

Augmented Reality Experience in Real Museum

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INTRODUCTION

This report includes a research, design, and prototype of an augmented reality app which purpose is to be used by the visitors of a museum, art gallery or other exhibition to enhance and make their visiting experience better.

RESEARCH

For the research to be conducted the initial approach was by visiting a different range of museums and galleries. I visited a few museums like the design museum, natural history museum and British museum. I got to learn and collect lots of information about the artifacts inside them. The most interesting part I thought inside the museum was when was the use of headphones to listen about description of respective artifacts. Some computer screens were given information of the specific things and were also interactive with visitors e.g., the active volcano and earthquake data shown in natural history museum [See figure 1]. Regarding this thing, I noticed that visitors there liked to interact with the information displayed by led screens or the voice narration than reading the small text of paragraphs there. As from my view, I was more inclined into looking at pieces of stuff that were visually attractive to me. As same as I did, I saw a few people who didn't like viewing things that were not big enough and were placed in a darker area. In one building inside a British museum me and my friend tried to find the way out because we were moving in the same circle again and again. The navigation board was not clear about the exit for visitors which concluded visitors like me to get lost and confused there. I believe in this situation maybe AR service could have been a great help to visitors to show them their way out through their phone. Also, in one situation I saw a bunch of kids looking for the giant moon in the natural history museum because it was trending on the internet, and they were struggling to find it including me. As looking at these problems live, I felt AR could do so much in the field of navigation as well [4].

Similarly, another problem which I could notice was about the description/information written about the artifacts or materials. Most of their text was written in tiny font and was not placed correctly according to the artifact. From Figure 2 you could see that the information written about the artifacts was too small in fonts. From figure 3 you could also see that the placement of the information text box was not clear about which coin it was describing. There were too many coins placed where I think the description section failed to indicate which coin it was referring to. I think using the phone to scan the coin where it shows the information about them by its sides (done by AR text form) would make it much better for the visitor to understand about them. Nowadays many museums are trying to implement the use of AR in them to give the visitor to view things in a different light.

In July 2017, the art gallery of Ontario, Toronto had an AR installation where the subjects of the paintings could come alive by showing their phone in front of paintings [1].

So, viewing all the artifacts in British Museum I found an area of Sri Lankan mask where different sorts of the mask were displayed there. Its information was given at the bottom which was very hard to read because of the small text and dim light. I got to know that not much information was given about each mask. Also, it mentioned some masks not being present there and left out, so I thought the use of 3d mask to make them virtually see in a phone would make it more like the missed mask is in front of them.

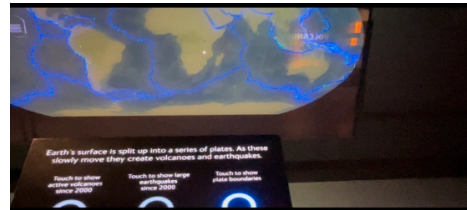


Figure 1. Picture captured during visiting of museum of active volcano and earthquake data all around the world using screens.



Figure 2. Image shot in british museum where description about the artifacts are written in small fonts.

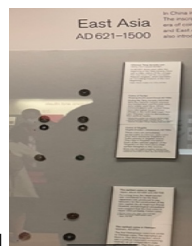


Figure 3. Image shot in British museum where the placement of information box makes hard for the visitor to understand which coin the box are explaining.



Figure 4. Picture of Sri Lankan devil mask in British museum.

DESIGN CONCEPT

The artifact I will be using for augmentation would be an ancient Sri Lankan mask that was used while performing a ritual called devil dance [2,3]. There are 18 different sorts of devil masks where each of them represents its meaning. The main reason I was inclined into choosing masks from the British museum was because I was quite amused by the history and practice just the masks were holding. While reading the description about them I noticed that the details provided were very vague. I could see that if there were an additional explanation of each piece the visitor would have gotten more dept information on what actual the mask means. The mask was represented in the museum to show that they were used while performing the ritual dance, but no video of the actual dance was not shown. Visitors could be interested in watching how the performance is done using the mask. Considering these things, I thought it could all be made possible if the visitors had an AR app with them. Likewise, it was written that there were few masks which were missed in the museum and only images of them were shown there. Noticing this problem, I thought what if the masks that were not present in the museum could be shown on their phone in a 3D model way, which could make them feel like they are viewing them live.

