Integration of Creativity into Website Design

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Abstract. The desire to achieve a sound design of a product and its interaction with humans runs the gamut from the simplest hardware products to the most complex information technology systems. This paper proposes a conceptual framework highlighting the central role of creativity in ergonomic design of websites. The integration of creativity helps to achieve synergy of the three dimensions in ergonomic design: functionality, usability, and affectivity. A factor structure of website creativity is further discussed in terms of its relation to the ergonomic design framework. Suggestions for the realization of website creativity are provided, and future research directions are discussed.

Keywords: Creativity, e-commerce, information technology, website design.

1   Introduction

The first two technological revolutions (the steam engine revolution of the early 19th century and the electricity/internal combustion revolution of the early 20th century) boosted the variety of human products, brought prosperity to the commercial market, and fueled development of the economy. Though the impacts of those revolutions were substantial, they seem minor compared to that of the third technological revolution, with its hallmark of Information Technology (IT). The inventions of computers, the internet, and various IT products have enhanced the quality of life in many respects. The advent of the information age makes it possible for people to enjoy extensive interactions with IT products and services. The most salient characteristics of IT products are that they are generally more complex than ordinary consumer goods and provide intangible and dynamic services. It is those traits that distinguish IT products from traditional hardware goods [1].

The advent of IT also greatly intensifies market competition and calls for sustained generation of creativity. Companies need to launch innovative products and services in order to beat their rivals. In today's commercial market, with increasingly heightened competition, a corporation merely providing products and/or services like those developed by others finds it progressively more difficult to increase its market share. The

continuous power of creativity calls for the recognition that it is one of the most important determinants of a company's competitive advantage. Without creativity, long-term failure is a near certainty [2-4].

As a representative of IT products and hypermedia computer-mediated environments, web-based applications and services now play a pivotal role in everyday social life. The World Wide Web (WWW) has risen to be the most versatile mass medium and also a global platform used by individuals, organizations, and governments throughout the world [5]. Over the past decade, the number of businesses that have established their presence on the WWW has been skyrocketing. The websites of companies, institutions, and universities serve as their online shop front. People interact with those websites via the Internet and form their first impressions. All these entities intend to attract prospective customers, partners, or students by making their websites appealing to the target groups [6]. Commercial applications have been developed to explore the capabilities provided by websites. In 1996 over half of the 200 most heavily advertised brands in the United States were represented with websites [5]. Netcraft, an Internet monitoring company that has tracked website growth since 1995, reports that in January 2007 there were 106,875,138 websites with domain names and content on them, compared to merely 18,000 websites in August 1995. Websites, acting as hubs of communication, entertainment, and commerce, have played a major role in daily life.

The main focus of this article is on the design of creative and successful websites, which have the power to attract customers and influence their purchase intentions. A conceptual framework regarding the role of creativity in website design is proposed. Then, factors for website creativity are discussed in terms of its relationship with the conceptual framework.

2 The Role of Creativity in Website Design

The desire to achieve a sound website design with which humans can easily interact has gained much attention in the area of Human-Computer Interaction (HCI). Consumers are becoming more and more demanding, and thus how to win those increasingly picky customers has become a key to market success [7].

Traditional ergonomic design of websites typically embraces two fundamental dimensions, functionality and usability (see Fig. 1). First and foremost, the design of a website should satisfy its functional needs. Functionality is mainly concerned with what a website provides in practical terms, the level at which it performs its functions, and the different options it offers the customer [7]. Sound functional design can thus be regarded as a hygiene factor, according to Herzberg's [8] motivation theory. The absence of functionality causes user dissatisfaction, yet the presence of good functionality may be taken for granted by customers and not necessarily lead to user satisfaction. A website with sound functionality should also be easy to use. The importance of usability in website design and more broadly in HCI design has long been emphasized in the human factors and ergonomics literature [9]. Diversified instruments have been developed to evaluate usability and make a website easy for human use. Usability can be considered to be a combination of both hygiene and motivational factors, since it may foster user satisfaction.
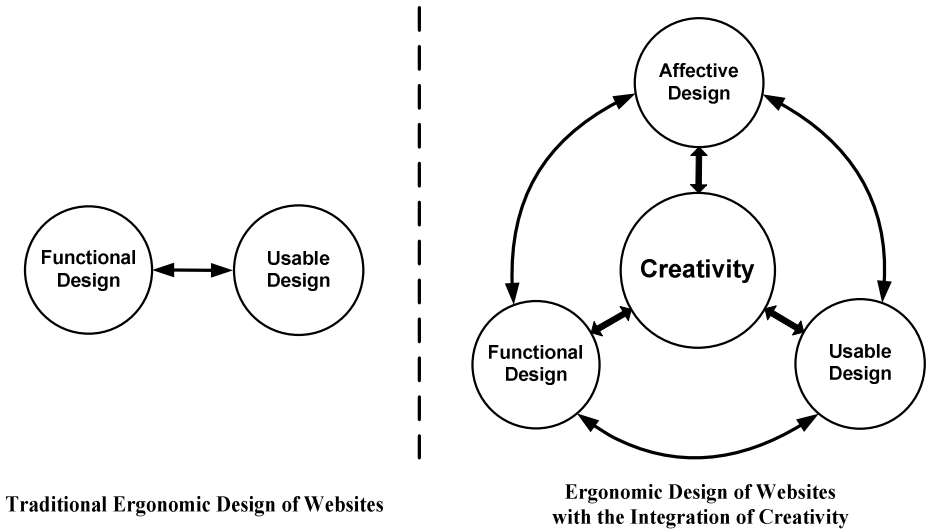
Fig. 1. Integration of Creativity in Website Design

