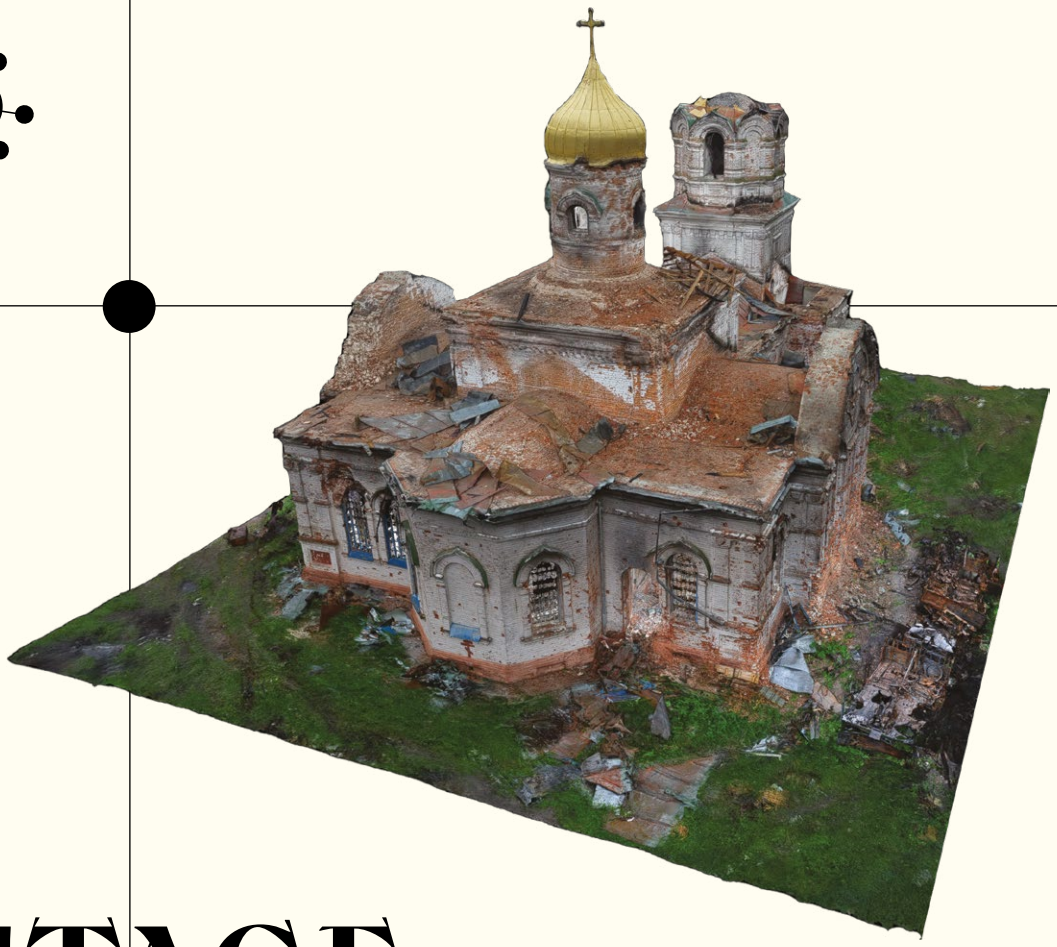
hemo
Ukrainian Heritage Monitoring Lab



HERITAGE MONITORING FOR RESTORATION

Report on the results of projects documenting the loss of cultural heritage

Lviv-Kyiv-Kharkiv

2023

HERITAGE EMERGENCY RESPONSE INITIATIVE UA ШТАБ ПОРЯТУНКУ СПАДЩИНИ
ТУСТАНЬ
WORLD MONUMENTS FUND
Cultural Emergency Response
Smithsonian Cultural Rescue Initiative
Cultural Heritage Monitoring Lab
PENN CULTURAL HERITAGE CENTER

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Video: Justice. Preservation. Restoration.
Heritage monitoring UA

www.youtube.com/watch?v=KepR-nUzt2E

HeMo collects up-to-date heritage data, links it to the register of monuments and museums, saves it to a database created according to international standards and an infrastructure approach, and makes it available to beneficiaries (e.g., ministries, regional administrations, architects, donors, and military and special services and societies) on the heritage.in.ua platform. Such an infrastructure of verified data is needed to support the restoration of objects, return of stolen artifacts, criminal proceedings against Russia, and presentation, popularization, and management of Ukraine's heritage.

We engage and train experts and activists to use the monitoring tools we have created so that the Ukrainian heritage community can take care of the vulnerable beauty of our past, preserved in monuments and museums.

Throughout the war, Russia has attacked Ukraine's cultural heritage. This has exposed the systemic problems that prohibit us from fully responding to the destruction, and it also galvanizes us to take immediate action and assume a full presence on the international stage.

Over the course of six months, multidisciplinary teams of specialists conducted dozens of expeditions in the Chernihiv, Sumy, Kyiv, and Kharkiv regions to document the damage to Ukrainian cultural heritage caused by the Russian invasion. The teams photographed the damage, documented the losses according to the methods developed by the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM), and collected eyewitness accounts and evidence of crimes against culture according to the methods developed by the Smithsonian Cultural Rescue Initiative (SCRI), including carrying out the necessary aerial photography and laser scanning for 3D models.

