

Web-based integrated solutions for Cultural Heritage

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CNR ISPC





Users evaluation

- web-based design
- web-based data generation (webgis...)
- web-based data management
- web-based data editing
- web-based data analysis
- web-based storytelling and narrative content creation (twine et al)
- web-based exploration (visualisation et al)
- web-based evaluation



00 : 22

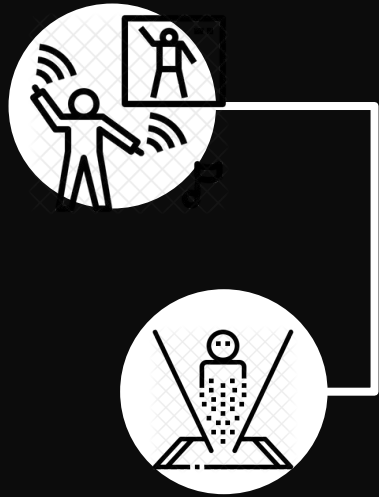
8 years ago... Keys to Rome: a collaborative production





80.000 visitors
4 museums
4 collections
7 applications
10 countries
involved in a
web-based
production

Admotum *holoint*



3DHOP (3d heritage online presenter)

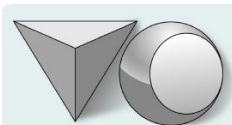
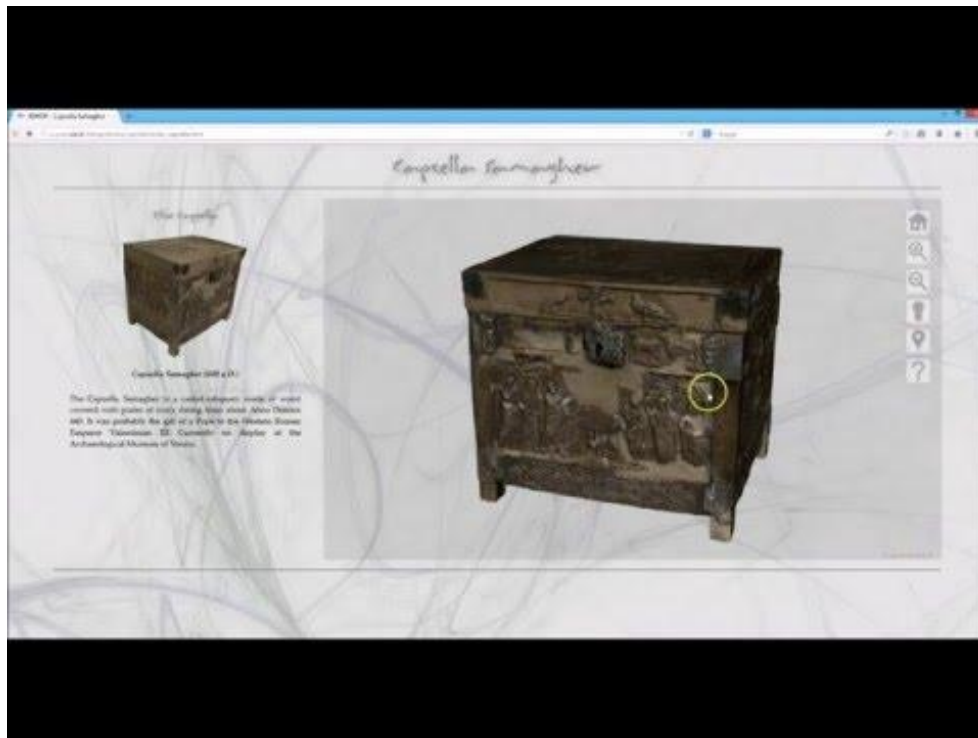


Consiglio
Nazionale
delle Ricerche



ISTITUTO DI SCIENZA E TECNOLOGIE
DELL'INFORMAZIONE "A. FAEDO"

piattaforma per integrare all'interno di pagine internet modelli 3D ad alta risoluzione, quali ad esempio quelli ottenuti per scansione 3D. Gestisce la complessità dei dati in ingresso mediante un motore di rappresentazione e rendering multirisoluzione.



V I S U A L
C O M P U T I N G
L A B O R A T O R Y

Visual Media Service

<http://visual.ariadne-infrastructure.eu/>



Il Visual Media Service consente una semplice pubblicazione e presentazione on line di asset digitali complessi.

