

DIGITAL PERSPECTIVES TO BRING DISSONANT HERITAGE BACK TO LIFE. THE MILITARY LANDSCAPE OF THE GALLA PLACIDIA LINE

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Abstract

This paper focuses on enabling strategies to enhance the military landscape of the Galla Placidia Line by stressing all opportunities offered by digital technologies in the field of cultural heritage. The proposed solutions have been implemented as part of an ongoing project funded by the Emilia-Romagna region and Ravenna municipality, which supports a conscious digital transition of cultural sectors as a new way of understanding, enjoying and preserving historic architectures and sites. Assumptions and aims of the research also face the pressure the entire planet is experiencing due to Covid-19 pandemic. First, this study describes the fortified system of German bunkers erected along the Adriatic coast during World War II, highlighting its limits and potential and framing the research background; then, it presents the tested digital tools pointing out their positive effects on processes of knowledge, conservation and enhancement of such a dissonant heritage.

Keywords

Digital Cultural Heritage, dissonant heritage, conservation, sustainable tourism, military landscape, German bunkers.

1. Introduction

Nowadays, digital technologies provide unexpected and unprecedented opportunities in updating processes of knowledge, conservation, enhancement and management of cultural heritage with multilevel impacts on cultural, economic, social and environmental sectors.

As a matter of fact, Digital Cultural Heritage (DCH) has progressively established as a very challenging field of research, which played a crucial role in the most pressing lockdown imposed by the Covid-19 pandemic, especially due to the extended impossibility to directly experience the physical dimension of cultural monuments and sites, thus mortifying cultural tourism.

These issues are at the core of the “*Linea Galla Placidia*” project, which aims to reflect on strategies and tools in using Digital Media Technologies (DMT) and Information and Communication Technologies (ICT) as a new way to access, enjoy, understand, and safeguard the defensive system of German bunkers erected along the Adriatic coast during World War II. This is a network of forgotten and abandoned military architectures, reinforced concrete skeletons lying

on the coast and inland, mostly unused, and intentionally demolished.

Despite a small community of volunteer had started to list and care for these archaeological remains, structured programs and scientific studies involving local administrations, cultural institutions and properties were missing.

For this reason, in 2018, the authors started a project of historical research, survey and planning whose first outreaches were published in an open access article (Mariotti, Ugolini, & Zampini, 2018). Thanks to this first publication other stakeholders joined the community so that a more articulated project of enhancement could be formulated.

Such a dissonant military landscape represented an exemplary case study for testing a digitally aware technology including open-source digital archives, interactive and geo-referenced maps and virtual installations to name but a few.

The study here presented describes the organization and initial results of this last ongoing phase. The paper is divided into two main sections. The first one introduces the military system of the Galla Placidia Line: it highlights limits and potential in recognising this network as a heritage in its own right, it points out to date the lack of scientific studies, conservation activities and

enhancement strategies, then it frames the research cultural background. The second section explores the tested digital solutions by combining theoretical and practical perspectives. Finally, results achieved so far are discussed and future research directions are presented. [CM, AU, AZ]

2. Research background, assumptions and aim

2.1 The military landscape of the Galla Placidia Line

On 8th September 1943, the Armistice between Italy and the Allied forces marked a turning point in World War II: it stated Italy's disengagement from the alliance with the German troops that suddenly became an occupying enemy determined to fight for every inch of land under their control. In order to avoid the Allies landing via the Adriatic Sea, north of the Gothic Line, the last fortified line before entering the heart of the Reich, the German forces built up a new coastal defence system, codenamed the Galla Placidia Line (Montemaggi, 2008). This fortified system stretched for about 130 km, from Monte San Bartolo near Pesaro to the Ravenna seashores, including 2.800 reinforced concrete bunkers and anti-shipment elements known as dragon's teeth. This monumental

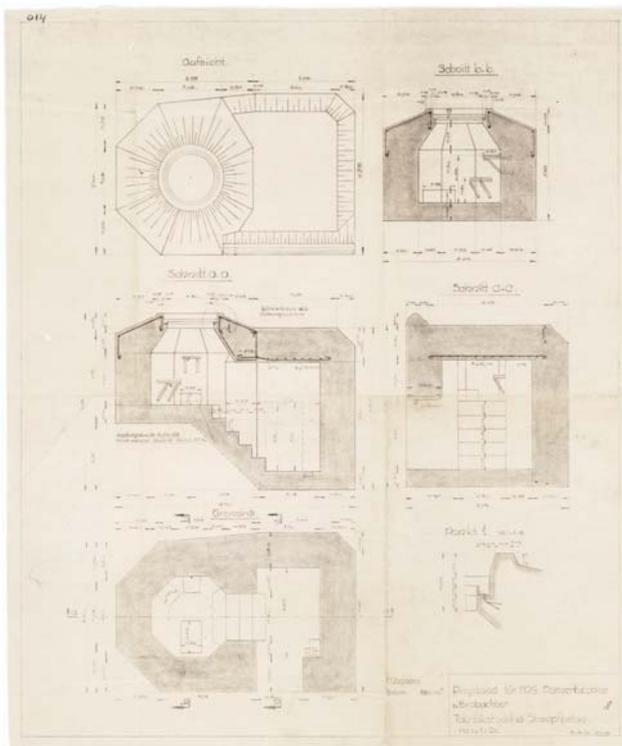


Fig. 1: Tobruk (Vf58c) as represented in the Typenheft, NL-HaNA, Bunkerarchief, 2.13.167, inv.1038, ©Public domain

construction increased the strength of borders in the so-called *Festung Europa*.

The Todt Organisation played a key role in the whole process as it was entrusted with the task of codifying all types of defence structures that were individually developed by the *Wehrmacht* Corps, and of standardising their characteristics. The aim was to speed up construction and achieve maximum adaptability to different contexts and the result was a series of handbooks, known as *Typenheft*, literally "standardised design", in which about 700 structures were collected and meticulously represented with detailed measured drawings and technical captions.

Great attention was paid to the concrete composition due to its exposure to the marine environment, to all construction stages and internal furniture as well as to the plant equipments, accurately designed and prepared during the casting phase. Nothing had to be left unplanned or unsolved in order to maximize the defensive potential.

