



Digital Repository of Ireland

Notes Before Completing the Application

We have read and understood the notes concerning our application submission.

True

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

Reviewer 3

Comments:

CORE TRUSTWORTHY DATA REPOSITORIES REQUIREMENTS

Background & General Guidance

Glossary of Terms

BACKGROUND INFORMATION

Context

R0. Please provide context for your repository.

Repository Type. Select all relevant types from:

Domain or subject-based repository, National repository system; including governmental, Archive, Research project repository

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Reviewer 3

Comments:

Accept

Brief Description of Repository

The Digital Repository of Ireland is a national digital repository for Ireland's arts, humanities, social sciences, and cultural heritage data.

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Reviewer 3

Comments:

Accept

Brief Description of the Repository's Designated Community.

DRI's designated community is composed of our members, whose collections are stewarded by DRI, as well as end-users of DRI's open access data that span across research, education, the cultural sector, and the general public. Membership is open to Research Performing Organisations and institutions, organisations and digital archives who hold humanities, social sciences or cultural heritage data. As of 2020 DRI has 22 members, which include universities, archives (including the National Archives of Ireland), the National Library of Ireland and other organisations holding digital collections of contemporary and historical interest, or research data in the domains served by DRI.. Core academic institutions continue to manage the repository and implement its policies, guidelines and training. These are the Royal Irish Academy (RIA), Trinity College Dublin (TCD) and Maynooth University (MU). End-users are academic researchers

or educators and the general public. Members' collections are accessible to end users via the DRI web interface. DRI supports and promotes the approach of 'as open as possible, as closed as necessary,' in that the majority of collections are available to the general public. A small selection of digital assets are restricted to research and teaching use only, but their metadata remains open via the web interface. The end users for restricted data are mostly academic researchers or educators, particularly those who use qualitative social scientific data.

Reviewer Entry

Reviewer 1

Comments:
Accept

Reviewer 2

Comments:
Accept

Reviewer 3

Comments:
Accept

Level of Curation Performed. Select all relevant types from:

B. Basic curation – e.g. brief checking; addition of basic metadata or documentation, D. Data-level curation – as in C above; but with additional editing of deposited data for accuracy

Reviewer Entry

Reviewer 1

Comments:
Accept

Reviewer 2

Comments:
Accept

Reviewer 3

Comments:
Accept

Comments

DRI distributes responsibility, including data preparation and ingest, to depositing members (1). This responsibility is supported by our well documented processes and training programmes (2). This activity gives stakeholders high levels of autonomy and control over the ingest (or deposit) process. To maintain high standards of data deposit, membership is underpinned by a suite of legal agreements, as well as training and skill sharing within and among the community of DRI partners. DRI's automated processes reject deposits which are not associated with metadata prepared to one of DRI's supported international standards. DRI also operates research projects that actively build new collections; for these, data are curated to a high standard.

(1) DRI Collection Policy 2020, <https://doi.org/10.7486/DRI.kk91v774c> Accessed 25th June 2021

(2) <https://www.dri.ie/about/guide-to-deposit>

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Reviewer 3

Comments:

Accept

Insource/Outsource Partners. If applicable, please list them.

The DRI uses the DataCite service via a membership with the British Library to both mint and store the DOIs (Digital Object Identifiers) for ingested digital objects. As a national infrastructure for digital preservation and digital archiving in the social sciences and humanities, the DRI plays an important role in convening, educating, and building the data preservation community in Ireland. To do this well, DRI is actively involved in a number of global networks. For example, DRI is an official partner in the Samvera project - a community based, widely supported open-source repository solution, as well as an implementer and contributor to the IIF community. DRI is also a partner in the Research Data Alliance Europe project, a member of the Digital Preservation Coalition, a member of the Coalition of Open Access Repositories (COAR), and a Supporter of the CARARE Association, and a contributor via the EOSC FAIR working group to the formation of the European Open Science Cloud.

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Reviewer 3

Comments:

Accept

Summary of Significant Changes Since Last Application (if applicable).

DRI introduced a paid membership model for depositors in February 2018. The revenue from this supplements the core funding we receive from the Department of Education and Skills. We have two membership categories: Full and Associate. More information on our membership fees can be found here:

<https://www.dri.ie/membership-fees>

In 2019 the DRI became an accredited Europeana Aggregator. This allows DRI to send metadata to the Europeana platform where Irish material can be discovered and viewed in a European context. This broadens the designated community to include the Europeana Network and the broader European public.

The income stream of core funding for the DRI was increased by DRI's funders in 2019, and in 2020 the post of National Open Research Coordinator was placed at the DRI, acknowledging DRI's leadership and national influence in open and FAIR data practices.

Since the last application, DRI joined COAR, the Coalition of Open Access Repositories. DRI has also formally endorsed Ireland's National Framework on the Transition to an Open Research Environment and the TRUST Principles.

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Reviewer 3

Comments:

Accept

Other Relevant Information.

Supporting Documentation:

National Framework on the Transition to an Open Research Environment:

http://norf-ireland.net/wp-content/uploads/2019/07/NORF_Framework_10_July_2019-2.pdf

The TRUST Principles - and RDA Community Effort: <https://www.rd-alliance.org/trust-principles-rda-community-effort>

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Reviewer 3

Comments:

Accept

ORGANIZATIONAL INFRASTRUCTURE

1. Mission/Scope

R1. The repository has an explicit mission to provide access to and preserve data in its domain.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 3

Comments:

4 – The guideline has been fully implemented in the repository

Response:

The DRI mission statement is part of DRI's business plan, which has been approved by DRI's funders – the Department of Education and Skills, via the funding mechanisms of the Higher Education Authority and the Irish Research Council – and by DRI's governance bodies - the Management team and the founding Board.

The DRI Mission Statement is as follows:

The Digital Repository of Ireland is a trusted national infrastructure for the preservation, curation and dissemination of Ireland's humanities, social sciences, and cultural heritage data. (1)

The DRI Vision Statement is as follows:

The Digital Repository of Ireland is a national service for the long-term digital preservation of Ireland's humanities, social science, and cultural heritage resources.

DRI is a trusted digital repository (TDR), providing online access to a wealth of digital resources across multiple domains for students, scholars and the public.

DRI actively engages in the development of policy, and is an internationally recognised leader in digital archiving and repository infrastructure .(1)

The DRI's mission statement is implemented by the provision of the DRI Repository, its governance frameworks and service level agreement with the Department of Education and Skills, policies and workflows developed by DRI, the partnerships with content owners, and an active and broad education and outreach programme. The DRI's comprehensive education and outreach program includes training courses, seminars, workshops, conferences and fact sheets, detailed metadata guidelines, user guides and other publications. A full list of publications can be found <https://repository.dri.ie/catalog/3b591898r>.

A full list of events can be found at <http://www.dri.ie/events>.

(1) <https://www.dri.ie/about-dri> Accessed 6th February 2020

Supporting Documentation:

DRI Factsheet No. 4: Long-term Digital Preservation (April 2014): <https://doi.org/10.7486/DRI.rr17fc082-1>

Digital Repository of Ireland. Digital Archiving in Ireland: National Survey of the Humanities and Social Sciences, Digital Repository of Ireland [Distributor], Digital Repository of Ireland [Depositing Institution], DOI: 10.7486/DRI.5m614676f: <https://doi.org/10.7486/DRI.5m614676f-1>

About DRI: <https://www.dri.ie/about-dri>

Digital Repository of Ireland Publications: <https://doi.org/10.7486/DRI.3b591898r>

DRI Events: <http://www.dri.ie/events>

All URLs visited on 6th of February 2020 unless marked otherwise.

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Reviewer 3

Comments:
Accept

2. Licenses

R2. The repository maintains all applicable licenses covering data access and use and monitors compliance.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:
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Reviewer 3

Comments:
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Response:

The roles and responsibility of depositors and the Repository are clearly outlined in the Organisational Manager Agreement and in Deposit Terms & Conditions (see below). Within our federated membership structure these agreements assert that it is the Depositor's responsibility to apply the appropriate licenses to the data and the Repository's responsibility to ensure these licenses are displayed within the system. DRI applies licensing information at the object level and this displayed along with the object metadata.

The DRI Breaches Procedure outlines the DRI response to instances of noncompliance with conditions of access and use (this is not a public document and is available on request).

The repository uses End User Licenses governed by the laws and jurisdiction of the Republic of Ireland (see End User Licenses). Our Restricted Data policy outlines that we archive social scientific data pertaining to human subjects which may require both restricted access and anonymisation. Our End User licenses therefore also contain clauses which pertain to restricted-use (confidential) data.

The Digital Repository of Ireland supports the principles of Open Access, and in recognition of this, content published on the Digital Repository of Ireland's informational website (www.dri.ie) is licensed under Creative Commons Attribution 4.0 International (CC BY 4.0), unless otherwise stated. Content on this informational site which is not covered by this licence is clearly marked with the appropriate licence or copyright statement. All metadata in the Repository is publicly accessible and licensed under a Creative Commons CC-BY or CC0 licence.

The Digital Repository of Ireland publishes content in the DRI repository which has been deposited by DRI members. The DRI would not own or have not created, and cannot assign a licence to this content. This content may include photographs, scanned archival documents, videos and publications. In cases where the DRI does not have permission to assign a licence to content, this content is clearly marked with the appropriate licence or copyright statement by the members who have ingested the content.

