Implementation of the CoreTrustSeal

The CoreTrustSeal board hereby confirms that the Trusted Digital repository DRUM (The Data Repository for University of Minnesota) complies with the guidelines version 2017-2019 set by the CoreTrustSeal Board.
The afore-mentioned repository has therefore acquired the CoreTrustSeal on May 25, 2017.

The Trusted Digital repository is allowed to place an image of the CoreTrustSeal logo corresponding to the guidelines version date on their website. This image must link to this file which is hosted on the CoreTrustSeal website.

Yours sincerely,

The CoreTrustSeal Board

Assessment Information

Guidelines Version:	2017-2019 | November 10, 2016
Guidelines Information Booklet:	CTS Requirements 2017-2019
All Guidelines Documentation:	Documentation
Repository:	DRUM (The Data Repository for University of Minnesota)
Seal Acquiry Date:	May. 25, 2017
For the latest version of the awarded CoreTrustSeal for this repository :	https://www.coretrustseal.org/why-certification/certified-repositories/
Previously Acquired Seals:	None

This repository is owned by:

University of Minnesota Libraries Digital Conservancy

USA

T 612-625-5756
E datarepo@umn.edu
W https://conservancy.umn.edu/

Assessment

0. Context

Applicant Entry

Self-assessment statement:

The Data Repository for University of Minnesota (DRUM) is a well-curated subset of a larger general institutional repository called the University of Minnesota Digital Conservancy. The DRUM institutional data repository and associated curation service launched in November 2014 by the University of Minnesota Libraries.[1]

Designated Community: DRUM is a publicly available collection of digital research data generated by U of M researchers, students, and staff. Anyone can search and download the data housed in the repository, instantly or by request. The Data Repository accepts submissions from University affiliates for digital archiving and access. Our policy states: "Data must be authored by at least one University of Minnesota - Twin Cities researcher with an active U of M Internet ID."

1.

Levels of Curation Service: All data in DRUM are individually curated at the data file (level D). Our staff review all incoming data files and apply specialized curation activities such as quality assurance, file integrity checks, documentation review, metadata creation for discoverability, and file transformations into archival formats. We work closely with authors to ensure that the data is in a format and structure that best facilitates long-term access, discovery, and reuse.

2.

Outsourcing Partners: The U of M Office of Information Technology (OIT) provides data storage and backup for the assets stored in DRUM following our service-level agreements for campus-based data storage. [2, 3]

3.

Other: DRUM is listed in the Registry of Data Repositoroes re3Data.org under ID:r3d100011393 [4] and indexed by SHARE and the Web of Science Data Citation Index. [4]

4.

URLs:

DRUM Main Webpage: http://hdl.handle.net/11299/166578 (accessed 2016-12-15)

1.

OIT Storage Webpage: http://storage.umn.edu (accessed 2016-12-15)

2.

Copy of OIT's storage SLA:
https://docs.google.com/document/d/12woEC8qO3ikdOjHzfALChVbWkYObNn9wTAhl9TGQTiY/edit

(accessed 2016-12-15)

3.

Re3data.org record URL for DRUM http://doi.org/10.17616/R30D19 (accessed 2016-12-15)

4.

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

1. Mission/Scope

Minimum Required Statement of Compliance:

0. N/A: Not Applicable.

Applicant Entry

Statement of Compliance:

4. Implemented: This guideline has been fully implemented for the needs of our repository.

Self-assessment statement:

The University of Minnesota is the organization responsible for preserving and providing access to research data generated by our affiliates. This is made specifically clear in the 2015 policy titled "Research Data Management: Archiving, Ownership, Retention, Security, Storage, and Transfer" which is a policy that sits at the highest level of approval for an academic institution (e.g., an official university-wide policy approved by the Board of Regents). In this policy the University established that the University Librarian holds the following responsibilities:

- "Ensures accessibility and preservation of research data through curation, metadata, repositories, and other access and retrieval mechanisms to meet federal, state, sponsor, and University requirements.

- Trains and supports researchers in the creation and implementation of data management plans.

- Assists campus library directors if their assigned responsibilities exceed campus capacity.

- Works with campus library directors to develop research data management solutions system-wide, where appropriate." [1]

The Data Repository for the University of Minnesota (DRUM) is the primary service used by the University to exercise this policy.

URL

1. Research Data Management Policy: https://policy.umn.edu/research/researchdata (accessed 2016-12-15)

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

2. Licenses

Minimum Required Statement of Compliance:

0. N/A: Not Applicable.

Applicant Entry

Statement of Compliance:

4. Implemented: This guideline has been fully implemented for the needs of our repository.

Self-assessment statement:

Relevant licenses for data stewarded by DRUM are: a Terms of Use policy [1], an End-User Access Policy [2], a University-wide Acceptable Use Policy [3], and when applicable, users are expected to follow the (optional) Creative Commons licenses applied to datasets by data producers. In addition, the library maintains up-to-date awareness and education of applicable regulations to inform data consumers about the ethical and legal use of digital data. [4,5] More details about our specific policies are below.

