Chapter 10
Evaluation Experiments of Personalized Tours for Exploring Cultural Heritage

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ABSTRACT

Personalized software has been extensively used in museum guides and recommendation systems for tours because it provides added value to the interaction of the user with cultural heritage. However, this added value can only be confirmed through an evaluation experiment. Therefore, this chapter presents the indoor and outdoor personalized tours for exploring cultural heritage. More specifically, the chapter focuses on the methods used for personalization, the technology employed to improve interaction, and the evaluation experiments that have been implemented. The evaluation experiments are further categorized with respect to the method of evaluation and the criteria used. Finally, it provides a discussion on the main conclusions drawn from the researchers conducting evaluation experiments of the system performing indoor and outdoor tours for the exploration of cultural heritage.

INTRODUCTION

The exploration of cultural heritage has changed by the use of Information and Communication Technologies (ICTs). Visitors acquired easy access to cultural heritage regardless of place and time through the Internet. Additionally, even physical access to the cultural heritage in museums or outdoors changed significantly with the use of mobile guides. However, interaction with cultural heritage still encounters several problems. The vast amount of information presented in museums is often overwhelming to a visitor, making it difficult to select personally interesting exhibits (Ardissono et al. 2012). Indeed, as Jeong and Lee (2006) have noticed, visitors of museums may suffer physical and/or psychological fatigue during their long-lasting walking and focusing on exhibits. This often results in quitting the tour and feeling tiredness mainly due to the tediousness of the uninteresting exhibits.

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Furthermore, museum visitors differ and their visit experience is composed of the physical, the personal, as well as the socio-cultural context, and identity-related aspects (Falk 2009). Therefore, it is really difficult for a museum to cover the interests and desires of all different users.

A solution to this problem may be given through the personalization of user experience. Indeed, since the first experiments of the late 90s, personalization applied to cultural heritage visits has been seen as a way to improve the overall visitor's experience (Not & Petrelli 2019). Petrelli et al. (1999) support that most museum visitors are willing to receive recommendations and assistance during their interaction with the exhibits. As a result, personalized guiding systems for museums (Vayanou et al. 2014; Katifori et al. 2014) or archaeological sites (Alexandridis et al. 2019) have been developed. This resulted in different recommendation systems have been used for personalizing interaction indoors or outdoors.

In this respect, personalization methods have been applied to adapt the route followed in a museum (LISTEN, PEACH, PIL, MNEMOSYNE, ec(h)o, Museum Wearable, etc.) or in a city (Cheverst et al., 2000, Fink and Kobsa 2002; Scherp & Boll 2004; Wakkary et al. 2009), the menus of a system (e.g. CHESS), the virtual reality route (e.g. MoMa), the text following an exhibit (PEACH, AmI, MyMuseum) etc. For this purpose, these systems use different user modeling techniques for acquiring and maintaining information about the users' interests, knowledge, and other characteristics.

Despite all these interesting approaches for personalizing cultural heritage, there are researchers that express concerns about the effectiveness of some of these approaches (e.g. Marty 2011). Indeed, as Lanir et al. (2011) point out it is not clear how reducing choice in terms of the number of content items that are presented to the visitor affects visitor behavior and satisfaction. This fact shows that personalization methods on their own are not enough for improving a cultural recommendation system or cultural website. Their effectiveness can only be confirmed through an evaluation experiment that is carefully examined and implemented.

Towards this direction, Hendrix (2010) supports that personalization methods should be evaluated based on their ability to meet user needs. Similarly, Bowen and Filippini Fantoni (2004) add that the personalization methods cost and this cost is only justified if it brings added value to the museum for a good percentage of museum visitors. This added value can only be confirmed through an evaluation experiment that is implemented with the participation of experts and/or users.

Evaluation of ubiquitous computing systems is extremely complex (Spasojevic and Kindberg, 2001) and there are only a few articles that focus only on the evaluation phase of a personalized system (Kadobayashi et al. 1998). Most evaluation experiments are part of a paper that presents both the personalization system and the evaluation experiment. Some of them use ad-hoc evaluation approaches borrowed from other better-established domains (Hatala & Wakkary 2005). As a result, Pechenizkiy & Calders (2007) try to attract attention to the problem of scientific evaluation of personalization. The importance, as well as the complexity of the evaluation of personalized software, is emphasized by Ardissono et al. (2012) in a review of personalization methods used in cultural heritage.

Taking into account the importance of recommendation system for personalizing indoor and outdoor tours in order to explore cultural heritage as well as the need and the difficulties in evaluating these systems, this paper presents the methods used for personalization in recommendation systems and the technology used. However, it mainly emphasizes in the systems that have been evaluated and provides a categorization of the experiments found in the literature with respect to the method used.

In view of the above the paper is structured as follows: Section 2 presents the recommendation system and the main user modeling methods that are used. The next two sections present the recommendation systems that provide individualized support in indoor and outdoor tours for the exploration of cultural