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Real vs. Virtual: A Theoretical Framework for Assessing the Role of Authenticity in Visitor Interactions with Museum Technologies

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ABSTRACT

People travel and increasingly engage in cultural activities, a phenomenon that has been called cultural tourism. Two principal reasons for these trips or visits are the need to break with monotony and the search for enjoyment and authentic experiences. Conversely, 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, prior research has focused on authenticity without taking into account the presence of technologies in cultural settings. Conversely IS research has not really studied perceptions of authenticity in entertaining contexts. As a result, the consequences of visitors' interactions with IT during their cultural trip are not clear.

The research's objective is to propose a framework assessing affective and cognitive reactions of museum visitors when interacting with IT, and more particularly virtual reality systems. This framework is based on Sun and Zhang's (2006) model of Individual Interaction with IT (IIIT). This paper also relies on the concept of authenticity, and more particularly on the constructivist view of authenticity.

Keywords

Authenticity; Enjoyment, virtual reality; museum technologies; interactions; tourism; cultural heritage

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 enjoyment and authentic experiences (MacCannell 1973, 1976). Enjoyment is also one of the eleven visitor "rights" when going to cultural heritage sites, as highlighted by Rand (2000). In effect, people are not only looking for exciting experiences, but long for enjoyment during their leisure time. Therefore, cultural activities should provide entertainment as well as authentic experiences to visitors in order to meet their expectations.

Cultural places such as museums rely on information technology (IT) to organize their exhibitions and their communications with the public. In effect, e-Heritage Systems, that is, technologies aligned with the cultural heritage environment, have great potential for meeting visitor expectations and enhancing their experiences (Monod and Klein 2005). In addition, several studies promote technologies as a reasonable way for cultural institutions to reenergize their relationships with their visitors

(Fopp. 1997; Messham-Muir 2005; vom Lehn and Heath 2005). For instance, the Internet enables distant access to museum resources (Galani 2003) and virtual reality systems contribute to immersive experiences (Lok 2004) while audioguides provide contextual background to visitors (Deshayes 2004).

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 enjoyment and authenticity. First, research in museums and tourism has focused on authenticity without taking into account the presence of technologies in cultural settings. Conversely, IS researchers have not paid a great attention to visitor experiences with technologies in the cultural heritage area.

Second, the effect of technology on authenticity perceptions is ambiguous. Actually the word "technology" seems to jar with the word "authenticity," in that technology connotes things that are fake or simulated whereas authenticity connotes things that are natural and real. According to Simon (1969), technologies belong to the artificial realm because they are "man-made as opposed to natural" (p.4). Furthermore, the pervasiveness of screens in our world, as explained in the phenomenological study of screens carried out by Introna and Ilharco (2004), can have diverse effects on visitor reactions. On one hand, we argue that visitors who value authentic experience may want to avoid using technology during a cultural activity. Indeed, as said earlier, people seeking authenticity can be reluctant to interact with virtual copies of artifacts (Amirou 2000). On the other hand, we believe that progress made with technologies like virtual reality and 3-dimensions makes images more authentic. In addition, people get used to the presence of technology in their lives and do not necessarily perceive its inauthenticity.

Given that the consequences of visitor interactions with IT during their cultural trip or visit are not clear, this paper introduces a research model to assess visitor interactions with IT in the museum context. We use a framework developed by Sun and Zhang (2006) called the model of Individual Interaction with IT (IIIT). This model introduces affective and cognitive reactions of individuals when they are using IT. Thus, the IIIT model will enable us to assess visitor reactions when they use IT in cultural settings. We also rely on the concept of authenticity, and more particularly on the constructivist view of authenticity, to study people's interactions with IT.

This paper is organized as follows. The second section presents the theoretical background of this research. The third section introduces our research model and its set of hypotheses. In the fourth section, we describe the methodology we intend to use. The last section concludes this research with potential contributions and limitations of this study.

THEORETICAL BACKGROUND

Sun and Zhang's (2006) model of interaction with technologies

Our research questions are linked to the Human-Computer Interaction sub-discipline. Indeed, this research aims at measuring visitors perceptions, affective reactions (perceived enjoyment and perceived authenticity) and cognitive reactions (perceived ease of use) when they interact with a technology. Moreover, we try to determine if perceived enjoyment and perceived authenticity can influence technology use. Therefore, this research relies on the model of Individual Interaction with IT (IIIT) elaborated by Sun and Zhang (2006).

