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Presence and digital tourism

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Abstract This paper provides an introduction to digital tourism as mediated by presence research as a means to create substantive user experiences (UX) for visitors. Tourism is a rich and varied socio-economic activity that permeates our global society. Digital tourism is the digital support of the tourist experience. In this paper we introduce and survey both fields and introduce a number of examples of tourist experiences based on our blended spaces approach. Cutting across this is the sense of presence that visitors can experience in real or digital tourist experiences. We conclude the paper with a discussion of designing the user experience in blended tourist spaces.

Keywords Tourism · Blended spaces · Design · User experience · Usability

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1 Introduction

Tourism is a large global industry, both in terms of numbers of participants (both tourists and operators) and in terms of the overall expenditure. According to UNWTO forecasts, international tourist arrivals are expected to exceed one billion in 2012, having grown to 980 million in 2011, up by 4.4 % from the 939 million recorded in 2010 (UNWTO 2011). Tourism as a leisure activity is a pervasive aspect of our local, national and the global economies. For some, it is their leading source of income for goods and services. The number of motivations people have for undertaking tourist experiences—from ecotourism to medical-tourism—emphasize that this is a very loosely coordinated yet important socio-economic aspect of life.

Consider, for example, that in 2009, five of the top ten visitor attractions in Scotland were Museums or Galleries, with in excess of 4.3 million visits. Unpacking these visits reveals a rich array of reasons for each visit including weather, serendipity, school visits, research visits, special events and in response to marketing activity by the venue, region or country. Developing technology to support visits based on such a broad range of human interests and motivations is challenging. In the US National Parks Service, there are hundreds of tourist attractions ranging from the great parks themselves such as Yellowstone to historic houses, chapels and reconstructed villages. Each attraction presents its own challenges in terms of interpretation, language, isolation or popularity, along with numbers and diversity of visitors.

Broadly speaking, digital tourism is concerned with the use of digital technologies to enhance the tourist experience. This may be as mundane as posting recommendations on a tourist Website, but increasingly, it concerns the mixing of the real world with digital content designed to

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enhance the visitor experience. These mixed reality technologies have been around for over 10 years, but it is only with the proliferation of smartphones and tablet devices that mixed and augmented reality interaction is reaching the mass market. There are now enough examples of mixed reality interactions that we can begin to abstract principles of design and principles of user experience (UX) for these new spaces of interaction.

Mixed reality comes in a number of forms, spanning the reality spectrum described by Milgram and Kishino (1994) from digitally enhanced physical spaces to physically enhanced digital spaces. An example of the former would be a ruined historic building with an augmented reality projection of how it used to look. An example of the latter might be using a real sword to fight imaginary battles in a real castle. In the middle lie many combinations of physical and digital objects and spaces, from quick response (QR) codes on buildings providing information to geographical positioning system (GPS) triggered events on a smartphone, to augmented reality overlays using real-time feature tracking or GPS and compass information to a mixture of maps with real-time video of the physical location depicted on the map.

However, designers have very little advice on how to design for engaging experiences in mixed reality and more particularly how to design a good UX for a tourist. The concept of presence could be useful here as if we feel present in a medium we feel engaged with the content. Presence can be seen as "the subjective experience of being in one place or environment even when one is physically situated in another" (Witmer and Singer 1998). It may be conceptualized as the "illusion of non-mediation" (Lombard and Ditton 1997). There is forward presence ("being there") and backward presence ("being here"). Both play a part in the creation of a UX in which a tourist feels present.

