

Panel Heritage Reloaded: Innovative Reuse of 3D Cultural Content

Panellists:

1. Alexandru Stan, IN2 Digital innovations (5Dculture Coordinator, 5Dculture Community of Practice)
2. Sander Münster, Time Machine Organisation (Demo case “Virtual educational museums”, “Virtual research infrastructure”, “Historic city information systems”)
3. Matevž Straus, Arctur (Demo cases “Cultural Tourism”)
4. Anthony Corns, The Discovery Programme: Centre for Archaeology and Innovation Ireland (Demo case “Brú na Bóinne World heritage site”)
5. Alberto Sánchez, University of Jaen (Demo case “Iberian Archeology”)
6. Siepke van Keulen The Netherlands Institute for Sound & Vision (Demo case “Virtual exhibitions”)
7. Suzanne Mulder, Central Museum Utrecht (Demo case “Virtual Fitting Rooms”)
8. Elisa Farella, Fondazione Bruno Kessler (AI tools)
9. Marco Medici, Inception (Storage and Visualisation of 3D)
10. TBC, Europeana Foundation (Common European Data Space for Cultural Heritage)

120 min.

Target Audience: Cultural heritage professionals, 3D digitisation experts, researchers, educators, creative industries, destination managers, general public

Key words: 3D, reuse, heritage, best practice, Europeana

Abstract

As part of the common European data space for cultural heritage the project 5Dculture started out as a combined effort of cultural heritage preservation institutions, international networks, and IT solution enterprises to jointly explore potential re-use scenarios for already existing 3D cultural content. 5DCultures’s efforts are focusing on enabling and demonstrating how 3D cultural heritage content from the domains of fashion, archaeology, and architecture can be creatively reused in museums, schools, tourism and by cultural and creative industries. In doing so, partners make available a set of tools for working with 3D content, from AI and Semantic technologies for 3D enrichment to 3D content storage, management, viewing, interaction and storytelling.

Reusing 3D content means reimagining it. We foster innovation that inspires new narratives and fresh perspectives, making cultural heritage a dynamic tool for education, creativity, and meaningful experiences. The different reuse scenarios covered by the project can be grouped based on the domain of the 3D content used (Farella et al., 2024, Corns et al., 2024):

- Fashion Collections: using 3D digitised historical garments for an enhanced visitor experience in museums with virtual try-ons and social VR.
- Archaeology: exploring new methods of experiencing archaeological sites and artefacts, adding the dimension of artistic reuse, gamification, and education, e.g. by using 3D prints of archaeological artefacts in educational activities with children and young adults, as well as people with visual impairments.
- Historic Buildings and Cityscapes: working with enhanced visual applications that redefine cultural tourism, empower research, and transform education through virtual exploration of historical sites.

5Dculture complements the ongoing efforts of setting up the common European data space for cultural heritage, a European Union flagship initiative that aims to accelerate the digital transformation of the cultural heritage sector, building upon the work of the Europeana Initiative (European Commission, 2021). A digital community of practice for heritage professionals working with 3D content has been set up by the project to share resources, news and best practices on the topic.

During the panel speakers coming from various project partners will share with the audience the highlights and lessons learned from the different scenarios that were targeted within the project, and will discuss the future possibilities that these demonstrate and the challenges ahead that remain to be tackled.

Motivation

In recent years the process of digitising cultural heritage in 3D with a high level of detail has seen a stark increase within many member states of the EU, in part driven by the fact that many cultural heritage objects are vulnerable and at risk. Coupled with the need to accelerate the digital transformation of the cultural heritage organisations, it is key to ensure that the sector is well equipped to make the most out of the opportunities offered by 3D data, opening up to the next generation use and reuse scenarios that are more immersive, engaging, informative and sustainable.

So, as more cultural content is digitised in 3D, catalysed by such innovative initiatives like the Twin it! campaign run by the common European data space for cultural heritage, it is important to consider how this 3D content can be stored, shared, visualised and re-used.

The project team of 5Dculture will showcase innovative scenarios for the reuse of 3D digital content, aiming to actively engage with experts in the respective fields as well as inspire the audience by showing potential use cases for scientific, educational, artistic, touristic, and even commercial engagement.

Presentations

Introduction: 3D Cultural Heritage Content in 5Dculture - A journey towards re-use (10 minutes) - Alexandru Stan

3D digitisation of cultural heritage content has been rapidly accelerated in the last couple of years thanks to a number of trends that worked in unison: increased policy focus on 3D digitisation at both European and national level, increased availability of equipment, software and know-how for high-quality digitisation, availability of more low cost solutions and approaches for 3D digitisation. What is now increasingly important in order to keep the momentum going and help reach the digitisation targets set by the EC recommendations of 2021¹ is to demonstrate how the digitised 3D content can be reused sparking innovation not only in the cultural heritage sector but in many others. One of the main goals of 5Dculture has been to explore new scenarios of reuse for content coming from various domains. The digital community of practice set up by the project provides the platform to learn from the experiences and success stories of the 5Dculture scenarios.

From Twin it! to reuse and beyond: What to expect from the Common Data Space for Cultural Heritage (10 min), Speaker TBA

The Twin it! campaign set up by Europeana Foundation with the support of the EU member states has been a resounding success with over 38 emblematic and high-quality 3D models shared to the common European data space for cultural heritage. During the final event it became clear that there is a strong need from the community to continue such initiatives. And now that the models are available in Europeana, they can be creatively reused by anyone. In this talk we will reflect on the Twin it! campaign and consider the path ahead.

