

Good practice in management of ‘invisible’ archaeological townscapes¹

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Abstract: Technological developments and methodological improvements that characterised in recent years archaeological diagnostics and survey of complex sites fulfilled the objectives of European legislation and recommendations for preservation of archaeological heritage and cultural landscapes. These innovative approaches also disclosed new challenges for the management and valorisation of a particular category of archaeological sites where most of the archaeological features are buried and ‘invisible’ to visitors. Therefore, scientific acquisitions must be made available to the public in an appealing way and should fulfil expectations of local communities by way of the sound application of innovative methodologies. To illustrate such new approaches we will present the experience achieved in the framework of the EU-funded Radiography of the Past project in respect of the valorisation of archaeological sites and the interactions with local governments and stakeholders. This case study is about facing the challenges of promoting cultural tourism in very remote areas and integrating well-preserved landscapes with the extraordinary results achieved thanks to non-destructive fieldwork. This goal was reached via the elaboration of a targeted management plan for an archaeological park. The plan framed all aspects and identified all actors that would ensure the scientific management and preservation of the site with the aim of understanding the heritage site’s position in the social landscape and of exploiting its potential for educational and touristic purposes. To disseminate knowledge and involve local inhabitants, we developed multimedia systems to virtually guide visitors through the urban environment, perfectly preserved yet invisible beneath the soil. The 3D reconstructions and real-time virtual tours of the Roman town lead the non-specialist public through the research process from methodological aspects to technicalities of data capture and from data processing and interpretation to visualisation and contextualisation. To produce these deliverables, techniques of storytelling were adopted under the guidance of specialists of the discipline.

Keywords: Archaeological site management plan; 3D digital visualisation; archaeological townscapes; urban heritage

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Introduction

The fascinating technological developments and methodological improvements that characterised in recent years archaeological diagnostics and survey of complex sites fulfilled the objectives of European legislation and recommendations for preservation of archaeological heritage and cultural landscapes.

Among these legislative frameworks, the European Landscape Convention on Landscape preservation (FLORENCE 2000) marks a turning point in European policy for landscape protection, as it concerns natural, rural, urban and peri-urban landscapes, disregarding their 'beauty' or 'unaffectedness' as it includes also degraded landscapes. Therefore, specialists are pushed to resort to methodologies of investigation that are respectful of the environmental context. In this way, the necessities of preservation of the archaeological heritage, already stated in 1992 in the Treaty of La Valletta², are further enforced (CORSI forthcoming A). This incentive to make use of innovative non-invasive approaches, however, disclosed new challenges for the management and valorisation of a particular category of archaeological sites where most of the archaeological features are buried and currently 'invisible' to visitors.

In this latter case, scientific acquisitions need to be made available to the public in an appealing way and should fulfil expectations of local communities by way of the sound application of multidisciplinary methodologies and innovative technologies.

Furthermore, these new communication strategies should dispel doubts arising from the idea that archaeologists will not excavate every single isolated, small and remote archaeological site and will deprive the public from materially and individually enjoying the archaeological heritage of one's backyard.

To illustrate such new approaches we will present the experience achieved in the framework of the EU-funded project titled Radiography of the Past (short-named Radio-Past), in respect of the valorisation of archaeological sites and the interaction with local governments and stakeholders.

The research agenda and the workflow implemented in the framework of the project aimed at tackling all aspects of scientific research on these complex sites, starting from the theoretical and methodological issues (VERMEULEN, CORSI 2015), ranging from the technological innovation in data capture to the integration of different applied technologies and survey technique, from data interpretation to data visualisation, ending in site valorisation and management.

The focal point of this paper will be on these latter aspects of management, communication and dissemination.

In particular, we will focus on how we faced the challenges of promoting cultural tourism in very remote areas and how we succeeded in integrating well preserved natural and historical landscapes with the extraordinary results achieved thanks to non-destructive fieldwork.

Given the fact that one of the goals of the EU-funded project was to design guidelines for good-practice, we touched upon most of the topics related to 'archaeology without excavations', and for each one of them we

² Article 3 (ib) of the European Convention on the Protection of Archaeological Heritage, better known as the Treaty of La Valletta 1992, which states that 'to preserve the archaeological heritage and guarantee the scientific significance of archaeological research work, each Party undertakes: ... to ensure ... that non-destructive methods of investigation are applied wherever possible'.

provided recommendations that can be adopted in a broader framework (CORSI, SLAPSAK, VERMEULEN 2013).