The first bunker typology developed was called *Regelbau* followed by a three-numbered code that identified the various conformations; later on, a more compact one was defined to speed up and simplify the construction process. Known as *Bauform*, this second type of bunkers was in turn divided into *Ringstand* or *Tobruk* and *Pantherurm*, whilst the term *Panzernest* identified the last type, using completely precast series (Kauffmann & Kauffmann, 2003; Boglione, 2012; Mariotti *et al.*, 2018).

Despite German mobilisation, the Allied had different invasion plans: Operation Olive broke through the Gothic Line by land and the coasts of



Fig. 2: Marina Di Ravenna (Ravenna), bunker defending the port, now destroyed, ©Private Archive

Romagna with their fortifications were spared from a sea attack, which turned out to be a red herring. The heart of the battle moved to the shores of Normandy.

At the end of the war a decision had to be made on the fate of these silent witnesses of a landing that never took place: according to the peace treaty, several bunkers were destroyed, but their complete dismantling turned out to be very complex; consequently, some of them were buried or intentionally covered by sand, others reused as storages and warehouses. They were rejected ruins of a war to forget, subjected to a process of *damnatio memoriae* that led to their oblivion.

Lights on the German fortification system were rekindled in the 70s with Paul Virilio's work *Bunker archéologie* (Virilio, 1975), but only a recent local community interest in the Galla Placidia Line projected the challenge of its preservation into the present.

Today, the remains are just a fragmented set of architectures with no purpose and totally absorbed in the contemporary landscape with the most critical issue being the impossibility to recognize and figure out the scale of this defence system, even on an architectural level. In fact, the remaining structures underwent a gradual process of metamorphosis, sometimes spontaneous and sometimes intentional, that compromised or forever altered their material consistency.

The lack of a specific protection regulation is also one of the main causes behind this: bunkers, like all artefacts of particular historical interest, are protected by the Italian *Code of the Cultural and Landscape Heritage* (D.Lgs 42/2004, art. 12) provided that they are owned by public bodies and

that they are at least seventy years old. Nevertheless, most bunkers do not meet the above-mentioned legal requirements and over time a carefree attitude towards this historical legacy has developed. In 2003, an important effort to overcome this legislative gap was attempted by extending World War I heritage protection regulations (D.Lgs n.78/2001, *Tutela del patrimonio storico della Prima guerra Mondiale*) to World War II ones, although without achieving the desired goal, and the situation has not changed yet.

The first conservation actions on this fortified system date back to the 80s and they have almost always relied on volunteers. In the Romagna area, in particular, the no-profit organisation Comitato Ricerche Belliche 360° (CRB360°) still coordinates today a wide range of operations including reconnaissance of bunkers, removal of shrubs and weeds and, in some cases, excavation, camouflage painting of surfaces and fitting of interior rooms. The CRB360° mission opened up interesting scenarios of research and experimentation that led to a very stimulating project.

As a matter of fact, the state-of-the-art in terms of knowledge and heritage care strategies for the Galla Placidia Line is very poor today: first of all, there is a lack of extensive and systematic studies on this military landscape – just consider that the exact quantitative and qualitative consistency of the Line is still unknown –, and secondly there is a lack of an enabling toolbox, made up of real and virtual tools, capable of supporting a convincing storytelling and an effective protection. Therefore, these are the assumptions that configured the need and justification for this research and at the same time set out its crucial challenges. [CM]



Fig. 3: Post-war scenarios: abandoned bunkers along the coast of Lido di Savio (Ravenna) on the left, © Giordani 1971; and the failed demolition of a Regelbau 668 in Punta Marina (Ravenna) on the right, ©Authors

2.2 Past and present scenarios of the research

In 2018, thanks to the growing attention and concern that the volunteers were paying to this fortified system, it became clear that the risk of dissipating this experience could not be run. This commitment had laid the foundations for a wide-ranging work, and it encouraged the research group to start a campaign to promote a conscious conservation and enhancement of this dissonant heritage.

First of all, the group undertook a historical and documentary study about the military structures in order to reconstruct the events that had led to their planning and execution. Bibliographical, archival, and iconographical research were commenced, and a prime focus was reserved to the typological and technical characteristics without neglecting the state of preservation. The first results of this ongoing research were published in an open-access article (Mariotti *et al.*, 2018), which also presented the earliest strategies for the local community's active involvement. The paper stated the importance of building a shared path for achieving a concrete impact, and the expectations were met in the aftermath when the work proceeded in two different directions.

From an academic point of view, in agreement with the Ravenna Superintendency and in collaboration with CRB360°, eight curricular internships were set up for students attending the master's degree in Architecture. The goal was to conduct a census and a survey of the still standing fortifications. The activity built on the provisional lists drafted by the volunteers and consisted of

standardising and enriching this first inventory according to a set of entries deduced from the data structure adopted by the Central Institute for Catalogue and Documentation (ICCD). A work proved crucial for the development of the subsequent phases.

In addition to that, a master's degree thesis was proposed in collaboration with the Faculty of Cultural Heritage to analyse and characterise the constituent materials. The study of the samples (still in progress), taken from structures in different states of conservation and the few surviving decorated surfaces, is hoped to clarify how the German engineers and Todt workers operatively applied the strict regulations of the manuals. Likewise, these technical data will provide scientific evidence for the definition of conservation strategies.

The second field of development concerned the strengthening of heritage communities. The opportunity to move in this direction and formalise some collaborations came thanks to a call for initiatives intended to promote the enhancement of 20th-Century memories and histories. The tender was promoted by the region Emilia-Romagna in spring 2020. On that occasion, the association Pro-Loco di Marina di Ravenna, in partnership with the Department of Architecture and with the support of other third-sector associations, decided to implement part of the actions suggested by the research group and finally submitted a pitch entitled "*Sentinelle di un paesaggio dimenticato del Novecento. I bunker della Linea Galla Placidia a difesa delle coste romagnole*" (or in brief "*Linea Galla Placidia*" project).



