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The Role of Authenticity in the Experience of Visitors Interacting with Museum Technologies

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ABSTRACT

Cultural places such as museums tend to rely on Information Technologies (IT) to support their exhibition and communication to the public. Although technology has undeniable advantages for museums and their visitors, it is not evident that IT contributes both to more enjoyment and to an experience of authenticity. Indeed, little attention has been paid to user reactions with hedonic systems available in cultural heritage sites.

The objective of this research is to assess affective and cognitive reactions of museum visitors interacting with IT. We also try to determine the role played by authenticity in visitor interactions with museum technologies. To test our hypotheses, a free simulation experiment was conducted at a French national museum where 184 questionnaires were completed. The results indicate that technologies are not incompatible with perceptions of authenticity and that IT can contribute to edutainment experiences of visitors.

Keywords

Authenticity, enjoyment, emotions, learning, immersion; museum technologies.

INTRODUCTION

Cultural tourism is an important phenomenon describing the fact that people increasingly include cultural activities during their trips, activities such as museum visits, historic sites or cultural events (NASAA, 2004). Indeed, The Travel Industry Association and the Smithsonian Magazine report that in 2002 nearly 118 million American adults had an artistic or cultural activity while traveling (NASAA, 2004).

This phenomenon is explained by several factors. One that has been particularly studied by researchers working in the tourism area is authenticity. The search of authenticity performed by tourists takes different forms: people who look for authenticity may want to see genuine things (Bruner, 1994), to meet locals and live like them

when traveling (Cohen, 1988). Tourists seeking authenticity can also be reluctant to interact with virtual copies of artifacts or with any other reproductions (Amirou, 2000). Actually, people seem to engage in cultural activities during their trips in order to escape monotony and to have authentic experiences (McCannell, 1973, 1976).

Cultural places such as museums rely on information technology (IT) to organize their exhibitions and their communications with the public. Nevertheless, even though these technologies have undeniable advantages for museums and their visitors, it is not evident that they contribute both to a deeper sense of flow and authenticity.

Therefore, the research question and its respective sub-questions that guide this study are the following:

1. What are the affective and cognitive reactions of museum visitors when interacting with museum technologies?
 - a. Do visitors experience authenticity, enjoyment and immersion when using museum technologies?
 - b. Does the use of museum technologies facilitate the experience with museological content, more particularly an increased learning experience?

AUTHENTICITY

At first glance, one might think that with the continuous progress being made in technology development, there is no need to study perceptions of authenticity when users interact with IT. However, given that Featherman et al. (2006) have shown that perceptions of authenticity can influence IT usage, the issue of authenticity does seem to deserve attention. Featherman et al. (2006) studied perceptions of authenticity in the context of e-services, and came to the insight that when users perceive e-services to be artificial and non-authentic, their risks perceptions increase. Additionally, Featherman et al.

(2006) explain that perceived authenticity can explain technology adoption.

Authenticity with IT has also been lightly addressed in the context of cultural heritage. Several researchers have proposed features or design characteristics for IT in order to improve user experience of authenticity. For instance, Epstein and Vergani (2006) relied on the theoretical background of authenticity to develop their IT artifact. It is a mobile technology named the History and Unwired media, which assists individuals visiting Venice, Italy. Visitors particularly appreciate the interactivity of the device that enables intimacy and immersion in the environment, but also connection with the Venetian characters (Epstein and Vergani, 2006). The authors point out that their device also includes video, audio content and a narrative structure. The research that is the closest to ours is the evaluation of cultural heritage Web sites made by Sigala (2005). Actually, Sigala (2005) adopts the constructive perspective on authenticity as well and applies it to the evaluation of IT. More precisely, Sigala (2005) addresses how authenticity is constructed in online environments and she also highlights the main features that facilitate an authentic experience with Web sites. The findings of this research lead to the conclusion that the principal features, which can contribute to meaning-making experiences of online visitors, are: search, navigation, multimedia and personalization (Sigala, 2005). However, our research departs from hers in that we do not address Web sites, nor do we highlight features of technology. We rather focus on user reactions to authenticity perceptions and we investigate the consequences of authenticity for user interaction with IT.

We conclude this literature review by noting that, in the context of IT use, research on authenticity is still limited. Nonetheless, as suggested in the literature, authenticity plays a significant role in user interactions with IT. Furthermore, the school of constructivism views authenticity as an affective reaction (Selwyn, 1996). Therefore, we need to show how this emotion can be embedded in IS frameworks and linked to other emotional reactions of IT users.

