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Adopting digital and virtual technologies to enhance cultural heritage: the case of the Aldrovandi Digital Twin

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BY

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PHAIDRAcon



Project CHANGES and virtual technologies

Make the digital and virtual enhancement of Cultural Heritage (CH) a permanent and widespread practice to

- increase the **knowledge**, **curation** and **management** of artefacts in all forms
- expand the involvement of the general public, thus, improving **accessibility**, **inclusiveness**, critical **thinking**, **participation**, **enjoyment** and **sustainability**

Spoke 4 goal: to provide **tools** and **prototypes** to address such a digital enhancement in the context of six different templates of museums and art collections

- **experiment** with using the digital and virtual technologies in defined and **representative real-case scenarios** involving an heterogeneous set of cultural heritage institutions
- define and share **guidelines** for acquiring and digitising CH and develop a set of open **tools** and **data** that can also be reused by other national institutions





Work organisation: main activities

Preparation (first period)

Defining suitable **research lines with the CH institutions** involved for designing experimental settings (mutual benefit and collaboration)

Running a **pilot case study** in advance, to derive the guidelines to prepare and share with the winners of the Cascade Call

Investigating **workflow and methodologies** to produce CH data (datasets, software, 2D and 3D models, etc.) and set up an involvement and **exploitation strategy**

Implementation (second period)

Developing the **guidelines** for running the acquisition and digitalisation process and the **prototypes** to be used in the context of the “core” case study the Cascade Call winners

Guiding the research work in collaboration with **CH institutions and the companies** that won the Cascade Call

Identifying the potential **stakeholders** interested in the implementation of the research and implementing tools to **monitor and assess** case studies and research exploitation

Case studies

“Core” case studies

Cascade Call had
available €2,645,570

9 project funded to work
on different templates of
museums and art
collections across the
whole country

Research case studies

Proposed by partners
without the support of
the Cascade Calls



Templates of museums and art collections considered in the project

- | | |
|--|--|
| (A) High-density and innovative museum | (B) Natural history and scientific museum |
| (C) Widespread art gallery | (D) Sites museums with (in)tangible heritage |
| (E) Historical palaces | (F) Demo-ethnic-anthropological museums |



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A pilot study

We set up a pilot study to gather all the guidelines and workflows mentioned in the previous slides, i.e. to create the digital twin of the temporary exhibition (ended on May 28, 2023) "The Other Renaissance: Ulisse Aldrovandi and the wonders of the world", to make it accessible online by users, using various devices (from home computers, to tablets and VR headsets)

Objects to digitise: 104 specimens, 27 printed volumes, 17 manuscripts, 5 nautical charts and maps, 1 diorama, 7 herbariums, 21 models, 7 woodcuts, 3 paintings, 6 painted ceilings, 11 casts, 2 medals, 4 scientific instruments, more than 30 other objects 9 videos, 2 prints, and 27 panels with graphics

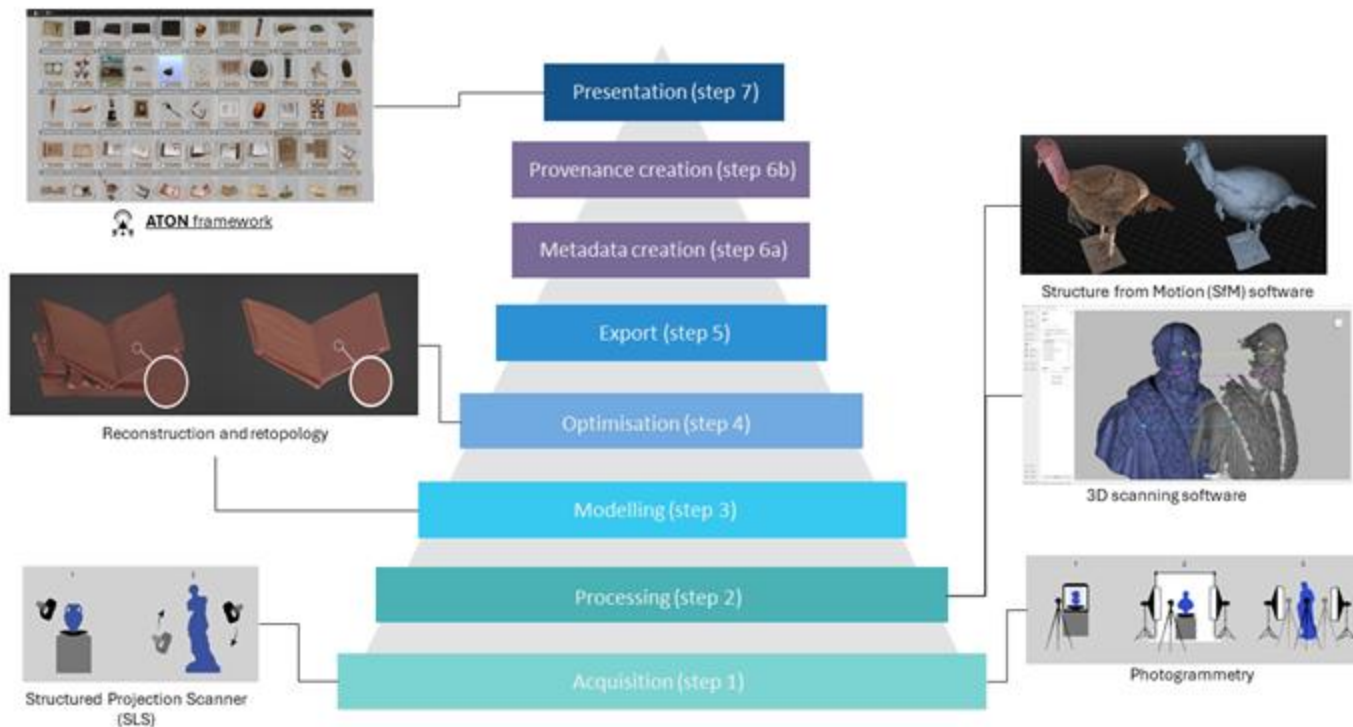




The guidelines

In the past 2 years and an half, we have compiled and published the guidelines dedicated to museum objects, rooms and landscapes

