



# Empirical analysis of consumer reaction to the virtual reality shopping mall

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## Abstract

The Internet shopping mall has received wide attention from researchers and practitioners due to the fact that it is one of the most killing applications customers can find on the Internet. Though numerous studies have been performed on various issues of the Internet shopping mall, some research issues relating to the user interface of VR (virtual reality) shopping malls still await further empirical investigation. The objective of this study is to investigate whether the user interface of the VR shopping mall positively affects customer satisfaction in comparison with the ordinary shopping mall. For this purpose, we developed a prototype of the VR shopping mall for which the user interface consists of both 3D graphics and an avatar, using it as an experimental medium. 102 valid questionnaires were gathered from active student users of the ordinary shopping mall, and two research hypotheses were then tested to prove whether the three explanatory variables such as convenience, enjoyment, quality assurance improve in the VR shopping mall, and whether customer satisfaction is also significantly enhanced in the VR shopping mall in comparison with the ordinary shopping mall. Additionally, we conducted the PLS (partial least square) analysis to test whether the customer satisfaction is explained significantly by the three explanatory variables or not.

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## 1. Introduction

To most users, the interface of the Internet shopping mall (abbreviated as *shopping mall*) is the system (Kendall & Kendall, 1998). In this sense, the ordinary shopping mall with user-friendly and attractive user interfaces would provide higher customer satisfaction. With the advent of the Internet, people are growing accustomed to using the ordinary shopping mall for purchasing, advertising, and other business purposes (Baty & Lee, 1995; Jarvenpaa & Todd, 1997; Lederer, Mirchandani, & Sims, 1997). However, considering the fact that the promise of electronic commerce is based on the underlying user interface to some extent (Huizingh, 2000), more studies should have been directed at investigating the importance of user interfaces of the ordinary shopping mall. Recently, as the advent of mobile commerce, a framework was suggested for the customer interface design of the mobile commerce (Lee & Benbasat, 2004).

Whereas the traditional user interface of the ordinary shopping mall usually includes several hyperlinks, graphic icons, and contents (Ghose & Dou, 1988; Huizingh, 2000; Larson & Czerwinski, 1998; Liang & Lai, 2000; Wells & Fuerst, 2000), the user interface of the VR (virtual reality) shopping mall, which is often composed of 3D graphics (Bhatt, 2004; Oinas-Kukkonen, Perttunen, Simila, & Svento, 1998; Steuer, 1992), is relatively new and provides new means of transacting with customers (Pratt, Zyda, & Kelleher, 1995).

A user interface consists of a physical medium and content presentation interface elements (Baecker, Grudin, Buxton, & Greenberg, 1995; Kim & Yoo, 2000; Miles, Howes, & Davies, 2000; Mitta, Delk, & Lively, 1995). These user interface elements influence the customers' experience of interacting with the ordinary shopping mall and can determine the level of interface involvement, where interface involvement is defined as the ability of a user interface to facilitate user involvement with the material presented through the interface (Reeves & Nass, 1996; Rice, 1993; Schneiderman, 1998). Higher interface involvement increases user involvement with the ordinary shopping mall's products or other information presented, resulting in more active processing of the information by the customer (Andrews & Shimp, 1990; Petty & Cacioppo, 1979) and leading to a more positive customer response such as attitude, product evaluation, customer satisfaction, and customer intentions (Andrews & Shimp, 1990). Therefore, what is central to the effectiveness of a user interface is its ability to facilitate the transmission of information to the user (Nickerson, 1969; Osborne, 1987; Reeves & Nass, 1996; Schneiderman, 1998).

In electronic commerce on the Internet, the ordinary shopping mall transacts with customers by resorting to simple user interfaces such as hyperlinks, graphic icons, and menus etc., through which product information as well as additional aspects of the shopping atmosphere are transferred to current and potential customers. In contrast, the VR shopping mall interacts with customers on the basis of rather different user interfaces such as 3D graphics and avatar. The role of user interface in electronic commerce was tested for print versus on-line catalogs (Griffith, Krampf, & Palmer, 2001), indicating that media vividness and other elements of the content–presentation interface employable on a web site stimulate higher levels of consumer involvement with retailer offerings and a more positive consumer response than a content–presentation interface of direct on-line replication of printed material.

However, it remains still unclear whether the user interface of the VR shopping mall can provide higher interface involvement than the ordinary shopping mall (see the literature survey in Section 2). To fill the research void like this, this study is aimed at empirically testing

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