In order to deposit data within DRI, members must sign a legal agreement which confers upon them the responsibility to add copyright and license statements to the digital objects. The online data deposit infrastructure additionally prompts depositors to add copyright and a license statement at the point of ingest. Depositors may choose from a drop-down menu of Creative Commons licences or where appropriate add their own license statement. Finally, on depositing collections, all depositors are required to agree to a Terms and Conditions statement which asserts that they have applied the correct copyright and license statements to the objects within the collection. The End Use Terms and Conditions mandate that users must agree to abide by the terms of this license. For more information see the Factsheet on Copyright, Licensing and Open Access.

Where there is a suspected licence breach we follow our Notice and Action Policy and associated Notice and Action Procedure.

Supporting Documentation

DRI Organisational Manager Agreement (March 2018): <https://doi.org/10.7486/DRI.zk527x75s>

DRI Deposit Terms and Conditions (Jan. 2018): <https://doi.org/10.7486/DRI.1544r4085>

DRI Factsheet No. 2: Copyright, Licensing, and Open Access (Feb 2014): <https://doi.org/10.7486/DRI.rb699s72v>

DRI Restricted Data Policy (Amended 2019): <https://doi.org/10.7486/DRI.8623xk58w>

DRI Factsheet Metadata and the DRI (Amended 2019)

<https://doi.org/10.7486/DRI.bz60sj10d>

DRI End User Terms and Conditions (Amended March 2020): <https://doi.org/10.7486/DRI.4b29qt95d>

DRI Notice and Action Policy (Jan 2014): <https://doi.org/10.7486/DRI.vh5499702>

DRI Position Statement on Open Access for Data (2014): <https://doi.org/10.7486/DRI.vx02dw063-1>

National Principles for Open Access Policy Statement:

<https://doi.org/10.7486/DRI.w376gn74s>

All URLs visited on 2nd July 2020 unless marked otherwise.

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Reviewer 3

Comments:

Accept

3. Continuity of access

R3. The repository has a continuity plan to ensure ongoing access to and preservation of its holdings.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 3

Comments:

4 – The guideline has been fully implemented in the repository

Response:

DRI seeks to preserve digital objects and maintain their long-term usability in accordance with DRI's preservation strategy.

The DRI is a purpose-funded trustworthy digital repository that is focused on long-term preservation. It operates a business model with a number of income streams, including the Irish government, research project funding, European Commission project funding, philanthropic funding, membership fees and some consultancy and training.

The funding from the Irish government supports a core complement of staff that enable the repository to function while staffing levels may change on additional project-funded aspects. The Digital Repository of Ireland is named as a key national infrastructure in the Department of Business, Enterprise and Industry Innovation 2020 strategy on research and development (1), and as of September 2020, DRI became the home for Ireland's National Open Research Coordinator, who is tasked with creating a roadmap for the implementation of open research/open science in Ireland. The DRI is funded via a service level agreement with the Department of Education, and this SLA is renewed periodically.

DRI's core funding is augmented by the acquisition of research project funding, as well as a revenue-generating membership scheme, launched in February 2018. This membership scheme focuses on increasing the volume of material deposited in the archive, but also the diversity of membership. This contributes to the overall sustainability of the repository by raising revenue which can be reinvested in the repository and regular engagement with our members ensures we are meeting the long-term needs of the humanities and social sciences in Ireland.

With a view to the longer-term, DRI is collaborating directly with a number of large state institutions in Ireland to provide expertise, and potentially, preservation as a service to core bodies. This furthering of DRI's 'embeddedness' in the wider Irish data infrastructure complements DRI's long term sustainability, and by extension, the security of the data over the long term.

Relocation or transition of activity

The legal agreements signed by depositors grants to the repository the right to assign its benefits, rights and obligations to a third party in a situation where it is necessary. Should DRI funding cease, the repository partners would determine a final location for the repository and its deposited data, either at one of the partner's institutions, or at one of the many institutions that DRI partners with, such as the National Library or the National Archives (both legally mandated heritage institutions). The repository and national infrastructure that constitutes DRI is maintained by three national partners with technical and domain expertise in digital archiving: the Royal Irish Academy, Trinity College Dublin and Maynooth University. The repository's servers and digital expertise are located in Trinity College Dublin, with test, training and backup servers located in Maynooth.

Should any depositor voice dissatisfaction with this plan, the DRI's partner institutions, in collaboration with owners/depositors, would provide download access to their data and its deletion from the DRI Repository thereafter. This is also outlined in the Organisational Manager Agreement, which must be signed before any data is deposited.

(1) <https://enterprise.gov.ie/en/Publications/Publication-files/Innovation-2020.pdf> p.47 Accessed 14th February 2014
Supporting Documentation

DRI Factsheet No. 5: About DRI Membership (April 2016): <https://doi.org/10.7486/DRI.rv04g792m>

DRI Factsheet No. 4: Long-term Digital Preservation (April 2014): <https://doi.org/10.7486/DRI.rr17fc082-1>

About DRI: <https://www.dri.ie/about-dri>

DRI Board: <http://www.dri.ie/dri-management-board>

DRI Membership Policy: <https://doi.org/10.7486/DRI.0574f668r>

DRI Organisational Manager Agreement (March 2018): <https://doi.org/10.7486/DRI.zk527x75s>

All URLs visited on 2nd July 2020 unless marked otherwise.

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Reviewer 3

Comments:

Accept

4. Confidentiality/Ethics

R4. The repository ensures, to the extent possible, that data are created, curated, accessed, and used in compliance with disciplinary and ethical norms.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 3

Comments:

4 – The guideline has been fully implemented in the repository

Response:

The DRI policy manager is a trained social scientist with extensive expertise in best practice in archiving and managing social science data. Guidance on consents, confidentiality and anonymisation is provided where required by the policy manager and the Irish best practice organisation in qualitative social science data, the Irish Qualitative Data Archive (1).

The depositing organisation is assessed before becoming a member and signs legal documentation asserting that a full and correct package will be deposited (see Membership Policy and legal agreements below). The depositing organisation and other affiliated organisations are captured on ingest and the information is displayed with the digital objects (see How To DRI: Publishing your DRI Collection).

In addition to the digital objects, associated assets and contextual information may be deposited where applicable. Depositors are requested to submit contextual information according to the rules and ethics of the individual disciplines. These additional documents provide information on the data creation process and additional information on the digital objects which allows future researchers to understand more fully the digital objects. Where the digital objects are generated in research conducted on people the depositor is asked to include details of the legal or ethical approval obtained. These contextual documents are publicly available. The How to DRI: Contextual Information guide outlines the types of documentation which would be useful for the depositor to include with their contextual information documents along with information on how to deposit them within the system.

DRI supports a range of access controls to data. These are outlined below and in the Restricted Data Policy which gives guidance on data with disclosure risk as does the Guide to Research Data Management Plans. All users are required to agree [via a tick box] with the standard End User Terms and Conditions.

Public access data/ unrestricted data:

This level of access applies to all metadata in the Repository (and can also apply to objects and collections). Users are required to agree [via a tick box] with the standard End User Terms & Conditions. Registration is not required.

Unregistered users are able to view the metadata and public access/unrestricted assets.

In order to safeguard certain kinds of data, especially those generated through research carried out with human subjects, DRI will allow for the imposition of two different types of data restriction. We will follow these definitions:

Safeguarded data/ Standard access: Users are prompted to agree [via a tick box] with the standard end user agreement. Registration is required in order to be able to view the data.

Safeguarded Data/ Special Conditions: Some data collections are subject to additional conditions of access. Users are prompted to agree [via a tick box] with the standard end user agreement. Registration is required in order to be able to view the data. Users will have to meet further special conditions. These special conditions include one and/or more of:

- The user must wait until an embargo period has expired, i.e. data only available after a time period.
- The user completes a Special Condition Data Access form provided by the system.
- Additional special conditions: the user must be manually approved by the depositor who will ensure that the user meets the additional special conditions.

The Repository application allows the depositor to set access restrictions on their data. Data can be available to the public, to logged-in users only, or restricted to named individuals (see the Restricted Data Policy). These access restrictions are implemented via a custom user and groups code library developed by DRI which stores the permissions as technical metadata alongside each object or collection (this technical metadata can be accessed only by the developer team). Users may request access to data via the web interface.

On accessing data with access restrictions a user is reminded not to share the data. End-users additionally only obtain access on acceptance of End User Terms and Conditions which places legal restrictions and responsibilities on data use. End User Terms and Conditions are displayed when a user visits the Repository for the first time (stored in a cookie), and also on the DRI web page on the policy section of our publications page. Data is distributed via an ssl connection to ensure security while in transit to the user. Where there is a suspected breach we follow our Restricted Data policy and associated Breach procedure (this internal workflow is not available publicly). Our staff have expertise dealing with data with a disclosure risk.

The responsibility for curation and review of higher-risk and sensitive data, as outlined in the Organisational Manager agreement and deposit agreement, lies with our members who deposit data to DRI. DRI members joining DRI also undertake to deposit data in accordance with our Restricted Data Policy, ensuring that appropriate ethical approval and consents have been obtained. Where it is necessary our Policy Manager works closely with our members to advise them on best practice and provides protocols and training. DRI therefore does not directly review and curate our members data, rather we advise and provide training (where required) to assist our members to meet their ethical and legal commitments,, in particular those outlined in D3 of the Deposit Terms and Conditions 'the depositor will ... ensure that in the case of research data with human subjects that consents collected are ethically and legally appropriate and sufficient to allow deposit to DRI'.

Currently all our restricted data is deposited by the member organisation the Irish Qualitative Data Archive (IQDA). The IQDA works closely with the researchers who are providing their research data to the archive, advising them on

anonymisation processes, GDPR and ethical approval processes and ensuring sufficient consents are deposited with the data sets. It is best practice to also deposit a sample of the consent form with the data set.

