Using Social media to stimulate history reflection in cultural heritage

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Abstract—**CrossCult H2020 is a European project, the aim of which is the reflection of history in a cultural setting. In this paper, we describe how social media can be linked to cultural heritage and in particular how we can incorporate games, social networks, history reflection and culture. The paper presents the case study of one of the project pilots, to show how history reflection can be enhanced with the use of social networks.**

Keywords—social networks; user profiling; cognitive style; reflection; history

I. INTRODUCTION

CrossCult is an Horizon 2020 European project that aims to alter the way people view History and support multiple interpretations of the European past in a cross-border fashion. Using cutting edge technology, CrossCult is enriching the cultural participation with digital cultural resources and proceeds with personalized interactive experiences to trigger cognitive and emotional responses for active history engagement. Within the framework of the project, 4 indicative pilots will be implemented which will run in 7 European sites [1]. In particular, the third pilot of CrossCult aims at providing visitors with an unconventional manner of interaction with museum items by facilitating crosscutting and transversal viewings of the artifacts. Such interactions will allow the visitors to engage in deeper levels of reflection, compared to traditional means of history presentation (e.g., type of a statue, or its construction date), including social aspects of life in antiquity, power structures etc. The Archaeological museum of Tripolis, Greece has been selected as the venue for this pilot due to a number of reasons:

- The site is less known or popular among tourists (both Greek and foreign) with lack of visiting motivation.

- The exhibits of this site have a deep historical value, however, they are unknown to the wider public.

- Minimum information regarding the exhibits of this museum is currently provided to visitors.

In such space, personalized experiences could be beneficial for the visit, since they can allow the visitor to explore the museum in a way that is relevant to her. As part of this pilot, personalization will consist of recommendations to the visitors regarding available items for interaction (digital resources, exhibits or Points of Interest) and paths to follow during the museum visit.

Quick profiling strategies, such as quizzes, games, and information gathered from social networks (e.g. Facebook) will be utilized for collecting user information. Such user profiles will be progressively updated using different feedback mechanisms including explicit forms of feedback (e.g., likes/dislikes, ratings and comments) as well as implicit ones (e.g., the fact that a user stands in front of an item, the number of times she replays an audio/video clip, or whether he/she shares a piece of content with others). The recommendation and personalization engines will be based on state-of-the-art knowledge-based, diversity-based and collaborative filtering approaches.

In this light, Pilot 3 deals with the interconnection of the physical items of the museum with the reflection topics and with related digital objects and in the same time connecting the cultural experience with social media. Social media are used in multiple ways in pilot 3. Not only profiling information is gathered through them but also the cultural experience is shared on social media with the visitor's network of friends, thus allowing further discussions on the museum themes and the reflection topics. The synthesis of physical and digital objects, reflection topics and social networks will hopefully provide a meaningful and holistic cultural experience.

II. RELATED WORK

Personalization has been used in cultural heritage to provide the visitor with relevant information and relevant cultural experiences, increasing the Quality of Experience [2]. The main reasons of the necessity of personalized applications are: 1) To cover all the different needs of the museum's visitors [3,4,5] and 2) Usually, typical museum are very short [6, 7]. The challenge of personalization in cultural heritage has been at the core in several projects such as EXPERIMEDIA BLUE [8], a social and mobile visit

personalization system analyzing user's cognitive profile and CHESS [9], which enables personalized interactive stories for visitors of cultural sites. Moreover, Oppermann et al. has proposed a personalized guide which uses both user interests and her position inside the museum [10]. Another similar research was performed by Van Hage et al.. Their research identified visitor preferences and computed a personalized visit based on visitor walking patterns [11].

In addition, there seems to be a connection between game playing and personality factors [12]. Games can be used to identify different personal preferences and characteristics and can be thus used for profiling purposes and in particular for museum profiling purposes, since other direct profiling methods might require more time [13].

Furthermore, according to Farnadi et al. [14], social media websites provide a unique opportunity for personalized services to capture various aspects of user behavior and characteristics. Users provide large amounts of information in their profiles in a variety of ways, like textual information (e.g., status updates, blog posts, comments) or audiovisual content (e.g., uploaded photos and videos). Many latent variables such as personalities, emotions and moods—even if they are not explicitly given by users—can be extracted from user generated content.