The screenshot shows a web browser window displaying the ARIADNE visual media service website. The browser's address bar shows the URL `ariadne1.isti.cnr.it/index.php` and the search bar contains the text "digital heritage 2015". The website header includes the text "ARIADNE visual media service" and navigation links for "Browse", "Upload", "Help", and "Contacts". The main content area features the title "ARIADNE visual media service" and the subtitle "Create your online showcase for 3d models, images and RTI." Below this are two buttons: "Upload »" and "Browse »".

The page is divided into three columns, each with a heading and a description:

- 3D models**: 3D representations produced with 3D scanners or photogrammetry are extremely high-resolution and hard to visualize at interactive rate. This service produces a web page that supports interactive visualization of your data, after converting it into an efficient multiresolution encoding. Buttons: "View details »", "Demo".
- RTI images**: Relightable images (called Reflection Transformation Images, RTI, or Polynomial Texture Maps, PTM) are becoming an increasingly used media. This service closes a current gap, giving support for easy publication on the web and interactive visualization of RTI images. Buttons: "View details »", "Demo".
- High-resolution images**: High-resolution images are a commodity resource in archaeology. Unfortunately, they are most often disseminated and published on the web by using low-resolution versions (a single 40Mpixel images is 120MB in uncompressed format and around 10MB when lossy compressed). Buttons: "View details »", "Demo".

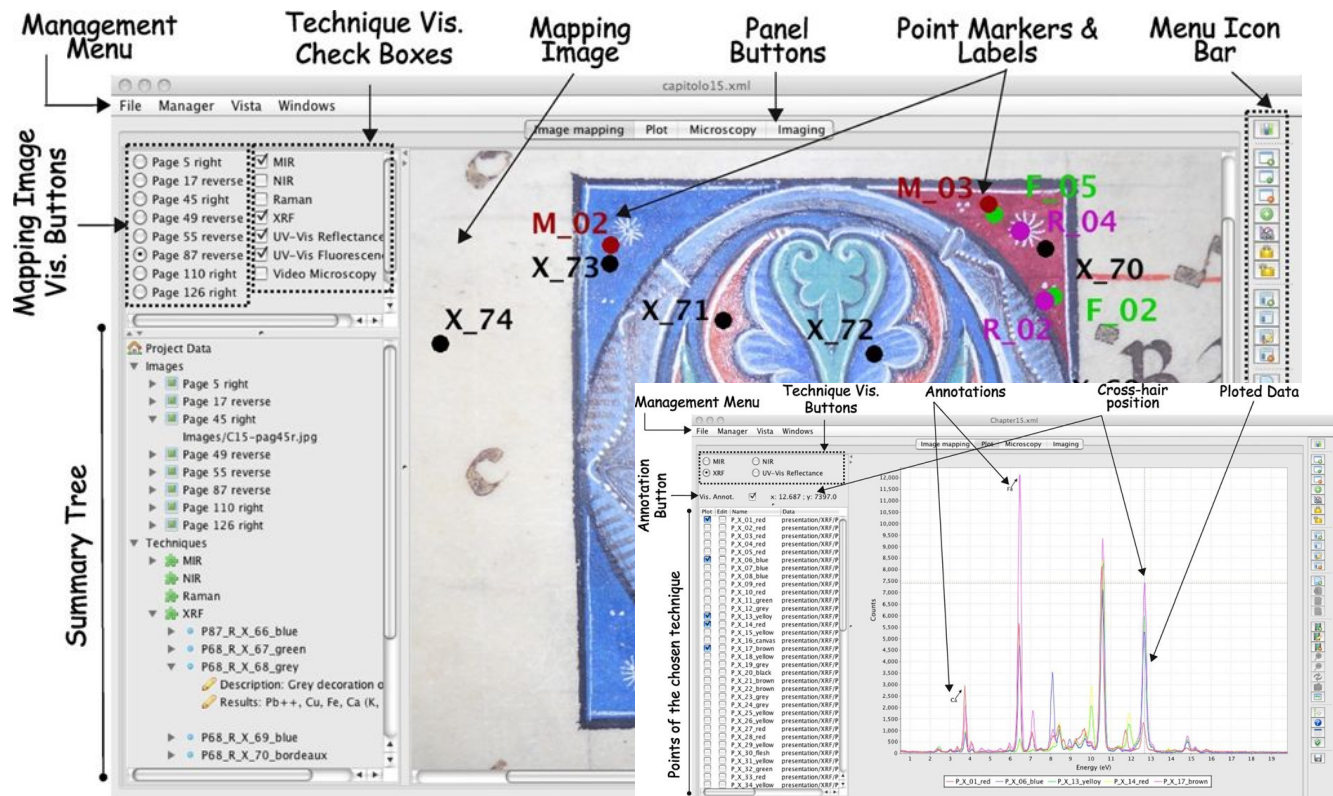
At the bottom left of the page, it says "Visual Computing Lab - ISTI - CNR".