Nonetheless, mere design for performance and usability is no longer sufficient. In other words, a website satisfying these two fundamental aspects is still far from being competitive in the market's intense competition. Not only must the website perform its functions well and be easy to use, but it should also support an overall experience attractive and pleasant to customers, which calls for considering the user's affect and pleasure. The significance of affective design (a motivational factor) has been high-lighted in the literature, and it is suggested that the three dimensions (functionality, usability, and affectivity) of ergonomic design should go hand in hand to create a sound product or service [7, 10, 11].

However, there is still large room for improvement beyond meeting the aforemen-tioned design requirements, and creativity is the catalyst that can make such difference. Searching for ways of achieving a sound website design can be characterized as a problem-solving activity [9]. The literature in creative cognition suggests that creativity involves viewing a problem from various perspectives at different abstract levels, each leading to a specific problem formulation [12-14]. The three dimensions of website design requirements imply general objectives that can be clearly defined and formu-lated as problems in accordance with a specific design context. Creative problem solving involves exploration and transformation of conceptual spaces, and creativity is germinated when previously unrelated patterns of thought get connected to produce a creative product [1, 15]. There is usually more than one method meeting design goals. Effectively applying creative problem-solving techniques (brainstorming, morpho-logical analysis, etc.) can facilitate individual or team cognition in generating varieties of design alternatives, which ultimately leads to creative products that better satisfy those specified design goals by way of iterative ideation-evaluation phases [16-18]. Therefore, creativity is an integral part of the design process. By integrating creativity into website development can a designer realize synergy of those three dimensions of ergonomic design and come up with a creative website that functions better, is easier to

use, triggers more of the customer's pleasure, and thus becomes more commercially competitive (see Fig. 1).

Heed was once only paid to issues regarding functionality and usability, but further requirements regarding creativity and desirability have now emerged. There is a need to appreciate the sum total of the customer's experience with the product and service, rather than just focusing on utility and usability [10]. Previous research indicates that creativity matters – creativity has a halo effect that renders the product more appealing to customers. Research in web design has found that a creative website interface is preferred by users even if its usability is degraded [19]. Therefore, creativity is an important source adding both supplemental and substitutional value to a website [20, 21]. Yet, it is the supplemental value creativity affords that should be emphasized. When a website is creatively designed in terms of functionality, usability, and affectivity, it can achieve larger success. The ever-changing market demand structure galvanizes a shift from the product-based to value-based competition, and thereby creativity (being an important value-adding source) should be addressed in the development of the full spectrum of web-based applications and services.

Developing novel and useful web-based applications and services to achieve market success is the key objective for most corporations in web business. The nature of this pursuit is a subjective endeavor. Never can there be a website that is considered to be the best and well-liked by everyone. That is the nature of website design, where every individual or team could come up with a different idea, and the success of a design cannot be evaluated fully until it is released to the target market. It is creativity that serves as the engine propelling the never-ceasing evolution of websites. The designer's goal should be to develop websites that are novel and appropriate, and which fit the application context well [1, 22]. Horn and Salvendy [11, 20, 23] found that creativity of traditional hardware products could considerably increase the consumer's purchase intention. Subsequent research of IT product creativity further reveals that website creativity can also shape the consumer's web use behavior as well as purchase intention when visiting an e-commerce website [21]. It is proposed that website creativity will increase the site's perceived attractiveness, ease of use, and usefulness, which ultimately predict the user's behavioral intention to visit, remain on, and revisit the website, as well as the user's satisfaction and the site's profitability [1, 21, 24].