Clearly, there are a number of issues that interfere with presence, causing breaks in presence that may have a large negative impact on the UX. The transition from the physical world to the digital world is often unnecessarily complex. For example, digital content may be delivered on a device such as smartphone. The tourist has to get this out of her pocket and perhaps has to turn it on, or open up an app, or otherwise configure the device. Such actions cause a break in the sense of presence of being in a historic building. Another issue concerns the tourist's awareness of digital content. A marker, such as a QR code, can be used to indicate the existence of digital content. Scanning the QR code with a phone will deliver location, time specific and relevant digital content, but the very existence of the marker may detract from the authenticity of the experience of a physical space. Content may be triggered by other less intrusive methods such as features of the physical space that can be linked to some digital content (augmented reality, AR, markers) or by the phone sensing the tourist's physical location through GPS. Interference of the GPS signal, or misalignment with the AR marker, can again result in breaks in presence and a frustrating UX.

This has led us to try to move beyond the idea of mixed reality and to propose the idea of blended spaces (Benyon 2012). Benyon (2012) argues that these are spaces that mix the physical and the digital in a harmonious way that aims to maximize the UX of the whole blended space. The blended space has properties not possessed by either the physical or the digital spaces independently. The aim is to produce the new experience of being in a seamless blended space. This takes effort of careful curation of the site and of content creation. There needs to be well-designed transitions between the physical and digital spaces and people need to be made aware of the existence of content in a way that does not break the sense of presence. People are moving through different layers of experience that are evolving as the digital and real worlds are increasingly intertwined. People become present in a blended space and become essential actors in its use.

In this paper, we look at the developing field of digital tourism and how understanding the sense of presence can help to develop a great UX for tourists. Section 2 provides an overview of the digital tourist domain, and in Sect. 3, we look at some UX examples from the blended spaces in Edgar Allen Poe's home. Section 4 provides a discussion of presence in this context, and we provide a brief conclusion about designing the UX in blended tourist spaces.

2 Digital tourism

Digital Tourism can be defined as the digital support of the tourist experience before, during and after the tourist activity. This might be a recommendation system to help someone find suitable accommodation during holiday planning (Ardissono et al. 2003), a mobile tour-guide application on their smartphone while there (Abowd et al. 1997) or the ability to easily explore holiday photos around a table once at home (Apted et al. 2006). The concept of digital tourism is not new and permeates many of the online activities people engage in today with trip planning using Expedia and TripAdvisor, travel management with airline frequent flyer websites and Tripit, mobile tour-guide applications on smartphones and photo management including Facebook, Flickr, iPhoto or Picasa.

However, what is new is the concept of digitally enhanced tourism. Through the use of technology, the aim is to further improve the quality or extent of a tourist experience (Uriely 2005). Instead of making travel bookings easier, or replacing a printed guide with a multimedia one or supporting better photo management, new technologies can appreciably intensify the tourist experience. This

includes allowing people to immerse themselves in remote and inaccessible sites in a manner that moves beyond a simple multimedia experience (Cruz-Neira et al. 1993). In practice, research can include novel interfaces, the collection, management and processing of context data, middleware required to enable the dynamic composition of devices and services, navigation, search, recommendation, mobile interaction, augmented reality and ubiquitous human computer interaction (Quigley 2009).

Research has explored the motivations of the tourist, their behaviour (Uriely 2005) and goals. Here, we first consider the three principal aspects of a tourist experience in terms of before, during and after. Before visiting a town, city or country, tourists can often uncover the main sights or famous aspects of it. However, does knowing this match their real interests? Will visiting such sites provide the type of cultural, social or historical experience they are seeking? There are sites that match their interests, but they have never heard of these and they will never realize it. And of course there are the many sights that people serendipitously discover and match or even extend their interests. When planning a visit to a new location, there are many things "we don't know, we don't know" about the place. Currently, systems that try to provide a view into where people are going, take little account of the rich context or "user model" for each individual. User modelling has been extensively researched in hypertext systems, personalization, e-Commerce and recommendation systems (Cheverst et al. 2002). The research and development challenge here is that our before activities can be spread across many applications, services and systems so building up a clear user model which we can rely on is difficult.

