



VirtualArch

Visualize to Valorise – For a better utilisation of hidden archaeological heritage in Central Europe

O.T1.3. Regional strategy for the medieval mines on the Monte Calisio - pilot heritage 5 - (IT)

Project

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1. Description of the pilot site Monte Calisio and analysis of the situation

The pilot site of the Autonomous Province of Trento is the Monte Calisio plateau, also called Monte Argentario ("Silver Mountain"); in large part under the municipality of Civezzano, it is at north-east from the town of Trento, at an altitude between 800 and 900 m asl. In the late Middle Ages it has been a very important mining area, mostly because of the exploitation of silver ore (*galena argentifera*), from around 12th to 15th century AD. A complex organisation of work, even codified in a mining code called Codex Wangianus, took place during the mining period, with specialised workers coming from German speaking regions (Tirol, Bavaria, Bohemia, Saxony). A trace of the old mining activity is the presence of thousands of sinkholes that are still visible on the surface and in the DTM and LIDAR scans on an area of over 12 square km. A labyrinth of galleries has been partly documented, some are still open and well preserved, with mining traces still visible.



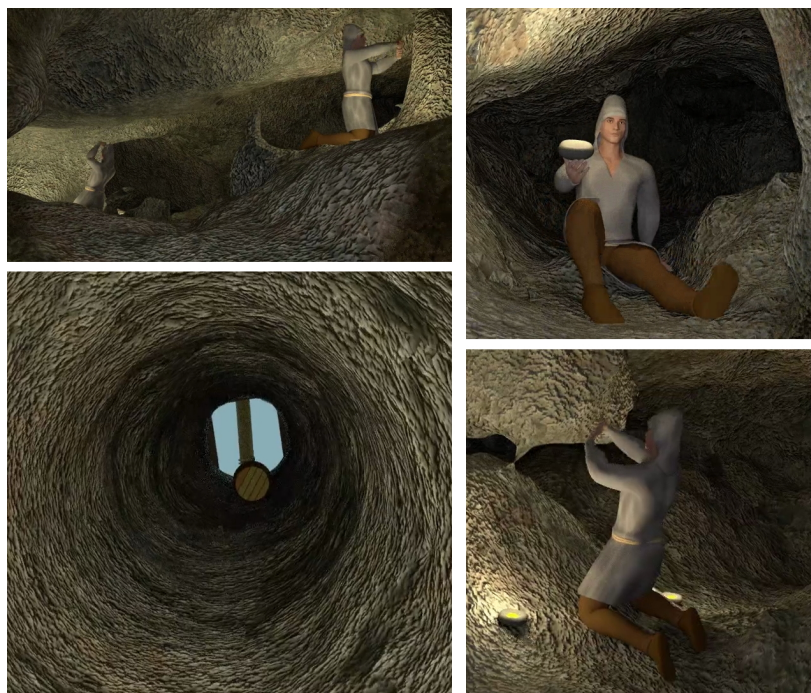
View of Monte Calisio from Trento (photo: M. Dorigatti)

2. Aim and results achieved through visualization

The aim of the visualization activity has been to valorize the unknown and submerged heritage of the mining activities on Monte Calisio plateau (eg. mines, mine workings, silver use, etc.) which is not accessible to public due to security issues and to allow immediate understanding of its importance. In order to achieve this, the project envisioned the production of an application for mobile devices, to allow visitors to get information on the history of the mining activities carried out in the past on Monte Calisio, both through texts, videos and virtual/augmented reality etc. Furthermore, new panels have been made, with a dual function: they serve both as an information tool and also as an access point to the app, due to the presence of Qr codes on them from which it is possible to download the mobile application.



External and internal 3D realization of the miners work



Tools used by miners inside the 'canope' (mines)

3. Involvement of the stakeholders

Since most part of the mining area is under the authority of different local administrations, they were involved as stakeholders. Many stakeholders were identified belonging to different sectors from administration to tourism, education, forestry, agriculture, associations, etc. Their participation to the project has been useful and interesting. The main stakeholder of the project has been the Ecomuseo Argentario, which provided knowledge and support, especially in the survey activities and in the creation of the panels, both regarding the texts and the images. The selection of the content to be presented in the application and on the panels has been long discussed, in order to answer the request of the main stakeholders of the project, which will heavily utilize the VirtualArch results in their future activities.



