Chapter 21

Context-responsive decision-making to enhance Multilateral Agreements in Core Principles Cultural Heritage Preservation

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1. Introducing the central theme: setting up an inventory for a collaborative protection of Heritage sites with background, rationale, and relevance definition of the objective

The evolving nature of IT technology mandates a more structured informational approach to digital management: this imperative is underscored by the challenges of accurately, timely, and impartially disseminating sensitive data related to national security, all while adhering to contemporary standards of architecture.

When considering Heritage Modelling, our primary attention has been on a set of wide-ranging bureaucracy models to be determined within the operational limits of Geographic Information System (GIS): this focus becomes particularly pertinent when addressing Heritage sites impacted or damaged by the complexities of Electronic Warfare (EW) (Belal A. and Shcherbina, 2019); initially explored in isolation, it was subsequently bridged with fields like defense engineering, telecommunications, statistical analyses, and military unclassified operations.

Central to this endeavor is the mission of a professional Order, which underscores the importance of modern and future orientations necessary for the professional practice: this mission not only promotes best practices but also seeks to adapt and evolve in response to contemporary challenges and technological advancements; with this backdrop, our goal is to devise a framework specifically tailored for Public Administrations (PA).

Besides, this framework aims to empower them to operate in terms of Boundary Spanners (BS), hence, fostering synergies with ministerial entities; an integral part of this strategy is to harness tools that bolster Situational Awareness (SA), especially when navigating the complexities presented by criminal activities, extremist entities, and warfare dynamics.

By weaving in the mission of a professional order, established by Regio Decreto (Royal Decree) n. 2537 of 2 December 1925, the passage now emphasizes the importance of evolving professional practices in adherence with technological innovations in a historical moment in which the academia has displayed an inconsistent stance on threats to Heritage landmarks: there's a tendency among scholars to delve into deep qualitative ponderings, occasionally at the cost of broader academic inclusivity; yet, it's fundamental to recognize that cultural landmarks aren't just historical touchstone: they're entwined with societal and political dynamics, frequently imperiled by environmental and human-induced threats.

Amidst these discussions, the cognitive Heritage lens is molded by internationalization doctrines: such doctrines can shape or even steer political narratives, potentially holding nationalistic fervor and, in extreme cases, fostering divisive actions like conflicts, erasure of minority histories, ethnic purges, and large-scalse atrocities.

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Figure. 1 (left). Vestiges from the past. "*Karola*" firing control tower on the Atlantic. (Schofield J., 2009).
Figure. 2 (right). Echoes of fear. "*Barbara*" firing control tower in the Landes. (S. J., 2009).

1.1.   Research question and aim for a preparatory decision-making analysis: defining the recognition of a unified key issue in cultural Heritage apropos of department Training

Art is not art, primarily not intended about aesthetics in absolute terms, not mere artistic expression either but rather stands as a testament to the social and political zeitgeist of its time. Similarly for architecture, it was not merely a haven at its core, but a reflection of political aspirations and societal principles etched in perishable materials, i.e., leather, clay, hay, wood, and eternal, as well as in the eternal medium of marble representing respectively the tangible outcome of political decisions and priorities.

The thematic emphasis of this section is both challenging and crucial to our qualitative analysis' direction: throughout history, there's been a persistent effort to erase cultural identity and annihilate collective memory or to impact citizens mobilities in an instrumental capacity of supervisory structures. However, this unbalanced perspective may shift if we consider the insights of Paul Virilio, who argued that technology is, customarily for Electronic Warfare (EW), never neutral, but rather an expression of the "*administration of fear*", markedly, in our current era where we find ourselves increasingly confined within smart cities and national borders, as highlighted by Armitage (2018): "*people whose lives are being destroyed by the revolution brought about by the end of salaried work, by automation, by delocalization*".

We now view the remnants of World War II with a quiet respect and a keen intent to learn, paving the way for a new humanity in this century so that in its wake, as nations sought to rebuild and promote an agreeing cognition of peace, there emerged a renewed emphasis on cultural preservation and human dignity: central to this focus was the establishment of the United Nations Educational Scientific and Cultural Organization (UNESCO), in 1946; acting as the foundational pillar, these principles informed the drafting of the Universal Declaration of Human Rights (UDHR), which was officially adopted in 1948.

Hitherto, it was profound human devastations, exemplified by large-scale atrocities, that emphasized the urgent necessity for wider collaborations and responsibility, subsequently redefining these interactions, as Geoffrey Robertson in 1999 pointed out, that individual state representatives became legally accountable for "*crimes against humanity*"; this critical moment paved the way for the establishment of international benchmarks, e.g., the UDHR in 1948 by the UN: the assertion is that "*every individual is entitled to attain, via collaborative national and international endeavors, the economic, social, and cultural rights crucial for their dignity and the holistic growth of their persona.*"

On the event of the "*Bridging Universal and Local Values*" conference in Amsterdam in 2003, which was later documented in 2004 as World Heritage Papers 13, UNESCO championed the perspective that the preservation of Heritage isn't solely the domain of government mandates or the expertise of Heritage specialists: instead, the active engagement of local communities has emerged as the predominant narrative in UNESCO's top-down strategy.

"Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers." Art. 19 (UDHR)".

2. Materials and methods

For our study, primary data was procured by way of organized deliberations at our established professional institution: the objective, behind this set of aggregated census figures, was to consolidate the most unequivocal relationship between academia, policy formulation by UNESCO/EPSF, and Electronic Warfare's industrial expectations; the foundational data, particularly focusing on Heritage and Electronic Infrastructure (EI), has addressed focus to a novel qualitative appraisal, categorized into 8 branches to facilitate data interpretation.

Besides, given the potential bias stemming from our impartiality as representatives of the aforementioned chamber of planners and architects, our team strictly handled unclassified and manifest data, adhering to the highest ethical standards and transparency currently in place: we proceeded to verge relevant literary sources and archival resources available to the public to set 34 Variable Impact Studies (VIS) alongside with sub-Boundaries Spanners (BS); the resulting charts, in last instance, were merged them into a unique: i) operational foresight; ii) review and update; iii) joint training and iv) SWOT scrutiny. Our approach to the research was constructed to ensure replicability, and be applicable by our subscribers' architects, thereby assuring consistent albeit general findings across varied settings. Thus, the entire study was conducted under stringent ethical guidelines, with a particular emphasis on transparent disclosure of non-classified information sources for a shared urban awareness.

2.1. Objective definition

Firstly, we aimed to guarantee the primary novel aspect: "*Is it to understand the impact of Electronic Warfare* (EW) *on cultural sites?*" or, possibly, "*to evaluate the challenges of integrating heritage preservation within military operations?*"; in this regard, we agreed on determining that the objective could also be to create a balanced strategy that serves both national security and cultural conservation for Military Heritage.

Once the main objective has been identified, it was essential to set Specific, Measurable, Achievable, Relevant, and Time-bound (SMART) sub-contents which could range from conducting a thorough review of existing EW values to liaising with Heritage experts to understand the significance of potential sites under threat.

Likewise, the phase of defining the objectives should also have included consideration of potential constraints, such as limited access to categorised information or the sensitive nature of certain data; in addition, stakeholders involved, ranging from defense personnel to cultural Heritage experts, lack clarity on the land use of such infrastructures, henceforth, hindering collaborative and concerted efforts towards achieving them.

2.2. Data sources

For this training, data entries were logged at various moments to monitor progression: primary data collection involved direct engagement, encompassing interviews and online content review to ensure the information was up to date; supplementary, secondary data was extracted from an exhaustive review of existing literature, governmental reports, archival materials, and publicly available datasets.

To uphold the integrity and precision of our sources, each one underwent a stringent validation procedure: peer-reviewed journals and official publications were given precedence; furthermore, we accessed a diverse range of publisher platforms, such as Taylor & Francis and Springer, ensuring alignment with our overarching objectives, primarily guided by the Digital Object Identifier (DOI) archival protocol.

Given the absence in the realm of Variable Impact Studies focused on such relationship, the difficulty in setting a clear objective definition has persisted throughout the entire search of literary inputs.

2.3. Search strategy and limitations emerged in the review process

Our research approach emphasized, chiefly, a systematic trawl of academic databases, along with governmental the contents of governmental webpages, i.e. earmarked as "Declassified" or "released to the public", inherently capped the scope and profundity of our analysis. Additionally, some historical events remained intangible due to their delicate nature, leading to an informational tilt.

We are aware of the potential information bias, where our resources might not portray a complete or impartial perspective on the subject: therefore, while we have aimed to make this review as comprehensive and unbiased as feasible, the innate constraints tied to data access and the possibility of missing subtle details need to be highlighted; to conclude, it's worth noting that connections with auxiliary bodies, such as environmental guards, to academically identify EW Heritage sites, remain unclear.

2.4. Selection criteria: inclusion and exclusion criterion case by case

To maintain the integrity and relevance of our research, specific criteria guided our data source selection of Heritage, with emphasis placed on the relevance, reliability, publication date, accessibility, authenticity, authorship affiliations and timeliness of academic materials.

Conversely, sources promoting irrelevance, unverified sources, duplication, temporal limits, redundant information, or not directly aligning with our research objectives were excluded: this approach ensured a focused and reliable dataset for our analysis, for both the historical and scientific aspects alike.

2.4.1. Literature survey of morphological analysis applications

In our research process, a systematic literature review was conducted to understand the breadth and depth of morphological analysis applications converging into a unique manifold as follows: we scoured academic journals, conference proceedings, and authoritative books to collate pertinent studies and methodologies listing eight specialization groups: this survey serves as a cornerstone, offering a comprehensive understanding of prevailing work exclusively pertinent to the architectonical realm of cultural Heritage; potential *lacunae* and avenues that warrant further exploration have been gradually identified, i.e. facilitating a chronological overview of spotlighting the community's annual focal points concerning Heritage and its value of authenticity across Heritage conflicts.

Specialization	References
Engineering and Product Design	Urbat M. (2009): *[…] geological & Paleomagnetic […] fragments from the Buddha […]* Toubekis G. et al. (2011): *Preservation […] Heritage Site of Bamiyan: Laser SCAN […]* Margottini C. (2014b): *Properties of local material […] cliff and niches […]* Beckh M. (2016): *Design and partial assembly of the Western Buddha Scaffold […]* Bagneris M. et al. (2017): *[…] statue provided by innovative uses of 3D model […]* Ebolese D. et al. (2019): *UAV SURVEY FOR THE ARCHAEOLOGICAL […]* Lo Brutto M. et al. (2020): *3D survey for the archaeological study […]* Nagaoka M. (2020): *The Future of the Bamiyan Buddha Statues […]* Croce V. et al. (2023): *H-BIM and Artificial Intelligence: Classification of Architect. […]* Fainholtz T. et al. (2023): *From crisis housing to cultural heritage. […]* Femenias P. et al. (2023): *Modern heritage and housing renovation: Policy […]* Fontana M. (2023): *Virtual Domes. Utopian architecture at […]*
Design Theory and Architecture	ICOMOS (1964): *The Venice charter for the conservation and restoration […]* Brandi C. (1977): *Teoria del Restauro.* Gober F. et al. (1984): *[…] Cassino: The Second, Third, and Fourth Battles […]* ICOMOS (1990): *The charter for the protection and management […]* ICOMOS (1994): *The Nara document on authenticity. Paris.* Murphy K. (2000): *[…] Viollet-le-Duc at Vézelay. […]* ICOMOS (2002): *Principles for the conservation of heritage sites in China. […]* Loulanski T. (2006): *Revising the Concept for Cultural Heritage […]* Di Mauro L. (2008): *Architettura di Stato? Un problema storiografico.* Petzet M. (2009b): *Anastylosis or reconstruction […] conservation […]* Halbertsma M. et al. (2013): *Living with History, 1914-1964: Rebuilding Europe […]* Meyer Susanne Adina. (2013). *«Are there various Riegls? Museo, storia dell'arte […]* Donato A. et al. (2014): *La Fortificazione Della Piazza Di Messina […]* Stig S. et al. (2015): *War and Cultural Heritage: Biographies […]* Al A. et al. (2016): *The Culture Of Traditional Architecture and its Role […]* UNESCO Kabul (2016): *[…] considerations & potential effects on authenticity […]* UNESCO (2018c): *Warsaw recommendation on recovery and reconstruction […]* Bartolomucci C. (2019): *John Ruskin e le "Cattedrali della Terra": le montagne […]* ICOMOS (2021): *[…] Guidelines on Fortifications and Military Heritage […]* Rennie K. (2021): *Index. The Destruction and Recovery of Monte Cassino.* Koskinen E. (2023): *Contested and Ambivalent Heritage: Revisiting Responses […]*

Future Studies and Scenario Development	Murphy D. (2001*): Slowly, families accept the ruins as burial ground.* Shackel P. et al. (2004): *Places in mind. Public archaeology as applied anthropology.* Little J. et al. (2007): *Archaeology as a tool of civic engagement.* Gerstenblith P. (2013): *Enforcement by domestic courts: Criminal law […]* Arimatsu L. et al. (2015): *Protecting cultural property in non-international […]* Brodie N. (2015): *Syria and its Regional Neighbors: A Case of Cultural […]* Scammell R. (2015): *Create UN military unit to protect ancient sites from ISIS […]* Bennoune K. (2016): *[…] Cultural heritage is a human rights issue […]* Brosché J. Et al. (2016): *Heritage under attack: motives for targeting cultural […]* United Nations (2017): *Security Council condemns destruction, smuggling […]* Legnér M. (2018): *Post-Conflict Reconstruction and the Heritage Process […]* Belal, A. et al. (2019): *Heritage in Post-War Period […]* Cody C. (2019): *Prosecuting Members of ISIS for Destruction of Cultural Property […]* Hussein H. et al. (2019): *[…] the urban identity of the old city of Mosul […]* Aljawabra A. (2020): *Heritage, Conflict, and Reconstructions […]* Cunliffe E. (2020): *No Strike Lists – From Use to Abuse? Heritageinwar. […]* Barakat S. (2021): *Necessary Conditions for Integrated […]* Albert M. et al. (2022): *50 Years World Heritage Convention […]* Chizzoniti D. et al. (2022): *[…] reconstruction in a post-war […] Mosul […]* Albert M. et al. (2022): *Destruction of Heritage Is Destroying Identity […]* Axelsson Y. et al. (2023): *(Un)contested Heritage. […]*
Technological Forecasting/Technology Foresight	Zaghloul A. et al. (2010): *Antenna developments for military applications.* Freedberg S. (2012): *[…] Will Stealth Survive as Sensors Improve? F-35 […]* Howard D. (2013): *[…] The Future of Airborne Electronic Attack […]* Juhász A. et al. (2016): *«REMOTELY SENSED DATA FUSION IN MODERN AGE ARC.[…]* UNESCO & UNITAR (2018): *multi-temporal satellite imagery-based damage […]* Choi S. et al. (2020): *Method for Effectiveness Assessment of Electronic Warfare […]* Richards J. (2022): *The transfer of heritage modelling from research […]* Stone P. (2022): *[…] Preparing in Peace for Conflict […]* Zhang X. et al. (2022): *Theory to Countermeasures Against New Radars.* UNESCO (2023*): […] Prevention and Fight Against the Illicit Trafficking […]* Tarquini S. et al. (2023): *[…] digital elevation model of Italy […]*
Management Science, Policy Analysis and Organizational Design, Strategic Planning	Cox D. (2010): *Archives & Records in Armed Conflict: International Law […]* UNESCO (2015): *State of conservation of World Heritage properties. […]* Doppelhofer C. (2016): *Will Palmyra risew again? - War Crimes against Cultural […]* O' Keefe R. et al. (2016): *Protection of Cultural Property Military Manual […]* DeBoer M. et al. (2017): *NATO Allied Command Transformation.* Parulli F. (2018): *Fragilità dei Beni Culturali – il lavoro del Comando Carabinieri […]* Fox, P. (2022): *[…] No Cultural Property Protection Without Leadership […]* Knauer B. (2023): *[…] Reconstruction to Urban Preservation: Negotiating Built […]* Dimelli D. et al. (2023): *The Reconstruction of Post-War Cities—Proposing […]* Ministero della Cultura (2023): *Tutelare il Patrimonio – Il ruolo del TPC nella […]*
Heritage Protection and Conservation in Conflict Zones: Key studies	Keane D. (2004): *The Failure to Protect Cultural Property in Wartime.* Kossiakoff M. (2004): *The Art of War: The Protection of Cultural Property […]* Stanley P. (2005): *Cultural heritage in postwar recovery.* Schofield J. (2009*): Introduction Considering Virilio's (1994) Bunker Archeology […]* Langfield M. et al. (2010): *[…] Key Issues in Cultural Heritage […]* Howe S. (2012): *Can the 1954 Hague Convention Apply to Non-State Actors? […]* Viejo D. (2013): *Reconstructing Heritage in the Aftermath of Civil War […]* Joint Force Quarterly (2014): *Resilient command and control, diversity in PME […]*

	Muller N. (2015): *Heritage under attack.*
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	UNESCO (2017): *UNESCO Heritage Director calls on Armed Forces [...]*
	Cunliffe E. et al. (2018): *The Protection of Cultural Property in the Event of Armed [...]*
	Donders Y. (2018): *[...] cultural heritage and human rights [...]*
	Interpol (2019): *Creating a National Cultural Heritage Unit. [...]*
	Cunliffe E. (2020): *No Strike Lists – From Use to Abuse? Heritageinwar. [...]*
	Isakhan B. et al. (2020): *[...] Destruction of Yezidi Heritage [...]*
	Weiss G. et al. (2020): *[...] Cultural Cleansing and Mass Atrocities [...]*
	Chalcraft Jasper. (2021): *[...] Into the Contact Zones of Heritage Diplomacy [...]*
	Albert M. T. et al. (2022): *50 Years World Heritage Convention: Shared Responsib. [...]*
	Bradford B. (2022): *[...]1954 Hague Convention to Protect Museums [...]*
	Chizzoniti D. et al. (2022): *[...] reconstruction in a post-war [...] Mosul [...]*
	Legnér M. (2022): *The protection of movable cultural property in wartime: [...]*
	Moxham O. (2023): *Camouflaged War Heritage Brecciated War Heritage Sites [...]*
	International Committee of the Red Cross. (n.d.): *Rule 17.*
	Krauss J. (n.d.): *CULTURAL HERITAGE IN CONFLICT & POST-CONFLICT SETTINGS [...]*
Innovation and Knowledge Management	McDonald L. (1998): *Restitution of archives: Archival claims, legal issues.*
	Stovel H. (1998): *Risk preparedness: A management manual for world [...]*
	Regional Conference (2000): *[...] on Authenticity and Historic Reconstruction [...]*
	Leturcq G. (2009): *Heritage-making and Policies of Identity in the Post-conflict [...]*
	Scott D., et al. (2010): *The Archaeology of Historic Battlefields: A History [...]*
	Barros T. (2011): *«The discursive construction of archival science: Conceptual [...]*
	Manacorda S. et al. (2013): *Protecting cultural heritage as a common good [...]*
	Renshaw L. (2013): *The Archaeology and Material Culture of Modern Military Death.*
	Krzyżanowska N. (2016): *«The Discourse of Counter-Monuments: Semiotics [...]*
	Khalaf W. (2017): *A Viewpoint on the Reconstruction of Destroyed UNESCO [...]*
	Petrauskas G. et al. (2018): *Archaeology of Modern Conflict: War after the War [...]*
	Wahba S. et al. (2018): *Culture in City Reconstruction and Recovery.*
	UNESCO (2018): *[...] Heritage Properties as a Complex Multi-disciplinary [...]*
	Armitage J. (2019): *«Remembering Paul Virilio».*
	Bezdrabko V. (2019): *«HANS HENRICH BOOMS AND ARCHIVAL APPRAISAL» [...]*
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	Duranti L. (2022): *«Why a world gone digital needs archival theory more than [...]*
	Lowry J. (2022): *Disputed Archival Heritage.*
	Poulain Maxime et al. (2022): *The Archaeology of Conflicts: Early modern [...]*
	Han Dai-In et al. (2022): *Virtual reality consumer [...] for the metaverse [...]*
	Ngoepe M. et al. (2022): *«Confronting Jenkinson's Canon: Reimagining [...]*
	UNESCO (2023): *[...] Prohibiting and Preventing the Illicit Import, Export [...]*
	Debattista Martin. (2023): *[...] EDUCATIONAL POTENTIAL OF VIRTUAL REALITY [...]*
	Lixinski L. et al. (n.d.): *The limits of framing in international law: the shortcomings[...]*
Modeling Theory, OR Methods and GMA*	Corbalan J. M. (1991): *[...] ingenieros militares "borbonicos" de Flandes [...]*
	Duffy C. (2006): *Fire & stone. The science of fortress warfare 1660-1860.*
	Allsop D. et al. (2007): *[...] experimental firing [...] modern battlefield assemblage [...]*
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	Rubio-Campillo X. et al. (2015): *The Spatiotemporal Model of an 18th- [...]*
	Pietroni E., et al. (2021): *Virtual Restoration and Virtual Reconstruction in. [...]*
	Sospedra-Roca R. et al. (2023): *«Virtual Approach to a Battlefield: Fatarella [...]*

Chart 1. Branches of the disciplines assessed in the Qualitative Narrative Scope Review based on scientific literature priorly to the Qualitative Thematic Synthesis with Subjective Evaluation. *Goal Model Analysis.