Fig. 4: Some moments of the field survey with local expert Walter Cortesi from CRB 360° and the students of Architecture of the University of Bologna, ©Authors

The proposal won the regional funding (Regional Deliberation no. 604 of 03/06/2020), and lately, also the Municipality of Ravenna (one of the local administrations crossed by the Galla Placidia Line) resolved to support the project, recognising its quality and a solid commitment to developing the territory.

Because of the financing received and the stakeholders involved, the plan of activities was prioritised, emphasising actions linked to tourism promotion. However, according to the University's vision, aspects of conservation and study were kept at the core. In the light of these objectives and taking into consideration the Covid-19 outbreak, the proposal took as its guiding thread the adoption, development and implementation of site-specific Digital Media Technologies and Information and Communication Technologies.

The set goals were what Letellier, Schmid, and LeBlanc (2007) defined as "Heritage Information", as to say all those "integrated activities of recording, documentation and information management", required to "acquire knowledge, understand meaning and values, promote the interest and involvement of people"; the Heritage Digitalisation; and thus, the arrangement of the conditions for grounding a vibrant touristic development plan.

Accordingly, the following actions were outlined and implemented:

- the collection of iconographic sources by the digitisation of historical photos
- a further extension of the census carried out by the students (both in terms of structures included and additional information)
- the creation of a web app
- the activation of a training course for official tourist guides
- the organization of an online webinar with international experts¹ and the opening of a Facebook page of the project, in order to promote its inclusion in international dynamics and networks.

¹ The online webinar "Preserving military landscapes of World War II" was held on the Zoom platform on December 17th, 2020. It included the institutional welcome of Emilio Agostinelli (Superintendency of Ravenna) and Giacomo Costantini (Municipality of Ravenna – Tourism Department), and contributions by Andrea Ugolini (University of Bologna), Mona Schieren & Christel Trouvé (Bunker Valentin, Bremen,



Fig. 5: Punta Marina (Ravenna), Regelbau and Tobruk in the pine forest, now musealized, ©Authors

This articulated program allowed the research group to develop concrete actions and theoretical reflections about the role of these technologies in enhancing such a complex heritage. The milestone of this project is to fill a crucial gap in the current state-of-the-art, including scientific knowledge, communication, and protection strategies. The main outreaches achieved so far will be presented in the following paragraphs. [AZ]

3. The "Linea Galla Placidia" project

3.1 Understanding the dissonant heritage

The concept "dissonant heritage" may seem unusual or perhaps ambiguous. When we define heritage, we recognise that it can give rise to conflicting or otherwise contradictory interpretations by different socio-cultural groups (or by the same group changing its mind over time) and by groups with different power levels. A typical example of dissonant heritage are the architectural works left behind by dictatorships when societies become democratic (as happened in the aftermath of the collapse of Nazism, Fascism or Communism) or those linked to the Shoah and mass extermination, sometimes denied by those who wanted, favoured, suffered or tolerated them (as happened in Germany, Poland or Italy) or even rejected by the victims, to erase their memory. Nevertheless, these artefacts and objects are

Germany), Mathieu Meyer (Raversyde Atlantik Wall, Ostenda, Belgium); Heimo Prünster (Provincial Museum Fortress of Fortezza, Littorio Alpine Wall, Italy); Stefano Pulga (freelance restorer); Chiara Mariotti (Università Politecnica delle Marche); Alessia Zampini (University of Bologna); Walter Cortesi (No-profit association CRB360°).

paramount for the history of the 20th century, having become forms of active remembrance of social life for future generations (Ruggeri Tricoli, 2009; Ugolini & Faccio, 2021).

Therefore, it is clear that the “dissonance” of an artefact or site is the result of interpretative strategies by those making the assessment as things or objects never have any unambiguous meaning in themselves. Meanings are collective constructions that change over time according to the different social groups and their power. The question of power relations thus lies at the heart of the discourse on heritage.

In every society, dominant groups have always used their vision of the past to identify important monuments, just as those in charge of their protection and preservation have conditioned their conservation and restoration strategies (Smith, 2006). Such a process depends on historical and cultural conditions, current and past political determinants, as well as the personal beliefs and motivations of individuals and groups involved in the interpretation process.

If that heritage inevitably carries the messages and values of the society that promotes it (Tunbridge & Ashworth, 1995), it becomes a complex object, generated by a system of relationships, enriched by different meanings that end up marking our lives. Heritage is a concept that constantly changes and, most importantly, should be seen as the result of a social and historical process. It is, therefore, important to understand how these meanings are constructed and how they guide individual and collective actions. The symbols of a dissonant and controversial past may sometimes seem inconspicuous to us, often hidden or actively

marginalized, precisely because they embody those values that the community considers inappropriate in the present. Thus, dissonance manifests itself in the power to include or exclude something from a heritage list. Such action may entail the risk of activating dangerous processes of de-patrimonialization, which, in its turn, contribute to the destruction of those social mechanisms that should instead connect the experience of contemporaries to that of previous generations (Hobsbawm, 1995). The belief, for example, that the Nazis only are responsible for the political and racial deportation in Italy took place is challenged by the incredible dissonant heritage of more than 250 detention and transit places and camps for Jews, stateless people and opponents of the regime (generally unknown to most Italians) established in Italy after the racial laws of 1938 (Ugolini & Delizia, 2021).

Accordingly, the damage resulting from such attitude is a flawed construction of memory, or worse, of forgetting what has been. Nevertheless, such an assertion can generate two forms of opposing problems: excluding too much, typical of the institutional approaches, and including too much, typical of the bottom-up approaches. This problem remains open for the time being and is likely to find negotiated solutions over time.

Going back to dissonance and its effects, for heritage such as the system of fortifications of the Galla Placidia Line, the risk of oblivion has been real for a long time due to their “fragility” (despite its *firmitas*) caused precisely by their being inconvenient, uncomfortable objects that remind people of the occupation, of death and destruction, bulky objects hard to reconvert to new functions, in a moment of economic boom in Italy when



Fig. 6: Dragon's teeth reused as breakwaters and for sunbathing: picture on the left retrieved from https://www.facebook.com/groups/ComitatoRicercheBelliche?locale=it_IT%2F; picture on the right ©Authors

reconstruction aimed to overcome the sad memories of the past. If we manage, on the contrary, to analyze today the reasons behind this dissonant heritage, to translate and communicate their meaning, it will be easier to save them from the abyss of oblivion, regardless of their conservation, accepting their diversity and incompleteness.