Press conference in Trento – September 2019

4. Existing communication strategies

At the moment the promotion of the mining area on Monte Calisio is done using traditional channels:

The Soprintendenza per i beni culturali uses its institutional web page www.cultura.trentino.it to promote the VirtualArch project and the developed app indicating the link where it can be downloaded. The Soprintendenza reaches its users also through social networks like Facebook, Instagram and Twitter, especially local inhabitants. The posts done during the past years promoted the VirtualArch projects and the results achieved.

The Ecomuseo Argentario, as main actor working in this area, promotes the VirtualArch project and consequently the app on its web site. Furthermore the Ecomuseo offers guided visits for groups along the mining paths and in particular collaborates with primary and secondary schools located in the surroundings but also with schools located in other areas of Trentino with educational activities. In particular, the Ecomuseo offers educational activities and speleological tours inside the 'Canopa delle Acque'.

For the a.y. 2019/2020 the Ecomuseo has enhanced the mining activities with the activity on the field "The ancient silver mines": a first session has to be done in class working with audiovisual equipment, thematic documents and evidences, while a second part is on the field visiting the mining area and observing the excavation traces. The flyer of the aforementioned activities can be downloaded from the Ecomuseo web site and it is also sent to the schools.



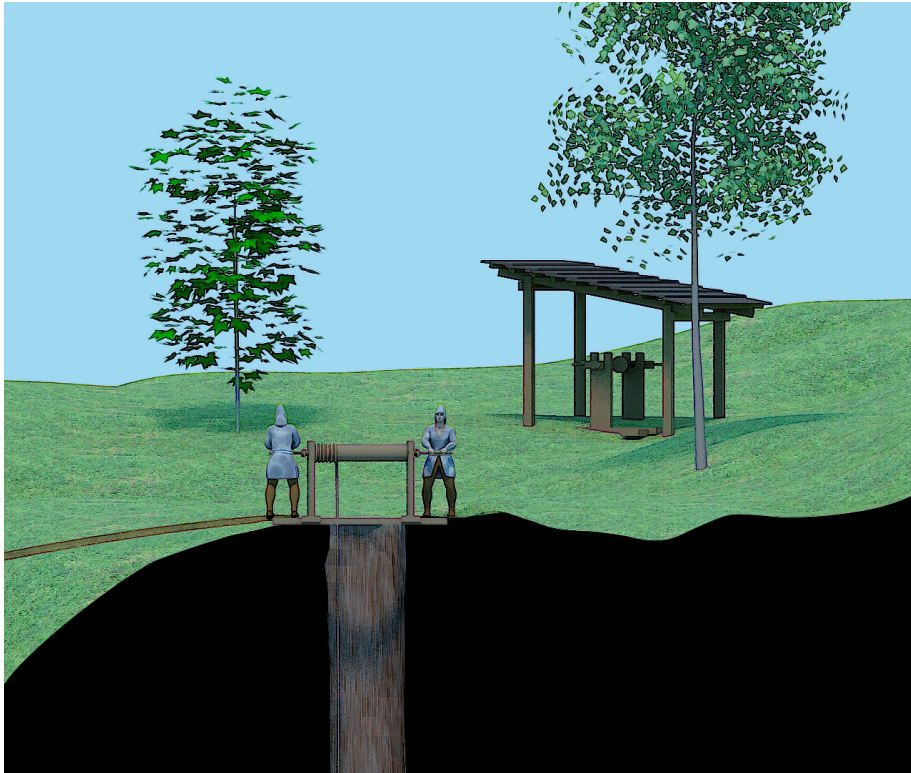
Flyer with educational activities for schools (Ecomuseo Argentario)

