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Libraries under Fire: Evaluating Legal Situations and Digital Protections in Modern Warfare: A Case Study of Ukraine

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ABSTRACT

Libraries serve as the baseline infrastructure of national identity, making them strategic targets for cultural cleansing libricide during total war. Examining the Russo-Ukrainian War (2022–2026), this study highlights the failures of international frameworks like the 1954 Hague Convention against modern warfare. While Ukraine's macro-level Infrastructure Attrition Rate sits at 2.02%, front-line regional facility losses soar between 30% and 50%. To counter kinetic destruction and ideological purges, Ukraine implemented a dual-track survival strategy: combining local grassroots efforts (physical fortification and mobile suitcase libraries) with state-backed digital alliances (partnering with SUCHO to secure 50+ Terabytes of data in the cloud). This case demonstrates how modern library science can transition vulnerable physical assets into resilient, decentralized data repositories to preserve sovereign knowledge during military conflict.

Keywords: Libricide; Infrastructure Attrition Rate; Cloud Migration; SUCHO; Wartime Library Science.

1- Introduction

Libraries and archival systems are more than physical repositories; they are the baseline infrastructures holding a nation's collective identity, historical records, and sovereign information space. In periods of total war, however, they are often transformed into strategic targets. The destruction of libraries during wartime historically termed *libricide* or *biblioclasm*. The term *libricide* Coined and popularized by library historian Rebecca Knuth, libricide does not refer to accidental losses during a fire or standard war collateral damage. It implies a deliberate intent to murder a culture by erasing its records. It is a form of cultural genocide, where an aggressor target-bombs or torches a library specifically to eliminate a community's history, language, and shared identity. Whereas the term *biblioclasm*, includes the massive destruction of libraries during wartime, it also encompasses smaller, localized acts – such as a

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single regime publicly burning a specific stack of banned books in a town square, or an individual ripping up a text out of religious or political anger.

The targeting of documentation centres and libraries is rarely accidental; it frequently functions as an act of “cultural cleansing” aimed at erasing an independent nation’s unique historical narrative. The systematic dismantling of library networks, archives, and educational backbones aims to fracture the psychological continuity, linguistic heritage, and sovereign memory of a population (Gosart, 2024; Heleta, 2025). By destroying a nation’s libraries, an enemy tries to erase that nation’s history and claim they never really existed.

On February 24, 2022, a war was outbreak between Russia and Ukrainian, it is a multi-layered geopolitical crisis war causes destruction to libraries, and it is still going on therefore, this paper shows how international laws fail to protect libraries during war, using Ukraine’s response to bombed infrastructure as a case study. By examining how Ukraine quickly shifted to scanning books, archiving websites, and using cloud storage, this study explains how modern library science can create automated digital backups. These safety nets ensure a nation’s knowledge survives even if its physical buildings are destroyed.

2- Literature review

Tracing of destruction of libraries due to war crimes reveals a recurring pattern where repositories of knowledge become major casualties of military conflict. Here arranging the crimes against libraries in chronological order.

1761 BC (*The Library of Zimri-Lim, Mari*): The earliest documented instance occurred during the Bronze Age when King Hammurabi of Babylon torched the city of Mari, destroying the Library of Zimri-Lim (Parrot, 1953). Though the palace archive was levelled, the intense heat accidentally baked and preserved its thousands of cuneiform tablets for modern recovery.

612 BC (*The Library of Ashurbanipal, Nineveh*): Over a millennium later, a second major structural catastrophe occurred when the monumental Library of Ashurbanipal in Nineveh was buried under ruins during the imperial capital’s fall to an allied coalition of Babylonians and Medes (George, 2020).

48 BC (*The Great Library of Alexandria, Egypt*): The most culturally resonant wartime loss in history remains the burning of the Great Library of Alexandria. Unlike the deliberate targeting of the Mesopotamian collections, a massive portion of Alexandria’s irreplaceable scroll repository was accidentally consumed by fire during Julius Caesar’s naval siege (El-Abbadi, 1992). Trapped by enemy forces, Caesar ordered his fleet to be set ablaze, but the fire spread uncontrollably from the dockyards to the city’s literary quarters.

262 AD (*The Library of Celsus, Ephesus*): This destructive pattern continued into the common era when a Gothic invasion devastated Asia Minor, torching and ruining the famous Library of Celsus in Ephesus and leaving only its iconic front facade standing (Denker, 2025; Parsons, 1989).

