Flow and Attitude Toward the Website on the Evaluation of Products Present By Means of Virtual Reality: a Conceptual Model

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The website represents the future of a company’s business communications on the Internet, since it allows supplying large amount of information as well as creating virtual experiences with the product. In this context, virtual reality constitutes a technology which provides users with realistic and interactive virtual environments. In this paper, based on the five groups of models, we analyze the effect of virtual reality presentations, by means of interactivity and richness, on flow and attitude toward the website, and the subsequent effect of those variables on online product evaluation.

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Future research is needed to provide empirical support for the propositions presented here and to assess cultural differences in response to other types of questions (e.g., knowledge and behavior rather then attitude).

References


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Abstract
The website represents the future of a company’s business communications on the Internet, since it allows supplying large amount of information as well as creating virtual experiences with the product. In this context, virtual reality constitutes a technology which provides users with realistic and interactive virtual environments. In this paper, based on five groups of models, we analyze the effect of virtual reality presentations, by means of interactivity and richness, on flow and attitude toward the website, and the subsequent effect of those variables on online product evaluation.

Introduction
The key characteristic for the assessment of virtual reality in terms of consumer’s experience is the concept of telepresence defined as the sensation of being in an environment created by a communication medium (Steuer, 1992). On the basis of sensory stimuli transmitted by Virtual Reality, individuals feel the perceptual illusion of being present and highly involved in the environment created by the medium, whereas they are physically in another place (Kim and Biocca, 1997). Telepresence is determined by two factors: interactivity and richness (Suh and Lee, 2005; Coyle and Thorson, 2001; Klein, 2003; Steuer, 1992).

Likewise, literature has highlighted flow (Hoffman and Novak, 1998) and attitude toward the website (Fortin and Dholakia, 2005; Fiore and Jin, 2003; Taylor and Todd, 1995) as important antecedents of Internet behavior. On the basis of this approach, we propose a model of the effect of interactivity and richness on product evaluation, including flow and the attitude toward the website as mediating variables.
Proposed Model

The model tested draws from five areas. First, the effect of interactivity and richness on attitudes draws from the work of Fortin and Dholakia (2005). In this study, the authors analyze the effect of interactivity on attitude toward the brand, attitude toward the ad, and purchase intention. Second, attitude toward the Web has been considered by Technology Acceptance Model (TAM) (Karahanna et al., 2006; O’Cass and Fecench, 2003) as antecedent of technology acceptance. Third, an extension of TAM, the Web Acceptance Model (WAM) (Castañeda et al., 2007) substitutes attitude toward the Web by attitude toward the website as predictor of future re-visit intention. Fourth, latter research in the adoption of innovations theory has used the evaluation of products to predict adoption (Nabih et al., 1997; Parthasarathy et al., 1995; Rogers, 1995; Klonglan and Coward, 1970). Fifth, Hoffman and Novak’s (1996) model takes into account the effect of telepresence on flow, and the effect of this outputs on behavioral variables.

In virtual reality literature, Sheridan (1992) uses the term interactivity to refer to the control of sensations and the ability to modify the environment, while Zeltner (1992) refers to the relationship between autonomy and interaction. Based on those dimensions, interactivity is then defined as the degree to which two or more communication parties can act on each other, the communication medium, and the messages, as well as the degree to which such influences are synchronized (Liu and Shrum, 2002). Richness is defined as the form in which the environment presents the information to the senses (Steuer, 1992).

Although different studies have analysed how the use of virtual reality affects attitudes towards the website (Fiore et al., 2005; Martin et al., 2005; Schlosser, 2003), there is no agreement on the interaction effect of attitude towards the website, interactivity and richness on intentions (Fortin and Dholakia, 2005; Park et al., 2005; Hopkins et al., 2004). However, based on Coyle and Thorson’s study, which tested that higher levels of interactivity and richness increase attitudes toward web sites, due to the fact that the virtual experience with the product is perceived as more similar to a direct experience, we proposed:

\[ H1: \text{Interactivity is positively related to attitude toward the website} \]
\[ H2: \text{Richness is positively related to attitude toward the website} \]

The flow state is defined as the holistic sensation that people feel when they act with total involvement (Csíkszentmihalyi, 1977). Hoffman and Novak (1996) suggest that the success of online marketers depends on their ability to create opportunities for consumers to experience flow. They found a positive effect of interactivity and richness on telepresence and, consequently, of this variable on flow. The interactivity offered by virtual reality through a website favors communication, personalises the way the information and the product are presented, and increases enjoyment (Fiore and Jin, 2003). Similarly, the realistic experience provided by richness facilitates the occurrence of flow.