5. New strategies focusing on using Virtual Reality and Augmented Reality for a better communication of the hidden heritage on Monte Calisio

The use of virtual and augmented reality will be embedded in the future communication strategies of the Monte Calisio area in order to better preserve and promote the cultural heritage hidden under the ground. The use of this innovative technology will allow visitors to have an immersive experience entering in a virtual mode inside the galleries, which are unknown to the most because they are closed or because it is forbidden to enter due to safety reasons. An exception is the 'Canopa delle Acque' that is visitable but only with expert guides who must provide helmets and lights to the group. The virtual reconstruction can be also used to introduce the speleological tour inside the 'Canopa delle Acque' in order to show how the visited galleries appeared in the Middle Ages. In fact the content of the reconstruction has been created on the basis of historical and scientific data adapted then to the end-user in a more suitable and informative way.

The interactive tool of the app will attract for sure more visitors, enlarging the number of users, especially young people, the so called digital natives, who are used to use this technology. Furthermore this solution will also encourage older people to discover this archaeological heritage because it offers a user-friendly and intuitive approach. In particular young generations consider social networks as a natural part of their life and a common way of interaction with peers. This means that, if the VR and AR are able to raise emotions, these will be then shared on the social networks improving the interest for the local heritage, enhancing its value. They also

The aim at using virtual and augmented reality is to raise awareness of the hidden archaeological heritage and to be an enrichment for the public as cultural identity.



3D video visible in the VirtualArch app (external view of the mine)



3D video uploaded in the VirtualArch (internal view of the mine)

6. Action plan 2020-2025

From now on the promotion of the Monte Calisio should be integrated with the results achieved by the projects, especially enhancing the use of the virtual reality shown in the mobile app and the dedicated panels placed on the mining paths.

First of all, the hidden archaeological heritage on the Monte Calisio must be preserved and to do this the awareness of its importance has to be raised. To reach this goal the actors working on the field (e.g. Ecomuseo Argentario and local tourist boards) and that have contacts with the end-users must be trained.

Dedicated trainings for guides in charge of the promotion of this territory will be organized to show them how the app works and they will be asked to integrate their visits using this new technology. Since the app and the panels contain English texts, the visit can be enjoyed also by tourists coming from different countries. This activity will be carried out in collaboration with the Ecomuseo Argentario and Fondazione Bruno Kessler. The company that developed the app is at disposal to verify possible technical problems.

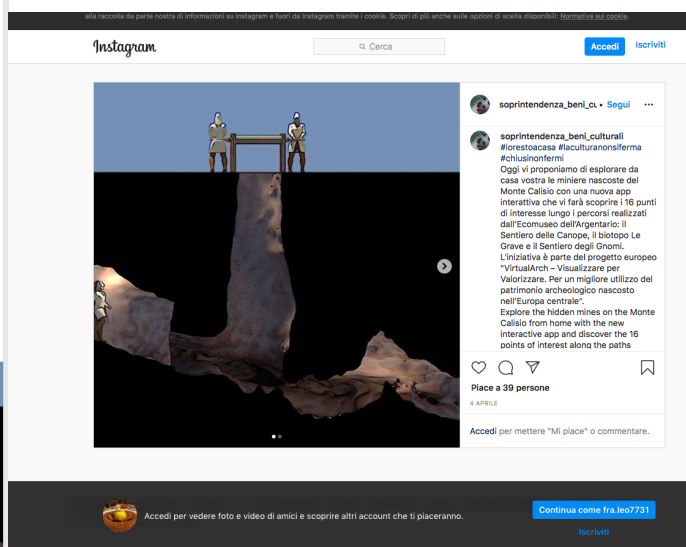
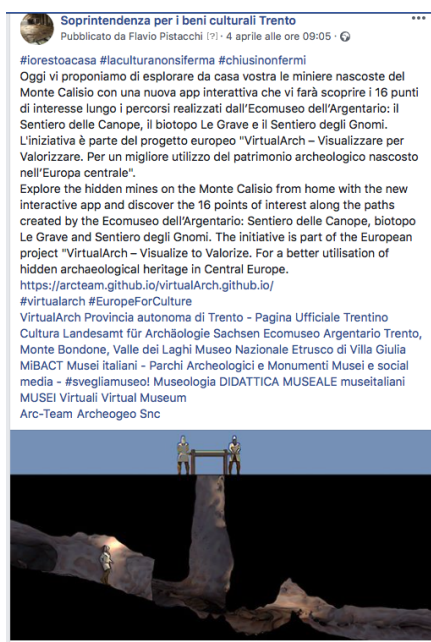
Other planned actions finalized to promote and disseminate the results of the project were the following (cancelled due to COVID-19):

