

**DIGITAL CULTURAL HERITAGE UNDER ATTACK:
SAVING UKRAINIAN CULTURAL HERITAGE ONLINE (SUCHO)****Quinn Dombrowski, Anna Kijas, Sebastian Majstorovic*****Цифрова культурна спадщина під ударом:
Збереження української культурної спадщини онлайн (SUCHO)******Квінн Домбровскі, Анна Кіяс, Себастьян Майстровіц***

Культурна спадщина лежить в основі війни Росії проти України, яка все ще триває через п'ять місяців після вторгнення 24 лютого 2022 року. Заяви Кремля свідчать про те, що фундаментальною метою режиму Путіна є підірвати та знищити чітку та самобутню українську національну ідентичність, культуру та мову – три поняття, які проявляються через культурну спадщину. Під час війни з таким порядком денним, міжнародно визнані рамки, такі як Гаазька конвенція 1954 року, можуть бути зруйновані, перетворивши символ блакитного щита, призначений для захисту культурних цінностей, на мішень. Хоча практики, кодифіковані Гаазькою конвенцією, створюють як можливості, так і проблеми для фізичної культурної спадщини в цій війні, найбільшою проблемою для збереження цифрової культурної спадщини є відсутність прецедентів. Збереження української культурної спадщини онлайн (SUCHO, sucho.org) розпочалося 1 березня 2022 року як реакція на надзвичайну ситуацію. Ця платформа організована трьома цифровими гуманітаріями-практиками та швидко залучила понад 1300 волонтерів. У цьому короткому есе троє співзасновників розмірковують про перші п'ять місяців SUCHO, відмінності між фізичною та цифровою культурною спадщиною, актуальність збереження цифрової культурної спадщини під час війни, і важливість цих матеріалів для майбутнього історії мистецтва.

Ключові слова: культурна спадщина, цифрова культурна спадщина, українська культура, діджитальна гуманітаристика, SUCHO.

Introduction

Cultural heritage is at the heart of Russia's war on Ukraine, still underway five months after the invasion on February 24, 2022. Statements from the Kremlin indicate that the fundamental goal of Putin's regime is to undermine and eliminate the distinct and distinctive Ukrainian national identity, culture, and language – three concepts that are manifested through cultural heritage. During a war with such an agenda, internationally recognized frameworks such as the 1954 Hague Convention can be subverted, turning the blue shield symbol meant to protect cultural property into a target. While practices codified by the Hague Convention provide both opportunities and challenges for physical cultural heritage in this war, the biggest challenge for preserving digital cultural heritage is the lack of precedent. Saving Ukrainian Cultural Heritage Online (SUCHO,

sucho.org) began March 1, 2022 as an emergency response effort organized by three digital humanities practitioners, and quickly grew to over 1,300 volunteers. In this brief essay, the three co-founders – Anna Kijas, Sebastian Majstorovic, and Quinn Dombrowski – reflect on the first five months of SUCHO, the differences between physical and digital cultural heritage, the urgency of preserving digital cultural heritage during a war, and the importance of these materials for the future of art history.

Emergency response digital humanities

Over the last decade, scholars, developers, and others involved with the broad interdisciplinary field of digital humanities have become more engaged with current social and political issues, particularly those in the United States. Through projects such as *Torn Apart / Separados* (<https://xpmethod.columbia.edu/torn-apart/volume/1/>) – which developed visualizations to document the extent and consequences of the Trump administration’s family separation policy at the border, and *Nimble Tents* (<https://nimbletents.github.io/>), which engaged volunteers in emergency mapping work in the wake of Hurricane Maria, digital humanists applied their technical skills to advocate for social change or support humanitarian relief efforts. While these projects fall outside the usual scope of research- or pedagogy-oriented activities that are more commonly the work of digital humanists, they have nonetheless gained recognition as a significant new area of focus, and an opportunity to put digital humanities tools and methods into practice in an impactful way.

SUCHO’s origins date to February 26, 2022, when Anna Kijas, a music librarian at Tufts University in Massachusetts in the United States, posted to Twitter about a “data rescue” event she was organizing on March 5th. The initial plan was to hold the event during a conference for music librarians, and to focus specifically on digitized Ukrainian collections of music-related materials (e.g. audio recordings, sheet music, etc.) In Vienna, Austria, Sebastian Majstorovic from the Austrian Center for Digital Humanities and Cultural Heritage saw the tweet, and recommended the open-source Webrecorder tool suite (<https://webrecorder.net/tools>) for the project. In California, on the west coast of the United States, Quinn Dombrowski from Stanford University was concerned that by March 5th, many important websites may already be offline or under the control of Russian hackers. Kijas, Majstorovic, and Dombrowski met with a few other colleagues on February 28th, and launched SUCHO the following day with a much larger scope: archiving as many websites related to Ukrainian cultural heritage as possible.