As a consequence, dragon's teeth, remaining of casemates or trenches, firing positions, observation or transmission posts will no longer appear to us as useless and incomprehensible concrete objects abandoned in a pine forest or along a beach, we will perceive them neither as engulfed by new buildings that have exploited their *firmitas*, nor useless time deposits, but as fragments of a story and history, whose understanding will become helpful for the future of communities that relate daily with this heritage, perhaps accepted in this way as less dissonant. [AU]

3.2 Building a joint cultural path

It is widely agreed that even a so-called "controversial/dissonant heritage" can be shared and valuable in educational activities that aim to develop autonomy and critical awareness in people. In this respect, the *Faro Convention* has proved revolutionary by giving an important role to active citizenship organized in the form of Heritage Communities (Council of Europe, 2005). According to the convention, since it is people that attribute cultural value to one artefact rather than another, this decision-making power is partly transferred from state to citizens.

However, this should not be seen as a lack of confidence in the work and professional competence of those who have spent years training in the field of cultural heritage management and enhancement. On the contrary, we can observe how the Convention makes us aware that in this scenario there is room for everyone and for different specificities: we could almost say that in this way the function of specialists is enriched (and we can add invested) by important social responsibilities (Volpe, 2016). We should therefore sustain volunteering as a helpful and supplementary action. We are convinced that there is ample space for what is defined as the "third sector", i.e. those voluntary organizations which, following their no-profit criterion and acting according to different logics than public institutions or businesses, can carry

out (and in fact in the case of the bunkers of the Galla Placidia Line this is already happening) activities of various kinds in the field of education, environmental protection, and the enhancement of cultural heritage through forms of social participation (Ugolini, 2019).

The Convention also attaches particular importance to the processes of transmission of heritage to future generations, but what exactly will we transmit? This is where heritage education comes in and opens up a wide field of action of exceptional importance. We can say that all cases of dissonance can become good opportunities to learn critical and open thinking. This overcomes the naive conception of teaching as a simple transmission of contents from those who know to those who do not know, in order to stimulate awareness of knowledge as a variable and negotiable social construction. This approach enables open and democratic societies to incorporate into their history even strongly discordant heritage constructs without perceiving them as threatening and therefore also without feeling the need to destroy or demonize them.

The research activities that have been carried out by the University of Bologna on the bunkers of the Galla Placidia Line, in collaboration since the very beginning with CRB360°, have enabled the activation of virtuous projects for the enhancement and reinterpretation of this heritage. In fact, through a shared working table around which the University of Bologna, the Ministry of Culture, local government actors, cultural institutions and associations for promotion and development have met on an equal footing, and activated participatory pedagogical activities (university internships, international study days, training courses and workshops) whose main purpose is the acceptance and inclusion of this discordant heritage in the cultural horizons of the community. This network was immediately linked to other international organizations with similar aims, such as *Atlantikwall Europe* bringing together partners from the seven Atlantic Wall countries (Belgium, Denmark, France, Germany, the Netherlands, Norway and the Channel Islands) to promote cultural heritage as a source of inspiration for cultural cooperation and to develop a sustainable network of Atlantic Wall heritage sites. Physical and cultural accessibility of the heritage of the Galla Placidia Line have therefore immediately become the objectives of an enhancement campaign, also in terms of tourism,

which does not neglect the “pedagogy of conservation” as care and safeguard, active above all from below, of a system that is no longer forgotten and for which the local communities seem determined to take charge. [AU]

3.3 Enabling a digital value chain

The multi-scalar dimension as well as the material and immaterial value of the fortified system of the Galla Placidia Line meant the project immediately developed a strong “digital” vocation. The aim was to test and validate a comprehensive digital chain to enhance the German bunkers along the Adriatic coast, without forgetting the importance of preserving historic architecture, which has always been the “real” counterpart of the project.

Pillars and principles of this digital value chain are rooted in several European key policy documents which were signed in recent years and which all unanimously recognised ICT as a driving force in the development of new paradigms for cultural heritage. One of the last was ratified at the height of the Covid-19 pandemic, this was the *Europe Day Manifesto* (European Heritage Alliance, 2020). It took on board the pressure that Europe and the entire planet are experiencing and highlighted seven interconnected ways of research and experimentation for supporting robust policies to reset and rebuild our societies and economies. Having in mind that the Coronavirus is still heavily affecting the world of culture, but also that cultural heritage is a resource capable of catalysing important positive changes as the *European Year of Cultural Heritage* demonstrated (European Commission, 2019a), one of these strategic pathways was precisely reserved for Digital Cultural Heritage and conceptualised into the topic “digitally transforming Europe”. This topic supported a transformation that is growing to the scale of a “digital revolution” as it was called during the *2019 Digital Day* (European Commission, 2019b).

As a matter of fact, a digital transition of cultural sectors started several years ago and has now reached important milestones: a first significant goal was achieved in 2008 with *Europeana*, Europe’s digital platform for cultural heritage, whose 2020-25 strategy on *Empowering digital change* is focused on three main challenges (the environmental, digital and social challenges) to make Europe a “vibrant ecosystem in the 21st Century” (Europeana, 2020). No less important,

the launch of the *Digital Agenda for Europe* (European Commission, 2010a) and of the *Digital4Culture* strategy within the *New European Agenda for Culture* (European Commission, 2018); at the same time, it is essential to include the *Declaration of Cooperation on advancing digitisation of cultural heritage* (European Council, 2019) as well as the decision of the European Commission to centre the 2019-24 political strategies on six headline ambitions including one to provide citizens with a new generation of technologies for the “Digital Age” within safe and ethical boundaries (European Commission 2019c).