However, a model to retrieve the profile of the player and the personality traits from games has not been fully exploited yet, although many digital games are connected to social media platforms [15, 16]. An initial attempt to extract the user profile through Facebook games was elaborated by Naudet et al. [2], where games were used to extract the players' cognitive styles and museum preferences.

Moreover, during the last decade, museums were mostly involved with one-way communication strategies using Facebook and Twitter to focus on event listing, reminders, and reaching larger or newer audiences by increasing the number of fans and promotional messaging. According to Fletcher et al., museums are currently trying to increase their use of social media for multi-way communication strategies [17].

Nevertheless, museum can exploit social networks further than just one-way communication strategies. Museums are a meeting ground for both official versions of the past, their histories offered through exhibitions, and the individual or collective accounts of reflective personal experience. Social media can enable informal ways of drawing together this knowledge by providing tools for participatory engagement, which have the potential to distribute new forms of learning. In social media, users/visitors can organize ideas and interpretations to create meaningful associations between their own and others' experiences [18]. Learning in environments such as museums and cultural sites can be enhanced with social networking. Russo et al. 2007 have proposed a framework for museum visitor's experiences through social networks for enriching physical learning. This model includes rapid publication of museums, personalization of the museums' content, content sharing and content creation by the audiences [19]. For instance, an interesting research was conducted by Weilenmann et al. Their goal was to explore how one particular photo sharing application, Instagram, is used to communicate visitors' experiences while visiting a museum of natural history [20].

However, several ethical questions have been raised with the wide use of social media in museum practices. According to Wong, museums need to train their employees to understand the nature of the social media landscape in order to understand limitations and opportunities [21].

In this pilot, we decided to follow this approach and to use social networks and particularly Facebook, as one of the most popular networks for three purposes:

- To promote our application for the Archaeological museum of Tripolis

- To extract user profile information quickly and efficiently

- To enable visitors to share their experience and post relevant museum material.

- To trigger visitor history reflection further

Therefore, the pilot's aim is to design a system (Facebook games, a mobile application and a virtual visitor's book) for exploring connections between exhibits, digital objects and reflection topics. Cultural Heritage can be greatly benefited from the use of technology, since it be a valuable tool for history exploration [22]. Thus, by using cutting edge technology, we try to stimulate museum visitors to reinterpret the past and associate exhibits with different reflection topics such as the social status of women, their role in ancient communities, their appearance, etc. Technology has been also used to enhance museum reflection [23].

III. CASE STUDY

As previously discussed, the application will use features of the CROSSCULT platform and more specifically, the user profiling and social network profiling tools. In this pilot, the user experience starts with a Facebook game entitled "Which goddess is your guardian?". It is a quiz game aiming to match the player with an ancient goddess as her protector, according to the answers that the player has provided. The player answers questions which have been designed based on the reliable tool for assessing individual's cognitive style, MBTI (Myers-Briggs Type Indicator) [24]. The MBTI is based on Jung's theory of psychological types. Individuals are described using four dimensions: extraversion-introversion (individual's focus of attention), sensing-intuition (the way an individual gathers information), thinking-feeling (the way an individual makes decisions) and judging-perceiving (the way an individual deals with the external environment). The combination of the four dimensions offers 16 personality types. Apart from the cognitive style, the following will be also used for personalization purposes: 1) available time for the visit 2) visitor's gender 3) age [25]. Thus, taking account the answers of this mini psychological quiz and further demographic

information about users from Facebook, suitable museum thematic tours will be presented to the visitor which correlate with visitor interests.

In this way, CrossCult will be able to propose a list of possible thematic visits in the museum according to users profile preferences. In a possible scenario (*Fig. 1*), a visitor is presented with some museum topics that might be interesting to her and she chooses one to start her visit (e.g. Religion and Rituals). During her visit around the different objects, the user is able to exchange messages and information with his friends on Facebook. Also, the user receives different digital objects relevant to the selected topic. For instance, in front of the prehistoric female figurines from Sfakovouni, the user learns how poppies have been used for healing malaria in the antiquity. Then, visitor decides to share this interesting information with his friends on Facebook. Moreover, the mobile application will give the opportunity to the visitor to take pictures of the exhibits (e.g. figurines) and to post them on her personal Facebook account together with different digital objects about healing practices in ancient times presented to her (e.g. ancient inscriptions). The visitor can also post the different reflection topics presented to her (for example, "Can you see similarities between ancient rituals and today's religious practices?") to discuss these issues further on Facebook with her friends.