Digital support during the tourist activity is currently a fragmented space including printed or digital guides, maps, social media, audio/video devices, mobile apps and kiosks. It is clear there is a lack of standardization and little understanding of the expectation of use. For many, digital or physical supports are a distraction from experience of engaging in a particular tourist site and reduce the sense of presence. Indeed, there are many problems with existing technologies not least of which is the cost and maintenance for the operator and visitor. Costs can be worthwhile as the tourism market is large and economically empowering. However, the costs must be weighed against the potential gains. In addition, we must also consider that there is an emerging market for supporting the remote digital visitor. We cannot expect all 7 billion people on earth to be able to visit Uluru, Machu Picchu, Angkor Wat or Easter Island. However, are there technologies, economic models or social imperatives that would encourage those who manage such sites to open them up for rich online visits? This is not a matter of an improved website but instead requires new forms of presence to realize a rich and improved remote user experience based on novel interfaces and a deeper understanding of the expectations remote digital visitors have when visiting sites they will never see in person.

After the tourist experience, each visitor is potentially a venue's greatest salesperson as a "digital tourist ambassador". In addition, each visitor might return again. If they do, can they easily know what they might want to see next time based on what they saw last time? Systems can personalize their next "pre-visit" experience to take their previous visits into account. Or take into account visits to similar and related places. The question is can people easily tie in their recommendations, media (audio/video), trails and comments about the places they visited to share with family, friends and others. If so, a visitor to a remote and little visited site can become a life-long advocate for a sites preservation, remote presence and promotion.

Digital tourism focuses on a wide variety of destinations and contexts, e.g., museums, rallies, countrysides, zoos and theme parks (Durrant et al. 2011a). Designers and researchers have been employing a number of different tools and solutions to accommodate the tourist, e.g., interactive maps, tourism assistants, identification of interest points and souvenir generation (De Carolis et al. 2009; Schering et al. 2009; Durrant et al. 2011b). These tools and approaches are a handful of design techniques in the digital tourism domain.

Mobile devices are a popular mechanism in the context of tourism and geo-centred navigation applications. Augmented reality has been a popular method of displaying historical content for tourism locations (Allsop 2011; Watanabe 2012; Schinke et al. 2010). Allsop discusses how the London Museum of Archaeology and the UK TV channel *History* recreated glimmers of Roman life in the streets of London (Allsop 2011). For the 2012 London Olympic Games, augmented reality was a centrepiece for tourism and hospitality. The London Holiday Inn created the STAY YOU Campaign, which brings British 2012 Olympic athletes into the guest hotel room (Watanabe 2012). In contrast to commercialized Hollywood augmentation applications, there are many tourism-centred prototypes that leverage augmented reality to sensitize users to points of interest (POI) off the screen (Schinke et al. 2010; Baudisch and Rosenholtz 2003). There have been recent developments and exploration to create and capture personal stories while waiting in amusement park queues (Durrant et al. 2011a). Although there are exceptions (Robinson et al. 2010), many tourism experiences depend upon having the mobile device continually in hand and in front of the user explicitly leading the user's movement and interaction paradigms (Allsop 2011; Watanabe 2012; Schinke et al. 2010). Technology should aim to improve and not detract from the experience itself. Our focus is to design tourism systems to be as transparent as possible and

avoid "periscope tourism" (when the visitor experiences the destination through the lens of a camera or the screen of a mobile device).

Digitally enhanced tourism seeks to improve the tourist experience before, during and after the visit in manner which better understands each visitor as a unique individual with their own interests, goals and expectations. Research and development teams in the Masters Human Computer Interaction program at Rochester Institute of Technology have been building systems and services that employ UX strategies from blended theory (Benyon 2012) cater to personalizing a tourist experience before during and after visiting a destination.