Terms of Use [1]. DRUM Terms of Use policy stipulates: "Users are expected to abide by the University of Minnesota Acceptable Use Policy, and other University policies, where applicable. However, by using or downloading the data, you signify your agreement to the conditions of use stated below:

- The user not make any use of data to identify or otherwise infringe the privacy or confidentiality rights of individuals discovered inadvertently or intentionally in the data.

- The user will give appropriate attribution to the author(s) of the data in any publication that employs resources provided by the Data Repository.

- If your use or publication requires permission, you must contact the authors directly; administrators of the Data Repository cannot respond to requests for permission."

Additionally, each record in DRUM includes a link to the Terms of Use with the following language: "By using these files, users agree to the Terms of Use. Content distributed via the University of Minnesota's Digital Conservancy may be subject to additional license and use restrictions applied by the depositor." [1]

End User Access Policy [2]: This DRUM policy stipulates "The Data Repository is an open access repository and makes collection holdings freely available, worldwide. Data authors may choose to make their data available in two ways:

·   Open Data (default): These data are available for immediate download. Users may contact the author with questions regarding the data. Authors may choose to apply a Creative Commons license to their data, which will give users certainty that they do not need permission for any uses allowed by the license. However, even without a Creative Commons license, users will be able to download and use data - subject to the DRUM Terms of Use.

·   By Request: In some cases, an author may choose to control access to their work, for up to 2 years, by which end-user access is moderated through the authors' permission (via email). If this is the case, the restriction and request form are clearly indicated in the record of the data. If you have trouble requesting access to data or do not get a response via email, please contact the Data Repository staff."

Acceptable Use Policy: This university-wide policy stipulates that the University of Minnesota has assigned responsibilities to various entities and personnels to monitor and investigate improper use of digital data. Individuals who are found to have violated the policies may be subject to limitation or termination of user privileges, and other disciplinary or legal actions [3].

Finally, depositors have the option to add an appropriate Creative Commons License. The Creative Commons license is displayed on the record of the dataset and included in the readme file that is created during the curation process to enrich the metadata.

1.   DRUM Terms of Use: https://conservancy.umn.edu/pages/drum/policies/#terms-of-use (accessed 2016-12-16)

2.   DRUM End-User Access Policy: https://conservancy.umn.edu/pages/drum/policies/#end-user-access-policy(accessed 2016-12-16)

3. University of Minnesota Acceptable Use Policy: http://policy.umn.edu/it/itresources (accessed 2016-12-16)

4. University Libraries Copyright Services: https://www.lib.umn.edu/copyright (accessed 2016-12-16)

5. University Libraries Copyright and Ethical Use of Data: https://www.lib.umn.edu/datamanagement/copyright (accessed 2016-12-16)

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

3. Continuity of access

Minimum Required Statement of Compliance:

0. N/A: Not Applicable.

Applicant Entry

Statement of Compliance:

3. In progress: We are in the implementation phase.

Self-assessment statement:

DRUM falls under the University of Minnesota Libraries' Digital Preservation Framework, which outlines our plan for the long-term preservation of all digital assets under library stewardship and "align[s] its policy, procedures, and practices with the Trustworthy Repositories Audit & Certification (TRAC) standard (ISO/DIS 16363)." [1]. Implementing this framework, a format-specific migration plan for files that meet criteria for "full support" (open, non-proprietary) ensure that data are fit for re-use over time [2]. Files that fall in our "Limited support" are maintained via fixity checks at the bitlevel. In addition, the University Libraries are currently implementing the preservation software Rosetta (by Ex Libris) into the storage systems housed in our Office of Information Technology. With this tool in place, the active digital preservation of the files will be monitored in real-time and any necessary preservation actions may be taken.

As part of the institutional repository, the University Digital Conservancy (UDC), DRUM is committed to "provid[ing] free, public access and long-term preservation to work created at the U of M." [3] The University Libraries formalizes this commitment in its Digital Preservation Framework that aims to providing the "long-term preservation of its diverse and extensive range of digital resources, thereby assuring enduring access to these resources." [4] Additionally, data producers sign a deposit agreement upon ingest granting the rights, not to the repository, but to the University of Minnesota's Board of Regents [5]. It is through this formal, high-level university entity that long-term stewardship takes place. Therefore, succession planning would only be required in the result of the U of M's dissolution. As the state's only land-grant institution of higher education (established since 1851) and as the only major public research university in the state of Minnesota, the University of Minnesota is unlikely to cease operation or substantially change its scope or mission. As a libraries-based repository, the succession plan for DRUM content is similar to all content managed and held by the library system.