Defining Guidelines for Good Practice

The definition of recommendations for good practice in the whole process of archaeological research, from fieldwork to data processing and interpretation and from site management to valorisation, draws from the fact that we have to deal with complex multidisciplinary and interdisciplinary fields of expertise, where communication and mutual understanding is guaranteed by the respect of well-defined workflows and procedures (MEYER 2013: 177). Furthermore, ‘Guidelines are needed in order to respond effectively to the changes that are occurring in the organisational and managerial structures of museums, universities and the private sector’ (BONACCHI 2012: XII).

We also must develop efficient strategies to transfer these acquisitions to specialists and a non-specialist public.

The case study concerns the archaeological park of Ammaia in northern Alentejo, Portugal. Ammaia is a Roman town abandoned during Late Antiquity³ (Fig. 1).

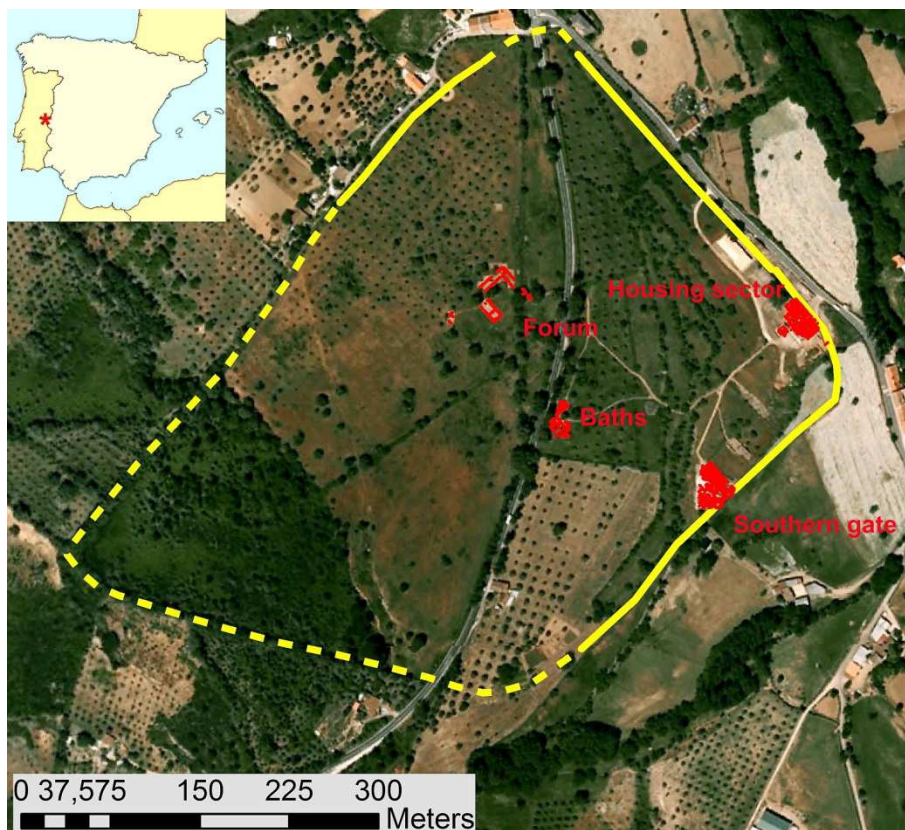


Fig. 1 – S. Salvador de Aramenha. Hypothetical reconstruction of the limits of Roman Ammaia. In red, the excavated areas. In the frame in the upper left corner, is the general location of the ancient town in the Iberian peninsula (elaboration C. Corsi).

³ The scientific results achieved thanks to the survey, archaeological excavations and the study of finds are summarised in the two monographic volumes: CORSI, VERMEULEN 2012, and CORSI 2014.

It was replaced by a hilltop settlement (founded by a Moorish chieftain), which developed into the stunning modern village of Marvão (Fig. 2).



Fig. 2 – S. Salvador de Aramenha, Marvão (Portugal). View of the ruins of the southern gate of the Roman town of Ammaia. Far in the background, the hilltop village of Marvão (photo by J. José Bica).

