

Chapter 9

Methods and Practices for Assessing the User Experience of Interactive Systems for Cultural Heritage

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ABSTRACT

Over the last few years, an increasing number of cultural sites, including museums, archaeological places, and historic cities, have adopted a wide range of interactive technologies to enhance the visitor (user) experience. This chapter presents a review of interactive systems for cultural heritage, selected from a total of 83 publications in 2012-2019, from the perspective of the methods employed for their empirical evaluation (i.e., the degree to which the system satisfies user goals and expectations). The review reports on several characteristics of interactive systems of CH including purpose, technology, content, and location of the interaction, and then emphasizes methods of empirical evaluation. The chapter provides discussion comparing to the results of the previous report, and outlook on particular challenges of interaction design and evaluation for CH.

INTRODUCTION

Digital Cultural Heritage (CH) is widely considered a new multidisciplinary research domain that incorporates methodologies from a wide range of disciplines and sectors. Expanding its initial purposes of preserving tangible and intangible heritage artefacts, such as archaeological sites, historic habitats,

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human-made constructions and art, processes of craftsmanship and traditional practices through digitization and documentation, CH is now being disseminated in a broad universal manner and it is becoming accessible via contemporary digital technologies. In the last decade there has been an exploitation of interactive applications to enhance the (natural or virtual) experience of visitors at cultural institutions and sites. The digital landscape of interactive systems employed to improve the overall user experience (UX) and communicate aspects of CH is constantly increasing and diversifying.

Interactive applications in CH include: mobile applications and games, location-aware audio guides, VR/AR/MR (virtual/augmented/mixed reality) enabled technologies, online virtual worlds, multi-touch displays of ranging sizes and setups, and various types of interfaces that transcend CH content to the users. Researchers and practitioners in the digital CH domain intersect empirical methods and experience from computer science, human-computer interaction (HCI), exhibition design, museology, architecture, history, and archaeology, without this list of disciplines being exhaustive.

Consequently, empirical studies and evaluations of interactive systems in CH can inform the respective research community and at the same time be informed, since it is a continuously evolving domain that reflects on its own practices. A fortiori, a review of empirical evaluations that encloses interactive systems that have been evaluated during the recent years is needed in order to track current technological trends and update on possible shortcomings and limitations. This review paper expands and enhances the previous review of Koutsabasis (2017) and reports on a systematically selected sample of 83 publications from 2012-2019 (with 30 publications added to the sample of the first review). Furthermore, this paper draws conclusions comparing the findings of the previous review, informing on improvements and drawbacks that concern previously identified issues. Additionally, it provides a broader record of approaches, methods and new emerging technologies.

The structure of the paper is as follows: The next section presents background and related work on empirical evaluation methods outlining the dimensions of empirical evaluations, participant issues, types of evidence (data), place and time of evaluation, etc. Then, the paper reports on the systematic method of collection and processing of the sample of publications. The next section reports on results starting from the characteristics of the interactive systems examined: main purpose, main interactive technology/interaction style, cultural content, and location of system use. Then it addresses the methods of empirical evaluation, namely: dimensions examined, general method, data collection methods (or techniques), participants, and finally comparative approaches. The next section discusses various issues stemming out of this review, also compared with the findings of the previous review, by acknowledging good practices, critically analyzing identified shortcomings of the current state of the art. The last section provides an outlook in the respected discussed areas.

BACKGROUND AND RELATED WORK

Empirical Evaluation of Interactive Systems

The evaluation of interactive systems has been extensively investigated in Human-Computer Interaction (HCI), which is an interdisciplinary field of computer science, psychology and design, “*concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them*” (Hewett et al. 1996). Evaluation in HCI is an activity that examines the degree to which an interactive system satisfies user goals and expectations (or more

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