3 Designing digital tourism experiences in New York

The Masters, Human Computer Interaction program at Rochester Institute of Technology, Rochester, NY, has been focused on creating courses, researching and teaching UX digital tourism. The programme builds and designs digital tourism experiences in the State of New York. We design novel, location-based experiences, with special emphasis on context, location, history, the user experience and personalization of location-specific souvenirs. Our research discusses how we (a) implement novel augmentations to supplement educational components of historical storytelling, (b) use GPS coordinates and near-field communication (NFC) to create location-based trigger events for user interaction and (c) create personalized souvenirs that represent the user's unique visit coupled with professional photos and user photos.

We have been visiting and researching tourism destinations in Western New York. We utilize user-centred design methods from HCI to study tourist behaviours before, during and after visits. We leverage Blended Theory to assist in the UX design and development of our prototypes (Mokey et al. 2012).

Although we have been focused on designing prototypes in the digital tourism domain. We would like to begin exemplifying our design strategy through a high-level UX scenario representing a visit at the House of Edgar Allen Poe. Later, we introduce Brick City Tours, the infrastructure designed to deliver the UX scenario from the home of Edgar Allen Poe.

3.1 Design scenario: the house of Edgar Allen Poe

Experiencing the home of Edgar Allen Poe provides many UX opportunities. At his home, National Park Services (2012) wrote and perfected his most celebrated gothic tales, modern detective stories and poetry. Our design strategy is not to distract the visitors by using novel technologies for the sake of "the cool factor" or beyond a simple multimedia effect (Cruz-Neira et al. 1993), such as AR bats flying out of a chimney or displaying movies of pendulums in the cellar. Instead, our design approach uses technology for location-based storytelling to supplement details of Poe's home coupled with his gothic tales. We use technology in a manner that discretely enhances the visitor's experiences. Our intention is to design an experience, which calls upon technology when it suits the specific context of the story, the location and the educational content. In the context of creating designs for Poe's home, the mobile device should be lingering in the background, away and in the pocket. Consider the following scenario: (Figs. 1, 2).