Movida

<https://www.sciencedirect.com/science/article/pii/S1296207412000477>

MOVIDA (MOBILE- LABORATORY VISUALIZATION DATA): software per data management e analisi di indagini non invasive per il patrimonio culturale. Consente “digital preservation” delle informazioni e funzioni analitiche attivabili già durante le misure in situ. Utilizzato dal MOLAB di E-RIHS





la pandemia

Nuove priorità, Nuove necessità, Nuovi requisiti



virtual tourism

I visitatori cercano esperienze **Significative**, **autentiche** e **Memorabili**

Meraviglia e Empatia (storica) (EMOTIVE)

Social VR for heritage: designing care and affect
into multi-user virtual reality

The ÇVR Experience - Overview

Meaningfulness



Historical Enchantment

Facilitated Dialogue

Provocation



cura per il nostro patrimonio

Subject

EVENT

Caring object



Link is STRONG

Reaction is
EMOTIONAL
NEUROBIOLOGICAL



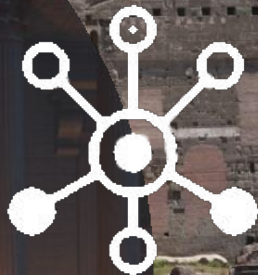
Link is WEAK

Reaction DOESN'T
HAPPEN

Senso di appartenenza (Social Cohesion)



Autl



Autentico è quello che tocca il profondo di una persona,
che dura nel tempo, che si sviluppa e cambia insieme alla persona

K. Jaspers, *Psychologie der weltanschauungen*, 1919

Strumenti

ATON framework

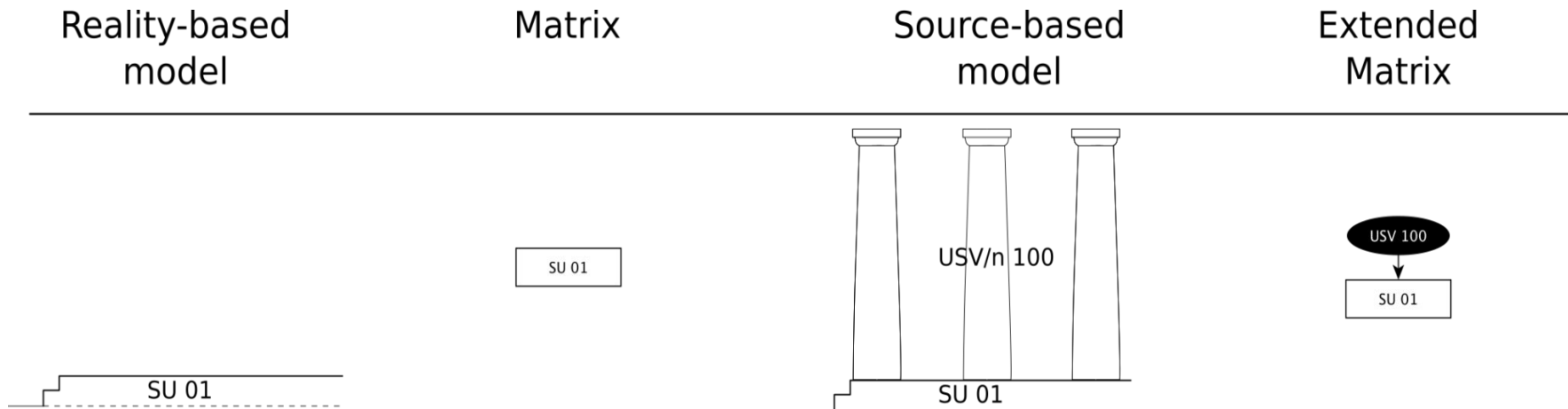


<http://osiris.itabc.cnr.it/aton/>

- **Open-source**
- Permette di creare web-app **cross-device** (*mobile, desktop, kiosk, HMD*)
- **Modulare**
- **Multi-utente**
- Progettato attorno a **standard web moderni**