2.5. Problem definition

For the effective progression of our research, it was imperative to delineate the specific problem we aimed to address: after comprehensive deliberation and examination of the existing literature, we identified a set of challenges and questions that remained unanswered or inadequately addressed in the realm of our study; by clearly defining the inconsistency, we ensured that our research efforts were directed, focused, and poised to contribute meaningful insights to peers.

3. Outcomes from the resulted analysis

Upon meticulous execution of such Variable Impact Studies research methodology, we stratified a series of findings that illuminated our initial inquiries; the data, once processed and interpreted, yielded patterns and insights that were both corroborative of some pre-existing notions and revelatory in other dimensions: this section delineates the quantitative and qualitative outcomes of our analysis, offering a comprehensive view of the discoveries made in the context of our study to peers; each result is presented with clarity, as also confirmed by the anonymous reviewers, supported by the empirical evidence gathered during our research process.

3.1. Overview of the review process

The review process was methodically structured to ensure thoroughness and accuracy: initiating with a broad literature survey, we progressively fine-tuned our focus based on relevance and applicability to the research objectives; each source underwent a meticulous evaluation against our predefined inclusion and exclusion criteria, ensuring only the most pertinent information was considered, henceforth, this stage, was crucial in eliminating potential biases and maintaining the integrity of the data.

Following the selection, each piece of literature was analyzed in-depth, extracting valuable data and insights that informed our subsequent discussions and conclusions; this section provides a detailed breakdown of each step undertaken, highlighting the rationale behind our choices and the challenges encountered.

3.2. Variable Impact Studies

The Variable Impact Studies were performed to gauge the robustness of our findings and determine how different parameters and variations might influence the outcomes: this involved systematically allocating key input variables and observing the resultant changes in our conclusions.

Through this iterative process, we identified certain parameters that exhibited a more pronounced impact, highlighting them as critical elements in our study; besides, the propensity to facilitate peers in architecture, responsible for initiating Sensitivity Analysis, such as land use and EW Heritage preservation, shed light on potential areas of vulnerability in our findings, prompting further investigation and refinement, i.e. the results from this analysis not only confirm the reliability of our preliminary conclusions but also provide a deeper understanding of the interplay between various factors in the research context.

3.3. Optimization of morphological analysis through variable analysis in Heritage protection during armed conflicts: ICCROM library's inventory

In the wake of armed conflict, cities comparable to Mosul, Iraq, stand as poignant reminders of the profound back-and-forth between war's physical destruction and its impact on the cultural and societal psyche: the immense task of reconstruction in such locales is not just about mending bricks and mortar but about healing the very soul of the community; Mosul's once-illustrious Heritage sites, bearing the weight of collective memory, lie in ruins, waiting for rejuvenation; yet the path to restoration is riddled with complexities that extend beyond architecture.

Historical architectural restoration theories accuse varied approaches to such endeavors: Viollet-le-Duc emphasized restoring structures to an envisioned ideal in his *compendium "Dictionnaire raisonné de l'architecture francause dy XI au XVI siècle"*, while Cesare Brandi argued for the preservation of a monument's original essence, making post-restorative additions clearly distinguishable.

As also expressed by author Chizzoniti et al. (2022) the case of Mosul imply that these theories become especially pertinent in modern war scenarios and resumed in their opening question: "*How might the process of reconstruction play a role in the re-identification of the local community?*".

From the current literature, the principle of *anastylosis*, which champions the meticulous reintegration of original architectural fragments pretends priority towards authentic materials and acts as a beacon for those seeking to meld the past with the present, ensuring that history is neither erased nor forgotten.

Nonetheless these radiant theories, the intricacies of modern-day Mosul's restoration have been profoundly compromised by socio-political and economic challenges and well resumed by the authors (Hussein S. et al., 2019) addressing concern to: i) the ethnic cleaning promoted by ISIS; ii) the reports that indict a disconcerting lack of transparency in Iraq, with over $40 million earmarked for Mosul's reconstruction allegedly going missing for the city-reconstruction as a whole; iii) over 5.000 buildings with the recycling of 3.000 tons of detritus per acre; iv) UNESCO preliminary evaluation of the old center of Mosul.

Nevertheless, the biased vision conducted by some local Mosul's authorities, allegedly driven by economic imperatives as author Chizzoniti revealed (2022), leans towards transforming the city into a hub of commercialism,

repleting with high-rises and global franchises: the economic rejuvenation is undeniably crucial and far from being blamed, on the other hand the risk lies in overshadowing Mosul's rich cultural tapestry and diluting its unique identity in the process; in post-war Heritage sites, international bodies like UNESCO, in collaboration with entities such as the ICCROM Library, have offered a glimmer of hope in this intricate dance of restoration: their collective endeavors, representing the aspirations of numerous nations, emphasized the need for a restoration approach that marries economic revitalization with cultural preservation, yet, the road ahead remains fraught with challenges.

Regrettably, prior to World War II, there existed a conspicuous absence of robust international frameworks dedicated to safeguarding irreplaceable cultural Heritage landmarks: structures of dominant significance, such as the Notre Dame de Reims Cathedral, not only epitomize architectural *finesse* but also emblemize human tenacity and cultural continuum; as global stakeholders navigate the intricate terrains of restoration methodologies, ranging from Ruskin's vehement opposition to restoration, advocated in the "*Seven Lamps of Architecture*" (1849) and "*The Stones of Venice*" (1853) as an alternative for conservancy, to Boito's balanced stance that harmonized historical respect with necessary interventions, a salient observation crystallizes: the crux of restoration transcends the mere physical re-erection of edifices.

It lies intrinsically in rejuvenating the ethos and spirit intrinsic to a locale and its denizens.

Amidst this intricate interplay, it becomes imperative to ensure a restoration approach that is transparent, inclusive, and deferential to the profound historical resonance of sites, exemplified by landmarks in Mosul, thereby paying homage to our collective human legacy.

"Being convinced that damage to cultural property belonging to any people whatsoever means damage to the cultural heritage of all mankind since each people makes its contribution to the culture of the world;

Considering that the preservation of the cultural heritage is of great importance for all peoples of the world and that it is important that this heritage should receive international protection..." (p. 8) (1954 Hague Convention)
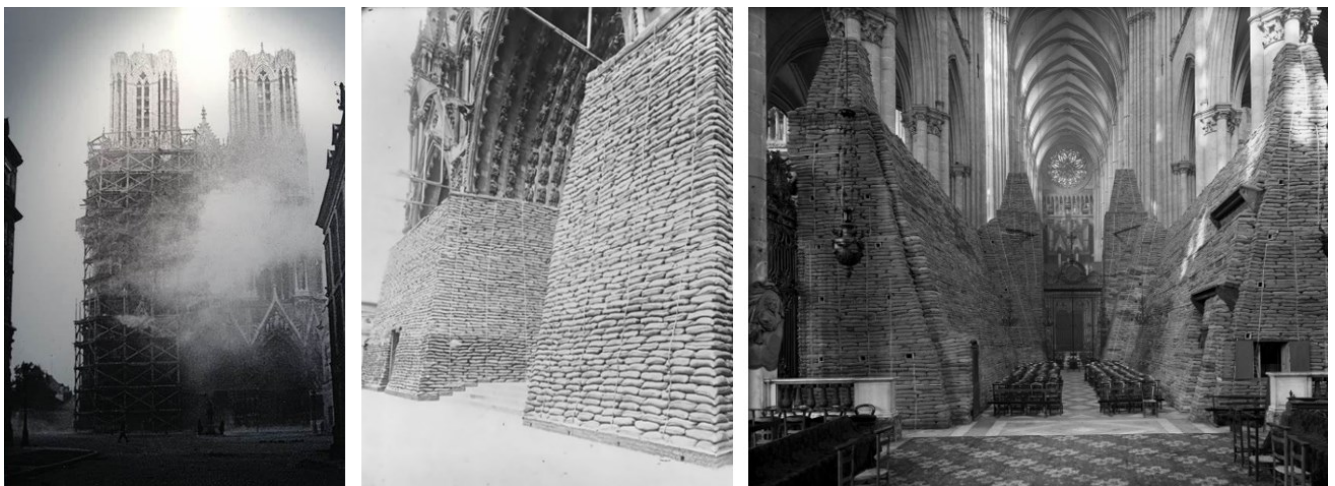
Fig. 3. Art in the crossfire: the sandbag-protected west façade of Notre Dame de Reims cathedral before WWI. Paris, France. Source: National Archives. Credits: CC0 1.0 Universal. **Fig. 4.** Structural Support: a symbol of sovereignty amidst defensive measures in aerial warfare before WWI. 1918. Paris, France. Source: National Archives. Credits: CC0 1.0 Universal. **Fig. 5.** Preservation and protection: the role of scaffolding and sandbags in Amiens cathedral. 1918. Paris, France. Source: National Archives. Credits: CC0 1.0 Universal.

3.4. Evaluating the robustness of environmental and social policy frameworks

With a foundational focus on Heritage in armed conflicts, we advance the ESPF framework, advocated to provide a comprehensive delineation of Cultural Heritage, encapsulating both tangible and Intangible Cultural Heritage (ICH).

This encompasses materials, whether transient or fixed, attributed to properties, sites, structures, or conglomerates thereof: such entities often resonate with archaeological, paleontological, historical, cultural, artistic, and religious undertones; the selection of territorial features, also encompasses a classification integrating natural characteristics like rock formations, lakes, and waterfalls, along with intangible cultural phenomena, such as enduring commercial activities deeply embedded within the historical and anthropological matrix of communities.

The repercussions of armed conflicts, with their profound impacts on these cultural repositories, further underscore the critical importance of preserving this Heritage, so that we selected the peculiarity to Heritage resilience paired with ESPF framework and evidenced by its eight provisions as it follows.

SPF Sensitivity Parameters	Comprehensive Analysis of Features	Rationale to Cultural Heritage	Sensitivity to Armed Conflicts Dynamics
1. Compliance with National Legislation	Adherence to each nation's legislation as governed by the Convention Concerning the Protection of the World Cultural and Natural Heritage.	Preservation of historical and cultural sites, ensuring they adhere to international standards.	Damage or destruction of heritage sites can lead to loss of compliance and potential delisting.
2. Protection of Natural Features	Safeguarding natural landmarks and landscapes, including rock formations, lakes, and waterfalls.	Natural features are often intertwined with cultural narratives and traditions.	Armed conflicts can lead to environmental degradation affecting these natural features.
3. Preservation of Intangible Heritage	Protecting non-physical cultural expressions, traditions, and practices.	Intangible heritage provides context and depth to tangible landmarks and artifacts.	Conflicts can disrupt the transmission of these traditions and practices, leading to cultural loss.
4. Restoration Principles	Adherence to restoration philosophies, like those of Viollet-le-Duc and Cesare Brandi.	Ensures restoration projects maintain the integrity and authenticity of cultural sites.	Armed conflicts can necessitate restoration, making these principles crucial for post-conflict recovery.
5. Anastylosis Technique	Promoting the reassembly of dislocated or fragmented parts of a monument using original materials.	Offers a method of restoration that maintains the originality of monuments.	Conflicts often result in damaged monuments; anastylosis can be pivotal in their restoration.
6. International Collaboration	Encouraging nations to collaborate on heritage preservation projects.	Facilitates pooling of resources, expertise, and best practices.	Post-conflict scenarios often require international assistance for restoration.
7. Awareness & Education	Promoting awareness of the importance of cultural heritage and educating communities.	Ensures local communities value and protect their heritage.	Helps in post-conflict community rebuilding and reconnecting with cultural roots.
8. Crisis Response Protocols	Establishing procedures and protocols for immediate response post-crisis.	Provides a blueprint for action in the aftermath of events that threaten cultural heritage.	Direct relevance as armed conflicts are crisis scenarios that require immediate heritage protection responses.

Chart 2. Overview of ESPF provisions pertaining to cultural Heritage protection in armed conflicts.

3.5. From landscape to digital realm: the rise of modern Electronic Warfare

In contemporary warfare dynamics, the intricate back-and-forth between Electronic Warfare and meticulously designed antenna frameworks is evident (Zaghloul A. et al., 2010) on digital harmonization and geo-morphology (Richards J., 2022, Tarquini S. et al., 2023); this duality not only facilitates a more profound integration with Geospatial Information System (GIS) modules but also emphasizes the significance of preserving the visual and cultural nuances of the landscape recognized under "*beni culturali*" (cultural goods).

The elasticity of Heritage, a notion alluded to by scholars such as Albert M. et al. (2022) and Legnér M. (2018) underscores its multifaceted potential, which can range from universally recognized values to localized informal understandings, correspondingly expressed by scattered monuments and remnants; this malleability, as Aljawabra A. (2020) suggests, has shifted societal paradigms (Shackel P. et al., 2004).

3.5.1. Silent skirmishes: the unseen battles of Electronic Warfare in peacetime

The multifarious domain of Electronic Warfare, encompassing Electronic Attack (EA), Electronic Warfare Support (ES), and Electronic Protection (EP), interacts with strategic paradigms such as the AEA global strike concept. Given Italy's alignment with NATO and, by extension, the U.S., there's an inherent alignment with specific operational codes,

as evidenced in facilities like the Sensitive Compartmented Information Facility (SCIF) and doctrines from the Department of Defense: historical accounts, such as those from the CHECO Division of the U.S. Air Force during the Vietnam air campaign, illustrate the perennial tussle for dominance in the electromagnetic realm and its land use.

The campaign's chronicles highlight the strategic agility required in AEA operations (Choi S. et al., 2020), with both adversaries continually recalibrating their tactics in a complex boogie of electronic maneuvers and parries priorly (Stone P., 2022): this evolution, as documented by Major Mark D. Howard in 2013, underscores the unknown role of current adaptive AEA strategies, further emphasizing the significance of robust planning and layered electronic defenses for planners.

Fig. 6. The Aviation Command and Tactics Trainer (ACTT), Middle Wallop, Hampshire, United Kingdom: Mission Command Training of pilots at crew, flight, and sub-unit levels supported under the Operation Training Phase of the Army Pilots Course as part of the pre-deployment package. Photo by: Peter Davies, 18th September 2012. Credits: CC BY-NC 2.0. **Fig. 7.** Target Hand-Off System deployed under the Augmented Immersive Team Trainer on virtual targets. December 13, 2016. Photo by: Lance Cpl. Juan A. Soto-Delgado, U.S. Marine Corps. Credits: Public Domain.

3.5.2. Common operational picture as a cultural test for the intersection for tradition and modernity: a novel research aspect of a unified Electronic Warfare Landscape

The evolving landscape of international defense and security, characterized by the rapid integration of cutting-edge technology and counter-strategic modelling (Zhang X. et al., 2022), necessitates a unified, albeit independent, harmonization of tradition with modernity: Self-Determination in maintaining Heritage preserved by outer forces and internal groups, leads to active change in today's democratic societies, gaining added significance when viewed through the lens of Active Citizenship for land use (Little J. et al., 2007) in such a volatile environment at the expenses of neglected cultural Heritage (Belal A., et al., 2019, Barakat S., 2021).

Fig. 8. "*Wullenweber*" Circularly Disposed Antenna Array AN/FLR-9. Misawa, Japan. Photo by: Narita Masashiro, July 10, 2010. Source: wikimedia.org. Credits: CC-BY-2.1-JP. **Fig. 9.** "*Rhombic*" Anthorn VLF Antenna Masts. Source: wikimedia.org. Photo by: Phil Williams, February 13, 2006. Credits: CC BY-SA 2.0 DEED. **Fig. 10.** *"Discone"* UHF Antenna at Hangar. Glenn Research Center al Lewis Field. USA. Photo by: Donald Huebler, May 27, 1976. Photo ID: 17447567 (National Archives and Records Administration). Credits: Public domain.
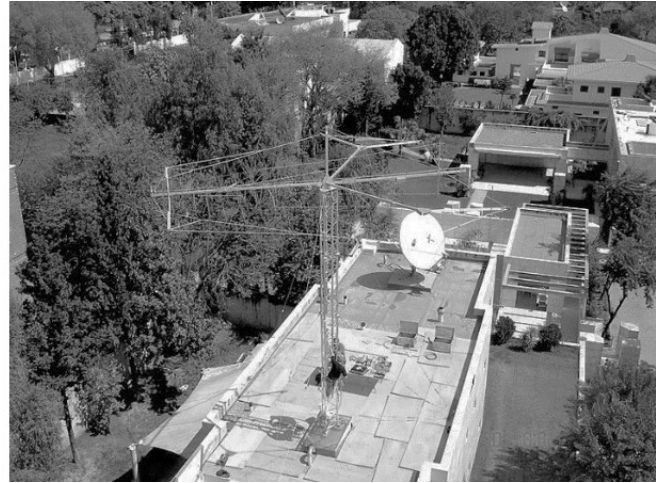
Fig. 11. "*VORTAC TGO*" short VHF Omni-directional Range. Aichtal, Germany. Photo by: Hans-Peter Scholz Ulenspiegel, June 4, 2005. Source: wikimedia.org. Credits: CC BY-SA 2.0 DE DEED. **Fig. 12.** *"LogPeriodic"* HL-471. Swiss Embassy in Islamabad, Pakistan. Photo by: Andreas Sommer, March 30, 2009. Credits: CC BY-SA 4.0 DE DEED.
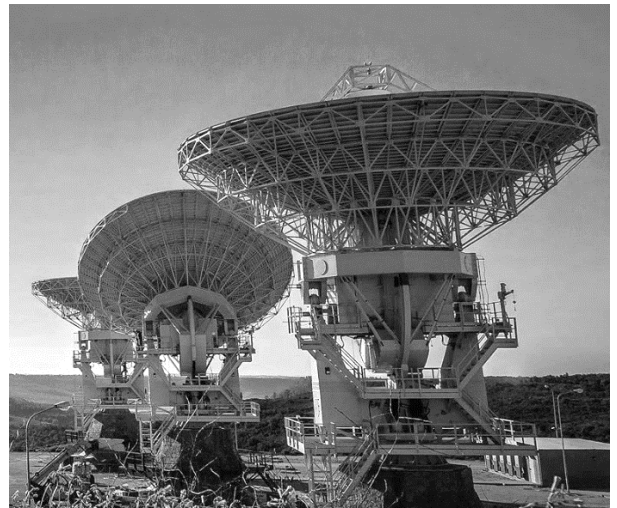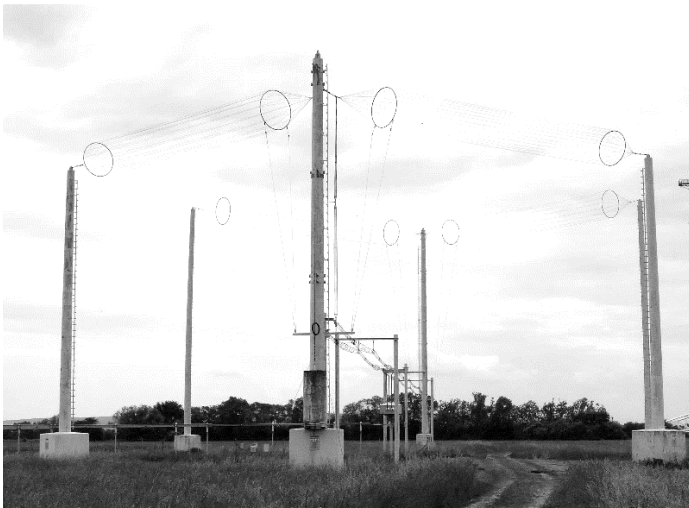

Fig. 13. *"Moosbrunn Quadrantantennen"* Vee Antennas. Moosbrunn, Austria. Photo by: Ulrich Eitler, May 30, 2015. Source: wikimedia.org. Credits: CC BY-SA 4.0 DE DEED. **Fig. 14.** U.S. Naval Radio Transmitter Facility, Niscemi, Italy. Photo by: U.S. Navy photo/Released, March 13, 2018. Source: wikimedia.org. Photo ID: 180313-N-JQ378-003. Credits: Public domain.

Sicily, with its intricate blend of historical richness and contemporary evolution, exemplifies this intricate simulation between the past and the present: the showcased prowess of the U.S. RQ-7B Shadow UAS, the RQ-21A STUAS, and the E-3 AWACS are an example of UAV exercises enrolled into electronic deterrence and epitomize the melding of modern small-scale warfare techniques with strategies deeply rooted in centuries-old defense traditions retrieved from digital sensing (Juhász, A. et al., 2016, UNESCO & UNITAR, 2018).

The incorporation of cutting-edge technological instruments presents a counterintuitive dilemma: the encroaching menace of covert adversaries, equipped with sophisticated Electronic Warfare (EW) capabilities, aiming to penetrate and extract confidential data. Remarkably, Heritage inventories (Brosché J. et al., 2016), which serve as repositories of a nation's cultural and historical last storeroom, are now susceptible to cyber ambushes (Freedberg S., 2012) that challenge with Riegl's assertion, emphasizing the evolving nature of EW landmarks as modern monuments (Cunliffe E., 2020): "*The sense and meaning of a monument do not belong to the works by virtue of their original purpose; it is rather we, the modern subjects, who attribute them*" (Meyer A., 2013).