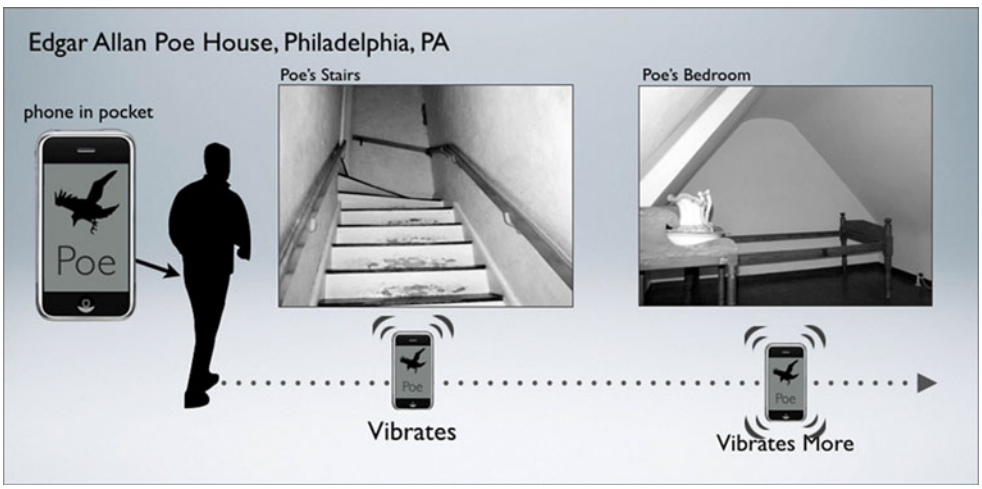

Fig. 1 Unobtrusive use of smartphone to sensitize the user to digital content

Fig. 2 Augmented reality projection of beating heart

> The visitor has entered Poe's dark, nineteenth-century home. The visitor wanders around Poe's cellar and wonders if the walls of the dark, damp place inspired 'The Black Cat' (Poe 1984). Moving in the dark up the musty wooden staircase, the visitor feels movement on his leg. "No problem," he thinks, "It is only my mobile phone, and it couldn't have been a cat!" He looks at the phone but no one has texted him nor has he received an email. Returning the mobile phone back to his pocket, he continues up the stairs to a landing. Curious to see where the narrow old staircase leads, he decides to ascend the narrow staircase. As soon as he reaches for the stair railing, his mobile phone vibrates again. As before, he checks his phone; there are no messages of any kind. Ignoring this strange event, he quickly returns it to his pocket and continues moving upward. Atop the staircase he turns to enter Poe's sleeping chamber. Once in the cramped bedroom, his mobile phone begins to vibrate continuously. The vibrations seem to pulsate in his pocket. He pulls out his phone yet again. Finally, a message:
>
> Now, I say, there came to my ears a low, dull, quick sound, such as a watch makes when enveloped in cotton. (Poe 1984 p. 124)
>
> The visitor presses the button to open the full message. The phone continues to vibrate unceasingly. Meanwhile, the mobile phone is redirected to the camera in live-view. The phone is vibrating and vibrating uncontrollably. The visitor points the mobile phone at the floorboards. The vibration stops. The vibration is replaced with "a low, dull, quick sound, such as a watch makes when enveloped in cotton"; a heart is seen pulsating underneath the floorboards.

Although the AR version of "The tell tale heart" is a dramatic UX scenario, it represents the essence of our approach to our tourism contexts. The aim is to create a sense of presence in the blended space, provided by digital content in the physical location. The Poe design scenario encompasses a wide range of human reactions, which are influenced by a sensitive utilization of many mobile technologies all working in concert. We use vibrations, text messages, audio files, location trigger events and animations in the camera's live view, all intended to supplement education and enhance the UX first. The current generation of technology is used only second to the user. The aim is to invoke a more emotional and engaging experience by adding digital content to the narrative of exploring Edgar Allen Poe's house.

Although the Poe UX scenario is a concept to illustrate our approach, there are existing examples of blending digital and physical spaces. Benyon points to a similar experience in Edinburgh, Scotland where QR markers are used to trigger digital content from the author Stevenson at the same physical locations that he visited (Benyon 2012). At Rochester Institute of Technology (RIT), we have deployed the global village explorations prototype, which guides visitors serendipitously through the campus using vibration, voice guidance and growls from Richie the tiger, the RIT mascot (Mokey et al. 2012). Since the deployment and evaluation of the global village explorations prototype, students and faculty from the mobile experiences for tourism course have created, Brick City Tours (BCT).

3.2 Brick City Tours

To begin to achieve a UX akin to that illustrated in the Poe scenario, we have begun to develop tools to recruit prospective students to RIT. Each year thousands of prospective students visit our campus as "educational tourists". In order to continually develop and test prototypes in blended tourism spaces, we have focused on contexts relating to RIT campus tours. We have developed BCT to not only provide real UX solutions for prospective RIT students but also give our designers an opportunity to create an infrastructure that could scale to such locations as the House of Edgar Allen Poe. Our long-term goal is not to design 400 tourism apps for one location or to combine four-hundred locations in one app. Our goal is to design one system that is flexible and scalable to many educational destinations, e.g., zoos, living history museums, parks, university campuses.

Brick City Tours is not an app. BCT is an infrastructure, a host of tourism-centred services, which connect visitors to the destination before, during and after visits. Our researchers are focusing on connecting prospective students to RIT. Our strategy is to turn these prospective students into RIT ambassadors as they share their campus experiences to their friends and family. Through the

