Augmented Reality Guided Tours

In modern society and with new generations of tourists, augmented reality guided tours (ARGTs) are now a novelty. This means that ARGTs can be pre-programmed into real-world tours, guaranteeing the best experience for different tourist profiles. This digital tool consists of guided tours through augmented reality (AR) – that is, an interactive experience where objects that reside in the real-world environment are enhanced by computer-generated perceptual information. A virtual meeting including history, heritage, ethnography and local traditions, among others, is provided, covering the main emblematic tourist points, with multilingual options, and with a mixed system of markers and georeferenced orientation. The technology has similarities with virtual reality, but AR does not replace the real-world environment; it augments it by overlaying digital components. There are several successful examples: interactive hotel elements, augmented tourist destinations, beacon technology and push notifications, AR gamification technology-empowered tourism experiences. All these support tourists to co-create value throughout all stages of travel (Buhalis, 2019).

Digital technology has contributed effectively to innovation and creativity in leisure travel – namely, in new ways of travelling and digitally interpreting different types of tourism tours. Jung and Han (2014) consider AR to be one of the most promising and advanced technological tools in modern times. It has begun be perceived as a valuable platform for guided tours from an advanced virtual perspective, especially in the new worldwide paradigm of social distancing. ARGTs allow the display of content in real time while tourists travel through the destination, due to the addition of new layers of information related to the real environment (Kouvanis, Kasimati and Zamani, 2012). This results in a new interactive experience, especially useful in places with a great amount of information available, such as historic sites and museums. AR has a strong impact on new performance of guided tours, as a pioneering alternative to digital travelling by inducing visual, sound and tactile effects. This technology allows for complete immersion in a fully simulated travel environment, without involving physical and geographical displacements, significantly increasing health safety. Koo et al. (2019) stated that joining in a traditional guided tour can provide a more profound experience to the participating tourists – however, availability of guided tours is limited (people, time) and presents other practical obstacles (i.e., language). Koo et al. (2019) developed an AR tour guide for a cultural heritage site as an alternative to the traditional tour services.

AR has revolutionized the way visits are guided in this new paradigm caused by the pandemic, which is, simultaneously, a challenge and an opportunity for guided tours. It is also a way for many businesses in the tourism industry to stay competitive and to enhance their marketing strategies based on differential thinking (Jung and Han, 2014). It is also possible that AR devices can potentially replace the common tourist guide, mainly for reasons of social distancing. It can become the next-generation personalized guide. It is also gaining increasing popularity across the tourism visit sector, allowing the digital reconstruction and recreation of heritage sites, considered one of the key sectors of tourism attractions, through a 'time travel' effect. Byung-Kuk, Kangsoo and Jong (2010) attest that multimedia tour guides are recognized as a new attraction due to tourists more easily understanding, through audio or video content, cultural heritage sites. AR-based tour guides enable tourists to enjoy intuitive and realistic experiences by overlaying virtual content on cultural heritage sites, in contrast to the conventional types of tour guides (ibid.). Cranmer, tom Dieck and Fountoulaki (2020) revealed five value dimensions – marketing, economic, tourist, epistemic and organizational – when exploring the exponential proliferation of AR in the tourism sector. In fact, AR has a disruptive impact on guided tours performance, through revolution of the augmented reality of tourist tours, creating an enhanced entirely digital environment with digital content and integrating both physical and virtual settings of guided tours (ibid.).

The application of AR adds real value to the touristic experience. Rodrigues et al. (2019) pioneered the development of the Mobile Five Senses Augmented Reality system (M5SAR), comprising two main modules: (1) a mobile application that deals mainly with the senses of

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sight and hearing, using a mobile device camera to recognize and track (museum) objects on the fly and provide related information about them; and (2) a portable device capable of enhancing the AR experience of the senses through the stimulus of touch, taste and smell, by associating itself with the user's smartphone or tablet. It consists of a mobile guide instrument suitable for cultural, historical and museum events. Rodrigues et al. (2019) extended the sense content for the museum's most important objects (masterpieces) – that is, text, audio, video or touch (cold, heat, vibration), thus enabling reality augmentation of all five senses.

ARGTs are usually experienced through a digital device (i.e., smartphone, tablet, etc.). This makes it less expensive for the consumer than more virtual reality-enabled headsets or devices. In some cases, AR also works hand in hand with other mobile technologies, such as digital cameras and GPS tracking devices. Regarding the operationalization of AR, tourists follow a route and view augmentation on their smartphone or Google Glass.