B. Fanini, D. Ferdani, E. Demetrescu, S. Berto, E. d'Annibale (2021). **ATON: An Open-Source Framework for Creating Immersive, Collaborative and Liquid Web-Apps for Cultural Heritage**. *Applied Sciences*, 11(22), 11062.

EM è un linguaggio formale con cui tenere traccia durante il lavoro di interpretazione necessario ad una ricostruzione virtuale.



EM 1.2 (beta) - June 2020

Extended Matrix Quick Start

E. Demetrescu



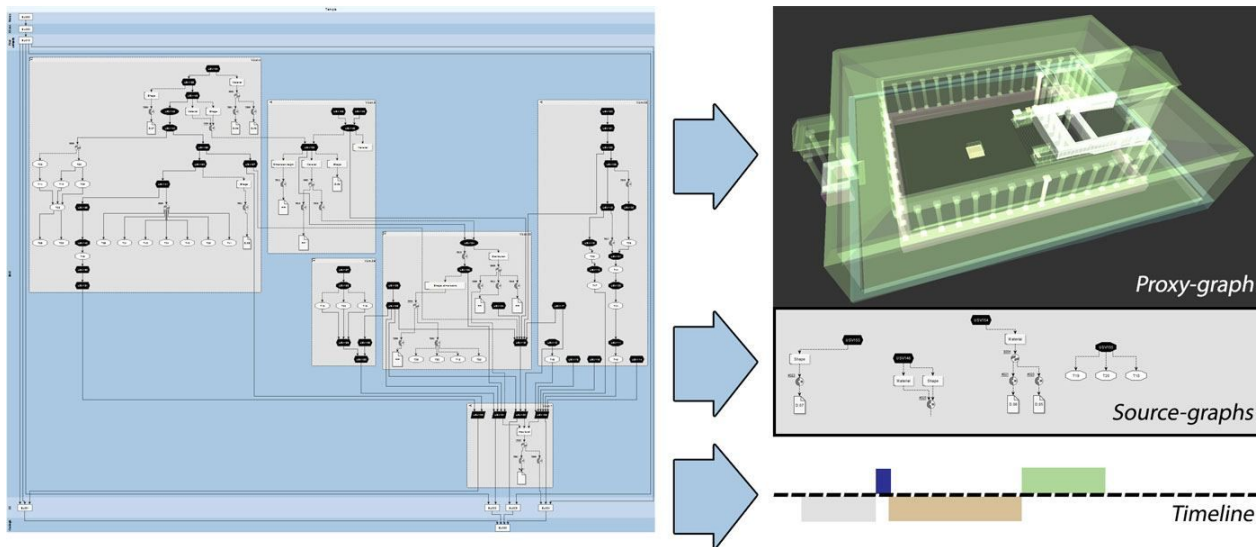
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EM e EMviq

<http://osiris.itabc.cnr.it/scenebaker/index.php/projects/emviq/>

EMviq (Extended Matrix Visual Inspector and Querier) è uno strumento interattivo di visualizzazione 4D e di interrogazione runtime, che consente un'estrazione automatica di files GraphML (EMs) collegati ad una visualizzazione 3d. EMviq è sviluppato da B. Fanini (CNR ISPC)