The IIIT model is the result of a comprehensive analysis of the literature on affect. Actually, Sun and Zhang (2006) reviewed several disciplines including psychology, marketing, consumer research, and organizational and social psychology in order to clarify the core affect concepts generally used in information systems. This led to a first abstract conceptualization entitled "Model of the Individual Interacting with Object" (IIO). Sun and Zhang (2006) present IIO as a general model since it describes linkages between traits, affective reactions, cognitive reactions and behavioral intentions, and it reflects individuals' interactions with any object they encounter. Sun and Zhang (2006) provide a more specific model for IS research, the IIIT model, in which individual's interactions are created through information technologies. This model is composed of four categories: (1) trait, (2) affective reactions toward using IT, (3) cognitive reactions toward using IT, and (4) IS use. Each category includes several variables that have been extensively studied in the IS literature.

Trait has been studied in IS either by referring to computer playfulness or personal innovativeness of IT. The affective reactions toward using IT cover eight variables. These are: perceived affective quality, perceived playfulness, cognitive absorption, perceived enjoyment, attitude, satisfaction, flow and computer anxiety. The cognitive reactions toward using IT include computer self-efficacy, perceived ease-of-use and perceived usefulness. Finally, IS use is composed of behavioral intention and actual usage.

According to Sun and Zhang (2006), trait influences both affective and cognitive reactions toward using IT. Affective reactions and cognitive reactions have a reciprocal relationship since they are influenced by each other. IS use is predicted by

these affective and cognitive reactions. The authors of the IIIT model believe that this representation has the potential to explain individual interactions with IT. Indeed, IIIT relies on solid theoretical foundations since Sun and Zhang (2006) employed the Theory of Reasoned Action (TRA) and the Technology Acceptance Model (TAM) to build their framework.

In that IIIT 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., computer playfulness, perceived enjoyment, perceived ease of use, and IS usage. We also add a new concept to this framework, the construct of authenticity. Indeed, this last variable continues to be overlooked in IS research with the exception of Featherman et al. (2006), who have shown that perceptions of authenticity play an important role for interactions with IT. We believe that this role may be all the more important in a cultural context, where people look for authentic experiences.

Authenticity in tourism research and museum studies

Authenticity is a key concept in tourism research and museum studies. The word *authenticity* was first used in the museological literature where it is defined as a situation:

> "where persons expert in such matters test whether objects of art are what they appear to be or are claimed to be, and therefore worth the price that is asked for them – or, if this has already been paid, worth the admiration they are being given" (Trilling 1972, p.93, as cited in Wang 1999).

Authenticity was introduced into tourism studies by McCannell (1973, 1976) as part of the Staged Authenticity Theory. According to McCannell (1973), people are in search of authentic experience because their life in an industrialized society is inauthentic. Cohen (1988) also points out that modern life is alienated. Therefore, these authors argue that individuals travel to discover new places that will be more authentic and natural. However, MacCannell (1973, 1976) explains that authenticity in tourist settings is staged. Indeed, tourist places represent the front stages that try to recreate an "atmosphere" of authenticity normally found in back stages. Tourists, who do not have enough knowledge and expertise to recognize real authenticity, do not manage to perceive this subterfuge (MacCannell 1973).

Authenticity serves different functions and has a number of advantages for the cultural industry. For instance, Taylor (2001) indicates that authenticity adds value to objects or cultural sites, and, therefore, is used by visitors as a sign of quality to evaluate cultural artifacts or places. Authenticity is also valuable to tourists because it helps them to find their real authentic selves through bodily feelings, self-making, family ties, and touristic communitas (Wang 1999).

Several researchers note that authenticity is not a one-dimensional concept since it encompasses different manifestations (Wang 1999; Reisinger and Steiner 2006). For instance, Wang (1999) identifies three types of authenticity: objective, constructive and existential authenticity. Indeed, Wang (1999) explains that objective and constructive authenticity deal with "object-related situations" and cannot account for all tourist situations (p. 350). Therefore, Wang (1999) proposes a existential authenticity that is independent from objects and linked, rather, to human beings.