(1) <https://www.maynoothuniversity.ie/iqda> Accessed 25th February 2020

Supporting Documentation

DRI Factsheet No. 5: About DRI Membership: <https://doi.org/10.7486/DRI.rv04g792m>

DRI Restricted Data Policy (Amended 2019): <https://doi.org/10.7486/DRI.8623xk58w>

DRI End User Terms and Conditions (Amended March 2020): <https://doi.org/10.7486/DRI.4b29qt95d>

DRI Membership Policy (August 2016): <https://doi.org/10.7486/DRI.sj13pg90x>

DRI Organisational Manager Agreement (March 2018): <https://doi.org/10.7486/DRI.zk527x75s>

DRI Deposit Terms and Conditions (Jan. 2018): <https://doi.org/10.7486/DRI.1544r4085>

How to DRI: Protect Your Data (June 2015): <https://doi.org/10.7486/DRI.t148tz10k>

How to DRI: Publishing your DRI Collection: <https://doi.org/10.7486/DRI.t435vt94n>

How to DRI: Contextual Information: <https://doi.org/10.7486/DRI.sn00qc64j>

DRI Guide to Research Data Management Plans

<https://dri.ie/research-data-management-plans>

All URLs visited on 1st of July 2020 unless marked otherwise

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Reviewer 3

Comments:

Accept

5. Organizational infrastructure

R5. The repository has adequate funding and sufficient numbers of qualified staff managed through a clear system of governance to effectively carry out the mission.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 3

Comments:

4 – The guideline has been fully implemented in the repository

Response:

DRI is constituted by three long-established and respected partner institutions with expertise in key areas of archiving, repository infrastructure, and HSS domains: the Royal Irish Academy (est. 1785), Trinity College Dublin (est. 1592) and Maynooth University (est. 1795). DRI staff are located across these three institutions with each institution and staff member providing unique experience and access to a wider group of experts who actively support work undertaken by DRI. The repository is hosted on servers in Trinity College Dublin with backup servers in Maynooth University and supported by software developers and systems administrators in Trinity College Dublin. The Policy Manager is based in Maynooth University. The Director, Digital Archivist, Education and Outreach Manager and Programme Manager are based in the RIA, and are supported by additional, project-based staff recruited to expand DRI capacity while contributing to core work. Institutional IT departments provide access and support to email, networking and other IT support services for staff.

As discussed in more detail in Section 3, the DRI has a core funding stream from Ireland's Department of Education and Skills, which is approximately doubled by additional income from projects and fees. The core funding stream by the government supports the key roles required to keep the repository and services running at a good standard, thereby ensuring continuity in the face of unexpected revenue shifts in the other income streams. The key roles funded by the Department of Education and Skills are: Director, Programme Manager, Digital Archivist, Education and Outreach Manager, Policy Manager, System Developer and Systems Administrator. In the five years since this funding agreement was made, it has become clear that these roles sufficiently ensure business continuity, support operations, governance and financial administration, provide expertise in archiving and technical infrastructure maintenance and development, progress and maintain policy alignment to best practice, ensure sufficient training and membership support is provided, and support the repository's technical infrastructure. Currently, the government is also directly funding the post of National Open Research Coordinator at DRI, which further embeds DRI into the national RDM landscape.

DRI has a strong history of seeking and winning additional project funding, from research grants (eg H2020, national

funding) and philanthropic sources. DRI's robust involvement in international networks creates ongoing possibilities for future funded partnerships.

The principal governance structure of the DRI is the Board. The DRI Board is comprised of members from across the Irish Archiving, Digital, Education and Cultural sectors who provide advice on the implementation of DRI's core activities and future endeavours. The principal management mechanism of the DRI is the Management Team (MT). The MT is responsible for the day-to-day operational management of the DRI in addition to overseeing requirements and developing the DRI strategy. The MT is comprised of the DRI Director (Chair), the DRI Programme Manager (both based in RIA), and senior staff from TCD and Maynooth University.

The Digital Repository of Ireland is a repository and research organisation with staff working in a wide range of domains, covering its governance, management, operational structure, implementation areas and task-forces. Staff members draw from a wide variety of backgrounds, including qualified archivists, librarians, social scientists, scholars of arts and culture, , historians, Irish language scholars, legal advisors, project management professionals, education and outreach specialists, software engineers, system administrators and information and data management professionals (for more information see <http://dri.ie/dri-team>).

In addition to this, experts from a wide range of institutions and sectors provide input to DRI activities through DRI's Board, Management Team, individual task forces, and Member Forum, including the Irish Film Archive, the Irish Research Council, National Library of Ireland, PRONI, DCU and University College Cork.

DRI is a member of a number of organisations dedicated to digital archiving, digital preservation, cultural heritage preservation, open access, and data sharing. Membership in these groups provides DRI staff training opportunities (often prioritised or at reduced/no fees), as well as priority access to best practice reports, new initiatives, and learning collaborations. These groups include the Digital Preservation Coalition, the Association of Archives and Records UK and Ireland, the Coalition of Open Repositories, the Research Data Alliance, Open Repositories. DRI's core funding includes a small budget for travel which facilitates staff training, conferences attendance and travel for work. Staff are also provided with training by the institutions where they reside.

Supporting Documentation:

DRI Board: <http://www.dri.ie/dri-management-board>

DRI staff and expertise: <http://dri.ie/dri-team>

Management Team (MT): <http://dri.ie/core-implementation-team>

DRI Management Board Biographies: <http://www.dri.ie/new-dri-board>

Royal Irish Academy: <https://www.ria.ie/>

Trinity College Dublin: <http://www.tcd.ie/>

Maynooth University: <https://www.maynoothuniversity.ie/>

All URLs visited on 1st July 2020.

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:
Accept

Reviewer 3

Comments:
Accept

6. Expert guidance

R6. The repository adopts mechanism(s) to secure ongoing expert guidance and feedback (either inhouse or external, including scientific guidance, if relevant).

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository

Reviewer 3

Comments:
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Response:

Unlike other organisations that seek to certify a repository that is part of their activity, DRI's core activity is operating a repository, hence its staff are experts in the various aspects of repository development, as detailed in the previous section. Beyond staff resources, the DRI actively accesses a wide variety of experts from a number of sources and perspectives:

Management Team (MT) and Co-opted Advisors: MT, DRI's management team consists of senior experts from the institutions that employ DRI staff, and these experts contribute formal feedback, via monthly meetings and regular review processes, to staff. Any significant decisions or queries from day to day operations are put to MT for discussion and approval.

In addition to MT, DRI has formally co-opted expert advisors from external organisations to advise in particular areas. For

example, one of Ireland's leading experts on copyright law, Barrister-at-Law and Associate Professor of Law Eoin O'Dell (based at Trinity College Dublin), is DRI's legal advisor. Additional expertise is contributed via participation on DRI Taskforces, including the Metadata Taskforce, Sustainability Taskforce, Members Taskforce, Business Records Taskforce, Trusted Digital Repository Taskforce and UI/UX Taskforce, who have invited individuals from relevant member and partner institutions to advise on specific areas of development (see <https://www.dri.ie/about-dri> for more information).

Additionally, DRI's Board includes senior executives in digital preservation, cultural heritage, Open Science, national archives and records, digital humanities and social sciences from across Higher Education, Cultural and Government sectors on the island of Ireland.

From 2011 to 2015, the DRI convened an International Advisory Group to provide input on strategy and policy issues. This body is currently being restructured to form an Expert Advisory Group (EAG) with experts drawn from both national and international groups with recognised expertise in a range of relevant areas.

Beyond these organisational structures of expertise, DRI is actively involved in a number of organisations, international infrastructures, networks and alliances that build, share and disseminate best practices in digital archiving, digital preservation, FAIR data sharing and sustained access.

At the national level, DRI has access to experts and early knowledge of relevant developments via membership in a number of fora and advisory committees. The Director is part of the Core Oversight Group of the National Open Research Forum, is on the the National Archives Advisory Council, and the DARIAH Ireland Steering Group.

Internationally, DRI is involved in large networks of expertise and knowledge transfer. For example, DRI's Director was a member of the recent European Commission FAIR data expert group, which provides access to a network of experts working in data management and preservation, as well as the FAIR working group for the Executive Board of the European Open Science Cloud (EOSC). After 5 years as Chair of ALLEA's (European Federation of Academies of Sciences and Humanities) E-humanities working group, which developed best practice in digital archiving and data sharing for the Humanities, the Director is now on the ALLEA Open Science taskforce. These expert groups provide access to a pool of experts across Europe.

DRI has been a funded partner in the H2020 Research Data Alliance Europe project since 2015 (RDA3 and RDA4). The RDA has over 10,000 members worldwide, who can be accessed via a number of expert working groups and biannual face to face plenary meetings. DRI staff are involved in dozens of working or interest groups in the RDA, covering a range of relevant areas. DRI is also a member of the RDA Organisational Assembly, providing a common ground for discussing state of the art practices and current challenges with similar organisations across the globe.

DRI is actively involved in the work of the Digital Preservation Coalition (DPC), including participating as a judge in the International Digital Preservation Awards. DRI staff co/organised the 3rd Research Data Alliance Plenary on 2014, Open Repositories conference in 2016, DPASSH in 2015, 2017 and 2019, and IDCC 2020. Staff also served on the Programme Committee for PASIG 2017, PASIG 2019, IDCC 2020, #WeMissiPres 2020 and on the Standing Steering Committee of Open Repositories. Each of these committees and networks provide rich access to a variety of experts, above and beyond

the formal networks of expertise maintained by DRI's management and governance structures.