Fig. 15. Bunker, Sant'Agata, Sicily, Italy. Photo by: USA Army. 1944 (?). Source: Birtle, J. (1993) p.25. Credits: Public Domain Mark 1.0. **Fig. 16.** *Favigna Castello*, Santa Caterina, Sicily, Italy. Photo by: Gabriella Panareo, April 27, 2018. Source: wikimedia.org. Credits: CC BY-SA 4.0 DE DEED.

As our dependence on volatile storage surges, there emerges an undeniable urgency for robust surveillance and EW defense mechanisms: these mechanisms are designed to pre-emptively counter any electronic reconnaissance attempts, ensuring that well known in ancient fortifications (ICOMOS, 2021) "*zone d'ombra*", or shadowed recesses in periurban belts, remain susceptible to breaches; such strategies are not only about preserving physical assets but are also about safeguarding the intangible ethos they enshrine.

Historical landmarks like *Monte Cassino* in Italy and *Tas-Silġ* in Malta, which have experienced the tumultuous ebb and flow of counter-offensives, retreats, and ambushes, underscore the feeble but anticipatory connection EW interchange introduced by portable broadcasting equipments, between volatile environments and Heritage monuments (Rennie K., 2021).

"the 4th Indian Division found it to be in Gerrilan hands (48). The Indians had to bitterly fight to capture point 593 and the ruins of a feldwebel fort upon its heights. Furthermore, the Indians found that the existing American positions were little more than forward outposts and the build-up of the supplies with which to., begin tile attack would have to be made over treacherous mountain trails unsuitable for vehicles. Logistics became dependent upon mule trains to traverse the sever, wiles distance from,. the allied front to the supply trairns" (Gober, D. et al., 1984, p. 34).

"in accordance with Air Force aircraft, but that the 2nd New Zealand Corps […] immediately exploit the shock effect […] In fact, when the weather forecasts for the 15th of February projected acceptable weather, the combination of good weather and the anticipated need of air, support at Anzio in the immediate future dictated that the air missions over Cassino be flown on that date. Thus the date was set notwithstanding the fact that tactically the 2nd New Zealand Corps (particularly the Indian Division) was riot yet prepared. The bombing began at 0930, the 15th and came as a surprise as much to the allied units or the ground as to the Germans. While it proved to be a spectacular display, there was riot much time for observation. With the bombing underway, the surprised chain of command had to begin to feverishly alter the original plans for attack. in order to exploit as quickly as possible the shock effect of the bombing" (Gober, D. et al., 1984, p. 81).

"Radio nets failed about 1300 hours and enemy snipers snot both messengers arid […], making communications virtually non-existent. The same enemy fires from the ruins and from positions on the hillside kept the engineers from coming forward to clear the rubble which blocked tanks and slowed the infantry. because reinforcements were slow to arrive and because of the poor communications, the allies were unable to seize the Point 435 defenses. The battle for tie town of Cassino._ […] cleaning of the town. This battle […] with ineffective communications. It seemed that the Germans reinfiltrated as fast as the ruin was cleared.." (Gober, D. et al., 1984, p. 62).

Fig. 17. Signallers of the 6th Battalion Royal West Kent Regiment using a radio in a dugout on Monastery Hill during the Second Phase, 15 February - 10 May 1944. Cassino, Lazio, Italy. Photo by: Sergeant W. E. McConville, No. 2 Army Film and Photo Section, Army Film and Photographic Unit. Production date: 1944-03-26. Material: Nitrate. Catalogue number: NA 13363. Credits: IWM Non-Commercial Licence. © IWM NA 13363. **Fig.s 18-19.** The Type 13 CMH (CentriMetric Heightfinder) Radar: The R.A.F.'s first centimetric radar, designed to enhance height data at Ground Controlled Intercept (GCI) stations. Introduced with dual vertically mounted cheese antennas, a narrow 1.5° vertical beam nodded between -1° and +20° elevation, and a 7.5° horizontal beam width. Its primary display was an E-scope, used for measuring aircraft height. Developed in 1942, it underwent various modifications with the Type 13 Mk V featuring an improved antenna similar to the Type 14 Mk VI. Key specifications include an S-Band frequency, 500 Hz pulse repetition frequency, pulse widths of 0.6 or 1.9 μs, and a peak power of 500 kW. Pictured: Type 13 Mk5 radar, with an antenna measuring 20 feet by 5.5 feet. Location: *Tas-Silg,* Malta; no 21033 A.M.E.S TYPE 13, a significant multi-period sanctuary site. Photo: via Subterranea Britannica Research Study Group. Publisher: Christian Wolff. Credits: GNU Free Documentation License & Creative Commons Attribution-Share Alike 3.0 Unported license.

3.5.3. Balancing progress and tradition: the technological imperative of Self-Determination in Active Citizenship for military landmarks

In the evolving dialogue of Heritage studies, inevitable disagreement emerges between the rapid technological evolution, particularly evident in the increasing emphasis on Electronic Warfare (EW) investments during peacetime (Zhang X. et al., 2022), and the enduring commitment to cultural preservation.

Societies must strike a balance, understanding the importance of Self-Determination, principally in the backdrop of local and indigenous narratives: dominant national discourse, with its overarching themes on memorial architecture, has the ability, from time to time, to overshadow the significant efforts at local and indigenous levels to use active deterrence in crisis prevention; this crisis deterrence is especially verified along national borders, whereby the electromagnetic spectrum plays an active key role in communications, navigation, radio, and radar, bridging a *continuum* with traditional Heritage narratives from the past (Petrauskas G. et al., 2018).

This dynamic is palpably evident in finnish Lapland: at this juncture, World War II (WWII) landmarks, exemplify still potent emblems of national might, and starkly juxtapose indigenous aspirations, inviting introspection; a salient question emerges: "*To what extent should we compromise our traditional ethos and values in the pursuit of technological advancement and defense?*". The introduction of modern infrastructures, exemplified by antennas, necessitates meticulous site analysis, carried out by a broader range of inputs. Hitherto, the assurances provided by evaluation studies within the realm of urbanism may not canonically address the following issues: "*How might such analyses inadvertently neglect the profound cultural and historical importance of these sites, potentially leading to multifaceted dilemmas*?".

Koskinen (2023) delved into the nuanced interplay of cultural rights, elucidating that while they anchor in broader human rights, they inherently celebrate diversity: this duality raises a thought-provoking inquiry: "*Can universally accepted principles genuinely embrace the intricate tapestry of diverse cultures*?". Global frameworks, influenced by monolithic national identities, may inadvertently marginalize the rich mosaic of cultural traditions within nations, underscoring the imperative of cultural pluralism and individual rights to partake in community-specific practices.

The WWII Heritage locales of Finnish Lapland serve as evocative case studies for these debates; far from being mere historical remnants, they evoke diverse sentiments: for many, these sites encapsulate familial and community narratives, while for others, they are emblematic of traumatic pasts. The "*Lapland's Dark Heritage*" project, among others, accentuates the significance of engaging with these sites through a lens of holistic inclusivity, emphasizing the imperative of recognizing and integrating a plethora of cultural narratives.

The tourism sector, with its inherent commercial inclinations, presents additional complexities: Santa's Village, despite its proximity to a former German Military base, conspicuously omits this historical linkage, hinting at the challenges inherent in intertwining contentious histories with contemporary attractions; such omissions underscore

the global challenge of reconciling "authorized" Heritage interpretations with local perspectives, especially in post-colonial contexts.

This balancing between progress and past set of conventions, while the commercialization of Heritage is undeniably significant and sustain the material aspect carried out by the industry of "*ambivalent heritage*", "*difficult heritage*", "*dark heritage*", via ethnographic fieldwork initiatives, it must be approached with a commitment to preserving historical authenticity. It is imperative to engage in a more democratic and inclusive Heritage management approach, valuing the myriads of voices that contribute to a "*multisensory experience*" of Finnish cultural Heritage highlighted by Koskinen.

3.5.4. Military Architecture in EW: escalating Heritage deterrence as a cultural practice

The right of every individual to participate freely in the cultural life of the community, as stated in Article 27, becomes especially poignant in the face of prolonged conflicts: in regions marked by instability, the deliberate destruction of cultural Heritage can leave profound scars; the process of rebuilding and restoring not just the physical structures but also the intangible traditions and beliefs of a community is challenging. Yet, there's a growing consensus that post-conflict cultural Heritage policies must be integrated within broader redevelopment goals, which include embracing cultural diversity and human rights.

While Article 27 implies a shared ownership of culture, it also highlights a private form of cultural ownership: this duality suggests that while everyone can partake in cultural life, individuals also have rights over their unique contributions, be it in science, literature, or art.

The right to Self-Determination, as enshrined in Article 1 of the two Covenants, augments the duty of states to preserve cultural Heritage: this article emphasizes that all people have the right to determine their political, economic, social, and cultural development, placing cultural Heritage protection within the realm of international human rights.

The writings of Ruskin on mountains illuminate his contemporary thoughts, even within this specific domain, highlighting the links between territorial protection and the culture of restoration. His profound contributions shaped the aesthetic sensibility towards landscapes and art criticism on the subject; in Ruskin's works, a significant relationship emerges between art, architecture, and the mountainous environment, bridging aesthetic allure with scientific observation: he initially delved into landscape elements—sky, waters, vegetation, light, colors—before venturing into the morphology of mountains, viewing them as "*constructions*".

Ruskin's ideas were ahead of his time, emphasizing environmental protection. Similarly, his reflections on restoration and the alteration of monumental contexts showcased his early concerns about the risks posed by mountain tourism; his understanding of mountains extended beyond just natural Heritage. He perceived them as true "*monuments*" imbued with aesthetic, historical, scientific, emotional, ethical, and social values. Conversely, his profound insight into the significance of mountains as monuments is not fully appreciated even today (Bartolomucci C., 2019). For further insights, they refer to "*Opportunité et Conséquences d'une inscription de l'Espace Mont-Blanc dans des dispositifs de protection internationaux, Nature & Patrimoine*".

Fig. 20. Observation station in the Strait of Dover. (Schofield J., 2009). **Fig. 21.** Cupola, shelter of the mountain façade, work site. (Schofield J., 2009).

3.5.4.1. ICOMOS guidelines on fortifications for a Military Heritage

Throughout human history, fortifications have been emblematic of defense, strategy, and power. From ancient earthworks to intricate military bases, they story tell a fabric of human resilience, innovation, unequivocally accompanied by domination: while they connect us to our past, these structures can also evoke painful memories for communities subjected to power dynamics; yet, by understanding and respecting these memories, experts reframe the narrative, fostering a more harmonious relationship between people, fortifications, and Military Heritage.

Fortifications, especially those from the 19th century, were strategically integrated into their cultural landscapes: thoughtfully, this integration provides insights into diverse societal approaches to defense and strategy.

According to the Factory Acceptance Test (FAT) deployment, these assemblies, whether still functional or obsolete, are an invaluable link to our history even though still indeterminate (Axelsson Yngvéus et al, 2023).

The ICOMOS guidelines on fortifications and Military Heritage aim to outline principles for conserving and valuing these structures and their surrounding landscapes: by recognizing fortifications and its surrounding impact (Scott D. et al., 2010), in the matter of unique cultural assets, experts reframe common cultural post-war challenges, listing variables retrieved from the guidelines which are advocated for preserving their tangible and intangible values but this duality involves understanding the fortification within its operational context and initial purpose, promoting research to ensure its preservation, and fostering knowledge-sharing for its conservation.
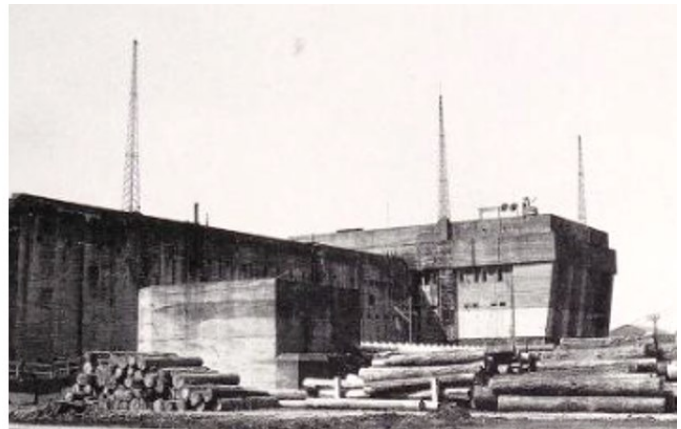

Fig. 22. "*Vacation bunker": f***om Defense to Leisure. Bunkers Turned Vacation Homes for *Amersfoort* Officials, Ijmuiden, Netherland. 1964. Photo by: Hendriksen Theo. Source: http://data.europeana.eu/organization/14822 50000004671093. www.archiefeemland.nl. Photo ID: 92004. Credits: CC BY-SA 4.0 DE DEED. **Fig. 23.** Submarine base of La Palisse: rear façade from two different angles. Schofield, John. (2009).

3.5.4.2. Fortifications and communities: anthropomorphy and zoomorphy

Military Architecture (MA), has played a marginal instrumental in molding the identities and traditions of communities, across the Italian peninsula: the interpretation of these significant structures, on the opposite end of the spectrum, necessitates a delicate approach, diving deep into their multi-scaled narratives, not overshadowing nor marginalizing any specific community or value set; this interpretation seeks to authentically reflect the ever-evolving cultural, social, and political milieus, drawing attention to the intricate synergy between contemporary elements and their roles in territorial defense: the aim is to enhance appreciation among visitors and the indigenous community alike, shedding light on the shared, transnational Heritage values intrinsic to these edifices.

The methodology adopted to bring this vision to fruition is multifaceted: at its core, it focuses on integrating Heritage values in a manner that resonates positively with both the local community and visitors; this is largely achieved while acknowledging and reconciling the site's military origins as a mere praxis of urban composition, and the diverse roles it might have assumed over time, by means of re-enactments into original destinations, i.e. prisons.

Concurrently, there's an emphasis on crafting and disseminating guidance documents, policies, and strategic frameworks that safeguard the profound Heritage values of the site.

As part of this comprehensive approach, there are dedicated initiatives aimed at magnifying the recognition and effective communication of the identity and values synonymous with these fortifications; furthermore, research efforts are intensified to better comprehend community perceptions and affiliations towards these monumental structures. Lastly documented, the strategy underscores the importance of collaboration, particularly with the communities that trace their origins to these sites, ensuring their active and informed participation in the conservation, management, and interpretation of fortifications and their associated Military Heritage.
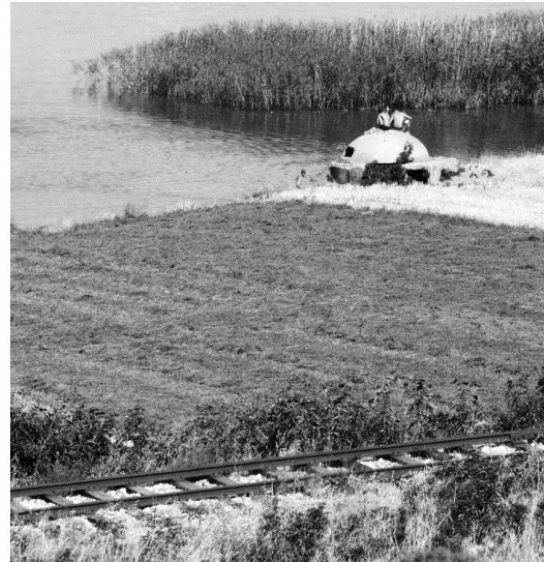
Fig. 24. Anthropomorphic **o**bservation station in the Strait of Dover. France. (Schofield J., 2009). **Fig. 25.** Bunker visited by swimmers along Ohrid lake. Albania. August 2012. Photo by: Marcin Szala. Source: wikimedia.org. Credits: CC BY-SA 3.0 DE DEED.

Fig. 26. Bunker. Tonnara di Bonagia, Sicily, Italy. July 2, 2016. Photo by: Andrea Albini. Source: wikimedia.org. Credits: CC BY-SA 3.0 DEED. **Fig. 27.** Bunker in Boguszowice (1939), Poland. May 3, 2010. Photo by: Schweppes. Source: wikimedia.org. Credits: CC BY-SA 3.0 DEED.

Fig. 28. *"Dragon Teeth"*.Chelmsford, UK. January 16, 2012. Photo by: Sludge G. Source: flickr.com. Credits: CC BY-SA 2.0 DEED. **Fig. 29.** *"Dragon Teeth"*. Aachen, Germany. Credits: PD.
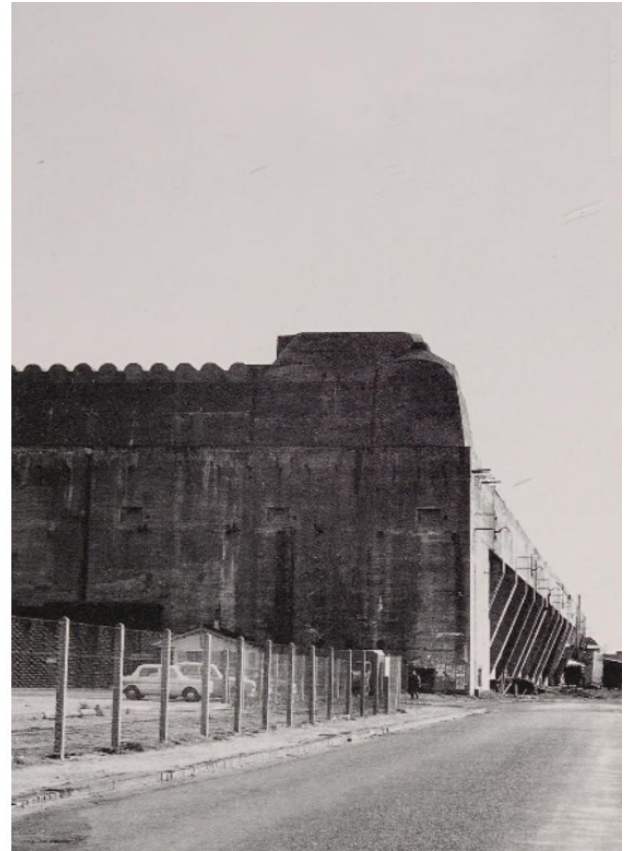
Fig. 30. Aerial view of a submarine base in Saint-Nazaire (I.G.N. photo) (Schofield J. (2009). **Fig. 31.** The rear façade of its submarine base. (Schofield J., 2009).

Fig. 32. "*Blockhaus en sursis*". La Rochelle. October 2019. Photo by: Thierry Ilansades. Source: flickr.com. Credits: CC BY-SA 2.0 DEED. **Fig. 33**. German submarine base. Pallice, La Rochelle. March 13, 2011. Photo by: Thierry Ilansades. Source: flickr.com. Credits: CC BY-SA 2.0 DEED.

Fig. 34. Bomb shelter in Berlin Sports Palace. (Schofield J., 2009). **Fig. 35**. Bunkers in Durres. Albania. 2011. Photo by: A. Lefterov. Source: wikimedia.org. Credits: CC BY-SA 3.0 DEED.

3.5.4.3. Contemporary reimagining of fortifications: advancing the urban necessity to qualify the passage from historical bastions to modern strongholds

In the flux of contemporary military paradigms, a multitude of historical fortifications find themselves obsolescent along the Italian peninsula, having been constructed in e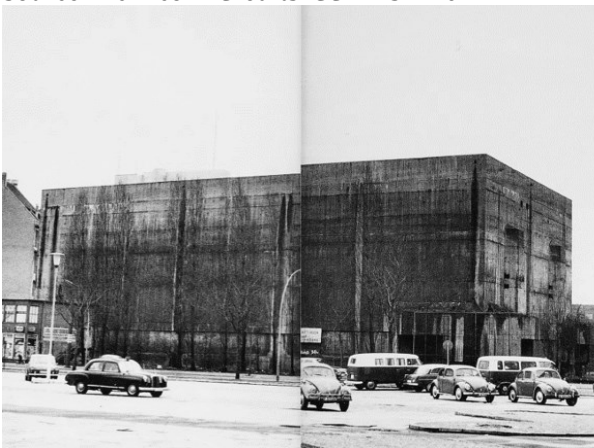pochs where their primary objective was to serve as formidable deterrents to potential adversaries from the sea: the quintessence of these structures, once feared as the pinnacle in terms of inaccessibility, is nowadays juxtaposed with the exigencies of modern-day utility and architectural adaptability; over the centuries, the trajectory for their prospective utility is anchored in principles of sustainable adaptation and reuse due to the superior materials demanded for their assembly.

Nonetheless this pertinent *ante-litteram* recycling, the current landscape architecture, seem to not adapt the sense of a shared rehabilitation thus ensuring alignment with the current EW fortification's authentic context and intrinsic value constituted by hardware and mechanical parts emerging as unique cultural property building up next-generation museums which require surveillance (UNESCO, 2023) due to their transportability (Legnér M., 2022).