Taking everything in knowledge, the design idea I had for my project was to augment a mask where visitors could see the information that the mask was holding. They could also watch a video on their phone which is just overlayed over the mask. The augmentation would also include some 3D displays of masks and information about them which were not present there. In figure 5 you could see the rough sketch design implemented before final prototyping the actual thing. The different forms of AR I would be using are the image target which is first used to be scanned by the camera to display things, also it will be showing a 3D mask model, canvas from the unity which includes texts and buttons.

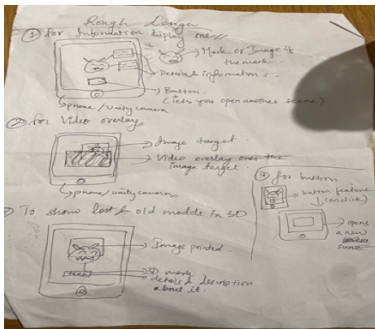


Figure 5. Sketch design for prototyping the AR app.

PROTOTYPE

The project of augmenting an artifact from a museum was carried out using software called unity and Vuforia. The implementation was done by using this software to make my design concept into reality. So, the image target was a black and white mask image which was supposed to represent the mask in the museum. I printed the image out so that we could use it as a target. My first initiation was to make it work on a phone device unfortunately I was working with iPhone and MacBook, so it didn't work as I expected. So, I used the unity camera to start my demonstration. At first, we need to show our printed image target in front of the camera which then will show the augmented information about the mask [Figure 6]. The information box was done by using the canvas feature from unity with some text and color. You could see a button down below the details which on click will open a new scene for us [Figure 6]. The change of scenes from one to another was done doing C# scripting and adding it to the button function. The opened new scene also includes the same image target, but the things displayed are different there. Since the button on the first

scene is for letting viewers watch a dance video, after clicking it the new scene will have a video overlay over the image target showing the dance performed by mask men's [Figure 7]. The overlay was also carried out using some C# scripting. Likewise, there was again the use of image target to show a 3D mask model which was not present in the museum so viewers could see them digitally on their phone to feel it real [Figure 8]. The 3D model was imported from the unity asset store and added to the scene project.

I personally made a lot of mistakes as well as improvisation doing this coursework. After having my project demonstration, I could see my project concept having lots of loopholes. My initial prototype included buttons on scenes called the next button where we could go to the next scene and view other 3D mask information. The mistake I did was if a person is to move around their phone from one mask to another the information could be shown just by using different targets the use of a button was very unnecessary thing. So, in my final prototype, I removed the button completely. The text color and size used in the initial prototype were very bright yellow and small which then later I improvised making it black and font bigger. There is more thing that I would like to improvise or use in the future is to use a model target instead of an image target. Because of the printing issues I couldn't demonstrate using a model target and ended up using an image target where the use of a model target (3D printed mask) would have made the AR experience more realistic.

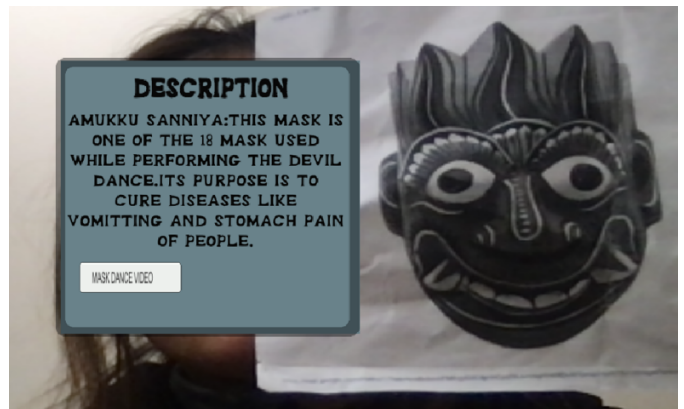


Figure 6. Main Scene after showing the image target on camera.



Figure 7. A video overlay on image target showing the dance performed by the masked men.



Figure 8. 3D model of a mask with its detail, which is not in museum.

CONCLUSION

After doing this coursework I could see that AR has lots of scope in making a museum visit experience more exciting and informative for visitors. I think the hardest part for me during this process was design thinking. I was very lost and messy in the design thinking part which concluded me making mistakes on initial prototyping. Despite that, I think I made quite a standard project and learned from all my failures done while developing the app.

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