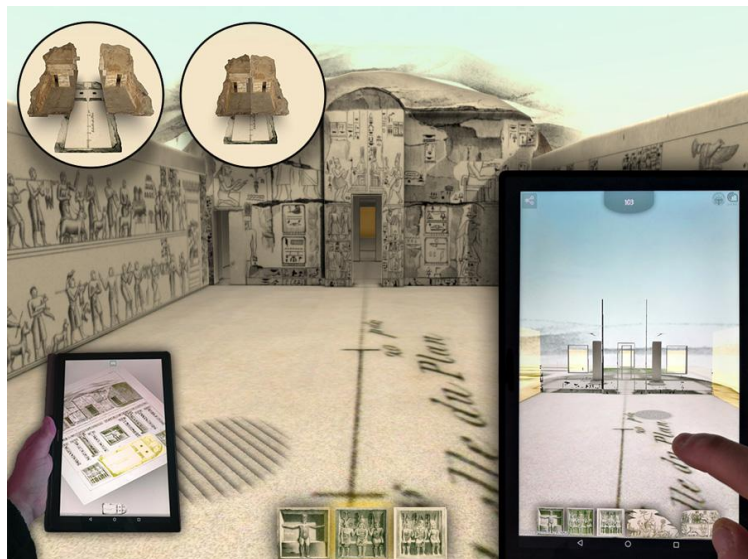
EMviq



Progetto Valorizzazione Parchi Archeologici ALES-MIC (piattaforma web runtime - 8 parchi archeologici - CNR ISPC direzione produzione esecutiva) - fruizione diffusa: on line (home), mobile (on site), cardboard e oculus - scenari multi-tematici e temporali (layer attuale, ricostruttivo, data transparency)

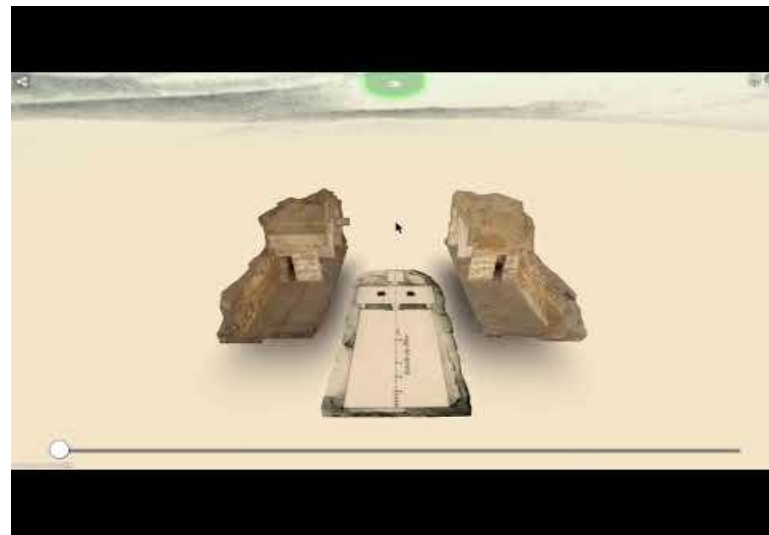


REDRASK (3D puzzle based on ATON)



<http://www.backtothefuture.polito.it/TemplePuzzle3D.html>

- Online 3D puzzle (cross-device)
- Ricontestualizzazione (elementi da tavole del 1800)



M. Lo Turco, P. Piumatti, M. Calvano, E. C. Giovannini, N. Mafrici, A. Tomalini, B. Fanini (2020). *Interactive Digital Environments for Cultural Heritage and Museums. Building a digital ecosystem to display hidden collections.* DISEGNARECON - ISSN 1828 5961

Temporal Lensing (ATON)



