24.2</td>
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<tr>
<td></td>
<td>5-7</td>
<td>81</td>
<td>37.7</td>
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<tr>
<td></td>
<td>&gt; 7</td>
<td>73</td>
<td>33.9</td>
</tr>
<tr>
<td>Portal services used</td>
<td>Free e-mail account</td>
<td>198</td>
<td>92.1</td>
</tr>
<tr>
<td></td>
<td>News</td>
<td>183</td>
<td>85.1</td>
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<td></td>
<td>Search engine</td>
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<td>Weather</td>
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<td>Forum</td>
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<td>43.3</td>
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<td></td>
<td>Software downloads</td>
<td>85</td>
<td>39.5</td>
</tr>
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<td></td>
<td>Photo album</td>
<td>84</td>
<td>39.1</td>
</tr>
<tr>
<td></td>
<td>Travel</td>
<td>74</td>
<td>34.4</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>53</td>
<td>24.7</td>
</tr>
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<table>
<thead>
<tr>
<th>Fit indicators</th>
<th>Recommendation</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-square</td>
<td>( p &gt; 0.05 )</td>
<td>559.20 *</td>
</tr>
<tr>
<td>Chi-square/df</td>
<td>&lt; 5.00</td>
<td>2.15</td>
</tr>
<tr>
<td>RMSEA</td>
<td>&lt; 0.08</td>
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</tr>
<tr>
<td>IFI</td>
<td>&gt; 0.90</td>
<td>0.92</td>
</tr>
<tr>
<td>CFI</td>
<td>&gt; 0.90</td>
<td>0.92</td>
</tr>
<tr>
<td>GFI</td>
<td>&gt; 0.90</td>
<td>0.82</td>
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<tr>
<td>NNFI</td>
<td>&gt; 0.90</td>
<td>0.91</td>
</tr>
</tbody>
</table>

Note: *\( p = 0.000 \)

Table II. Descriptive statistics of respondents

Table III. Overall model fit

Structural model
After satisfying the requirements of the measurement model, a structural equation analysis was conducted. The analysis of the structural model requires observing the path coefficients and examining model fit. The results of the goodness-of-fit index are
as follows: RMSEA = 0.076, IFI = 0.925, CFI = 0.924, GFI = 0.817, NFI = 0.914, and
\( \chi^2/df = 2.25 \). Except for GFI, which is marginally acceptable, all other goodness-of-fit
indexes are within the range of recommended levels. Thus the model should be
acceptable. All hypotheses are also validated (see Figure 2). The factors significantly

<table>
<thead>
<tr>
<th>Item</th>
<th>Item mean</th>
<th>Standard deviation</th>
<th>Standardised item loading</th>
<th>Error loading</th>
<th>t-statistic (for ( \lambda ))</th>
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</thead>
<tbody>
<tr>
<td>PU1</td>
<td>6.02</td>
<td>0.83</td>
<td>0.80</td>
<td>0.36</td>
<td>13.01</td>
</tr>
<tr>
<td>PU2</td>
<td>5.59</td>
<td>1.00</td>
<td>0.77</td>
<td>0.41</td>
<td>12.44</td>
</tr>
<tr>
<td>PU3</td>
<td>5.63</td>
<td>0.96</td>
<td>0.69</td>
<td>0.53</td>
<td>10.67</td>
</tr>
<tr>
<td>H1</td>
<td>6.38</td>
<td>0.71</td>
<td>0.81</td>
<td>0.34</td>
<td>14.03</td>
</tr>
<tr>
<td>H2</td>
<td>5.90</td>
<td>0.98</td>
<td>0.79</td>
<td>0.37</td>
<td>13.49</td>
</tr>
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**Table IV.**
Measurement model fit

**Notes:** PU: Perceived usefulness; H: Habit; PC: Psychic cost perceptions; PA: Perceived attractiveness;
PP: Perceived playfulness; IU: Intended use

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**Table V.**
Scale properties and correlations

