Factor structure of web site creativity

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ABSTRACT

The objective of this study is to develop an instrument measuring user-assessment of web site creativity and then to investigate the impacts of web site creativity on user behavior. A conceptual model for user perception and response to web site creativity was constructed and the initial Web Site Creativity Measurement Instrument was developed, whose construct validity was based on the literature. This instrument was then administered via a survey (N = 289) with satisfactory internal consistency. The results of factor analysis indicated a refined instrument with seven factors (28 items): Aesthetic Appeal, Interactivity, Novelty and Flexibility, Affect, Importance, Commonality and Simplicity, and Personalization, which explained 63% of the total variance. Stepwise regressions further identified important factors in predicting the user's attitude and behavior towards web site creativity. 62% of the total variance regarding the prediction of the user's overall preference towards creative web sites was explained by significant factors. Guidelines and checklist for creative web site design were also developed based on the refined instrument.

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1. Introduction

The public's interest in creativity never wanes but is ever growing. People appreciate the beauty of creative art, writing, inventions, thoughts, etc. Creativity is said to play a pivotal role in both social transformation and economic growth (Shneiderman, Fischer, Czerwinski, Myers, & Resnick, 2005). The ever-changing market demand structure galvanizes a shift from product-based to value-based competition, and it is suggested that creativity can serve as an important source adding further values to the consumer's overall product experience (Horn & Salvendy, 2006a). Recent research reveals the value of creativity for both traditional hardware products and more complex information technology (IT) products and services. By investigating creativity of traditional hardware products, Horn and Salvendy (2006a, 2006b, 2008) demonstrated that not merely does creativity play a key role in user satisfaction, it also shapes the consumer's purchase intention towards the product. Horn and Salvendy have developed an instrument valid for measuring the creativity of traditional hardware products, such as lamps, chairs, toasters, toothbrushes, etc. However, since there are huge differences between traditional hardware products and IT products due to the inherent dynamism of IT (Albert, Goes, & Gupta, 2004; Dysart, 1998; Zeng & Salvendy,

2008), whether the measurement tool for traditional hardware products can still be valid in the context of IT products is questionable.

This study mainly concentrates on web site creativity, which is appealing to people, influences their visiting behavior, leads to their satisfaction, and shapes their purchase intentions. As representative of IT products and hypermedia computer-mediated environments, web sites play a pivotal role in people's life. The distinctive characteristics of web-based applications and services imply potentially more creativity components and opportunities which are not available or are severely restricted in the context of traditional hardware products (Zeng & Salvendy, 2008). Yet, the lack of appropriate concept and measurement instruments of web site creativity, nevertheless, may severely impede future research in this field, which underscores the need to address such issue.

Based on the review and appraisal of the literature on creativity, product creativity, consumer behavior, web site development, and measurement instruments, web site creativity is defined as "the subjective judgment of a web site to exhibit novelty and appropriateness that elicits arousal and pleasure and is compatible with the user's preferences" (Zeng & Salvendy, 2008, p. 6). Yet an important question lies ahead: how to measure web site creativity?

Couger and Dengate (1992) pointed out that while relevant literature on creativity in Information Systems (IS) is especially sparse, the "literature regarding measurement of creativity in IS products/services is non-existent" (Couger & Dengate, 1992, p.

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288). The same is the case for the literature on web site creativity and associated measurement instruments. Researchers have given emphasis to the necessity of developing reliable and valid instruments in measuring creativity of products which can be simple hardware products or more complex IS products and services (Couger & Dengate, 1992; Horn & Salvendy, 2006a; Lobert & Dologite, 1994). It is their belief that "a better understanding of what constitutes a creative product will aid system designers in improving the product" (Couger & Dengate, 1992, p. 288).

The fact that the important topic of measuring web site creativity keeps being untouched in the literature underlines the need to develop a valid and predictive instrument to fully capture user perception of web site creativity and to further investigate its impacts on the success of web site development and on the web visitor's behavior. In addition, effective guidelines can be provided to help designers and managers develop their web applications and services which are more creative, engaging, and commercially competitive.

In order to construct an encompassing instrument which can fully capture web site creativity and predict the user behavior, a conceptual model encapsulating this construct was first built up based on the literature and was addressed in Section 2. In Section 3, an operational measurement instrument was developed in light of the conceptual model and was further refined via a survey. Results derived from data analysis were discussed in Section 4, and Section 5 concluded with implications of enhancing web site creativity and its impacts.

2. Conceptual model

2.1. Assumptions

Emulating Horn and Salvendy's (2006b) research, three major assumptions are made for this study. First and foremost, web site creativity lies in the eyes of the beholder. In other words, web site creativity is mainly a subjective assessment that the judge asserts towards the web site. The evaluation of web site creativity highly depends on the judge and context where the judge interacts with the web site. Therefore creativity is not merely a physical or an objective attribute of the web site.