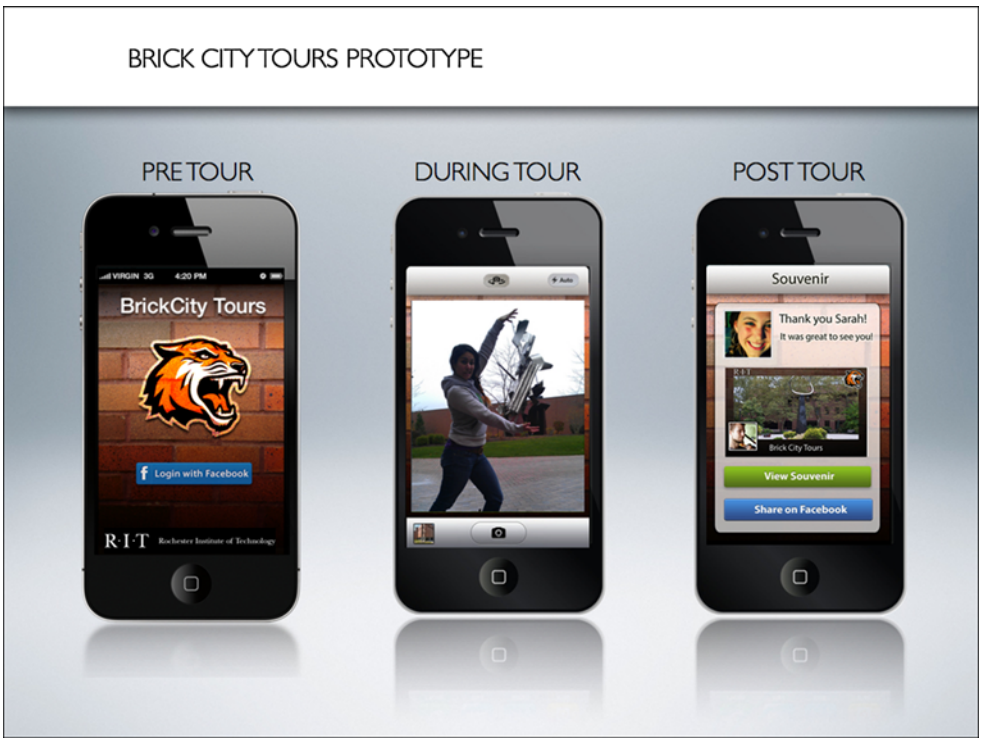

Fig. 3 Brick City Tours iPhone UI—before, during and after

augmentation and mediation of digital and physical spaces, our prototype developed and designed for the iPhone is strategically designed to interface with the visitor the pre-tour, during tour and post-tour (see Fig. 3).

3.2.1 Current tours on RIT

After 10 weeks of interviews, shadowing, site visits and empirical study, we have uncovered many opportunities to improve the RIT campus visit. Current campus tours are impersonal, and visitors are bombarded by information. RIT employs many students to give campus tours on campus. Tours are often organized from tour-guide time slots, e.g., Sam the tour guide departs at 11:00 am, Sally the tour guide departs at 1:00 pm. If visitors need more information about a location or topic during a tour, they are referred to RIT Website, pamphlets or a tour guide email address. BCT streamlines the overarching experience of visiting RIT campus before, during and after. The following is a high-level review of the BCT prototype as illustrated in Fig. 3.

3.2.2 Pre-tour

Since each prospective student may come to RIT with different interests and preferences, we enable visitors to customize their tours by choosing an RIT ambassador. Each RIT ambassador has a unique set of interests and backgrounds, e.g., Sam, is a third-year micro-engineering student who loves RIT Hockey, while Sally is a masters photography student seeking a career in studio photography. BCT synchronizes RIT ambassadors with the prospective student. Any visitor can select a RIT ambassador who is more like them.

3.2.3 During tour

While on tour, the visitor is able to do one thing, take photos. Since RIT tour guides inundate prospective students with information relating to departments, collages, sports, food facilities, libraries, general student life, etc., BCT does not intend to add even more content to the already overwhelming tour experience. Instead the behaviour of BCT is akin to a digital camera than a device with the potential to deliver hundreds of functionalities. We believe the user needs a tool and method of retaining all the information provided by the tour guides. While the prospective student is on tour, behind the scenes, BCT is aggregating information relevant to the visitor's interests in a variety of ways. First, we use Facebook and the pre-tour ambassador information to preselect places on campus as points of interest to automatically aggregate information for them. Second, the visitor's physical movement sensed by GPS triggers content to be collected. Third, when photos are taken, we use GPS data from that photo and further appropriate information around that location that could be used to further personalize the UX.

