Recreatus - Episode 01

Hello and welcome to the Recreatus podcast. This is a podcast on Virtual Heritage, the technologies used to enable virtual heritage projects, and the application of virtual heritage to support cultural heritage broadly. In this first episode, we are going to look at the larger body of Digital Heritage and how virtual heritage builds on this broader set of digital capabilities and methods.

Back in 1972, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) created the World Heritage Convention to identify, protect, and preserve valuable cultural heritage for future generations (<https://whc.unesco.org/en/convention/>). Fast forward 31 years to 2003 and UNESCO explicitly recognized the growing role of digital content as a representation of cultural heritage through the *Charter on the Preservation of Digital Heritage*. In the charter, digital heritage is characterized as “-consist[ing] of unique resources of human knowledge and expression. It embraces cultural, educational, scientific, and administrative resources, as well as technical, legal, medical, and other kinds of information created digitally, or converted into digital form from existing analog resources.” This definition focuses on all content created digitally as representations of the cultures they are created by,

Digital Heritage can also be a more active process where digital artifacts can be created to represent analog heritage objects. These artifacts can be simply direct copies of original heritage objects, or a recreation or representation of a heritage object or area. This is the part of digital heritage that virtual heritage falls within. In a 1999 issue of World Heritage Review, Robert Stone defined Virtual Heritage as “the use of computer-based interactive technologies to record, preserve, or recreate artifacts, sites, and actors of historic, artistic, religious, and cultural significance and to deliver the results openly to a global audience in such a way as to provide formative educational experiences through electronic manipulations of time and space” <https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=848434&casa_token=MOZhEyr3CQIAAAAA:F5DtfNUvfzZQ6wmUP7VakJ6B3o4OUqg_hNbtN4Rsp6aJ5tCx99jKa9l7w8-WUFmriQEaKbBVjAHDUA&tag=1>

While these definitions slightly differ in certain ways, they show a common goal within digital heritage: The use of technology to digitally preserve or convey culture. The end result of most, if not all, Digital Heritage projects are intended for both preservation and sharing. Let’s look at examples of how organizations are sharing digital copies/replicas of their heritage collections.

The British Library's Endangered Archives Programme is a good example of sharing heritage artifacts and information. The British Library constantly has projects that actively work to preserve documents utilizing digital means and then sharing those projects with the public (<https://eap.bl.uk/>). The EAP website provides access to a wealth of on-going projects to explore. Their archives provide the history of the documents, the content of the documents, and why the work was conducted for each project. The British Library has a large collection that is shared freely for educational purposes.

The Metropolitan Museum of Art digitizes its own collections online so that anyone can access them. While it is not the same as visiting the museum itself to experience the physical pieces of art, you can browse and find any MET collection or exhibition such as the *Art of Native America: The Charles and Valerie Diker Collection* (<https://www.metmuseum.org/exhibitions/art-of-native-america-diker-collection>) and look through and learn about the various pieces in the collection, current interpretations, as well as their history, dimensions, and provenance. You can even look at the art that they currently have in storage and not on display. Much of their collection is digitally documented on their website.

Outside of digital replicas of documents and art, the Smithsonian has created a 3D model repository (<https://3d.si.edu/>) where they share 3D copies of a variety of objects ranging from plants, artifacts, fossils, and other objects. Each collection includes an interactive 3D viewer so that online visitors can interact with the 3D models as well as read details about the object such as its description and provenance. Sharing digital replicas of cultural heritage objects in this way is an important part of Digital Heritage so that a broader part of the population can have access and learn about our current understanding of the objects.

These examples are made possible by our ability to digitally capture, and sometimes even reconstruct, heritage objects. This has been done with a variety of technologies and techniques as digital heritage and digital technologies in general have grown. For example, with hard copy documents the process must begin with capturing a digital version of the original. The process of capturing is generally driven by the source material since delicate, one-of-a-kind materials must be handled with more intent and attention to preservation than a late 20th century book that can still be found broadly in libraries and bookstores. Where the rare object will likely be photographed in a preservation focused environment, a copy of the recent book might be unbound and run through a sheetfed scanner.

In both methods a raster image of the original is the goal and product. This image then can be stored and shared, but we also generally run the text through optical character recognition software to see if it can be converted to editable text. This works well for block print documents, but handwritten documents are less likely to result in recognizable text with traditional OCR software. However, as more hand-written documents have been converted to text files AI have been trained on these datasets creating better OCR able to convert some hand-written documents. This text-based product makes interacting with the document and searching for specific content much easier than with the original photo or scan.

Capturing a raster image is also the first step in collecting digital replicas of paintings, drawings, maps, and similar visual products. Like text documents, art is handled differently based on rarity. But in addition to the visible elements, we can also use portions of the electromagnetic spectrum outside of what we can see with our own eyes to find how artists and restorers have altered paintings from their originals <https://www.boijmans.nl/en/collection/in-depth/x-ray-s-from-works-in-the-collection> and <https://www.abc.net.au/news/2014-06-27/before-and-after-a-history-of-hidden-paintings/5536130>

Multiple dimensional objects, from sculptures to structures can also be captured using similar techniques of photographing them. However, there is a trend towards using various scanning and measuring technologies such as photogrammetry and lidar to capture these objects in a way that is more representative of the original. Whether we use the differences between overlapping photos, or the distances captured using lidar, the 3d and volumetric models from these representations take us beyond the flat objects we often think of as documents.

As we continue to collect and share digital representations of material culture, we make it more discoverable. Access is greatly increased for those one-of-a-kind objects when they are digitized and shared since it is no longer necessary for those with an interest to travel to the original to gain access. This is not to say that a digital representation is the same as the original work, however, the digital representation does create greater access to a representation of the original and can often be studied in ways and in details that the original cannot or should not be studied by the audience at large. (Starry Night visuals <https://www.youtube.com/watch?v=lbLoHOE3-Jo> , <https://sketchfab.com/3d-models/the-starry-night-756b03a918544497b7a4ba644e37550b>)

\*\*Bring back around to definition(s)\*\*

As we wrap-up our discussion of Virtual Heritage as digital heritage, we can see that there are different outcomes and products created when we make a digital copy of an object versus creating a virtual representation of an item that may no longer be whole or, even, only exist as a description of the original. As we move through this first season of the Recreatus podcast we will provide examples of how virtual heritage is being used today, and talk to the professionals who are working to share collections and those who are recreating material culture that may no longer exist in its original form, all to preserve and share our current understanding of our cultural heritage.