EMOTIONS IN HCI RESEARCH

This research aims at measuring visitors' affective (entertainment and authenticity) and cognitive (learning) reactions when they interact with technology. Since studying human interaction with technologies is at the heart of the Human-Computer Interaction (HCI) field, the questions addressed by this research falls directly into the HCI sub-discipline.

Sun and Zhang (2006) elaborated a model of Individual Interaction with IT (IIIT) to assess both affective and cognitive reactions of users interacting with any type of technology. The IIIT model helps us identify the relevant variables to be studied in order to assess user reactions towards IT use. In that the IIIT model includes a large number of variables, we will only focus on those that are

the most salient for the purposes of our research, i.e., personal innovativeness with IT, enjoyment, cognitive absorption (immersion) and ease of use.

Personal innovativeness with IT will enable us to determine the profile of museum visitors and more precisely how they generally behave with IT, independently from museums. Ease of use has been used in several studies that show its relevance for evaluating technologies usability (Gefen and Straub, 2000).

Enjoyment and focused immersion are the concepts used to measure the entertainment aspects of visitor experience. Perceived enjoyment is a relevant predictor for hedonic information systems use as shown by Atkinson and Kydd (1997) and Van der Heijden (2004). Furthermore, Shaw (1985) produces evidence that enjoyment is one of the most important dimensions for people during their leisure time. Similarly, immersion is supposed to reflect an entertaining aspect of visitor experience (Belaen, 2003).

Although the IIIT model provides strong support for our research, we think that Sun and Zhang (2006) leave out other important variables such as learning. In effect, Sun and Zhang (2006) only identify one outcome of the interaction process, which is IS usage. IS usage is a key construct that needs further research as pointed out by several researchers (Burton-Jones and Straub, 2006, Barki et al., 2007), but learning appears as a more relevant outcome variable in the context of museum technologies. Indeed, a survey conducted with 6000 American households report that more than 87% households view learning as the principal outcome of their museum visit (Griffiths et al., 2007).

RESEARCH MODEL AND HYPOTHESES

We propose a research model (Figure 1) that includes a user trait, personal innovativeness, which is posited as predictor of ease of use. The latter represents the cognitive reaction towards using IT and it has direct influence on enjoyment and focused immersion. We also hypothesize that the affective variables (enjoyment, authenticity and focused immersion) are direct antecedents of learning. The constructivist view of authenticity is represented in the model by 1) perceived authenticity, which reflects the emotional aspects of authenticity, and 2) authenticity disposition, which accounts for *a priori* visitor attitudes towards museum technologies.

This research model includes nine hypotheses.

Hypothesis 1 (H1). A positive assessment of personal innovativeness with IT will positively influence perceived ease of use.

Hypothesis 2 (H2). A positive assessment of perceived ease of use will positively influence perceived enjoyment.

Hypothesis 3 (H3). A positive assessment of perceived ease of use will positively influence focused immersion.

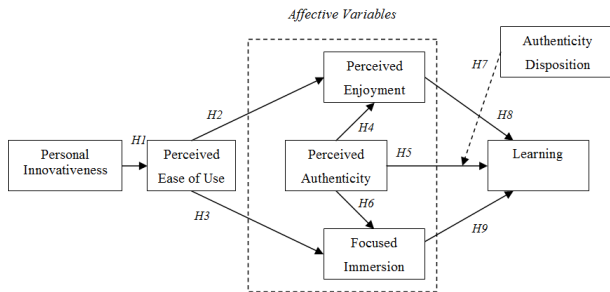


Figure 1. Research Model and Hypotheses

Hypothesis 4 (H4). Perceived authenticity toward IT positively influences enjoyment.

Hypothesis 5 (H5). Perceived authenticity toward IT positively influences learning.

Hypothesis 6 (H6). Perceived authenticity toward IT positively influences focused immersion.

Hypothesis 7 (H7). Authenticity disposition moderates the relationship between perceived authenticity and learning.

Hypothesis 8 (H8). A positive assessment of enjoyment will positively contribute to increased learning.

Hypothesis 9 (H9). A positive assessment of focused immersion will positively contribute to increased learning.