3.2.4 Post-tour

In the pre-tour, we have enabled the visitor to select his/her RIT ambassador tour guide. While on the tour, the visitor is taking photos while BCT aggregates points of interests in the background. During the post-tour, the visitor is presented with a product that is intended to represent their unique visit. We provide the prospective RIT student with a souvenir to share and distribute on Facebook. For the first time, the user will see a digital representation of their unique visit as a Facebook wall post. In this album, the visitor will find their photos, professional RIT images and information important to them. Our intention is to turn a RIT campus visit into a shared experience that enables visitors to experience the talent and innovation of RIT rather than simply reading or hearing about RIT.

3.2.5 Summary

Our approach to digital tourism enables our designers to experiment with multiple functionalities for a variety of different visitor locations and contexts. Digital spaces should be used to supplement educational experiences, while visitors avoid "periscope tourism". Our design approach encourages visitors to keep their devices nearby but not continuously in front of their faces or between their thumbs. Our design strategy is to automatically create products for the visitor in the context of their location and their experiences.

The design and development of BCT is on going and continues to evolve. Researchers at RIT are planning the third round of usability evaluations in spring of 2013. We plan on (a) conducting a series of usability tests to evaluate the BCT prototype, (b) test how our service personalizes the RIT tour experience and (c) measure whether or not prospective students feel that their automated and personalized souvenir represents their unique campus visit.

We are using blending theory (Benyon 2012) to contextually interact with both digital and physical spaces on the RIT campus. Our strategic approach to delivering unique visits rely on the careful implementations of digital services pre-tour, during tour and post-tour (Uriely 2005; Quigley 2009). Approaching tourism-centred services through integrated digital services uncovers opportunities for prospective students to become RIT ambassadors and attend our university. The design of BCT servicing RIT is only a small part of what our infrastructure is designed to do. Although RIT campus tours provide students and faculty with the opportunity to design and test our approach to digital tourism, it is the potential for our system to scale to a verity of educational destinations that can make visitors feel present in blended spaces before, during and after visits.

4 Presence

Digital tourism covers many issues, but one critical issue is the overall UX that of the tourist experience. A critical question for the future of digital tourism is the following: Is it possible to feel more presence in experiencing a place using the mediation of a technology than in reality? In other words, can digital tourism improve our feeling of presence?

According to the well-known definition of presence as "disappearance of mediation" (Lombard and Ditton 1997), the answer is no: presence is a function of our experience of a given medium (Media Presence), and specifically the "*perceptual illusion of non-mediation*" produced by means of the disappearance of the medium from the conscious attention of the subject. In this view, any technology is a barrier, a mediating tool that can only reduce the level of presence felt in any mediated experience.

The main advantage of this approach is its predictive value: the level of presence is reduced by the experience of mediation during an action or an experience. The main limitation of this vision is what is not said. What is presence for? As underlined by Lee (2004), "Presence scholars, may find it surprising and even disturbing that there have been limited attempts to explain the fundamental reason *why* human beings can feel presence when they use media and/or simulation technologies" (p. 496).

More, the increasing success of augmented reality touristic apps, that adds a technological layer of information to the real world, suggests the opposite: experiencing a medium—a mobile phone—that enriches the real experience (see Table 1 for the different possibilities). But how can I be more present in a real place?

