Chapter 87
Technology Intervention for the Preservation of Intangible Cultural Heritage (ICH)

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ABSTRACT

This paper presents the initial outcomes of a key scoping study undertaken to explore the role of augmented reality and motion detecting technologies in the context of Intangible Cultural Heritage (ICH) for museums related environments. Initial prototypes are in the form of an interactive infrared camera based application for children to engage with an Aboriginal puppet. This scoping study is unique, as it tries to combine two extremes: the curation of historical intangible artifacts and their preservation through digital intervention. Heritage related intangible content is always restricted because of its non-physical nature and can never be fully embed in an environment like museums and related exhibitions. This paper explores alternative opportunities for knowledge transfer of ICH content that manifest with playfulness in order to elicit a deeper understanding of such intangible cultural artifacts. This study is complementary to multiple disciplines including heritage preservation, museum technologies and emerging interaction design.

1. INTRODUCTION

Cultural heritage helps a community define its current and past identities for itself as well as others (Zhang, 2010). It has a tremendous power to elicit a sense of belonging in a community. Heritage and its preservation are also important for the local economy (Bowitz & Ibenholt, 2009). Heritage sites, museums and exhibitions generate employment opportunities and provide financial help for communities. Watson also acknowledges that songs are the most important carrier for cultural elements from one generation to the other (Watson, 2010).

Communities display their heritage through customs and objects from their past. The predominant forms of displaying such artifacts are museum spaces. New media and emerging technologies

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have the potential to move heritage preservation beyond static displays, capturing in cinematic or narrative forms and revitalize the intangible aspects (Yehuda, 2008). New and emerging technologies are utterly transforming two main activities central to the process of re-creating and understanding the past, (a) digital recording and analysis of scientific data and (b) the communication of new insights and understandings about the past to the widest possible audience through interactive applications (Silberman, 2004). Research has found that technology-mediated narrative and the interactive, situated, collaborative problem solving affordances of AR are highly engaging (Dunleavy, Dede, & Mitchell, 2008). In this regard, the concept of mixed reality based user interactions for heritage representation becomes one of the central interests for the design and evaluation of the future of museum exhibits.

There are two overarching factors that justify this scoping study:

1. Lack of interesting content related to ICH and its awareness for visitors to museums (Lee, 2004);
2. Lack of purposefulness for the use of emerging technologies, especially AR, in order to engage and provide knowledge transfer opportunities to museum visitors.

In this article, we will present a study in the context of ICH, museum exhibits and emerging technologies. We will discuss emerging user interactions, which involved a number of digital tools and methods to form cohesive, immersive and engaging interactions, which are essential for the design and evaluation of the future museum displays. In addition, a virtual AR prototype will be presented that leverages the kinesthetic value of the Xbox Kinect, "Virtual Calligraphy," currently under development for examining the knowledge transfer, engagement and provision of authentic learning environments in relation to the curation of ICH in museums.

2. BACKGROUND

The use of simulation games produces real-life situations with a deeper understanding of the subject matter (Boocock & Schild, 1968). Embodied and gestural based game devices with AR, have the potential to breathe new life into museum. The use of these technologies in the context of ICH not only provides tremendous showcasing opportunities but also guarantees the spontaneous, undirected learning experiences for people of all ages (Tanenbaum & Bizzocchi, 2009).

However, there are some challenges facing these exhibits. While new technologies have complemented museum related installations and representations of the past they are somewhat limited in showcasing objects with their related processes and contexts (Kalay, 2008). Visitors are experiencing the ubiquitous use of new technologies in museums around the world however this approach has created a challenging situation where more objects and artifacts are seen rather than examined in historical context (Lee, 2004). The ultimate goal is to allow users to understand the application content and goals in an easy and natural manner (Ganotto, Mainetti, & Paolini, 2008). Indigenous methodologies with intangible content such as calligraphic techniques are essential for knowledge transfer, future dissemination and the passing on of such wisdom to others. Without these opportunities, traditions and customs of cultural significance vanish. This is evident from the limited knowledge of the intangible heritage of lost civilizations such as ancient Greek music (West, 1994) and the Chinese indigenous musical performance named "kunqu" (Wong, 2009).

3. TYPES OF ICH

There are numerous manifestations of ICH. For example *Oral Traditions, Expressions and Language,* where a society makes a certain major decision to segregate themselves from another