Definition of standards of AR/VR/XR innovative products and indications on skills of virtual archaeology experts and technicians involved in WP3.

The technological coordination and the correct execution of the project involves the adoption of shared standards and the use of specific technological skills for virtual and augmented reality. We propose therefore the following definitions.

STANDARDS OF AR/VR/XR INNOVATIVE PRODUCTS

Standard for the visualization and interactive coding of virtual reality models on the web
The current standard for 3D web is webGL. There are ongoing developments of other standards that may emerge in the course of the project.

Standard for the visualization and fruition of archaeological contents in augmented reality
The two global operating systems for mobile devices (IOS, Android) have introduced the two components Apple ARkit and Google ARcore.

Custom solutions
For some offline or specific activities experts can use custom solutions, for example for immersive installations or, holographic exhibition or gamification.

GENERAL SKILLS OF EXPERTS AND DEVELOPERS

Virtual Reality Software Developers
For online visualization on the web experts and developers should have competence in 3D programming in webGL.

Augmented reality software developers
ARkit and ARcore expertise is required for augmented reality software development.

3D modellers for AR and VR
3D modelers must have specific skills for virtual and augmented reality, especially in the optimization of 3D models (polygons, animations and textures) for web and APP visualization (webGL, ARkit, ARcore). In addition, the modeling must be aimed at interactive use, then provide structured coding of parts to allow interaction.

Editors and storytellers

Editors who have to write the texts for the different forms of interaction in AR and VR, for example in immersive audio guides, must have skills in interactive and immersive storytelling.

DETAIL ON TECHNOLOGICAL AR/VR/XR PRODUCTS TO BE DEVELOPED IN WP3

- **ACTIVITY 3.3.1: AR/VR INTANGIBLE HERITAGE: MEDITERRANEAN DIET**
  N.3 - AR/VR intangible heritage: Mediterranean Diet: PP1, PP2, PP4, **PP10,** PP7

iHERITAGE will focus on tangible and intangible cultural heritage of the Mediterranean countries.
With regard to intangible heritage, innovative ICT applications will lead to the creation of the first database of registered intangible cultural heritage of the Mediterranean countries, which will be hosted in a specific section of the web platform used by Iheritage and made available by CCBM (PP1).

New AR/VR solutions related to food products at the basis of the Mediterranean Diet will be created, consisting of a marker on the label activating AR/VR contents showing production sites, methods of production etc.

- **Activity 3.3.2: AR/VR GUIDED TOURS**
  N.4 - AR/VR GUIDED TOURS: LB, PP10, PP4, PP6
iHERITAGE will introduce for the first time ever in some of the most outstanding Mediterranean UNESCO cultural heritage AR/VR audio-video guides, accessible cross media, on PC, smartphone, tablet and AR glasses.AR/VR audio-video guides will have an average of 20 Points of Interest (POI) for each archaeological site, accessible in augmented and virtual reality, including: 3D reconstructions, 3D recontextualisation, ARcheo Cinema, VR cardboard excursions etc… accessible pre, during and post visit.

Technological standards of virtual and augmented reality, and general the skills required to the technicians involved, are highlighted at the beginning of the document.

In summary, VR software development must be in webGL, the AR and VR frontend will be compatible with ARkit and Acore technologies. Modelers for 3D reconstructions will need to have skills for model optimization for web and AR and VR visualization, and for interaction with parts of the models. Editorial skills should be specialized in interactive and immersive storytelling.

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- **Activity 3.3.5: VR CARDBOARD EXCURSIONS**

  N.4 - VR CARDBOARD EXCURSIONS: PP2, PP5, PP10, PP9

  For tour operators operating in different contexts, from historic cities to archaeological sites, virtual reality allows you to create an upselling service on the excursion. The Cardboard viewer has several advantages: very low cost, can be left to users after use; brandable with the logo of companies and institutions; it's based on users' smartphones; can be used before, during, after the visit. VR contents to be accessed through cardboards will be created in the "VR Room" activity.

  For the technological standards of virtual and augmented reality, and for the skills of the technicians involved, refer to the definitions at the beginning of the document.

  In summary, VR software development must be in webGL, the AR and VR frontend will be compatible with ARkit and Acore technologies. Modelers for 3D reconstructions will need to have skills for model optimization for web and AR and VR visualization, and for interaction with parts of the models. Editorial skills should be specialized in interactive and immersive storytelling.

- **Activity 3.3.6: PAST ORIENTEERING**

  N.1 - PAST ORIENTEERING: ARCHEO VIDEO GAME ENGINE – Test pilot Byblos: PP10

  A 3D engine for archaeological gamification, based on the format of orienteering, applied to the past. In this way it is possible to influence and change the behavior of people, favoring the creation and consolidation of active interest by the users towards the message that developers have chosen to communicate. This product will be developed and tested by PP10 in the UNESCO site of Byblos, with monitoring of results of online users and leading to a pilot project.

  The game can be developed with specialized custom tools, able to manage gamification in VR and AR, for example Unity or Unreal. You need skills in game design and storytelling.

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- **Activity 3.3.10: VIRTUAL ARCHAEOLOGICAL RECONSTRUCTION**

  N.5 - VIRTUAL ARCHAEOLOGICAL RECONSTRUCTION (VAR): PP2, PP4, PP10, PP8, PP9

  The virtual archaeological reconstruction fascinates and involves the public, but divides the experts in archaeology. VAR will involve: laser scanning and photogrammetry, scenes of life, comparative analyses etc. Virtually reconstructed archaeological sites will be implemented in the following products: AR audiovideo guides; VR rooms-booths; holographic exhibitions. Common ICT standards for producing and archiving 3D contents related to Mediterranean cultural heritage will be set.

  3D modelers must have specific skills for virtual and augmented reality, especially in the optimization of 3D models (polygons, animations and textures) for web and APP visualization (webGL, ARkit, ARcore). In addition, the modeling must be aimed at interactive use, then provide structured coding of parts to allow interaction.