So, to sum up, creativity plays a pivotal role in website design. Ergonomic design of websites integrating creativity helps to realize synergy of functional, usable, and affective design, with the aim of developing creative websites that are more creative, appealing, and commercially viable.

3   Factors Influencing Website Creativity

Creativity can be defined in terms of creative personality, process, product, and press (the environment or context where creative productions are produced), depending on specific interest of the study and the associating context [1, 15, 20]. This paper takes an outcome-based perspective and adopts a definition of website creativity as "the subjective judgment of a website to exhibit novelty and appropriateness that elicits arousal and pleasure and is compatible with the user's preferences" (21, p. 568).

Fig. 2. Factor Structure of Website Creativity

Horn and Salvendy [11, 20, 23] developed a factor structure of traditional hardware product creativity. Due to the fact that IT products (and especially websites) differ appreciably from traditional hardware products in various aspects, a factor model that better captures such differences is indispensable for thoroughly studying this concept and providing design guidelines boosting website creativity [1]. A factor structure for website creativity has been developed, with seven key factors/dimensions: Aesthetic Appeal, Interactivity, Novelty and Flexibility, Affectivity, Importance, Commonality and Simplicity, and Personalization (see Fig. 2), explaining 63% of the total variance associated with website creativity items. This factor model has both construct validity and predictive validity, and 62% of the total variance regarding the prediction of the user's overall preference towards creative websites was explained by significant factors [21].

Aesthetic and visual virtues add to the appeal of websites [1, 25, 26]. Interactivity is one of the most important determinants for excellent website design, and the increase of interactivity positively affects the user's "perceived satisfaction, effectiveness, efficiency, value, and overall attitude" towards the website ([27], pp. 281, [28-30]). A third dimension, novelty and flexibility, reflects the dynamism of web services. Novelty is considered as a crucial determinant of creativity [20]. Flexibility implies continuous updates and management of the website's configuration, content preparation, and

interaction mode so as to achieve continuous improvement and foster the generation of creativity [31-35]. It is such continuous improvement that guarantees the novelty or originality of the website. A fourth dimension, affectivity, is concerned about emotional impacts of website creativity, which generally consists of two sub-dimensions: arousal and pleasure. Another major dimension, importance, deals with how important and useful the product is to the customer. It embraces two subscales: relevance and significance. This dimension reemphasizes that only those websites that are both novel and appropriate are of real creativity, echoing the definition of creativity from a pragmatic point of view which fits well with the business reality [13, 20, 21]. A sixth dimension, commonality and simplicity, suggests that there should be large quantities of and various types of components (developed by web designers) that can add creativity to web sites. Yet a trade-off between complexity, level of sophistication, and simplicity should be found. A moderate level of complexity is recommended; beyond that point the website interface would appear busy and confusing. Additionally, personalization refers to automatic adjustment of web service configurations, content, structure, and presentation, tailored to each individual consumer's preferences.

It is apparent that those seven key factors of website creativity link closely with the proposed design framework. Every factor can evoke design objectives that correspond to all three dimensions of design requirements (functionality, usability, and affectivity) and may emphasize a subset of these dimensions. For example, there are a number of technical issues related to making personalized websites a reality. Usability issues need to be taken into account because customized features may not be easy to use. In addition, personalized web interfaces with high aesthetic appeal would attract more users. Customizable features can be determined through data mining, which is a term broadly used for methods used to identify each individual customer's behavior (by analyzing his/her interactions with the interface, purchases, repeat visits, etc.). These features can then be set to provide personalized purchase suggestions. Some websites (such as Gmail and Facebook) allow each individual customer to personalize the display of the sites so as to increase their aesthetic appeal, catering to each individual's taste. It is suggested that website developers and managers can enhance the creativity of their websites by effectively addressing functionality, usability, and affectivity issues in light of the factor structure of website creativity.

4   Conclusion

The ergonomic design framework proposed in this paper highlights that creativity plays a central role in achieving synergy of functionality, usability, and affectivity. Integration of creativity in website design depends heavily on the specific design goal of the website and its application context. Creativity can add both supplemental and substitutional values to websites, and ultimately influence the web user's behavior. A creative website, being novel and appropriate, would increase the site's perceived attractiveness, ease of use, and usefulness, which ultimately predicts the user's behavioral intention and satisfaction, as well as the site's profitability. Future research should go further toward considering the impacts of creativity on IT product and service design. Previous research in IT creativity has mainly taken an outcome-based viewpoint, yet the value of unraveling those variables and processes that lead to creative design entails a process-based

perspective with application of the creative cognition approach. In business, teams have been playing a pivotal role in generating creative productions in organizational contexts. Therefore, research regarding the achievement of team-level creativity in IT product and service development with the pursuit of business success would be of much interest.

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