Augmented Reality-based Treasure Hunts in Cultural Mediation

How we use augmented reality to revolutionize cultural mediation in Vienna's city centre

Miriam WEBERSTORFER, ArchäoNOW, Austria
Emanuel KASPAR, Austria

Augmented reality in cultural mediation

The personal motivation of the project members lies in the overlapping of several fields of interest: Archaeology, history, biology and especially their mediation. Being at the cutting edge is an ideal, which can be seen as a competitive advantage in the economic sector and why ArchäoNOW has established itself as a pioneer especially in Vienna.

Digital technologies are already transforming the most diverse fields. One area that is currently facing a major change is learning and knowledge transfer. Not only teaching methods are changing, but above all the methods of conveying content. The cultural sector is also particularly affected and must reorganize itself structurally and thematically in order to be able to react to the rapid pace (Pöllmann and Herrmann, 2019). The project team is convinced that the intelligent use of modern technologies in combination with new content concepts will greatly enrich the experience of cultural assets and open up new target groups.

Augmented Reality (AR) is one of the technologies that can make a decisive difference here. AR expands the real world, which is perceived by the senses, with digital elements. There are two different methods of detecting and triggering AR. One is based on the identification of the place, the other is based on the optical recognition of an object.

The fields of application are versatile and so AR also offers various possibilities in the field of cultural mediation (Pedersen et al., 2017). At present, this technology is still a few steps away from becoming standard. Nevertheless, many visitors to cultural institutions nowadays expect a lot from the digital offerings. These expectations are mainly shaped by the entertainment industry, such as games and films, but also by advertising. In competition with many other leisure activities, the aim is also to meet the wishes of a younger target audience (Pierdicca et al., 2015; Dieck and Jung, 2016; Marques, 2017; Katz, 2018).

Fig. 1. Participants of ArchäoNOW's treasure hunt, Stephansplatz Vienna (© ArchäoNOW).

Essentially, different digital offerings suggest to the audience that an institution is not satisfied with what already exists, but rather strives to keep its finger on the pulse of the times and thus remain attractive through innovation and experimentation (Marques, 2017).

Especially in urban and public spaces, outside museums and exhibitions, cultural mediation continues to be based almost exclusively on classical methods, such as city tours. However, the quality of guided tours depends heavily on the knowledge and skills of the mediators. A disadvantage of guided tours is that they are restricted to certain time windows and the number of participants is limited (Martins, 2012). In the case of interactive cultural mediation programs, such as the ArchäoNOW treasure hunts, the above factors are excluded. The learning experience is extended in many ways by playful elements. If this form of mediation is now supplemented with AR, unprecedented possibilities open up.

Fig. 2. Digitally reconstructed buildings of ArchäoNOW's treasure hunt, Stephansplatz Vienna (© Franco Lanfur VARS).

On the cognitive side, the aim is to give the participants access to historical and scientific references. AR enables the persons to fully dedicate themselves to the objects (e.g. buildings and artefacts) and at the same time receive relevant visual as well as acoustic information. On the emotional side, the aim is to turn cultural mediation into an emotional, surprising, creative, entertaining and pleasurable experience and to arouse the curiosity of the participants and turn them into explorers. Furthermore, it is about the participants being able to make a personal connection to the objects to be mediated, to get involved themselves and to exchange ideas with the city as well as with the other participants and friends. That is why participative aspects are very important in mediation.

The question now arises as to which important aspects of cultural mediation can be successfully covered by AR and whether there is any evidence of this. As far as evidence is concerned, the

research situation so far is rather poor. Chang et al. suggest that there has been very little research on mobile AR-guide applications (2014). In the literature, however, it has been stated by various sides that the use of AR has a positive influence on the learning experience. The authors Jung et al. (2016), Pedersen et al. (2017) and Moorhouse et al. (2017) even speak of a serious improvement. Valente Marques provides a detailed study of various aspects of the visitor experience at museums and an overview of previous studies. In her own study she states the multidimensional study of the Visitor Experience strongly supports the positive influence of AR technology over visitor satisfaction and meeting of expectations, two critical aspects of the visitor experience (Marques, 2017). Indicators emerge that AR has a positive effect.

AR thus undoubtedly has great potential to influence and transform cultural mediation in the long term. The more advanced the AR technology and the more optimized the content AR concepts are developed, the more cultural mediation can unfold. The technology can be used sensibly to make hidden things visible, such as the terracotta army (Asian Art Museum, n.d.) or the statues of the Acropolis Museum (Digital Heritage, 2013). It is particularly attractive for the team of ArchäoNOW team to create new, surprising, lively, pleasurable and entertaining approaches to versatile objects. The aim is to lower the inhibition threshold in access to AR and to appeal to younger visitor groups.