On an ongoing basis, staff are active members of professional associations or discussion networks in a number of relevant areas, including: The Samvera Europe Steering Group, IASSIST, DARIAH Europe, Archives and Records Association (Ireland), International Council on Archives, JISC Digital Preservation, Research Data Managers, the Association of Internet Researchers, COAR, CO-DATA, UK Anonymisation Network, Fedora Commons network, CARARE, Irish Medical Humanities Network, Europeana Network Association, Blacklight Development Community, and IIIF-Discuss, a discussion forum for the International Image Interoperability Framework (IIIF).

As much as DRI seeks external expert advice, it also widely solicits feedback from its designated communities. The original Stakeholder Advisory Group, created at the DRI project inception, has been developed into a Members Forum, and DRI events coordinators solicit direct reviews. DRI staff provide direct support to members around collection management, data preparation and ingest, and there is a mechanism to feed suggestions from these interactions through to the Requirements Taskforce. New repository features are developed in tandem with a requirements-gathering process and user acceptance testing (UAT). DRI additionally maintains an active and responsive Twitter account (@dri_ireland), an inquiries email address (dri@ria.ie), a mailing list and a blog which addresses issues of importance to SSH archiving (<http://www.dri.ie/blog>).

Supporting Documentation:

DRI staff and expertise: <http://dri.ie/dri-team>

Management Team (MT): <http://dri.ie/core-implementation-team>

About DRI: <https://www.dri.ie/about-dri>

DPASSH: <https://www.dri.ie/digital-preservation-arts-social-science-and-humanities-2019>

DRI Blog: <https://www.dri.ie/blog>

All URLs visited on 26th of February 2020 unless marked otherwise.

Mailing Lists:

air-l@aoir.org

blacklight-development@googlegroups.com

codata-international@lists.codata.org

dariah-all@gwdg.de

digitalpreservation@jiscmail.co.uk

DLF-ANNOUNCE@LISTS.CLIR.ORG

DPC-DISCUSSION@JISCMail.AC.UK

fedora-tech@googlegroups.com

humanist@lists.digitalhumanities.org

iasst-l@lists.columbia.edu

members@coar-repositories.org

pasig-discuss@lists.stanford.edu

RESEARCH-DATAMAN@JISCMAIL.AC.UK

samvera-tech@googlegroups.com

UKAN@JISCMAIL.AC.UK

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Reviewer 3

Comments:

Accept

DIGITAL OBJECT MANAGEMENT

7. Data integrity and authenticity

R7. The repository guarantees the integrity and authenticity of the data.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 3

Comments:

4 – The guideline has been fully implemented in the repository

Response:

On joining DRI each member signs the Organisational Managers Agreement (OMA). This legal agreement outlines that DRI undertakes to preserve the digital objects and maintain their long-term usability in accordance with DRI's preservation policy. This document also outlines that the repository is not under any obligation to make available the digital objects in the same formats or resolutions as deposited. DRI does, however, undertake to preserve the significant properties of deposited materials, and in practice, the repository will preserve the data exactly as it was ingested in so far as is possible. Even where format migration is required the original uploaded asset will be stored alongside the derived asset and its preservation metadata.

To ensure the integrity of the data, at the storage level, the Ceph (1) distributed storage system includes automatic data scrubbing functionality to check and fix bit-flip/decay errors. Within the repository application MD5 checksums are calculated at ingest and stored alongside the asset in the Archival Information Package (AIP) and also stored in a central database. The integrity of the asset and metadata is checked regularly by a process that opens the AIP and recalculates checksums. This is then compared against stored checksums. Any discrepancies are reported to the administrator in an automated email report, or can be viewed through the web interface and data recovery procedures are followed. The results of these tests are available to the user through object audit reports.

Versioning is handled at the application layer within the AIP according to the MOAB (2) format. Updated, or derived versions are saved alongside the previous versions and no files are deleted. Version metadata is captured whenever a change is made.

An audit trail is recorded of all changes to the digital objects, and both metadata and asset files are versioned. If a new version of an asset file is ingested, the old version continues to be stored and preserved. While older versions are no longer available to end-users they can always be retrieved by the data owner in case of error. Updating of objects can occur freely before the object is published as part of the ingest and review workflow. Once reviewed and published a persistent identifier in the form of a Digital Object Identifier (DOI) is minted and certain elements of the metadata and asset file are no longer permitted to change without minting a new DOI. Published data can be edited, but the workflow involves creation of a new DOI and what is essentially considered as a new digital object. This is described in the 'Persistent Identifiers and DOIs' Factsheet.

The Repository encapsulates ingested data as a digital object, which is a Fedora digital object along with the digital asset. The data model incorporates a set of Fedora data-streams so as to handle the different types of metadata required by the system. Examples of metadata types include descriptive metadata, technical metadata, and DRI administrative metadata, which incorporates preservation metadata (stored as a combination of RDF and Dublin Core).

Descriptive metadata is accepted in a variety of formats (Dublin Core, MARC, MODS or EAD). Other types of metadata generated by the system are stored in a combination of RDF and Dublin Core. Technical metadata is extracted from assets uploaded to the repository by an automated process that utilises the open-source File Information Tool Set (FITS) [FITS], developed by Harvard University. The output from this tool is stored as a datastream of the Fedora digital object. The fields contained in the output will vary depending on the type of asset uploaded but will be in FITS XML format, as described by the schema maintained by Harvard Library [FITS XML]. Administrative metadata is primarily used by the

repository application internally and so is stored in a variety of formats. Related attributes of the data model are preserved in the MOAB AIP in XML format, other metadata is held in the MySQL database.

[FITS] <https://projects.iq.harvard.edu/fits>

[FITS XML] http://hul.harvard.edu/ois/xml/xsd/fits/fits_output.xsd

ActiveFedora also facilitates the specification of relationships between digital objects as Rails associations. These relationships are saved using the Resource Description Framework (RDF) specification in a special data-stream. This allows for easier access and management of the relationships between stored digital objects, as well as exposing this relational information to third party applications. The DRI data model is described in Building the Digital Repository of Ireland Infrastructure, Chapter 6.

Our preservation policy is supplemented by regular training events and our membership meetings which highlight DRI's preservation practices.

(1) <https://ceph.io/>

(2) The Moab Design for Digital Object Versioning, Issue 21, 2013-07-15. <http://journal.code4lib.org/articles/8482>

Supporting Documentation:

DRI Organisational Manager Agreement (March 2018): <https://doi.org/10.7486/DRI.zk527x75s>

Digital Repository of Ireland. Building the Digital Repository of Ireland Infrastructure, Digital Repository of Ireland [Distributor], Digital Repository of Ireland [Depositing Institution], <https://doi.org/10.7486/DRI.qr474f68n>

DRI Factsheet No. 7: Persistent Identifiers and DOIs (June 2015): <https://doi.org/10.7486/DRI.s752kt28n>

DRI Preservation Policy (April 2018): <https://doi.org/10.7486/DRI.2r377c523>

All URLs visited on 2nd July 2020 unless marked otherwise.

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Reviewer 3

Comments:

Accept

8. Appraisal

R8. The repository accepts data and metadata based on defined criteria to ensure relevance and understandability for data users.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 3

Comments:

4 – The guideline has been fully implemented in the repository

Response:

DRI's Collection Policy provides an overview of the types of data, digital assets and collections which DRI aims to preserve, and informs potential depositors on whether they may hold appropriate content for ingestion. DRI's Membership model also outlines the kinds of organisations most likely to hold data within DRI's remit. All new members who deposit data are approved by the management team who make decisions based on the nature of the data to be deposited. If DRI were to widen the Collection Policy remit or accept members data that does not fall within our current Collection Policy, this would need to be approved by the management team.

Uploaded preservation-quality assets undergo a rigorous set of checks before they are permanently stored in the Repository. As set out during DRI's initial Requirements analysis (see DRI Requirements Specification below), incoming files are scanned and validated for file type correctness using the File Information Tool Set (FITS) (1). These tests deliver error messages to the user who is attempting the upload if the ingest fails. They also generate a report with the file type and other essential properties of the file. If all tests are passed, the assets are preserved in DRI's internal storage system (see section 6.2.2 Building the Digital Repository of Ireland Infrastructure). Technical information on file formats is captured on ingest and displayed in a report available to the depositor. The depositor is also asked to include information about the digitising processes, including technology and software use in the Contextual Guide attached to their collection.

As discussed earlier, DRI supports and provides detailed guidelines for a variety of widely-adopted metadata standards that are relevant to our designated community (Simple and Qualified Dublin Core, MODS, MARC21 encoded as MARCXML, and EAD). A selection of mandatory elements ensures a level of adherence to these international standards, and metadata will be automatically rejected by the system if mandatory elements are not included. Recommended

elements do not have to be included, but DRI strongly advises that they are completed if possible in order to facilitate searching. All submitted elements, whether mandatory, recommended or optional, are stored and available in the Repository. By following the metadata guidelines data producers make their collections more easily searchable in the Repository, and cross-searchable with other DRI collections.

DRI archives qualitative social science data and data from the humanities and the heritage sector. We undertook an extensive survey to identify which standards were used by our stakeholders, none of our current members identified the use of a domain standard. We review on a regular basis (every four years) the standards we support.

While we have an intentionally circumscribed remit of “social sciences and humanities,” it is important to note that SSH is an umbrella term that covers a wide variety of disciplines, so in favour of interoperability and cross-searchability across the repository, we have chosen to support a number of standards generic to that umbrella of disciplines. To support a richer and more domain specific application of metadata with these standards, DRI gives guidance as to the use of controlled vocabularies (<https://dri.ie/vocabularies>), including the use of HASSET a specialist social science vocabulary and GEONAMES.