The area is located about 200 km northeast of Lisbon, only 12 km from the border with Spain. It is included within the Natural Park of the Serra de São Mamede, and it is locally well known for rural tourism and inserted in food and wine routes. There is very limited accessibility with public transport.

The site of Ammaia is now a greenfield site with very few modern disturbances. Among these disturbances is a 19th-century farmhouse which has been restored and adapted as an onsite archaeological museum.

Reaching the Goals

The Management Plan

The goal of designing a procedure for the valorisation of an archaeological site where most archaeological heritage is invisible was reached via the elaboration of a targeted management plan for the archaeological park.

In general, the management plan frames all aspects and identifies all actors who would ensure the scientific management and preservation of the site with the goal of understanding which position the heritage site has in the social landscape. The management plan also aims at exploiting the potential of the site for educational and touristic purposes.

A management plan has to address three main points, starting with the identification of its purpose and policy, i.e., the need to state why and how the site will be managed. It also must set objectives, describing

clearly which activities will be undertaken to translate policy into actions. Last but not least, the strategy will be deployed, indicating how the actions can be operationalised (VAN ROODE 2013).

In these considerations, the analysis focused on those aspects that are essential for future conservation of the site: the position as heritage site in the local community (an important issue regarding the economical context of the region) and its value as heritage commodity. In fact, to design a heritage policy, it is necessary to take into account the physical condition of the site and to provide management strategies that will endorse the scientific values whilst at the same time incorporating the site in the social and economic landscape in which it is imbedded. Furthermore, it is essential to perform a stakeholder analysis to understand why the site is important and to whom (VAN LONDEN ET AL 2009: 53).

The Ammaia management plan was elaborated by Sigrid van Roode, representative of Past2Present, one of the three private companies (Small and Medium Enterprises, SMEs) partners of the Radio-Past project (VAN ROODE 2013). The management plan was the outcome of several years of research and work carried out in Ammaia in partnership with Arjen Bosman, also representative of Past2Present.

The work of van Roode took into account the Portuguese legislation, based on the fact that although the country signed the Treaty of Valletta in 1992, it was implemented into legislation only after the near destruction of rock art engravings as a result of the planned Coa Dam in 1995. Nonetheless, certain ‘confusion’ affected the organisation and establishment of the institutions which would have taken care of the heritage preservation and management. In 1997 the Portuguese Institute for Archaeology (IPA) was created, and in 2002 it was merged into the IPPAR institute. In 2007 that institute was replaced by the IGESPAR, which was absorbed in 2012 by the DGPC.

The site of Ammaia was declared a national monument in 1949 (VERMEULEN 2012). Due to its location in a natural park, its development as an archaeological park also had to take into account applicable legislation concerning natural and ecological resources.

The Involvement of Local Stakeholders and the International Funding

Leveraging the originality and innovation of our approach, stressing the uniqueness of this enterprise and highlighting the effectiveness of integrating cultural heritage and natural environment, we dragged on the local communities and the national institutions for research and development, and we attracted the attention of national and international media. With the support of the Universidade de Évora, the international team of researchers headed by Frank Vermeulen and Cristina Corsi started several projects, raising large international and national funding and culminating with the award of the Marie Curie IAPP funding in 2009 for the project “Radiography of the Past. Integrated non-destructive approaches to understand and valorise complex archaeological sites” (VAN ROODE ET AL. 2012). This financial support made it possible to establish in Ammaia an international and multidisciplinary laboratory for research and innovation in archaeological diagnostics (CORSI, VERMEULEN 2015).

The activities and results achieved by the team were so encouraging that the Portuguese National Fund for Research (FCT) decided to invest many resources to support fellowships for young and experienced scholars to be affiliated with the ‘Ammaia open Laboratory’. The successful application for the national competition allowed another important project to start: ‘The Ammaia project. A concerted action of

archaeology, natural sciences and applied technologies to place a Roman town in context' (CORSI, VERMEULEN 2015).

Another constructive collaboration was established in the framework of the Projectos transfronteiriços bilaterais of the Rede de Investigação Transfronteiriça Extremadura-Centro Alentejo (RITECA), with the Instituto de Arqueologia de Mérida. The project, titled 'Revalorização do património arqueológicos: a aplicação de técnicas de análise não destrutivas', intends to extend the data acquisition and the experiments done in the last few years by our team to 'neighbouring' geographical contexts and to broaden the approaches applied to this specific field of research, experimenting with new techniques and exchanging experience and expertise (CORSI forthcoming B).