\[ H3: \text{Interactivity is positively related to flow} \]
\[ H4: \text{Richness is positively related to flow} \]

Marketing literature has also verified the positive relationship between attitude toward the ad and attitude toward the brand (Ko et al., 2005; Hopkins et al., 2004; MacKenzie et al., 1986). As such, we expect that attitude toward the website will influence attitude toward the product, yielding higher product evaluations. Therefore, an increase in attitude toward the website, as a result of increased interaction with the product and the possibility of obtaining detailed information (Ward and Lee, 1999), will positively impact product evaluation. As well, higher levels of flow imply a positive consumer experience (Finneran and Zhang, 2005) which will be manifested in a higher product evaluation.

\[ H5: \text{Attitude toward the website is positively related to product evaluation} \]
\[ H6: \text{Flow is positively related to product evaluation} \]

Finally, a higher level of flow is capable of conferring value to the online experience, which will positively influence attitudes toward the website (Finneran and Zhang, 2005; Mathwick and Rigdon, 2004).

\[ H7: \text{Flow is positively related to attitude toward the website} \]

Method

The study was carried out with a sample of 177 university students. The experimental design was based on a website. The data collection process was completed online. We used a sport watch as the product as it belongs to a category frequently marketed on the Internet, and has been frequently used in virtual reality studies (Jiang and Benbasat, 2007; Daugherty et al., 2005; Jiang and Benbasat, 2005).

After visiting various websites, with a focus on well known brands of watches, we chose one representative commercial presentation which fulfilled the objectives of the study. The level of interactivity was manipulated through allowing subjects to obtain images of the product from different perspectives, as well as displaying information related to the product by using the mouse (Klein, 2003; Coyle and Thorson, 2001). In order to manipulate the variable richness, we followed the methodology used by Li et al. (2001) and Klein (2003). The product is presented in two sizes.

The initial page of the website presented the sport watch under one of four conditions (interactive/non interactive; high/low level of richness). Subsequently, participants evaluated the product (Mukherjee and Hoyer, 2001), the level of interactivity (Coyle and Thorson, 2001), their attitude toward the website (Martin, et al., 2005) and their flow state (Hoffman and Novak, 1996) during the visit to the website.
Results

We used confirmatory factor analysis (CFA) to test the discriminant validity of the measures. Results show that the model fit the data well. Then, we checked whether the correlations among the latent constructs were significantly less than one which provided evidence of discriminant validity. The internal consistency of the scales were tested using both the composite reliability ($ρ_c$), and the average variance extracted (AVE). All values were significantly greater than 0.60, and 0.50, respectively, and demonstrate internal consistency.

In order to verify the hypotheses, we used structural equation modelling with the Robust Maximum Likelihood Method and the asymptotic variance-covariance matrix. The fit statistics for the full model ($χ^2(96)=238.49$; $p$-value=$0.00$; CFI=$0.98$; SRMR=$0.050$; RMSEA=$0.072$; NNFI=$0.98$) were within the acceptable ranges (the chi-square is significant, $p<0.05$; SRMR and RMSEA ≤0.08; and NNFI and CFI ≥0.90), which indicated a good model fit.

Results showed that interactivity and richness have a strong direct effect on attitude toward the website ($β=0.74$; $p<0.01$; $β=0.70$; $p<0.01$), and flow ($β=0.98$; $p<0.01$; $β=0.58$; $p<0.01$), therefore confirming H1, H2, H3, and H4. Moreover, we found a positive impact of attitude toward the website ($β=0.37$; $p<0.01$), and flow ($β=0.13$; $p<0.01$) on product evaluation, supporting H5 and H6. Finally, we observed a direct effect of flow on attitude toward the website, as proposed in H7 ($β=-0.18$; $p<0.05$).

One important criterion of a model’s success is its performance compared with that of rival models (Bagozzi and Yi, 1988). Based on Luna et al’s (2003) model, we developed a rival model which hypothesized the opposite relationship between attitude toward the website and flow.

We compared our proposed model with the rival model using the following criteria: overall fit, percentage of the models’ statistically significant parameters, and explained variance of the endogeneous constructs. The overall fit for the rival model was equal to that of proposed model. However, in the rival model, the effect of attitude toward the website on flow was not significant at 95%. Finally, the explained variances for all endogeneous constructs were the same in the proposed and rival model. These findings provided more confidence to the proposed model.

References