1. Digital Preservation Framework: https://www.lib.umn.edu/dp/digital-preservation-framework (accessed 2016-12-16)

2. UDC Preservation Policy: http://conservancy.umn.edu/pages/policies/#preservation (accessed 2016-12-16)

3. About the Digital Conservancy: http://conservancy.umn.edu/pages/about/(accessed 2016-12-16)

4. Digital Framework: https://www.lib.umn.edu/dp/digital-preservation-framework(accessed 2016-12-16)

5. DRUM Deposit Agreement: http://conservancy.umn.edu/pages/drum/policies/#deposit-license(accessed 2016-12-16)

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

4. Confidentiality/Ethics

Minimum Required Statement of Compliance:

0. N/A: Not Applicable.

Applicant Entry

Statement of Compliance:

4. Implemented: This guideline has been fully implemented for the needs of our repository.

Self-assessment statement:

To the extent possible, DRUM ensures that data are created, curated, accessed, and used in compliance with disciplinary and ethical norms. Curators for DRUM do this by performing a curatorial review of ALL datasets submitted to the repository. If the data contain information derived from human subjects we request a copy of the IRB approved consent form that all participants signed to ensure that any data (de-identified or otherwise) are shared in accordance with this regulated and approved plan. DRUM's deposit agreement states that "The Content contains no restricted, private, confidential, or otherwise protected data or information that should not be publicly shared." We aim to ensure that this certification by the depositor is true by inspecting each file deposited with specialized software (Identity Finder and Bulk Extractor) prior to acceptance, to detect any private or confidential information [2]. DRUM staff work with the data producers to de-identify sensitive information. Otherwise, data with disclosure risk are not accepted [3]. Our staff are engaged with regular training activities on campus (both as participants and as instructors) [4]. The DRUM website also provides links to other relevant ethical guidance such as University policies on responsible use of digital data [5, 6] and the University of Minnesota offers resources on deidentification procedures and sensitive data classification [7].

URL:

1. DRUM Deposit License http://conservancy.umn.edu/pages/drum/policies/#deposit-license(accessed 2016-12-16)

2. DRUM Guide on How We Detect Sensitive Information: https://drive.google.com/file/d/0B5Dm3XFQloc4YU82M0s2bk5TQ1k/view?pref=2&pli=1 (accessed 2016-12-16)

3. About the Data Repository: http://conservancy.umn.edu/pages/drum/(accessed 2016-12-16)

4. Data Management BootCamp 2017: https://www.lib.umn.edu/datamanagement/workshops/winter2017 (accessed 2017-02-24)

5.   University Libraries Copyright Services: https://www.lib.umn.edu/copyright (accessed 2016-12-16)

6.   University Libraries Copyright and Ethical Use of Data: https://www.lib.umn.edu/datamanagement/copyright (accessed 2016-12-16)

7.   University Policy Library How to Classify Data: http://policy.umn.edu/it/dataclassification-proc01 (accessed 2016-12-16)

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

5. Organizational infrastructure

Minimum Required Statement of Compliance:

0. N/A: Not Applicable.

Applicant Entry

Statement of Compliance:

4. Implemented: This guideline has been fully implemented for the needs of our repository.

Self-assessment statement:

DRUM is hosted by the University Libraries at the University of Minnesota. University Oversight is defined in the campus Data Management Policy and shared between the Vice President for Research, the CIO of the Office of Information Technology, and the University Librarian.[1]

DRUM is lead by the Research Data Management/Curation Lead, based in the libraries. DRUM staffs between 4-6 curators that have a portion of their time dedicated to curation work for the data repository. To utilize their expertise and skills, curators are assigned datasets for curation based on the file formats and discipline of the data creator, such as GIS data, social science data, scientific data, digital humanities data, and public health data. Each curator has working knowledge of the field and understands the common data types and software used in the field. The current staff includes:

·   DRUM Coordinator (Digital Repository Archivist, 10%)

·   Scientific Data Curator, full-time librarian hire underway (10%)

·   Public Health/human subjects data curator (10%)

·   Social sciences data curator (10%)

·   Spatial/GIS data curator (10%)

·   Liberal Arts Data Management Specialist (10%), based in the College of Liberal Arts (CLA) Information Technology

-     Preservation Strategist, 5%

-     Repository Developer, based in the Libraries (as needed)

Each DRUM curator goes through a training process where they learn the background of data management and preservation, available tools for data curation, and relevant policies & regulations. DRUM staff are instructed to follow the curation procedure outlined in our local workflow. Curation workflows developed at DRUM have been presented and published in numerous ways, such as the 2017 book publication Curating Research Data: A handbook of current practice (Chicago, IL: American College and Research Libraries), by Lisa R Johnston who has served as the director of DRUM since launch.DRUM plans to scale using the Data Curation Network, a shared staffing approach to curating research data in academic libraries (grant funded project lead by the Research Data Management/Curation Lead). [2]

DRUM is supported by a number of library working groups. These currently include the Research Data Services Team (responsible for outreach and training); DSpace Management Team (technical development/road mapping); University Digital Conservancy (institutional repository) Management Team (governance for the UDC and DRUM). DRUM is discussed and presented on in a number of non-library groups, including the campus-wide data policy implementation team (based in the Office for the Vice President for Research), an informal Community of Practice for Research Data Management, and various University Senate committee meetings.