Public Archaeology vs Public Appearance

The organisation of many events was made possible by international funding, establishment of several bilateral agreements with prestigious academic institutions like Ghent University, and the support of the University of Évora, the FCT and local bodies like the Municipality of Marvão, the Fundação Cidade de Ammaia and the Parque da Serra de São Mamede. These events extended from the highest academic level (with two international Specialization Fora on non-destructive approaches to complex archaeological sites and the organisation of one international colloquium) to the widest public, with open lectures, participation in television and radio programmes, reportages in popular magazines, the opening of a Wikipedia page about the site in different languages, the use of social media like Facebook, newsletters addressed to an ever-expanding mailing list, continuous exchange with the researchers of other international projects, etc. In addition, participation in European meetings, conventions and fairs (in most cases, sponsored by the European Commission) boosted the results of the projects and allowed an extraordinary and very successful dissemination.

Several short films were produced with the support of the media agency 7Reasons, showing the 'behind the scene' aspects of the project from data capture to data processing and from interpretation and visualisation. One educative video shows how non-destructive survey can be applied with success to complex archaeological sites. All these products, together with the activity reports, news releases and multimedia products, have been made freely available on the project website (www.radiopast.eu) and on YouTube.

Strategies for Engagement

Building an Archaeological Narrative with Digital Technologies

As anticipated, the peculiarity that makes Ammaia an interesting case study is the fact that most archaeological evidence gathered on site remains buried underground and therefore is 'invisible'. If this characteristic simplifies the preservation of archaeological structures, it also poses some challenges for the promotion of the site. The main question is: How do we make the 'invisible archaeology' interesting for a non-specialist public? In other words, how can we guide visitors in experiencing the invisible on archaeological sites?

From the technical point of view, we obviously relied mainly upon the newest developments in Information Communication Technologies (ICTs), specifically 3D reconstructions and interactive tools, and we integrated

these tools with traditional media. The whole team of researchers was engaged in the production of means such as 3D films, documentaries, 3D reconstructions and real-time applications.

But beyond the technical aspects, we had to deal with the construction of an archaeological narrative. And, inspired by the specialists of communication of our international team, we tried to tell stories.

The definition of storytelling increasingly is featured in archaeological literature. In spite of its ‘common sense’, the term’s technical meaning refers to scientific approaches to pedagogy and communications techniques (PLUCIENNIK 1999; PRAETZELLIS 2014; VAN DYKE AND BERNBECK 2015). So, clearing up misunderstanding and simplifying our work, we could say that we employed storytelling narrative techniques to communicate information about certain topics.

We focussed on three main themes:

1. What are non-destructive approaches to complex archaeological sites? How do they work?
2. What did we find out thanks to these new methodologies?
3. What did we understand of the daily life of these towns?

To convey these messages, we mainly used written texts and digital media, addressing different audiences. As anticipated, apart from the scientific community which we will neglect here for obvious reasons, we attempted to design the communication for a non-specialist public with special care for local stakeholders.

The main deliverables that were produced to address these first two points are:

- a short video assembling footage from fieldwork and digital images. This was used to explain the methodologies and instruments of archaeological survey, presented in the framework of international fora devoted to education and a European convention on Innovation (http://www2.radiopast.eu/?page_id=1831).
- a booklet in English and Portuguese in which we briefly described the methodologies of fieldwork, the data collected so far, the interpretation of the data and the hypothetical reconstructions based on this evidence (<http://www2.radiopast.eu/wp-content/uploads/Ammaia-Uma-cidade-romana-LR.pdf>).
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I consider this goal of making people understand that archaeological excavation itself has to be considered a threat to the preservation of archaeological heritage to be the real priority.

To disseminate knowledge about the sites and to involve local inhabitants, we also developed multimedia systems to virtually guide visitors through the urban environment, perfectly preserved yet invisible beneath the soil.

Indeed, the third point was tackled producing a 7.20-minute film that not only is freely available on the project website (<https://www.youtube.com/watch?v=TOE7MeRe9K8&feature=youtu.be>) and on YouTube but also is being disseminated as a DVD attached to the aforementioned booklet *Ammaia – A Roman town in Lusitania*. The film merges footage of real environmental context and of field activities with 3D reconstructions of the town in its heyday.