Indeed, the classified information behind military landmarks, is partially far from being released before their dismissions, and therefore currently not aligned to a shared degree of *equilibrium* with the civilians: MA modifications are addressed to international treaties, with unknown criteria applied to the dimension of Multi-Domain-disciplinary contingency (UNESCO, 2018); sea, air and sub-orbital space, in unison catalyzing, hence a specific Multi-Criteria Decision Analysis (MCDA) that promotes international cohesion at the expenses of local Active Citizenship.

Fig. 36. Observation tower camouflaged as church belfry. (Schofield J., 2009).

The metamorphosis of these past bastions, nevertheless, may offers in future a vision as repositories of erudition, where inquisitive minds can immerse themselves in the Multi-domain of military legacy, modelling IT information, together with structural infrastructures land use, as an amalgamation of historical narratives, technological evolution,

international diplomacy, disputes on raw resources agreements, visual mitigation introduced by stealth colors on account of engineering of materials, and miniaturization of components carried out by scientific advancements.

These material and informative components transcend their roles as mere pedagogic platforms, metamorphosing into disaggregated scratches of information, towards inclusivity and reconciliation in dedicated IT communities, electro smog parameters (eligible for an Industrial Archaeology's record) and corporate design that find resonance in our contemporaneous socio-political landscapes.

Such material and volatile alterations should be orchestrated in the future under the aegis of fine-tuned Conservation Master Plan, meticulously crafted and realized by specialists who possess profound IT insights into the architectural intricacies of these strongholds: this blueprint would proactively eschew arbitrary modifications, precluding extraneous restorations based on mere visual qualitative considerations with all due respect to Riegl restoration doctrine of: i) "*Alterswert*", antiquity value; ii) "*Geschichtswert*", historical value and iii) "*Gebrauchswert*", value of utilization), i.e. without taking into account fibers and engineered materials, and forestall the indeed divestment of potentially invaluable historical vestiges in Military Industrial Heritage (He. L. et al., 2015); neither adding nor subtraction as Brandi would commence but reinstalling such fibers in a well distinguishable way.

As we suffer from the challenges of modern-day accessibility, the infusion of avant-garde technological stratagems would provide avenues to render these miniature fortresses in the matter of electronic witness from the past combined with Camouflaged War Heritage (CWH) (Moxham O., 2023), without diluting their neutral historical interpretation.

Fig. 37 (left). Maintenance on an Air Liner Heavy Base ISTAR (Intelligence Surveillance Target Acquisition and Radar) used for monitoring the Area of Operation (AO) operated by a Lance Corporal from ES Bn (Equipment Support Battalion) REME (Royal Electrical Mechanical Engineers). Photo by: Sgt Wes Calder RLC. Item ID: Image 45153780.jpg. Credits: CC BY-NC 2.0. Non-Commercial Use Authorized. **Fig. 38 (top).** K-span structure under construction. Concrete pouring into wall forms by the hands of the U.S. Navy Builder Constructionmen, December 11, 2018. Photo by: Staff. Sgt. Ryan Campbell. Item ID: 170512-Z-MC713-1119. Credits: Public Domain. **Fig. 39 (bottom).** Sandbags are being deployed by the New York Air National Guard to respond to the state of emergency triggered by rising water levels and flooding, May 12, 2017. Photo by: Staff Sgt. Ryan Campbell, U.S. Air National Guard. Item ID: 181212-N-HK244-1013. Credits: Public Domain.

3.5.4.4. Fortifications are not typical buildings: materials beyond time for semiotics

Fortifications, whether solitary structures or intricate defensive systems, represent an evolution of architectural, technological, and strategic genius developed over extensive timelines. Often, these historical edifices are not fully understood in their entirety, resulting in fragmented perceptions that do not capture the comprehensive essence of the site: this essence encapsulates not just the physical structures but also the encompassing cultural landscapes, emotional viewpoints, familiar fractures of the population they weave (Krzyżanowska, N., 2016).

The refinement of the emotional review lead us to a more profound, multidisciplinary comprehension of these sites beyond the engineering modelling applied to the sites: this involves the meticulous top-down and bottom-up confrontation, applied by urban policy-makers as the execution of Conservation Management Plans, which serve as blueprints for preserving the fortification's integrity (Duffy C., 2006). Coupled, the emphasis on sustained, holistic research delves into every facet of the fortification, from its architectural nuances to its weaponry significance (Allsop D. et al., 2007). Strengthening networks and fostering partnerships are integral to this process, ensuring that a diverse spectrum of expertise and perspectives contribute to the fortification's understanding and preservation. At the heart of these efforts is recognizing the intrinsic values that fortifications and their associated defensive Heritage bring to the table.

These structures are not just stone and mortar; they are historical living documents that narrate tales of architectural prowess, technological innovations, artistic inclinations, and the socio-political events that precipitated their creation: as time has progressed, these structures have garnered layers of meaning, further enriching their significance. Fortifications should not be viewed merely as standalone monuments due to the fact that they also function as systematic organizers of territories, shaping the landscapes around them. Acknowledging these multifaceted values, might not be always desirable to be considered if we consider mass graveyards (Weiss G. et al., 2020) or spaces whereby consumed torture (Renshaw L., 2013); the violence is crucial for a renewed „*Modern Military Death*" conceptualization: it's this recognition that accentuates the unique characteristics of fortifications, influencing strategies for their conservation, human and architectural rehabilitation, and appreciation to re-use that urban site.

3.5.4.5. Human and anthropological value : the archaeology of conflicts and human rights

Fortifications stand as tangible markers of historical dynamics, emblematic of humanity's enduring need for protection and territorial demarcation: rooted deeply in the annals of conflict (Viejo D., 2013), they've often borne witness to tumultuous clashes (Ostwald J., 2007), where the aspirations of one group met the resistance of another (Howe S., 2012, Cunliffe E. et al., 2018), culminating in weaponry victories and defeats that shaped the course of history among ruins of battlefields (Krauss J., n. d.).

These bastions are not just silent spectators but key actors (Corbalan M., 1991, Langfield M. et al., 2010) in the theatre of a dynamic war, some even serving as fulcrums around which nations were carved and identities forged (Khalaf W., 2017, Wahba S. et al., 2018).

Yet, their significance isn't confined to the bricks and mortar as an emerging histography attempts to reconstruct (Poulain M. et al., 2022) priorly to the invention of photography: beyond their towering walls and moats lies an unexpected tapestry of failed negotiations that led to re-use cultural landscapes into urgent encampments, compromising archaeological originality that offer insights transcending conventional historical narratives (Leturcq G., 2009, Regional Conference, 2000) and, therefore, embracing new "*Innovation and Knowledge Management*" (Barros T., 2011, Manacorda S. et al., 2013, Bezdrabko V., 2019).

These subterranean stories, when unearthed, can shed light on aspects of past societies and their interactions, filling gaps in our understanding: as such, fortifications served as bridges, connecting present-day societies with their ancestral roots, and reminding us of the intricacies of „*large-scale*" and „*low-impact*" military features that have shaped the course of human civilization; agreed the importance of such valorization, the international community has taken steps to establish National Cultural Heritage Crisis Unit (Interpol, 2019), Contact Zones (Chalcraft J., 2021), and formulate No-Strike lists (Cunliffe E., 2020).

Furthermore, the act of preserving memory encapsulates notions of identity (Donders Y., 2018) and belonging, collective recollections, cultural diversity, intangible Heritage, economic benefits, accessibility to cultural experiences, Heritage shield (Rule 17) and beyond, as clearly highlighted in 50 years World Heritage Convention (Albert T. et al., 2022).

Fig. 40 (left). The Battles of *Monte Cassino*, Italy. January - May 1944. A visual representation of the events during the said period. Image retrieved from the Imperial War Museum under the IWM Non Commercial Licence. Photographs and artworks created by active service members are covered by Crown Copyright provisions. Faithful reproductions can be reused under that licence, which is considered expired 50 years after their creation. Image accessed on September 2023. Source: Wikimedia.org. Credits: CC0 1.0 Universal. **Fig. 41 (right).** The Battle of *Cassino*, Lazio, Italy. January-May 1944.Third Phase 11 - 18 May 1944: A low aerial view of the Monastery showcasing its complete destruction. This event is associated with the Cassino IV (May), Battle of Monte Cassino 1944, during the Second World War, and is part of the Air Ministry Second World War Official Collection. Image retrieved from the Imperial War Museum under the IWM Non-Commercial Licence. Photographs and artworks created by active service members are covered by Crown Copyright provisions. Faithful reproductions can be reused under that licence, which is considered expired 50 years after their creation. Photographed by F/O Baker, a Royal Air Force official photographer. Accessed in September, 2023. Source: Wikimedia.org. Credits: CC0 1.0 Universal.

3.6. Zones of contention: Italy's legal intersections of Military needs and Heritage Territories: qualitative thematic synthesis with subjective evaluation of socio-economic implications

The intricate juxtaposition of military imperatives and cultural Heritage preservation within the Italian context is encapsulated within a broad spectrum of legislative instruments. As nations evolved and the socio-political climate became complex, Italy found itself at the intersection of safeguarding its cultural patrimony while concurrently addressing its defense and strategic needs.

4. Results

Upon analyzing the collected data and subsequent processing, we observed significant patterns and correlations that align with the study's objectives: these findings provide valuable insights into the research question, elucidating key aspects and guiding further exploration in the field; normative results, along with interdisciplinary operational doctrines, will be presented in the subsequent sections.

4.1. Stakeholders in Italy's military expropriation: roles, responsibilities, and cultural Heritage impacts

In recent years, the dynamics of expropriation for public utility have become increasingly prominent, especially in the context of military zoning in Italy. As the nation seeks to modernize and expand its defense infrastructure, there is an evident need to allocate land for such purposes: this has led to a series of complex interactions between local communities, Heritage conservation bodies, and defense authorities.

The delicate balance of safeguarding Italy's rich cultural Heritage while accommodating the demands of modern defense mechanisms presents both challenges and opportunities; this section delves into the current state of affairs, highlighting key instances and the implications of military zoning decisions on the Italian landscape.

Entity	Primary Role & Responsibilities	Implications for Cultural Heritage Sites	Potential Controversies & Challenges
Ministero della Difesa	Management of Italian armed forces and related infrastructure	Direct competence in military expropriations	Coordination with other state/local entities
Agenzia del Demanio	Management of state-owned properties, including acquisitions, sales, and leasing	Valuation and compensation for expropriated lands	Ensuring fair valuation and compensation
Regioni e Provincie	Territorial and urban planning based on Statutes of Autonomy	Approval of regulatory plans and potential modifications	Navigating regional-national priorities
Comuni	Local urban planning and direct engagement with citizens	Changes to local urban planning for military areas	Addressing local concerns and modifications
Enti Parco e Aree Protette	Management of protected natural areas	Impact assessment in protected areas	Balancing environmental preservation with military needs
Soprintendenze	Protection and valorization of historical, artistic, and anthropological heritage	Intervention in expropriations involving cultural assets	Ensuring protection of cultural sites amidst expropriations

Chart 3. Sensitivity Analysis: roles, implications, potential threats, and future confronts of Italian entities in military expropriations and cultural Heritage Protection.

4.2. Expropriation for public utility : current status of military zoning across the Italian peninsula

In Italy, the topic of expropriation for public utility, especially concerning military zoning, is addressed by a multitude of legal provisions that intersect with the objectives of cultural Heritage preservation: the "*Codice Civile*" (Civil Code) sets the foundational framework, addressing general rights and methods of expropriation, while the historic "*Legge* n. 2359" from 1865 established the principle of compensation.

The consolidation of these laws was achieved through D.P.R. 327/2001, offering a clearer structure for the expropriation process. Nonetheless, regional and local variations introduce nuances, leading to potential inconsistencies in application. Specifically, the "Legge Navarra" describes strategic cultural key component of "Made in Italy" that are eligible to re-transform areas, initially structured for military purposes.

This military-centric focus occasionally clashes with cultural Heritage protection mandates, as laid out in the "*Codice dei Beni Culturali*" (Heritage Code), highlighting potential conflicts between defense needs and the preservation of Italy's rich cultural tapestry. Overall, while the process appears well-regulated, challenges emerge in interpretation, application, and balancing collective versus individual rights.

Legal Provision	Scope & Purpose	Implications for Cultural Heritage Sites	Potential Controversies & Challenges
Codice Civile (Art. 832 and following)	General rights and methods of expropriation	Defines property owner rights	Interpretation of "public utility"
Legge n. 2359 (1865)	Regulation of expropriations for public utility	Principle of compensation introduced	Age of the law; modern applicability
D.P.R. 327/2001	Consolidation of expropriation laws	Clear structure for expropriation	Determination of reward value
Regional and Local Laws	Specific regional rules on expropriation	Regional nuances in expropriation	Variability and inconsistency across regions
Legge n. 50 (1977) "Legge Navarra"	Expropriations for military purposes	Designation of strategic areas	Balance between military and cultural needs
Cultural Heritage Protection Laws (e.g., "Codice dei Beni Culturali")	Preservation of cultural heritage sites	Protection of significant sites	Potential conflicts with military expropriations
General Impression	Well-regulated process of expropriation	Aim to balance collective needs with individual rights	Interpretation and litigation challenges

Chart 4. Variable Impact Study: assessing procurement policies.

4.2.1. Italian Civil Protection and Military regulatory framework

Italy's civil protection is governed by several key legislations, including the Law of 31 December 1985, n. 801, which addresses the organization of the Republic's information system in compliance with civil rights. The DPCM of 24 November 2010 sets rules for classifying and managing classified information, especially within EU and NATO contexts. Military establishments, including their energy efficiency standards, fall under regulations like the Legislative Decree of 15 March 2010, n. 90. In addition, NATO has its general directives on information security, which member states, including Italy, adapt and implement within their national contexts.

Category	Legislation/Regulation	Description/Details
Civil Protection	Law of 31 December 1985, n. 801	Provisions concerning the organization of the Republic's information system.
	DPCM of 24 November 2010	Rules for the classification, management, and protection of classified information at the national level and within the European Union and NATO contexts.
	Law of 11 March 1978, n. 121	State's special powers in economic matters and sectors strategic for national security.
	Legislative Decree of 19 February 2014, n. 14	Legislative provisions concerning defense.
	Emergency Code	Set of rules and procedures related to emergency management, including civil protection.

Armed Forces & Military Bodies	Law of 12 July 2011, n. 114	Establishment of the Military Road Police Service.
	Legislative Decree of 15 March 2010, n. 90	Regulations on energy efficiency of buildings, including military establishments.
	Legislative Decree of 30 March 2001, n. 165	General provisions on the organization of work in public administrations, including military personnel.
NATO Regulations	General Directives on Information Security	NATO's general directives on information security. Each member state implements these directives through its national laws. (Note: The specific nature of many NATO directives might not be publicly accessible).

Chart 5. Variable Impact Study: assessing procurement policies in the Ministry of Defence.

4.2.2. Military operational dynamics : Variable Impact Study of key perspectives

In the intricate landscape of Italy's cultural Heritage protection, the Prefecture has consistently played an instrumental role, especially *vis-à-vis* military involvement, including primarily the *Carabinieri*, military police force, in various epochs marked by preservation, emergencies, wartime arrangements, and natural disasters also assisted by *Guardia di Finanza* "*Nucleo Tutela Patrimonio Artistico*" (NTPA) and *Polizia di Stato*. An analytical examination of the Prefecture's role in this domain can be elucidated as follows:

Aspect	Interventions/Activities	Legal Framework or Supporting Document	Implications & Outcomes
Emergency Coordination	Rapid deployment of law enforcement, notably *Carabinieri*, post-natural calamities.	"*Codice dei beni culturali e del paesaggio*" (Legislative Decree 42/2004)	Safeguarding cultural sites from damages and illicit activities.
War-time Cultural Assets Protection	Protection of cultural assets during geopolitical tensions or conflicts.	1954 Hague Convention	Ensuring inviolability of cultural assets during hostilities.
Specialized *Carabinieri* Units	Collaboration with Carabinieri's TPC (*Tutela Patrimonio Culturale*).	National directives & internal *Carabinieri* mandates	Thwarting art thefts, counterfeits, and unauthorized trafficking.
Archaeological Parks Management	Military interventions within archaeological parks for conservation and security.	Regional legislations and national codes	Sustained conservation, security, and regulated accessibility of archaeological sites.
Symbiosis with MiBACT	Systematic collaboration on intervention strategies and conservation endeavors.	Various legislative acts and decrees	Streamlined efforts in emergencies and routine conservation activities.
Training & Capacity Building	Training modules for personnel on cultural asset contexts.	NATO best practices & national training directives	Equipping personnel with competencies for cultural asset-related contexts.

Chart 6. Variable Impact Study: orchestrating defense and Heritage through Italy's Prefecture.

Scholar/Expert	Primary Focus & Contribution	Relation to Military Contexts & Modern Challenges	Implications for Cultural Heritage Conservation
Salvatore Settis	Comprehensive writings on Italian cultural heritage conservation	Addresses challenges of contemporary society in heritage preservation	Advocacy for integrated conservation strategies
Tommaso Di Carpegna Falconieri	Discussion on the relationship between archaeological sites and military uses	Emphasis on wartime contexts	Highlighting vulnerabilities & potentials of archaeological sites in war zones
Adriano La Regina	Conservation and management of heritage in modern urban contexts as a former superintendent for Rome's archaeological assets	Dealt with urban planning and archaeological protection	Balancing modern urban growth and heritage preservation
Carlo Ginzburg	Exploration of history, memory, and identity	Historical interpretations influencing cultural heritage understanding	Emphasizing the importance of memory and identity in heritage conservation
Luca Zevi	Writings on architecture and urban planning in relation to history and heritage	Navigating modern architectural needs with heritage constraints	between contemporary architectural practices and heritage preservation
Generale Fabrizio Parrulli	Leadership role in the protection of cultural heritage both domestically and abroad via the TPC	Emphasis on protection during conflict scenarios	Reinforcing military's role in heritage safeguarding during times of conflict
Colonnello Roberto Riccardi	Writings on the role of Italian armed forces in cultural heritage protection	Special focus on peacekeeping operations	Highlighting military's proactive role in heritage conservation

Chart 7. Variable Impact Study: integrating Military and academic perspectives on Italian Heritage.

The legal framework governing expropriations in Italy, especially for military purposes, is an intricate tapestry of legislative acts and decrees. Key among them include:

1. Civil Code: particularly, it articles 832 onwards, that addresses the right to expropriation for public utility, providing a general overview of expropriation and the rights of the expropriated property owner.

2. Law no. 2359 of 1865: A foundational piece of legislation, it regulates expropriations for public utility in Italy, introducing the principle of compensation.

3. Unified Text of the legislative provisions on expropriation for public utility (D.P.R. 327/2001): This presidential decree coalesces various legislative provisions on expropriations, structuring the process and setting the methods for determining expropriation compensation.

4. Regional and Local Laws: Tailored to the specificities of individual regions, these laws further detail or specify expropriation modalities according to local needs.

5. Law no. 50 of 1977 (known as "*Navarra* Law"): It specifically deals with expropriations for military purposes, delineating areas of strategic interest and setting out the modalities for expropriations in these zones.

The protective legal framework is further augmented by overlapping civil normatives focused on cultural Heritage conservation, like the Code of Cultural Heritage; when a military area of interest encompasses sites or edifices of cultural or historical significance, these laws can profoundly influence, or even limit, the expropriation process. Collectively, these legislative instruments underscore Italy's commitment to achieving a delicate balance between military imperatives and the sacrosanct duty of preserving its rich cultural Heritage.

4.2.3. Which are the guardians of maritime Heritage? The waters of cultural preservation under the SPECT Framework by Italy's *Marina Militare*

The Italian marine Army: *Marina Militare*, renowned for its naval prowess, is enabled by a multifaceted responsibility that extends beyond traditional maritime defense; through the SPECT (Strategies, Policies, Events, Controls, and Tactics) framework, the *Marina Militare* integrates naval operations, partially meeting cultural Heritage considerations under doctrines rooted in both national and international regulations.

This framework stands as a testament to Italy's dedication to preserving its rich maritime history while maintaining robust naval defenses; SPECT not only ensures the safeguarding of territorial waters but also emphasizes the importance of ancient maritime relics, submerged archaeological sites, and historic naval routes: *Marina Militare*'s commitment to this balance manifests in their proactive diplomacy, collaboration with cultural bodies in the Mediterranean sea and across international missions, continuing its training that prioritizes cultural understanding.

While the primary objective remains defense readiness, the underlying principle of SPECT ensures that the *Marina Militare* also acts as a guardian of the seas' cultural treasures. This dual mandate ensures that while seas may divide lands, they also unite nations through shared maritime Heritage and mutual respect.

