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Augmented Reality and the Events Curriculum: the Students' Perspective

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Augmented Reality and Image Recognition Technology in Tourism: Opportunities and Challenges

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Abstract

Technology and tourism have a long legacy as reflected upon by Buhalis & Law (2008; 2014). Within this, mobile technology and augmented reality (AR) has come to the fore more recently within the last five years (e.g. Pesonen & Horster, 2012; Yovcheva et al 2012; Linaza et al 2012; Wang et al, 2012). However, while AR has been developed in a range of contexts, the focus of this paper lies in the role it plays in enhancing the visitor experience within arts and heritage tourism. This paper critiques the opportunities AR affords in enriching the visitor experience whilst recognising the pressures cultural organisations face in developing creative and innovative ways of displaying and interpreting artefacts. Secondly, it presents the challenges of producing a technology that supports an intuitive, easy to use multi-media guide for interpretation in a cost and resource efficient manner.

Keywords: augmented reality, image recognition, technology, visitor experience

Introduction and Literature Review

Technology and tourism have a long legacy as reflected upon by Buhalis & Law (2008; 2014). Within this, mobile technology and augmented reality (AR) has come to the fore more recently within the last five years. For example, research in near field communication technology (e.g. Pesonen & Horster, 2012), AR (e.g. Fiore et al, 2014; Yovcheva, 2015; Yovcheva et al 2012; 2014; Linaza et al 2012; Wei et al, 2014), while others have analysed the role of smartphones and the influence such hardware has on the mediation of the tourist experience (see Wang et al, 2012; Wang & Fesenmaier, 2013; Wang et al, 2014). As Kounavis et al (2012) note, AR has been used in a range of applications and contexts in recent years. It is a "visualization technique that superimposes computer generated data, such as text, video, graphics, GPS data and other

multimedia formats, on top of the real-world view…In other words, AR can augment one's view and transform it with the help of a computer or a mobile devise, and thus enhance the user's perception of reality and of the surrounding environment" (: 1). However, while AR has been developed in a range of contexts such as DMOs and city adventures (ibid.), the focus of this paper lies in the role AR plays in enhancing the visitor experience within arts and heritage tourism.

Interpretation and the visitor experience in arts and heritage spaces has been researched extensively (see for example: Fleck et al, 2002; Graburn, 1977; Moscardo, 1996). However, the role of digital within this has only recently received increased attention (e.g. Charitonos et al, 2012; Silverman, 2010). Museums and art galleries are coming under increasing pressure, through visitor expectation and direct competition with other institutions, to introduce digital content to enrich user engagement. As such, the sector has witnessed a recent surge in interest

in, and use of, digital interpretation channels such as apps. Multi-media, touch screen and audio guide technologies are an established way in which digital interpretation has been provided for exhibitions. Each serve to provide relevant information at key points within the visitor journey. Typically however, the content used with these technologies has a lifetime measured in years, they can be difficult to update, and therefore do not lend themselves easily to temporary exhibitions or changes to existing permanent collections without considerable effort or cost since these lifetimes are measured in months. Audio guides and the new breed of multi-media guides are also expensive to commission and operate, despite their potential to bring an exhibition to life and provide deep levels of interpretation beyond that which is possible to physically display. However, while apps can provide multiple levels of interpretation, provide access to archived material and engage different audiences simultaneously, the impact of this technology on the user experience remains relatively unexplored. By developing the "Let's Explore" mobile application (http://www.lets-explore.com), the research aims to identify the opportunities augmented reality and image recognition technology affords in enriching the visitor experience: visitor autonomy and empowerment within the visitor experience, personalising visitor journeys through tailored content delivery, and generating opportunities for interactive, user-generated engagement throughout the visit. It should be noted that this paper is part of wider research that has sought to inform organisations more widely of the limitations, usage and adoption barriers of 3D image recognition as an alternative to iBeacons, QR codes and NFC.

Methods

Working directly with key partners, namely The Lightbox (Woking, Surrey), Brooklands Museum (Weybridge, Surrey), Watts Gallery (Compton, Surrey), Historic Royal Palaces and Visit Surrey, this research emerges from a wider project that encompasses the development of technology supporting the provision of digital solutions within arts and heritage environments. Findings emerge from 40 interviews that were conducted as part of live public trials of the "Let's Explore" mobile application. The purposive sample was identified at the key trial sites of Watts Gallery and The Lightbox. Interviews were then transcribed verbatim and analysed using thematic analysis.

Findings and Discussion

Firstly, recognising the pressures cultural organisations face in developing creative and innovative ways of displaying and interpreting artefacts, this paper presents "Let's Explore" as a low-cost solution for cultural organisations to deploy and maintain their own content without relying upon bespoke development. While many technologies exist (i.e. QR codes, iBeacon), it uses image recognition technology to trigger interpretation of artefacts once they are detected. While this is a well-established technology, many technical challenges persist in exhibition spaces (i.e. lighting and glare). Indeed, while commercial 2D recognition solutions work well on image targets with sufficient contrasting features, such as posters, photographs and paintings, technology remains incapable of detecting images with very limited features. This paper explores solutions to this and extends findings into 3D object recognition through key point analysis.

Secondly, the paper presents the challenges of producing a technology that supports an intuitive, easy to use multi-media guide for interpretation in a cost and resource efficient manner. It reflects on the importance of ensuring technology can be managed by organisations to ensure flexibility and control in managing app content and considers "Let's Explore" as a flexible technology framework that facilitates such autonomy. This requires an understanding of the existing limited capacity and resources of smaller/regional organisations that rarely have a technology infrastructure to support Wi-Fi in their exhibition spaces.

Thirdly, the paper reflects upon the impact of "Let's Explore" on the visitor experience. With visitor empowerment and experience enrichment driving the rationale for introducing effective digital interpretation, the paper shares findings from public trials. It suggests this technology provides an opportunity across demographic groups to increase dwell-time, facilitate deeper, multifaceted visitor engagement, and empower visitors to personalise their journeys through exhibitions. In understanding user engagement, the paper critiques findings to identify the challenges

organisations face to develop and expose greater levels of information during exhibition design. For example, findings suggest visitor intrigue is stimulated not only by curatorial data, but also vignettes of contemporary history which may not be readily available in existing digital repositories.

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