- **visualisation seminars and guided field trips with scholars:** the aim of this activity was to show pupils what means visualization and how it works. This activity was thought to be done in collaboration with Fondazione Bruno Kessler enhancing the educational aspect. Furthermore, a guided field trip using the developed app with a trained guide were foreseen;

- **local inauguration** on the Monte Calisio plateau with free guided visits for the visitors using the app. The event would have been enriched by an open-air theater performance regarding the mining activities at medieval time.

The first cancelled activity 'visualisation seminars and guided field trips' was replaced by the realization of a **video** (of maximum 7 minutes), as promotional tool regarding an online guided visits using the app along the paths on Monte Calisio (selected for the VirtualArch project). The video will be uploaded on the web site of the Soprintendenza and will be used in a second moment as educational video for schools, associations, etc. A trailer of the video will be also posted on the main social media.

About the use of **social media**, because of the COVID-19, a communication plan has been done by the Soprintendenza per i beni culturali in order to promote its cultural sites from home. Posts on Facebook, Instagram and Twitter have been published promoting the use of the app to discover the mines on Monte Calisio. This action will reach all the 'friends' of the Soprintendenza with the hope to improve the interests for this hidden heritage.



Examples of posts already done on social media

Another communication action regards the creation of a **card** promoting the project and in particular the use of the app to discovery the hidden heritage on Monte Calisio. The card will be uploaded on the institutional web site and posted on the social networks. It will be sent also to the interested stakeholders by email (tourist boards, local administration, libraries etc). The card will be placed then in strategic places of the city of Trento like libraries, bars, cultural sites, associations, in order to capture the interests of the citizens but also of visitors.



Promotional card

The **results of the project will be also sent by email to those tourist boards/stakeholders** interested in promoting the area of Monte Calisio. The text will contain the link to the app and an ad hoc video will explain how it works. The aim is to put in evidence the new app and to add a new way of visiting the area of Monte Calisio for coming tourists.

Furthermore, the **three flyers promoting the VirtualArch project in genral ‘Public Archaeology’, ‘Mining Archaeology’ and ‘Touristic threats’** have been translated into Italian and printed in two languages (Italian and English). These materials will be also uploaded on the institutional web page of the Soprintendenza and located in strategic places of the city of Trento.

In the next years the Soprintendenza per i beni culturali is going also to promote the VirtualArch project during **some relevant events** that take place on fix days organizing guided visits on the Monte Calisio using the app:

- National Family day (October)
- European Heritage days (September)
- Kidpass day (May)

One positive aspect of the use of VR/AR technology is that it can be constantly updated and integrated going beyond the traditional tools. For example a communication strategy for the future could be implementing a **multilingual app** -and not only English as it is now, so that visits can be enjoyed by tourists coming from different countries.

For the future, another strategic point will be **the collaboration with the Ecomuseo Argentario, that should be improved**, especially in terms of protecting and promoting the hidden archaeological heritage on Monte Calisio plateau, as already declared in the Agreement in 2012. On the base of the aforementioned Agreement the Archaeological Office on behalf of the Soprintendenza per i beni culturali will carry out the following measures:

- delivery to the Ecomuseo of all the materials produced during the VirtualArch project, for instance the GIS and the database as outputs of the survey that have been carried out and information and historical-archaeological data collected to create the video and the APP. The goal is that these materials should be disseminate as widely as possible;
- tutoring, on behalf of the archaeologists responsible for ancient metallurgy, about future research activities;
- tutoring about educational events on behalf of the Educational Office;
- training of the guides or other staff who want to work on the topic of the ancient metallurgy.