1193 AD (*Nalanda University Library, India*): In the medieval period, the conquest by Bakhtiyar Khalji’s forces resulted in the burning of the legendary Nalanda University Library, known as Dharmaganja, which served as the grandest repository of Buddhist and Vedic knowledge in the ancient world (Kalpalatha, 2020; Suvimalee, 2021).

1914–1992 (*Twentieth-Century Conflicts*): The vulnerability of libraries persisted into modern warfare, heavily categorized under the academic frameworks of state-sanctioned libricide and physical biblioclasm (Hoeniger, 2024; Knuth, 2007). This era was marked by the deliberate German burning of Belgium’s Library of Louvain in 1914 (Hoeniger, 2024), the massive book losses across Britain and Germany during World War II aerial bombings, and

the catastrophic 1992 Serb incendiary shelling that targeted and destroyed the National Library of Sarajevo (Knuth, 2007).

3- Objectives

The present study deals with the following objectives:

- 1- To analyse why international laws, fail to protect libraries from being bombed during modern wars.
- 2- To find the numbers of libraries and books have been damaged, destroyed, or stolen in Ukraine.
- 3- To evaluate the number of regions libraries affected due to the war.
- 4- To estimate the Infrastructure Attrition Rate to calculate regional facility losses.
- 5- To identify what strategies how Ukraine's government and librarians adapted to protect the libraries.

4- Methodology

This study uses a mixed-methods case study design to evaluate the survival of library networks during armed conflict, focusing on the Ukrainian system from 2022 to 2026. The methodology combines qualitative policy analysis—reviewing the 1954 Hague Convention, government field decrees, and open-source cloud migration logs—with quantitative tracking of satellite-verified damage data from UNESCO and the Ukrainian Ministry of Culture. To measure the impact of war on cultural infrastructure, the research applies mathematical metrics, including an infrastructure attrition rate formula to calculate regional facility losses and a modified. By cross-verifying data across multiple independent sources and maintaining strict security safeguards regarding live data servers, this framework provides a reliable, dual-track analysis of how public library networks transition from vulnerable physical buildings to resilient, cloud-based data repositories.

5- Data analysis and interpretation

5.1- *Failing of international laws, to protect libraries:*

Here is the breakdown of why international laws fail, organized into a clear, scannable table for your study.

Table 1: Structural Flaws and Operational Failures of Cultural Property Law regarding Wartime Libraries.

Failure Category	Legal Concept / Tool	Operational Flaw (Why it Fails in Reality)
The Legal Loophole	Imperative Military Necessity (Article 4, 1954 Hague Convention)	If an army claims the enemy is using a library for military purposes (like housing soldiers), its civilian protection is instantly cancelled. Commanders routinely abuse this excuse to justify attacks.
Technological Backlog	The Blue Shield Emblem (Physical warning symbols)	Physical markers on a roof are useless against modern warfare. Long-range, GPS-guided missiles and heavy artillery are programmed via digital coordinates from miles away and cannot "see" a painted symbol.
Ideological Warfare	Cultural Identity Protection (Treaty baseline rules)	International laws assume both sides respect human heritage. However, in conflicts driven by cultural cleansing, an attacking army deliberately targets libraries to erase the enemy's independent history, language, and identity.

Structural Inability	Punitive Jurisdiction (International Criminal Court / War Crimes Law)	Global law is <i>punitive, not preventative</i> . Courts can only prosecute war crimes years after the fighting ends. Law cannot stop a missile mid-flight or un-burn a rare manuscript collection.
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The 1954 Hague Convention fails to protect libraries because commanders abuse the “military necessity” loophole to justify strikes, while physical safety emblems are useless against modern GPS-guided weapons. Furthermore, international law cannot prevent deliberate cultural cleansing where libraries are targeted intentionally, nor can it stop a missile mid-flight. Because the International Criminal Court only punishes crimes years later, libraries must rely on active digital backups rather than legal promises.

5.2- Numbers of libraries damaged and destroyed:

This section presents the documented impact of the war on Ukraine's library infrastructure, drawing from verified data directly from verified wartime assessments conducted by organizations such as: The Ukrainian Ministry of Culture and Strategic Communications; The Luhansk Regional Human Rights Centre “Alternative” (which published the comprehensive monitoring study “Russian Attack on Ukrainian Libraries”); Field reports from PEN Ukraine and the United Nations Educational, Scientific and Cultural Organization (UNESCO).

