ELSEVIER

An empirical study of audience impressions of B2C web pages in Japan, China and the UK

Jian Hu [a,*], Kazuyuki Shima [a], Ruediger Oehlmann [b], Jiamin Zhao [c], Yasuhiro Takemura [a,d], Ken-ichi Matsumoto [a]

[a] *Software Engineering Laboratory, Nara Institute of Science and Technology, 8916-5 Takayama, Ikoma, Nara 630-0101, Japan*
[b] *Kingston University London, Penrhyn Road, Kingston Upon Thames KT1 2EE, UK*
[c] *Jinan University, Guangzhou City, Guangdong Province 510632, China*
[d] *Osaka University of Arts Junior College, 2-14-19 Yata, Higashi-sumiyosi-ku, Osaka 546-0023, Japan*

Abstract

Negative impressions that arise during a first interaction with a Business-to-Customer web page often have the unpleasant side effect to destroy a firm's efforts in achieving B2C electronic commerce on the WWW. This paper verifies the relation between audience impressions and the visual style of a B2C web page. In comparison to previous work, the experimental procedure was greatly improved. It was therefore expected that this leads to improved results with higher reliability. Moreover, this study considered the impressions of Japanese, Chinese, and English subjects to investigate differences and consistencies in impressions, which are based on the underlying culture. Three empirical studies based on self-report questionnaires were conducted in Japan, China and the UK. The studies measured the subjects' impressions of various B2C web pages that showed eight design factors. The evaluation values for 17 impression factors and their antonym terms were collected in the questionnaires. The studies in China and the UK were conducted using the same procedure as in Japan. Sign tests of the results show a significant difference in subjects' impressions corresponding to changes in design factors. Moreover, the results show cross-cultural consistencies in various impressions but also several differences between the subject groups. The paper concludes by discussing the implications of the empirical results for the visual design of international B2C web pages in terms of target impressions.
© 2003 Elsevier B.V. All rights reserved.

Keywords: Business to consumer electronic commerce (B2C EC); First impression; Cross-cultural effects; Visual web design; Web usability

---

1. Introduction

1.1. The importance of the impression of a Business-to-Customer web page

The Internet profoundly changes the way in which commerce is conducted. In some ways, Internet commerce seems deceptively simple [1,2]. However, there are many factors affecting the success of electronic commerce. One of these factors is web usability, which becomes increasingly important for the Internet society. One day it may become a reality that usability drives the Internet economy [2]. Many Web sites are confronted with usability problems which shall be solved by usability evaluation, web improvement and redesign.

Usability of IT applications should display five major attributes: learnability, efficiency, memorability, errors and satisfaction [3,4]. "Satisfaction" shows a user's subjective impression of a system. "Satisfaction" requests the system should be pleasant to use so that users like it [4,5]. For business to customer electronic commerce (B2C EC) on the WWW, satisfaction of customers appears more important. However, satisfaction is not intuitive and has often been ignored by designers.

First impression is a subattribute of satisfaction [6], which decides a consumer's image of a product or a company. Impression has the same role in B2C EC on WWW. The positive/good impression of a B2C web page is an important component of audience satisfaction. With a bad impression of a B2C web page, audiences will stop browsing or will not return any more. There are so many similar B2C web pages on WWW.

The importance of impressions has been emphasized in the design of physical products [7–9]. In real world commerce, the impressions elicited by a sales agent or a commercial organization as a whole influence the overall satisfaction of the customer [10]. The feelings that are aroused in interacting with a system are especially important for systems that are used on a discretionary basis such as EC [11]. In the case of EC, impressions of the web pages will influence the audience's desire to purchase. Impressions can be expected to play a similarly important role in the design of B2C Web pages just as they do for physical products. The

impressions created in interacting with a B2C web page are especially important for EC systems, which are used on a voluntary basis. People do not have to use such a system if they dislike it [2]. The same conditions apply to a B2C web page.

In B2C EC on the WWW, services or products are supplied to customers through web pages, which are the interface between the seller and the buyer. A positive impression can play an important role in attracting audiences to a web page and turning them into customers. Therefore, the research is needed to analyze the relation between audience impressions and the visual style of a B2C web page. However, little research has been conducted regarding the impressions of B2C web pages. Nielsen's research on web usability merely mentions that the first impressions an audience obtains from a given web page are important [2,12,13]. A systematic methodology that takes in consideration impressions will be helpful in the design of B2C web pages.

Kim and Moon [10] have conducted experimental research on the feeling of trustworthiness, which especially focused on the feeling of trustworthiness that the interface of a cyber-banking system should elicit in customers who carry out financial transactions. Forty terms for emotions were identified to indicate emotions elicited by the user interfaces of cyber-banking systems. Fourteen design factors were concluded to describe the studied user interfaces. The results of their research indicate that it is possible to design customer interfaces of cyber-banking systems, which will elicit target emotions, such as trustworthiness.

1.2. Cross-cultural impressions

Culture is always viewed as a collective phenomenon. It represents "mental programming", which is partially predetermined by the collective values of their local community [14]. Nielsen [2] advocates that web usability shall consider international use that serves a global audience. Barber and Barde [15] argue that the success of a global interface may only be achievable when the interface design reflects the cultural nuances of the target audience. Negative and positive consumer