Reisinger and Steiner (2006) highlight four perspectives on the different schools of authenticity thought. More particularly, they show that modernists, realists and objectivist consider authenticity to be an objective fact judged by experts and independent from tourist perceptions. By way of contrast, Reisinger and Steiner (2006) argue that for constructivists, authenticity is a social interpretation which depends on context and personal beliefs. In the postmodernist school, authenticity is competing with inauthenticity because some tourists are satisfied as well with inauthentic experiences.. The fourth perspective introduced by Reisinger and Steiner (2006) is Heideggerian. It suggests that authenticity is always there because individuals perceive as authentic everything they encounter in the world.

Consequently, our research cannot ignore these different points of view and, for this reason, we decided to rely on the constructivist approach. In fact, the other schools of thoughts were not compatible with the present work. First, since we intend to assess visitor perceptions, objective authenticity is not appropriate. Further, we do not study existential authenticity because it is related to natural, outdoor activities like "camping, wilderness or mountaineering" (Wang 1999, p.360), clearly a setting that is extremely different from our museum context. Conversely, constructivists believe that authenticity is a feeling and a negotiable process dependent on the visitor judgment (Cohen 1988). Therefore, this research takes into account two manifestations of authenticity: (1) authenticity as a disposition and (2) authenticity as an emotion.

Authenticity as a disposition

Cohen (1979) asserts that authenticity is not perceived unilaterally among tourists. Indeed, he argues that some tourists seek authenticity and value such experience whereas other tourists do not have such expectations and will appreciate both authentic and inauthentic experience. As a result, Cohen (1979) sets up a classification of tourist dispositions toward

authenticity. He distinguishes five different types of tourists on a continuum. These are: existential, experimental, experiential, recreational, and diversionary tourists. Existential and experimental tourists are most concerned with authenticity because when traveling they want to embrace new cultures and live like the natives (Cohen 1988). Cohen (1988) defines experiential tourists as individuals willing to "participate in the authentic life of others" (p.377). Last, recreational and diversionary tourists look more for enjoyment and entertainment than authenticity in cultural settings (Cohen 1979). They will also be easily satisfied with staged authenticity.

Authenticity as an affective state

Selwyn (1996) argues that authenticity can be "hot" when it is considered to be a feeling or "cool" when it is viewed as knowledge (Wang 1999, p.351). Since "cool authenticity" refers to an objective experience, we only take into account the "hot authenticity" that accounts for authenticity as an affective state. Furthermore, Chhabra et al. (2003) note that as people feel more nostalgic and more concerned with the past, what is important for them is not an objective authenticity but a perceived authenticity that will be consistent with their emotional state.

Authenticity in tourism and museum studies have been studied without taking into account the role played by technologies. In the next section we introduce how the concept of authenticity has been studied in IS research.

Authenticity in IS literature

The development of virtual environments has raised the question of authenticity in IS research. Generally, this question has been addressed rather indirectly by studying or improving the characteristics of virtual reality systems technologies. Some research has also been conducted on perceptions of authenticity in commercial contexts.

Virtual reality systems

Those technologies most closely related to the concepts of authenticity and reality are virtual reality systems. *Virtual reality* is defined as "a computer simulation of a real or imaginary system that enables a user to perform operations on the simulated system and shows the effects in real time" (The American Heritage Dictionary of English Language). Additionally, a new type of virtual reality technologies is appearing, mixed reality. In this type, hybrid environments where visitors can look at real and virtual objects in the same time are created (Lok, 2004, Sparacino, 2004). Milgram (1994) classifies the experience of virtuality on a continuum from the least virtual to the most virtual. The continuum is: physical reality, augmented reality, augmented virtuality and virtual reality. Three-dimensions (3-D) are also linked to virtual technologies. Indeed, Billinghurst and Kato (2002) explain that "the term augmented reality is often used to refer to interfaces in which 2D and 3D computer graphics are superimposed on real objects." (p. 66).

Hughes et al. (2005) studied the effects of mixed reality technology in a science center and they show that mixed reality enhances the experience of visitors. For instance, 98% of the visitors were inclined to stay longer in the museum because of the mixed reality technology. Similarly, the visitors recognized the cognitive and affective benefits of the technology. They felt that they learned more thanks to the technology. They also believed that they had an entertaining experience.