URL

1. This expert was published in "Data Curation Network: How Do We Compare? A Snapshot of Six Academic Library Institutions' Data Repository and Curation Services" by Lisa R. Johnston, Jake Carlson, Patricia Hswe, Cynthia Hudson Vitale, Heidi Imker, Wendy Kozlowski, Rob Olendorf, Claire Stewart. Journal of EScience Librarianship, JeSLIB 2017; 6(1): e1102, doi:10.7191/jeslib.2017.1102.

[2] Data Curation Network project, https://sites.google.com/site/datacurationnetwork/

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

6. Expert guidance

Minimum Required Statement of Compliance:

0. N/A: Not Applicable.

Applicant Entry

Statement of Compliance:

4. Implemented: This guideline has been fully implemented for the needs of our repository.

Self-assessment statement:

In addition to the DRUM organizational structure described in section 5, the University of Minnesota is home to a number of qualified data curation advisors and related efforts. The Research Data Managment/Lead sits on the campus-wide data storage committee run through the Office of the Vice President for Research which has a strong high performance computing, informatics and health/scientific data focus. The University Library works closely with the Minnesota Population Center, a local resource, and is a member of numerous national organizations such as the Digital Public Library of America, the Digital Library Federation, HathiTrust, the Digital Preservation Network, to name a few. [1] DRUM actively seeks input from University stakeholders and performs an assessment of all data submitters following curation of their data. The results of our surveys and usability testing have been postitive and actively feed back into our developmental roadmap [2, 3]. Finally, DRUM was developed as a library-wide initative that continues to draw from the technical services, IT, metadata, and subject expertise in the libraries [4].

URL

1.   University Library Partnerships and Grants, https://www.lib.umn.edu/about/partnerships (accessed 2-23-2017)

2.   DRUM depository survey results published as Johnston, Lisa R. (2016). Curating Research Data in DRUM: A workflow and distributed staffing model for institutional data repositories. Retrieved from the University of Minnesota Digital Conservancy, http://hdl.handle.net/11299/178889.

3.   Usability testing results published as Johnston, Lisa R; Larson, Eric; Moore, Erik. (2015). Usability Testing of DRUM: What Academic Researchers Want from an Open Access Data Repository. Retrieved from the University of Minnesota Digital Conservancy, http://hdl.handle.net/11299/172556.

4. University of Minnesota Libraries. (2015). The Supporting Documentation for Implementing the Data Repository for the University of Minnesota (DRUM): A Business Model, Functional Requirements, and Metadata

Schema. Retrieved from the University of Minnesota Digital Conservancy, http://hdl.handle.net/11299/171761.

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

7. Data integrity and authenticity

Minimum Required Statement of Compliance:

0. N/A: Not Applicable.

Applicant Entry

Statement of Compliance:

4. Implemented: This guideline has been fully implemented for the needs of our repository.

Self-assessment statement:

DRUM maintains the chain of custody for datasets and our repository technology system ensures the integrity and authenticity of during all stages of the curation workflow. DRUM uses DSpace for its technology platform, which is based on the OAIS model for tracking the integrity and authenticity of all digital objects housed in the system. Specifically:

1. Fixity: DRUM tracks provenance and issues a checksum for each digital object on ingest and can validate the checksums to ensure that the digital objects do not change overtime. DRUM uses MD5 checksum format [1].

2. Documentation of completeness: All DRUM submission receive curatorial review and data files and metadata that are incomplete will be augmented in collaboration with the data author. DRUM collection policy states that "Data must include adequate documentation describing the nature of the data at an appropriate level for purposes of reuse and discovery. All data receive curatorial review and data that are incomplete or not ready for reuse may not be accepted in to the repository." [2]

3. Change log: Provenance for the file ingest and appraisal process is tracked via the repository system. In addition, DRUM curators keep record of the original submission metadata and create a working copy of the files. We document all the changes made during the curation process in a curation log, which is preserved as part of the metadata (buy not available for public download).

4. Version control: DRUM welcomes new versions of the datasets, but versioning is closely mediated. The new version is screened for protected information and goes through a curatorial process just like a new submission of dataset. Each version gets its own DOI and handle. The relationship between the versions is reflected in the URL of the handle and in the metadata fields of the data record. Data consumers can access all versions of the datasets in DRUM. On the web page of one version, the persistent identifiers of all the other versions are listed (See example [3]).