SPECT	Naval Operations & Activities	Naval Directives & Defense Protocols	Strategic Implications & Defense Outcomes
Strategic Posture	Surveillance of maritime heritage sites in territorial waters	National Defense Act, Maritime Surveillance Protocols	Enhanced security for maritime cultural assets, reinforcing national sovereignty
Protection	Deployment of naval assets for the protection of underwater archaeological sites	NATO Protocols on Maritime Cultural Preservation	Safeguarding submerged heritage from illicit activities and potential threats
Protection	Deployment of naval assets for the protection of underwater archaeological sites	NATO Protocols on Maritime Cultural Preservation	Safeguarding submerged heritage from illicit activities and potential threats
Coordination	Regular briefings with heritage experts on site significance	Navy-Heritage Collaboration Agreements	Ensured minimal disruption to significant sites during naval exercises
Training	Specialized training modules on cultural heritage preservation for naval personnel	Naval Training Protocols, in alignment with NATO best practices	Elevated awareness among naval ranks about the importance of cultural assets
Tactical Response	Quick deployment in response to threats to maritime heritage	Rapid Response Naval Directives	Immediate safeguarding of sites facing imminent threats, showcasing naval agility
Engagement with Allies	Joint naval exercises with NATO allies focusing on heritage site protection	NATO Directives on Cultural Site Defense	Strengthened international collaboration, fostering a collective approach to maritime heritage protection

Chart 8. SPECT: Strategy, Policy, Education, Collaboration, and Technology, Naval Operations.

4.2.4. Variable Impact Study of evaluating public health Impact from electromagnetic pollution in military urban contexts

The increasing integration of electronic technologies in military operations has elevated concerns regarding electromagnetic pollution and its potential health implications; this recognition delves into the intricate interplay between military electronic activities and public health.

By scrutinizing available data and peer-reviewed studies, we aim to discern the real-world impacts subjectively and suggest precautionary measures to mitigate potential health risks: this assessment underscores the necessity of continuously updating safety protocols in line with the evolving technological landscape.

Fig. 42. Tempio Pausania, Vallicciola, ex base NATO. A depiction of the former NATO base in Tempio Pausania, Vallicciola. Photographed on February 2018. Photo by: Gianni Careddu. Accessed on September 2023. Source: wikimedia.org. Credits: CC-BY-SA 4.0. **Fig. 43.** MUOS Satellite Earth Terminal antennae at NRTF Niscemi. A detailed view of the MUOS Satellite Earth Terminal antennae. Photo by: ANiedbalski. Accessed on September 2023. Source: wikimedia.org. Credits: CC BY-SA 4.0.

Normative/Case	Primary Purpose & Content	Relationship with Military Installations/Activities	Implications for Public Health & Safety
Legge 36/2001	Defines exposure limits, attention values, and quality objectives for protection against electromagnetic fields (0 Hz to 300 GHz)	Sets the standard for all EMF sources including military	Establishes safety thresholds for general populace
Decreto Ministeriale 10 settembre 2008	Adopts guidelines to reduce population exposure to electromagnetic fields	Applies to all electromagnetic sources, military infrastructure inclusive	Aims for a consistent reduction in public exposure
Decreto Legislativo 257/2016	Criteria and methods for planning and implementing environmental restoration in national interest sites	Implications for military sites requiring cleanup	Ensures environmental remediation, indirectly safeguarding public health
Quirra, Sardegna	Controversy due to pollution from military testing activities	Center of allegations due to military tests	Concerns raised about health issues among local population
Siniscola, Sardegna	Concerns over electromagnetic radiation exposure from radar antennas	Military radar installations are a primary concern	Local apprehensions about potential health risks
Niscemi, Sicilia	MUOS (Mobile User Objective System) U.S. base raised pollution concerns	U.S. military base with advanced communications system	Protests and concerns over potential electromagnetic pollution

Chart 9. Variable Impact Study: evaluating of a general public health impact from electromagnetic pollution in military urban contexts; from primary function, throughout military designations and EW accomplishments.

4.2.5. Acoustic regulation impacts: noise directives for military airports and their effects for community well-being

In the interior of the realm of military airport operations in Italy, noise regulation plays a fundamental role in striking a balance between operational necessities and the well-being of surrounding communities: the "Environmental Noise Directive" (Direttiva 2002/49/CE) sets the foundation by requiring noise exposure mapping and the formulation of action plans in zones with excessive noise.

National decrees, like DPCM 1 March 2011, further delineate the methodologies for evaluating such noise, encompassing the distinct challenges posed by air traffic; acoustic mapping becomes an instrumental tool in this context, discerning critical noise exposure zones, while restriction zones offer spatial solutions to counter noise disturbances. Mitigation strategies, ranging from soundproofing to operational tweaks, aim to minimize the auditory impact of these military installations.

Yet, central to this entire regulatory framework is community engagement, emphasizing the importance of dialogue and transparency between military airports and the residents they may affect.

Regulation/Key Element	Core Provisions & Content	Implications for Military Airports	Potential Impact on Local Communities & Safety
Direttiva 2002/49/CE	"Environmental Noise Directive" - Rules for assessing and managing environmental noise. Requires noise exposure mapping and action plans for excessive noise.	Mandates noise mapping and action plans for military airports	Sets the benchmark for noise levels around airports
DPCM 1 marzo 2011	Adopts criteria for noise mapping and action plans concerning environmental noise. Defines methodologies for environmental noise evaluation, including air traffic noise.	Directly relates to noise from military airport operations	Provides a structured framework for noise evaluation
DPCM 14 novembre 1997	Establishes criteria for determining and measuring sound emissions from significant external noise sources.	Ensures military airports adhere to noise emission standards	Ensures external environments aren't excessively noisy
Acoustic Mapping	Determines noise impact areas through measurements and simulations, identifying critical noise exposure zones.	Essential for gauging noise footprints of military airports	Helps in identifying high-risk noise zones for residents
Restriction Zones	Areas where new constructions or other noise-sensitive activities are limited or prohibited.	Might limit expansion or change-of-use areas around the airport	Provides zones of safety from excessive noise exposure
Mitigation Measures	Involves soundproofing, operational changes (like flight times), optimized flight trajectories, and use of quieter technologies.	Offers strategies to reduce noise pollution from airport operations	Direct measures to reduce noise disturbances for communities
Community Engagement	Maintaining open dialogue with local communities, informing them about planned measures, and addressing their concerns.	Ensures transparency and mutual understanding between the airport and residents	Provides a platform for communities to voice concerns

Chart 10. Variable Impact Study: evaluating the impact of noise regulations across military airports.

Navigating the complex matrix of regulations governing lead concentrations in aquatic ecosystems, Italy's D.Lgs. 152/2006, D.Lgs. 31/2001, and D.Lgs. 230/1995 provide foundational national standards for water quality and radiation protection, each with specific provisions for lead. While these regulations anchor domestic water protection, regional laws introduce granularity, offering nuanced solutions tailored to local water bodies.

On the international front, the Drinking Water Directive and the Water Framework Directive underpin the broader European stance on water safety and ecosystem conservation, setting clear criteria for pollutants, including lead. The Ramsar Convention and Basel Convention further emphasize the global commitment to safeguarding aquatic habitats and responsible waste management.

As lead contamination continues to pose ecological challenges, it's evident that both national and international regulations play a pivotal role. However, continuous revisions and tighter monitoring mechanisms are imperative to ensure the vitality of our water ecosystems.

Regulatory Aspect	Key Provisions & Limitations	Implications for Environmental Protection & Management	Suggested Enhancements & Revisions
National Regulations			
D.Lgs. 152/2006 (Environmental Code)	Establishes limits for pollutants in water. Lead has specific restrictions.	Sets foundational standards for water quality in Italy.	Continuous updates based on recent scientific findings.
D.Lgs. 31/2001	Drinking water quality: sets maximum lead levels.	Ensures the safety of drinking water for the populace.	Regular monitoring and stricter enforcement measures.
D.Lgs. 230/1995	Protection against ionizing radiations; sets lead levels in certain contexts.	Broadens the scope of environments where lead is regulated.	Include more comprehensive assessments for lead dispersion.
Regional Laws	Specific regulations for water quality and aquatic ecosystem protection.	Allows tailored solutions for regional water bodies.	Coordination between regional and national standards.
International Regulations			
Drinking Water Directive (98/83/CE)	EU standards for drinking water, including lead limits.	Reinforces national standards with broader European context.	Periodic revisions based on emerging research.
Ramsar Convention (1971)	International conservation of wetlands, potentially vulnerable to lead contamination.	Highlights the significance of wetland ecosystems.	Encourage nations to develop specific lead contamination strategies.
Water Framework Directive (2000/60/CE)	EU framework for surface and groundwater protection. Criteria for pollutants, including lead.	Comprehensive approach to European water protection.	Introduce more stringent monitoring mechanisms.
Basel Convention (1989)	International regulation on cross-border hazardous waste movement. Although not lead-specific, it sets principles for managing hazardous waste.	Sets the groundwork for responsible waste management.	Develop specific addendums focusing on lead-based waste.

Chart 11. Variable Impact Study: evaluating the protection of aquatic ecosystems from lead contamination based on national and international regulations; key limitations, ecological allegations, and adjustments.

Lead contamination emanating from shooting exercises has multifaceted implications both environmentally and on human health. When lead from ammunition settles in aquatic environments, it degrades substrate quality, jeopardizing benthic fauna, i.e. over time, aquatic creatures, including fish and mollusks, show heightened lead levels, posing consumption risks.

Additionally, aquatic flora, crucial for maintaining ecosystem balance, face the brunt of lead toxicity. The human implications are equally alarming. Lead, being neurotoxic, can have detrimental effects on children's cognitive

development and various physiological systems in adults. Especially concerning is the potential health risk to communities residing near military training sites.

Addressing these challenges demands multi-pronged and fine-tuned approaches. Transitioning to lead-free ammunition, rigorous water quality monitoring, and educating military personnel about sustainable practices are vital: remediation efforts to cleanse water bodies and collaborations with environmental agencies can pave the way to a safer, lead-reduced environment.

Impact/Intervention Domain	Key Observations & Findings	Implications for Military Operations & Training	Potential Mitigation & Response Strategies
Environmental Impact			
Aquatic Ecosystem Contamination	Lead from ammunition can settle at the bottom, affecting substrate quality and negatively influencing benthic fauna.	Regular training exercises can exacerbate contamination levels	Consider alternative training locations or lead-free munitions
Bioaccumulation	Aquatic organisms, e.g., fish and mollusks, may accumulate lead, leading to unsafe consumption levels.	Continual exercises increase bioaccumulation risks	Regular water quality checks; Public advisories for consumption
Flora Alteration	Lead presence can hamper the growth and development of aquatic plants, altering natural ecosystem balances.	Potential long-term ecological shifts from training activities	Monitoring and possible flora rejuvenation programs
Human Health Impact			
Lead Toxicity	Neurotoxic effects, especially in children, can hamper brain development. Negative effects on circulatory, renal, and endocrine systems in adults.	Nearby communities might be at risk from water sources	Regular health check-ups; Public advisories
Fish Consumption	Contaminated water bodies can make fish and seafood consumption hazardous.	Potential public health crises	Fishing advisories; Regular fish health assessments
Preventive & Remedial Measures			
Alternative Ammunition	Lead-free ammunition exists and can replace traditional ones during shooting exercises.	Requires logistical changes and potential increased costs	Pilot programs to test the efficacy of lead-free ammunition
Monitoring & Assessment	Regular water monitoring is essential to gauge lead contamination levels.	Continuous commitment to environmental health	Establish dedicated water quality teams and labs
Information & Training	Educating armed forces on the environmental impact of lead ammunition and promoting sustainable practices.	Improved environmental awareness within the military	Training programs and workshops
Remediation	Cleanup operations might be needed to remove lead from water bodies or the substrate.	Financial and logistical implications	Dedicated cleanup missions; Collaboration with environmental agencies

Chart 12. Variable Impact Study: estimating the environmental and health impacts of lead contamination from shooting exercises addressed to economic activities by civilians.

4.3. Considerations to include NATO's environmental commitments and practices

The Atlantic defense organization has recognized the imperative to integrate environmental considerations within its strategic and operational framework: the Environmental Protection Policy stands testament to NATO's commitment, emphasizing pollution reduction and waste management, thereby setting a proactive environmental agenda for its member states following the Organization for Security and Co-operation in Europe (OSCE).

The Science for Peace and Security (SPS) Programme goes a step further, channeling funds and fostering collaborations to address environmental security, an area that undoubtedly requires augmented attention. Through the Allied Joint Doctrine, NATO provides actionable steps, ensuring that environmental conservation is not just a policy directive but an operational reality; Partnership for Peace (PfP) Programme serves as a conduit for a more collaborative approach to environmental challenges, bridging the military-civil divide. Addressing specific operational challenges, NATO has set guidelines spanning hazardous waste management, munitions use, water conservation, and soil protection: these guidelines not only underscore the importance of environmental conservation but also recommend advancements, emphasizing the organization's forward-looking approach.

Regulatory & Policy Aspect	Key Provisions & Objectives	Implications for Environmental Protection & Military Operations	Suggested Enhancements & Future Directions
NATO's Core Environmental Policies			
Environmental Protection Policy	Foundational principles for environmental conservation during military operations, including pollution reduction and waste minimization.	Sets the tone for NATO's commitment to sustainable operations.	Periodic reviews and updates to meet evolving environmental challenges.
Science for Peace and Security (SPS) Programme	Funding and cooperation for various sectors, including environmental security.	Encourages research and collaboration on environmental issues.	Increase allocation for projects addressing environmental concerns.
Allied Joint Doctrine for Environmental Protection	Detailed guidelines for environmental protection during NATO-led military activities.	Provides actionable steps for operational environmental conservation.	Regular training for member states to ensure adherence.
Partnership for Peace (PfP) Programme	Aims for cooperation in environmental protection and emergency management among others.	Promotes collaborative approach to environmental challenges.	Expand partnerships to include more environmental experts and NGOs.
Specific Operational Standards & Guidelines			
Hazardous Waste Management	Procedures and standards for managing hazardous wastes during military operations.	Ensures the safe disposal and minimization of hazardous wastes.	Integration of more advanced waste management technologies.
Limitation on Use of Hazardous Munitions	Guidelines to reduce the use of munitions containing heavy metals or other toxic substances.	Reduces the environmental footprint of military activities.	Continuous research to find safer munition alternatives.
Water Resource Protection	Standards to ensure the conservation and non-contamination of water resources during operations.	Protects vital water sources and ensures sustainable usage.	Implementation of more stringent water conservation measures.
Soil Contamination Prevention	Measures to prevent soil degradation and contamination during military activities.	Protects terrestrial ecosystems and maintains soil health.	Collaborative projects to rehabilitate previously affected areas.

Chart 13. Variable Impact Study: estimating the environmental and health impacts of lead contamination with a detailed augmentation carried out by external influences.

4.3.1. Estimation of social/economic value and economic growth in the back-and-forth of military expropriations and cultural Heritage in Italy

Italy's cultural Heritage is indeed a testament to this scope definition, encompassing artistic, architectural, and historical phenomena. Post-World War II, the nation has also emphasized strategic defense and security, with leaders such as General Fabrizio Parrulli and Colonel Roberto Riccardi advocating for the protection of these cultural assets so that the evidence of a juxtaposition of cultural preservation and military objectives is sculpted as a complex socio-economic environment.

The concept of expropriation, particularly for military purposes, is multifaceted and unknown: on one hand, it addresses national defense and ensures territorial sovereignty, on the other, it can create socio-economic ripples in local communities; however, if not undertaken vision and prudence, such expropriations can stimulate infrastructure unbalance, fostering short-term job opportunities and regional economic false revitalization.

Enhancing this criticism for a virtuous urban framework may be indeed economically beneficial in future directions for Italy's growing Heritage tourism industry: the military's commitment to protecting its own cultural sites at all costs from potential threats, may be easily dreadful and stressing the tourism sector.

Integral to this socio-economic dynamic is Italy's solid legal structure overseeing expropriations: legislative tools, such as D.P.R. 327/2001, provide clarity on compensation methodologies, offering financial solace to those affected by expropriations; this legal foundation, when paired with the strategic growth of military domains, can overstimulate or drastically contain infrastructure expansion, luring investments and rejuvenating regional economic terrains.

Variable	Description	Potential Impacts
Expropriation Subject	Types of assets subject to expropriation.	Variation in types of assets expropriated.
Expropriation Criteria	Conditions under which expropriation can occur, as defined by D.P.R. 327/2001.	Increase/decrease in expropriation instances.
Compensation	Mechanism for determining compensation as per art. 822 and 826.	Fluctuations in compensation value.
Timeline	Duration of the expropriation process and specific stages.	Variation in response time.
Legal Implications	Rights of owners of expropriated assets and avenues for redress.	Increase/decrease in legal disputes.
Operational Impact	Influence of expropriation on military operations.	Impacts on logistics and operational capacities.
External Reactions	Public perception of expropriation, considering military sensitivities.	Implications on reputation and public acceptance.
Expropriation Subject	Types of assets subject to expropriation.	Variation in types of assets expropriated.
Expropriation Criteria	Conditions under which expropriation can occur, as defined by D.P.R. 327/2001.	Increase/decrease in expropriation instances.

Chart 14. Variable Impact Study: D.P.R. 327/2001 and Articles 822 & 826.

4.3.2. Italy's dual imperatives of harmonizing modern defense infrastructures with historical-cultural significance: the Law 185/1990

The connection between modern military operations and the preservation of military Heritage sites underscores the importance of a structured Electronic Warfare (EW) blueprint. Italy's procurement frameworks, such as the "*Codice degli Appalti*" (D.Lgs. 50/2016) and "*Legge Quadro sulla Difesa*" (L. 185/1990), ensure that defence procurements are standardized while retaining the flexibility to address national security concerns for logistics.

Temporary Business Groupings (RTI) allow consortiums of companies to bid, exclusively or not, on complex defence contracts, pooling their collective expertise for the nation's security leading to unbalance in land use destination. The centralization of specific defence equipment procurements, for civil activities, is patrolled under "*Direzione Generale per le Attività Territoriali*" (DGAT) streamlines operations, ensuring timely and efficient procurement processes.

Regulatory & Policy Element	Key Provisions & Objectives	Implications for Defence Procurements & Operations	Recommendations & Future Directions
Core Procurement Frameworks			
Codice degli Appalti (D.Lgs. 50/2016)	Common procurement rules, with potential special provisions for national security concerns.	Standardizes procurement processes, with flexibility for security.	Periodic reviews to align with evolving security needs.
Legge Quadro sulla Difesa (L. 185/1990) *Special Procurement Contexts*	Outlines general defence policy principles, including procurement provisions.	Establishes foundational principles for defence-related procurements.	Assess effectiveness and adapt to modern defence challenges.
NATO-related Procurements	Procedures in line with or involving NATO standards, following intergovernmental agreements.	Ensures compatibility and adherence to NATO standards.	Continuous alignment with NATO's evolving standards.
Procurements with Secrecy Clauses	Procurements that have sensitivity and thus include specific secrecy clauses.	Protects sensitive information and national security.	Regular audits to ensure clause adherence and relevance.
Temporary Business Groupings (RTI) *Defence Equipment Procurement Agencies*	Temporary consortiums of companies for bidding on tenders. Often used for high-value or technically complex defence contracts.	Facilitates collaboration and pooling of expertise for complex projects.	Monitor performance and ensure transparency in operations.
DGAT-DGAAN	Divisions within the Defence Ministry for land and naval armaments' procurement respectively.	Centralizes and manages specific defence equipment procurements.	Regular evaluations to optimize efficiency and ensure modernization.

Chart 15. Sensitivity Analysis: evaluating the protection of aquatic ecosystems from lead pollution promoted by military sorties based on national and international regulations.

4.3.2.1. Architects' operations in Military contexts: anticipated Confidentiality clauses

In military contexts, architects confront unique challenges, often intensified by the delicate nature of defense operations. As illustrated in Chart 16, several components shape the architectural landscape in these settings. The source of information stands out, with real-time databases being paramount for accurate designs. The jurisdiction, often specific to military zones, can drastically alter the project's trajectory.

Architectural specifics vary when compared to civilian projects, emphasizing the significance of confidentiality and discretion. With ever-evolving safety standards and security protocols, designs must be agile. Balancing modern requirements with the preservation of historical and cultural sites further complicates the task.

Additionally, while the professional integrity remains a constant, architects must stay updated with changing military standards and global shifts in sustainability: continuous training, thus, becomes vital to ensure relevancy in designs and to uphold the highest standards of professionalism in these sensitive environments.

Component	Sensitivity Level	Rationale
Source of Information	High	Access to real-time databases dramatically increases accuracy and relevance.
Jurisdiction	Moderate-High	Changing the jurisdiction would necessitate a complete re-evaluation of context and specifics.
Nature of Work	Moderate	Shifting from architects to another profession would alter some specifics.
Confidentiality and Discretion	High	Adjustments to confidentiality levels or the nature of military operations directly impact obligations.
Safety and Security	High	Changes in security protocols or safety standards would change architectural considerations.
Cultural and Historical Preservation	Moderate	Varying interpretations or emphasis on preservation vs. modernization could influence architectural approaches.
Compliance with Military Standards	Moderate	Different military standards or protocols would necessitate adaptation and re-education.
Professional Integrity	Low	A universally accepted norm; variations wouldn't significantly impact the broader context.
Environmental Considerations	Moderate	Shifting global attitudes towards sustainability could alter the emphasis on eco-friendly solutions.
Continuous Education and Training	Moderate	Changes in technological advancement rates or methodologies could influence training frequency and nature.

Chart 16. Variable Impact Study for architectural practices in military urban contexts.