Mobile / Desktop / Immersive VR

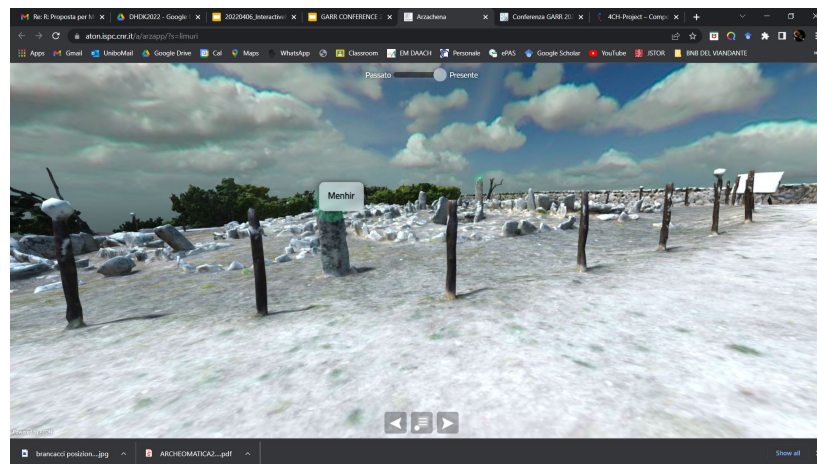
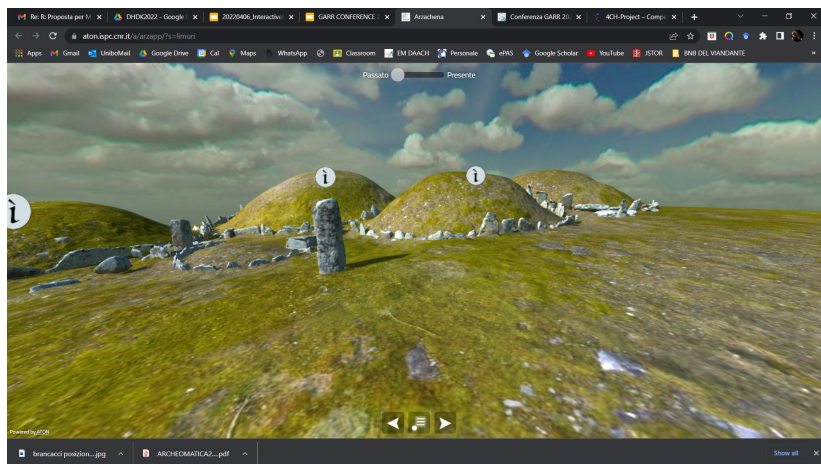
B. Fanini, D. Ferdani, E. Demetrescu (2021) Temporal Lensing: An Interactive and Scalable Technique for Web3D/WebXR Applications in Cultural Heritage. Heritage. 2021; 4(2): 710-724

Civiltà Nuragica



<https://www.arzachenaciviltamillenaria.it/guida-interattiva>

<https://aton.ispc.cnr.it/a/arzapp/?s=limuri>



Brancacci VR



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IL CANTIERE della CAPPPELLA *Brancacci*



The turning point infrastrutture per le Heritage Sciences

E-RIHS: European Research Infrastructure for Heritage Science



Integrated platforms of the E-RIHS



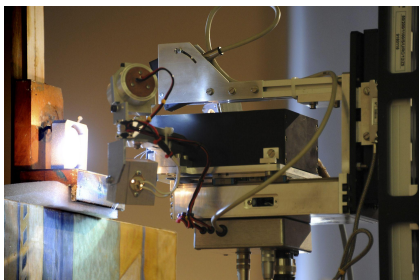
Archlab:

Access to specialised knowledge and organized scientific information in datasets largely unpublished from archives of prestigious museums, galleries and research institutions.



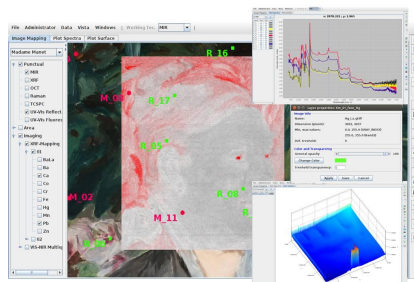
Fixlab:

Access to large-scale and medium-scale facilities particle accelerators and synchrotrons, neutron sources; non-transportable analytical instruments.



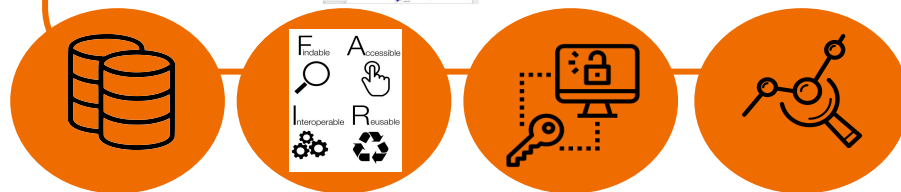
Molab:

Access to an impressive array of advanced mobile analytical instrumentation for non invasive measurements on valuable or immovable objects, archaeological sites and historical monuments.