An introductory part of the film aims at placing Ammaia in its geo-historical context and to insert this almost unknown Roman town in the political and economic framework of the expanding Roman Empire.



Fig. 3 – Ammaia. Screen-shot of the video “Ammaia. A Roman Town in Lusitania” produced as deliverable of the EU funded project “Radiography of the Past”. Virtual 3D reconstruction of the view of the town and its suburbium from south-west (© M. Klein for 7Reasons Media Agency).

The synthesis of our knowledge about Roman Ammaia, however, has been designed keeping in mind the concepts at the base of the storytelling techniques (supra). The starting point of the film therefore is the water collection point of the newly discovered western aqueduct. Following the water flow inside the conduct, we explore the suburbia of the town (Fig. 3), now relatively well known thanks to integrated archaeological survey, and we finally enter the town from its main gate (Fig. 4).



Fig. 4 – Ammaia. Screen-shot of the video “Ammaia. A Roman Town in Lusitania” produced as deliverable of the EU funded project “Radiography of the Past”. Virtual 3D reconstruction of Southern Gate (© M. Klein for 7Reasons Media Agency).

What follows is a walk through the town centre, browsing the core of public (the forum with the basilica, Fig. 5) and social (the main thermal complex, Fig. 6) life.



Fig. 5 – Ammaia. Screen-shot of the video “Ammaia. A Roman Town in Lusitania” produced as deliverable of the EU funded project “Radiography of the Past”. Virtual 3D reconstruction of the basilica detected thanks to geophysical survey on the southern side of the Forum square (© M. Klein for 7Reasons Media Agency).

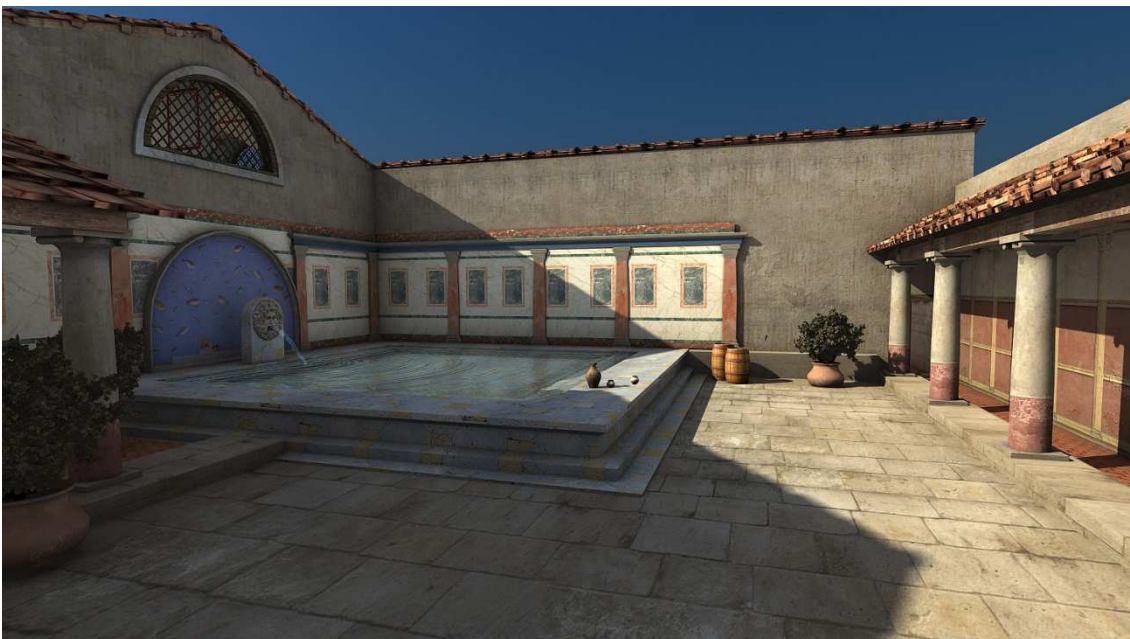


Fig. 6 – Ammaia. Screen-shot of the video “Ammaia. A Roman Town in Lusitania” produced as deliverable of the EU funded project “Radiography of the Past”. Virtual 3D reconstruction of thermal complex located near the Forum, partially brought to light with excavation and partially known thanks to geophysical survey (© M. Klein for 7Reasons Media Agency).

