Augmented Museums Through Mobile Apps

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Abstract Historical and artistic heritage fruition lives a quick and intensive introduction of new tools based on capabilities of personal devices and mobile applications. Augmented reality (AR) could represent a strategic media to join physical art crafts to web-based contents and social media issues. Moreover AR could enhance links between museums and local systems of tourist operators, productions, manufacturing, commerce, helping in assure economical sustainability of cultural founding. Marte5, as innovative start-up company, in the ambit of "Polis" Tuscan district, has developed those concepts into some focused R&D works, both for museums as for historical heritage. These experiences have shown how AR and moreover mobile tools could help visitors to get a deeper regard on art crafts, but also how mobile apps could extend visit experience and drive heritage visitors to become also tourists and consumers. Such approach is based on a strategic centrality of cultural and historical heritage in creating positive relations with local economy, and requests a review of traditional culture in museums conservation and exposition.

1 Introduction

Marte 5 is an Italian start-up focused on mobile tools for augmented reality (AR). AR is a technology that allows overlying physical world (objects, surfaces, GPS points) with interactive contents such as video, images, animations, 3D or web-based contents. Those contents are accessible, at this step of evolution, trough "Apps" on devices like smart phones, tablets and e-glasses.

AR makes possible to bring information "where" they are needed and "when" needed, in a simple and innovative way, allowing also enriching crafts/sites or products with new functions. This is a revolutionary concept that breaks down the boundaries of the web letting objects speak for themselves. It's "real virtuality".

This approach gives great development possibilities for expositions content management, introducing new ways of interaction inside exhibitions, but also before and after the visit.

Marte5 has analysed and developed some interesting R&D cases during last two years, and would give contribution for a more comprehensive overview of relations between ICT and museums management.

1.1 Museums and Apps: some insights

During last years main museums, art galleries, monuments and archaeological sites, who decided to offer multimedia innovative services to its visitors, have

evaluated to replace previous solutions (audio guides, paper catalogues) with more complete and interactive App solutions. As economical impact, in Italy, we refer, only in 2011, of 26 million visitors, for a gross tickets income of 110 million euro, increasing up from 80 million in 2001 and 104 in 2010 (data: Italian Central Statistical Office, Ministry of Heritage and Cultural Activities).

It's clear that mobile devices are becoming, all over the world, some like a virtual expansion for everyone. In the third quarter of 2012 was reached the threshold of 1 billion active devices worldwide, while in late 2013 number of smart phones and tablet sells have passed PC ones also in Italy. As expected, it is estimated that global adoption of smart phones will double the number of users by 2015.

Regarding Italy, latest complete statistics for the year 2012 recorded 20 million smart phones, 42% of the total, highlighting how the use of the Internet had a marked increase, with 27.7 million users who were Internet connected at least once in a month. A positive trend that has increased by 7% in 2013.

Some of the Museums Apps are available on mobile stores (Google Play, Apple Store):

1 – Maxxi: a web-app for Maxxi expositions information. Available as free download.

2 – Uffizi: well structured App, with visit proposed paths for Uffizi Galleries, preview of 33 works, news section and general info such as opening hours and ticket costs. The application is priced at € 1.79.

3 - Vusiem British Museums - Guide to the British Museums paths with maps, with virtual interactive access to a part of the collection, descriptions and audio guide, free distributed.

4 - Musee D' Orsay - web App, referred to museum website. The application is free.

5 - Mic Museums Romans - is a simple application that lets you know in real time all the events and information about the 20 museums of the circuit "Musei in Comune" in Rome. This is not a single museum guide, but offers a gallery set of pictures, texts and other information. The app is on sale for € 0.80.

6 - Marconi Museum – made by the Guglielmo Marconi Foundation, helps discovering Villa Griffone, where Marconi Foundation and Museum are established. It's free distributed.

7 - Hopper Exhibition, National Museum of the Prado, Rafael Exhibition. It is high quality set of Apps, developed by a Spanish international company operating in the field of museum services. Each App provides functions of audio guide and virtual tour for these museums, and is on sale at the standard price of € 1.99.