Influence of perceived authenticity

At first glance, one might think that with the continuous progress being made in technology development, there is no need to study user perceptions of authenticity when users interact with IT, especially virtual reality. However, this issue does seem to deserve attention given that Featherman et al. (2006) have shown that perceptions of authenticity can influence IT usage. 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. Li et al. (2001) also note that in the virtual product environment, consumers will tend to pay more attention to products' attributes and characteristics.

However, these prior studies did not focus on perceptions of authenticity in hedonic context of IT use, like cultural or touristic visits.

RESEARCH MODEL AND HYPOTHESES

We conclude the literature review by noting that (1) perceptions of authenticity can have an influence on IT usage, (2) not all individuals are sensitive to authenticity, but (3) this concept is particularly relevant for people using IT during cultural activities (i.e., trips, heritage site visits). Therefore, the two following research questions guide this study:

1. Do visitors experience authenticity and enjoyment when using museum technologies such as virtual reality?

2. Is technology usage within museums dependent on the type of experience expected from visitors? Does a disposition toward authenticity predict IT usage?

To answer these questions, we propose the following research model (Figure 1). This model hypothesizes that IT usage is a function of three factors, namely perceived enjoyment, perceived ease of use, and perceived authenticity. The constructivist view of authenticity is represented in the model in perceived authenticity, which reflects the emotional aspects of authenticity, and authenticity disposition, which accounts for the different types of visitors.

Figure 1. The Research Model
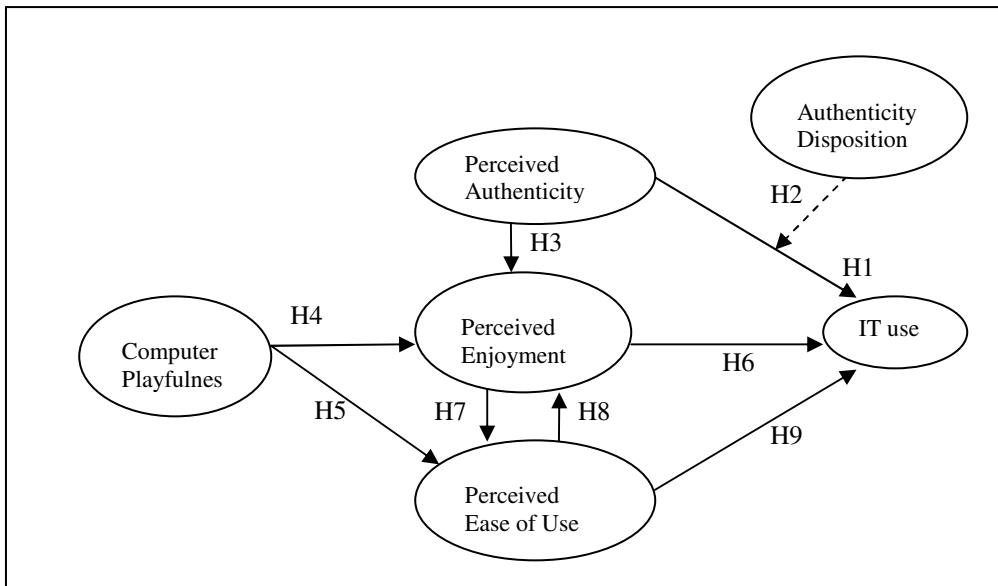
Hypotheses

Waitt (2000) explains that, according to Baudrillard (1983), "simulations have become so 'authentic' that they achieve a state of hyper-reality – where the representation becomes more important in the evaluation of authenticity than direct experiences of the original." (p.847). Eco (1986) also believes that tourists prefer hyper-reality and simulations rather than reality. This can be explained by the fact that technology sometimes contributes to a more authentic experience and has the potential to transform inauthentic into authentic (Fjellman 1992). Additionally, Reisinger and Steiner (2006) assert that interpretive materials like audioguides or computers can influence tourist's experience of authenticity. Indeed, IT such as virtual reality can display disappeared objects, enhance their appearance, and also reconstitute past scenes (Fopp. 1997). For instance, the MUSE project provides to visitors a virtual reconstitution of the ancient site of Pompeii (Scagliarini et al. 2001). Billinghurst and Kato (2002) also explain that the aim of mixed reality is to make the real and the virtual indistinguishable. Furthermore, Cohen (2002) argues that visitors will want to use IT and be satisfied with simulated experiences when they realize that accessing the real object is impossible because of time or place constraints. Taylor (2001) takes the example of the Maori culture and notes that old media like brochures or postcards tend to display stereotypes or fixed ideas, like "ceremonial costumes or cooking scenes"(p. 20). IT has the potential to display dynamic images, videos or audio documents that will better account for an authentic culture. As a result, if visitors believe that technology can enhance their authentic experience, we posit that they will want to use it. Our first hypothesis reflects this belief.