Before the 2022 conflict, Ukraine's network of 35,000 libraries—comprising roughly 18,200 public, 14,600 school, and 1,850 academic or national institutions—served as a massive cornerstone of the nation's cultural infrastructure. Since then, this system has faced severe devastation through war damage and ideological cleansing, resulting in over 700 structurally damaged libraries and the systemic purging of more than 2.5 million Ukrainian volumes in occupied zones.

The table below catalogues a representative list of these confirmed institutions, divided by their status of damage and regional location:

Table 2: Ukraine Library Casualties: Structural Damage and Collection Loss Metrics.

S.No.	Library Name	Location (Oblast / Region)	Legal / Operational Damage Status	Key Material or Collection Loss
1	Mariupol Central City Public Library (named after V. H. Korolenko)	Donetsk Oblast (Mariupol)	Entirely Destroyed	Total loss of local history collection, infrastructure completely levelled.
2	Donetsk Regional Library for Children	Donetsk Oblast (Mariupol)	Entirely Destroyed	Levelled during urban siege; thousands of specialized children's volumes lost.
3	Toretsk Central Library	Donetsk Oblast (Toretsk)	Entirely Destroyed	Completely gutted by direct artillery strikes.
4	Chernihiv Regional Library for Young People	Chernihiv Oblast	Entirely Destroyed	Historic 19th-century building completely collapsed from a bomb

				hit.
5	Factor Druk Printing and Library Distribution Hub	Kharkiv Oblast	Entirely Destroyed	Missile strike on May 23, 2024, burned 50,000 books concurrently.
6	Zahaltsi Village Branch Library	Kyiv Oblast	Entirely Destroyed	General structure housing the library suffered complete roof and wall collapse.
7	Kharkiv State Scientific Library (named after V. H. Korolenko)	Kharkiv Oblast	Severely Damaged	One of Europe's largest libraries; building facade, rare book vaults, and glass roofs shattered.
8	Chernihiv Regional Universal Scientific Library (named after S. and O. Rusov)	Chernihiv Oblast	Severely Damaged	Historic 1913 building sustained heavy structural damage, windows blown, walls cracked.
9	Kherson Regional Universal Scientific Library (named after Oles Honchar)	Kherson Oblast	Severely Damaged	Subjected to multiple close-range shillings; structural fire heavily burned upper floors.
10	Kherson Regional Library for Children (named after Dniprova Chaika)	Kherson Oblast	Severely Damaged	Heavy shell damage to reading rooms, computational equipment systematically looted.

5.4- Geographic Distribution of Impact:

The physical toll is heavily concentrated in the eastern and southern regions of Ukraine, directly mirroring the primary paths of military operations:

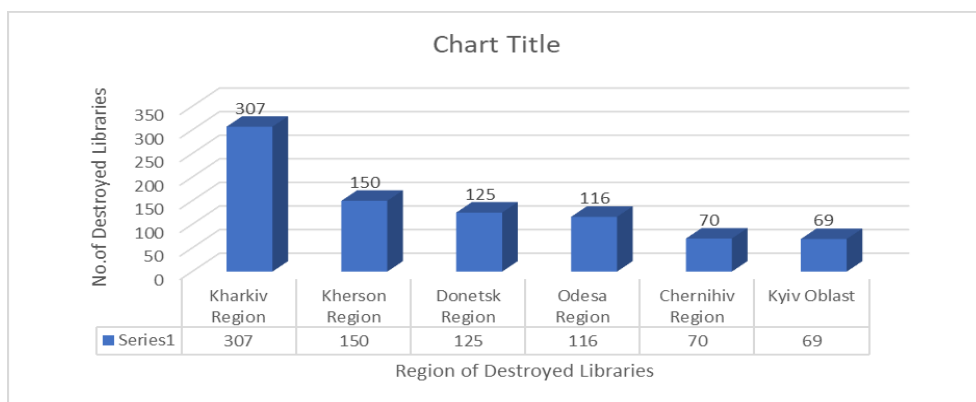


Figure 1: Regional breakdown of library infrastructure casualties in Ukraine.

The above bar chart illustrates the total number of destroyed libraries across six Ukrainian regions, highlighting that the Kharkiv Region suffered the heaviest losses with 307 impacted facilities.