8 - National Museum of Korea. It's a complete museum guide, well made, royalty-free as completely financed by the Ministry of Tourism to promote Korean culture.

9 - The Louvre by Fileos. Audio guide for Louvre museum visit, available in sale for € 0.95.

1.2 Augmented reality on paintings exposition – "Salone dell'arte e del restauro di Firenze 2012" case study

One of our firsts relevant experiences in AR tools for cultural heritage has been developed by Marte5 as technical sponsor of "Salone dell'Arte e del Restauro" of Florence, in November 2012.

During this exposition we showcased some museums solutions based on augmented reality mobile apps. One of the most interesting content was on a painting that had been restored during the exhibition. In this case AR was

intended as a tool supporting restoring operations. Every graphic and photographic data, as different light exposition pictures, was visible for restaurateur directly upon the real painting, using a tablet and a specific mobile App.
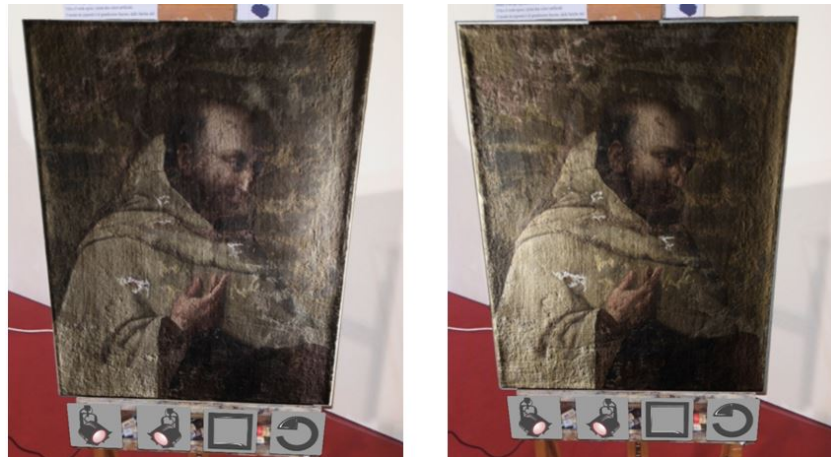

Figure 1. Different light conditions simulated with augmented reality tools on a real paint during "Salone dell'Arte e del Restauro" of Florence 2012 exibition.

1.3 ARTiblisi project: augmented reality in heritage valorisation

A very interesting experience was developed during 2013 by University of Florence, Faculty of Architecture, under the coordination of Paola Puma and Nana Iashvili for Tbilisi State Academy of Art (TSAA), in the ambit of a research activity on new tools for heritage information management and fruition [Pum12].
In this case Marte5 provided a standard augmented reality browser (Marte5, free distributed for Android and iOS) and a set of augmented reality contents developed with the research team.
This work, presented to Georgian authorities had a great appreciation and is now in a second founding stage for a complete implementation on Tiblisi historical heritage.

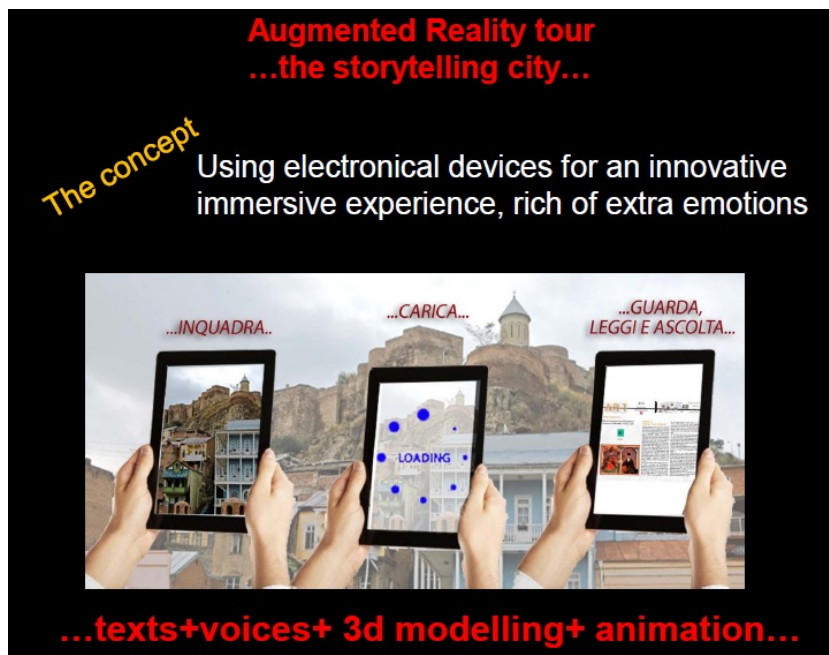Figure 2. "ARTiblisi" project augmented reality application screenshot.