The purpose of this report is to publicize the results of documenting the loss of heritage to support its stabilization and restoration. The report is designed for the partners who made the project possible and continue to support it, as well as for those who document, collect, and store data on heritage and loss; who will use the data and methodology, make policy, and need access to reliable data; and for everyone who is interested in partnership and cooperation.

«Today there are many initiatives that monitor the cultural losses of the war. Our first contribution to this important work is the results «from the field», where the destruction is verified and documented «on the ground», with our own eyes. However, we not only document, but also structure, the chaos. We have created an information system in which we organize and store data in the absence of official machine-readable heritage registers and amid the disorganization and duplication of data. Our ultimate goal is to be united by our heritage, not just by the hatred for our common enemy. Heritage can help us to heal the wounds from the war, reconnect with our roots, enjoy beauty, and gain strength.

It is important to share the cultural heritage that the totalitarian regime has hidden from us and to make it available in the future to all Ukrainians, as well as to the world—to our children,» says Vasyl Rozhko, the founder of HeMo and the head of Tustan NGO, about the idea behind the initiative.

The application of the collected information is quite broad, ranging from the creation of restoration projects to adding evidence to cases for the International Criminal Court. Equally important is the contribution to our cultural heritage monitoring information system, which HeMo launched as a result of our documentation expeditions and will be useful to all those working in the field.

This war, imposed by Russia, is waged against our identity, history, and property. It is a war on our heritage. Therefore, our ultimate goal is a new role for and understanding of heritage in Ukrainian society, and as a result, the careful management of it. We have the opportunity to preserve and share our endangered material culture for our children and the whole world.

WHO ARE WE?

Vasyl Rozhko

Ihor Poshyvaylo and I founded the Heritage Emergency Response Initiative (HERI) on the evening of March 3, 2022, to respond to the destruction of heritage during the war, as well as to prepare for postwar recovery. By the morning of the following day, we had managed to assemble a team with the same composition as the Museum Security Headquarters in 2014, when I worked at the Ministry of Culture as the head of the museum affairs department. Subsequently, the Ministry of Culture and Information Policy approved a working group on the preservation of cultural heritage during martial law. HERI is an umbrella initiative that includes the following museum institutions: Tustan (Tustan NGO, Tustan State Historical and Cultural Reserve) and the Maidan Museum (National Memorial to the Heroes of the Heavenly Hundred and Museum of the Revolution of Dignity, Maidan Museum NGO).

Initially, HERI was involved in many activities: mapping the losses, building a response network, helping museums and museum workers, coordinating the logistics of packing materials and equipment supplied to museums by international partners, assisting with evacuations, training professionals, and establishing partnerships with international cultural heritage organizations.

The first resources provided for HERI's initial response were the pre-war funds granted to Tustan NGO ($10,000) from the Prince Claus Fund for Culture and Development, Cultural Emergency Response (CER)—which soon allocated funding for the full launch of all HERI activities. Since its headquarters were not originally registered as an institution due to martial law, HERI's project and financial operator functions were performed by Tustan NGO (see the detailed reports on Tustan NGO's website).

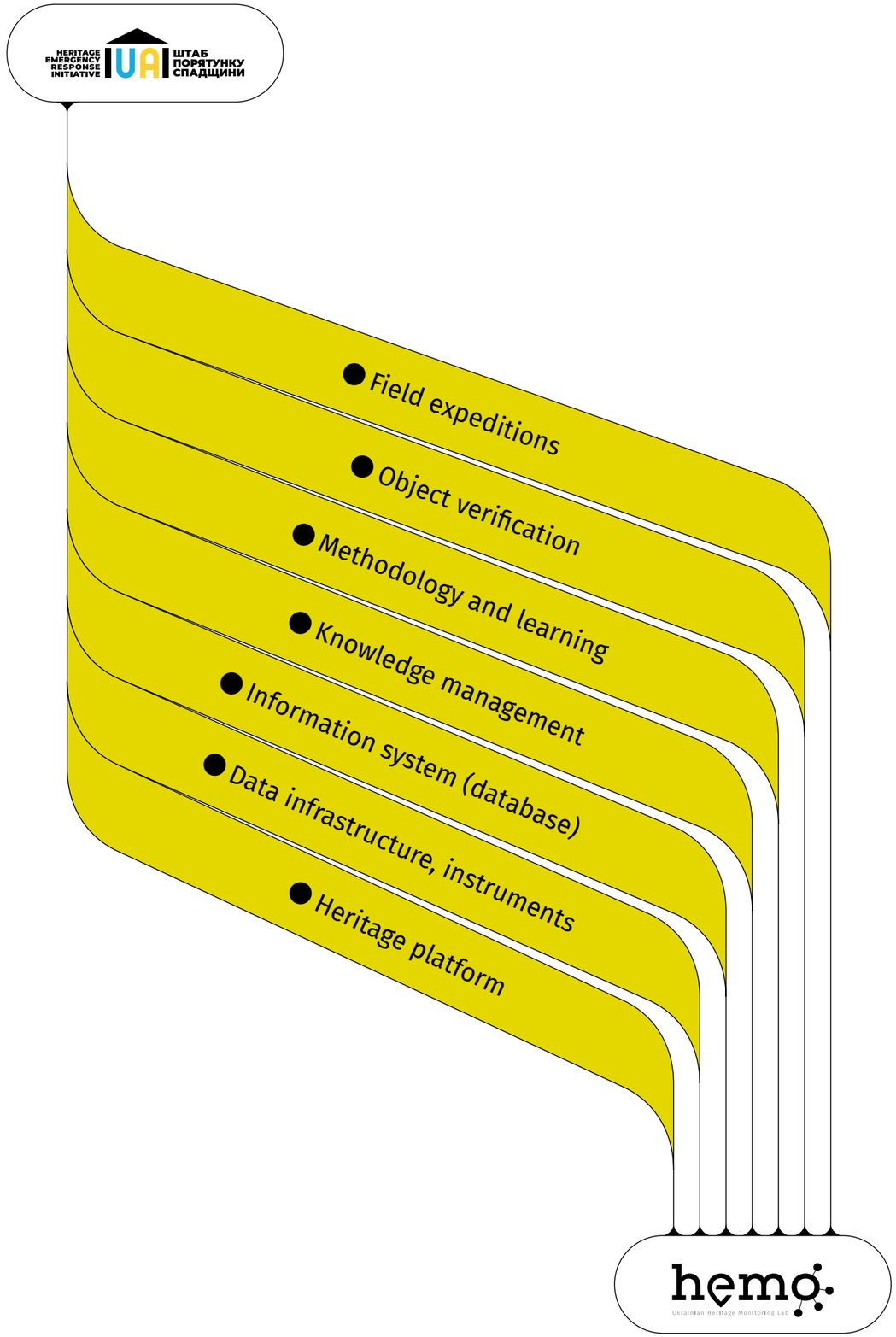
HERI's loss documentation expeditions began with the rescue and 3D documentation of the legendary rooster locker from Borodyanka on April 28, 2022. Documentation of the church in V'yazivka followed, as well as of objects in Kharkiv and the Chernihiv region. Expeditions have become difficult and complex, from collecting and verifying information to documenting the loss of cultural heritage for its restoration and related criminal proceedings.

As a result of working meetings with UNESCO and the State Register of Cultural Heritage (MCIP), our concept of the data infrastructure was born and created with the intent to collect data on Ukrainian heritage based on current international standards.

The leadership course for cultural heritage managers in difficult circumstances, held by SCRI and CER in the fall of 2022 in the Netherlands, helped us to narrow our focus and move from doing everything to monitoring heritage and creating an information system.

This is how the idea of the now-integral Ukrainian Heritage Monitoring Lab (HeMo) arose, which the team supported and began to implement.

The results of six months of such focused activities, including developing the information system and methodology, were presented at the «Heritage Monitoring for Recovery» reporting conference on loss documentation on April 27, 2023, and are summarized in this report.



TEAM:

Vasyl Rozhko
Lviv
Ph.D. in Architecture, MBA, team leader
Strategy, organizational development, partnerships, fundraising, project management

Mariya Zadorozhna
Kyiv
Art historian, expedition leader
Coordination of research and interaction with beneficiaries

Vladyslav Pioro
Kyiv
Leader in the digitalization of heritage
Development and evolution of the information system and data infrastructure

Andriy Yamelynets
Lviv
Leader of the direction of geographic information systems
Creation and visualization of geospatial data analysis

Nataliya Rak
Lviv
Ph.D. in Economics, co-coordinator of the project office
Implementation and development of research methodology, financial management

Oksana Fitel
Lviv
Co-coordinator of the project office
Information support, communication with partners, preparation of reports

Yuliya Prus
Lviv
Coordinator of field teams
Logistics support and interaction with beneficiaries

Valeriy Mishchenko
Bila Tserkva
Architect-restorer, leader of the expedition teams
Architectural documentation, analytics

Ivan Shchurko
Lviv
Architect-restorer, leader of damage monitoring and data verification
Restoration of damaged monuments, data refinement

Roksolana Makar
Kyiv
Art historian
Collection of eyewitness testimony, documentation for forensics

Zoryana Pohranychna
Drohobych
Photographer
Photographic documentation for stabilization and recovery

Roman Myska
Lviv
Ph.D. in History, coordinator of the finance department
Financial project management

Halyna Olshevska
Lviv
accountant
Accounting support

Matviy Pohranychnyi
Drohobych
Photographer
Photographic documentation for forensics

Serhiy Revenko
Kyiv
Architect
Architectural documentation, photographic documentation, aerial photography

Nataliya Dvornikova
Kharkiv
Architect
Processing and entering data into the information system

Kateryna Solomina
Kharkiv
Photographer
Photographic documentation for stabilization and recovery

Illya Litvinchuk
Lviv
Architect-restorer
Monitoring and verification of data on episodes of damage to monuments

Yuliya Frolova
Lviv
Architect-restorer
Monitoring and verification of data on episodes of damage to monuments

Taras Bochulyak
Lviv
Technical support

Anastasiya Oleksiy
Kyiv
Art historian
Planning and organization of expeditions, data entry into the information system

Viktor Dvornikov
Kharkiv
Architect-restorer, leader of the regional teams in the Kharkiv region
Architectural documentation, photographic documentation