At the same time, the 3D reconstructions and real-time virtual tours of the Roman town also lead the non-specialist public through all stages of the research process from methodological aspects to technicalities of data capture and from data processing and interpretation to visualisation and contextualisation.

The 3D animations were produced using a real-time engine mainly because this application easily allows modifications following interactions among researchers and progresses of fieldwork and data processing (KLEIN 2013). This led to the creation of a real-time interactive application, also freely available for download on the project website (http://www2.radiopast.eu/?page_id=3088) and inserted in the DVD.

The engine enables the user to fly and walk through various scenes, opening doors and peeping into rooms. The user also can inspect different objects of interest in the Roman town as well as in a virtual museum, which usually reproduces what is displayed in the existing onsite museums (KLEIN 2013, Fig 7-8).

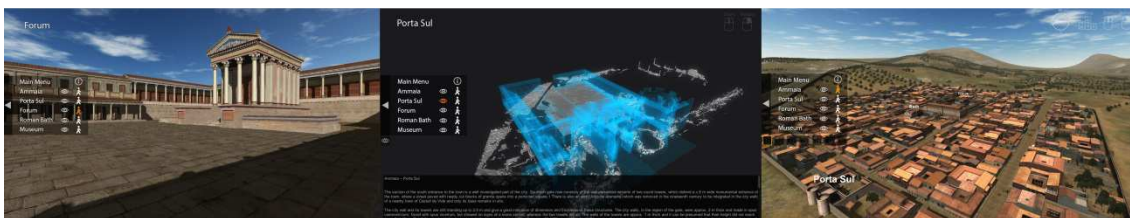


Fig. 7 – Ammaia. Realtime construction editor developed with the library of modularised building blocks (© M. Klein for 7Reasons Media Agency).

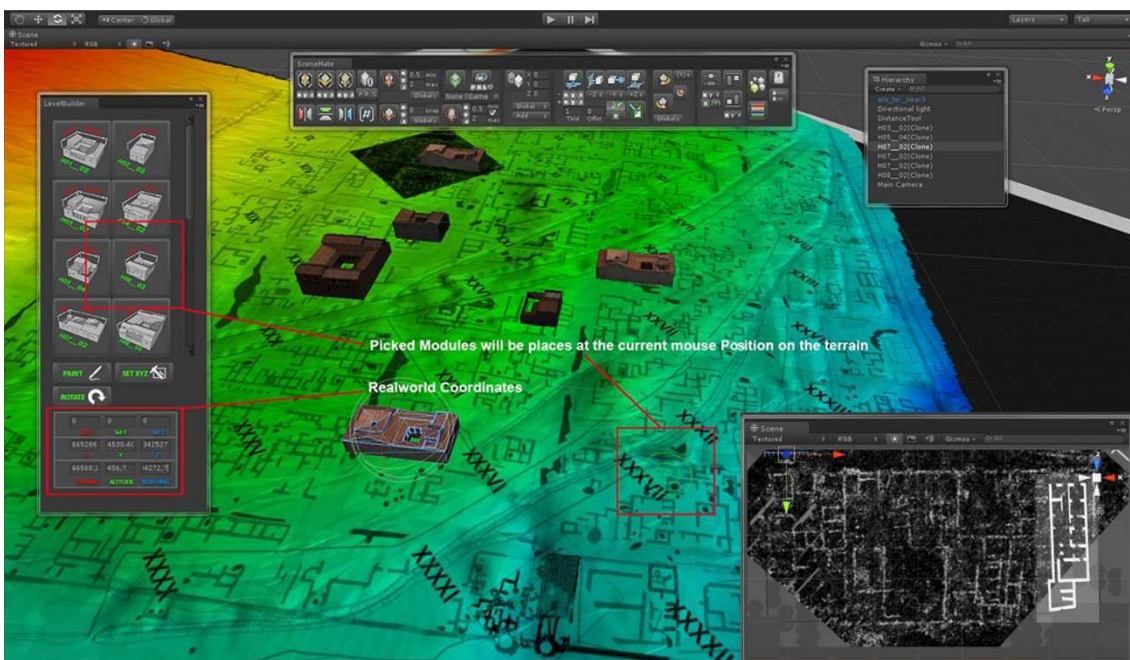


Fig. 8 – Ammaia. Screen-shots of the interactive real-time application developed by M. Klein for 7Reasons Media Agency.