Figure 3. "ARTiblisi" project presentation image.

1.4 "ARt!" mobile tool for customs museums visits

During 2013 Marte 5 has summarized previous experience in "ARt!" project. "ARt!" is a standardized mobile App for museum fruition, designed for iOS and Android system that can be used on smartphones and tablets. Currently standard provided functions are the followings:

AUGMENTED REALITY - It is the most innovative proposal function from Marte 5. A dedicated tool within the application activate the camera and allows

to view multimedia and interactive contents, simply framing paintings or artworks, seamlessly integrated with the work itself, offering a totally immersive experience, with critical studies, reading keys and new ways of fruition such as, for example, sound and videos in real time.

CATALOGUE - Display .pdf catalogs related to museum exhibitions, in various languages and high-resolution images.

EVENTS - Provides interactive informations about events or exhibitions.

MEDIA- Immediate access to audio-visual content related to the activities of the museum.

WEB - Connections to the museum's website, social networks, access to promotions and on-line ticketing.

BOOK SHOP - Links to any e-commerce channels through which it is possible to buy books, gadgets and objects related to the activities of the museum.

AUDIO GUIDE - Audio guides in various languages can be heard by a dedicated function, organizing content for thematic routes, areas of interest or individual works.

Figure 4. "Art!" Augmented reality tool sample on Picasso's "Guernica".
(See also video on Link: http://vimeo.com/55766752)

2 Conclusions

Smart devices, as already discussed, have a great diffusion and should than be evaluated as the first choice for every direct interaction between visitors and artistic, cultural and historical heritage.

Each mobile device, in a deeper view, could be than considered as an added room of user's house: a place where he/her spend a good part of the day and share information and interactions with other people (a social network family, enlarged to "circles" and "friends").

A mobile App could than be considered as a great opportunity to bring cultural and artistic contents in the life of wide range of users, constantly increasing.

Economical sustainability of those projects can be enhanced by various foundings options, depending on the aim of the application and a forecast number of users. In all analyzed cases a preview of 300.000 visitors/year could now be considered as a minimum level for a dedicated project with a pay-back

based on in-app purchase, while for greater number of visitors this way of distribution could give an extra revenue.

Augmented reality it's just a part of such projects, but represents a very interesting way of interacting within an exhibition, expecially because this technology does not add any physical elements (even if very small, like QRcodes) and is than absolutely non-invasive.

But augmented reality could also be used to create innovative links between to the economic "biosphere" of a museum or historical heritage. This concept, that will be use also in next EXPO 2015 in Milan, has been experimented by Marte5 in the first eno-touristic App guide of San Miniato (San Miniato Wine and Truffles, free distributed, for iOS).

In this case the discovery of San Miniato historical heritage is connected, through augmented reality, with the discovery of wines and wineries of the area, creating an innovative interaction that does not sacrifice cultural quality contents of the project, but creates an interesting path for visitors and help in discovering new sites that are commonly not visited by tourists.

Figure 5. "San Miniato Wine And Truffles" augmented reality guide presentation picture on Apple Store. (See also App video on youtube: http://www.youtube.com/watch?v=2rM-R_khrgI).

References

[Pum12]   Puma, P., 2012. Local cultures, global heritage: surveying, collecting, communicating - new information models for knowledge and dissemination of cultural heritage. , ARACNE EDITRICE, pp. 600-608, ISBN:9788854848412