**Notes:** Diagonals represent the square root of the average variance extracted, while the other matrix entries represent the correlations; PU: Perceived usefulness; H: Habit; PC: Psychic cost perceptions; PA: Perceived attractiveness; PP: Perceived playfulness; IU: Intended use; composite reliability = \((\sum \text{standardised loading})^2/\sum (\text{standardised loading})^2 + \sum \epsilon_j\)^{1/2}. Average variance extracted (AVE) = \(\sum (\text{standardised loading})^2/\sum (\text{standardised loading})^2 + \sum \epsilon_j\).
influencing intended use are led by habit, followed by perceived playfulness, perceived usefulness, and psychic cost perceptions (judging by the level of standardised path coefficient). Therefore H1, H2, H3, and H8 have all been supported. Perceived usefulness is significantly influenced by habit, followed by perceived attractiveness; therefore H4 and H5 have both been supported. Perceived attractiveness significantly influences perceived playfulness and psychic cost perception; therefore H6 and H7 have both been supported. The variances of intended use, perceived usefulness, and perceived playfulness are 66, 67 and 38 percent respectively. The measure of the variance explanation shows that the model has sufficient explanatory power and therefore could predict the intended use of web portals.

Discussion and implications
The objective of this paper was to develop a model to understand the intentions to use a web portal from an internet user’s perspective. The study also attempted to understand the effect of an individual’s rational and irrational factors regarding their web site usage behaviour. Previous studies have often examined the rational side of the internet environment. Little research has focused on the role of irrational factors regarding web site usage. However an individual’s motivations to use a web site are not limited to rational factors. Many irrational factors may have effects on one’s usage behaviour too. The main reasons for using a web site are not only to enhance performance, but also to increase pleasure and enjoyment. The need to provide an attractive and playful web site has gained marketers’ attention. The results of this study empirically validate that portal users have both rational and irrational motivations. The results also suggest that non-rational factors have a stronger influence on the intention to use a portal than rational factors. While the rational factor of perceived usefulness once again emerges as a major determinant of intention to use a web site, irrational factors explain significant variance in usage intentions beyond perceived usefulness alone. As technology developments continue to focus on more appealing interfaces, the importance of experiences that are intrinsically motivating, i.e. aesthetically pleasing, pleasurable and fun in and of themselves, might dominate as predictors of usage intentions. It is
interesting that users often continue using a specific information technology out of sheer habit rather than a strong belief that the technology produces a desirable outcome. While a desirable outcome is still important, users are more likely to use a technology that they are accustomed to. People who choose to use a specific information technology, web portals in this case, might not do so out of rational consideration. Factors devoid of rational grounds, such as attractiveness, playfulness, habit, and psychic cost perceptions, also have a significant impact on portal usage.

This study shows that perceived attractiveness of the web portal has a significant effect on perceived usefulness, perceived playfulness and psychic cost perceptions. Web sites with an attractive design (including layout, colour selection and general impression) stimulate more perceived usefulness and perceived playfulness than those with unattractive designs.

Moreover, unattractive web sites may cause users to incur psychic cost. We suggest that unattractive web sites may reduce surfing pleasure and lead to the reduction of users’ pleasure. In sum we found that aesthetics play an important role in the decision to use a portal. This result is comparable to the research of van der Heijden (2003). The aesthetics of a web site not only influence users’ first impressions of the web site, but also influence their perceptions of its usefulness and playfulness. How a portal attracts loyal users will be critical to practitioners in e-commerce. Therefore, when designing a portal, a portal manager should pay more attention to the aesthetic aspect of the web site in order to be more successful.

Perceived attractiveness has a negative influence on psychic cost perceptions. Many studies have proved that environmental factors are related to emotional reaction (e.g. Baker et al., 2002; Donovan and Rossiter, 1982; Greenland and McGoldrick, 1994; Wakefield and Baker, 1998). If the layout and colour selection of a portal is attractive, the user’s unpleasant feelings can be reduced; therefore increasing users’ perceived attractiveness of a portal could be helpful in reducing the psychic cost perceptions. Portal managers should pay more attention to designing web sites that stimulate pleasant feelings.