We regularly survey developments in best practice (and indeed have contributed to the development of the Metadata Standards Catalog, built through the Research Data Alliance. Should a member or a stakeholder require us to support an additional standard in the repository, this would be brought to our Requirements Taskforce for consideration, and we would make an assessment as to whether it would be possible to support it based on the wider demand for this standard and the quality and importance of the data to be supported.

DRI provides a guide to recommended and preferred formats. This is published as a Format Fact Sheet and is regularly reviewed against international developments (such as the Library of Congress Recommended Formats statement) and updated. The Repository also provides a report on the characterisation that was performed on ingested asset files which informs the user of any issues with the file format. Although DRI provides recommendations on formats for ingest it will ingest non-standard formats, in an effort to balance best practices with the realities of existing institutional data. DRI staff work closely with new Depositors to encourage the ingest of recommended formats, and will highlight poor format choices early in the Membership phase.

The DRI Withdraw Data Policy outlines how we respond to requests for data removal. In the case that data must be removed, the DOI will remain active, at least partial metadata will remain on DataCite and a landing page for the object will remain accessible on the Repository.

1. File Information Tool Set (FITS) <http://projects.iq.harvard.edu/fits> , accessed 2nd July 2020.
2. Fedora. <https://duraspace.org/fedora/>, accessed 2nd July 2020.

Supporting Documentation

Digital Repository of Ireland. Building the Digital Repository of Ireland Infrastructure, Digital Repository of Ireland [Distributor], Digital Repository of Ireland [Depositing Institution], <https://doi.org/10.7486/DRI.qr474f68n>Digital Repository

of Ireland. Digital Archiving in Ireland: National Survey of the Humanities and Social Sciences, Digital Repository of Ireland [Distributor], Digital Repository of Ireland [Depositing Institution], DOI: 10.7486/DRI.5m614676fDRI Factsheet No. 3: File Formats (June 2015): <https://doi.org/10.7486/DRI.rj43ck402-1>

DRI Collection Policy (April 2015): <https://doi.org/10.7486/DRI.s465jx541>

DRI Requirements Specification: <https://doi.org/10.7486/DRI.wd37kb264>

Metadata Guidelines: <https://doi.org/10.7486/DRI.r4958092r>

Guide to Metadata Quality Control: <https://doi.org/10.7486/DRI.c821w6752>

EAD, ISAD(G) and the Digital Repository of Ireland (August 2016): <https://doi.org/10.7486/DRI.rj43ck28s>

MODS and the Digital Repository of Ireland (February 2016): <https://doi.org/10.7486/DRI.rr17fb96g>

Dublin Core and the Digital Repository of Ireland: Version 3 (2020): <https://doi.org/10.7486/DRI.2z119b06h>

Qualified Dublin Core and the Digital Repository of Ireland v 2 (2020): <https://doi.org/10.7486/DRI.3198b690b>

MARC21 encoded as MARCXML and the Digital Repository of Ireland, <https://doi.org/10.7486/DRI.1831s091f>

DRI Withdraw Data Policy (April 2014): <https://doi.org/10.7486/DRI.rb699s823-1>

(1) <https://rdamsc.bath.ac.uk/> Accessed 11th of February 2021

All URLs visited on 2nd July 2020 unless marked otherwise.

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Reviewer 3

Comments:

Accept

9. Documented storage procedures

R9. The repository applies documented processes and procedures in managing archival storage of the data.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 3

Comments:

4 – The guideline has been fully implemented in the repository

Response:

The Repository preservation workflow segregates archival assets from their access and discovery surrogates and applies different preservation levels to each. At ingest, the asset is packaged with its metadata and manifests. Packages are stored on separate logical groupings of storage media (hot storage clusters) that are fault tolerant, self-healing and replicated, ensuring that packages are always available and resistant to disk failures. Two of these hot storage clusters are separated geographically (two different cities).

A backup and tape management strategy is in place and describes how often and when backups occur and how tapes are to be handled. Backup is managed by Bareos open source technology. Backups are taken from hot storage regularly and stored to cold storage at another location, first to disk then to tape. A new tape machine was put into service in 2020. Future plans will see that all storage media are rotated and tested for defects.

An integrity process continuously tests archive packages in all locations, re-calculating the checksums of all assets, and comparing them to the stored manifest. Should a discrepancy be found, an alert is generated and data recovery procedures are undertaken.

These data recovery provisions are:

- The system administrator receives alerts and determines the nature and extent of the incident
- Depending on the scale of the incident a team is assembled
- The affected data owners are alerted
- The last known good copy is recovered from cold storage
- This is recovered as a new version alongside the damaged/missing data

Hard drives are monitored for SMART defects. Tapes are monitored for defects by the physical tape machine and also by Bareos tape backup software. Any defects in either hard drives or tapes are alerted through our Nagios alert/monitoring system. Chapter 5 of the Report on the DRI Infrastructure: Building a National Trusted Digital Repository discusses the storage solutions and storage architecture employed by DRI.

Supporting Documentation

Digital Repository of Ireland. Building the Digital Repository of Ireland Infrastructure, Digital Repository of Ireland [Distributor], Digital Repository of Ireland [Depositing Institution], <https://doi.org/10.7486/DRI.qr474f68n>

Digital Repository of Ireland. DRI Preservation Policy, Digital Repository of Ireland [Distributor], Digital Repository of Ireland [Depositing Institution], <https://doi.org/10.7486/DRI.2r377c523>,

All URLs visited on 24th of March 2020 unless marked otherwise.

Reviewer Entry

Reviewer 1

Comments:
Accept

Reviewer 2

Comments:
Accept

Reviewer 3

Comments:
Accept

10. Preservation plan

R10. The repository assumes responsibility for long-term preservation and manages this function in a planned and documented way.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository

Reviewer 3

Comments:
4 – The guideline has been fully implemented in the repository

Response:

The Digital Repository of Ireland is committed to the long-term preservation of deposited assets. Trusted preservation is at the core of DRI's mandate and has informed the project's requirements from the beginning. The repository's commitment to digital preservation best practices is informed by ISO16363 and the Core Trust Seal (CTS), and supported by extensive international research into the practices of exemplary existing national repositories.

The DRI membership structure, deposit and end use processes are all underpinned by a suite of legal agreements (see DRI Factsheet No. 5: About DRI Membership and Member Policy). Standard contracts have been developed which mandate compliance on behalf of our members with Irish and International law (see legal agreements below). These are supplemented by appropriate fact sheets and guides (for example see 'Copyright, Licensing and Open Access Factsheet'). The roles and responsibility of Depositors and the Repository are clearly outlined in the Organisational Manager Agreement. This agreement also grants to the Repository the right to copy, transform and store the items as well as provide access to them. The Depositor retains ownership of the digital objects and DRI does not assume sole right to provide access to and availability of any digital object. Depositors are allowed to make their own digital objects available in any means that they wish. Under our federated membership structure DRI members deposit their data and associated metadata (including rights statements) directly to the DRI infrastructure.

Both digital assets and their associated metadata are preserved within the repository. Other artefacts, such as web-renderable, or low-resolution surrogate versions of the assets, export versions of metadata, etc., are stored but not preserved as they can be regenerated by the system from the originals.

The repository software automatically performs many of the necessary steps to create and store the AIP from the SIP, allowing the SIP to be relatively simple and not require significant preparation by the data depositor. The repository performs file format identification, generates technical metadata and produces a report for the user, rejects malformed or invalid metadata entries and warns about duplicate records on ingest. All preservation actions taken by the repository software are recorded and form part of the Preservation Metadata.

To ensure continued access, DRI undertakes a yearly format watch process. The format watch process involves collaboration between the roles of Digital Archivist, Policy Manager and technical staff. The status of formats contained within the repository are reviewed and a migration plan developed and implemented for any found to be at risk. This process involves first generating a report of all formats currently in the repository, and then investigating these formats on a case-by-case basis. A variety of resources are consulted to help with this undertaking, for example, PRONOM (1) the Library of Congress Digital Formats website (2) and the Digital Preservation Coalition Technology Watch Reports(3). Further detail on our format migration and emulation strategy is outlined in the Preservation Policy.

The preservation actions that the repository software carries out on ingested materials are explained in the DRI Preservation Policy and in the technical report Building the Digital Repository of Ireland Infrastructure.

DRI provides training, detailed guidelines, and user support to ensure that the digital objects are deposited in accordance to DRI's preservation policy (see DRI Guide to Deposit).

(1) <http://apps.nationalarchives.gov.uk/pronom/Default.aspx>, accessed 22nd March 2018.

(2) <http://www.digitalpreservation.gov/formats/intro/intro.shtml>, accessed 22nd March 2018.

(3) <http://www.dpconline.org/advice/technology-watch-reports>, accessed 22nd March 2018.

Supporting Documentation

Digital Repository of Ireland. Building the Digital Repository of Ireland Infrastructure, Digital Repository of Ireland [Distributor], Digital Repository of Ireland [Depositing Institution]<https://doi.org/10.7486/DRI.qr474f68n>DRI Membership Policy: <https://doi.org/10.7486/DRI.0574f668r>

DRI Factsheet No. 4: Long-term Digital Preservation (April 2014): <https://doi.org/10.7486/DRI.rr17fc082-1>

DRI Organisational Manager Agreement (March 2018): <https://doi.org/10.7486/DRI.zk527x75s>

DRI Factsheet No. 2: Copyright, Licensing, and Open Access (Feb 2014): <https://doi.org/10.7486/DRI.rb699s72v>

DRI Guide to Deposit: <http://www.dri.ie/about/guide-to-deposit>

DRI Preservation Policy (March 2018): <https://doi.org/10.7486/DRI.2r377c523>

All URLs visited on 2nd July 2020 unless marked otherwise.