4.3.2.2. Confidentiality obligations for Architecture in Defense Projects

In military environments, architects often navigate intricate landscapes marked by heightened confidentiality and security: engaging in projects on behalf of defense institutions, they are bound by stringent confidentiality clauses; these clauses ensure that sensitive information, whether relating to design blueprints or strategic placements, remains undisclosed. Adhering to such stipulations is not just a professional obligation but also a crucial measure to safeguard national security interests: as such, understanding and abiding by these anticipated confidentiality provisions become paramount for architects operating in these specialized contexts; herewith a list of questions arose: "*How do these confidentiality clauses impact the day-to-day operations of architects involved in defense-related projects* ?"; "*Can you provide examples of specific types of sensitive information that these clauses are designed to protect in military environments* ?"; "*What are the potential consequences for architects or architectural firms if they fail to comply with these confidentiality provisions* ?"; "*How do architects balance the need for creative freedom with the constraints imposed by confidentiality requirements in military projects* ?"; "*What kind of training or preparation do architects typically undergo to ensure they understand and can comply with confidentiality clauses in defense work* ?"; "*How do military confidentiality requirements for architects compare to those in other high-security fields, such as cybersecurity or intelligence* ?"; "*What role does technology play in ensuring that sensitive architectural designs and strategic placements remain secure from unauthorized access* ?"; "*In what ways do confidentiality clauses affect the collaboration between architects and other stakeholders* (e.g., contractors, engineers, military officials) *on defense projects* ?".

Category	Legislation/Regulation	Description/Details
Italian Legislation	D.Lgs. 24 Ottobre 2007, n. 231	Governs the protection of classified information in Italy. Details about classification levels, protection methods, and penalties for violations.
	D.Lgs. 3 marzo 2017, n. 21	Concerns the administrative liability of entities of the Ministry of Defense for violations related to classified information and industry security.
	Codice Penale (Criminal Code)	Contains articles related to espionage, state secret revelations, illegal gathering of confidential information, etc. Dictates penalties for betraying state secrets or engaging in espionage activities.
NATO Regulations	COSMIC TOP SECRET	Highest level of classification within NATO.
	NATO SECRET	Unknown
	NATO CONFIDENTIAL	Unknown
	NATO RESTRICTED	Unknown
	NATO Security Policy (C-M(2002)49)	Provides a framework for the protection of classified information, covering personnel security, physical security, and information assurance.
Advanced Italian Statutory	Costituzione della Repubblica Italiana	Articles related to defense, national security, and state integrity.
	Legge 124/2007	Establishes provisions related to the information system for the security of the Republic and the classification and protection of information.
	Regolamento di attuazione della legge 124/2007	Implements Legge 124/2007. Provides detailed provisions on the organization and functions of the information security bodies.
	Legge 801 del 24 ottobre 1977	Fundamental law that establishes the organization of information and security services and the discipline of state secrecy.
	Codice di Procedura Penale	Contains articles related to the protection of information during investigations and criminal proceedings.
NATO Directives and Provisions	Directive on the Security of NATO Information (AC/35-D/2002) REV5	Establishes policies and procedures for the protection of NATO classified information.
	NATO Civil and Military Personnel Security Clearance Directive (AC/35-D/1002) REV3	Concerns security clearance procedures for NATO's civil and military personnel.
	NATO Industrial Security Directive (AC/35-D/1035) REV2	Policies and procedures for the protection of classified information disclosed to industries involved in NATO contracts.
Additional Italian Legal Provisions	DPCM 29 novembre 2017	Rules on security measures for networks and information systems.
	Legge 133/1999	Provisions for fulfilling obligations arising from Italy's membership in the United Nations and NATO, with particular emphasis on information security.
	Decreto Legislativo 231/2001	Pertains to the administrative responsibility of legal entities, companies, and associations, and among other things, concerns offenses related to security and defense.
	Legge 21 febbraio 2006, n. 49	Governs international cooperation in security matters.
Additional NATO Directives and Provisions	NATO Security Policy (C-M(2002)49)	Defines general security policies for NATO.
	NATO Handbook on the Security of Information (AC/322-D(2007)0048, REV3)	Detailed guidelines on how to protect classified information.
	NATO Glossary of Security Terms and Definitions (AAP-6)	Defines security-related terms and concepts within NATO.

Chart 17. Variable Impact Study: emerged convergence for architects in regulatory frameworks.

4.3.3. Structural Italy at the crossroads: charting a path for modern military installations amidst historical landmarks

The intertwining of Italy's rich cultural fabric with its strategic military infrastructure poses unique challenges and opportunities. The "*Codice dei beni culturali e del paesaggio*" (D.Lgs. 42/2004) lays the bedrock for safeguarding Italy's cultural assets, setting the tone for their coexistence with modern military installations.

Italy's early commitment to Heritage protection, demonstrated by Legge n. 1089/1939, provides historical guidelines that remain relevant today. As the nation's defence needs evolve, so does its approach to managing military infrastructures. Collaborative agreements between the Ministry of Defence and Superintendencies exemplify this harmonious integration, fostering synergistic endeavours between Heritage preservation and defence imperatives. On the international front, Italy's NATO membership and its adherence to treaties like the 1954 Hague Convention underline its commitment to balancing global defence obligations with Heritage conservation.

Regulation & Policy Framework	Core Provisions & Objectives	Implications for Defence Infrastructures & Cultural Heritage	Recommendations & Future Considerations
Central Cultural Heritage Regulations			
Codice dei beni culturali e del paesaggio (D.Lgs. 42/2004)	Comprehensive guidelines on safeguarding and enhancing Italian cultural heritage, covering both immovable and movable assets.	Sets the foundational principles for managing cultural heritage in the proximity of military assets.	Periodic updates to align with evolving heritage preservation methods.
Legge n. 1089/1939	Initial legislation that set protections for monuments, natural environments of beauty, and items of artistic or historical significance.	Historical basis for current cultural heritage protection.	Ensure its provisions are integrated in modern regulations.
Defence Infrastructure and Cultural Heritage Intersection			
Military Construction Laws & Decrees	Regulate the building, maintenance, and decommissioning of military structures.	Might necessitate adaptations based on cultural heritage proximity.	Collaborative assessments with cultural bodies before infrastructure modifications.
Specific Agreements: Ministry of Defence & Superintendencies	Specific partnerships to manage coexistence between cultural heritage and military infrastructures, encompassing restoration, enhancement, or access.	Facilitates synergistic protection and use of cultural and military sites.	Regular reviews to address evolving needs of both sectors.
International Norms & Local Legislations			
NATO Regulations	As a NATO member, Italy follows specific territorial and military infrastructure guidelines, potentially impacting nearby cultural heritage.	Balances military obligations with cultural preservation.	Engage in dialogues within NATO on heritage protection nuances.
International Agreements	Italy's participation in treaties like the 1954 Hague Convention for cultural property protection during armed conflicts.	Sets international standards for heritage protection during military conflicts.	Regular training for military personnel on these international standards.
Regional & Local Laws	Region-specific and local legislations that might shape the management of cultural heritage and military structures.	Ensures alignment with local cultural and historical nuances.	Continuous dialogue with regional and local entities for coordinated efforts.

Chart 18. Variable Impact Study: the intersection of Italian cultural protection of Heritage and military infrastructure.

4.3.4. Professionalism between arches and armaments: Italy's architects shape defense amongst cultural Heritage values; which is its institutional receiving?

Italy's storied landscapes, infused with centuries of architectural marvels, often intersect with its military installations, necessitating a delicate balance between preservation and functionality. The role of professional architectural orders in Italy is pivotal in this context: renowned for their expertise in design and restoration, architects are instrumental in ensuring the seamless integration of military necessities within culturally significant sites; the orientations are multifaceted, amid a constant divergence-convergence direction: architects must pay formal attention, by having responsibility to monitor their own training portfolio to execute their professional profile as institutionally confirmed by the "*Consiglio Nazionale degli Architetti, Pianificatori, Paesaggisti e Conservatori*" (CNAPPC).

By offering consultation on regulations and best practices, they serve as a bridge between architectural bodies and the pertinent Ministerial entities, especially in preparation, with an understanding of architectural preservation, fostering mutual respect amidst various categories; for complex projects, coordination tables present a valuable platform for stakeholders to discuss, deliberate, and decide on optimal solutions that respect both heritage and defense imperatives: this approach moves beyond the many limitations that confined intellectual commitment in the past, fostering a forward-looking perspective

Professional Bodies & Stakeholders	Core Functions & Expertise	Interactions with Defence & Cultural Heritage Contexts	Recommendations & Integration Strategies
Professional Architectural Orders in Italy			
Design & Restoration	Architects possess specialized skills in designing and restoring historic military structures or culturally significant sites within military areas.	Ensuring preservation while accommodating military functionalities.	Collaborative blueprints involving historians and archaeologists for holistic restoration.
Consultation	The orders can offer advice on regulations, best practices, and design methodologies, especially in sensitive contexts like military or heritage protection zones.	Aligning military strategies with architectural and cultural priorities.	Regular consultations for major infrastructural changes or expansions.
Training	Collaboration with the Ministry of Defence and Superintendencies to provide specialized training courses for military personnel and heritage technicians.	Enhancing awareness and expertise in architectural and landscape preservation.	Periodic workshops to update on evolving architectural practices and heritage norms.
Coordination Tables	For complex scenarios where military presence intersects with significant cultural assets, joint consultation tables can be established.	Finding sustainable, mutually beneficial solutions.	Scheduled meetings to review ongoing projects and future plans.
Promotion & Enhancement	Through their professional bodies, architects can advocate for and highlight restoration initiatives of historic military sites, raising public awareness.	Bolstering public support for conserving and enhancing architectural and landscape heritage.	Collaborative exhibitions, publications, and media outreach on successful projects.

Chart 19. Variable Impact Study: synergizing military, cultural, and architectural dynamics in Italy.

4.3.5. Structural reimagination of Italy : modern military meets architectural restoration

Renowned for their expertise in design and restoration, architects are instrumental but, in the interim, leaders in ensuring the seamless dimensional texture of usability: by offering consultation on regulations and best practices, fostering mutual respect for both domains.

The promotion and enhancement of restoration initiatives, spotlighted by architects, garner public support and emphasize the importance of harmonizing Italy's rich architectural legacy with its defense infrastructures, in which multilateral consultations are an obligation.

Architectural Interventions & Sites	Collaborative Stakeholders	Historical and Cultural Context	Revitalization & Reuse Strategies
L'Ordine degli Architetti, Pianificatori, Paesaggisti e Conservatori (OAPPC)			
Reggia di Caserta, Caserta	Collaboration with the Italian Air Force and UNESCO.	A UNESCO World Heritage site, the royal palace represents a monumental baroque-era architecture.	Restoration of building portions and creation of new exhibition spaces, preserving the site's integrity.
Caserma "De Cristoforis", Como	Association with local government bodies.	Former military barracks reflecting Como's military history.	Transformation into a cultural and residential hub, retaining the site's historical essence.
Caserma "Santa Marta", Verona	Partnership with the Italian Army.	A historic barracks showcasing Verona's military architectural heritage.	Converted into a residential complex, ensuring the original architecture remains unaltered.
Arsenale Militare, Venice	Collaboration with the Italian Navy.	A historically significant military complex that played a pivotal role in Venice's maritime supremacy.	Redevelopment into spaces dedicated to exhibitions, cultural events, and educational activities, celebrating its naval legacy.
Caserma "Curtatone Montanara", Pisa	Association with Pisa's academic community.	A military installation showcasing Pisa's defensive history.	Transformation into an academic complex, merging the military heritage with academic needs, fostering a space of learning amidst history.
Architectural Interventions & Sites	Collaborative Stakeholders	Historical and Cultural Context	Revitalization & Reuse Strategies

Chart 20. Variable Impact Study: joining military legacy with cultural vitality; a site-based endeavour.

4.3.6. Melding mechanisms with military: engineering interventions in Italy's defense landscape

On the othe side, Italy's defense landscape is undergoing significant transformations with engineering interventions spearheaded by *Ordine degli Ingegneri*. Collaborations with defense departments are paving the way for fortified military infrastructures, integrating advanced engineering principles. Meanwhile, partnerships with local municipalities are breathing new life into abandoned military sites, turning them into vibrant communal spaces: and leading to interrogatives such as: "*How do the roles and responsibilities of the Ordine degli Ingegneri differ from those of architects when collaborating with Italy's defense departments ?*" ; "*How do the methods of transforming abandoned military sites into communal spaces differ between engineers and architects in terms of planning and execution ?*"; "*How do engineers and architects balance the preservation of heritage with the need for modern infrastructure in defense projects, and what are the key differences in their approaches ?*".

Engineering Interventions & Sites	Collaborative Stakeholders	Technical Challenges & Solutions	Project Outcomes & Benefits
L'Ordine degli Ingegneri			
Military Infrastructures	Collaboration with various defense departments and specialized agencies.	Designing robust and efficient structures; integrating civil, electrical, and mechanical engineering principles.	Creation of fortified and sustainable military infrastructures that cater to the modern defense needs.
Requalification of Abandoned Military Sites	Partnership with local municipalities and cultural bodies.	Ensuring structural safety; integrating energy-efficient systems; preserving historical essence.	Transformation of derelict military sites into vibrant public spaces, residences, or cultural centers.
Remediation Projects	Association with environmental agencies and the Ministry of Defense.	Addressing contamination issues; restoring ecological balance; civil and environmental engineering solutions.	Rehabilitation of polluted military sites, making them safe and usable for varied purposes.
Military Technologies	Collaboration with defense technology agencies and research institutions.	Design and maintenance of communication systems; radar technology enhancements.	Development and upkeep of advanced military communication systems, ensuring defense superiority.
Collaborations with Defense	Joint ventures with the Ministry of Defense for training and research initiatives.	Bridging the academic, professional, and defense worlds; knowledge exchange.	Fostering a synergy between engineers and defense personnel, enhancing skills and understanding.
Protection Systems	Partnership with heritage and archaeological agencies; involvement in sensitive military operations.	Designing protective measures for historical sites; mitigating risks from military activities.	Safeguarding invaluable historical and archaeological sites from potential military-induced threats.

Chart 21. Variable Impact Study: engineering the defense; emerged modelling patterns for future orientations.

4.3.7. Harmonizing Heritage and defense: Civil Protection's role in safeguarding Italy's archaeological legacy

The evolution of Italy's defense landscape is intrinsically tied to its engineering prowess, ensuring that modern military landmarks coexist harmoniously with Heritage sites. The "*Ordine degli Ingegneri*" plays an essential role in this intricate dance of defense and design. Through partnerships with defense departments, they engineer cutting-edge military infrastructures, epitomizing efficiency and fortitude, especially if we consider its promotion across international cutting-edge corporations. Abandoned military sites, with their historical echoes, are requalified under their watchful eyes, transforming them into thriving public hubs while preserving their historic integrity.

Beyond mere construction, the order's remediation projects showcase their commitment to environmental and ecological balance, ensuring that military operations leave minimal ecological footprints.

Collaborations with defense agencies foster a symbiotic relationship, enhancing mutual understanding and skill exchange between engineers and military personnel. But then, which boundaries spanners are required?

Areas of Intervention & Collaboration	Stakeholders Involved	Challenges & Solutions	Key Outcomes & Benefits
Protezione dei Siti Culturali Archeologici			
Emergency Response to Disasters	Collaboration with local municipalities, archaeological agencies, and first responders.	Rapid response to earthquakes, floods, or fires; ensuring minimal damage to archaeological sites.	Swift intervention prevents irreversible damage to historic sites and aids in immediate restoration.
Coordination with Soprintendenze	Partnership with Soprintendenze, cultural heritage agencies, and local communities.	Ensuring rescue and restoration operations uphold the historical and cultural value of archaeological sites.	Strengthened ties with heritage bodies, ensuring a harmonious approach to preservation.
Risk Assessment and Planning *Interactions with Military Defense*	Collaboration with risk assessment agencies, local municipalities, and archaeological bodies.	Developing comprehensive risk plans for potential threats to archaeological sites; preventive measures.	Proactive measures reduce potential damage and ensure preparedness for unforeseen events.
Support During Emergencies	Association with military forces, local defense bodies, and emergency response teams.	Mobilizing military resources and personnel during large-scale calamities for logistical support.	Combined strength of military and civil protection ensures effective and efficient disaster response.
Joint Drills	Partnership with military defense units, emergency simulation teams, and local municipalities.	Conducting joint drills to refine protocols for emergencies; ensuring coordination between military and civil units.	Enhanced preparedness and streamlined response protocols during real-time emergencies.
Protection of Military Heritage Sites *Civil Protection as a Liaison*	Collaboration with military heritage agencies, defense bodies, and cultural preservation units.	Balancing operational requirements with the historic value of military sites.	Ensuring dual protection - safeguarding operational integrity and preserving historical significance.
Bridging Cultural Heritage and Defense	Involvement of heritage bodies, military units, and local communities.	Mediating between heritage conservation needs and military operational requirements; addressing concerns of both domains.	Creation of a harmonized environment where both cultural preservation and defense needs are met.

Chart 22. Variable Impact Study: Civil Protection in the preservation of archaeological sites.

4.3.8. From ground-up: Civil Protection's bottom-up approach to rescuing civilians and preserving Heritage in Italy

Italy's Civil Protection demonstrates a commendable bottom-up approach in ensuring civilian safety, especially during critical events like earthquakes and floods. For instance, the aftermath of the Emilia earthquake in 2012 saw a rapid response, providing immediate relief and safeguarding endangered historical sites. Similarly, during the L'Aquila earthquake in 2009, Civil Protection, in collaboration with military and cultural experts, orchestrated restorative efforts, preserving L'Aquila's irreplaceable Heritage. The Florence Flood of 1966, despite occurring before the official formation of Civil Protection, highlighted the nation's resilience, with the military and volunteers rallying to salvage invaluable cultural treasures. Furthermore, proactive measures in locations like *Capo Teulada*, Sardegna, ensure a harmonious balance between military activities and archaeological preservation.

Whether addressing electromagnetic concerns near bases or restoring historic buildings once occupied by the military, Italy's Civil Protection exemplifies a proactive, community-centric approach, intertwining civilian rescue with the reverence for national Heritage.

Event/Scenario	Stakeholders Involved	Key Challenges & Interventions	Outcomes & Benefits
Terremoto in Emilia (2012)			
Earthquake aftermath	Civil Protection, Armed Forces, Cultural Heritage Experts	Immediate relief to affected populations; Evaluation and stabilization of historic buildings at risk.	Swift assistance to victims and preservation of historical sites.
Terremoto in Abruzzo (2009)			
L'Aquila Earthquake	Civil Protection, Military, Cultural Heritage Experts	Intense collaboration for relief and safeguarding of L'Aquila's historic monuments and archaeological sites.	Integrated efforts in restoration and safety measures for historical sites.
Alluvione di Firenze (1966)			
Florence Flood	Military, Volunteers, Art Experts (Prior to official formation of Civil Protection)	Combined action to save invaluable artworks and manuscripts from destruction.	Salvaged priceless cultural artifacts and historical documents.
Capo Teulada, Sardegna			
Military firing range vs. Archaeological sites	Defense Ministry, Heritage Preservation Agencies, Local Communities	Discussions about the use and protection of the area, balancing military needs with archaeological significance.	Ongoing dialogues ensuring both defense and heritage preservation needs are met.
Military Drills & Archaeological Sites			
Planned military exercises	Military, Soprintendenze	Coordinating to ensure no damage to archaeological sites or artifacts during exercises.	Safe and coordinated drills without compromising heritage sites.
Electromagnetic Pollution			
Concerns near military bases	Civil Protection, Defense Ministry, Local Communities	Addressing concerns about electromagnetic pollution from powerful radars; ensuring safety standards are upheld.	Mediation and reassurance, upholding safety standards.
Restoration of Historic Buildings			
Previously used for military purposes	Defense Ministries, Heritage Preservation Agencies, Local Authorities	Restoring and returning historic buildings to communities. Collaborative restoration projects.	Revitalization of historical structures for community use and cultural appreciation.

Chart 23. Variable Impact Study: Civil Protection coordinating with military defense and Heritage.

4.3.9. Designing military sites: interdisciplinary approaches to military Heritage preservation and EW integration

In the intricate journey of preserving and revitalizing fortifications and military Heritage sites, a robust and multifaceted strategy becomes paramount: the creation of a Master Plan for these historical edifices requires a detailed amalgamation of various studies and assessments to ensure their integrity, relevance, and sustainability.

