

Social Platform for Heritage Awareness and Participation

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Abstract

Pluggable Social Platform for Heritage Awareness and Participation (PLUGGY) will support citizens in shaping cultural heritage and being shaped by it. PLUGGY will enable them to share their local knowledge and everyday experience with others. The PLUGGY Social Platform will facilitate a continuing process for creating, modifying and safeguarding heritage where citizens will be prosumers and maintainers of cultural activities. It will be web based, easily accessed and will allow the development of shared identity and differentiation. PLUGGY Social Platform's users will curate stories using the PLUGGY Curatorial Tool. Content will be both crowdsourced and retrieved from digital collections, allowing users to create links between seemingly unrelated facts, events, people and digitized collections, leading to new approaches of presenting cultural resources, and new ways of experiencing them. An Augmented Reality, a 3D sonic narration, a Geolocation and a collaborative Games applications will be developed to allow the full experience of the Virtual Museums created in the Social Platform of PLUGGY.

Categories and Subject Descriptors (according to ACM CCS): H.5.1 Artificial, augmented, and virtual realities,

1. Introduction

The Faro Convention argues that a heritage that is everywhere, and relevant to everyday life, is likely to be one of the preconditions for genuine sustainability. This is the case certainly at the social and cultural levels, but probably also at the economic and environmental levels [Fairclough 2014]. The convention itself stresses the importance of heritage communities, defined as a social groups who value specific aspects of cultural heritage which they wish, within the framework of public action, to sustain and transmit to future generations [Faro Convention 2005]. The PLUGGY Social Platform will facilitate a continuing process of creating, modifying and safeguarding heritage where citizens will be consumers, creators and maintainers of cultural activities. It will be web based, easily accessed and built around people's values, aspirations and needs allowing the development of both shared identity and differentiation. It will enable citizens to share their cultural heritage material, build heritage communities, create distribution channels and interact with each other, in the same way that modern social platforms enable their users to do so. VR and AR applications will play a major role in enabling the users of the platform to fully experience the crowd-sourced content in the platform.

2. Rational and objectives

PLUGGY focuses its implementation plans around the Social Platform and the Virtual Museums and frames its objectives around the following three pillars of rationale, emanating from the Faro Convention.

The emergence of new social paradigms in the area of European Heritage: The Faro Convention outlines a framework for considering the role of citizens in the definition, decision-making and management processes related to the cultural environment in which communities operate and evolve. Citizen participation has become an ethical obligation and a political necessity. It revitalises society, strengthens democracy and creates governance that can renew the conditions for "living together", encouraging well-being and a better quality of life. Thus a new heritage paradigm is becoming visible. In the traditional view, material things were privileged, and values were based on supposedly-intrinsic properties or represented a national history. This was a paradigm that encouraged the reduction of heritage to tourism and consumption. In contrast, the emerging new paradigm puts the production of heritage in the foreground, and aims to encompass greater democratic participative action, with greater concern for the local and the everyday. It uses the concept of landscape that is promoted by the European Landscape Convention (increasingly popular in academia and policy) as a global frame for heritage, recognising that

heritage assets and objects offer fundamental social and economic values and benefits far beyond those traditionally recognised [Fairclough 2014].

Culture as a component of sustainable development:

The role of culture as a component of sustainable development is also being increasingly discussed in policy debates. UNESCO emphasised the importance of culture during the Decade of Culture and Development (1988-1998) and through its Conventions (e.g. on the Protection and Promotion of the Diversity of Cultural Expressions 2005; for the Safeguarding of the Intangible Cultural Heritage 2003; concerning the Protection of the World Cultural and Natural Heritage 1972). It is currently working towards the objective of including culture in the UN Post 2015 Millennium Development Goals (UNESCO Hangzhou Declaration, May 2013). At the “regional level”, in Europe both the Council of Europe’s Landscape Convention and its Faro Convention imply more culturally-sensitive approaches [Fairclough 2014].

Cultural heritage as an element of both shared identity and differentiation: Heritage is most often defined as the “best” buildings and monuments. Rarely are these located where most people live, ‘here’; too often they are – almost it seems by definition – somewhere else, ‘there’; people might visit them on holiday but this type of heritage is not part of the everyday landscape of their normal lives. If heritage is thus defined as ‘elsewhere’, there is a risk that it will unintentionally become an instrument of exclusion. It can however become an instrument of inclusion and commonality if, following Faro, it is defined contextually as local, lived-in, ‘ordinary’, if it is seen as a legacy from our predecessors rather than more narrowly from ancestors, and if it is recognised as an element of both shared identity and differentiation [Wolferstan & Fairclough 2013].

