10 Extended Reality technologies as a tool for managing crises and shaping tourism safety perceptions

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Abstract

New technologies are considered by different industries as a useful tool for having efficient emergency and crisis management. For tourism industry in particular (that involves and interfaces with multiple other industries), it is critically important to act proactively in a risk situation, to effectively face a disaster, and to reduce the impact of a crisis. This chapter provides an overview of the Extended Reality (XR) technologies (Augmented Reality [AR]; Virtual Reality [VR]; Mixed Reality [MR]). It discusses opportunities of using XR in tourism, and it provides contemporary examples of XR applications. It also focuses on emergency management via XR in tourism. Finally, it provides specific recommendations for XR use before, during, and after a crisis in order to better prepare for, manage and recover from emergencies and crisis.

Keywords:

Tourism, crisis management, virtual reality, augmented reality, mixed reality, extended reality, tourism safety

Introduction

There is no definition of crisis which is globally accepted (Coombs, 2012). According to Pauchant and Mitroff (1992) the meaning of a crisis focuses on the disruption that has an impact on a specific system and constitutes threat for basic assumptions. Concerning tourism, Sönmez et al. (1994) noted that a crisis may have an impact not only on related businesses, but is also capable of destroying the destination. Thiessen (2011) suggests two typologies of crisis based on the dimensions: time and content. Considering the time dimension, Coombs (2012) proposes that a crisis includes three phases: pre-crisis, crisis and post-crisis. With regards to the content dimension, Rosenthal and Kouzmin (1993) consider intentional man-made crises (terrorist attack) and natural external causes (hurricanes), whilst James and Wooten (2005) focus on sudden (earthquake) or predictable crisis (recession). The notion of stability and safety in economic, health and social terms being a static condition, has been contested in the recent years (Pappas & Glyptou, 2021). Examples such as the 9/11 terrorist strikes in 2001, the Indian ocean tsunami catastrophe in 2004, the refugee crisis in 2015, and many others only prove that a serious crisis isn't something rare, but rather increasingly commonplace.

Considering the most recent example of the Covid-19 pandemic, it caused the slowdown of most economic activities, as well as the introduction of radical changes in global health and safety standards. As a result, many industries were affected, including transportation, educational institutions, and sport (Chakraborty & Maity, 2021); but tourism was particularly disrupted. While the impact of Covid-19 on tourism is yet to be fully understood, some facts remain unchallenged. According to the World Travel and Tourism Council lists, at immediate risk remain up to 75 million workers with the possibility the daily loss of up to one million jobs in the travel tourism sector. The potential Travel Tourism GDP loss was estimated in 2020 of up to US$ 2.1 trillion (Skare et al., 2021). These are just some of its effects with significant implications for customers, businesses and destinations across value and supply chains.

The lack of risk management for a pandemic situation forced individuals to rapidly formulate and apply disaster management plans, many of which included technological solutions. Compared to traditional communications methods, new technologies such as Virtual Reality (VR),

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Augmented Reality (AR) and Mixed Reality (MR) not only provide a safe environment but also present individuals with the opportunity for interaction and engagement. Technologies such as VR, AR and MR offer a great opportunity for crisis management in pre-, during and post-crisis phases, as they can assist in restoring feelings of safety and security but also revamping tourism and hospitality companies' and destinations' images.

While the existing literature for XR technologies applications in many fields such as education (Merchant et al., 2014; Cihak et al., 2016; Loureiro & Bettencourt, 2014), health care (Freeman et al., 2017; Cobbett & Snelgrove-Clarke, 2016; Alvarez et al., 2011, and retail (Park & Yoo, 2020; Fan et al., 2020; Bonetti et al., 2018) is abundant, the literature concerning the use of XR technologies in tourism, and especially as a tool for managing crises and shaping tourism safety, is predominantly silent. It is therefore necessary to further research the ways that all these new technologies can be valuable in avoiding or countering tourism crises. Hence, this chapter examines the use of AR, VR and MR technologies in the pre-, main, and the post-crisis phases and discusses potential applications for the tourism and hospitality industries. The theoretical contribution of the chapter lies within the fact that it jointly considers three distinct knowledge areas and explores issues that exist in the intersection of technology, crisis management and tourism. To do so, the chapter first discusses the different XR technologies, in particular AR, VR and MR. It then proceeds to contextualize these technologies within the tourism domain, providing some current application examples. It proceeds to review the use of XR technologies as emergency and crisis management tools. The chapter then continues by considering XR technologies for managing tourism crises. Finally, it offers a summary of key point and concluding remarks.

XR technologies

According to Fast-Berglund et al. (2018) the term extended reality (XR) refers to all combined environments (real and virtual) and includes different types of technologies i.e Augmented Reality (AR), Virtual Reality (VR) and Mixed Reality (MR).

AR technology offers the user the opportunity to overlap virtual objects to the real world (Peddie, 2017). This is done through a variety