



The Role of CRIS in Advancing FAIR and Open Science Practices

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Abstract

This paper presents the evolution of Open Science practices at Iscte – Instituto Universitário de Lisboa, documenting the transition from an established Open Access framework to a comprehensive, institution-wide approach encompassing research data management, interoperable infrastructures, and research assessment reform. We describe the design and implementation of an integrated system landscape connecting Zenodo, the institutional Current Research Information System (CRIS), and the Institutional Repository, demonstrating how this architecture ensures FAIR compliance while maintaining interoperability with national and international infrastructures such as RCAAP and OpenAIRE. Our findings suggest that the CRIS, through the project page, serves not merely as an administrative tool but as a strategic instrument for aggregating research outputs and supporting responsible research assessment.

1 Introduction

Over the past five years, Open Science at Iscte has evolved from a long-standing commitment to Open Access into a comprehensive, institution-wide framework. While Open Access has been formally embedded in institutional practice since 2009, with an updated policy adopted in 2015, more recent developments have focused on strengthening the management, sharing, and reuse of research data in alignment with national and European Open Science priorities.

A pivotal milestone in this evolution was the approval of the Research Data Management and Sharing Policy in 2023 (Iscte, 2023), which consolidated institutional practices around data governance, research ethics, and the FAIR principles - Findability, Accessibility, Interoperability, and Reusability. This policy builds upon a mature technical ecosystem that includes the institutional repository, operational since 2006, and the CRIS, *Ciência_Iscte*, which became interoperable with the repository in 2013 and, more recently, with the Zenodo research data repository. This interoperability

enables the linking of research outputs, including scientific publications, research data, and data management plans, to corresponding funding grants in a manner fully compatible with OpenAIRE.

2 Technical Infrastructure and Workflows

The interoperability between *Ciência Iscte* and the Institutional Repository (IR) enables the seamless export of both metadata and full-text documents from the CRIS to the IR. When uploading a publication in PDF format, authors receive guidance regarding which version is permitted for deposit according to publisher policies. The deposit process is initiated through the "send to Repository" function, at which point Library staff validate the metadata, verify associated persistent identifiers, and confirm the appropriateness of the deposited version (Amante et al., 2014).

The workflow for depositing research data is considerably more complex, reflecting the coordination required across multiple institutional services. In addition to the Library, this process involves the Research Support Office (RSO), the Information Systems Development Service (ISDS), and the Rectorate. The design of this workflow ensures compliance with the FAIR principles at every stage (Inácio et al., 2023).

For research data management, Zenodo was selected as the primary repository due to several strategic advantages: its reliance on open-source software, its maintenance by CERN in collaboration with OpenAIRE, its native compliance with FAIR principles, its infrastructure for generating persistent identifiers (DOIs), and its REST-based Application Programming Interface (API) that permits external systems to create, update, and retrieve deposited resources.

3 System Integration Architecture

A system integration was established between *Ciência Iscte*, Zenodo, and the Institutional Repository through a carefully designed technical architecture. The initial implementation involved creating procedures that enable *Ciência Iscte*, via the Zenodo API, to retrieve information about research data deposited on the platform by *Iscte*'s researchers. This integration supports the transfer of deposited resource metadata (including title and authors), the import of data files, the establishment of links with publications and projects, and the automatic association of publicly shareable information with researchers' profiles (Boavida, 2025).

Within the Institutional Repository, a dedicated collection was created for research data, complemented by collections within each repository community to support record mapping and the aggregation of information from external sources. A dedicated metadata template was developed to meet the requirements of an information catalogue, incorporating fields deemed essential for optimal dataset characterisation while ensuring that the information functions as an endpoint for data initially entered in Zenodo. A specific document type for research data description was also implemented at both repository and community levels.

4 Operational Process

From an operational standpoint, the process commences when a researcher deposits research data on the Zenodo platform. For monitoring purposes (including verification of compliance with funder requirements and practices outlined in data management plans) the Research Support Office receives a notification of the deposit and subsequently informs the Library, which assumes responsibility for record curation. To streamline researchers' work and ensure maximum compliance with the

descriptive requirements of both the CRIS and the Repository, a suite of support resources for data deposit was developed (Iscte, 2025).

Research Data Import

In this section you can import research data originating from the [Zenodo](#) system. You can choose to import the data via an ORCID or via a specific DOI from a Zenodo research data record. Choose the appropriate option below.

Using this method, a search will be performed for all existing research data in Zenodo associated with an ORCID. Specify the ORCID in the text box below.

ORCID

Search

Using this method, a search for a specific research data record will be performed using a DOI. Specify the DOI in the text box below.

DOI

Search

Figure 1 - Importing research data records from Zenodo into the CRIS

Following validation, records become available for import via the CRIS using either the DOI or the authors' ORCID identifiers (Figure 1). At this stage, it becomes possible to complete, through association, certain fields that are not present in Zenodo, such as related projects or publications, Sustainable Development Goals, or Fields of Science and Technology (FOS) classifications. The Library then subsequently exports the metadata records to the Institutional Repository through the existing connection between the Repository and the CRIS, which is also utilised for scientific publications. This Zenodo → CRIS → Institutional Repository linkage ensures data consistency across systems, as information is entered only once in Zenodo and subsequently transferred to other systems without modification of the original metadata.