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Reviewer 3

Comments:

Accept

11. Data quality

R11. The repository has appropriate expertise to address technical data and metadata quality and ensures that sufficient information is available for end users to make quality-related evaluations.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 3

Comments:

4 – The guideline has been fully implemented in the repository

Response:

The DRI staff and taskforce members include qualified archivists, librarians, social scientists, humanities scholars, legal advisors, project management professionals, education and outreach specialists, software engineers, system administrators and information and data management professionals (for more information see <http://dri.ie/dri-team>).

Deposit of objects requires metadata in a recognised standard supported by DRI, with all mandatory fields, and institutional affiliation completed. DRI supports ingest using the most commonly used metadata standards in Ireland (see Requirement 8 for full list), and advises on preferred file formats for long term preservation. Detailed Guidelines are provided for each of the supported standards to help the depositor prepare their data for ingest into the Repository. These guidelines outline mandatory and recommended fields, as well as giving advice on relevant content standards and controlled vocabularies. Guidelines are supported by regular training workshops.

As indicated in R8, the DRI supports standards used by our stakeholders, as none of our current members identified the use of a domain standard, these are not currently supported.

It is recommended that depositors include citations to related works in the metadata for example by using the isPartOf term in Dublin Core. The same DC term can be used to link to related works held within the repository.

Data ingestion to the repository can happen in one of three different ways:

First, the Repository includes a web-based user interface for single object ingest. This user interface provides blank fields to allow cataloguers to create metadata for a single digital object and ingestion of associated digital assets. The metadata records are stored as XML and can be exported by the cataloguer as an XML file if desired. The single ingest web form supports Simple and Qualified Dublin Core. Second, metadata in XML format can be ingested directly into the Repository using single ingest XML upload. Third, bulk ingest of metadata records in XML format can also be ingested via the DRI client tool. This is a command-line application providing access via an API to the DRI Repository. All supported standards may be ingested via XML ingest. The appropriate namespace and schema information must be included in the header of the XML record.

Most of our member institutions employ archivists or domain experts who ensure the quality of the data deposited within DRI. DRI additionally provides training and user guides on digitisation, collection management, file formats, metadata,

contextual information and other data quality issues. We additionally facilitate learning through the regular showcasing of members collections at members forums and the provision of an online forum through which members can share their experiences and queries of data preparation and ingest. Overall, these processes and fora contribute to the deposit of quality data. The system performs checks on formats on ingest and alerts the depositor to any inconsistencies.

Supporting Documentation

DRI staff and expertise: <http://dri.ie/dri-team>

DRI Notice and Action Policy (Jan 2014): <https://doi.org/10.7486/DRI.vh5499702>

DRI Citation Policy (April 2015) <https://doi.org/10.7486/DRI.rx91h486p>

All URLs visited on 2nd July 2020 unless marked otherwise.

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Reviewer 3

Comments:

Accept

12. Workflows

R12. Archiving takes place according to defined workflows from ingest to dissemination.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 3

Comments:

4 – The guideline has been fully implemented in the repository

Response:

The DRI Collection Policy provides an overview of the types of data, digital assets and collections which DRI aims to preserve, and should inform potential depositors on whether they may hold appropriate content for ingestion. The DRI also publishes several fact sheets describing best practice, recommended formats, etc. These fact sheets are intended not only as a guide for DRI users to manage and assess their collections prior to ingestion into DRI, but we have been informed that they also serve as guides to best practice for organisations beyond our designated community.

The DRI provides online guides which outline fully all steps associated with depositing data within DRI (see DRI Guide to Deposit). The Repository supports both synchronous and asynchronous (batch) data workflows for ingesting and processing data. These are documented in the Building the Digital Repository of Ireland Infrastructure (in particular Chapters 7 'Preservation', 8 'Metadata and Data Modelling' and 9 'User Interface Design' and the Cucumber Specifications).

The Repository holds a variety of objects from the social and cultural (social science and humanities) domains. Different metadata standards are appropriate to different types of data within these domains. The workflows for ingest of the different standards vary.

A web-ingest form is provided for Simple and Qualified Dublin Core. Web upload of individual XML files is possible for Simple and Qualified Dublin Core, MODS and MARC21 encoded as MARCXML, while ingest for all standards is available via a command line tool (a batch GUI is in development). Ingest of EAD is currently only possible from the command line due to the complexity of the records.

The metadata standard in which the descriptive metadata is encoded affects the workflow applied to ingested data. For example, while a form-based ingest creates a single object within the repository, an EAD ingest may include downloading of remote asset files and creation of multiple digital objects corresponding to the different EAD levels. All metadata ingested must be well-formed and must contain the mandatory DRI metadata fields or it will be rejected at this stage. Once digital objects have been created, technical metadata about the asset is automatically extracted and saved as part of the object to enhance both access and preservation.

Although DRI provides recommendations on asset file formats for ingest, it will ingest non-standard formats. Depending on the file format various different surrogate access versions of the asset will be created, for example, web-renderable JPEG images for TIFF files, and webm and mp4 files for AVIs. In the case that an unsupported file format is ingested, no access surrogate will be created, but depending on the object permissions the asset file may still be provided for download.

Once ingested, metadata and data are archived in Fedora and an Archival Information Package (AIP) is created and stored on disk for long-term preservation (1). The AIP uses the Moab versioning format, and the initial version is created with a version of 1. Additional administrative metadata will be added as the object and the collection in which it resides are reviewed and edited. Finally on publication a Digital Object Identifier (DOI) persistent identifier is minted and associated

with the object. Each time that an edit is made, a new version of the Moab AIP will be created and stored.

Over time as data formats evolve, it may be necessary to take preservation actions on these files in order to ensure continued access. The DRI maintains a technology watch to identify at-risk data formats and has a process for mitigating these risks. In addition DRI has a policy framework which mandates regular policy review, including policy on data formats. As with edits, any preservation actions which involve a change to the object (e.g. format migration) will cause a new version of the Moab AIP to be created. Preservation actions will also trigger the creation of preservation metadata which is stored in a combination of RDF, Dublin Core and PREMIS.

Several dissemination workflows are available within the repository. These depend on various factors such as the asset file format and the level of security associated with the objects.

The Restricted Data policy outlines the differing security levels attached to different types of data. While all our metadata is openly available, the depositor is able to set access restrictions as part of the ingest workflow (these levels are outlined in R4: Confidentiality/Ethics). Supported asset file formats which have access surrogates automatically created on ingest can be configured to only allow download and viewing of this surrogate version. This may be desirable where the data owner only wishes to allow access to a lower resolution version of their asset, or where it is necessary to strip metadata embedded in the asset file before dissemination. In the case where an asset file may have two versions with different security requirements, e.g. an original and redacted or anonymised version, then the original can be ingested as a 'preservation-only' asset, and it will never be disseminated via the repository.

Assets can be downloaded singly, or as part of an object archive which includes related object metadata, licence information and checksums to allow the verification of the asset files.

These workflows for ingest, preservation and dissemination are built into the repository codebase and reviewed regularly. DRI's Workflows Taskforce is responsible for defining the user interfaces and workflows necessary to interact with the system in order to ingest material into the Repository, or to access that material. Monitoring and developing the technical processes of ingestion of material into the Repository. They review existing user and data workflows as well as to specify new workflows based on feature requests approved by the Requirements Task Force.

(1) See Reference Model for an Open Archival Information System (OAIS)

<http://public.ccsds.org/publications/archive/650x0m2.pdf> page 36, accessed 2nd July 2020

Supporting Documentation:

Digital Repository of Ireland. Building the Digital Repository of Ireland Infrastructure, Digital Repository of Ireland [Distributor], Digital Repository of Ireland [Depositing Institution], <https://doi.org/10.7486/DRI.qr474f68n> DRI Guide to Deposit: <http://www.dri.ie/about/guide-to-deposit>

DRI Collection Policy (April 2015): <https://doi.org/10.7486/DRI.s465jx541>

DRI Restricted Data Policy (Amended 2019): <https://doi.org/10.7486/DRI.8623xk58w>

DRI Policy Framework (Feb. 2012): <https://doi.org/10.7486/DRI.qz2167463-1>

All URLs visited on 2nd July 2020 unless marked otherwise.

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Reviewer 3

Comments:

Accept

13. Data discovery and identification

R13. The repository enables users to discover the data and refer to them in a persistent way through proper citation.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 3

Comments:

4 – The guideline has been fully implemented in the repository

Response:

Objects in the repository are indexed into Solr (1), a powerful open-source search engine tool (see Building the Digital Repository of Ireland Infrastructure, Sections 6.3 and 7.2) to provide search functionality. Search can be performed across collections allowing related objects from a range of different organisations and different metadata standards to be

returned, or can be restricted to a particular collection in order to drill-down into a dataset. Searching with wildcards is supported, along with suggested terms ("Did you mean?"). Searching can be performed via a search box, as well as refinement of the search results via faceted search. A map search function is also provided allowing coordinate-based searching. Hierarchical browsing of collections is also supported. Logged in users have the ability to view a search history and to save and re-run their searches as well as bookmarking particular objects or collections.

The Repository acts as a data provider. We support harvesting from DRI, collections will be exposed via OAI-PMH for third parties to harvest and re-use the data.