According to these principles and in the midst of Covid-19 restrictions, the project defined main research axes to enhance this military landscape by stressing all opportunities offered by digital technologies. As a result, three macro-tasks were identified, each of which sought to align with EU policy outcomes and to produce site-specific impacts:

- *knowledge digitalisation*. Data related to the mapping of bunkers and the inspection of their residual consistency had to be digitalised and brought into a repository capable of ensuring smart and user-friendly visibility and accessibility. This objective complied with a democratic vision of culture that supports diversity, inclusivity and creativity while emphasising the value of heritage as a common good. In this way, digitisation can be seen as “the most obvious instrument of democratisation of cultural heritage” (Sonkoly & Vahtikari, 2018);
- *e-informing & e-learning*. The history of this little-known defence system had to support the construction of a scientifically based identity that would be both recognizable and appealing to a wide audience not exclusively of experts. This step was fundamental to ensure an effective dissemination of cultural contents in the case of both online knowledge sharing through digital devices (e-informing) and onsite through tourist visits. The need to train expert guides during the pandemic was then resolved by means of online training courses (e-learning); by focusing on this matter, the project also aimed to narrow the divide between institutions, associations and tour operators that are digitally equipped, and those that are not (European Heritage Alliance, 2020);

- *virtual storytelling*. Bunker tours already organised by some local associations had to be combined with a virtual format. By creating this two-way visitor interface, the assessment and enjoyment of this military landscape would be greatly widened, enriched and updated, but not simply replicated through ICT. As the use of bunkers is today mostly limited to visiting them, constructing a coherent digital storytelling was crucial to conveying history and reinforcing the sense of belonging to places, as the Leeuwarden Declaration on *Adaptive re-use of the built heritage* states (2018).

Dealing with the digital site of the problem, these tasks also embraced the concept of “enhancement” as a coordinated set of actions affecting knowledge, fruition and conservation, as also declared in the *Code of the Cultural and Landscape Heritage* (D.Lgs 42/2004, art. 6). Although the project’s benefits for knowledge and fruition were very clear, those for conservation might be less immediate. Nevertheless, all doubts are dispelled if one considers that digitally mapping all surviving and lost fortifications by implementing an ID data sheet for each one (data regarding the history, materials, construction techniques and the state of conservation) would represent an indispensable measure for the physical conservation and it would enable the creation of a virtual landscape indirectly preserving its real historical memory. Last but not least, ICT would also directly affect the physical preservation of bunkers, thanks to the implementation of preventive conservation plans starting from the construction and behaviour analysis of 3D models.

As a rule, all project activities would always be carried out in a logic of integration, but above all of knowledge and expertise sharing between experts (conservation experts and ITC specialists) and non-experts (tourists and citizens); besides, sharing is the basis of our mission of handing down heritage to future generations.

In this regard, ICOMOS dedicated the last *International Day of Monuments and Sites* to the theme of sharing: in the face of the ongoing worldwide healthcare crisis, it reminded us that sharing cultures and heritage also means sharing responsibility “for the care and safeguarding of the significant attributes, meanings, and values of

heritage” (ICOMOS, 2020). This is a key issue for the dissonant military heritage of the Galla Placidia Line, which risks blending into the contemporary landscape and being lost forever. [CM]

3.4 Supporting traditional and e-tourism

Since the very beginning, the possible spillovers of this research on the touristic sectors appeared clearly evident.

First of all, these bunkers and fortifications are widespread along a portion of the Adriatic coast known as “Riviera Romagnola”, whose tourist vocation is formidable. This macro-area can catalyse 70% of the entire tourist presences in Emilia-Romagna (Regione Emilia Romagna, 2020). The region, in turn, is firmly in the top five favourite destinations for travel and tourism (Conferenza delle Regioni e delle Province Autonome, 2020) and fourth for tourist reputation (Demoskopika, 2020), in a nation where travel and tourism have a total economic impact² on GDP of 13% (Banca d’Italia, 2018; WTTC, 2020).

Moreover, despite the controversial legacy linked to these military fortifications, witnesses of a dramatic period, archaeology of death, the spontaneous birth of committees for their protection, and the establishment of several social communities (now counting more than 1.500 members) demonstrated that memories of World War II could be a true driving force, or in terms of tourism, powerful attractors.

Because of this attractiveness and in the light of the considerations about dissonance explicated in the previous paragraphs, how to convey these histories and meanings in a touristic key became a



Fig. 7: Summer bunker tour in Cervia, ©CRB360°

² The total economic impact involves “direct” effects, “indirect” effects, i.e. from the supply of goods and services by

tourism businesses, and the “induced” effects generated by the consumption of tourism workers.

field of reflection. One significant concern, for example, was the possibility of reading the initiative as a celebration of these objects and, by transposition, of the war. This is why the group placed much emphasis on the construction of the touristic discourse during the round tables.

Subsequently some meetings were scheduled with the Tourism Councillor of the Municipality of Ravenna³ to define a shared strategy for the development of the area guided by a sustainable form of tourism. Some of the needs highlighted by the administration were the importance of overcoming the seasonal nature of tourism, which usually concentrates during summertime (May to September); expanding the touristic storytelling to historical periods never told before to address, especially to schools, a more comprehensive offer; and last but not least, focusing on the training of guides. The requests entirely matched the project's premises and perfectly aligned with the European recommendation for tourism policy (European Commission, 2010b).

To provide some confirmation of this coherence, it is useful to recall for example that the very nature of the bunkers, visitable in any season, even in winter, makes them an excellent destination to invest in for increasing the economic competitiveness of the area during the off-season.

Furthermore, as remembered by the above-mentioned document, essential to this objective is also the availability of skilled staff (European Commission, 2010b). For this reason, a great deal of energy was spent to ensure that an online training course for official tourist guides, managed by the University, could be set up. Delivered through the Zoom platform to cope with the Covid-19 restrictions, the lessons were attended by more than 60 professional guides, demonstrating the importance of ICT in supporting a widespread Continuous Professional Development (Caruana, 2015). The Intended Learning Outcomes (ILO) were to explain why this dissonant heritage was worthy of being preserved, to educate about its forgotten history and characterizing features, but also to offer new job opportunities to these

professionals who had been severely affected by the pandemic crisis. In these terms, the course provided a virtuous example of the so-called third mission and addressed another cornerstone advocated by the sustainable tourism principles, as to say the "job efficiency" (World Bank, 2017).

In addition to that, the development of a web app allowing to tailor the visitors' experience according to the available time, the way of transport, the proximity to a specific location, answered the criteria of "technological update" backed by the European Commission (2010b).