Master plan objective	Description of the intervent
1. Historical Contextualization	Delve into the chronological narrative of the site, understanding every epoch of its evolution and utilization.
2. Morphological Evolution	Trace the transformations and adaptations in the site's form and structure over time.
3. Topographic Insights	Conduct meticulous planimetric and topographic surveys to capture the site's physical nuances.
4. Archaeological Scrutiny	Evaluate existing archaeological studies, identifying gaps and areas for further exploration.
5. Structural Integrity	Undertake a comprehensive structural evaluation, paired with in-depth structural analyses.
6. Preservation Diagnostics	Monitor the site's preservation status, pinpointing vulnerabilities and interventions.
7. Cultural Landscape Exploration	Examine the site's symbiotic relationship with its surrounding environment and history.
8. Interpretive Insights	Craft studies that facilitate the understanding and appreciation of the site's significance.
9. Reuse EW Analysis Infrastructures	Investigate the feasibility of repurposing structures without compromising their historical essence.
10. Utilization Restoration Studies	Understand current and potential future uses, ensuring alignment with conservation objectives.
11. Criteria and Recommendations	Formulate guidelines based on thorough analysis, setting the path for future interventions.
12. Risk EW Vigilance	Establish a risk assessment and preparedness strategy, safeguarding against unforeseen threats.
13. Operational EW Blueprint	Draft a business and operations plan that marries historical preservation with functional viability.
14. Visitor EW Dynamics	Conduct surveys to gauge visitor perspectives and craft effective management strategies for enhanced experiences.
15. EW Management	Envision a holistic plan that ensures the site's protection, coupled with sustainable management

Chart 24. Variable Impact Study: foundational studies and assessments; the sub-branches delineate a comprehensive progression of methodologies and considerations in the domain of fortification research and Electronic Warfare (EW) integration. Beginning with a deep dive into the historical origins (1. historical contextualization), it advances through detailed analyses of the fortification's form and landscape (2. morphological evolution & 3. topographic insights). Subsequent stages involve a deeper exploration, from archaeological evaluations (4. archaeological scrutiny) to understanding the fortification's current state (5. structural integrity & 6. preservation diagnostics). The chart further elaborates on the broader cultural significance (7. cultural landscape exploration) and the interpretive narratives that can be drawn (8. interpretive insights). Modern applications and considerations, especially in the context of Electronic Warfare (EW), are encapsulated in stages 9 through 15, emphasizing the reuse of infrastructures, restoration strategies, operational plans, visitor dynamics, and holistic management (9. reuse EW analysis infrastructures to 15. EW management).

Crucially, the orchestration of this Master Plan demands the expertise of an interdisciplinary cadre of specialists. Professionals armed with the requisite qualifications, knowledge, and experience in fortifications and military Heritage are imperative.

4.3.10. Evolving fortification: bridging the gap between Vitruvian principles and embracing modern archaeological insight for EW intrinsic potential Heritage

When making a choice between traditional and innovative techniques for Heritage conservation, it's imperative to assess each scenario distinctly. The guiding principle should be to opt for techniques that are minimally invasive and align closely with Heritage values. This is particularly important when we factor in safety and durability requirements,

as highlighted in the ICOMOS Charter – Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage from 2003.

    The historical lens through which we view these fortifications requires a nuanced understanding. The aftermath of military operations often leaves markers of historic events, like losses or destruction. Instead of erasing these markers, there's a strong case to conserve them, letting them stand testament to the events of the past.

    In light of the 2021 final draft by ICOMOS pertaining to fortifications and military Heritage, we advocate for an augmented Vitruvian triad, underpinned by the principles of Electronic Warfare infrastructure. This recalibrated framework seeks to provide a contemporary lens through which conservation methodologies can be understood and applied in today's digitized defense landscape.

Core Tenets	Implementation	Foundations	Doctrine
Firmitas	*Antenna Resilience*	*Hardware Robustness & Signal Integrity*	*A resilience against jamming and other electronic attacks is prioritary. With the increasing sophistication of jamming techniques, the antenna's ability to function optimally across a broad range of Hertz frequencies in multi-domain epochs; the manufacturing of advanced materials to withstand or mitigate interference, such as metamaterials or frequency-selective surfaces, is eligible to landscape planners in terms of shaping a shared design.*
Utilitas	*Adaptive Frequency*	*Operational Efficiency & Adaptive Technologies*	*Agility, especially in the electronic domain. Systems needs to possess the capability to dynamically switch between frequencies, ensuring uninterrupted communication: this adaptability mirrors the flexibility beyond the traditional fortifications known in architecture, ensuring they*
		Adaptive Technologies	*possess the capability to dynamically switch between frequencies, ensuring uninterrupted communication: this adaptability mirrors the flexibility beyond the traditional fortifications known in architecture, ensuring they mantain operational parameters*

			regardless of external challenges: in the electronic context, it's about swiftly navigating the Hertz spectrum, incorporating further technologies, i.e. cognitive radio, for automatic frequency hopping based on environmental conditions.
	Adaptive Technologies		*possess the capability to dynamically switch between frequencies, ensuring uninterrupted communication: this adaptability mirrors the flexibility beyond the traditional fortifications known in architecture, ensuring they mantain operational parameters regardless of external challenges: in the electronic context, it's about swiftly navigating the Hertz spectrum, incorporating further technologies, i.e. cognitive radio, for automatic frequency hopping based on environmental conditions.*
Venustas	*Stealth Elegance*	*System Design*	*Advanced materials, such as radar-absorbing materials (RAM) or engineered structures like fractal antennas, become essential. These components, while ensuring efficient operation, are designed to reduce an object's radar cross-section or to deceive enemy sensors. The incorporation of stealth technologies not only enhances the system's aesthetics from an engineering standpoint but ensures its survival and effectiveness on the modern battlefield.*

Chart 25. Electromagnetic Fortifications in Modern Warfare:
novel adaptation of the Vitruvian triad amidst the EW Domain.

Fig. 44 A Saab-Ericsson Giraffe AMB radar displayed at the Paris Air Show, 2007. Originating from Sweden and introduced in 1977, this early warning radar operates in the C band, S Band, and X band frequencies. With around 450 units built, it boasts a rotation per minute (RPM) of 60, a range between 10 and 470 kilometres, and can detect altitudes between 0 and 40,000 metres, specifications varying by variant. Photo by: Duch.seb. Date: 24 June 2007. Credits: Attribution-ShareAlike 3.0 Unported (CC BY-SA 3.0). [File: Giraffe AFB-radar.jpg]. Source: wikipedia.org. **Fig. 45**. An Italian Special Forces Sniper team anticipates their target during a STALK exercise at the International Specialty

Training Center (ISTC) Alpine Sniper Course, located in the Hochfilzen training area, Austria, on September 24th, 2021. Photo by: Sgt. Patrik Orcutt. Item ID: File:210923-Z-JY390-029 - ISTC Alpine Sniper Course 2021 (Image 26 of 33).jpg. Credits: Public Domain. Source: wikimedia.org. **Fig. 46.** English: Italian Vegetato Desert. Photo taken on 23 May 2010. Photo by: Menelicche. Credits: Released into the public domain by the copyright holder. Source: wikimedia.org.

4.3.11. Military Architecture and land use preservation: the holistic land rights of local individuals

Local communities worldwide share a profound, interconnected relationship with their ancestral territories: as *Likid Magdagasang*, Chief of the Mandaya Indigenous group, articulates, their bond with the land transcends mere ownership; it encompasses social, cultural, spiritual, and environmental dimensions. Such a "holistic" perception of land rights perceives it as a living tradition, with the community acting as its custodians, responsible for its well-being.

This deep-seated connection between Indigenous people and their territories is not merely symbolic; landforms the foundation for their creation myths, religion, spirituality, art, culture, and social fabric. It binds generations past, present, and future: the Aboriginal and Torres Strait Islander Social Justice Commissioner aptly notes that cultural rights are fluid, not stagnant snapshots of a presumed "pure" past. Cultures evolve, and the essence of enjoying one's culture shouldn't be confined by dated perceptions of its "authenticity".

Modern legal frameworks, too, are beginning to recognize and validate this holistic perspective: a landmark decision involving the *Tsilhqot*'in Indigenous community in Canada underscored that the community's relationship with the land has ensured its "cultural security and continuity" for centuries. Similarly, the UN Declaration on the Rights of Indigenous Peoples acknowledges the spiritual bond Indigenous communities share with their lands and resources.

In the broader realm of human rights, both the Universal Declaration on Human Rights (UDHR) and the International Covenant on Economic, Social and Cultural Rights (ICESCR) emphasize the right to participate in cultural life. While these documents lean towards a conception of culture rooted in arts and sciences, the International Covenant on Civil and Political Rights (ICCPR) introduces a nuanced approach.

Conservation strategies, as proposed by the Vienna Memorandum on Historic Urban Landscapes, also advocate for a participatory approach. It calls for replacing authoritative conservation methods with ones that prioritize community consultation and inclusive governance: this approach, while ideal, poses challenges in regions like *Srinagar*, where conflict complicates policy implementation. In such volatile environments, addressing whose voices get priority and how Heritage preservation aligns with the everyday struggles of residents become pivotal questions.

In sum, the holistic approach to land rights underscores the intricate web of connections Indigenous communities share with their territories. Recognizing and respecting this bond is not just about acknowledging past injustices, but also about paving the way for a more inclusive, equitable future.

4.3.12. From Heritage core to stealth combat: a study on unprecedented warfare and relevant literature criteria for urban resilience

In an era of rapid technological advancement and global connectivity, the fabric of our shared history remains under constant threat from both natural and man-made adversaries: the devastation of invaluable Heritage sites, as witnessed in the tragic destruction of the National Library in Sarajevo, serves as a stark reminder of our collective responsibility to preserve the repositories of human memory and culture.

Historically, conventions like the "Laws of War: Laws and Customs of War on Land (Hague IV); October 18, 1907," have underscored the imperative to shield cultural and humanitarian sites during armed conflicts. Article 27 of this convention explicitly mandates the protection of edifices dedicated to religion, art, science, charitable endeavors, and historical significance. It emphasizes the preservation of hospitals and sanctuaries for the ailing and wounded unless these places are employed for military purposes during active hostilities.

However, in the contemporary landscape, where physical deterrence can often be bypassed, the sanctuary of the digital realm emerges as a potent tool. Digital restoration and archiving not only encapsulate the physicality of Heritage structures but also capture the intangible ethos, memories, and narratives they embody. This digital deterrence, in the form of a Central Core Archaeological Park, can serve as a resilient bulwark against the vagaries of conflict, ensuring that the echoes of our shared past are not silenced by the cacophony of present-day strife.

Such a digital initiative would integrate cutting-edge technologies like augmented reality, 3D modeling, and virtual reconstructions, offering an immersive experience that transcends geographical and temporal boundaries. It would ensure that even if physical structures are compromised, their digital avatars continue to educate, inspire, and foster a sense of shared human Heritage.

Moreover, this rationale for a Central Core Archaeological Park rooted in digital deterrence aligns seamlessly with the broader vision of international conventions and treaties. By harmonizing the principles of the Hague and Geneva conventions with the capabilities of modern technology, we can craft a resilient strategy that shields our shared Heritage from the unpredictable storms of conflict and time.

4.3.13. Ante-litteram looting and the shadows over Pompeii and Herculaneum

In the annals of history, the term „*ante-litteram*" rooted in Latin, characterizes phenomena that predate their modern definitions. This concept, when applied to the ancient cities of *Pompeii* and *Herculaneum*, buried by the eruption of Mount Vesuvius in AD 79, paints a vivid tableau of early treasure hunting.

The rediscovery of these cities, frozen in time, attracted scholars and fortune seekers alike. As the archaeological excavation unveiled the splendors of Roman life, it simultaneously beckoned looters who stripped these cities of precious artifacts, frescoes, and more, trading them to eager collectors.

Throughout history, various sites have been subjected to predatory actions, leading not just to their physical degradation, but also to the gradual erosion of the intricate fabric of their associated cultures and daily lives. Modern perspectives on such episodes underscore the pressing imperative of safeguarding cultural Heritage. For instance, places like Pompeii and Herculaneum stand as stark testaments to the repercussions of unfettered opportunism amidst historical wonders. The present-day conjures images of desolate bunkers, once intended for protection, now lying abandoned, and their underlying archives bereft of surveillance.

Sir Hilary Jenkinson's seminal work, the Manual of Archive Administration (1922), laid the foundation for archival theory and practice across numerous countries, especially within the British colonial sphere. In this treatise, Jenkinson urged archivists to be discerning when choosing records for permanent conservation. Drawing on contemporary examples like South Africa, the paper delves into challenging traditional records selection norms, proposing that financial audit trails might offer the most reliable indicators for historical record conservation. The discussion acknowledges the inherent constraints of this ‚follow the money' approach but also offers potential countermeasures. This discourse, in essence, rejuvenates and extends the thoughts initiated by Jenkinson in his groundbreaking work.

Yet, the broader spectrum of Heritage, especially in the realm of Military Archaeology, does not universally recognize entities like antennas as part of the Electronic Heritage. The focus typically remains on imposing, tangible structures like bunkers. Contrasting the psychological implications of bunkers across nations, South Korea's bunkers, for instance, failed to instill the intended sense of security. Such spaces, echoing wartime violence and ideological hostilities, raise critical questions: How might they be seamlessly integrated into the modern urban scape while preserving the memories of the specific political epochs they represent?

Moreover, archival practices are not neutral. They both mirror and perpetuate the discourses—both ideological and scientific—of the eras in which their principles are articulated. In the digital age, as Duranti (2022) posits, the archival discipline is more critical than ever. The digital transformation presents multifaceted challenges, necessitating research into ensuring the reliability, accuracy, and authenticity of electronic records. Moreover, the potential applications of AI in record generation, management, and sharing demand rigorous exploration. In this context, it's essential to recognize that records and archives are not mere infrastructural elements; they form a „critical" infrastructure analogous to utilities like electricity and water. Through these records, society's beliefs, values, and facts are anchored, and our collective institutions find their foundation.

4.3.14. Beyond Multi-criteria Decision Analysis (MCDA): incorporating operational metrics into military EW doctrine to Electronic Decision Superiority (EDS)

Italy's defense strategy, while embracing modern Electronic Warfare (EW) capabilities, seeks a harmonious balance with its rich cultural Heritage.

This approach emphasizes the importance of seamlessly integrating operational metrics with Heritage preservation. Key metrics include enhancing EW capabilities, implementing effective deterrence measures, and ensuring environmental considerations. The strategy also addresses challenges like navigating expropriation and mitigating potential risks.

Operational Metrics	Scale	Rationale	Operational Friction Points	Recommended Tactics and Strategies
EW Capabilities	9	Electronic Warfare is vital in modern defense, providing a technological edge against adversaries.	Adequacy of current capabilities	Invest in advanced EW technologies
REQ			Compatibility with preservation efforts	Coordinate with heritage experts
Deterrence Measures	8	Deterrence ensures that potential threats are minimized without resorting to active confrontation.	Effectiveness against modern threats	Regularly update deterrence strategies
REQ			Impact on nearby cultural sites	Designate zones and buffer areas
Balancing Military and Heritage Goals	10	Italy's rich cultural heritage requires utmost priority alongside defense, making this balancing act crucial.	Competing interests of defense vs. preservation	Joint planning sessions
Request action			Misalignment of priorities	Clear communication and collaboration
Environmental Factors in EW	7	While EW is critical, it's also essential to ensure that its deployment does not harm the environment.	Potential environmental degradation	Incorporate green practices in EW
REQ			Conflicts with environmental conservation	Environmental impact assessments
Navigating Expropriation	8	Gaining access to strategic lands while respecting property rights and sentiments is critical for smooth ops.	Legal challenges	Understand and respect property laws
REQ			Community resistance and sentiments	Engage in community dialogues
Risk Mitigation and Security Weak Points	9	A defense strategy is only as strong as its weakest link, making risk mitigation fundamental.	Vulnerabilities in defense systems	Periodic security audits
REQ			Potential threats to cultural sites- Integrate cultural site security into defense planning	Potential threats to cultural sites- Integrate cultural site security into defense planning

Chart 26. Operational foresight: setting criterion based on shared interoperability.

In the dynamic theater of Electronic Warfare (EW), the convergence of Heritage preservation with strategic military imperatives is paramount. The chart delineates the multifaceted nature of EW, emphasizing the necessity of adaptive tactics to address the evolving electronic threats: it underscores the importance of multi-domain integration for holistic defense strategies and the resilience of EW equipment against potential adversarial counteractions. A centralized knowledge repository fosters informed real-time decision-making, while feedback mechanisms enhance strategy refinement. International collaborations in EW not only pool resources but also amalgamate diverse strategic perspectives; managing public perceptions and ensuring cultural Heritage Sensitivity (HS) are crucial, with the latter ensuring that military and civil operations respect and value cultural sites.

This synthesis of Heritage conservation and EW is encapsulated in the chart, spotlighting the need for periodic reviews and ensuring the alignment of Heritage protection with the ever-evolving demands of multi-domain EW operations.

Operational Metrics	Scale	Rationale	Operational Friction Points	Recommended Tactics and Strategies
Adaptive EW Tactics and Strategies	8	The rapidly changing nature of electronic threats necessitates adaptive strategies.	Resistance to change or adaptability lags	Continuously monitor global EW trends and adapt tactics accordingly.
Multi-Domain Integration with EW	10	Seamless integration across domains is vital for comprehensive defense and offense in EW.	Challenges in integrating EW operations across domains	Conduct joint exercises simulating multi-domain operations with a strong EW component.
EW Equipment and Infrastructure Resilience	9	Ensures equipment used in EW is robust and can withstand enemy counteractions.	Equipment vulnerability or outdated infrastructure	Regularly update and stress-test all EW equipment and infrastructure.
Knowledge Repository and Information Sharing	7	Maintaining a centralized knowledge base aids in training and real-time decision-making.	Information silos, outdated or inaccessible knowledge bases	Develop a centralized, frequently updated EW knowledge base accessible to all relevant entities.
Feedback Loop and Continuous Improvement	9	Feedback from operations provides invaluable insights for strategy refinement.	Delayed or ineffective feedback mechanisms	Establish a robust feedback mechanism and incorporate insights into training and doctrine updates.
Collaboration with Allies and Partners in EW	8	Collaborating with international partners offers diverse perspectives and shared resources in EW.	Data security concerns or misaligned strategies with allies	Engage in joint EW exercises with allies and establish secure communication channels.
Public Awareness and Perception Management	7	Public understanding of EW operations aids in gaining support and mitigating potential misconceptions.	Misinformation or public apprehension about EW operations	Implement public awareness campaigns highlighting the importance and safety measures of EW operations.
Cultural Heritage Sensitivity	10	Ensures military and civil personnel understand and respect the value of cultural sites they might encounter.	Lack of awareness about the significance of cultural sites	Integrate heritage education into training modules and joint operations.

Chart 27. Review and update of Heritage legacy and ESM (Electronic Support Measures), ECM (Electronic Countermeasures) and ECCM (Electronic Counter-Countermeasures): the criticality of shaping periodic reviews in aligning Heritage levels of tutelage, paired with the emerging demands of a multi-Domain military framework in EW Landscape.

Operational Metrics	Scale	Rationale	Operational Friction Points	Recommended Tactics and Strategies
Adaptability to Changing Contexts	10	The dynamic nature of global and regional contexts necessitates regular updates to stay relevant.	Resistance to change due to established practices	Conduct regular environmental scans and update accordingly
Incorporating New Technologies	9	Leveraging new technologies can enhance operations, preservation efforts, and response mechanisms.	Lag in technology adoption due to bureaucratic processes	Dedicated tech integration teams and training
Feedback Mechanisms	9	Continuous feedback from ground personnel ensures practices are effective and relevant.	Inadequate channels for feedback or feedback not being acted upon	Establish and promote open feedback channels
Cross-sector Collaboration	10	Regular reviews can enhance collaboration between defense, civil protection, and cultural heritage sectors.	Siloed operations leading to disjointed strategies	Joint review sessions and collaborative planning
Legal and Regulatory Updates	10	Ensuring alignment with updated legal frameworks is crucial for compliance and operational integrity.	Unawareness of recent legal changes or misinterpretation	Regular legal training and dissemination of updates
Operational Effectiveness	9	Regular reviews can identify inefficiencies, leading to enhanced operational effectiveness.	Complacency with current practices despite inefficiencies	Periodic operational audits and improvement plans
Cultural Heritage Preservation Updates	10	As cultural understanding evolves, preservation strategies may need updating to reflect current best practices.	Outdated preservation methods that might harm heritage sites	Collaboration with cultural experts for updates

Chart 28. Joint training: advocating for preparatory sessions among Civil Protection staff, armed forces personnel and cultural Heritage experts to foster mutual understanding and common practices.

5. Discussions

In the evolving landscapes of modern warfare and Heritage conservation, understanding the symbiotic relationship between Electronic Warfare (EW) strategies and the preservation of archaeological parks is paramount; the following SWOT analysis seeks to map the strategic assets, operational shortfalls, tactical advantages, and potential ambush points inherent in this delicate balance.

Through this lens, we aim to provide a comprehensive overview that guides both military strategists and Heritage conservationists in their collaborative endeavors, ensuring not only the safeguarding of invaluable historical sites but also the effective deployment and management of EW operations in their proximity: the fusion of these seemingly disparate domains underscores the intricate complexities and opportunities that arise when history intersects with modern defense mechanisms.

SWOT Analysis	Description
Strengths (Strategic Assets)	
Fortified History	Archaeological parks as fortified repositories of history.
Economic Stronghold	Significant tourism magnets bolstering regional economies.
Strategic Alliance with Global Entities	UNESCO recognition providing diplomatic protection.
Intelligence and Training Grounds	Platforms for training, terrain analysis, and education.
Weaknesses (Operational Shortfalls)	
Terrain Vulnerability	Susceptibility to both natural and man-induced threats.
Logistical Challenges	High costs and expertise for park upkeep.
Restricted Terrain Access	Limited accessibility impeding comprehensive surveillance.
Terrain Conflict Zones	Tensions between urban expansion and heritage preservation.
Opportunities (Tactical Advantages)	
Coalition Warfare	Collaborations with global entities like UNESCO.
PsyOps and Civil Affairs	Enhancing tourism to bolster national image and morale.
Tech Reconnaissance	Use of tech like drones for site surveillance.
Civil-Military Operations	Grassroots intelligence through local community involvement.
Threats (Potential Ambush Points)	
Environmental Warfare	Climate changes threatening the sites.
Guerrilla Adversaries	Threats from looters and vandals.
Economic Warfare	Constrained budgets hampering conservation.
Hot Zones	Geopolitical tensions endangering proximity sites.