Why web archiving?

Images of monuments surrounded by sandbags and museum staff carrying paintings from galleries into basements vividly illustrate the labor necessary to protect cultural heritage that exists in the form of irreplaceable physical objects. Digital cultural heritage is far more removed from public consciousness, but is no less susceptible to destruction during a war. The ubiquity of high-speed internet connectivity in the developed world, and the widespread use of cloud storage that comes with it, makes it easy for people to forget about the ultimate physicality of the digital. “The cloud” and “the internet” are not things that exist unmoored from physical reality. They depend on the existence and maintenance of servers – expensive electronics that require a steady supply of electricity, cooling, and a connection to networks of physical cables that span the globe. If any of these things are disrupted – if power goes out, if cooling systems fail, if cables are severed – websites and data become unavailable. If servers are damaged or destroyed, and no backup exists in another location, the data is gone.

For more than 20 years, cultural heritage institutions around the world have invested tremendous resources into digitizing parts of their collections, presenting their holdings to their local communities, their country's diaspora, and the world more broadly. Whether they contain 3D models of sculptures, high-resolution scans of documents, or just a handful of photographs of their physical spaces along with an online catalog of their holdings, the websites of libraries, archives, and museums are a major vehicle through which cultural heritage and cultural identity are shared with local and global publics. In many cases, these websites also include a blog-like section that documents the day-to-day life of the cultural heritage organization through prose and images that capture holidays, special events, visits from dignitaries, and other noteworthy activities. Over the last 15 years, the medium for capturing these moments has shifted from the analog to the digital, meaning that the images of events and daily life on these blogs are no longer surrogates for some physical object: these memories only exist as digital files. Perhaps the images also exist in other locations – on the original photographer's phone or personal cloud storage – but the copy on the blog is often contextualized with information about the event and the participants, making it a richer resource than the same file stored in the cloud among photos of food, pets, and selfies from the photographer's phone.

The value of web archiving, then, is threefold: first, cultural heritage websites themselves are a major communicative medium of our time, for audiences local and global, and are important to preserve as a record of our contemporary era. Second, many cultural heritage websites include digital surrogates of significant physical cultural heritage objects, and ensuring those surrogates are safe is especially important when the original physical objects are at risk. And third, cultural heritage websites often include "born-digital" materials documenting the present, which should be safeguarded because they only exist in digital form, and these websites add considerable value to the image files themselves by adding context.

SUCHO's approach to web archiving

National libraries, universities, and consortia have all adopted web archiving to varying extents as a collection-development strategy, or at least as a way to ensure that their own web-based resources are documented in some form for the long term. In the context of a large institution, web archiving is almost always undertaken with a great deal of planning and preparation. Technical resources – both servers and staff – must be allocated to the task, and processes must be established for what to collect, how often to archive those sites, and how the data will be both stored and made available to users. In short, one does not simply leap into archiving as much Ukrainian cultural heritage as possible within the context of an institutional web archiving program. While the co-organizers made early inquiries in their institutional contexts at the very beginning of the project, it was clear this would not be a productive approach.

Instead, SUCHO drew on the power of volunteer-powered web archiving and organizing. Majstorovic paid out-of-pocket for the project's domain name and initial server resources, which was crucial to establishing early momentum for SUCHO. While Dombrowski was able to secure emergency grants from the Association for Computers and the Humanities (ACH) and the European Association for Digital Humanities (EADH) – the North American and European digital humanities professional associations, respectively – it was easier to make the case for funding a project that was already underway.

From the beginning, SUCHO decided to use a distributed approach to web archiving: rather than running or adopting a centralized platform for doing the archiving, volunteers would use their own laptops, servers, extra computers, or any other devices they had available to capture websites using whichever component of the Webrecorder tool suite was most comfortable for

them. Coordinators attempted to segment the submitted links by what tool would make the most sense – e.g. 3D tours would be sent to the Webrecorder browser plug-in so that volunteers could navigate through the tour and capture all the constituent images, while simple sites with little or no user interactivity would go to Browsertrix, which could navigate through all the pages in an automated fashion. This sorting proved to be too much overhead for a project operating at the speed and scale of SUCHO, and ultimately all links were added to a list to be captured using Browsertrix, with sites only moving to other tools if issues arose with the Browsertrix capture. Simultaneously, all links were also added to a list to be submitted to the Internet Archive’s Wayback Machine and – crucially – to have the Wayback Machine capture manually checked by volunteers, who could then submit any missing sub-pages to be captured.