DRI uses Digital Object Identifier (DOI), a well known, widely used persistent identifier system. It is currently in use at digital repositories including the UK Data Archive, the British, German and Dutch National Libraries and the Open University. DOIs are minted for objects in the repository allowing a persistent identifier and URI for long-term access to each object. The minting of a DOI requires 5 metadata fields (mapping to Dublin core) for each digital object. This metadata is searchable on the Datacite website and is submitted under a Creative Commons CC0 license. If an object in DRI is subsequently deleted or closed, the metadata will remain on DataCite (our Withdraw Data Policy outlines how we respond to requests for data removal), and a landing page for the object will remain accessible on the Repository.

The DOI is displayed in the object metadata and can also be found by using the cite button for the object. The licensing statement is displayed with the object metadata.

For example, the repository provides the following citation for an object. Gray, Jane, O'Carroll, Aileen, & Ó Riain, Seán. (2015) LHArchiveA33 Interview with Nuala, Digital Repository of Ireland [Distributor], Irish Qualitative Data Archive [Depositing Institution], <https://doi.org/10.7486/DRI.9593xq70p>

The licensing statement for this object is "All Rights Reserved. This object is not licenced for general reuse. Please see Rights Statement for more detail".

More information is provided in the Rights Statement which reads,

Copyright Gray, Jane; O'Carroll, Aileen; Ó Riain, Seán; Geraghty, Ruth; This work is licensed for teaching and research use only. Access to the transcripts and the full collection of audio clips is restricted to bona fide researchers and teachers, and to students that are currently registered at a third-level academic institution. A selection of the audio clips are openly available to the public.

DRI is listed in re3data.org (the Registry of Research Data Repositories) (2), FAIRsharing (3), MERIL (4), the Repository Finder extended by FAIRsFAIR (5)

DRI automatically generates citations for the collections it holds. The fields used to generate these citations are drawn from the descriptive and technical metadata attached to the object and are based on international best practice. These are outlined in the Citation Policy.

(1) <http://lucene.apache.org/solr/>

(2) Re3data.org entry : <https://www.re3data.org/repository/r3d100011805>

(3) FAIRsharing entry: <https://fairsharing.org/biodbcore-001517/>

(4) MERIL entry: <https://portal.meril.eu/meril/view/facilitys/14864>

(5) Repository Finder: <https://repositoryfinder.datacite.org/search?certified=&open=&pid=&query=Digital%20Repository%20of%20Ireland&sort=relevance&subject=>

Supporting Documentation:

Digital Repository of Ireland. Building the Digital Repository of Ireland Infrastructure, Digital Repository of Ireland [Distributor], Digital Repository of Ireland [Depositing Institution], DOI: <https://doi.org/10.7486/DRI.qr474f68n>

DRI Citation Policy (April 2015) <https://doi.org/10.7486/DRI.rx91h486p>

DRI Withdraw Data Policy (April 2014): <https://doi.org/10.7486/DRI.rb699s823-1>

All URLs visited on 2nd July 2020 unless marked otherwise.

Reviewer Entry

Reviewer 1

Comments:
Accept

Reviewer 2

Comments:
Accept

Reviewer 3

Comments:
Accept

14. Data reuse

R14. The repository enables reuse of the data over time, ensuring that appropriate metadata are available to support the understanding and use of the data.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 3

Comments:

4 – The guideline has been fully implemented in the repository

Response:

All digital objects must be deposited with associated metadata and where appropriate, contextual information and associated documentation (see How to DRI: Contextual Information). DRI supports a number of descriptive metadata formats (see Requirement 8 for the full list, and our rationale for supporting generic standards. We do not currently support domain standards, however some of these generic standards are widely adopted by the domains we support). Detailed guidelines to their use within DRI are provided.

The descriptive metadata also contains provenance information such as on the ownership of the digital objects and location of analogue originals, if they exist. Depositors are also asked to deposit contextual documents (see How to DRI: Contextual Information) that provide more detailed information about the origin and the creation of the digital objects. End users are encouraged to include a citation to digital objects in any use. This citation is provided by DRI and includes the object's DOI.

Preservation metadata and object provenance is also captured and stored. Metadata output by the FITS tool is also captured and stored as technical metadata.

Data is deposited in formats used by the designated community (a requirements gathering process identified what these were, see Digital Archiving in Ireland: National Survey of the Humanities and Social Sciences). The acceptable and preferable formats are outlined in the File Format fact sheet. DRI follows best practice with regard to file format obsolescence. The technical team monitors file format trends and identifies assets that may be at risk. Asset files will be migrated where appropriate. Migrated files will undergo the same file identification and characterisation process applied to uploaded files, and a report will be made available to show the essential properties of the new file so that differences between the versions can be identified and corrected where appropriate. Furthermore, the original version of the file will always be preserved alongside any migrated versions. We provide recommendations on file formats and these are updated on a regular basis (see DRI Factsheet No. 3: File Formats).

The DRI creates and stores surrogate versions of ingested assets which are web-renderable and potentially compressed for optimal display; these are the versions that are delivered to the data consumer. The list of generated surrogate files will evolve over time as technology changes and new surrogates will be created. This will ensure that a usable version of the file will be available.

Supporting Documentation:

Digital Repository of Ireland. Building the Digital Repository of Ireland Infrastructure, Digital Repository of Ireland

[Distributor], Digital Repository of Ireland [Depositing Institution], DOI: 10.7486/DRI.qr474f68nDigital Repository of Ireland.
Digital Archiving in Ireland: National Survey of the Humanities and Social Sciences, Digital Repository of Ireland
[Distributor], Digital Repository of Ireland [Depositing Institution], <https://doi.org/10.7486/DRI.5m614676f-1>
DRI Factsheet No. 3: File Formats (June 2015): <https://doi.org/10.7486/DRI.rj43ck402-1>
DRI Factsheet No. 7: Persistent Identifiers and DOIs (June 2015): <https://doi.org/10.7486/DRI.s752kt28n>
How to DRI: Contextual Information: <https://doi.org/10.7486/DRI.sn00qc64>

All URLs visited on 2nd July 2020 unless marked otherwise.

Reviewer Entry

Reviewer 1

Comments:
Accept

Reviewer 2

Comments:
Accept

Reviewer 3

Comments:
Accept

TECHNOLOGY

15. Technical infrastructure

R15. The repository functions on well-supported operating systems and other core infrastructural software and is using hardware and software technologies appropriate to the services it provides to its Designated Community.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 3

Comments:

4 – The guideline has been fully implemented in the repository

Response:

The DRI technical infrastructure has been designed to be robust and reliable, and this includes the use of well-supported standards, operating systems, hardware and software components.

The DRI hardware is divided between two geographic locations, with production services at Trinity College Dublin (TCD) and test/training services at Maynooth University (MU). At the main TCD site, 10 Dell PowerEdge servers provide the compute resources (~540GB RAM, 152 CPU cores) for an OpenNebula private cloud on which the DRI production virtual servers are hosted. A further 10 servers comprise a Ceph storage cluster providing the underlying storage resources for all DRI services, with approximately 384TB of raw storage. Also at TCD is a tape storage machine, used for offline backup, which is located in a separate data centre to the other physical machines. At the MU site, 7 Dell PowerEdge servers are used for the OpenNebula cloud and Ceph storage cluster. As MU hosts test and training services it has fewer resources, with approximately 64TB of storage available to Ceph and 76GB of RAM with 60 CPU cores for OpenNebula. At both TCD and MU the DRI servers are located within data centers managed by the IT services of the university, providing stable power, cooling and networking infrastructure.

The DRI software stack is Open Source software published under the Apache License, Version 2.0 and the source code is publicly available on the GitHub code-sharing platform. The software also relies on several Open Source components such as Samvera, Fedora, Solr and MySQL. In addition to the main software application, a variety of tools developed by DRI for exporting and manipulating metadata and digital objects are also available as open source software on GitHub

DRI and its member organisations are active in the Open Source communities of these tools and technologies, and are members of the Samvera Consortium.

DRI uses Ansible, an Open Source automation platform as part of its software deployment system. Ansible allows the development and system administration team to programmatically describe each server within the DRI infrastructure so that any component can be recreated automatically to replace a failed machine or increase capacity. The Ansible scripts, many of which are available on GitHub, describe the entire architecture of the DRI. Software Updates are made in accordance with the DRI OS and Software Upgrade Policy.

The repository application and the development methodology is described in the report Building the Digital Repository of Ireland Infrastructure. The application is also well documented in the form of user guides as well as executable specifications written using the Cucumber framework and RSpec. These tools allow the development team to translate project requirements into acceptance tests which are run against the code each time a change is made to ensure that all functionality works as expected. These automated tests are human-readable and are available in the same GitHub repository as the application code.

At an organisational level, the DRI structure is heavily influenced by the Reference Model for an Open Archival Information System (OAIS) (1). This reference model establishes a common framework of terms and concepts which constitute a

digital repository and lays out the functional components and responsibilities of such a repository at an organisational level. The various OAIS functional components are represented in DRI by distinct functions, staff, working groups and task-forces or by software components.

Various other frameworks and standards also informed the development of the Repository application. For example the application uses well understood Model-View-Controller paradigm and the software development process relied heavily on an Agile methodology and elements of Behaviour-Driven Development (BDD) and Test-Driven Development (TDD). User interfaces were developed in line with W3C Web Content Accessibility Guidelines, while the API is based on the REST architecture.

