

## Chapter 9

# Challenges of Mobile Augmented Reality in Museums and Art Galleries for Visitors Suffering From Vision, Speech, and Learning Disabilities

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### ABSTRACT

*In Today's digital world, AR is a tech which imposes layers of virtual segments on the real world. Research Practitioners and Designers in all applications seem to be more concerned about the learning facilities than keeping the visitors engaged in public art exhibitions, Museums, and holiday tourist locations. These ignored circumstances have provoked studies to emphasize more on the usability of Mobile Augmented Reality (M.A.R.) at Art galleries and Museums. According to the recent surveys, the current M.A.R. applications at target locations focus on healthy people without any disabilities, and not on those with disabilities. This chapter recommends major design elements of M.A.R. at museums and art galleries, and highlights all the challenges faced by visitors suffering from visual, speech, and Learning Disorders. The research discusses the 11 vital elements which include Usability, Design, Motivation, Interaction, Perceived control, Satisfaction, Attention, and others involving engagement of M.A.R. necessary for building an effective M.A.R. application for disabled people.*

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## **INTRODUCTION**

Augmented Reality, also called as A.R. is a subpart of the Virtual Reality (V.R.) technology. A.R. is a recreation of V.R. which imposes several intrinsic layers of virtual content on the physical objects in the real environment. By imposing virtual content, it provides a medium to describe the physical object on a screen of any smart mobile device by directly pointing the device towards the object. The pervasive devices possess ubiquity for the public to get accustomed to the A.R. applications existing in the digital market. The fundamental difference between V.R. and A.R. is that V.R. is all about placing the user in a virtual environment where the sensations such as smell, touch, and view can be created artificially. A.R. is in the form of an application where the user needs to use the G.P.S. (Global Positioning System) of the smartphone to pinpoint it to the user's location and view the scene on displays (Mandy Bing, 2017). The appeal for implementing A.R. in Museums and Art galleries is obvious and concise- The technology permits rich media such as videos and images to lay over the real environments and enhance the user experience. Moving forward, the research focuses on Mobile Augmented Reality and its challenges for the visitors suffering from vision disabilities and impaired learnings. In this section, we are going to shed light on A.R., real-time applications of A.R., and A.R. in Museums.

### **AR: A Creative and Powerful Tool of Information**

Being a platform for endless layers of Information, AR tools has discovered the potential ability to offer the visitors an extra pack of Information on their pocket-sized smartphone displays. On comparing with Q.R. scanning applications which makes use of standard tracking features, A.R. tools emphasize more on Deep learning and Image recognition methods for scanning the real world objects and putting all its cards on the table. Museums mostly make use of location-based A.R. applications, which enables the visitors to inspect the details of the real entities. Similar parallel researches are being conducted to allow visitors to save the Information and insights of real objects in their local phone storage for making it work offline. Offering more features strengthens the connections between visitors and museums. A.R. apps don't only create a medium to suck knowledge, but also makes one dive deeper into details by engaging the users by a super friendly G.U.I. (Graphical User Interface). Therefore, AR is also depicted as a creative tool for education.

### **M.A.R. (Mobile Augmented Reality)**

Like we discussed in the above section, Mobile Augmented Reality can ideally be defined as a carry-and-go Augmented Reality in your pockets via smart devices such as mobile phones, tablets, P.D.A.'s and wearable devices. Alan B. Craig states that smart device acts as hardware for your A.R. software application, simply put (Alan, 2013). There is significant confusion between the concepts 'portable A.R.' and 'Mobile Augmented Reality (A.R.)'. Portable AR allows the users to move the technology flask from one place to another. It's just like the definition of 'Energy' – Can be exchanged and Transferred, but cannot be created nor can be destroyed. Desktops and chargeable laptops are a few common examples of portable A.R. devices, whereas a compact mobile device can suit mobile A.R. example. The newest A.R. devices available for public use include Microsoft Holo Lens, Magic Leap, Oculus Rift, Samsung Gear V.R., H.T.C. Vive and others to be made available shortly. The below-given figure enlists the latest portable and M.A.R. applications for A.R. apps.

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