Vasyl Myronenko
Kharkiv
Photographer, drone operator
Aerial photography, photographic documentation for forensics, stabilization and recovery

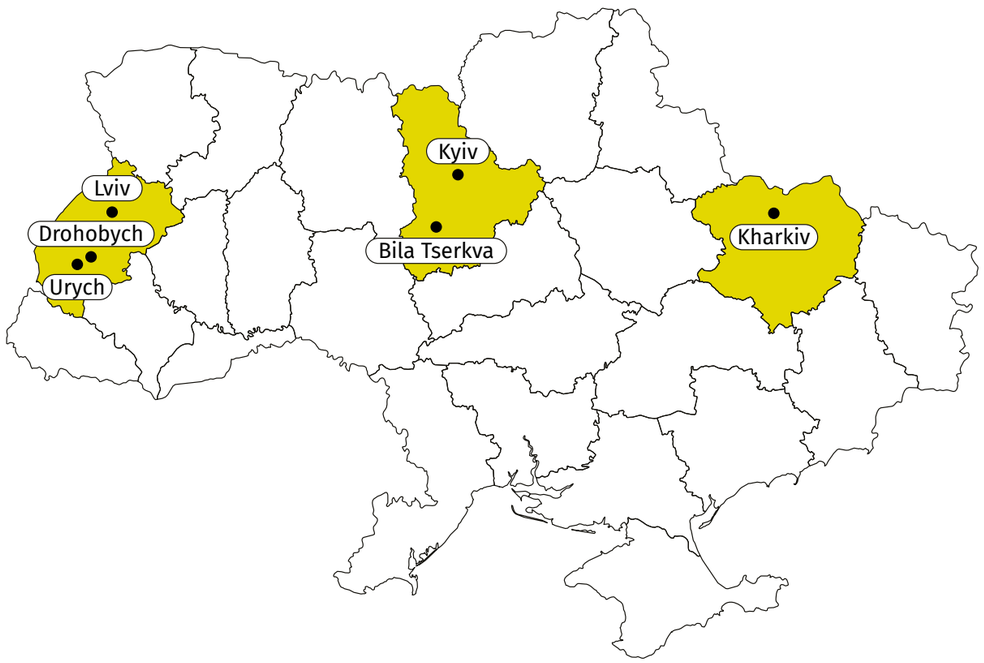
Valentyna Yefimova
Kyiv
Culturologist
Monitoring and verification of data about the robbery of museums

Nataliya Ryazanova
Lviv
Ph.D. in Architecture, architect-restorer
Monitoring and verification of data on episodes of damage to monuments

Ihor Shabat
Lviv
Technical support, cloud storage

Yuriy Honek
Lviv
Development and maintenance of the geographic information system

GEOGRAPHY OF THE TEAM



INSTITUTIONS INVOLVED

«Tustan» Lviv Regional NGO
Lviv
www.tustan.org.ua

«Tustan» State Historical and Cultural Reserve
Village of Urych, Lviv region
www.tustan.ua

NGO Ukrainian Center for the Development of Museum Affairs
Kyiv
www.facebook.com/ucrms

Cultural Institution «Mizhvukhamy»
Kyiv
www.mizhvukhamy.com

Institute of Geographic Information Systems
Lviv

NGO Urban Development Platform
Kharkiv

Department of Architecture and Restoration of Lviv Polytechnic National University
Lviv
lpnu.ua/atr

OUR RESULTS

REPORT ON THE RESULTS OF SUCH PROJECTS

Assessment of losses of cultural heritage objects of Kyiv, Chernihiv, and Sumy regions» with the support of the World Monuments Fund, 1.10.2022–31.03.2023

«First aid to cultural heritage in Ukraine, II stage» forensic documentation of the Kharkiv region, development of the geographic information system and database, and creation of methodology, with the support of the Smithsonian Cultural Rescue Initiative and Cultural Emergency Response, 1.10.2022–31.03.2023

PARTNERS

Cultural Emergency Response (CER)
www.culturalemergency.org

Smithsonian Cultural Rescue Initiative (SCRI)
www.culturalrescue.si.edu

World Monuments Fund (WMF)
www.wmf.org

Cultural Heritage Monitoring Lab, Virginia Museum of Natural History (CHML)
www.vmnh.net/research-collections/chml

Penn Cultural Heritage Center, Penn Museum
www.penn.museum/sites/chc

PRODUCTS

Field expeditions

Data infrastructure and instruments

Information system HeMo

Verified lists of objects, cleaned of duplicates

Expedition field data entered into the database

Developed methodology and recommendations

Experience and expertise

A team prepared for scaling and challenges

RESULTS

6
months of expeditions

27
team members

>1,100
hours of synchronized meetings

4
regions

43
expeditions

445
explored objects

106
ICCROM forms

9
3D models

18,010
photos

700
verified objects

HOW HAVE WE DONE THIS?

HeMo had to conduct expeditions under the conditions of the highest uncertainty: developing, mastering, and adapting methods, a lack of up-to-date and machine-readable lists of losses and heritage objects, problems of coordination and interaction with collaborators, and hardships such as winter, bad weather, shelling, and blackouts. It was necessary to take small steps and keep the broader goal in sight, constantly synchronizing while taking care of the health and safety of our «team in the field». Organization, personal learning, common purpose and values, caring for ourselves and others, and trust: This is how the team grew.