Second, there is a universal set of criteria for the assessment of web site creativity. The evaluation towards each aspect or dimension is made on a continuum which is comparable across web sites and contributes to the overall level of web site creativity. In order to be creative and appealing to a customer, a web site has to reveal creativity in terms of one or more dimensions which the user emphasizes within certain interaction context. To maximize the overall level of web site creativity, it is critical to maximize the evaluations associated with all the aspects highlighted by the user within a certain context.

Last, but not least, creativity is assumed to be both supplemental and substitutional value-adding sources to the asset of web sites. The assessment of web site creativity could potentially serve as an important part of overall evaluation of web sites in terms of desirability, attractiveness, consumer centricity, user satisfaction, purchase intention, etc.

2.2. Model description

The construct of web site creativity comprises seven major dimensions: web site affect, importance, novelty, interactivity, changeability, personalization, and aesthetics. The first three major dimensions are adopted as refined and validated factors in the Product Creativity Measurement Instrument (Horn & Salvendy, 2008). The concept of affect refers to emotional impacts of product

creativity or specifically web site creativity. Affect generally consists of two sub-dimensions: arousal and pleasure. The second major dimension, importance, deals with how important and useful the product is to the customer. It embraces two subscales: relevance and significance. A third dimension, novelty, has been widely discussed in the literature and is considered as a crucial determinant in creativity (Horn & Salvendy, 2006a). The next three dimensions (interactivity, changeability, and personalization) encapsulate those distinctive creativity components and opportunities typically possessed by web-based applications and services (Zeng & Salvendy, 2008). Interactivity is one of the most important determinants for creative and excellent web site design, and the increase of interactivity exerts positive effects on the user's "perceived satisfaction, effectiveness, efficiency, value, and overall attitude" towards the web site (Cao, Zhang, & Seydel, 2005; Chen & Sockel, 2004; Hostetter, Kranz, Seed, Terman, & Ward, 1997; Kuan, Bock, & Vathanophas, 2005; Teoa, Oha, Liua, & Weib, 2003, p. 281; White, 2006). Changeability or flexibility implies continuous updates and management of the web site's configuration, content preparation, and interaction mode so as to achieve continuous improvement and bolster the generation of creativity (Albert et al., 2004; Canali, Casolari, & Lancellotti, 2005; Dysart, 1998; Lin, Choong, & Salvendy, 1997; Smith & Mosier, 1986). Additionally, personalization refers to automatic adjustment of web service configurations, content, structure, and presentation, tailored to each individual consumer's preferences. Personalization is another important source of web site creativity and can foster more creative, enjoyable, yet effective web services than those based on the one-size-fits-all approach (Bevan & Spinhof, 2007; Canali et al., 2005; Cao et al., 2005; Ho, 2006; Perugini & Ramakrishnan, 2003; Sam, Boucelma, & Hacid, 2006; Tam & Ho, 2005; Zviran, Glezer, & Avni, 2006). Last, but not least, aesthetics also serves as an important potential source of web site creativity (Amabile, 1982; Laviea & Tractinsky, 2004; Procter & Symonds, 2001; US Department of Health and Human Sciences, 2006).

Fig. 1 demonstrates the refined cognitive process model of assessing web site creativity, which is based on the general model of human information processing and also information processing model of assessing product creativity (Horn & Salvendy, 2006b; Proctor & Van Zandt, 2008). The interaction between the user, web site, and context forms the starting point of evaluating web site creativity. The necessity for such interaction is justified in the literature (Csikszentmihalyi, 1999; Zeng & Salvendy, 2008). Only then could the user integrate the information extracted from the interaction and ultimately form the evaluation of web site creativity.

The information processing model mainly consists of three stages: sensation, perception and cognition, and eventually response. The stage of sensation is one of the most critical parts in the model. Within this stage, the web user senses information stemming from the interaction with the web site and general context via various modalities, such as visual, auditory, and even tactile senses.

At the second stage, the user's understanding of context and web site attributes shapes his/her perception of these components. The stimuli sensed at the first stage influence the user's affect. Based on the perception of relevant components, the user compares the perceived web site attributes and context information to a set of creativity criteria. This set of criteria involves the seven major dimensions proposed, which have been intensively discussed in the literature review by Zeng and Salvendy (2008). Criteria associated with general hardware product creativity include affect, importance, and novelty (Horn & Salvendy, 2006a; Zhang & Li, 2005); while additional proposed criteria with respect to web site creativity embrace those dynamic attributes (interactivity, changeability, and personalization) and aesthetics. All the