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ADVANCEMENTS OF THE H2IOSC PROJECT: INTRODUCTION TO THE SPECIAL SECTION AND KEY RESULTS

This third special section is dedicated to presenting the progress made by the CNR-ISPC research group on Open Data, Open Knowledge, and Open Science, active within the framework of the H2IOSC Project (Humanities and Cultural Heritage Italian Open Science Cloud), a few months ahead of its conclusion, scheduled for the end of October 2025. Funded by the European Union through the NextGenerationEU program and by the Italian Ministry of University and Research as part of the National Recovery and Resilience Plan (PNRR), the project was launched in November 2022 with the aim of establishing a federated cluster of the Italian nodes of the research infrastructures CLARIN, DARIAH, E-RIHS, and OPERAS within the ESFRI framework (European Strategy Forum on Research Infrastructures), with a focus on Social and Cultural Innovation.

As in the previous two editions (Caravale, Moscati, Rossi 2024 a, b), the contributions presented here stem from the activities of the Rome and Milan research units, which participated in three Work Packages: WP2 (Landscaping & Building Communities), WP4 (RIs Nodes and Resources Interoperability), and WP7 (Community Pilots: Innovative Cross-domain Services and Environments). The work was carried out in a coordinated, interdisciplinary manner, and in constant dialogue with the relevant scientific communities, achieving results that are both satisfactory and fully aligned with the goals set out in the infrastructure's work plans. These efforts have consistently aimed at increasing and enhancing the knowledge of digital resources in the fields of archaeology and epigraphy, and more broadly, Heritage Science, along with the assessment of tools designed to improve the findability and accessibility of such resources.

Two of the platforms developed from scratch during the project period are presented here, in addition to those already featured in previous issues of the journal (Heritage – Semantic Tools and Interoperability Survey, in Scarpa, Valente 2024; Open Digital Epigraphy Hub, in Rossi, Salvador 2024). The first, DHeLO (Digital Heritage Landscaping Platform – https://chloe.cnr.it/s/DHeLO/page/home), is dedicated to cataloguing digital products, tools, and research projects. It was initially developed using a MySQL relational database (Mancuso, D'Eredità 2024), and later evolved into an infrastructure based on Linked Open Data, thereby improving its interoperability and scalability thanks to the adoption of Omeka S – an open-source platform that ensures long-term flexibility and maintainability (Mancuso, in this special section).

The second platform, the Open Digital Archaeology Hub (https://openarchaeohub.cnr.it/), is an advanced digital archaeology platform developed – as

is the Open Digital Epigraphy Hub – as a pilot product of WP7. In the field of digital archaeology, it shares the objective of aggregating, integrating, and providing access to data, tools, and digital resources, offering unified interfaces to facilitate the discovery and analysis of scientific content. The ArchaeoHub in particular brings together heterogeneous resources such as scholarly texts, images, bibliographic metadata, datasets, interactive resources, and research projects, with a geographic access point as its core navigation feature. In this initial pilot phase, it primarily offers internal data derived from the textual, bibliographic, and visual repositories of A&C, integrated with information on freely accessible online digital resources. However, thanks to its modular and extensible architecture, the platform is designed to allow the integration of external archives from academic journals, research projects, and specialized institutions. In this perspective, it was submitted to the fourth and final (June 2025) free-of-charge Trans-National Access (TNA) Call as one of the services offered by H2IOSC for a diverse external user base (Caravale *et al.*, in this special section).

Alongside the presentation of tools developed specifically within the project, this special section also includes a reflection on a long-standing open-access digital archive, that was selected as an exemplary case study for the pilot on digital epigraphy. The contribution on the Digital Archive for the Study of pre-Islamic Arabian Inscriptions (DASI, https://dasi.cnr.it) illustrates how this archive, which currently contains critical editions of over 8500 inscriptions, has been renewed in line with the strategic guidelines of the E-RIHS infrastructure within H2IOSC, with the goal of expanding the range of digitized epigraphic resources and improving their representation and FAIRness (Rossi, in this special section).

This section also hosts critical reflections on some of the key topics promoted by H2IOSC, including semantic interoperability and the use of ontologies. In a still rather fragmented landscape, marked by limited standardization in data structuring, the CIDOC CRM model emerges as the most widely adopted ontology in the cultural heritage sector at the international level. Its specific features are highlighted here, particularly its ability to represent the complexity and nuances of cultural heritage information with fine granularity, while allowing for richly connected relationships between entities. At the same time, an evaluation is proposed of the challenges that this ontology poses for its practical use, especially in integrating heterogeneous data such as those in the domain of Heritage Science (Scarpa, in this special section).

In-depth knowledge of existing infrastructures in the field of Heritage Science is essential for developing effective strategies for data integration at both national and European levels, and for making the most of the outcomes produced by H2IOSC. From this perspective, the experience of ARIADNE

– Europe's archaeological data infrastructure – is examined. ARIADNE stands out for its role as an intermediary among data providers, offering an environment in which heterogeneous resources from various institutions can be linked, uniformly described, and made accessible within a common framework. The analysis, based on queries conducted on the resources' administrative metadata through ARIADNE's SPARQL End Point, reveals chronological and spatial trends in the aggregation of resources within the infrastructure (Valente, in this special section).

The opening contribution to this special section (Caravale, in this special section) is dedicated to another dimension of open-access resources that H2IOSC has promoted and enhanced: the publishing domain. It is explored through the experience of A&C, which, as a diamond open access journal, represents a virtuous model of scholarly publishing, contributing to the open dissemination of research in the field of digital archaeology. Its continuity over time and its multilingual editorial policy confirm its vitality within the current framework of open data strategies for research dissemination through digital infrastructures and cloud-based systems. Against the criticisms often levelled at the long-term sustainability of projects developed within the Digital Humanities, it is encouraging to see the positive responses offered by solid research foundations. Through the pages of the journal, one can trace the natural evolution of projects initiated in the last century that remain robust and effective today, thanks to the adoption of logical models for data structuring and representation that have endured and adapted to technological changes.

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