Chart 29. SWOT Analysis: Bridging Electronic Warfare Operations and Archaeological Heritage Conservation.

5.1. Detailed thematic analysis: synergies between cultural Heritage conservation and Electronic Warfare doctrines

In an era dominated by an ever-evolving electronic threat landscape, the necessity for dynamic defense strategies becomes paramount. These strategies encompass not only rapid-response mechanisms but also an intentional integration of Heritage-conserving electronic technologies.

State architecture, as elucidated by Professor Leonardo Di Mauro (2008), pertains to structures commissioned, financed, or directly influenced by the state.

This encapsulates a spectrum ranging from official government palaces and monuments to public infrastructures like railway stations, schools, and hospitals. Such edifices, beyond their functional essence, are meticulously designed to convey specific narratives concerning the state's power, legitimacy, and identity. Consequently, state architecture transforms into a conduit through which governments engage in dialogues with their citizens and the global community.

The historiographical realm delves into the study and interpretation of history. When broaching state architecture, several historiographical issues surface:

1. Interpretation: "*should state edifices merely be perceived as power and authority manifestations, or do they also mirror the cultural and social aspirations of their time*"?

2. Sources: "*decisions surrounding state architecture often transpire behind closed doors, making it challenging for historians to access primary documents elucidating the motivations underpinning specific architectural choices*".

3. Bias and perspective: "*as with any historical subject, there's potential for bias and one-sided portrayals. This becomes especially pronounced when historians hail from a particular cultural or political background, or when the buildings under consideration remain politically contentious*".

4. Conservation vs. modernization: "*a persisting historiographical quandary revolves around balancing the conservation of historical structures against contemporary needs demanding their modernization or adaptation. The pivotal questions here are: When should historical structures be preserved, and when is it apt to alter or raze them*"?

5. Globalization and external influences: "*in an increasingly interconnected world, architectural influences merge and intertwine. Ascertaining the provenance of a style or concept becomes intricate, prompting historians to mull over how state architecture reflects or counteracts global trends*".

Paul Virilio's sentiments, as relayed by Armitage (2018), paint a grim landscape of modernity, emphasizing the catastrophic and tumultuous ramifications of technoscience and the pursuits of the modern West. Virilio's assertion that every technical object's invention concurrently heralds a unique accident offers a contemplative perspective on progress and its inadvertent consequences.

Krzyżanowska (2016) accentuates the intrinsic power of cities as both mediums and outcomes of dominion. Designing spatial order and commemorations remain paramount instruments of symbolic authority, echoing symbolism and axio-normativity in urban terrains. These designs cater to the multifaceted modes of commemoration in contemporary urban sites. The emergence of counter-monuments, epitomized by the Stolpersteine commemorating National Socialism's victims, underlines the transformative potential of monuments. They serve not just as hegemonic constructs but also as Heritage sites molding a convenient past that aligns with civic aspirations, bolstering social stability.

Category	Details
Description	The swift evolution of electronic threats necessitates tactics, strategies, and technologies that are equally dynamic and flexible.
EW Doctrines	- Counter-Electronic Warfare (CEW): Capability to withstand and overcome enemy electronic threats. - Offensive Electronic Warfare (OEW): Employing electronic measures to disrupt, deceive, or deny enemy electronic capabilities.
Heritage	- Integration of electronic technologies into historical sites for surveillance and preservation. - Training for heritage personnel on the latest electronic threats and their mitigation.

Chart 30. Adaptability and Innovation in Electronic Warfare.

Category	Details
Description	Balancing modern defense operational needs with respect and conservation of cultural heritage sites.
EW Doctrines	- Cultural Site Protection: Integration of defensive electronic measures to shield cultural sites from external electronic threats.
Heritage	Detailed planning to ensure that EW operations do not damage historical sites. - Guidelines on how the armed forces can cooperate with heritage agencies to safeguard sites during operations.

Chart 31. Cultural Heritage conservation and cultural sensitivity.

Category	Details
Description	The necessity for coordinated action across varied domains to ensure comprehensive defense and offense.
EW Doctrines	Multi-Domain Electronic Warfare: Coordinating EW operations across land, maritime, aerial, and cyber domains.
Heritage	Collaboration between heritage experts and EW specialists to ensure historical sites are protected during multi-domain operations. - Joint workshops between heritage professionals and military personnel to share knowledge and best practices.

Chart 32. Multi-Domain integration and collaboration. Effective warfare and preservation strategies are sculpted through iterative feedback. This section emphasizes the importance of feedback from the ground, ensuring operations remain relevant and efficient.

Category	Details
Description	Emphasizing the importance of receiving on-ground feedback and employing this information to refine and enhance operational strategies.
EW Doctrines	- Post-Action Analysis: Evaluation of EW operations to pinpoint areas of improvement and refine future tactics.
Heritage	Feedback from heritage experts on how EW operations impacted historical sites. - Future planning based on tangible feedback to ensure heritage protection.

Chart 33. Feedback and continuous improvement. Legal frameworks provide the backbone for both warfare and heritage conservation, ensuring operations are conducted within internationally accepted norms. This section underscores the necessity of adherence to evolving legal frameworks.

Category	Details
Description	Ensuring all operations and tactics align with evolving legal and regulatory frameworks
EW Doctrines	- Ensuring all operations and tactics align with evolving legal and regulatory frameworks
Heritage	Review of laws and regulations related to heritage preservation to ensure EW operations do not breach these directives. - Collaboration between heritage-focused attorneys and military personnel to ensure a clear understanding of laws and regulations.

Chart 34. Regulation and compliance.

6. Discussion : future orientations towards a Building Back Better' review analysis

The concept of "Building Back Better" (BBB) has become increasingly relevant in heritage management, particularly in post-disaster recovery contexts; in last instance, we decided to dedicate a space for BBB whose innovation not only relies on the physical reconstruction of heritage sites but also on the integration of traditional knowledge, social compatibility, and sustainability to ensure resilience against future threats: its approach, its principles, and its application in heritage management, include subtle tensions between preservation and adaptation, drawing from the given sources, an additional literature to be explored.

The stress of BBB framework has proven creating inclusive, safe, resilient, and sustainable urban environments: this involves not merely preserving the authenticity of heritage sites, with yearly new sites and actors to be included as for a World Heritage List (WHL) as highlighted by Al-Barzngy, M. et al. (2023) who ensure "strategic military benefits" and, hence, continuity and "financial revenues"; whose monetary compatibility speaks volumes for the socio-cultural dynamics which have affected such "*Local Communities*" (LC) and "*Local Resources*" (LRs).

Key principles include using local resources and traditional skills, fostering a sense of familiarity and authentic belonging, as pointed by Khalaf, R. (2021): "*BBB avoids recreating the same vulnerabilities that existed before damage/destruction caused by armed conflicts and/or natural hazard-related disasters*"; addressing both immediate reconstruction needs and long-term resilience against future hazards like climate change and conflicts (UNESCO-World Bank, 2018) in favor of "*Outstanding Universal Value*" (OUV).

One notable application of BBB principles is seen in the post-earthquake reconstruction in Marathwada, India: the initial relocation and reconstruction efforts failed because the new village layouts did not accommodate traditional lifestyles and social structures, underscoring the necessity of incorporating traditional architectural knowledge and practices into reconstruction efforts to maintain social and cultural continuity (Patiwael, G. et al., 2019).

Similarly, the Heritage Impact Assessment (HIA) guidelines, as also critiqued by Patiwael, G., suggest that a multidisciplinary approach in HIAs is essential for capturing the diverse values and perspectives associated with heritage sites.

Nevertheless, these guidelines often remain rooted in preservationist discourses, potentially limiting their applicability in dynamic and evolving contexts where BBB principles are most needed.

While the BBB approach is theoretically sound, its practical implementation raises several critical issues: first, the inherent tension between preservation and adaptation must be navigated carefully; preservationists often prioritize maintaining the material integrity and authenticity of heritage sites, which can conflict with the adaptive reuse and modernization needed to ensure sites' relevance and resilience (UNESCO-World Bank, 2018; Ashworth, 2011). Furthermore, the subjective nature of assessing heritage values and impacts complicates the application of BBB: different stakeholders, including heritage professionals, i.e. the International Federation of Landscape Architects (Zaina F. et al.,2022), urban planners, and local communities, may have divergent views on what constitutes acceptable change, leading to inconsistent outcomes in HIAs and reconstruction projects (Patiwael et al., 2019; Ashworth, 2013).

Another challenge lies in the integration of traditional knowledge with modern building practices: while using local materials and skills can enhance cultural continuity, it may also limit the adoption of advanced technologies that could improve resilience; thus, finding a balance between traditional practices and modern innovations is crucial (UNESCO-World Bank, 2018; Smith, 2006).

The Building Back Better approach in heritage management offers a progressive framework for post-disaster recovery, emphasizing resilience, continuity, and socio-cultural compatibility.

Nonetheless, its practical application requires careful navigation of the tensions between preservation and adaptation, as well as the diverse perspectives of different stakeholders; by embracing a multidisciplinary approach and balancing traditional knowledge with modern practices, heritage management can achieve more sustainable and resilient outcomes: future research and practice should focus on refining BBB principles to better address these challenges and ensure that heritage sites not only survive but thrive in the face of future threats.

7.   Conclusions: EW, Heritage and reimaging a BBB military-civil EW synergy

Innovative research in this domain predominantly revolves around framing, an aspect not yet universally endorsed by the scientific community. The study focuses on infrastructures emblematic of the burgeoning field of Electronic Warfare (EW) technology. Analogous references, akin to already recognized structures like bunkers, are cataloged. These references are subsequently subjected to a sensitivity analysis, assessed through a multi-scale approach.

Italy remains a living chronicle of millennia of cultural, architectural, and historical metamorphosis. Its mosaic of archaeological landmarks, Heritage precincts, and architectural wonders transcend national significance, becoming global patrimonies. Amidst the backdrop of swift technological progress and the evolution of warfare modalities, Italy's strategic Mediterranean berth and its geopolitical weight render it a prospective arena for sophisticated electronic warfare endeavors.

The burgeoning domain of EW in Italy, mirroring global trajectories, aspires to clinch dominance over the electromagnetic spectrum. As modern combat embraces network-centric paradigms, EW emerges as a cornerstone, furnishing strategic advantages for both offensive and defensive undertakings. Yet, superimposing these state-of-the-art electronic strategies on Italy's cultural tapestry presents distinctive quandaries.

Entities like the Italian Armed Forces, Civil Protection detachments, and analogous agencies are entrusted with the dual mandate: ensuring national security while guarding Italy's invaluable historical matrices. The juxtaposition of avant-garde defense mechanisms with the preservation of Heritage sites has engendered unprecedented collaborations among military tacticians, Heritage stewards, and civil protection entities. Heritage zones, given their expansive and multifaceted nature, command heightened vigilance.

Synchronized training regimens, iterative feedback loops, and interdisciplinary collaborative blueprints have been sculpted to foster mutual comprehension among stakeholders. By weaving international legal edicts, such as UNESCO's directives and the Hague Convention, into military doctrines, Italy accentuates its dual commitment: fortifying defenses while safeguarding cultural treasures.

Fig. 47. Bunker discovered during a real estate development in *Dompierre sur mer*. La Rochelle, Dompierre-sur-Mer, Nouvelle-Aquitane. October 2019. Photo by: Thierry Ilansades. Source: flickr.com. Credits: CC BY-SA 2.0 DEED. **Fig. 48.** Bunker complex *La Jarne*. Poitou-Charentes, France. Photo by: Thierry Ilansades. Source: flickr.com. Credits: CC BY-SA 2.0 DEED.
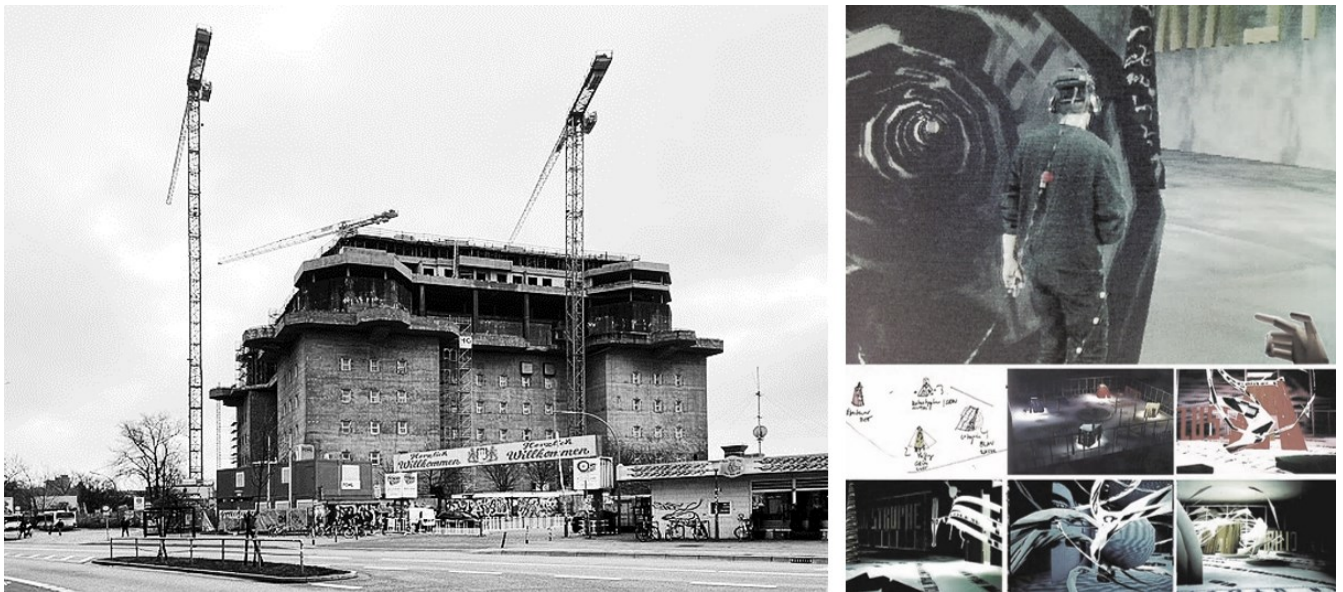
Fig. 49. Construction work on the anti-aircraft bunker at Heiligengeistfeld. Flakturm IV, St. Pauli, Hamburg, Germany. January, 2021. Photo by: Minderbinder. Source: wikimedia.org. Credits: CC BY-SA 4.0 DEED. **Fig. 50.** Home of the Brain, Virtual Reality Installation recently self-reviewed by Fleischmann, Monika and Wolfgang Strauss in 2019, (1989-91) March 31, 1991. Photo by: ThinkingSpace. . Source: wikimedia.org Credits: CC BY-SA 4.0 DEED.

Augmenting this, public enlightenment campaigns are decisive in the decision-making process. By enhancing societal cognizance of EW maneuvers, they aim to galvanize public endorsement and demystify potential misgivings.

To encapsulate, Italy's intricate endeavor to meld contemporary electronic warfare strategies with its historical legacy heralds a collaborative epoch.

While the trajectory is labyrinthine, Italy's unwavering allegiance to defense and conservation heralds a horizon where antiquity and contemporaneity seamlessly intertwine. The orchestrated alliance among defense, civil protection, and Heritage custodians offers a global template, elucidating the delicate equilibrium between advancement and preservation.

The pioneering virtual reality initiative, "Home of the Brain" (1989-91), orchestrated by Monika Fleischmann and Wolfgang Strauss under the aegis of ART+COM, Berlin, unveiled an interactive expanse dotted with the intellectual abodes of four philosophers. Enthusiasts, armed with VPL data gloves and VR goggles, were invited into a realm echoing the musings of luminaries like Vilém Flusser, Paul Virilio, Marvin Minsky, and Joseph Weizenbaum. This immersive odyssey, mapping the media theories of digital-era thinkers, earned acclaim, clinching the coveted Golden Nica at the 1992 Prix Ars Electronica.

Barros (2011) underscores the seminal contributions of key intellects who sculpted the bedrock of Archival Science. While relatively nascent, especially juxtaposed against long-standing social sciences or even Library Science, the discipline's evolution can trace its roots to these foundational figures. Their scholarship, replete with ideological and conceptual tussles, birthed pivotal milestones. The enduring echoes of power dynamics, evident in the contemporary discourse, underscore the discipline's historical richness. Intriguingly, there's an ongoing oscillation between advocates championing Jenkinsonian universalism and proponents of more modern, Schellenberg-inspired paradigms.

Bezdrabko (2019) delves deep into the intricacies of archival appraisal theory. Despite extensive literature, certain facets remain enigmatic. Hans Booms, a colossus in 20th-century European archival circles, revolutionized archival appraisal. His vision emphasized a holistic evaluation, encompassing societal values and individual perspectives. Booms' avant-garde approach transitioned archives from bureaucratic vaults to public repositories and underscored the hermeneutic significance of understanding document creation motives. His expansive definition of "documentary heritage" transcended administrative boundaries, encapsulating varied "texts," irrespective of their manifestation.

Durante (2022) postulates a provocative conundrum in our digital epoch: "*can we trust records in an age devoid of originals and immutable fonds* ?" Amidst the digital sprawl, metadata and security emerge as the twin pillars of trustworthiness. As records and archival documents morph into synonymous entities, the quest for authenticity intensifies. The archival gold standard predicates a record's authenticity on its genuineness. But, "*how do we decipher a record's inherent claim* ?".

Concluding, the research prompts fundamental questions: "*Should we enshrine physical storage within the cultural and archaeological pantheon, undeterred by hierarchical nuances, especially given emergent maintenance and security imperatives* ?" ; "*Should we perceive Electronic Warfare infrastructure through the lens of Paul Virilio's "Phenomenology*

of Perception", a phenomenon molded by global technological interactions over decades ?" ; "*Is it time to meld Heritage with Electronic Infrastructure into a singular entity* ?": the juxtaposition of silicon and ancient marbles, pulverized stones with the patina of antiquity, and artillery shrapnel, paints a poignant duality.

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Conflict of Interests

The primary author declares no conflict of interest. The numerical conclusions, as well as their numerical processing, have not accountability in the role, design, collection, or interpretation of data but aims at demonstrating adequate and fine-tuned methodologies in favour of "*Valutazione Impatto Ambientale*" (VIA) (Environmental Impact Assessment (EIA), "*Valutazione Impatto Strategica*" (VAS) (Strategic Environmental Assessment, SEA), that are derived from three branches in the process of Training and Internationalization c/o the *Ordine degli Architetti Pianificatori Paesaggisti Conservatori di Napoli e Provincia*: architecture of landscape, engineering for the territory and agronomy whose international commitment was inaugurated by former President Arch. Raffaele Sirica (1995-1997) in occasion of the Habitat II program by the second United Nations Conference on Human Settlements, taken place from June 3 to 14, 1996, in Istanbul, Turkey. The Department does not promote any misconduct, e.g., 95/46/EC and Regulation (EC) No 45/2001 (EC) No 45/2001, by endorsing: the reintroduction of historical components ecologically suitable, a sustainable land use perspective and data extraction techniques without animal experimentation and environmental invasive footprint in accordance with the rigorous Italian legislation for the landscape. No research institution, e.g., university teaching, has ever been involved in the research.

Data availability statement

The data that support the findings of this study are available on request from the lead researcher, Ing. Arch. Salvatore Polverino, at formazione@napoli.archiworld.it. Access to the data will be granted upon request and approval by the Institutional Review Board c/o *Ordine Architetti Napoli PPC* and will be subject to a data sharing agreement that ensures the confidentiality and anonymity of the participants. Requests for access to the data will be considered on a case-by-case basis and will require a clear explanation of the intended use and analysis of the data.

Ethics statements

This study was conducted in accordance with the principles of the European code of ethics for scientific research ruled by the Declaration of Helsinki (2013) and was approved by the Institutional Review Board. Participants were informed of their right to withdraw from the study at any time without penalty. The research ensured no harm or risk to participants, and all gathered data were exclusively utilized for understanding the built environment in relation to Military and Heritage Architecture from the past. All data provided are rigorously unclassified and released into the public domain without any copyright infringement. Any questions or concerns regarding the study can be directed to the lead researcher at: *Ordine Architetti PPC Napoli*, Department Training and Internationalization, Piazzetta Matilde Serao 7, 80132, Napoli, Italy, or formazione@napoli.archiworld.it. We express appreciativeness to Prof. Arch. Ahmad Nia in the guise of external expert and representative for the Mediterranean area on behalf of *Ordine Architetti Napoli PPC*.

Credit author statement

The author, Ing. Arch. Salvatore Polverino, confirms unique contributions to his corresponding membership from the

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