- Acquisition
- Post-processing
- Optimisation for real-time and web3d
- Metadating
- Presentation





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Cultural Heritage Object (CHO)



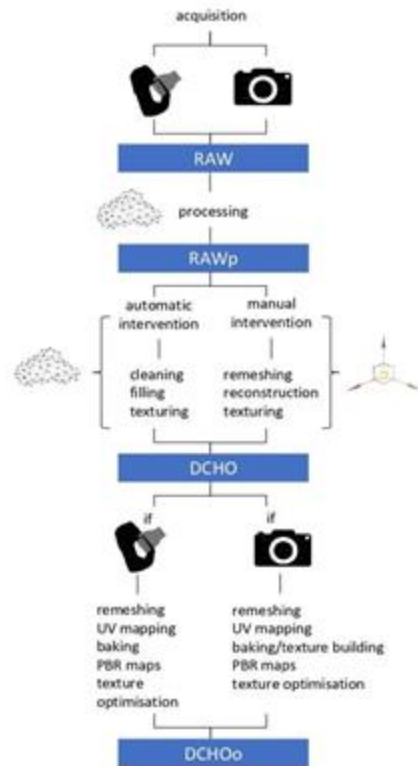
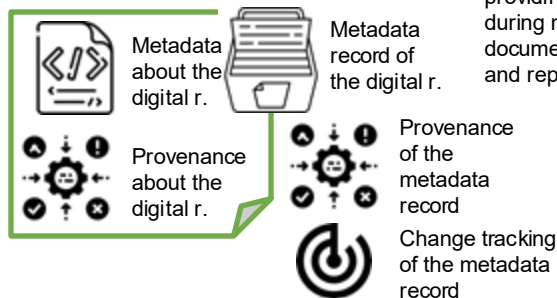
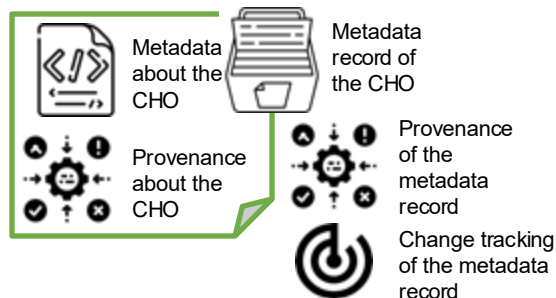
Digital representation



Organised into four derivative versions:

1. Raw Material (RAW)
(produced after the acquisition)
2. Processed Raw Model (RAWp)
(produced after the processing)
3. Digital CH Object (DCHO)
(produced after the modelling)
4. Optimised DCHO (DCHOo)
(produced after the optimisation)

which enables direct comparisons,
providing a record of authorial decisions
during modelling → necessary
documentation to ensure transparency
and reproducibility





CRM_{dig}
Model for provenance
metadata



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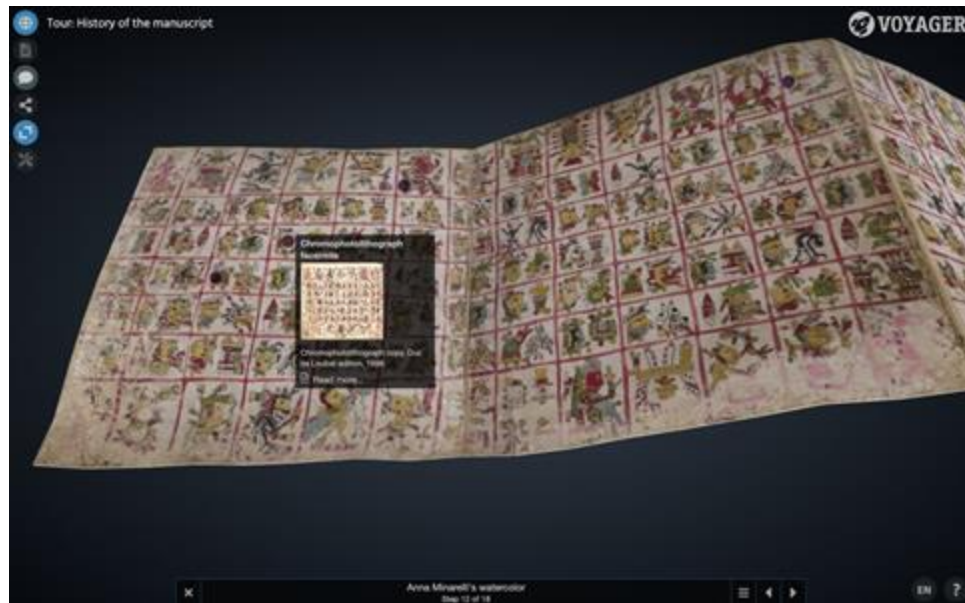
Demo

Aldrovandi digital twin

Experimenting and going beyond the borders

Although the primary goal of Spoke 4's outcomes focusses on enhancing CH, **cross-fertilisation** between different disciplines and unexpected applications in additional settings can arise and can set up unpredictable collaborations among researchers

Example: the development of an interactive scholarly digital edition, with different narrative dimensions explorable by the user, of the Cospi Codex, one of the 3D pieces digitised from our pilot study





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Demo

Cospi Codex Scholarly Digital Edition



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Virtual technologies for
museums and art
Collections

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