5.   Authentication: All depositors to DRUM must be authenticated according to our policy "Data must be authored by at least one University of Minnesota researcher with an active U of M Internet ID." and this check is done using the Shibboleth Internet protocol. [2]

6.   Provenance metadata: DRUM records all provenance metadata in the form of authenticated user submission credentials, contact information, and timestamps.

URL:

1.   UDS Preservation: https://conservancy.umn.edu/pages/policies/#preservation (accessed 2016-12-16)

2.   DRUM Data Collection Policy: http://conservancy.umn.edu/pages/drum/policies/#data-collection-policy (accessed 2016-12-16)

3.   Example for Versioning: http://conservancy.umn.edu/handle/11299/92942?show=full (accessed 2016-12-16)

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

8. Appraisal

Minimum Required Statement of Compliance:

0. N/A: Not Applicable.

Applicant Entry

Statement of Compliance:

4. Implemented: This guideline has been fully implemented for the needs of our repository.

Self-assessment statement:

DRUM has a comprehensive data collection policy [1]. All data are appraised by a DRUM coordinator in a review process to ensure that they meet our local collection policy and do not violate the deposit agreement. We ensure that the collection is relevant and useful by doing the following:

1.	Quality Control of data: It is DRUM policy that "Data must include adequate documentation describing the nature of the data at an appropriate level for purposes of reuse and discovery. All data receive curatorial review and data that are incomplete or not ready for reuse may not be accepted into the repository." [1] To ensure compliance with this policy, DRUM supports the data producer before (educational workshops, before-you-submit guides, consultations) and during (mediate all deposits and partner with the submitter) the submission. For example, DRUM collects metadata during the initial submission process where data depositors are instructed to upload documentation files and/or incorporate information about methodology in the metadata fields "abstract" and "description" in the DRUM Deposit Form. During curation, if needed, additional methodology on data collection and data processing is requested from the data producers. When documentation delivered is not sufficient, curators use a readme.txt template [2] to send to the producer for completing. Additionally, curators ensure that all files collected adhere to legal and ethical requirements.

2.	Quality control of Metadata: All DRUM submissions undergo curatorial review and a curator will appraise the metadata to determine if it is complete. If not complete, curators will work with data submitters to add additional metadata as needed [1]. The metadata are based on Dublin Core Element Set and incorporate all the applicable Dublin Core elements. Our DRUM metadata schema is published [3]. The metadata helps potential data consumers find and understand the data. DRUM metadata are exposed to online search engines, such as Google and Google Scholar, and are brokered through external indexing systems, such as DataCite and the Web of Science Data Citation Index. This exposure helps with the discovery of the dataset and helps potential data producers determine the relevancy of the dataset for their use. Additionally, persistent identifiers are added to each record metadata in the form of a DOI (via DataCite.org) and handles (via DSpace). Finally, all metadata are available for (open) ingest by third parties (XML of via API).

3.	File Formats: University Digital Conservancy (UDC), the platform of DRUM, has published a preservation policy that includes a list of preferred formats for which the UDC provides full support in preservation and accessibility [4]. The policy is based on the University of Minnesota Libraries Digital Preservation Framework [4]. Additionally, DRUM curators review the dataset during the curation process and appraise the formats of data. If applicable, data files are converted into machine-readable and non-proprietary formats (preferably formats fully supported by the UDC's preservation policy [5]) and the original files are retained. For example, all Microsoft

Excel files are converted to non-proprietary formats using our freely available "Excel Archival Tool" [6].

URL:

1. DRUM Data Collection Policy: https://conservancy.umn.edu/pages/drum/policies/#data-collection-policy (accessed 2016-12-16)

2. Readme Template: http://z.umn.edu/readme (accessed 2016-12-16)

3. DRUM Metadata Schema: http://hdl.handle.net/11299/171761 (accessed 2016-12-16)

4. University Digital Conservancy Preservation Policy: https://conservancy.umn.edu/pages/policies/#preservation (accessed 2016-12-16)

5. Digital Preservation Framework: https://www.lib.umn.edu/dp/digital-preservation-framework (accessed 2016-12-16)

6. Excel Archival Tool: http://z.umn.edu/exceltool (accessed 2016-12-16)

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

9. Documented storage procedures

Minimum Required Statement of Compliance:

0. N/A: Not Applicable.

Applicant Entry

Statement of Compliance:

4. Implemented: This guideline has been fully implemented for the needs of our repository.

Self-assessment statement:

Data files in DRUM are written to an Isilon storage system with two copies, one to ?each of the two geographically separated University of Minnesota Data Centers?. The local Isilon cluster stores the data in such a way that the data can survive the loss of any two disks or any one node of the cluster. Snapshots are taken three times a day, replicated across two geographically distinct data centers, and kept for 30 days. Within two hours of the initial write, data replication to the 2nd Isilon cluster commences. The 2nd cluster employs the same protections as the local cluster, and both verify with a checksum procedure that data has not altered on write [1]. Additionally, the University Digital Conservancy (UDC) that houses DRUM performs routine fixity checks using checksum methods for all deposited data and performs periodic refreshment to new storage media [2].