METHODOLOGY

This research was conducted at the National Center of the History of Immigration (NCHI), a French museum located within Paris. This museum was selected as a setting for our field study for several reasons. First, the learning and affective experience are among the objectives of this museum, which aims at *educating* the public and providing an *emotional experience* on the history of immigration. The aspects of authenticity are also addressed by the museum in its approach to present people's traditions, memories and history. Hence, the museum goals correspond to our research variables. Third, we had another imperative, which was the presence of technologies in the museum in order to assess visitor reactions to IT. The NCHI offers different types of IT for the use of the public, they are: audioguides, computers, videos, and interactive kiosks.

The methodology that we implemented was a field study and more specifically a free simulation experiment (Fromkin and Streufert, 1976). In this experimental methodology, participants are studied in a closed setting that is the museum. However, we have relatively less control over the manipulated independent variables and the subjects' approach to the experimental task. Actually, there are not treatment conditions, but rather a stimulation to which subjects can freely respond (Straub et al., 2004).

Thus, the values of the independent variables can vary freely with respect to subject interactions with the system. For this research, the stimulation given to the subjects was their interaction with the museum technologies. The independent variables that varied freely were the affective and cognitive reactions to IT use, namely authenticity and ease of use.

The stimulation given to subjects consisted in the interaction with the technologies available at the NCHI. However, we did not survey visitor perceptions of each tool provided by the museum. We decided to focus on two types of technologies: the audioguides and the set of interactive kiosks and computers.

Our data collection technique was the questionnaire (Straub et al., 2004). The questionnaire distributed to visitors was composed of existing scales for the IS constructs. Learning was measured with the self-reported learning and learning interest scales of Alavi (1994). Perceived ease of use items were originally developed by Davis (1989), while we borrowed the items of perceived enjoyment from Davis et al. (1992). The PIIT items and focused immersion were adapted from Agarwal and Karahanna (2000). Perceived authenticity scales were adapted from Featherman et al. (2006). Relying on the literature and the help of three judges, we developed new scales for authenticity disposition.

We followed this approach to survey NCHI visitors. In order to include the maximum of persons, we installed at the museum entrance where visitors borrow the audioguides. Therefore, we stayed behind the desk with the employees in charge of 1) providing guidance to visitors and 2) of distributing the free audioguides required for visiting the permanent exhibition. This position was strategic because visitors had to return to this desk at the end of their visit to give back the audioguides. We took advantage of this time to ask visitor feedback regarding their interaction with the museum technologies. Surveying the visitors just at the end of their visit appeared also as a good way to ensure that their experience was still memorized. Our sample was randomized to the greatest extent possible. We conducted the study during weekends and weeks so that different types of visitors would be included. In order to encourage people taking part in this research, we also used incentives that consisted in NCHI branded notebooks.

In sum, we collected 183 questionnaires over a period of one month and a half. This pooled sample includes 113 questionnaires dealing with the museum audioguide and 70 questionnaires pertaining to the set of interactive kiosks and computers.

Results

The data analyses were performed with SmartPLS 2.0 (Ringle et al., 2005).

Testing the model, we found a reasonable percentage of explained variance for our dependent variables. Explained

variances for our dependent variables are the following. “Ease of use” has an R^2 of 0.07, “immersion” has an R^2 of 0.194, “enjoyment” has an R^2 of 0.515 and “learning” has an R^2 of 0.451. It is noteworthy that our research model accounts for more than 45% of the explained variance of the outcome variable, which is learning.

Eight out of nine hypotheses were validated, providing strong support for our research model. Except for H3, which is not significant, path coefficients are significant at the .05 alpha level. More specifically, PIIT positively influences ease of use ($B=0.265$, $p<0.001$), validating H1. Perceived ease of use has a strong positive effect on enjoyment ($B=0.485$, $p<0.001$) but no effect on immersion ($B=0.158$, $p>0.05$). As hypothesized, a positive assessment of perceived authenticity has a positive influence on enjoyment ($B=0.337$, $p<0.001$) and immersion ($B=0.339$, $p<0.001$). So H4 and H6 are validated. The affective variables retained to evaluate the entertainment aspect of museum visit (authenticity, enjoyment and immersion) all have a significant positive effect on learning, supporting H5, H8, and H9.