H1. Perceived authenticity toward IT influences IT use.

As explained in section 2, Cohen (1979) highlights five different types of tourist experiences of authenticity. All individuals can perceive (in)authenticity, whether their judgment is right or wrong, but not all individuals are influenced by their authenticity perceptions. It seems that existential and experimental tourists are those who are the most sensitive to authenticity experiences (Cohen 1979). Similarly, Goulding (2000) notes three different types of experiences of authenticity

in the museum context. In effect, she identifies three types of visitors with different expectations towards authenticity, they are: the existential, the aesthetic, and the social visitors. Additionally, Bruner (1991) found that the bulk of tourists do not feel alienated by modern life and do not search for authenticity during their cultural travels. Tourists are aware that they are surrounded by reproductions, but they will accept "fake" as long as it is well represented (Bruner 1991). Therefore, perceived authenticity of the experience toward using IT can be at a low level, but if an individual has a poor disposition toward authenticity, this will not influence her/his use of IT. Conversely, if the individual is an existential or an experimental tourist, the level of perceived authenticity will have a greater influence on her/his use of IT.

As an extension of H1, we hypothesize the following:

> H2. Authenticity disposition moderates the relationship between perceived authenticity and IT use.

MacCannell (1999) asserts that "tourists enter tourist areas precisely because their experiences there will not, for them, be routine" (p. 106). Indeed, cultural trips or visits represent a way to break with the routine and to access authentic experience. Tourists look for authenticity because it is supposed to enhance their experience by providing better enjoyment. Therefore, we propose that:

> H3. Perceived authenticity positively influences perceived enjoyment.

We decided to focus on H1, H2 and H3 because they represent the new linkages that we intend to investigate in this research. H4 to H9 will not be developed in this paper due to space constraints. Nevertheless the hypothetical relationships are well supported by the literature as articulated in Sun and Zhang's model. Table 1 gives a synthetic view of the different hypotheses.

Table 1. The set of hypotheses

Hypotheses number	Hypotheses statement
H1	Perceived authenticity toward IT influences IT use.
H2	Authenticity disposition moderates the relationship between perceived authenticity and IT use.
H3	Perceived authenticity positively influences perceived enjoyment.
H4	Computer playfulness positively influences perceived enjoyment.
H5	Computer playfulness positively influences perceived ease of use.
H6	Perceived enjoyment positively influences IT use.
H7	Perceived enjoyment influences perceived ease of use.
H8	Perceived ease of use influences perceived enjoyment.
H9	Perceived ease of use positively influences IT use.

METHODOLOGY

This research will be conducted in a French museum, where different types of IT, including virtual reality systems, are available for the use of the public. One of the targeted museums is dedicated to arts and ethnology. This museum has been recently renovated and offers now more than 150 multimedia screens and interactive kiosks. To gain access to the field, museum professionals of the IT department will be contacted and met face-to-face to introduce our project. Their collaboration and support will probably give more credibility to the study.

The planned methodology is a field study and more particularly a free simulation experiment (Fromkin and Streufert 1976). In this experimental methodology, participants will be studied in a closed setting that is the museum. However, we will 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 will be their interaction with the museum technologies. The independent variables that will vary freely are the perceptions of authenticity, enjoyment and ease of use.

Our data collection technique will be a questionnaire (Straub et al. 2004). The questionnaire distributed to visitors will be composed of existing scales for the IS constructs. We will rely on Featherman et al. (2006) scale of perceived artificiality and will reverse it in order to measure perceived authenticity. Relying on the literature, we will develop new scales for authenticity disposition.