URL:

1. Boilerplate language for DMPs: https://www.lib.umn.edu/datamanagement/DMP (accessed 2016-12-16)

2. UDC Preservation Policy: http://conservancy.umn.edu/pages/policies/#preservation (accessed 2016-12-16)

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

The answer is not really a description of 'high-level arrangements' but rather describes the technical implementation.

10. Preservation plan

Minimum Required Statement of Compliance:

0. N/A: Not Applicable.

Applicant Entry

Statement of Compliance:

4. Implemented: This guideline has been fully implemented for the needs of our repository.

Self-assessment statement:

Our Digital Preservation Framework outlines our plan for the long-term preservation of its digital assets and "the Libraries intend to align its policy, procedures, and practices with the Trustworthy Repositories Audit & Certification (TRAC) standard (ISO/DIS 16363)" [1].Specifically, the University Digital Conservancy (UDC) that houses DRUM supports the long-term usability of data files held in DRUM in several ways. Regular data monitoring and secure storage maintains the integrity of data. A migration plan and provenance records make sure that data are fit for re-use over time [2]. In addition, the University Libraries are currently implementing the preservation software Rosetta (by Ex Libris) onto the storage systems housed in our Office of Information Technology. Therefore the active digital preservation of the files will be monitored in real-time using this new tool.

1. Preservation levels: UDC has two preservation support levels: full support and limited support. [2]

2. Contract and transfer of custody: DRUM Deposit Agreement states that "I understand that the Digital Conservancy will do its best to provide perpetual access to my Content. In order to support these efforts, I grant the Regents of the University of Minnesota ("University"), through its Digital Conservancy, the following non-exclusive, perpetual, royalty-free, world-wide rights and licenses:

• to access, reproduce, distribute and publicly display the Content, in whole or in part, in order to secure, preserve and make it publicly available, and

• to make derivative works based upon the Content in order to migrate the Content to other media or formats, or to preserve its public access.

These terms do not transfer ownership of the copyright(s) in the Content. These terms only grant to the University the limited license outlined above. [3]

3.   Preservation plan: University Digital Conservancy (UDC), home to DRUM, is committed to "provid[ing] free, public access and long-term preservation to work created at the U of M." [4] The University Libraries that hosts UDC formalizes this commitment in its Digital Preservation Framework to providing the "long-term preservation of its diverse and extensive range of digital resources, thereby assuring enduring access to these resources." [3] Additionally, the repository content is stewarded by the University of Minnesota's Board of Regents [4]. It is through this formal, high-level entity that long-term stewardship takes place. Therefore, succession planning would only be required in the result of the U of M's dissolution. As the state's only land-grant institution of higher education (established since 1851) and as the only major public research university, the University of Minnesota is unlikely to cease operation or substantially change its scope or mission. For this succession to fail, it would take an act of the state legislature in removing the University's charter – an unlikely scenario.

URL:

1.   Digital Preservation Framework: https://www.lib.umn.edu/dp/digital-preservation-framework (accessed 2016-12-16)

2.   UDC Preservation Policy: http://conservancy.umn.edu/pages/policies/#preservation (accessed 2016-12-16)

3.   DRUM Deposit Agreement: http://conservancy.umn.edu/pages/drum/policies/#deposit-license(accessed 2016-12-16)

4.   About the Digital Conservancy: http://conservancy.umn.edu/pages/about/(accessed 2016-12-16)

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

11. Data quality

Minimum Required Statement of Compliance:

0. N/A: Not Applicable.

Applicant Entry

Statement of Compliance:

4. Implemented: This guideline has been fully implemented for the needs of our repository.

Self-assessment statement:

It is DRUM policy that "Data must include adequate documentation describing the nature of the data at an appropriate level for purposes of reuse and discovery. All data receive curatorial review and data that are incomplete or not ready for reuse may not be accepted into the repository." [1] To ensure compliance with this policy, DRUM supports the data producer before (educational workshops, before-you-submit guides, consultations) and during (mediate all deposits and partner with the submitter) the submission. For example, DRUM collects information on methodology during the initial submission process where data depositors are instructed to upload documentation files and/or incorporate information about methodology in the metadata fields "abstract" and "description" in the DRUM Deposit Form. During curation, if needed, additional methodology on data collection and data processing is requested from the data producers. When documentation delivered is not sufficient, curators use a readme.txt template [2] to send to the producer for completing. Additionally, curators ensure that all files collected adhere to legal and ethical requirements (more information provided in question 5) and that data are contexualized by linking out to related publications and source material.