In general, two types of teams worked in the field: local (Kharkiv) and mobile. The initial hypothesis was simple: We will plan everything and quickly check and start the process, including the selection of objects, detailed expedition, desk audit, and loading data into the database. But in reality, the process does not work like that. When we arrived at the selected cultural objects, some of them had already been partially (or completely) restored, with no visible signs of damage. Then another type of expeditions arose—verification expeditions to quickly examine a large number of objects and decide which ones should be recorded in detail. At the same time, database tools grew and developed, gradually structuring the chaos. It was necessary to verify lists where a physical object could be duplicated, have five to six different names, or have no coordinates, or to link objects to the status of a landmark.

This is how a comprehensive methodology emerged and took shape, more widely presented at the reporting conference on loss documentation «Heritage Monitoring for Recovery» on April 27, 2023. The team has gained incredible experience that it is ready to share in order to expand the capacity of the professional community to document the losses and preserve memory (write to info@heritage.in.ua for more information). We will disseminate detailed practical recommendations for architects, civil servants, and local authorities through professional events, on the website, and in social networks.

DOCUMENTATION PROCESS

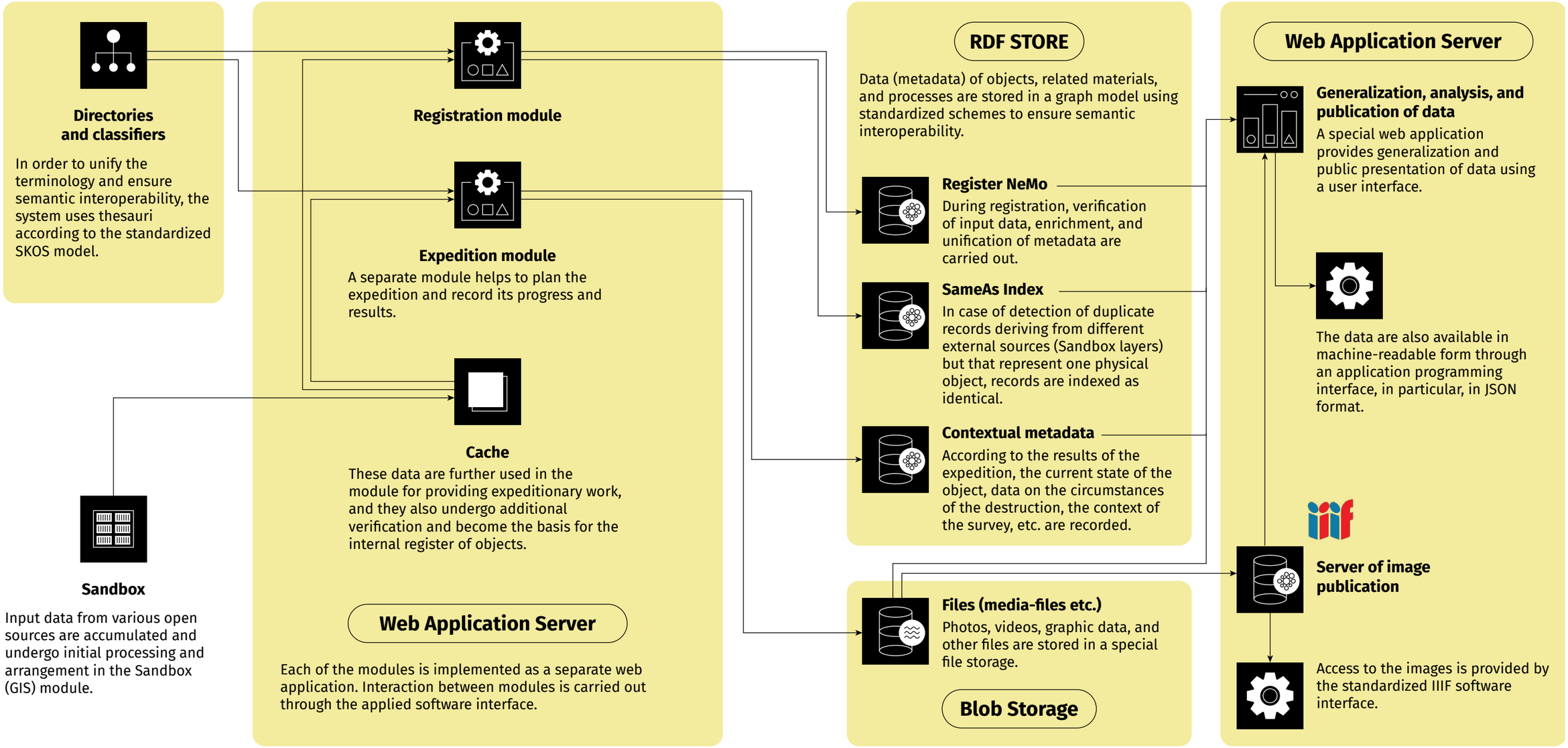
1. Selection of damaged objects
2. Clarification and data verification
3. Preparation of expeditions
4. Quick expedition for status verification
5. Documentation according to the ICCROM methodology
6. Desk audit
7. Entry into the database

INFORMATION SYSTEM (DATABASE)

After the expeditions, the team completes desk audits and fills out the corresponding forms. Next, all the results (photographs, 3D models, and documentation) must be stored in a structured and secure manner for use. For this, the HeMo information system (database) was created. All data are uploaded here and linked to a specific object (museum or monument).