Different types of technologies can be found in museums. The most common IT are audioguides, touchscreen kiosks, televisions, computers and multimedia catalogs. Therefore, participants will have the choice between different kinds of IT. However, in order to assess authenticity perceptions, we will focus on the generic class of "virtual reality technologies" that aim at representing the reality (i.e., virtual reality, mixed reality). We will provide further details on the characteristics of the selected technology after gaining access to the field site.

The study will follow a two-step approach. First, visitors will be asked to participate in the study when they arrive at the museum. To ensure that our participants know the types of IT available in the museum, as well as the location of the technologies, we will introduce them to the museum technologies via a PowerPoint presentation. At this stage we will gather their predispositions to authenticity. After that, the participants will be invited to visit museum exhibitions. Second, at the end of their visit, visitors will return to fill in our questionnaire. The questionnaire will measure visitor perceptions of authenticity, enjoyment, and ease of use toward IT, as well as their actual IT usage. Their computer playfulness will also be assessed. This instrument should provide feedback on visitor interactions with the museum technologies.

Our sample will be randomized to the greatest extent possible. On randomly selected days, we will invite every visitor to participate in the study, but give her the choice to take part in the research. In order to encourage people to take part in this research, we will use incentives such as free museum tickets or souvenirs from the gift shop. The questionnaire, as well as the PowerPoint presentation, will be rendered both in English and French so that a large number of visitors can participate. We intend to collect two hundred instruments. The data will be analyzed with techniques of structural equations modeling.

DISCUSSION

We present hereafter the theoretical and managerial contributions, as well as some limitations for this research.

Contributions

Theoretical contributions

First, Chhabra et al. (2003) noticed that there are few quantitative studies dealing with the relationships between visitor perceptions of authenticity and satisfaction. Furthermore, it seems that prior research on authenticity has ignored the fact that more and more cultural visits rely on technologies. IS research has simply not yet paid attention to the influence of authenticity perceptions in hedonic contexts of IT use. This is why we are applying our framework to the case of museums.

That being said, Sun and Zhang (2006) do encourage IS researchers to study the effects of affect on interactions with IS. The present research takes this element into account by studying two affective reactions, perceived enjoyment and perceived authenticity. Therefore, this study tries to improve our understanding of authenticity manifestations and their consequences in interaction with technologies.

Second, while previous research in Human-Computer Interaction has mainly focused on computers, we propose to study other types of digital technologies such as virtual reality systems. These technologies are particularly common in touristic and cultural settings. Consequently, we intend to focus on technologies dedicated to entertainment and education. We also intend to examine these technologies in their context of use, the museum setting. Further, we will measure actual use and not intention to use. Consequently, this research can contribute by extending findings on individual's interactions with IT.

Managerial contributions

According to the International Council of Museums (ICOM 2002), enjoyment of the public is one of the four core missions of museums. This research studies two affective variables that play an important role in visitors' experience, specifically perceived enjoyment and perceived authenticity. These two factors are also important for cultural institutional business. Actually, 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 if cultural institutions' aim is not profit, they still need to raise money over and beyond expenses as they have new goals for efficiency in the modern era.

This study can also guide museum policy with respect to IT. Indeed, if our results show that IT contributes to better enjoyment and authentic experience, this would demonstrate the utility and efficiency of IT and encourage museums to invest more in IT. By way of contrast, if the IT equipment does not contribute to a better experience, this may indicate to museum professionals that their equipment is either obsolete or does not fit visitor expectations, so it would need to be replaced. It could also suggest that IT was not useful in this context.

Limitations

This research does not include all the variables identified by Sun and Zhang (2006) as playing a role in people's interactions with technology. Moreover, we did not take into account the possible mediating effect of perceived enjoyment on the relationship between computer playfulness and perceived ease of use, as shown by Sun and Zhang (2004). Future research can include these other factors and relationships.

CONCLUSION

In conclusion, this paper proposes a new model to assess visitors' interactions with technologies in museum setting. We introduce the concept of authenticity, a concept whose origin lies in museum and tourism studies, but one that is also relevant for IS research. In employing the constructivist view of authenticity, we augment two variables to the existing IS research. These are: perceived authenticity and authenticity disposition. We argue that authenticity has the potential to influence people's interactions with IT in cultural settings such as museums. Relying on the framework of Sun and Zhang (2006), we outlined a set of nine hypotheses that will be tested via a free simulation experiment in a museum setting.

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