

Enabling Cultural Heritage Oriented European Strategies

Open discussion (topic 3):

Developing and disseminating innovative decision-support tools to promote exploitation of advanced/enabling technologies in cultural heritage prevention, conservation and restoration

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Why promoting innovation in cultural heritage prevention, conservation and restoration

"A scientific approach is essential for the conservation of the cultural heritage, as a preliminary basis that will ensure **effective planning** of ordinary and extraordinary maintenance works, as well as to assure their **efficacy and durability**"

Business Plan, CEN TC 346 – Conservation of Cultural Heritage

Although the conservation of cultural heritage involves a different **code of ethics**, it can be compared to medicine, where artifacts are analogous to patients and conservators are similar to doctors

Position Paper, Echoes Cluster

An evidence and ethics based approach is needed for decision-making in innovation in the cultural heritage field



Challenges to introduce innovations in the cultural heritage sector

- □ Wide diversity in terms of substrates, methods and techniques, ways of applications
- □ Stringent ethical requirements ("Conservators need to be conservative")
- Need to work on a case-by-case basis
- □ Long experienced professionals, working with their own consolidated techniques
- Strong preference for well-known products & skepticism or lack of knowledge on new technologies
- □ Lack of "quality" certifications
- □ Labour intensive activity
- □ Limited production volumes
- Fragmented sector in terms of needs and players (e.g. having different missions, targets and size)
- Strong impact of the socio-economical context (on choices for prevention, restoration and conservation)



Complexity of evaluation criteria (examples from NanoRestart)

Economical

Feasibility



Costs/affordability Cost effectiveness **Intevention time reduction** Performance/efficiency Market size Durability

Technological



Performance/efficiency Selectivity Removability, reversibility Reliability Sensitivity Long term impacts Technical bottlenecks

Social/Ethical/Legal

Compatibility Reliability Reversibility, re-treatability non-invasivity Ageing of the treatment Long term impacts Need for training Users and consumer perception





Operator Health and Safety Safety risks (e.g. workers, users) **Environmental impacts**



An innovation value chain perspective: a variety of actors and needs

Basic research Applied Research Prototyping	Testing, validation Production Go to market
 Actors: Researchers Tech developers/producers Museums Professionals (e.g. conservators) Companies (diagnosis, equipments, retail, etc) Scientific bodies Policy makers, authorities Users, society 	 Knowledge/support needs (examples): conservation challenges, substrates tech solutions, materials technical, ethical, safety, legal, economic requirements (long-term) testing method Safety and sustainability procedures Quality, advantages compared to benchmarks



An intervention value chain perspective: a variety of competences

- **Diagnosis** of the works of art characteristics and degradation
- **Definition of requirements** (technical, ethical, legal, safety, environmental and economic criteria)
- Design of the intervention strategy: analysis, selection of tech, development of solutions, ways of application and use, selection of mock-ups, product optimization, etc.
- Customization of the tech solutions
- Validation & Testing
- Benchamrk, monitor of quality, feasibility, reliability of intervention
- **Training** to professionals and value chain actors
- **Exploitation**, introduction into the market and making it accessible to the wide community

Generally no transparent, structured and reproducible processes in intervention

 \rightarrow Need to guide the process



Decision-support tools: some practical examples







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Decision-making tools: some practical examples

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Quantitative approaches/tools





Decision-support tools: some practical examples

	Helpful	Harmful
Internal Origin	STRENGHTS New/breakthrough properties for cleaning, consolidation, protection and sensing Customization capabilities Environmental sustainability and chemical safety 	 WEAKNESSES Some products address very specific challenges Additional testing needed for some products
External Origin	OPPORTUNITIES Better performances than existing solutions Applicability on a wide range of substrates Matching ethical principles in Cultural Heritage (re-treatability, removability, long-term conservation) Tech development aligned with EU tech roadmaps/priorities Potential applications beyond Cultural Heritage conservation	THREATS • Need to increase awareness and confidence on these new technologies

Qualitative/Semi-quantitative approaches/tools







Why decision-support tools?

A model for decision-making in the field is urgently needed. It should provide all actors along the value and supply chain **reliable ways to assess the feasibility and viability of these solutions compared to existing benchmarks**.

NanoRestart Exploitation Plan



Open issues

Developing and disseminating innovative decision-support tools to promote exploitation of advanced/enabling technologies in cultural heritage prevention, conservation and restoration

What priority areas: prevention, conservation, new materials for CH?

What purpose: knowledge base and awareness (e.g. repositories), scientific analysis (e.g. modelling), strategic decision (e.g. tech assessment), consensus and confidence building (sharing, dialogue, standards), market analysis, cultural assets management...

What tools (and good practices) along the innovation and "intervention" value chains?

What targets: harmonization, quality (and minimum quality/reliability requirements),

What actors: researchers, conservators, museums, scientific organizations, artists, ...

What (infra) structures: experts (e.g. consultancy), policy & normative (e.g. local authorities, standard bodies), public- private partnerships.....



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