At the end of her tour, the visitor would be able to download a map with suggested tours in the wide area of Tripolis and the wide area of the museum, based on the initial location of the exhibits she visited. This map aims to trigger further cultural visits on some of the places that she learned about during the tour (e.g., Sfakovouni). Furthermore, she will be able to share this map with her friends on Facebook and to arrange their next trip. After the visit, the user can continue engaging with museum content and reflection topics in the visitor guest book, also available on Facebook. The virtual visitor's book offered by the app is a place to gather new, subjective interpretations of history that the venue experts can later study to extract relevant knowledge about the visitors and also enrich the knowledge bases of the CROSSCULT system.

Pilot 3 will incorporate physical objects, digital objects and reflection topics. In doing that, we will produce a well populated and semantically rich ontology that can assist historian and museum personnel (e.g. museum curators) to explore different connections between physical objects, digital objects and reflection topics and concepts. In addition, visitor cultural experience will be enhanced by the use of social networks and the underlying ontology can be exploited further to allow cognitive processes such as reflection as well as social processes such as discussion on social media related to the museum visit.
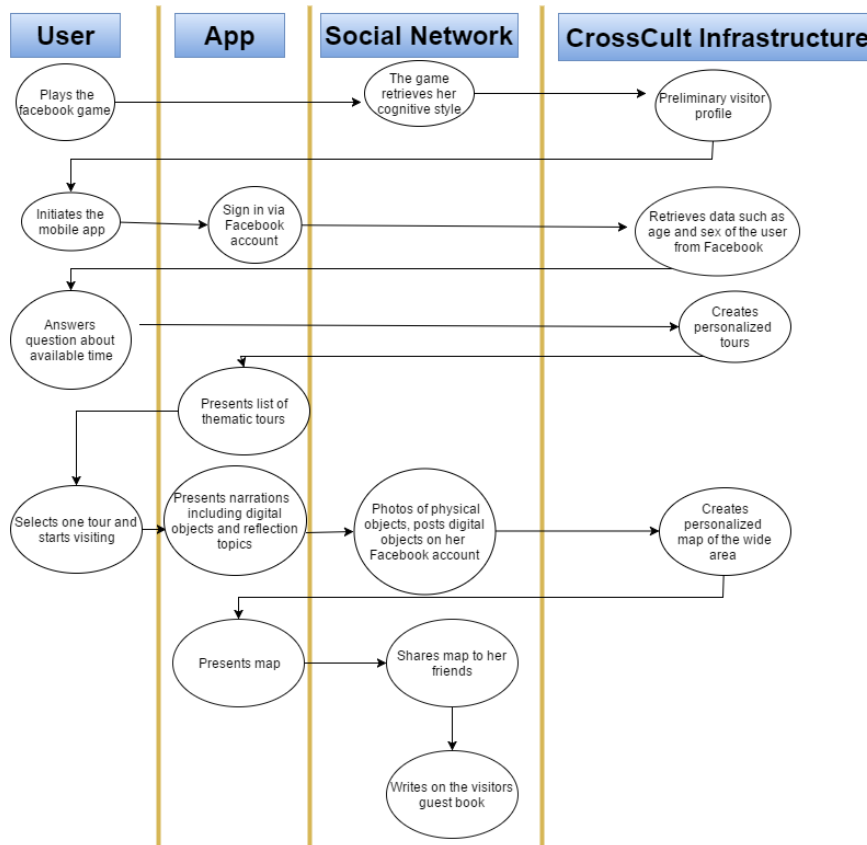

Fig. 1: Activity diagram of a user story

IV. CONCLUSIONS

In this paper, the CrossCult H2020 project was briefly presented together with one of the project pilots. To the best of the authors' knowledge this work is novel in many aspects since it attempts to connect online games, personalization techniques, history reflection and social networks in order to enhance cultural heritage experiences. So far, the different games to be used in pilot 3 have been designed, the museum physical objects to be used as well as the digital objects have been also identified and the thematic areas to be explored further are specified. In addition, recommended personalized routes inside the museum have been determined. Our next step is the implementation of the pilot, starting from synthesizing all the available and necessary information and explore ultimate ways to incorporate social networks, games, personalization, physical and digital objects.

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