URBAN AND REGIONAL DEVELOPMENT

DIST - XR and Metaverse for Sustainable and Inclusive Cultural Heritage

Funded By	Dipartimento DIST
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Context of the research activity	To establish a replicable and scalable methodology aimed at enhancing cultural heritage through the use of immersive digital technologies that are also inclusive for people with vulnerabilities. The approach will be integrated with on-site activities using recycled materials, in order to highlight the importance of creativity and actively engage school groups.
Objectives	Develop and validate a replicable, scalable methodology to enhance cultural heritage through immersive digital technologies (XR/Metaverse) that are inclusive for people with disabilities and other vulnerabilities, and integrated with real-world creative activities using recycled materials to foster sustainability awareness and engage schools.
Skills and competencies for the development of the activity	This research aims to develop and validate a replicable and scalable methodology for enhancing cultural heritage through immersive digital technologies (XR and Metaverse) that prioritize inclusion for individuals with vulnerabilities. The project addresses the dual challenge of digital innovation and social equity, ensuring that extended reality experiences are accessible, meaningful, and adaptable across diverse heritage contexts. The approach combines immersive virtual environments with hands-on creative activities using recycled materials, fostering sustainability awareness and active engagement among school communities. By integrating WebXR platforms with inclusive design principles the research will create prototypes that meet accessibility standards and promote cultural participation for all. The methodology will be structured into co-design workshops with museums, educators, and user groups, followed by technical development and pilot implementations in schools and heritage sites. Evaluation will adopt mixed methods, including usability metrics, accessibility compliance, and qualitative feedback from vulnerable users and educators. The project will also deliver open-source toolkits, lesson plans, and reproducibility guidelines, enabling small institutions to adopt low-cost solutions. Expected outcomes include a validated framework for inclusive XR heritage experiences, scalable models for educational integration, and policy recommendations for sustainable digital heritage practices. By bridging immersive technology, circular economy principles, and participatory education, this research will contribute to advancement of inclusive digital

	transformation.