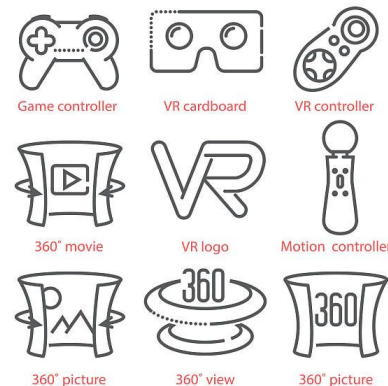
Digilab:

Virtual access to scientific data concerning tangible heritage, making them FAIR. It includes searchable registries of multidimensional images, analytical data and documentation.



DATA STORAGE DATA FAIR-IFICATION DATA ACCESS DATA ANALYSIS

DIGILAB nel PON SHINE



Strategia Nazionale di Specializzazione Intelligente

Area tematica

Turismo,
Patrimonio
culturale e
industria della
creatività

Traiettoria di sviluppo

Tecnologie e applicazioni per la conservazione, gestione e valorizzazione dei beni culturali, artistici e paesaggistici.

SHINE azione potenziamento IR E-RIHS

OR1 FIXLAB

- Stonelab
- Dating lab
- Insideout-lab
- THz-lab
- X-Ray tomo-lab

OR2 reMOLAB

- Ground-lab
- Aerial-lab
- Marine-lab

OR3 hyMOLAB

- Xray-lab
- Molecular-lab
- Optical-lab

OR4 DIGILAB

- VRDesignCenter-LE
- BackupCenter-LE
- DataCenter-NA
- Cavea-NA
- FabLab-NA

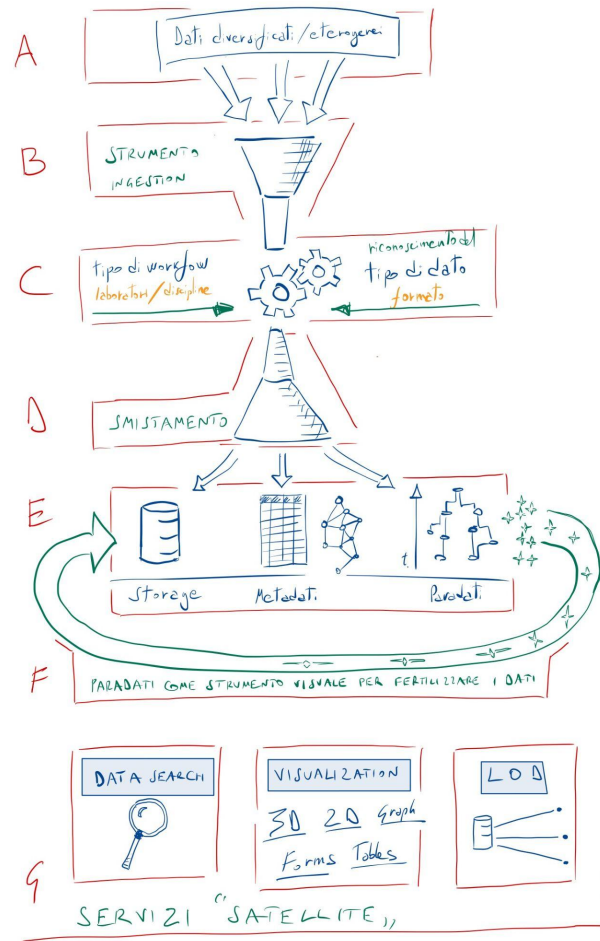
DIGILAB WORKING GROUP

CH Data Space CNR ISPC

<https://www.archesproject.org/>

Exploratory phase:

@arches



European trend topics

DG CONNECT trend topic:

digitalizzare TUTTO il patrimonio culturale a rischio entro il 2030, il 40% entro il 2025

(con call specifiche finalizzate a creare un data space per il patrimonio culturale)

[fonte: Europeana conference 2022]

DG RESEARCH AND INNOVATION :

european collaborative cloud for cultural heritage

Digital Library del Patrimonio



Cloud nazionale della ricerca

Digital Library del Patrimonio Culturale

Digitalizzazione delle collezioni di musei, archivi e luoghi della cultura, per aumentare le risorse culturali digitali.

65 milioni di risorse digitali da rendere disponibili nella Digital Library in 3 anni.



Verso un nuovo Rinascimento

Cognitively and emotionally enriched multi-user web-based VR environments and platforms

Science integrated platforms

sofia.pescarin@cnr.it

COND
VISIONI

Conferenza GARR 2022
Palermo 18-20 maggio