URL:

1. DRUM Data Collection Policy: https://conservancy.umn.edu/pages/drum/policies/#data-collection-policy (accessed 2016-12-16)

2. Readme Template: http://z.umn.edu/readme (accessed 2016-12-16)

3. DRUM Metadata List: http://hdl.handle.net/11299/171761 (accessed 2016-12-16)

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

12. Workflows

Minimum Required Statement of Compliance:

0. N/A: Not Applicable.

Applicant Entry

Statement of Compliance:

4. Implemented: This guideline has been fully implemented for the needs of our repository.

Self-assessment statement:

DRUM has a detailed workflow that is followed by the staff when handling data submissions. We have curation experts for a variety of data types (GIS, scientific, social sciences, public health, humanities) and procedures for different data formats. An early version of our curation workflows are published online [1] and more up-to-date workflows are in a new book publication [2, 3]. The steps for submitting to DRUM are summarized below:

1. U of M researcher submits their data to DRUM using a custom submission workflow in DSpace.

2. DRUM coordinator receives notification and performs pre-acceptance appraisal.

3. Coordinator determines the type/discipline of data and assigns the submission to the appropriate DRUM curator.

4. Data curators open and review files. Detect missing information, validate software code, and create custom documentation.

5. Curators work closely with the author to augment the files and bring in the library liaison as needed.

6. Curators finalize the submission in DRUM and publish the dataset with a DataCite DOI.

DRUM communicates with the depositors about the workflow before (educational workshops, before-you-submit guides, consultations) and during (mediate all deposits and partner with the submitter) the submission.

URL:

1. Early Draft of DRUM Data Curation Procedures (Report from the 2013 Data Curation Pilot)
    http://hdl.handle.net/11299/162338(accessed 2016-12-15)

2. Current DRUM Data Curation Procedures Published as: Johnston, Lisa R. (editor) (2017). Curating Research Data Volume Two: A handbook of current practice. Chicago, IL: American College and Research Libraries.
    http://www.alastore.ala.org/detail.aspx?ID=11961

3. Johnston, Lisa R. (2017). Appendix: Summary of the Data Curation Handbook Steps from Curating Research Data Volume Two: A Handbook of Current Practice. American College & Research Libraries. Retrieved from the University of Minnesota Digital Conservancy, http://hdl.handle.net/11299/183502.

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

It could be useful to maintain a public document describing the current DRUM workflow (the relevant reference goes to a generic description in a book on "Curating research data").

13. Data discovery and identification

Minimum Required Statement of Compliance:

0. N/A: Not Applicable.

Applicant Entry

Statement of Compliance:

4. Implemented: This guideline has been fully implemented for the needs of our repository.

Self-assessment statement:

DRUM provides data discoverability and identification in a number of ways. We have an advanced search tool on our website powered by Solr full-text indexing of all text-based files in the repository as well as faceted browsing of the repository metadata [1]. In addition, the full-text index and all associated metadata are exposed to online search tools such as Google and Google Scholar. DRUM provides an OAI feed for metadata harvesting: DRUM metadata is indexed by Thomson Reuters' Data Citation Index, a service for discovery of data sets, and SHARE, an American Research Libraries program. In addition to metadata dissemination, DRUM provides two kinds of persistent identifiers: a handle and a Digital Object Identifier. DRUM uses the DataCite service provided by CDL's EZID though the Purdue University Libraries to generate a DOI for each dataset [2]. In addition, to help facilitate proper attribution, each dataset has a suggested citation, which includes the DOI (see example [3]).

URL:

1. DRUM Website: http://hdl.handle.net/11299/166578 (accessed 2016-12-16)

2. EZID Website: http://ezid.lib.purdue.edu/ (accessed 2016-12-16)

3. Example on Suggested Citation: http://dx.doi.org/10.13020/D6V88Z (accessed 2016-12-16)

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

14. Data reuse

Minimum Required Statement of Compliance:

0. N/A: Not Applicable.

Applicant Entry

Statement of Compliance:

4. Implemented: This guideline has been fully implemented for the needs of our repository.

Self-assessment statement:

All datasets accepted into DRUM are intended for reuse. Our collection policy states "Data must be deposited for open access -- this means that visitors to the Data Repository site may download and reuse your data. Data that is not suitable for reuse should not be shared in the Data Repository. Authors will have the option of restricting access for a maximum of two years (see End-user Access Policy)." [1] We help facilitate reuse in the following ways:

1. Metadata: The metadata are based on Dublin Core Element Set and incorporate all the applicable Dublin Core elements. Our metadata list is published in DRUM [2]. The metadata helps potential data consumers find and understand the data. DRUM metadata are exposed to online search engines, such as Google and Google Scholar, and are brokered through external indexing systems, such as DataCite and the Web of Science Data Citation Index. This exposure helps with the discovery of the dataset and helps potential data producers determine the relevancy of the dataset for their use. Additionally, persistent identifiers are added to each record metadata in the form of a DOI (via DataCite.org) and handles (via DSpace). Finally, all metadata are available for (open) ingest by third parties (XML of via API).