The web platform www.heritage.in.ua was created for public use and data exchange. Materials on the platform are available under the Creative Commons Attribution 4.0 International (CC BY 4.0) license. The platform is constantly updated and developed.

To make working with the information system more convenient, a number of tools have been created that are constantly being improved, including the expedition planner, verification and registration modules, and thesauri. In order to ensure interoperability—the ability to interact with other resources, publish data, and easily exchange them—an infrastructural approach (see p. 15) and international standards were used to create the database. We focus on open solutions and formats; publication of data in a machine-readable form; working with data on the basis of Linked Data / Linked Open Data; import and export of data in RDF format; metadata standards (CIDOC CRM, EDM, CARARE, etc.); and thesauri (SKOS). This approach allows users to not only comprehensively process all available data on objects, but also to understand the way they appeared, the author, and the history of development.



GEOGRAPHIC INFORMATION SYSTEM

Before each expedition, HeMo must select war-damaged objects for examination. Currently, there is no single platform that provides reliable up-to-date data on heritage losses, nor are there any machine-readable registers of immovable heritage or museums. Therefore, HeMo collects the objects of all available lists from open sources through a geographic information system (GIS). GIS is a database for working with spaces, maps, and locations; it is one of the components of HeMo's internal information system. GIS is used for primary data processing, as well as for analysis, cartography, and logistics tasks.

WHERE WE GET INFORMATION FOR GIS ABOUT DAMAGE TO CULTURAL HERITAGE OBJECTS:

569 Recorded war crimes according to MCIP data (https://culturecrimes.mkip.gov.ua)

488 Potential damage (Cultural Heritage Monitoring Lab)

50 Damages according to Regional Military Administration (RMA) (Sumy, Chernihiv RMA)

95 Damage to the city of Kharkiv (public initiative led by Viktor Dvornikov)

INFORMATION (REGISTERS) ABOUT CULTURAL HERITAGE OBJECTS:

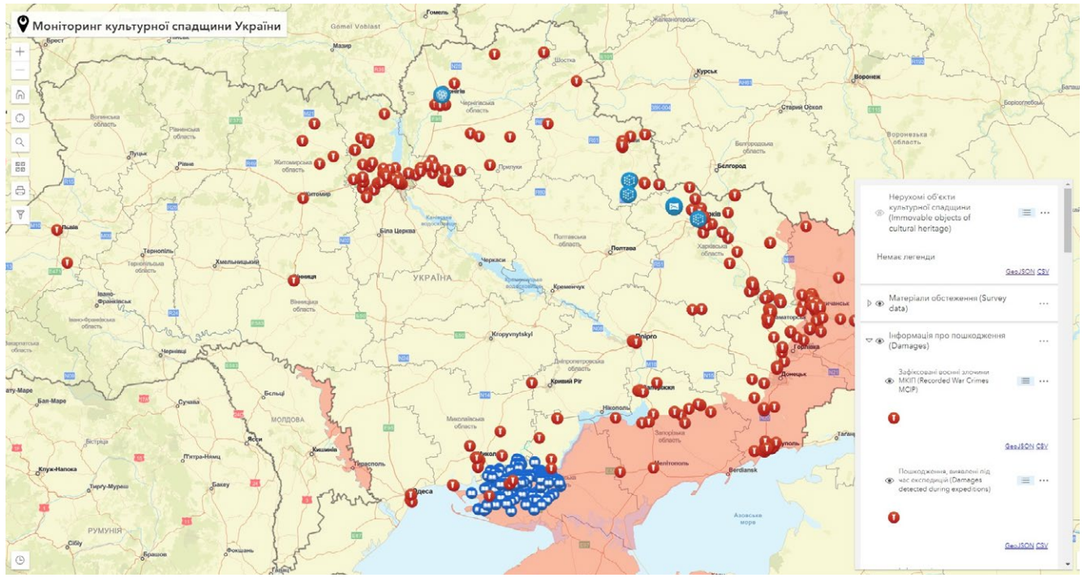
18 986 State Register of Immovable Monuments of Ukraine (http://mkip.gov.ua)