The Soprintendenza per i beni culturali remains the institutional interlocutor of the Ecomuseo Argentario every time questions concerning the preservation of the cultural heritage emerge.

According to the communication strategies foreseen by the Soprintendenza regarding the training of guides, the **Ecomuseo should organize its educational activities** having as main topic the mining activities contacting the trained guides and integrating the visits with the updated information obtained by the project concerning the miners’ life. The use of VA and AR will be a contribution to education and also an interactive tool to discover and promote the hidden cultural heritage. In particular, the use of the app on mobile phones or tablets will stimulate the interests of visitors, especially of scholars who after visiting the archaeological site, could bring there later their parents or relatives or even show them the app at home on their laptop. The app can be also used to introduce the speleological tour inside the ‘Canopa delle Acque’ to show how the galleries looked like in the Middle Ages.

About the **headquarter of the Ecomuseo Argentario**, located in the same building of the Civezzano library, this should be arranged valorizing the fact that the area of Monte Calisio was object of an Interreg Central Europe project. To enhance this aspect the VirtualArch roll-up will be placed in one room of its seat and whenever groups, schools or associations visit the library the promotional video -illustrating the history, the landscape and the use of the app, can be launched on the library screen. The present library section dedicated to the local history and the historical mining activity should be constantly updated, for example with publications coming from Virtual Arch partners. The video can be also used by the Ecomuseo itself or by teachers explaining the forthcoming visits on Monte Calisio as part of the educational activities. Since the Virtual Arch project and the developed app is also promoted on the **web page of the Ecomuseo, this part will be translated in English** to reach a larger number of public.

7. Visualization approaches to be used in the future both for conflict management (e.g. with forestry, agriculture or nature protection) and for tourism development

The cultural heritage is an important resource for the economy but its knowledge must be spread and promoted. VR and AR, digitization and open data have become not only useful but fundamental tools. More accessibility to the heritage means development for tourism, research but also education. Thanks to the VirtualArch project, the Soprintendenza per i beni culturali collected and elaborated many and interesting data through surveys and digitization activities regarding the medieval mining traces on the Monte Calisio. This work allowed to deepen the knowledge of this area and its peculiarities, not only referring to the archeology but more in general to the cultural and natural aspect. Because of this huge amount of information, the Soprintendenza will be able to strengthen its preservation tools, first of all the reporting about at-risk areas from the archaeological point of view within the Trentino's land-use plan (PRG), which is a method that has been used for a long time and that is very effective. In particular, it will be possible to focus on areas which are at real risk within the wide territory of Monte Calisio, being acknowledged that considering the entire Monte Calisio Plateau at-high-risk could generate the opposite effect, namely to trivialize the information and consequently decrease the attention on this topic.

The usage of visualization tools can lead to the simplification of the information itself, since they will help even those who are not experts understand what the risk from the archaeological point of view means: for instance showing the overlapping DTM-aerial photo or between an aerial photo and the underground gallery survey.

The aforementioned tools will be used, then, as integration of the every-day communication between the Soprintendenza per i beni culturali and the municipalities to which the Monte Calisio Plateau belongs. Workshops and/or Seminars can be also organized addressed to the colleagues of the Provincia autonoma di Trento who work on the territory, first and foremost the Forestry Department, but also the Agricultural or City Planning Departments, etc: once again the revised cartography, the database linked to the GIS and the reconstruction of the mining activities will be preferred tools for the training. In agreement and with the collaboration of the Ecomuseo Argentario informative sessions for the local inhabitants can be planned, in particular for farmers since their work has an high impact on the territory.

Finally, again in collaboration with the Ecomuseo, the operators working in the tourist sector will be involved in order to raise their awareness and ask them to put in their touristic offer addressed to visitors interested in this territory also contents, advices, information about the presence of the hidden medieval mining traces.