In order to assess the effect of the moderator variable, disposition towards authenticity (H7), we performed an effect size test (Mathieson et al., 2001, Carte and Russell, 2003). This test compares the variation of explained variance between a) the model that includes the moderator and b) the original model and determines the level of significance of the moderator effect. We used the formula proposed by Mathieson et al. (2001): $f^2 = (R^2 \text{ full model} - R^2 \text{ partial model}) / (1 - R^2 \text{ full model})$.

We first measured the variation of change in R^2 and second we tested the significance of this change. The change in R^2 is 0.62 and the effect size (f^2) is 0.124, so the inclusion of the moderator in the research model leads to a medium effect size.

DISCUSSION AND CONCLUSION

This research investigates the affective and cognitive reactions of visitors interacting with museum technologies. We showed that the use of technologies contribute both to learning and enjoyment for visitors. More precisely, the visitors who interacted with the audioguides, interactive kiosk and computers all perceived authenticity during their visit. This research shows that the use of IT during a museum visit is not incompatible with perceptions of authenticity.

Hypothesis 3 was not validated suggesting that ease of use does not influence visitor perceptions of immersion. This result can be explained by the particular setting that we used to conduct our field study. As it turns out, NCHI is a museum that puts forward immersion and its exhibition has been designed in a way that visitors have the sensations to be projected into the past from the beginning of their visit. For instance, the museum displays video of immigrants and audio content in the entire museum. The curators have also privileged a dark

atmosphere in order to create a feeling of intimacy. As a result, even if technologies are not easy to use, we can understand that visitors still felt immersed during the exhibition.

Contributions

Several researchers in the HCI field call for more studies measuring IT phenomena in a natural or real-world context. For instance, Finneran and Zhang (2005) encourage more research on the experience of flow occurring in a naturalistic context. Boehner et al. (2007) also urge researchers to assess emotions as they occur in daily life.

“Given the pervasiveness of computing technology in our everyday lives and its concomitant societal impact, it is essential that we address people’s actual lived emotional experiences” (Boehner et al., 2007, p. 289)

By surveying visitors in a real museum setting, the present research contributes to 1) the study of emotions as lively experienced by visitors and 2) the study of information systems in their context of use. In the study, we measured visitor perceptions towards IT actual use. Generally research assessing visitor reactions towards IT has relied on laboratory experiments, which simulates user environments. These studies also measure intentions rather than actual behaviors. By surveying visitors who interacted with IT in a natural life context (leisure time), we are very close to real life experiences. Consequently, this research can contribute to building the IS and HCI research traditions in natural contexts.

While previous HCI research has mainly focused on computers in a business context, this study includes other types of digital technologies dedicated to entertainment and education, namely audioguides, interactive kiosks and computers. These technologies are particularly common in tourist and cultural settings and represent relevant hedonic information systems to be studied.

According to the International Council of Museums (ICOM, 2002), enjoyment and education of the public correspond to the core missions of museums. This research examines both entertainment aspects (enjoyment, authenticity and immersion) and learning reactions of visitors. These factors are also important for cultural institutional business. Markedly, Chhabra et al. (2003) observes that individuals who perceive a high degree of authenticity during their visit tend to spend more money in the cultural setting. They even purchase objects to keep a souvenir of their authentic experience. Even while the aim of cultural institutions is not to profit, they still need to raise money over and beyond expenses to satisfy new goals for efficiency in the modern era. Our study also show that positive reactions towards IT contribute to increased learning.

Limitations

Although using real museum visitors to test our research model adds value to this research, it also added complexity to our research methodology. More precisely, because the participants were tired at the end of their visit or had little time to participate in the research, we had to create a short instrument.

Furthermore, our research model principally accounts for positive reactions towards IT use. However, IT use in museums may produce negative outcomes like anxiety, frustration or distrust. Future research should investigate this other side of visitor experience by including negative reactions and extending the set of variables. We also decided to focus on learning instead of IT use as outcome variable. Nonetheless, extent of use and frequency of use are relevant dimensions to be assessed in future research.

Another limitation that can be mentioned is the scale used to measure perceived authenticity. To be sure, we wanted to rely on an IS scale to assess this construct, but the scales provided by Featherman et al. (2006) may not be very descriptive of authenticity as it was experienced by our participants. Future research should try to improve these scales by adding other facets of authenticity like escapism. Moreover, this research only takes into account the constructive perspective of authenticity. It would be interesting to study existential authenticity.

We also point out that this research employs subjective scales to assess learning. Consequently, we did not use objective measures for the outcome variable.

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