By aggregating all research outputs resulting from a given project, this integrated Zenodo-CRIS-IR axis assumes particular significance in promoting and realising FAIR and Open Science principles. Each project record in *Ciência_Iscte* generates a dedicated project page that aggregates all relevant information, including the project description, funding details, and links to researcher profiles. Furthermore, each page consolidates the list of publication outputs (Figure 2), related research data records (Figure 3), and the project's data management plan (Figure 4).

Project Fundings

Reference/Code	Funding DOI	Funding Type	Funding Program	Funding Amount (Global)	Funding Amount (Local)	Begin Date	End Date
HORIZON-HLTH-2022-IND-13	--	Contract	European Commission - Horizon Europe	1972260.75	193176.25	2023-01-01	2024-12-31

Publication Outputs

Year	Publication Type	Full Reference
2025	Review article	Martins, D., Lewerenz, S., Carmo, A. & Martins, H. (2025). Interoperability of telemonitoring data in digital health solutions: A scoping review. <i>Frontiers in Digital Health</i>. 7
2024	Scientific journal paper	Lewerenz, S., Martins, D. & Martins, H. (2024). Assessing cross-border telemedicine data exchange in the European Union: A call to action. <i>Telemedicine and e-Health</i>. 30 (11), 2759-2762

Figure 2 - Example of partial information on project's page in the CRIS (project fundings and related publications)

Related Research Data Records			
DOI	Title	Type	Publication Date
10.5281/zenodo.15488563	FHIR IG - XpanDH Project Common IG: Initial release	Software	2025-05-22
10.5281/zenodo.15488582	FHIR IG: XpanDH-Laboratory Results: Initial release	Software	2025-05-22
10.5281/zenodo.15488588	FHIR IG: XpanDH-Medication (e)Prescription and (e)Dispensation: Initial release	Software	2025-05-22
10.5281/zenodo.15488586	FHIR IG: XpanDH-Patient Summary: Initial release	Software	2025-05-22
10.5281/zenodo.15041095	XpanDH X-Bundle assets	Dataset	2025-03-17

Figure 3 - Example of partial information on project's page in the CRIS (related research data records)

Project Files		
File Type	Description	File Size
Data management plan	20230427_XpanDH_DI.3_v1.0.pdf	303 KB

Figure 4 - Example of partial information on project's page in the CRIS (project files)

5 Impact on Research Assessment

Beyond its external Open Science-oriented functions, the CRIS also serves a vital internal role within the institution. Research center staff have access to project data through the system's administrative backoffice, which enables them to generate comprehensive reports consolidating all research information required for assessment purposes. This dual functionality – serving both the transparency objectives of Open Science and the operational needs of internal research management – underscores the strategic value of the CRIS as a central hub for institutional research intelligence. By providing research center managers with the tools to monitor, analyse, and report on research activity, the system supports informed decision-making at multiple organisational levels while reducing administrative burden through automated data aggregation.

The impact of this integrated approach lies in fostering accountable research assessment, operationalising Iscte's Research Data Policy through active engagement of the scientific community and advancing Open Science more broadly. We recognise that it is essential to establish attractive mechanisms that encourage and reward policy compliance, alongside the provision of financial and infrastructural resources necessary to support these practices.

Iscte has explicitly incorporated Open Science indicators into its evaluation regulations, notably data management plans, datasets, and publications in Open Access journals following the Diamond Open Access model. Crucially, these activities have been integrated into the institution's performance evaluation framework: researchers receive formal recognition and credit for engaging in open science practices, including dataset sharing and publication, as well as making their work available through Open Access channels. This incentive structure represents a deliberate institutional effort to promote behavioural change by aligning individual career advancement with broader Open Science objectives. While these indicators are currently quantitative in nature, the institution is actively exploring approaches to assess quality and impact, drawing upon frameworks such as SCOPE and those developed by FAIRsFAIR and the Research Data Alliance.

6 Institutional Framework and Alignment

The institution has established a comprehensive framework that embeds these practices through its strategic plan and a set of supporting policies. These are operationalised through defined workflows, procedures, and dedicated infrastructures, ensuring consistent and coordinated implementation across the institution.

This framework is aligned with key international and national initiatives, including the Coalition for Advancing Research Assessment (CoARA), the European Open Science Cloud (EOSC), and the Human Resources Excellence in Research Award. At the national level, alignment is ensured through active engagement with the Re.Data consortium and with FCT/FCCN, the national funding and digital services agency. This approach is expected to contribute to a gradual shift towards more transparent, collaborative, and responsible research practices, particularly among early-career researchers and project-based teams.

Looking ahead, Iscte remains strongly committed to improving its infrastructure to better meet researchers' needs through the adoption of open and sustainable solutions. The institution is currently developing and implementing a strategy for handling sensitive data while preserving the core principles of Open Science, balancing maximum knowledge sharing with essential protections for privacy, commercial interests, security, and intellectual property. This strategy also encompasses the responsible use of artificial intelligence and the promotion and safeguarding of research integrity.

7 Conclusions

This paper has illustrated the design of an integrated system landscape that maintains interoperability with national infrastructures, such as RCAAP, and international ones, such as OpenAIRE. We have demonstrated that the CRIS, through the project page, transcends its role as a purely administrative system to become a strategic instrument for aggregating research outputs in a unified space, enabling FAIR and Open Science practices, and supporting responsible research assessment. The Zenodo-CRIS-Institutional Repository architecture presented here offers a replicable model for institutions seeking to strengthen their Open Science infrastructure while ensuring compliance with evolving national and international requirements.

References

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