2.1. Objectives

The main objectives of PLUGGY include:

- Design, develop and implement a heritage-centric social platform
- Design an architecture of the social platform to allow the easy integration of applications, the scalability of the platform and the support of specialized devices (AR/VR/trackers etc.)
- Design, develop and implement the integration of the PLUGGY Social Platform with online digital collections and other social media.
- Design and implement the main curatorial tool of the platform as the main tool of creating stories with meaningful narratives with the content of the platform, resulting to Virtual Exhibitions around specific topics
- Implement 4 different applications, utilizing the social platform and the curatorial tool, in order to showcase the potential of the platform and to be used as kickstart applications for the after-the-project life of the platform

- Deploy the social platform and curatorial tool over the internet and evaluate their impact

Demonstrate and evaluate the 4 applications for usability, effectiveness and user engagement in two major pilots

3. PLUGGY apps

3.1. Curatorial Tool and Augmented Reality App

The app allows stories to be experienced through virtual models and overlaid information, on live video streams. The app authoring interface extends the Curation Tool to allow association of assets and behaviours to markers for augmenting real exhibitions and other indoor experiences with virtual content.



Figure 1: Curatorial Tool and AR app

3.2. Geolocation

A mobile app targeted to outdoor activities, the app makes geolocated stories available to users when physically near the coordinates where the assets are virtually situated. The app extends the Curation tool by allowing curators to situate virtual content geographically on a map at specific coordinates.



3.3. 3D Sonic Narratives

An application for the creation and interactive playback of 3D sonic narratives and, more in general, for allowing the creation 3D audio content within PLUGGY. In addition to a 3D sound spatialization tool (both for loudspeakers and headphones playback), the application will integrate functions/modules for selecting, editing and mixing audio from already-existing sources (e.g. import audio-files), for generating audio content from non-audio material, and for applying creative sound effects (e.g. reverberators, spatial spread algorithms, etc.)



3.4. Collaborative Games

A video game authoring app that provides the basic bricks (rules, routes) to develop, without programming knowledge, collaborative games where participants are engaged into asset and story discovering through challenges and other gamification-based engagement techniques.

4. A use case

In their campaign for the construction of a local museum, which they believe would foster sustainable business opportunities based on the cultural heritage of the area, members of this association have recently joined the PLUGGY Social Platform to create the first Malaga Industrial Heritage Virtual Museum. They have geolocalized the 3D models of all the chimneys still standing in the city using PLUGGY Geo-location App. They can now be experienced through the PLUGGY AR App, together with photographs of the area and fragments of scanned documents of the time that members of the Association are preserving.



5. Discussion

Currently no ICT tools exist to support citizens in their everyday activities in shaping cultural heritage and being shaped by it. There are important initiatives to build applications and repositories for heritage dissemination which compile collections from museums, libraries and other institutions through virtualization [Europeana, Google Cultural Institute]. However they have been top-down driven by institutions and have so far not succeeded at involving citizens in the creation of heritage communities around them. In contrast, current social platforms have demonstrated their potential to build networks through the individual and distributed contributions of users. However, their possibilities have not been fully exploited with regards to cultural heritage promotion and integration in people's everyday life. PLUGGY aims to bridge this gap by providing the necessary tools to allow users to share their local knowledge and everyday experience with others, together with the contribution of cultural institutions, as museums, building extensive networks

around a common interest in connecting the past, the present and the future.

5.1. How VR and AR can contribute to the creation and preservation of the all-around cultural heritage

Driven by small powerful mobile devices with cameras and graphical capabilities, the development of mobile augmented reality (AR) applications is becoming popular [Peasgood, 2015]. The capabilities of AR technologies allow interactive content (2D images, text, web links, 3D content, AR games, etc.) to be layered over existing objects and images allowing users to explore a digital world layered above the physical artefacts and spaces. The development of AR technologies provides tools to support and facilitate the evaluation the “trackability” images and objects in the real world, the generation/integration of appropriate content and the definition of interaction/behaviour of the AR experience [Tillon et al, 2010].

An example of such an AR experience is the Victoria & Albert Museum (London, GB) utilising the Hewlett Packard's AR platform Aurasma (<https://www.aurasma.com/>). In this art exhibition, the artist Christian Kerrigan (a digital artist who specialises in deciphering man's relationship to technology, nature and time) brought his 'Hidden Garden' to digital life (<https://vimeo.com/43483870>). Other examples include the British Museum working with Samsung on long term partnership to develop engagement with the collections through technology including an augmented reality mobile program Passport and the Afterlife, running on Samsung phones, in the ancient Egypt galleries.

A related promising direction is to enhance user sound experience. The 3D Audio development toolkit has been developed within the EU-funded 3D Tune-In project (<http://3d-tune-in.eu/>). Sonic narratives [Monache et al, 2012] are generally based on music features (e.g. timbre, pitch-melody, tempo, etc.), and are often not interactive (simple audio playback). The addition of spatial attributes (e.g. being able to position sound sources not only on the left or on the right, but on a full 360° sphere, and at different distances), and most of all the addition of interactivity (e.g. for the user to be able to explore soundscapes moving around in the acoustic virtual environment), are features which have not been widely explored until now - for example, [Krakowsky, 2009] explored spatial sonic narratives, but exploited simple 2-dimensional audio panning techniques.

The field of serious games has been shaped by [Sawyer, 2002] defining ‘serious game’ based on the idea of connecting a serious purpose to knowledge and technologies from the video game industry. Serious Games are computer games designed for a primary purpose other than pure entertainment, enjoyment or fun – they combine both “game” (video game structure) and “serious” (non-entertaining purpose) dimensions. This combination can be purpose shifting (embedding an entertainment game into a serious scenario), modification of pre-existing games (transformation of a game scenario to give serious information) or built from

scratch (considering serious dimension during game design) [Djaouti et al, 2011], [Sauve et al, 2011].

There is growing interest in the potential of games also for creating awareness, interest and knowledge on heritage artefacts. It is now common to find game based content within museum websites providing entertaining and educational experiences. Currently such games are relatively simple and limited in their range of application to cultural collections. These game based experiences are typically built into the museums' web sites and implemented by technical web designers. Such games may exist in the form of simple web-based applications to more complex solutions employing modern games technology to create virtual worlds and interactive experiences that may include socially based interactions. Game technologies evolved from the low level application programming interfaces to the HTML 5 technologies bringing the advanced game experience to the web applications running in the modern web browsers supported by mobile clients [Scacchi, 2012]. Development of games was further dramatically simplified by the modular game engines and more sophisticated design tools that facilitate the creation of game content and the behavioural game mechanics [Gregory, 2014].

Ambition of the PLUGGY action is to provide innovative system for management of the digital collections which will: Support heritage awareness through serious games

PLUGGY will adopt role-playing game principles, where players assume the characteristics or roles of certain actors, for example historical figures. The aims of the game will be reflected in generated scenarios. The serious game platform of the project will focus on back-story and storyline - the player achieves the game goal by moving through this storyline to its end, the storyline serves as a rationale for the game play. To challenge players, the game will incorporate collaborative and echolocation principles as well.

PLUGGY will develop a system integrating augmented reality with 3D binaural sound. This will allow, for example, to virtually position a sound source in a specific GPS location, possibly corresponded with a point of interest and/or an artefact. With the help of the inertial sensors on a mobile device, end users will be able to interact with the virtual sound source, hearing it as if coming from a position fixed in space, all through a simple pair of headphones.

Support sound positioning and sonic narratives creation

PLUGGY will develop a tool allowing end-users to manipulate virtual sound sources which are not only located on the left or on the right, as for a standard stereo/headphone listening, but also on the front and/or back, above and/or below, and at different distances. This will be done both for a loudspeaker-based playback system, integrating techniques such as Ambisonic and VBAP, and for headphone-based systems, allowing end users to experience full-3D audio

through a simple pair of headphones. Different environments with different acoustical characteristics will be simulated with particular accuracy and realism.

PLUGGY will allow every end-user, with minor training, to create interactive and 3D sonic narratives. This will be available for material that is already audio-based (e.g. audio archives - the curators can create interactive 3D audio environments which the users can explore), and for material that is not audio-based (e.g. pictures, paintings, etc.), offering to the user an interface to integrate music/audio features with visual ones.

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