AI-enabled tools and services for 3D (10 minutes) - Elisa Farella

5Dculture is developing and deploying a series of digital technologies and tools to facilitate the management, enrichment and re-use of 3D heritage contents. 5Dculture is making use of AI and semantic technologies as well as the latest standards and best practices for 3D data management, storage, sharing and aggregation. 5Dculture technologies and tools are key to deliver the necessary solutions and services for the implementation of reuse scenarios in various fields, including fashion, archaeology and historical cityscapes. The offered solutions will be easy to be accessed and integrated in the Data Space for Cultural Heritage.

Effective management and visualisation of 3D content (5 minutes) - Marco Medici

3D data formats, metadata and paradata can have many “flavours” and vary from organisation to organisation. This creates many challenges when it comes to the efficient management and visualisation of the 3D data. In 5Dculture we set up a suite of complementary tools that cover both H-BIM and semantic data, as well as very large textured 3D models and point clouds.

3D Fashion content reuse: the case of virtual try-ons in a museum (10 minutes), Suzanne Mulder

The fashion heritage pilots developed in the 5D project aim to expand onto new digital territories by utilising 3D and augmented/virtual reality (AR/VR) technologies, bridging the gap between uncharted digital arenas and physical space of the museum and hopefully inspiring the cultural and creative sector at large. The primary objective is to explore and

¹ <https://digital-strategy.ec.europa.eu/en/news/commission-proposes-common-european-data-space-cultural-heritage>

create a more engaging and immersive museum experience using historical fashion digital assets.

The first fashion scenario in 5Dculture leverages the previous experiences of Centraal Museum Utrecht, a EFHA member, in utilising 3D historical objects and AR solutions to extend its fashion collections beyond the museum's physical spaces. In the "Virtual fitting room" pilot, a virtual try-on web application based on Snap Lens Studio and Camera Kit, was developed. With it you are able to virtually try on garments using a smartphone or laptop camera. The application provides a selection of digitised historical hats from CMU, allowing users to virtually wear them. The AR technology automatically adjusts the size and position of the hat on the user's head, creating a realistic and playful experience. This initiative enables visitors to engage with historical objects and imagine what it would be like to wear them. The museum, in turn, disseminates and valorizes its digitised collections, allowing a more personal and interactive experience with them.

Bringing fragile collection items together: a virtual museum visit through social VR (10 min), Siepke van Keulen

In the second scenario explored in 5Dculture we address the challenges faced by museums in organising fashion exhibitions that involve loans from other institutions. To avoid the many complexities related to loans (fragility of historical objects, high costs of transportation and couriering, as well as issues related to prolonged display and conservation), we experimented with new techniques of displaying using Social Virtual Reality. The aim was to curate an exhibition showcasing 3D costumes from fashion collections belonging to different cultural institutions. This scenario combines the digital and physical experience with 3D objects coming from various collections in a virtual immersive environment.

Reuse of high-quality 3D models: the case from Brú na Bóinne World heritage site (10 min), Anthony Corns

Archaeological 3D Content is already widely in use for research purposes and for presenting archaeological content to the interested general public. In the 5DCulture project, we explore other reuse scenarios for 3D content of the Brú na Bóinne site and of Iberian Archaeology.

The UNESCO World Heritage Site of Brú na Bóinne, is a significant archaeological and historical site in Ireland, renowned for its Neolithic burial mounds, which date back over 5,000 years. In the project, the quality of 38 legacy 3D models was significantly improved and over 183 new 3D models were created. (Re-)Use cases were explored: tourism, creative and digital arts and conservation/research, identifying suitable 3D assets and associated pipelines for delivery which are tailored to the user group.

3D archeology in educational scenarios (10 min), Alberto Sánchez

The use case about the Iberian Archaeology focuses on the reuse of 75 3D models of the archaeological objects belonging to the Culture of the Iberians (6th-1st ct. BC, east of Iberian Peninsula). The 3D models were used in different educational contexts (primary, secondary, university and for people with impairments), and also were adapted and completed with additional information (photos and video descriptions) for their use in Europeana.

Jump in the Time Machine: 3D models of historic cityscapes for 4D exploration (20 min), Sander Muenster

In 5DCulture, various historical cityscapes has been aggregated into the Data Space and re-used in 4D world viewers: 1) The Amsterdam Vaalkenbourg City (NL) 3D reconstructions were created for educational visualisations to show the development of the Amsterdam Vaalkenbourg quarter from the 17th to the 19th century. The whole borough, with over 200 buildings, was modelled in Blender at three different times (Waagen and Lanjouw, 2020). 2) The Sion Time Machine combined 3D scans, 3D parametric models and genealogical data into a city-wide 3D information system ranging from year 1600 to 1815 to show the development of the city and its inhabitants (Roduit et al., 2023). 3) The Dresden demo case started in 2016 and comprised a 3D dataset of ~1000 buildings provided by the municipality of the current city of Dresden. Results were presented in exhibitions in the Amsterdam Create Salon and the Dresden COSMO exhibition space.

Postcards re-imagined: using 3D-enabled storytelling for Cultural Tourism (10 min), Matevž Straus

Small Destination Management Organisations, characterised with small teams (up to 10) and with limited budgets and ability to procure external technological development. Such destinations are looking for digital tools to improve their (digital) interpretation of local cultural heritage - by easy-to-implement and cost-effective solutions. Smaller destinations (DMOs) look for innovative ways to market themselves through digital storytelling. For them "re-use" is crucial to reduce costs and ensure efficient use of resources. In this context we leveraged for a small destination in Slovenia, Idrija, high-quality 3D content of important cultural heritage landmarks and created a physical-digital tourism product. Starting from a physical postcard visitors are transported to a digital story that creates a "wow" effect through a hologram available on the visitor's smartphone, and further explores the cultural aspects through a digital story.

Conclusion, Discussions and Questions (15 minutes)

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