5.4- Infrastructure Attrition Rate of libraries:

Here is the streamlined, clear breakdown of Ukraine’s library Infrastructure Attrition Rate based on current cultural data.

- Pre-War Baseline (s_{start}) =35,000 total libraries
- Physically Damaged/Destroyed (L_{ost})= 700 libraries
- Remaining Baseline (F_{end}): 34,300 libraries
- Average Active Footprint (A_{verage}): $\{35,000 + 34,300\} \{2\} = 34,650$

Applying the Formula:

$$\frac{I_{AR} = (F_L)}{(F_{Avg})} \times 100$$
$$I_{AR} = \frac{(700)}{34,650} \times 100 = 2.02\%$$

While the 2.02% macro national average implies structural stability, isolating the public library sector reveals a higher systemic attrition rate of 3.35%. Furthermore, in heavily targeted frontline hotspots like Donetsk, Kharkiv, and Kherson, localized infrastructure attrition easily exceeds 30% to 50%, completely reshaping regional library access.

5.5- strategies Ukraine’s government and librarians adopted:

During military conflicts, cultural infrastructure faces both kinetic destruction and ideological purging. Ukraine’s response combines grassroots local action with state-level policy into a highly coordinated dual-track survival strategy.

(5.5.1). Local and Grassroots Adaptation (The Librarians)

- **Collection Conservation:** Librarians built sandbag walls, taped windows, packed rare manuscripts into sealed, plastic-lined crates, and hid valuable historical archives in deep basements.
- **“Wandering Libraries”:** Displaced staff packed essential books, laptops, and mobile routers into suitcases to run mobile book stations out of host centres or vehicles.
- **Community Fortresses:** Reinforced library basements became 24/7 bomb shelters, while reading rooms were repurposed into defines hubs for weaving camouflage nets and hosting emergency power, heat, and Starlink connectivity.

(5.5.2). State-Level Institutional Adaptation

- **Legislative Pivots:** The government legally redefined public libraries as Community Support Centres and integrated them into the national *Points of Invincibility* network to provide housing, legal, and psychological aid to displaced citizens.
- **Digital Alliances:** Partnering with international volunteer groups like SUCHO (Saving Ukrainian Cultural Heritage Online), the state migrated over 50 Terabytes of digital library collections and metadata to secure, external cloud servers.
- **Evidence Documentation:** Libraries deployed open-source intelligence (OSINT) to launch digital evidence portals, geolocating and archiving photos and records of destroyed institutions to build future war-crimes portfolios.

(5.5.3). *Core Matrix of Coordinated Protection***Table 3: Strategic Matrix of Ukraine's Dual-Track Library Protection Framework (Grassroots Local Action vs. State-Level Institutional Support).**

S.No.	Area of Protection	Local Librarian Action (Grassroots)	Government/Institutional Support (State)
1.	Physical Assets	Fortified structures with sandbags; packed and buried rare collections.	Coordinated cross-border evacuations; distributed fireproof preservation materials.
2.	Operational Services	Operated suitcase libraries; wove defines nets; ran civilian bomb shelters.	Legally reclassified libraries as crisis centres; funded utility resilience hubs.
3.	Digital Infrastructure	Digitized catalogues in basements using local backup drives and generators.	Secured off-site cloud hosting with SUCHO (saving Ukrainian Cultural Heritage Online); deployed Starlink satellite networks.
4.	Cultural Défense	Concealed banned literature; documented localized building damage.	Established national damage-tracking databases for international legal prosecution.

6- Conclusion

The systemic targeting of Ukraine's library infrastructure highlights a modern execution of *libricide*, where the destruction of physical repositories serves as a tool for cultural cleansing. Because international legal instruments – such as the 1954 Hague Convention – fail due to operational loopholes like military necessity and an inability to prevent active missile strikes, physical structures alone can no longer guarantee the survival of a nation's collective memory. Ukraine's response provides a vital blueprint for modern library science during periods of total war. By combining immediate grassroots resourcefulness (such as wandering libraries and physical fortification) with robust, state-backed digital alliances like SUCHO, Ukraine has effectively separated the survival of knowledge from the vulnerability of physical buildings. This highly coordinated, dual-track framework proves that while architecture can be levelled by kinetic force, a nation's sovereign information space can be rendered indestructible through cloud-based dispersion and proactive digital defence.

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