2. Data formats: UDC has published a list of recommended file formats. During the curation process, curators work with data producers to convert files into the recommended file formats that ensure that the file can be migrated, when needed, to the contemporary file format for use.

3. Evolution of file format and migration: Regular data monitoring and secure storage maintains the integrity of data. For select file formats (open, non proprietary) a migration plan ensures that data files will be fit for re-use over time [4].

4. Ensuring understandability of data: DRUM strives to ensure that the files it maintains are usable and understandable with "adequate documentation describing the nature of the data at an appropriate level for purposes of reuse and discovery. All data receive curatorial review and data that are incomplete or not ready for reuse may not be accepted into the repository." [1] To ensure compliance with this policy, DRUM supports the data producer before (educational workshops, before-you-submit guides, consultations) and during (mediate all deposits and partner with the submitter) the submission. For example, DRUM collects information on methodology during the initial submission process where data depositors are instructed to upload documentation files and/or incorporate

information about methodology in the metadata fields "abstract" and "description" in the DRUM Deposit Form. Metadata regarding the methodology, such as the instrument used to produce data and any codes or acronyms used in the data collection, is essential for data consumers to access and conduct secondary analysis and, if not included in the submission, DRUM curators work closely with the data producers to add a readme file using our template [3].

URL:

1.DRUM Data Collection Policy: https://conservancy.umn.edu/pages/drum/policies/#data-collection-policy (accessed 2016-12-16)

2.DRUM Metadata List: http://hdl.handle.net/11299/171761 (accessed 2016-12-16)

3.Readme Template: http://z.umn.edu/readme (accessed 2016-12-16)

4.UDC Preservation Policy: http://conservancy.umn.edu/pages/policies/#preservation (accessed 2016-12-16)

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

I was not able to find how disciplinary-specific formats are taken into account.

15. Technical infrastructure

Minimum Required Statement of Compliance:

0. N/A: Not Applicable.

Applicant Entry

Statement of Compliance:

4. Implemented: This guideline has been fully implemented for the needs of our repository.

Self-assessment statement:

1. Standard and software: The technical infrastructure of DRUM is the latest version of DSpace 5.x, an open source community developed software which follows the OAIS reference model specifications. DRUM has a detailed workflow aimed at long term preservation of digital objects and fulfills all mandatory responsibilities listed in Section 3.1 of the OASIS reference model. The DRUM workflow encompasses processes from data ingest to data dissemination. Four stages of curation (Receive, Appraise and Select, Processing, Access) ensures that DRUM datasets are independently understandable and available for the data consumers. DSpace is fully documented, open source software.

2. Infrastructure development: the University Libraries are currently implementing the preservation software Rosetta (by Ex Libris) onto the storage systems housed in our Office of Information Technology. Therefore even though the assets are stored outside the libraries, the active digital preservation of the files will be monitored in real-time using this new tool.

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

No information about connectivity but it is acceptable for this type of repository.

16. Security

Minimum Required Statement of Compliance:

0. N/A: Not Applicable.

Applicant Entry

Statement of Compliance:

4. Implemented: This guideline has been fully implemented for the needs of our repository.

Self-assessment statement:

The University of Minnesota takes the necessary precautions to ensure that data housed in our repository are protected and secure.

1. Recovery and backup: The U of M Office of Information Technology (OIT) provides data storage and backup for the assets stored in DRUM following our service-level agreements for campus-based data storage. [1][2]

2. IT security: Regular data monitoring and secure storage maintains the integrity of data. A migration plan and provenance records make sure that data are fit for re-use over time [3]. In addition, the University Libraries are currently implementing the preservation software Rosetta (by Ex Libris) onto the storage systems housed in our Office of Information Technology. Therefore the active digital preservation of the files will be monitored in real-time using this new tool.

3. Local Logs: The repository administrator actively montiors the log stats of DRUM to prevent malicious behavior such as artificially inflating download counts or systematic attacks.

URL:

1. OIT Storage Webpage: http://storage.umn.edu (accessed 2016-12-16)

2. Copy of OIT's storage SLA: https://docs.google.com/document/d/12woEC8qO3ikdOjHzfALChVbWkYObNn9wTAhl9TGQTiY/edit (accessed 2016-12-16)

3. UDC Preservation Policy: http://conservancy.umn.edu/pages/policies/#preservation (accessed 2016-12-16)

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

17. Comments/feedback

Minimum Required Statement of Compliance:

0. N/A: Not Applicable.

Applicant Entry

Statement of Compliance:

0. N/A: Not Applicable.

Self-assessment statement:

Thank you for the opporunity to work toward compliance and meet your standards for the Data Seal of Approval. We appreciated the new questions and the streamlined approach to the questions. We look forward to working with you on our application.

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

Thanks for answering the comments quickly and adequately.