But, be aware: These tools are not meant to replace the personal visit to the site. The use of digital devices which enable the public to visualise onsite the archaeological evidence buried underground (Fig. 9) is one tool that is being tested to make people experience the tridimensional (virtual) reality of urban Roman life in its spatial context. Indeed, the Radio-Past team delivered a full museum exhibition package (including panels text and layout) for presenting the site and the innovative non-destructive approaches applied in Ammaia in

order to test the potentiality of integrating interior museum displays with exterior spaces, resorting to a peculiar interpretation of augmented reality.



Fig. 9. – Ammaia. Hypothetical use of tablet devices to visualise the ‘invisible archaeology’ beneath the soil (© C. Corsi).

Testing the Potentials of Augmented Reality

Mainly thanks to the contributions of partners from the 7Reasons company, we went beyond the state of the art in the field of Augmented Reality (AR). Indeed, as proven by the survey undertaken by a team of Spanish colleagues (ETXEBERRIA *et al.* 2012), so far AR has been used exclusively to enhance the experience of at least partially preserved monuments. In other words, until recently AR products have been targeted to generate learning and educational scenarios for touristic purposes in well-preserved archaeological sites and to enhance the visitor’s experience of traditional excavation archaeology.

Instead, thanks to the internationally renowned experience of 7Reasons, in Ammaia we attempted to create a bridge between the computer-generated 3D contents and the real spatial context with the environmental and geo-location data being the only reality available for enhancement. The challenge therefore was to enable visitors to experience the invisible archaeological heritage (Fig. 10).