Tourism destinations require constant investment in new technologies, following the current trend of mobile use, in order to stay competitive in the global market (Jung and Han, 2014, p. 3). Technology innovations bring the entire range of stakeholders together within the tourism service ecosystems (Buhalis, 2019). Yung and Khoo-Lattimore (2019) divided AR in tourism research into three main factors: (1) terminology: inconsistency, lack of definitions and heterogeneity; (2) gaps and challenges identified: lack of AR awareness, usability, time commitment required, unwillingness to accept virtual reality, and substitutes; and (3) lack of theory-based research. Loureiro, Guerreiro and Ali (2020) state that the future evolution of augmented reality in tourism and hospitality should include four main key areas grounded on technological developments: (1) physical and sensory stimulation; (2) enhanced longitudinal virtual experiences; (3) well-being development; and (4) the use of artificial intelligence embedded in virtual environments. The latter include advanced technology such as: electroencephalography (EEG); longitudinal virtual experience; digital binocular station (DBS); wearable devices; brain–computer interfaces (BCI); physical and sensory stimulation.

Six dimensions integrate the ARGT. This set directly related to guided tours is shown in Figure 1. All these dimensions have a specific role in and impact on the creation of an immersive digital experience within the context of various types of tourism services.

All these new solutions and major drivers discussed increase the desire for ARGTs in tourism and it is thus one of the fastest-growing areas in the guided tour technology and digital fields (i.e., museums, culture, heritage). There is a need to explore AR as a new tool and way of communication in tourism, through a guidance system allowing a roadmap-building tour, ensuring that this system will be successful for tourists, enhancing the personalized visually augmented experience. This will also be achieved by combining ARGTs with interactive and didactic games for continuous, context-sensitive guided tours, both indoors and outdoors. The future development of digital solutions (in the promotion and innovation process) and strategies to react to the post-pandemic context will be the two main challenges for ARGTs in the future. With technology continuously evolving, it should come as little surprise that its applications within the travel industry will evolve too. Once ARGT becomes a compelling, full-featured platform, and it becomes clear that a vast number of consumers and visitors are becoming acquainted with the technology, its vast potential will be fully achieved.

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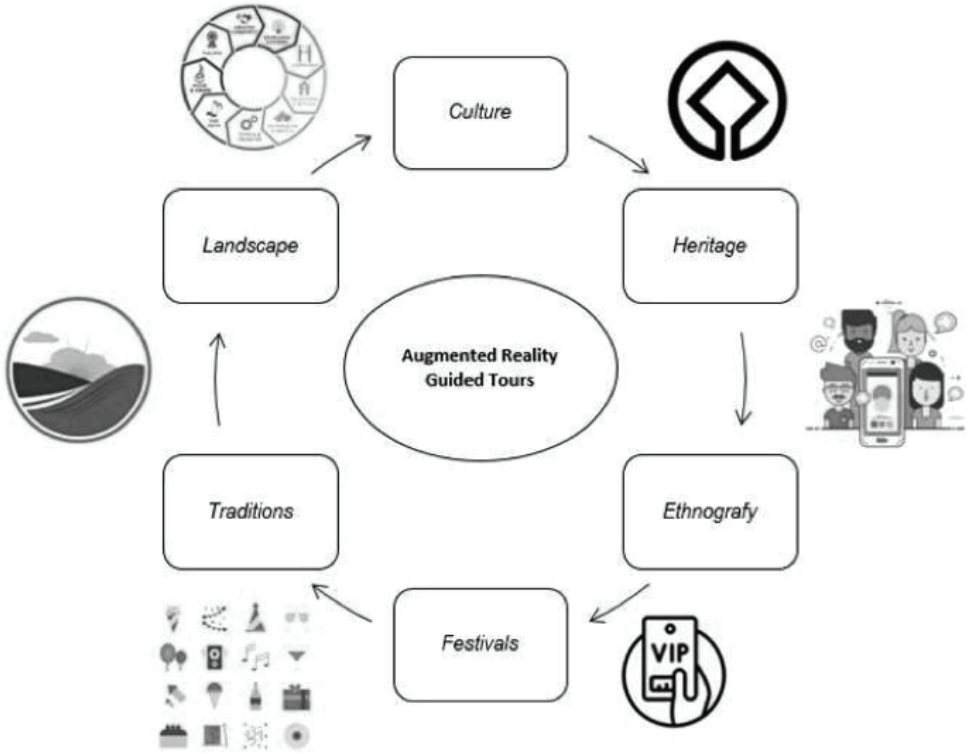

Figure SOUSA.1 Augmented reality guided tours model

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