The results of this study show that habit has the greatest influence on intention to use a web portal. Habit is also an antecedent to perceived usefulness. The most important factor is habit, which is directly linked to continuance intention, mediated by perceived usefulness. Since this study explores portal users’ continuing usage behaviour, habit seems to be a critical contributing factor. The past behaviour of users will have considerable impact on their current assessment of whether to continue the behaviour in the future. If users habitually use the portal and thus develop familiarity, they may develop intention for continuing usage. For a portal manager to attract the users of its competitors’ portals, one would have to find a way to break the habits of these users. They can do so by increasing the exposure of the portal to raise awareness and curiosity. This could be achieved by advertising on radio, television, newspapers and magazines, or by forming a strategic alliance with other industry players. Portal managers need to provide an incentive to the internet community at large, stimulating usage and allowing new users to become familiar with the portal. If the portal can create more positive values than the portal previously used, users would probably be willing to break the old habit, switch to the new one, and become loyal users.

Although habit has a significant influence on the intended use of a portal, users would not reject the idea of switching to another portal just because they are already
accustomed to one. Portal managers should continue to maintain or improve the usefulness and playfulness to meet the demands of users. In such an open environment as the internet, the business model of a successful portal could be easily duplicated by competitors; therefore portal managers are always under threat from existing and potential competitors on the market. Portal managers should devote resources to increasing users’ perceived usefulness, perceived playfulness and pleasure in order to retain customers and gain a competitive advantage. Portal managers should aim to strengthen the habit of usage and the intention of continuing usage in the future.

Contrary to previous research, which indicated that perceived usefulness is the most important factor influencing technology acceptance among users (Davis, 1989), the results of this study indicate that perceived usefulness may not be so critical. Other factors, such as habit and perceived playfulness, are more important in terms of influencing users’ intentions to use a portal. Although perceived usefulness is considered a key determinant in the practical information systems environment, irrational factors are going to play an important role in increasing usability in the internet environment. In order to develop portal loyalty, practitioners should also provide users with an interesting and pleasurable surfing experience. Prior research indicates that higher playfulness results in immediate subject experiences manifesting as positive emotion which transforms into motivation for continuance intention (Lin et al., 2005). Therefore hedonic factors are a critical consideration in the design of future portal technology. Practitioners must provide users with opportunities to concentrate as they work or play, sate their curiosity and be entertained. Overall the driving motives of web portal usage are for both business and leisure purposes. Portal managers should pay attention to hedonic as well as utilitarian motivation factors to stimulate web portal usage.

Limitations and future research
The sampling procedure is a major limitation of this study since the participants were not chosen at random. However, since the sample population was highly diverse, being comprised of users of different ages and backgrounds, sampling bias was avoided. The samples should still be representative. Researchers utilising the results of this study in the future should be aware this limitation. Also the study investigated factors influencing usage of web portals only. There are many different kinds of web sites. The results of the study may not be generalisable to other kinds of web sites. It is suggested that future research could be conducted to investigate the phenomenon in other kinds of web sites. Finally the cross-sectional nature of this study restricted temporal comparisons. Interesting issues such as changes in beliefs across acceptance and continuance phases were not examined. These represent potential ways of extending the current research. Future research may examine the proposed model longitudinally to prove causal interrelationships among the constructs.

References


**Appendix. Research constructs and scale items**

**Habit**

- The portal is where I usually go.
- This is my preferred portal.
- When I need to use a portal, this is where I go first.
- I often use the portal.
**Perceived attractiveness**
- Overall I find that the portal looks attractive.
- The layout of the portal is attractive.
- The colours that are used on the portal are attractive.

**Psychic cost perceptions**
- The portal has an unpleasant atmosphere.
- The portal has a displeasing atmosphere.
- The portal has an uncomfortable atmosphere.

**Perceived usefulness**
- I find this portal overall a useful site.
- The information on the portal is interesting to me.
- I find this a portal that adds value.

**Perceived playfulness**
- When interacting with the portal, I do not notice the time spent.
- When interacting with the portal, I am not aware of any noise.
- When interacting with the portal, I often forget the work I must do.
- Using the portal helps me enjoy my task.
- Using the portal makes my task fun.
- Using the portal keeps me happy during my task.
- Using the portal stimulates my curiosity.
- Using the portal leads to my exploration.
- Using the portal arouses my imagination.

**Intended use**
- I intend to continue using the portal in the future.
- I expect my use of the portal to continue in the future.
- I will frequently use the portal in the future.

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