

used as a case study for this exploration. Applications of current VR technologies are used to enhance user immersion and improve upon preservation and pedagogy for this intangible heritage. The medium of interactive digital story telling was used, and special attention was paid when designing interface for 360 environment by integrating both local and at-a-distance interaction mechanisms where appropriate within the simulation. Simulation was used as an important mechanism of preserving Old Bridge Diving heritage as it enabled empathy of the participant in the virtual world with the diver in the real world. This created a close and personal connection with the tradition. The user study highlighted several recommendations due to the observed shortcomings in some components of the aggregated system. The study also demonstrated the correlation between the virtual and the real world environments and the emotions that are conveyed through either. This indicates transfer of context and the experience of the community involved with the intangible heritage, one of the key elements of *preservation*.

For preservation, it is not only important to document the heritage, but to transfer the intangible part which can include feelings, perception, drive and motives. On the continuum of reality, from functional- through photo- to physical-reality, it is clear that the divers and wider heritage community are afforded many feelings and emotions testament to being there in the moment. Traditional media does not excite the same level of feelings from participants which would indicate this being somewhere low on the continuum of reality whereas VR yields feelings of immersion and presence more closely aligned to that of physical-reality and being there in the moment. It is clear that in the concept of preservation of the intangible elements of this heritage that VR has been the superior medium in comparison to more traditional methods.

5.1. Limitations

The limitations of this study are discussed within. For the most part the technology considered 360 field-of-view, which correlated with the visual domain. However the experience in the digital stories could be improved by integrating 360 acoustic cues into the VE. Additionally it is possible to separate, rather than collapse, across the groups identified in the demographic capture. With this it is possible, through inductive analysis, to garner some additional insight into the nature of preconditioning and the opinion of these different groups when considering this form of preservation. For example, the group that knew of the heritage rated elements of the stories more favourably than the other group. Insight into these elements is important when considering the design of future preservation systems.

6. Future Work

Future work will look to build upon the suggestions and observations made within this case study and attempt to synergise a framework for preservation of intangible heritage such that it makes recommendations to address the challenges for intangible heritage: validity, inclusivity, representativity, temporality, sensitivity and community.

In regards to technical improvements for this simulation it would be good to investigate the influence of more physically based

elements of the recreation. For example an environment map of the site, perhaps temporal. More accurate materials and textures would possibly increase immersion, it would be nice to identify the level of fidelity required in this example to elucidate the emotional responses expected from intangible heritage.

Additionally, during the interviews it was identified that there are many diving styles and the techniques may have adapted and evolved over time throughout the development of the diving heritage. Some of these may not even be practiced anymore. A motion capture database of these dives, with the provision to explore and experience these types of dives, from the frame of reference of a diver, should be created to further expand upon the preservation of the heritage.

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