The DRI Policy Framework, includes both the policy guidelines we adopt and the policy instruments we use to ensure robust policy development. Policies are reviewed on a four year cycle. DRI adopts the Core Trust Seal as our policy guideline. In framing policy, we also consult the ISO 16363 guidelines for additional guidance. The policy development process is logged in an internal Policy Tracking System.

Hardware replacement timelines are built into the Business plan and budget, and the DRI programme manager maintains an active list for feature planning for the infrastructure and a requirements gathering process centred on the Requirements Taskforce. DRI also runs a number of partnership projects targeting development of additional features and collections.

(1) Consultative Committee for Space Data Systems. (2012). Reference Model for an Open Archival Information System (OAIS). Washington, DC: CCSDS Secretariat. Accessed 15 September 2017

The DRI Risk Assessment Report identifies risks to the organisation and the repository. This report is the output of periodic Risk Assessment Workshops where the risks are reviewed and impacts and likelihood determined.

Our Crisis and Disaster Management plan, disaster recovery procedures, IT security policy and procedures, and business continuity plans are all informed by this Risk Assessment Report.

Our Crisis Management strategy adopts the following principles

- Prevention: prevent disasters where possible
- Preparation: prepare for the most likely disaster scenarios
- Quick Response: when disaster does strike
- Effective Recovery: recover effectively and maintain access.

The Repository infrastructure is built to handle failure. All major components are duplicated or clustered such that a server or node can be lost without affecting service. Storage is particularly highly-available: one node or several individual hard drives can be lost before service is affected. Additionally all hardware is monitored such that failing devices are identified before they become critical (for example failing hard drives or nodes). The DRI infrastructure mitigates against peaks in demand by having spare compute resources. Should demand rise temporarily, this spare capacity can be added to the application. Future separation of the ingest and access repositories will allow better allocation of resources and continuity of access during resource intensive ingests. It will also be possible to put the repository into "read only" mode, stopping ingestion, to allow the access repository to remain online.

The Repository has identified the key threats as: hardware failure, site failure, web based attacks (denial of service DOS etc). The ability to respond quickly to threats demands a robust and accurate monitoring system. Checks are in place for the threats outlined above such that in the event of one of these events, a member of DRI staff is alerted. The staff member then assesses the nature of the incident and if necessary, assembles a crisis management team. Recovering effectively demands spare resources and the ability to rapidly deploy new services. All nodes and services can be redeployed quickly using our Ansible configuration management system. Backups of all critical data including databases are kept and can be recovered back in place. During any downtime, a second site is available that we can failover to. This second site will have a full repository stack installed, should our main site go down, we can switch over and maintain access.

Supporting Documentation:

Digital Repository of Ireland. Building the Digital Repository of Ireland Infrastructure, Digital Repository of Ireland [Distributor], Digital Repository of Ireland [Depositing Institution], <https://doi.org/10.7486/DRI.qr474f68n>

DRI Policy Framework (Feb. 2012): <https://doi.org/10.7486/DRI.qz2167463-1>

Open Source Apache Licence V2 <http://www.apache.org/licenses/LICENSE-2.0>

DRI Samvera Repository Application on GitHub <https://github.com/Digital-Repository-of-Ireland/dri-app>

Samvera <https://wiki.duraspace.org/display/samvera/Samvera>

Fedora <https://duraspace.org/fedora/>

Solr <http://lucene.apache.org/solr/>

W3C Web Content Accessibility Guidelines <https://www.w3.org/TR/WCAG20/>

Ansible <https://www.ansible.com/>

Ceph <https://ceph.com/>

OpenNebula <https://opennebula.org/>

All URLs visited on 2nd July 2020 unless marked otherwise.

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept; Good use of open source software.

Reviewer 3

Comments:

Accept

16. Security

R16. The technical infrastructure of the repository provides for protection of the facility and its data, products, services, and users.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:

4 – The guideline has been fully implemented in the repository

Reviewer 3

Comments:

4 – The guideline has been fully implemented in the repository

Response:

Storage servers are hosted in locked racks in shared, modern, secure data centers that have controlled and monitored access with fire suppression and uninterrupted power supply. Storage servers are firewalled and all traffic from the internet is through load balancers. Access to the operating systems is by SSH key only that is centrally managed.

Only data centre staff have access to the physical servers and this access is administered by the data centre manager. Physical and network security of these datacentres comes under the purview of the Trinity College Dublin and Maynooth University IT Security policies. The DRI System Administrators have access to the servers via SSH and DRI software developers have access to those applications and systems required for their work. SSH access and access to various applications is granted or revoked by the DRI System Administrators. The procedures in place to ensure security are laid out in the DRI Security Policy document (internal). A DRI Security Audit and Security Policy Review is carried out twice yearly and a report (internal) produced.

Hosts running public services (such as the repository) are only accessible through a load-balancer that performs SSL termination. This ensures all services are accessible over HTTPS using SSL certificates obtained from “Let's Encrypt”. Certificates are renewed every 90 days as per the Let's Encrypt terms. The DRI repository application uses currently supported Ruby and Rails versions which receive patches and updates for security issues as per the Rails maintenance policy. Both Ruby and Rails versions are upgraded as required when new security releases are available.

As the repository code is available on GitHub, the technical team receives security alerts from GitHub for any dependencies that have known security vulnerabilities. When these alerts are received the dependency is updated and the application is deployed to the production servers.

Authentication and Authorisation to the Repository application and related services are controlled by a custom users module based on a well-supported open source authentication module. Users can optionally use EduGate to authenticate. User access levels are reviewed annually to ensure that users have access only to appropriate functions and digital collections.

The DRI System Administrators, Software Developers and the Digital Archivist have Administrator accounts on the DRI Repository application and can access reports of user activity and run administrative functions.

Designated Organisational Managers in each member organisation can assign user rights to their staff. Collection Managers can manage an individual digital collection while Edit Users can add and modify individual objects to which they have been given access. User Roles are described in the document 'How To DRI: Understanding Administrative Roles'. Information security and the security of digital objects is ensured by the maintenance of multiple backups and a regular integrity check process as outlined in R9.

Supporting Documentation:

DRI Security Policy (Internal document, available on request)

DRI Security Audit and Security Policy Review (Internal document, available on request)

How To DRI: Understanding Administrative Roles <https://doi.org/10.7486/DRI.2z1195209>

Trinity College Dublin IT Services policies <http://www.tcd.ie/itservices/general/policies.php>

Maynooth University Data & Privacy Policy <https://www.maynoothuniversity.ie/university-policies/data-and-privacy>

Rails maintenance policy https://guides.rubyonrails.org/maintenance_policy.html

GitHub Security Alerts <https://help.github.com/articles/about-security-alerts-for-vulnerable-dependencies/>

Reviewer Entry

Reviewer 1

Comments:

Accept

Reviewer 2

Comments:

Accept

Reviewer 3

Comments:

Accept

APPLICANT FEEDBACK

Comments/feedback

These Requirements are not seen as final, and we value your input to improve the CoreTrustSeal certification procedure. Any comments on the quality of the Requirements, their relevance to your organization, or any other contribution, will be considered as part of future iterations.

Response:

Thank you for your close review of our repository. It has been very useful and has alerted us to some issues which benefited from amendment or change.

We have updated our application to provide additional information required by the reviewers for the following requirements: R1,R2, R3, R4, R5, R6, R7, R10, R15, R16

The same question, with respect to supporting domain metadata was asked in R8, R11 and R14. We provide additional information on this topic in R8, and refer to it in submissions for R11 and R14.

Further comments:

Reviewer 1, commented with reference to R2:

You indicate that "all depositors are required to agree to a Terms and Conditions statement which asserts that they have applied the correct copyright and license statements. The End Use Terms and Conditions mandate that users must agree to abide by the terms of this license."

How is the license information presented to the user so that they can abide by it? I can see on the DRI site (for example, <https://repository.dri.ie/catalog/9593x0115>) that there is a rights statement, but I could not see a license statement. This would make it difficult for the end user to comply.

DRI reply:

The example cited above is a collection. DRI applies Licensing information to objects. At collection level, the licensing statement now reads "Please see individual objects for licensing information. "

The following object, for example, within the noted by the reviewer collection has a license attached to it, <https://repository.dri.ie/catalog/9593x040m>

Licence

All Rights Reserved. This object is not licenced for general reuse. Please see Rights Statement for more detail.

Reviewer 1, commented with reference to R6:

The advisory group information appears to be out of date. A number of members of the group (<https://dri.ie/international-advisory-group>) are no longer in the roles identified or in the archival community. I was also unable to access the About page linked (<https://www.dri.ie/about>).

DRI Reply:

The IAG group as listed on the website is a legacy group - thank you for pointing this out, we have now updated to reflect this fact. A core part of DRI's 2021 work plan is the reconstitution of the International Advisory Group as an Expert Advisory Group to take in both national and international expertise. We expect this newly reconstituted EAG to meet by the end of 2021.

Reviewer 1, commented with reference to R13:

I could not locate either the DOI or license information in the discovery portal

DRI Reply:

We have made changes to the infrastructure such that the DOIs are more prominently displayed with the metadata. However, there are a small number of objects who were published in DRI before we introduced the practice of minting DOIs and these do not have DOIs.

Reviewer 2, committed in respect to R15:

Good use of open source software. Please give more information about your database software. And has DRI developed software or tools that are being used and maintained?

DRI Reply:

The application uses a MySQL database. Other ancillary tools developed and published by DRI are also available on GitHub. We have updated the submission to clarify these points.

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

DRI's application has been well prepared and successfully describes the quality of its data management. The Requirements have been answered sufficiently with detailed references.

Reviewer 3

Comments: