

Fostering Accessibility during the journey at Museums: QR-Code solution to make Museum artefact description accessible in Sign Language

Al Dana Al Mohannadi, Shahbaz Ahmed
Mada Center

Abstract –

Museums form the cultural backbone of any city. Ensuring that they are accessible to People with Disabilities means that everyone can participate in the interaction with or even the curation of collections, whether they be displayed in a physical or virtual setting. Using different digital tools, barriers that have been traditionally associated with museum experiences can be easily broken down. Mathaf: Arab Museum of Modern Art – Mathaf and Mada collaborated on creating Sign language Interpreted content and having QR Code for each piece of art that will open a link containing a video interpreting in Sign Language. Mathaf provided the content which was then SL translated & recorded in Mada Studio. Such an initiative will support people with hearing impairment to have an independent museum experience.

Keywords: Sign Language, Deaf, Accessible Museum

Introduction

The concept of digital access focuses on ensuring that people with disabilities have equal access to all grades of life via ICT. This includes eliminating all barriers to the use of ICT products, services, and applications by persons with disabilities that facilitate daily life activities, increase work productivity, facilitate the exchange of information, and improve social life. If these services are not comprehensive enough to be provided to all, including persons with disabilities, they may indeed become tools for isolating certain segments of society from others, thereby preventing digital transformation, and ensuring that everyone contributes to it in a real and tangible way. New media pose new interaction requirements and new considerations in terms of accessibility. The need to address the requirements of a diverse population in the museum in terms of accessibility is extremely challenging. More specifically, people with hearing disabilities are considered among the ones that face barriers to understanding both written and oral information.

Museums can be a hostile place for visitors with a disability, with buildings that are hard to navigate in a wheelchair, and exhibits presented with few concessions to those with sensory or cognitive impairments. With the right solutions, expert recommendations and user feedbacks, accessibility can be improved to meet the growing need for accessible tourism spots in Qatar. Out of its commitment to perform the role as ICT Accessibility strategic enabler, and in line with Mada's efforts to enable equal basis for PwDs and the elderly to take

part in cultural life via ICT, Mada collaborated with Mathaf in developing an innovative Sign Language Video Interpretation project to provide full user experience for visitors with hearing impairment. The initiative seeks to allow hearing-impaired people to visit the Mathaf facilities and gain access to all information in the artefacts that is currently in the pilot phase. With such collaboration with Mathaf, Mada aims to enhance the user experience as visitors are guided through the various exhibits in a way that maximizes the learning experience. This makes museums more efficient, and the experience of the visitor more enjoyable.

Mada Use Case: Real-time sign language interpretation using Augmented Reality in Museums

Summary

Seeing that people with hearing disabilities in the Arabic speaking world rely heavily on the use of sign language to communicate, there is a critical need for the development of technology to provide sign language interpretation where human interpreters cannot always be present. As such, a solution is required to provide people with hearing disabilities access to static and rich multimedia content (e.g., video, audio announcements, text, graphics, signage) through Augmented Reality. The solution will enable people with hearing disabilities to access key information and partake in different activities more independently and equitably. This is particularly relevant in Museums, where both the user journey and displays rely heavily on the use of signage and multimedia displays to convey key information.

Target Users

- Museum visitors with Hearing Disabilities
- Sign language users

User Journey

Maryam is 24-year-old. She is deaf and uses sign language to communicate. Maryam is looking to use her smartphone to access information on static and digital signage in her everyday life.

Issue Statement

As a sign language user, Maryam is unable to read the information found in static or text and rich multimedia-based mediums (e.g., audio, video, graphics, etc.) during her visit to museums. The inability to access crucial museum-related information such as written display descriptions put people with hearing disabilities at a tremendous disadvantage to others.

Sign Language Video Tours

Most, if not all museums provide audio or guided tours to their visitors. Audio tours are provided through an audio device that contains audio descriptions of each exhibit, and guided tours are led by a staff member. Neither of these methods is beneficial to deaf visitors (unless there is another guide who signs in SL – which is unheard of). Exhibits do have text descriptions, but most times there is not much patience in visitors to read all the descriptions.

To provide greater convenience to deaf visitors, and to encourage them to visit museums to enlighten themselves, Mada teamed up with certified sign language interpreters in Qatar, along with Mathaf Arts Team to create video tours that will have audio, Qatari SL, and captions to enhance deaf visitors' experience. Each exhibit will have its video which will be accessed via a QR code displayed on the wall. Scanning the QR code via a phone or tablet will launch a video explaining the exhibit the deaf visitor is at.

Process Implementation

Mada received the narration script generated by the Mathaf curators' team which was then proofread and used for recording from Mada Studio. Qatari Sign Language specialists were hired by Mada to convert the script to signs and were recorded at the Mada Studio. The recorded videos were later matched with the Artifacts and a QR code was generated for each art piece. The first phase of the project targeted the permanent collection at Mathaf. Once finalized, the document was shared with the Mathaf team for final inspection of QR Codes before sending for the production team to print and install QR Codes next to the art pieces. Mada along with the specialist team and end-users visited Mathaf to test all the installed QR Codes and verified the functionality.



Figure 1: Sign Language QR Code Testing

Conclusion

A very common approach is that of the use of pre-recorded videos of human signers. Although this solution generally produces natural results, it is not viable as these videos cannot be easily updated and enriched with new information and thus become obsolete. Re-recording human signers eventually ends up being a tedious, time-consuming task and is also an expensive process, whereas “stitching” together clips of signs to produce words and sentences often

leads to non-natural results due to discontinuities that certainly appear in the video editing. As virtual signing avatars are developed, this matter can be rectified in the near future.