16 UNESCO World Heritage Sites in Ukraine

2 531 Museums

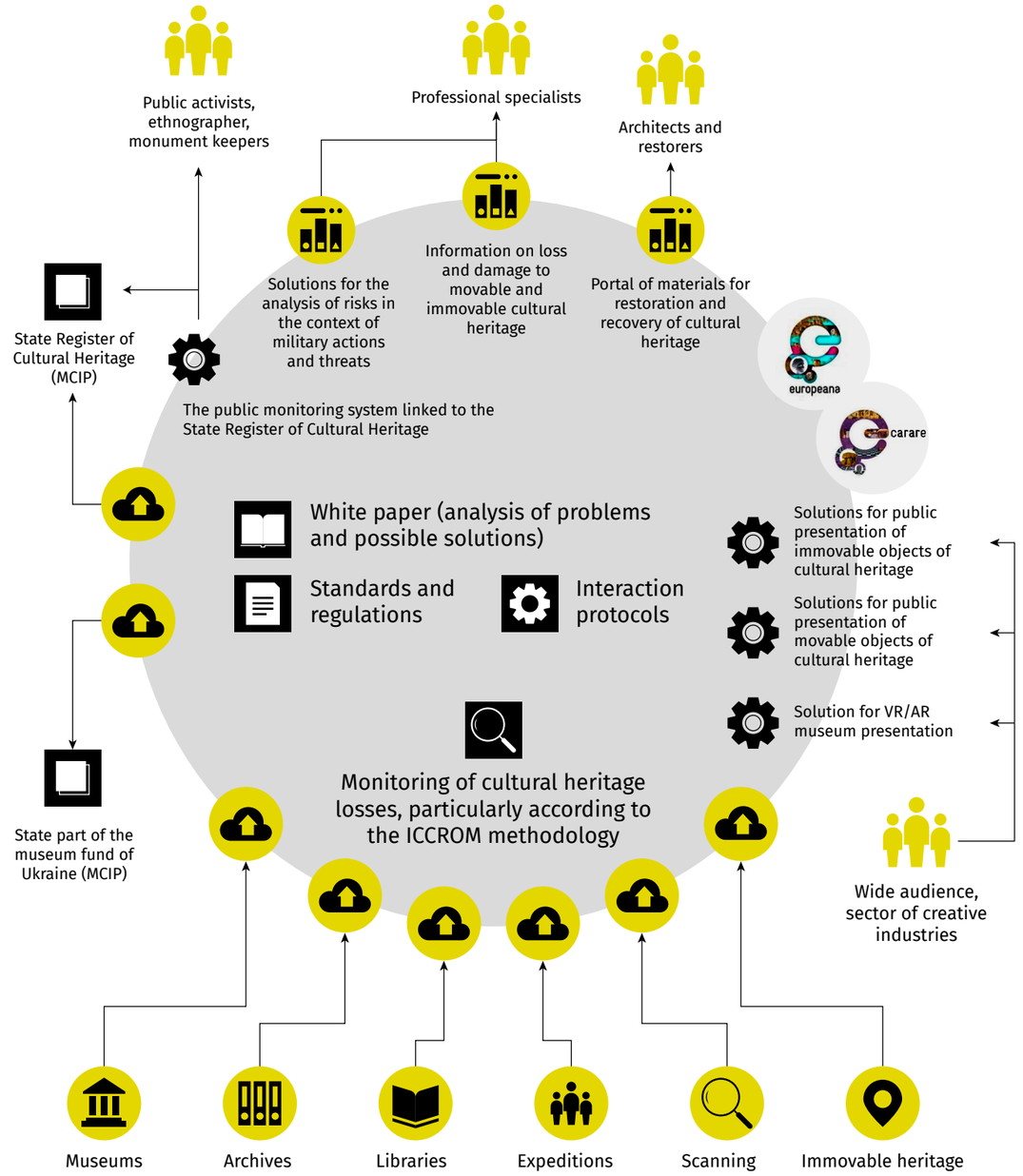
2 254 Wooden churches

401 Historical inhabited places



DATA INFRASTRUCTURE

The complex problem of digitization in Ukraine can be solved only through a systemic infrastructural approach: rules and standards, authoritative sets of data and metadata, technical software, organizational structure, and human resources. This will allow not only the digitization of heritage, but also the integration of different resources and datasets.



METHODS OF DOCUMENTING LOSSES FOR RECOVERY

The final list of objects for field surveys was formed according to the following criteria: The object belongs to the monuments of cultural heritage (or at least cultural infrastructure); the value of the monument; a significant degree of damage according to preliminary data; the need for field verification of damage data; and availability for security and logistics reasons.

The documentation uses a damage assessment methodology jointly developed by the flagship program of the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) on First Aid and Cultural Heritage Resilience in Crisis, in partnership with the National Museum of the Revolution of Dignity and the Heritage Emergency Response Initiative (HERI).

The method is intended for quick visual assessment of damage to individual buildings. The data help identify significant and moderate physical damage, assess risks that can potentially increase losses, and plan immediate measures to preserve and stabilize heritage sites in situ. Such an assessment helps determine the time, financial, and human resources needed to provide first aid to cultural heritage. The ICCROM forms filled out by the team for the processed objects can be downloaded from www.heritage.in.ua.

Additionally, due to the uniformity of such documentation, it is possible to get a general picture and group objects according to the severity of losses and other characteristics.

Minor damage

Minor structural damage, moderate non-structural damage

Triumphal Arch, Novhorod-Siverskyi

Moderate damage

Moderate structural damage, severe non-structural damage

House of the Firemen Society, Chernihiv

Heavy damage

Significant structural damage, very serious non-structural damage

K. D. Ushynskyi State Lyceum, Novhorod-Siverskyi

3D MODELING

Our documentary expeditions began with 3D modeling of a locker with a rooster in Borodyanka. The first method was photogrammetry based on the results of photography from a drone. Laser scanning was performed on complex destroyed objects, where interiors are important as well.