In recent research, Gorini et al. (2011) offered an interesting insight. In their experiment, 84 students,

Table 1 Enrichment of experience offered by augmented reality

Type of enrichment	Description
Visualization	To see information about the buildings, businesses, natural elements or environmental conditions surrounding the user
Navigation	An alternative to maps for guidance (navigation from point A to point B, or a walking tour)
Search	An alternative to list for receiving the results of a search query (where is the nearest hotel or restaurant?)
Play	To provide entertainment using the real world as elements in a game
Simulation	To provide a "simulation", a projection, of the future or reconstruction of the past by overlaying photographs and/or realistic 3D graphics on the real world (i.e. the "real world" is in the present)

randomly divided into four groups, were asked to find a blood container inside a virtual hospital in an immersive or non-immersive condition and with or without an emotionally related narrative. Their data show that providing a narrative explaining the context and the meaning of the virtual experience produced a significant increase in the experienced level of presence. Apparently, the connecting variable between presence and meaning is the emotional response (Gorini et al. 2011; Riva et al. 2007; Villani et al. 2009): the narrative produces a higher physiological activation that strengthens the subjects' sense of presence.

But how can this experimental datum be explained by a presence theory? In opposition to the concept of "Media presence", a second group of researchers considers presence as "Inner Presence", a broad cognitive process whose experiential outcome is the feeling of being located in a perceived external world around the self (Revonsuo 2006; Riva et al. 2011; Waterworth et al. 2010).

In their view, the feeling of presence is the product of an intuitive experience-based metacognitive judgment related to the enaction of our intentions (Riva and Mantovani 2012): I'm present in an environment—real and/or synthetic—when I'm able to intuitively transform my intentions in actions. This claim has three suggestions for the development of better touristic digital experiences:

1. Presence is related to the intentions of the user: the more the technology is able to anticipate the needs of the user, the higher will be the presence experienced;
2. Presence is related to action and action responses: the more the technology is able to transform the touristic experience in an active one, the higher will be the presence experienced;
3. Presence is the outcome of an intuitive process: in digital tourism technology should help to "make sense there" effortlessly. This explains why touristic augmented reality that offers a more meaningful and richer experience without a significant cognitive effort of the user, is so successful.

5 Conclusions

The degree to which people will feel really present in a blended space is a measure of the quality of the user experience; of the naturalness of the blended medium, the appropriateness of digital content and the spatial and aesthetic characteristics of the physical space. Designers of digital tourism experiences need to focus on this and on the emotional response that they are trying to evoke.

The sense of presence provides a useful way into designing digital tourism experiences that focus on the person and their interaction with the physical and digital spaces taken together; as a blended space. The concept of blended spaces aims to take the design of mixed reality experiences to the next level of understanding. Designers can look for the correspondences between the physical and the digital spaces and develop the anchor points that bring the spaces together. There needs to be an understanding and appreciation of the structure of the digital and physical spaces, the main objects and their relationships in both the digital and physical space and an understanding of the technologies and media available in both the physical and the digital. A sensitivity to these characteristics will enable a designer to create a great blended experience.

Thus designers need to look for unobtrusive ways of bringing digital and physical content together as in the Edgar Allen Poe house, subtle vibrations led the tourist to engage with the content, tying the narrative back to the writings of Edgar Poe. With the original passport, stamps gave visitors a sense of achievement and belonging. Brick City Tours furthers the personalization of interacting with tourist locations. Location-based interactions enable people to be aware of places that could interest them. Through the mediation of verity of mobile phone modalities, designers can anticipate points of interests by simply knowing where the visitor is. Shortly thereafter, content can be present in specific areas. Although technologies are able to transform the touristic experience into an active one, the technology must be proactive enough to know when to recede into the background and enable the visitor to explore the location's physical history. Visitors often acquire souvenirs while on holiday. Brick City Tours automatically creates personalized photo-centred products without any task-centred efforts from the visitor. Thus, we can deliver products to the visitors who could feel present in the past as they reminisce through their holiday mementos in the future.

Thus, understanding presence and how a good sense of presence can enhance experience can be applied at each of the stages of a tourist experience. Personalized physical mementos can help people remember. Location-specific alerts can direct people to interesting and relevant content. AR experiences can take people into blended spaces that give a new and distinct sense of presence.

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