Digital Technology: Research and Practice
Working Group Report Summary
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By their very nature, all digital cultural heritage and research data are at risk.

Digital tools and platforms provide a worldwide medium of cultural exchange and creation. Increasingly, the mission of libraries, museums, and archives to collect, preserve, and provide access rests on technology. Today, the field of conservation is fully reliant on digital methods for the documentation and analysis of objects. From content creation through to preservation, the digital present and future introduces new preservation challenges as well as exciting opportunities for deepening knowledge of art and artifacts.

Unlike most physical objects that are generally better able to withstand periods of benign neglect, digital objects and research data are inherently unstable, presenting forms of deterioration that include physical and chemical breakdown and tenuous hardware and software dependencies.

To conserve and preserve anything "digital," the content and data must endure two types of migrations: storage and format. These actions require policies, planning, training, and infrastructure to store and maintain the digital content into the future, principles that extend to new tools harnessed by conservators and scientists when researching materials and techniques within and across collections. Outlined below are the areas of key consideration the Held in Trust (HIT) Working Group on Digital Research and Practice identified for this pillar of cultural heritage preservation work.

KEY CONSIDERATIONS

Audiovisual media have short life expectancies.
For much of the twentieth century, audiovisual media have been the primary source record of America's history and culture. This physical magnetic media (video and audiotape), as well as film, must be digitized for the content to live into the future. The resulting digital files can be very large and complex, requiring more maintenance and data storage than most organizations can support. As a result, much content on analog audio, video, and film is deteriorating and being lost.

Organizations are struggling to manage and preserve born-digital content.
Most contemporary audiovisual content created by and deposited with cultural heritage organizations today is in digital formats. Born-digital content requires a deep understanding of sometimes proprietary formats and the required playback software and hardware. Organizations often do not have the training or funds to maintain and preserve these formats.

Emerging tools and methodologies present new opportunities for knowledge building.
Conservation research is rapidly adapting to emerging tools and methods that present opportunities to expand knowledge about collections. New methods for characterizing materials (e.g., multi- and hyperspectral imaging, elemental scanning, and texture mapping) create vast datasets that stress even state-of-the-art digital asset management strategies. There are also challenges of accessing and analyzing data using statistical and visualization methods that are

frequently proprietary and bounded by the knowledge of conservators and scientists who often lack sufficient training in data science and signal processing.

Despite such limitations, these new methods hold tremendous potential to move beyond in-depth analysis of singular objects to investigate entire collections, within and across institutions, for patterns relating to artist/maker techniques and regional practices over time. To realize this potential, the data pipeline, from the first object measurement through to storage, visualization, and engagement, needs to be reassessed to ensure that repeatable and interoperable techniques are widely available and adhere to open source/open science principles across collections.

Digital cultural heritage content collected and maintained by community-based organizations is at great risk.

Community-based archives exist regionally and are frequently in a solely online environment. These collections often center communities not visible in traditional collecting institutions and reflect how each community defines itself. The archives hold documents; images; oral histories; and documentation of events, music, and dance performances. While these collections face the same issues in digital preservation as their larger colleagues, their greater lack of adequate funding for operations to ensure sustainability, staff, training, and infrastructure threatens the disappearance of communities' documented histories.

STRATEGIC GOALS

The HIT Digital Research and Practice Working Group has identified the following four strategic goals to guide the field's actions today and into the future to better preserve and leverage digital cultural heritage and research data. Further detail on these goals and an outline of benchmarks over the short, medium, and long term can be found in the Working Group's [full report](#).

GOAL #1: Define and communicate frameworks, standards, and benchmarks to guide the preservation of technology-based cultural heritage.

While there is a growing body of research, action, and advocacy around the preservation of technology-based cultural heritage, many organizations are working through the related challenges and opportunities in silos. The establishment of clear frameworks, standards, and benchmarks for the preservation of analog and digital content that are accessible to collections regardless of size, location, and available resources will streamline this work and further collaboration across the field.

GOAL #2: Innovate and foster new modes of collections-based knowledge.

We need to create data pipelines that support large-scale, collection-level research within and across institutions, including new analytical equipment; methods for structuring, analyzing, and visualizing results; and open source/open science tools that ensure FAIR (Findable, Accessible, Interoperable, Reusable) cultural heritage data.

GOAL #3: Build partnerships to lower costs and environmental impacts.

Building partnerships across the cultural heritage field, as well as with allied fields and for-profit ventures, would help lower costs and environmental impacts related to digital research and practice. Such ventures should be designed to ensure equitable access across communities and be environmentally sustainable.

GOAL #4: Advocate for and build sustainability of community-based archives.

Community-based archives will benefit from progress towards the other three goals outlined above; however, they also need focused attention on their unique situations to ensure equitable access to resources and education.

IN SUMMARY

Digital research and practice within the cultural heritage preservation field is at a pivotal moment. The field must adapt to the preservation needs of technology-driven works of art, artifacts, and experiences. Meeting these challenges and securing these opportunities will require the reassessment of priorities within collecting institutions, focused and strategic investment from granting agencies and foundations, and increased collaboration across disciplines and through public-private partnerships. With coordinated, targeted effort, we will gain deeper knowledge of our shared cultural heritage and its preservation for future generations.

To learn further details around the findings and recommendations of the HIT Working Group on Digital Research and Practice, please access their [full report](#).

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