However, in a balance between traditional and e-tourism, the first has been privileged, opting for multimedia contents and tools that could support, but not entirely replace, the in-presence bunker tours. As already mentioned, the digital tool facilitates the visits, enrich them with in-depth content (partly exclusively on site), and help to achieve a major goal.

The hope is that this will not only favour the enhancement of this specific inheritance, but also to insert it in a virtuous chain boosting the socio-economic fabric of the area⁴, keeping the community participation alive, and increasing the will to care regularly for these places. [AZ]

3.5 Implementing a smart web app

In the cultural framework presented, one of the main achievements was the development and launch of a dedicated web app that could record and digitalise the information acquired, relating it with precise points in space, thanks to so-called "location intelligence" (Fernandes Vaz, Fernandes, & Rocha Veiga, 2018).

The initial objective was threefold: to have a repository of the data recorded during the study and census phases, to promote awareness for tourism purposes, and to foster community involvement for developing more accurate and participated preservation policy.

First of all, the company with the know-how needed to develop the application was selected. Since Pro Loco of Marina di Ravenna formally promoted the project, it was possible to proceed with a direct assignment. The choice fell on the

³ The fortifications are not present only in the Ravenna Municipality, but at this stage it was the only administration officially involved in the project. The Municipality of Cervia has already agreed to collaborate in the future phases of the project, while the priority objective remains the involvement of the other administrations to create an effective territorial system.

⁴ For example, some local associations, such as the lifeguards' cooperative, with an entrepreneurial spirit, foreseeing possible economic spin-offs for their activities, have already announced they are willing to finance future advancements such as the signage print.

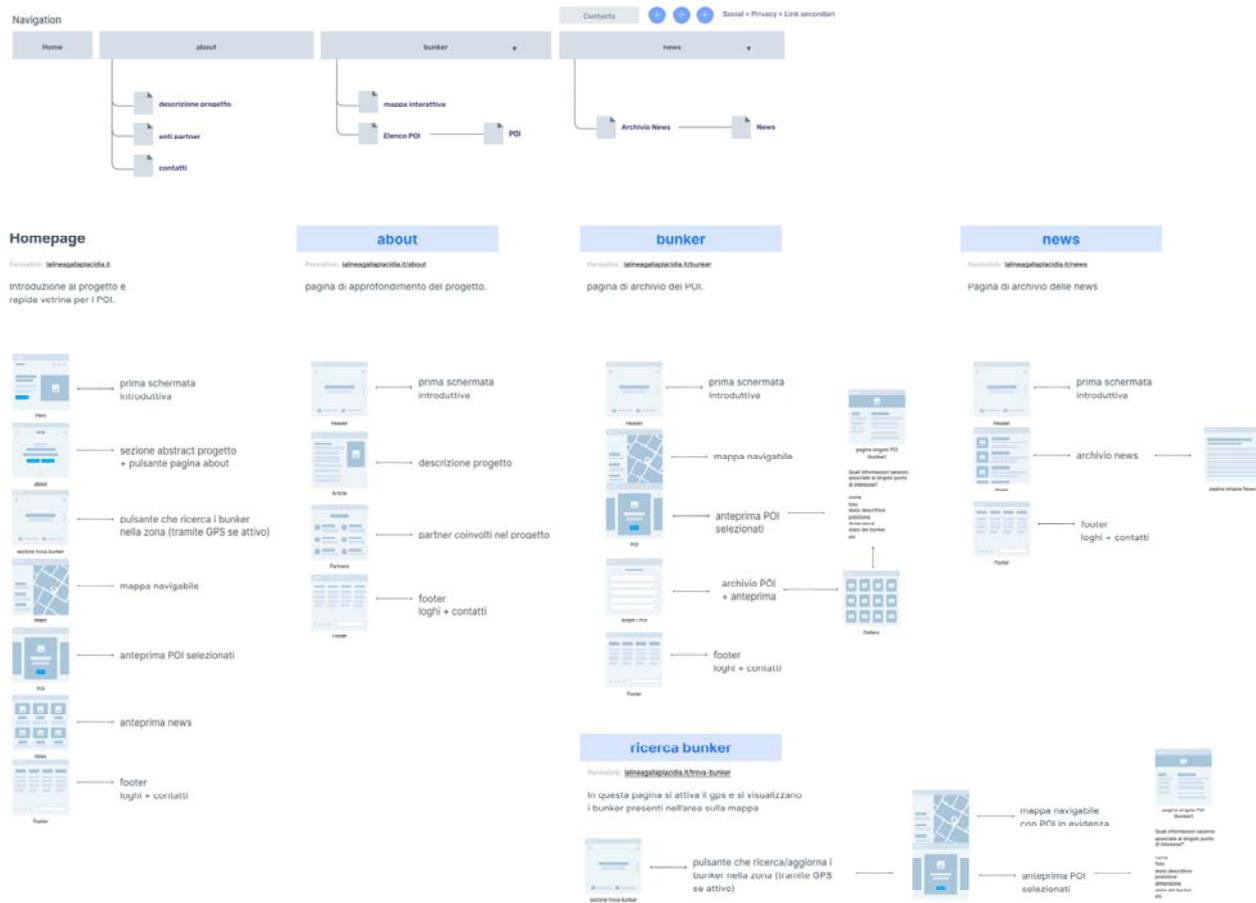


Fig. 8: The web app flowchart, elaborated by SmartFactory and Cosmo

start-up "SmartFactory" with a solid experience in the cultural sector, while the corporate identity of the project (logo, merchandising, web site layout and signage) was developed by the company "Cosmo".

The web app (La Linea Galla Placidia, 2020) is responsive and adaptable to laptop, smartphone or tablet experiences. It is currently in Italian and English, but other languages may be added over time. The site flow chart has a straightforward and intuitive layout. From the *home page*, where there are one significant image and a payoff text, scrolling down the screen takes the user to the *about* section. Here a summary description of the project is given, the partners are mentioned, and their contacts provided. Though, the core of the application is the *bunker* section. In this part, a navigable interactive map is available to quickly view all the bunkers in a specific chosen area or around the user.

The application, in fact, uses a GPS georeferencing system, which allows on-site visitors to accurately verify the presence of structures in their

proximity. At this stage the choice of the GPS appeared to be the most efficient in managing such a large-scale territorial system. However, if after a testing phase it should prove difficult to locate specific structures with precision, the possibility of integrating the system with beacon technology will be evaluated, as already foreseen in the initial phase of the project.

Each defensive structure was then identified as a Point of Interest (POI) and associated with a descriptive page. A series of standardised entries, defined according to both an open and closed vocabulary, contributes to the description.

The entries follow the scheme of data collected during the cataloguing phase and at the same time, thanks to shared thesaurus, allow to query the system and to refine the search on the basis of various parameters.

The items describing the bunkers, are as follows:

- *ID*: identification of the structure according to location, denomination

- *Type*: reference to the Typenheft code
- *Long description*: maximum 500 characters
- *Current use*: abandoned / storage / musealized / demolished
- *Approachable*: yes/no/only with tour
- *Accessible*: yes/no/only with tour

Complementarily, some digital media are added including photos and videos. Also in this case, the homogeneity of the information provided is emphasised whenever possible. Specifically, digital media involves current pictures to help identify the structure, digitised historical pictures, redrawing of the bunker derived from the survey campaign and the consequent virtual model, to better explain spaces and functions, eventual archival resources and more.

Additionally, in the future, it will be possible to integrate this georeferenced database with Augmented, Mixed or Virtual Reality, which would certainly be very effective and helpful for knowledge and storytelling purposes. Some bunkers, indeed, can only be accessed or approached if accompanied by guides; others are not accessible at all due to their state of preservation or their location on private property, while others have been profoundly modified over time and their link with the territory is no longer clear without some help in understanding them. In the mentioned situations, these tools could guarantee cultural accessibility while engaging the user, playing in this way an edutainment role.

A further section is dedicated to *news* and is mainly addressed to the community. This space will not be dedicated only to communications useful for planning a visit. It will primarily enlarge



Fig. 9: Example of bunker ID data sheet from the web app, retrieved from <https://lalineagallapladicia.it>

and boost the Heritage Community giving the possibility to actively join it, meet and grow, thanks to specif call to action or forum of discussion.

Finally, the educational objective of the web app will be implemented by creating a section dedicated to training, which will serve as a platform for public history initiatives, and above all, as a point of reference for all scholars and learners wishing to embark on studies in this field

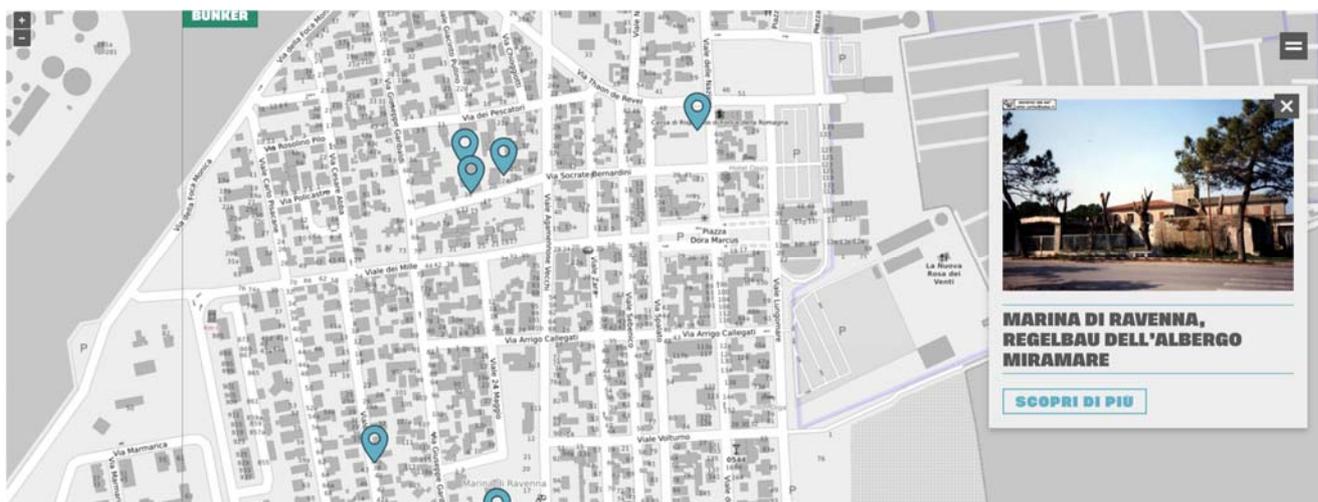


Fig. 10: Screenshot of the web app, *bunker* section

or to export these expertises in similar scenarios. It will collect the available historical sources and the technical handbooks that will derive from the future advancements. [AZ]

3.6 Planning future research

Being the project still ongoing, the research team has already planned next steps. In order to balance both real and virtual enhancement goals, future works will be mainly directed towards the physical and material conservation of the German bunkers, being this a priority of any heritage care strategy. Nevertheless, the digital approach in safeguarding historic architecture is still vital: the project intends to continue to take advantage of using ICT to improve the conservation of fortified structures on the one hand, and to ensure the feasibility of planned activities despite the Covid-19 restrictions on the other hand.

Such a vision derives from two specific needs of our time: the first one is to consider the digital world in a logic of complementarity and non-exclusivity with respect to the real world, thus fuelling a hybridisation of traditional and innovative methods and tools; the second need, which is specifically post-pandemic, is to define new paradigms for accessing and interpreting the phenomenon of culture and cultural heritage.

In line with these assumptions, three new goals have been defined for 2021.

The first activity will be the organisation of an international summer school as a stimulating opportunity to exchange ideas for preserving the German bunkers of the Galla Placidia Line.

The University of Bologna will coordinate this advanced course with the participation of the European network of scholars built up within the project since the 2020 December webinar. The aim is to provide participants with methodological and empirical tools to conserve and reuse recently abandoned buildings of cultural value, witnesses and bearers of a dissonant and not yet consolidated historical memory.

In addition, this experience will foster the knowledge transfer on this topic and trigger interdisciplinary cross-fertilisation between teachers from different backgrounds, research institutions and local voluntary associations. Although this initiative has been conceived as an onsite experience including visits and collective work phases, the most up-to-date digital tools, such as platforms for shared planning, will enable it to be online if the pandemic requires it.

The second key action will be the “field” work: it is intended as a real conservation teaching site in which to test and validate solutions for the conservation of reinforced concrete bunkers. The activity will be addressed to local voluntary associations that have so far been involved in discovering and protecting these structures and will be aimed at their “education for heritage care” in order to avoid interventions not consistent with the objectives of restoration as a discipline. The University of Bologna together with other expert conservators will coordinate this field work. Bunker on which volunteers will work will be selected from those already mapped and will be representative of a recurrent state of degradation



Fig. 11: Cervia (Ravenna), buker Regelbau 668 before and during maintenance works carried out by CRB360° on a voluntary basis, ©Authors

affecting fortifications of the Galla Placidia Line. This initiative will necessarily be performed on site, but, once again, digital technologies will amplify its echo and intensify its impacts. With this in mind, a sort of “digital conservation site report” will be produced, consisting of demonstrative micro-videos through which materials, methods and instruments of the main operational phases will be documented.

The field work experience will also be conceived as a preparatory activity to the third goal focused on drafting operational guidelines for the conservation of the German bunkers of the Galla Placidia Line. The idea is to create a very practical but scientifically based handbook, an easy-to-understand and easy-to-use toolkit collecting the best preservation practices from the existing literature and conservation experiences already successfully implemented. This handbook will be printed in both paper and digital format and should be free to download in order to promote its dissemination among voluntary associations and scientific communities.

As anticipated in the previous paragraph, digital products and services designed within the project will be channelled into special sections of the web app, which will thus be populated with information and virtual working spaces; the latter will be hierarchically organised and targeted according to users (tourists, citizens, volunteers, scholars, academics, and so on).

Last but not least, this research does not exclude additional steps in using digital technologies to enhance this military landscape. In this perspective, bunker 3D modeling will open up unconventional scenarios of conservation: designed as Digital Twin (DT), that is a “virtual representation of what has been produced” (Grieves, 2015), such a model will be used, for example, to monitor physical factors that can potentially threaten the integrity of tangible features of historic buildings. This process will prove extremely useful for supporting preventive conservation strategies (Jouan & Hallot, 2020; Della Torre, 2021).

Furthermore, 3D reconstructions can be used to experiment Augmented Reality (AR), Mixed Reality (MR) and Virtual Reality (VR) solutions, enriching virtual bunker tours with high-quality immersive experiences. The implementation of bunker tours will be one of the next goals to ensure ways of accessing and enjoying heritage during the pandemic.

Finally, the involvement of local citizens will not be neglected, especially to foster a science-based awareness of this controversial heritage. In the future, they will become a proactive actor of these strategies through special digital tools enabling them to interact and perform activities such as reporting a bunker that has not yet been mapped, denouncing phenomena of degradation (cracks, infesting vegetation, flooding, soiling) or dangers (collapses or demolitions) obviously validated by a scientific committee. A Heritage Community, in the sense of the *Faro Convention* will therefore be established, capable of supporting heritage enhancement in a spirit of civic co-responsibility, in a culture inspired by subsidiarity and care for the common good (Petraroia, 2020). By exploiting ICT potential to stimulate multi-level sharing, this community could also develop into a Digital Heritage Community, in compliance with a conservation and management vision that is progressively strengthening the link between society and landscape, people and places (ICOMOS, 2013). [CM]

4. Conclusions

The role of Digital Multimedia Technologies as well as of Information and Communication Technologies in enhancing this dissonant heritage is pervasive in every step of the “*Linea Galla Placidia*” project. As the academic research had predicted since a long time, this know-how unlocked crucial chances for promoting knowledge and sustainable planning of new “smart” landscape (Clini, Galli, & Quattrini, 2016).

The opened opportunities were several, from Heritage Information and Heritage Digitalisation to e-learning and virtual storytelling, up to Digital Heritage Community.

The Covid-19 outbreak forced a definition of the actions envisaged in the proposal submitted for the regional call precisely from this digital perspective, and in doing so, responding to the community aspirations became a priority.

The app development raised the question of whether this tool would negatively impact on-site tours, allowing visitors to organise their own tour, or worst, relegating the experience to a laptop screen. Provided that in times of a global pandemic this last risk could turn to be a favourable circumstance, during the conceptualisation and implementation of such a tool, the conviction matured that in similar situations, where physical

accessibility is complex or limited in time, where there is a tailored content management making the remote experience different from the one on site, where so many opportunities open in terms of education and social engagement, the web app can be a fundamental toolkit.

This is why the project always tried to combine academic aspects of research and study with concrete actions that could impact awareness-raising, education, social inclusion, and, in these terms, digital strategies proved innovative and resourceful. They accomplished keeping the project active, guaranteeing different levels of cultural accessibility (even if other steps can be taken to achieve greater incisiveness) and supporting a sustainable tourism capable of promoting the economic recovery of a sector so badly affected by the effects of the pandemic.

Unfortunately, data regarding the current views of the app are not available yet, but thanks to the project and the support provided by the app, several tourist agencies are going to activate, starting from June 2021, guided tours with the cooperation of the Pro Loco Marina di Ravenna.

Furthermore, the nature of the project created the condition for broaden synergies, among which it is worth to be quoted the important “IN LOCO” project that reunite significant abandoned place in Emilia-Romagna in order to foster their rebirth (Proli & Tartari, 2020).

Finally, a reflection is needed, from the work implemented so far, on the intrinsic value of digital tools, on their ability to enhance the existing heritage and “create” other forms of it. The app, in this sense, undeniably developed in support of the built cultural heritage, ends up condensing, organising and making accessible a series of cultural contents that in turn constitute an interpretation of the heritage itself capable of narrating and testifying the process of understanding and appropriation. It becomes the mirror of the participated cultural process which, as previously mentioned, led to the recognition of this heritage as such. In this perspective, perhaps, this final result could aspire to be recognized in the future as heritage itself, precisely a Digital Heritage, urging, exactly as the tangible counterpart to think about its future management and preservation. [CM, AU, AZ]

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ABBREVIATIONS

NL-HaNA National Archives of the Netherlands, Le-Hague