The potential is huge, and the fusion of virtual and real world will bring exciting changes in the future. Schavemaker argues that the potential for bridging the gap between the virtual and the real world in a single visual interface is a dream shared by many and thus a great stimulus for future innovation (2011). So, it remains exciting when AR will be used across the board.

Conclusion

Finally, it must be emphasized once again that not only newly developed technologies are necessary to create an augmented reality based cultural experience. It is also the art to create concise stories, which takes up most of the time of cultural mediators. Augmented reality can be part of a new way of thinking in digital storytelling and may be expected by customers in the future. For this reason, ArchäoNOW is at the forefront of the development of these cultural programs, improving and implementing them step by step. In this way, many more stories are to be experienced interactively. This development will also find its way into tourism, says H. W. Su. He argues that on the basis of augmented reality, virtual scenic spots and cultural and creative tourism platform can efficiently promote tourism and cultural promotion, enhance tourism texture, pioneering a new era of tourism (2014).

References

Chang, K.-E., Chang, C.-T., Huei-Tse, H., Yao-Ting, S., Huei-Lin C. and Cheng-Ming, L. (2014). 'Development and behavioral pattern analysis of a mobile guide system with augmented reality for painting appreciation instruction in an art museum', *Computers & Education*, 71, pp. 185–197.

Digital Heritage. (2013). Acropolis (CHESS): Interactive Adaptive Storytelling with AR at Acropolis museum. Available at: http://ceur-ws.org/Vol-1181/pros2014_paper_04.pdf (Accessed: 19. July 2019).

Jung, T., tom Dieck, M. C., Lee, H. and Chung, N. (2016). 'Effects of virtual reality and augmented reality on visitor experiences in museum'. A. Inversini & R. Schegg (Eds.), *Information and Communication Technologies in Tourism*, pp. 621–635. Vienna: Springer International Publishing.

Katz, M. (2018). Augmented reality is transforming museums. Wired. Available at: https://www.wired.com/story/augmented-reality-art-museums/ (Accessed: 19. July 2019).

Martins, C.S.N. (2012). 'Museum audio guides as an accessibility enhancer', *C. Álvarez de Morales, Ch. Limbach & M. Olalla Luque,* Accesibilidad en la nueva era de las comunicaciones Profesionales y universidad: un diálogo imprescindible, pp. 101–115.

Moorhouse, N., tom Dieck, M.C. and Jung, T. (2017). 'Augmented reality to enhance the learning experience in cultural heritage tourism: An experiential learning cycle perspective', *eReview of Tourism Research*, 8, pp. 1–5.

Pedersen, I., Gale, N., Mirza-Babaei, P. and Reid, S. (2017). 'More than meets the eye: The benefits of augmented reality and holographic displays for digital cultural heritage. Journal on Computing and Cultural Heritage', *JOCCH*, 10(2), Article 11.

Pierdicca, R., Frontoni, E., Zingaretti, P., Sturari, M., Clini, P. and Quattrini, R. (2015). 'Advanced interaction with paintings by augmented reality and high resolution visualization: A real case exhibition. Augmented and Virtual Reality'. *AVR 2015*. Lecture Notes in Computer Science, 9254, pp. 38–50.

Pöllmann, C. H. (2019). 'Kulturbetriebe im digitalen Wandel: Grundlagen einer digitalen Strategie'. Available at: www.springer.com (Accessed: 19. July 2019).

Schavemaker, M. (2011). 'Is Augmented Reality the Ultimate Museum App? Some Strategic Considerations'. Available at: https://mobileappsformuseums.wordpress.com/2011/08/05/is-augmented-reality-the-ultimate-museum-app-some-strategic-considerations/ (Accessed: 19. July 2019).

Su H. W., (2014). 'Augmented Reality-Based Virtual Scenic and Tourism Culture Creative Platform Research', *Advanced Materials Research*, Vols. 1044–1045, pp. 1526–1528.

Tom Dieck, C. and Jung, T. (2016). 'Value of augmented reality to enhance the visitor experience: A case study of Manchester Jewish Museum'. *E-Review of Tourism Research*, 7. Available at: https://www.researchgate.net/publication/283421093_Value_of_Augmented_Reality_to_enhance_the_Visitor_Experience_A_Case_study_of_Manchester_Jewish_Museum (Accessed: 19. July 2019).

Valente Marques, D.C. (2017). 'The visitor experience using augmented reality on mobile devices in museum exhibitions'. Available at: https://repositorio-aberto.up.pt/bitstream/10216/106660/2/206445.pdf (Accessed: 19. July 2019).