The 3D model allows HeMo to produce any necessary drawings of the building for project work.The «smart» design using HBIM-modeling methods is especially helpful to the architect-restorer (more details in the report of Dr. Bruno Deslandes at the link, 4h 28m 47s: https://www.youtube.com/watch?v=X6jzlj9bgUU).

A church in the village of V'yazivka (see images) is a prime example of HeMo's use of 3D modeling. In the spring of 2022, a photogrammetric 3D model was made, in the fall – a detailed laser scan. By putting the models together, it was possible to monitor the dynamics of destruction and damage to the dome. However, while the method and cost of rescue were being discussed, the church collapsed, and its detailed 3D model is the only thing left.

3D models made in expeditions are also available on the platform.

RESULTS OF EXPEDITIONS

Chernihiv Region

One of the key historical Ukrainian regions, dating as early as the ninth century, and one of the centers of Kyivan Rus. Hundreds of monuments from the earliest times of Ukrainian statehood, ancient settlements, medieval Cossack regimental towns, and extremely valuable archaeological and architectural heritage.

32

Documented

DEGREE OF DAMAGE

23	2	5
Minor	Moderate	Heavy

Sumy Region

Home to most of the monuments of the Ukrainian (Cossack) Baroque, which arose in the seventeenth to eighteenth centuries and are a synthesis of local architectural traditions and features of the European Baroque. Heritage objects of various historical periods and styles were destroyed and devastated, but these monuments, which are unique and specific to the Sumy and Chernihiv regions, testify to the scale and level of development of the Ukrainian Cossack state.

20

Documented

DEGREE OF DAMAGE

7	5	6
Minor	Moderate	Heavy

1

Destroyed

Kyiv Region

Kyiv was the central target of the invaders in February 2022, but due to the rapid liberation of the occupied territories, the cultural heritage of the northern part of Kyiv region suffered the most from the anger and aggression of the Russians. Dozens of modern sacred objects suffered significant destruction as well, and museums were looted and burned.

46

Verified

11

Documented

Kharkiv Region

Unique sacral architecture, residential buildings in the historic style of the second half of the nineteenth century, bright examples of modernism and constructivism (in particular, the «Derzhprom» complex), majestic historical urban and industrial complexes, and unique monuments of Ukrainian architectural modernism. The destruction is significant. Kharkiv, like the entire region, continues to be subjected to systematic and brutal shelling and bombing.

326

Verified

52

Documented

CONCLUSIONS

WHAT HAS BEEN DONE?

For six months (October 2022–March 2023), 445 objects were examined in 43 field expeditions to four regions, of which 106 were examined in depth. Data from the field research have been processed and entered in a database and linked to the monuments to which they relate. Tens of thousands of cultural heritage objects and the data of losses are collected in the geographic information system at different layers, which are verified and cleaned of duplicates using specially created tools. Open data are published on the www.heritage.in.ua platform.

WHAT SHOULD BE DONE NEXT?

In terms of documentation, many losses still need to be documented in Kharkiv. In comparison, Chernihiv, Sumy and Kyiv region have been surveyed almost completely. Thanks to the completed ICCROM forms, HeMo has a general understanding of the volume and degree of destruction. As a result, it is possible to target the stabilization of objects or design their restoration. If necessary, specialized in-depth studies can be carried out individually. In addition, it is necessary to carefully approach the cleaning of rubble (there may be valuable historical objects) and think about memorialization or museification of the destroyed heritage, as well as its socialization—conveying its value to society.

LESSONS LEARNED

The experience of the team members in the field of heritage, as well as work in wartime, allows us to see the broad picture of the data in the field. The methodology and experience of our initiative were presented in detail at the reporting conference, the video recording of which is available at this link.

Experience gained and a comprehensive methodology for documentation expeditions allow teams to be trained quickly and collaborate to scale. The HeMo team is ready to share its methodology and advice and to actively engage in partnerships.

WE OFFER A SOLUTION:

To co-develop a heritage data infrastructure based on international standards to take full advantage of the immersion, interoperability, machine-readability, and other benefits of the digital world. To help, we create tools and invite everybody to cooperate.

hemo
Ukrainian Heritage Monitoring Lab

HeMo is a platform of reliable data about Ukrainian heritage, created for its community

You can view surveyed objects and download data from the heritage.in.ua database

Follow our next events and projects on the HeMo Facebook page

Join our community of experts and receive regular newsletters

Contact for methodical consultations or about partnership:
info@heritage.in.ua

The report was worked on by:

Vasyl Rozhko
Mariya Zadorozhna
Vladyslav Pioro
Andriy Yamelynets
Nataliya Rak
Oksana Fitel
Valeriy Mishchenko
Ivan Shchurko
Viktor Dvornikov
Yevheniya Nesterovych

Design and layout – remarker

Heritage Rescue Headquarters
www.facebook.com/HERI.Ukraine

«Tustan» NGO
www.tustan.ua
www.tustan.org.ua

Cultural Emergency Response
www.culturalemergency.org

Smithsonian Cultural Rescue Initiative
www.culturalrescue.si.edu

World Monuments Fund
www.wmf.org

Cultural Heritage Monitoring Lab. Virginia Museum of Natural History
www.vmnh.net/research-collections/chml

Penn Cultural Heritage Center, Penn Museum
www.penn.museum/sites/chc

2023