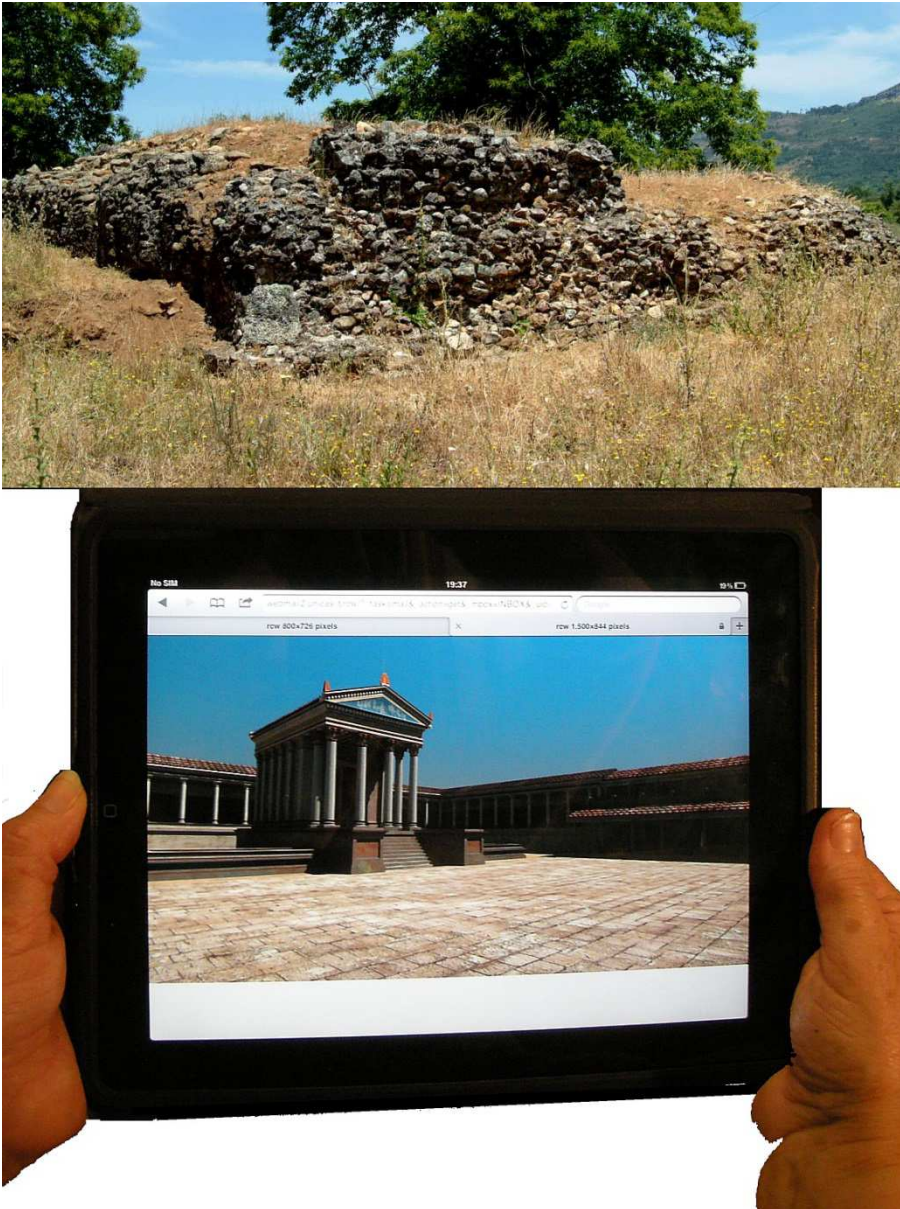


Fig. 10. – Ammaia. Hypothetical use of tablet devices to enhance visitor's experience with Augmented Reality integrating computer-generated 3D contents captured with survey and the real spatial context (© C. Corsi).

Because of the termination of the project, the practical applications of this new approach have remained a goal for future advances, but I already am convinced that the digital products that we developed are effective to convince the public that visiting an archaeological site where most archaeological features are invisible can be even more interesting and exciting than visiting a site with ruins overgrown by vegetation.

Closing remark

One of the strengths of the project Radio-Past was the ‘completeness’ of the research questionnaire, the fact that all stages of the investigation process were tackled from the theoretical and methodological point of view. The quality and quantity of historical data retrieved by means of fieldwork and innovative survey techniques was stunning, but it was the integrated processing and the elaboration of the interpretative outcome that made these results most valuable for the international scientific community as well as for society and local stakeholders.

Here we focussed on the last stages of the workflow, highlighting how the elaboration of a targeted management plan for the site of *Ammaia* concurred in the valorisation of the archaeological park and in the effectiveness of the dissemination and outreach activities.

Therefore, this case-study can be regarded as exemplary for such a specific type of archaeological site: regardless of its peculiarities, the methodologies deployed for assessment and the strategies adopted for operationalisation can be extended to many other diversified social, cultural and environmental contexts. Guidelines for best practice were seamlessly extracted from the field experience and interaction with the different actors involved in the project. These recommendations are perfectly streamed in the new European legislative framework and meet the newest paradigms of ‘cultural landscapes’.

Among the theoretical issues that have to be taken into account in the elaboration of a master plan for a ‘total approach’ to archaeological research in complex sites with a limited use of stratigraphic excavation is the question of ‘durability’ of the applied technologies. The “fascinating technological developments” to which we referred above imply a decreasing rate of ‘durability’ of these techniques: almost daily, new instruments and machineries for data capture are distributed on the market. This can entail a need for continuous investment for the acquisition of instruments and software as well as for the training of their operators. Obviously, this does not invalidate the scientific achievements nor weakens the theoretical construction underlying the adoption of these methodologies. Rather, this shortcoming should be turned into an invitation to build international multidisciplinary teams, where the soundness of the scientific questionnaire and the ethics of research should prevail over the technical aspects of tools and instruments adopted for fieldwork. The extra advantage of such composite teams would also be that the necessary tools and instruments need not be present in each individual unit but that each partner can bring in and therefore optimise its own toolkit. The fast decreasing commercial costs of remote sensing instruments for archaeological survey, such as drones, geophysical instruments, digital scanning instruments, etc. are an additional factor which provide future durability for such an approach.

Additionally it should be stressed that the creation of well-balanced interdisciplinary teams also has a very important advantage in the field of human resources. All researchers involved in the several projects centred around the archaeological site of *Ammaia* had the privilege to share an extraordinary professional and human experience. The scientific results and the general outcomes have been considered amazing by the whole group of stakeholders from financing institutions to local inhabitants and from the international scientific community to the non-specialist public.

These achievements have been possible thanks to the determination of an unusually broad multidisciplinary team of researchers and to their skills in integrated and interdisciplinary work.

For this reason, the most important legacy of our experience is the recommendation for the definition of guidelines for good practice which will take into account the most recent developments in international scientific literature and which will seek for the largest participation of experts from many different fields of research (CORSI, SLAPŠAK, VERMEULEN 2013).

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