The advantages of SUCHO’s distributed approach became evident on March 4th when a power outage at the Internet Archive made their web archiving infrastructure – which powers both the Wayback Machine and the ArchiveIt platform used by many institutions – unavailable for a large portion of the day. Particularly at the beginning of the war, when the pace of Russia’s attack and Ukraine’s defense was still unclear, the prospect of losing an entire day of work due to infrastructure downtime was unacceptable. Fortunately, even though the Wayback Machine tasks to be temporarily put on hold, archiving work continued with the Webrecorder tool suite, where there was no single point of failure. Every volunteer, wherever they were in the world, was using a slightly different arrangement of power and network connectivity. Furthermore, the widely-distributed network of volunteers, spanning from Sweden to the west coast of the United States, meant that the Slack workspace that coordinated SUCHO’s work was active around the clock, with volunteers in California going to bed just as colleagues in western Europe were logging on for the day.

Expanding beyond web archiving

SUCHO’s initial focus on web archiving had numerous advantages: volunteers could go about creating archives without having to coordinate with staff at the libraries, archives, and museums, and everything that volunteers captured was, by definition, already publicly available on the web. At least in the United States, this circumvented legal issues around copyright, as the legality of archiving public websites was affirmed by the U.S. Ninth Circuit of Appeals in the early days of SUCHO. Working with partners at the University of Alberta (Ukraine - Archives Rescue Team), SUCHO was also able to offer unlimited private storage for individuals and organizations in Ukraine, for instance, to safely store private administrative files from archives that were not part of the public web presence. Multiple institutions have received access to storage through this arrangement, and continue to upload data.

The fact that SUCHO was only able to offer support for digital or digitized documents limited the scope of its impact. Not all institutions had a robust digitization program in place before the war, and the risk to institutions’ physical collections meant that wartime digitization was one of many competing priorities. Nonetheless, as early as May 6th, we received emails from cultural heritage institutions requesting donations of digitization equipment. SUCHO was initially reluctant to get involved with physical-world logistics, as that would open up logistical and security complications that organizers were unprepared to handle while also coordinating large-scale web archiving work. But as the number of newly identified sites dwindled, SUCHO expanded its scope to include connecting cultural heritage institutions with digitization equipment and training. This initiative, led by Andreas Segerberg (University of Gothenburg) and Lars Ilshammar (Deputy National Librarian of the National Library of Sweden), in collaboration with NFDI4C, is in the process of connecting organizations with the equipment they have requested, while volunteers

prepare and translate instructions for high-quality digitization. The Swedish Academy has funded multiple high-end pieces of equipment for the project, with additional support coming from Amazon Web Services. Another SUCHO sub-project, a [gallery](https://gallery.sucho.org/) (<https://gallery.sucho.org/>) curating particularly striking finds from the web archives that volunteers have created, also serves as a fundraising venue for more digitization equipment. The band Pearl Jam donated some of the proceeds from their charity concert for Ukraine to SUCHO's digitization equipment fund through their Vitalogy Foundation, and Amazon Web Services has been another major donor.

While the web archiving, digitization equipment, and gallery fundraising initiatives have been focused on Ukrainian cultural heritage institutions, another project is collecting memes with an eye towards scholars and a future Ukrainian national digital library. Memes – created by ordinary people who combine familiar templates or news images with often-humorous commentary on current events – tell the story of the moment, documenting the churn of news cycles and shifting ground of battles waged both through military and media. Memes are often visually arresting, and draw on language- and culture-specific references, making them compelling pedagogical tools in addition to their documentary value. Anna Rakityanskaya (Harvard University) has been organizing a team of volunteers that has been capturing memes primarily in English and Ukrainian, and enriching the images with metadata and a transcription of the text. The memes are viewable as part of the SUCHO “meme wall” (<https://memes.sucho.org>) and will be made available as a downloadable data set, for use in future teaching and research.

Next steps

SUCHO's work is not over until the Ukrainian cultural heritage sector is in a position to rebuild, and we can work to reunite librarians, archivists, and museum staff with any data lost during the war. In addition, we hope that the archives we have created can serve as an inventory of the holdings of these institutions before the war, and be used in prosecuting war crimes against cultural property in violation of the 1954 Hague Convention. While the size of our active volunteer pool grows and shrinks with the news cycles, the co-organizers and a cadre of long-term volunteers remain committed to the cause, however long it takes. We hope that SUCHO not only plays a role in protecting Ukraine's digital cultural heritage, but that it can serve as a model for a more expansive view of wartime cultural heritage protection that gives digital materials the same standing as physical objects, wherever the next crisis emerges.

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Key words: *cultural heritage, digital cultural heritage, Ukrainian culture, digital humanities, SUCHO.*

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