# Output factsheet: Tools

<table>
<thead>
<tr>
<th>Project index number and acronym</th>
<th>CE947</th>
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<tbody>
<tr>
<td>Lead partner</td>
<td>Archaeological Heritage Office Saxony</td>
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<tr>
<td>Output number and title</td>
<td>O.T1.4 Interactive Visualisation Models</td>
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<tr>
<td>Responsible partner (PP name and number)</td>
<td>PP01 Archaeological Heritage Office Saxony</td>
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<td>PP03 Museum of Natural History, Vienna</td>
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<td>PP05 Czech Academy of Sciences, Prague</td>
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<td>PP06 Autonomous Province of Trento, Trento</td>
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<td>PP07 Institute for Protection of Cultural Heritage of Slovenia, Ljubljana</td>
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<td>PP08 Slovak Academy of Sciences, Nitra</td>
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<td>PP09 Municipality of Puck</td>
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<td>PP10 City of Zadar</td>
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<td>Delivery date</td>
<td>12/2019</td>
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## Summary description of the key features of the tool (developed and/or implemented)

During the INTERREG CENTRAL EUROPE VirtualArch altogether eight pilot heritages in 8 EU member states have been digitized and subsequently visualized using innovative approaches from the field of virtual and augmented reality (VR & AR).

For the following pilot heritages visualisations were produced:

1. Prehistoric salt mines of Hallstatt, Austria
2. Medieval silver mines of Dippoldiswalde, Germany
3. Prehistoric pile dwellings in the former Ljubljana marshes, Slovenia
4. Selected finds from the medieval city of Nitra, Slovakia
5. Medieval silver mines of Monte Calisio, Civezzano, Italy
6. Submerged Roman Harbour in Sukosan, Zadar, Croatia
7. Medieval harbour of Puck, Poland
8. Medieval mining settlement near Utin, Czech Republic

A more detailed description of the pilot heritages selected can be downloaded from the VirtualArch project website. Relevant activities were carried by project partners between 2017 and 2019.

These visualizations were produced aiming at a subsequent presentation to local and regional stakeholders on-the-sport via mobile devices such as cell phones or tablet computers. Relevant experiences made with...
this stakeholder participation are part of the more comprehensive report on output 1.2, here: Summarized Report on pilot actions testing visualisation of archaeological heritage for better use, protection and regional identity.

All partners gathered data on relevant archaeological heritage and subsequently started to visualize the heritage, facing the balancing act between the “historic truth” and artistic freedom. Both Virtual and Augmented reality approaches were used, but the main aim and challenge was to adjust these visualizations to locally specific requests and challenges. All visualisation had in common, that they should be presented via mobile applications to be used with mobile devices such as tablet computers or mobile phones.

This had effects both on the length of the visualization but also on the level of details presented. VirtualArch activities concentrated in archaeological heritage mainly invisible to the general public such as submerged harbors in the Baltic or Adriatic Sea or mining complexes in Austria, Germany and Italy not accessible due to security reasons. VirtualArch also dealt with questions of competing land uses such as agriculture and forestry in Czech Republic and Slovenia or urban development in Slovakia.

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NUTS region(s) where the tool has been developed and/or implemented (relevant NUTS level)

- DED2F
- AT315
- ITD20
- CZ063
- SI041
- SK023
- PL634
- HR033

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Expected impact and benefits of the tool for the concerned territories and target groups

Tools developed (here visualizations of hidden archaeological heritage) for pilot regions will be used to better present pilot heritages to different stakeholder groups and tourists. Main aim is to raise a higher awareness of the local population and tourist about the importance of these heritages and the specific need and chances to protect and further develop and use these heritages e.g. for tourism development. Visualization will be on the one hand available as conflict management tool to be used for communication with other spatial relevant stakeholders e.g. from forestry, agriculture, construction or urban planning. The tools will support a better presentation and understanding of these actors about the heritage to be protected. On the other hand visualizations are available for download free of charge for the local population and tourists. Download possibilities will be provided directly on-site or within public buildings nearby.

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Sustainability of the tool and its transferability to other territories and stakeholders
The rich and diverse archaeological heritage of central Europe is in parts excellently developed and utilized. However, a broad share of this heritage, even of international importance, is very often hardly visible and tangible for the public and faces increasing menaces. The VirtualArch project demonstrated how to unveil regional archaeological heritage - located underground or submerged, partly with global importance (UNESCO) - to local and regional stakeholders in particular from tourism, but also for heritage volunteers and other competing spatial interests such as from forestry and agriculture. VirtualArch demonstrated how to sustainable use and protect non-visible and little known archaeological heritage by increasing the capacities of public actors and by introducing innovative visualization approaches and methods. Developed innovative and trendsetting visualization tools in the field of virtual and augmented reality are best practice examples for other territories and archaeological stakeholders supporting both development and protection of archaeological heritage.

Project partner institutions partly together with local actors will sustain the information and will guarantee a longer access to visualizations developed. This are in particular:

- Pilot Region 1 (Hallstatt): Museum of Natural History Vienna together with Salzwelten Hallstatt GmbH
- Pilot Region 2 (Dippoldiswalde): Archaeological Heritage Office of Saxony, Dresden with MIBERZ, Freiberg and City of Freiberg, Germany
- Pilot Region 3: (Ljubljansko barje): IPCHS Slovenia, Krajinski park, Ljubljansko barje
- Pilot Region 4: (Nitra Region), Academy of Sciences of Slovakia, Institute for Archaeology, Nitra (SK)
- Pilot Region 5: (Monte Calisio Area, Civezzano): Autonomous Province of Trento, Department for Cultural Heritage and Ecomuseo Argentario, Civezzano (IT)
- Pilot Region 6: (Sukosan): City of Zadar (HR)
- Pilot Region 7: (Puck): Municipality of Puck (PL) and University of Torun (PL)
- Pilot Region 8: (Vysocina Region): Academy of Sciences of the Czech Republic, Institute for Archaeology, Prague (CZ)

Lessons learned from the development/implementation process of the tool and added value of transnational cooperation

One of the most important conclusions and from work carried out and visualizations elaborated is the necessity to chose the right and appropriate way and method of visualization, selection it from multiple and diverse possible virtual approaches for visualization of hidden archaeological heritage. However, beside the classical way of museum (finds) and information boards (outside), a digital content system provides supplementary material and potentials for interested people, in particular for virtual reconstructions and augmented reality approaches on-site. However, in particular the technological aspect of our society develops by very fast speed; hence also do the methods of visualization and presentation. Nowadays the development and subsequent accessibility of cameras with adequate lenses, photogrammetry became more than viable option to process the 3D models. Identifying the right approach is mainly defined by the target groups envisaged to be reached (science, tourism, heritage protection, agriculture, transport etc.) with visualizations produced. However, also the way and the location of presentation allows or restricts certain ways of visualization e.g. via mobile devices such as cell phones or tablet computers.

Within this process of common elaboration of tools and methods transnational cooperation was extremely important as it allowed a common learning and understanding but also a transfer of technologies and experiences between project partners with different stages of knowledge in the field of Virtual and
Augmented reality and the presentation via mobile devices.

References to relevant deliverables and web-links
If applicable, pictures or images to be provided as annex

All visualizations available on https://www.interreg-central.eu/Content.Node/VirtualArch.html