# Chapter 14
# Phygital Customer Experience Mixed Approach of Augmented Reality and Customer Experience (DCX) in the Context of Heritage Tourism

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## ABSTRACT

*What if customer experience was the primary driver of digital transformation? Indeed, new hybrid experiences have emerged thanks to daily-life technologies that fused both digital and physical worlds. This kind of experience uses applications and connected objects (IoT) to adapt and respond to consumer needs. Augmented reality and virtual reality are one of the most functionally and emotionally memorable phygital experiences that create value for customers. In this chapter, the authors chose heritage tourism as the study field for different reasons. While the adoption of augmented and virtual reality is gaining grownd, cultural heritage sites have started to consider the possibilities offered by these new and innovative technologies. This industry is starting to integrate AR and VR in several ways to attract more people. However, it is necessary to study how modern technology can be developed and implemented in a meaningful way to improve the tourist's experience. An AR- and VR-based mobile application has been developed and tested at Antonine's Baths in Carthage, Tunisia.*

## INTRODUCTION

The emergence of the internet has incited marketing researchers to study its effects on our consumer

society. Practitioners are increasingly interested in electronic commerce (Galan and Sabadie, 2001). Nevertheless, this type of commerce led to the emergence of a new form of hybrid experience or phygital experience that combined both the digital and the phygital to diversify tourism products. More particularly, visitors to archaeological sites are no longer passive; they have certain expectations and wish to participate actively in their cultural experience. Therefore, they require information and entertainment through innovation and creativity (Hoyer et al., 2020), in addition to multisensory stimulation (Li et al., 2019; Pine and Gilmore, 1999).

Indeed, this experience uses augmented reality software with connected objects to ensure adaptation and optimization to consumer needs. Accordingly, augmented reality came to the fore as an experience that offers memorable and satisfying phygital experiences that serve the functional and emotional needs of customers while creating value. The use of augmented reality contributes to improving the relational, hedonic and aesthetic dimensions of the digital customer experience. It has become a relevant interactive tool in marketing, increasingly used in different contexts.

The emergence of these interactive technologies has completely revolutionized the tourism industry (Buhalis and Law 2008), and converted traditional business channels (Wang & Liao, 2007). The competitive and financial viability of tourism organizations depends now on the innovation of the service provided, in this case: benefit to visitors (Neuhofer et al, 2014; Tussyadiah, 2014). AR has transformed guided tours by incorporating a new form of apps that deliver a unique immersive experience (Qin et al, 2021). The latter will allow the visitor to get involved in its unfolding, and, *in fine*, to live an experience enriched in emotions (Bruner and Kumar, 2005).

The use of augmented reality offered solutions in ifferent fields like: medicine, commerce, education, and architecture (Datcu et al., 2015). However, the development of AR applications to market cultural heritage is scarce despite the potential of this sector and its importance in attracting more visitors. Then, the aim of this chapter is to present the different facets of AR and the components of digital experience (the tourist experience) and to develop an application dedicated to market the archaeological sites of Antonine's Baths of Carthage in Tunisia. The innovation of this work consists in offering a new user experience inside archaeological sites in order to create a new link between the visitor and the heritage.

## AUGMENTED REALITY

Faust et al., (2012) define AR as "the superposition of virtual objects (computer-generated images, texts, sounds, etc.) on the user's real environment" (p 1164). For a long time, heavy and bulky devices (Rese et al., 2017) have hampered AR. However, with the widespread of smartphones, the interest of developers, retailers and consumers in augmented reality has increased dramatically. AR is brought to consumers in different ways such as mobile navigation applications (Qin et al, 2021; Javornik et al., 2016) as well as innovative learning tools in cultural heritage tourism (Moorhouse et al., 2017). Azuma (1997) identifies three attributes of an augmented reality tool; association of virtual and real objects, fostering interaction between users in real time and saving information in three dimensions (3D).

In addition, AR is an interactive technology that combines the physical and the digital by overlaying virtual annotations such as information, images and sound in real time (Javornik 2016). Theoretically speaking, AR is an interactive technology that modifies the physical environment with the help of superimposed virtual elements. This virtual layer, placed between the physical environments and the user, can add textual information, images, videos or other virtual elements. The devices that allow

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