

# Digital Repository Legacies: A Case Study in Assessing Organizational Trustworthiness

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# Abstract

“Academic libraries rarely discuss cases of digital repositories that do not meet the standards expected of trusted digital repositories.

Implications from inconsistent adherence to technical and professional criteria often surface during migration projects.”

In 2020, Stony Brook University Libraries began migrating assets to a mono-repository environment. Persistent historical factors presented challenges to repository trustworthiness.

This case study discusses a survey project to evaluate legacy repository statuses in the contexts of infrastructure, documentation, and staff capacity. It considers a paradigm of organizational accountability in digital asset stewardship and offers insights for reconciling inherited legacies with aspirations to be a trusted repository.”



# Introduction

- This present study was spurred by preliminary planning work at Stony Brook University Libraries (SBUL), an academic research library, in anticipation of migrating assets from a multitude of repositories to a mono-repository environment, DSpace 6.3.
- Digital repository standard: Audit and Certifications of Trustworthy Digital Repositories
  - *Trustworthy Repositories Audit & Certification: Criteria and Checklist (TRAC)*
- We conducted a survey project designed to appraise digital repository legacies at SBUL with an emphasis on organizational infrastructure using the TRAC Checklist and two digital preservation assessment reports.



# About the University Libraries

**1957:** Stony Brook University founded at Oyster Bay, NY (temporary campus)

**1963:** library opens on the Stony Brook campus

**1971:** library expansion project completed

**late 1990s:** developed multiple digital repositories (e.g., DSpace, CONTENTdm)

**2015:** bepress (Academic Commons)

**2016:** Omeka

**2020:** Began migration of digital content to DSpace 6.3

## Present

- No program or system for digital asset management (DAM).
- DRs are maintained separately from the libraries' online integrated discovery catalog (Ex Libris/Alma).
- DRs are used as short-term storage and access systems.
- The IR software bepress is used exclusively to publish faculty scholarly output.



# Research Questions

1. To what extent do SBUL meet the eighteen benchmarks outlined in “Appendix 3: Minimum Required Documents” of *Trustworthy Repositories Audit & Certification: Criteria Checklist (TRAC)*?
2. What evidence supports these findings: documentation, transparency, adequacy, and/or measurability?
3. What mitigating actions could advance SBUL toward achieving unmet benchmarks?
4. What opportunities and barriers exist for meeting unmet benchmarks?



# Literature Review

- Impetus for developing digital repositories
- Standards and best practices
- Management and infrastructure
- Professional development and training considerations



# The Problem:

## Reconciling legacy assets for migration with organizational readiness

- Library administration announced DSpace version 6.3 would be the platform for all digital assets
- New repository environment:
  - DSpace (asset management)
  - Omeka (exhibitions)
  - Be Press (scholarly works)
- Formed a working group based on organizational reporting structure, not skill sets
- Leading up to this, repositories weren't receiving major system updates and patches
- Pre-existing gaps in training and knowledge



# Methods

Assessed SBUL for evidence of the 18 minimal required documents specified in TRAC

1. Criteria was taken from Appendix C, “Minimum Required Documents” of the *Trustworthy Repositories Audit & Certification: (TRAC) Criteria Checklist*
2. Digital Preservation Coalition’s maturity modeling tool, the “Rapid Assessment Model” (DPC RAM) Rating Scale 0-4
  - a. 0 = “minimal awareness”
  - b. 1 = “awareness”
  - c. 2 = “basic”
  - d. 3 = “managed”
  - e. 4 = “optimized”
3. Assigned ratings informed by the findings of two SBUL rapid assessment digital preservation benchmark reports that also used the DPC RAM to measure the state of SBUL’s DRs



# Results

Table 1. SBUL rapid benchmark assessment using the TRAC minimum required documents and the DPC RAM model.

| TRAC organization section        | TRAC sub-section                                 | TRAC criteria  | Examples of TRAC stipulated documents  | DPC RAM organizational capability category | SBUL evidence: documentation, transparency, adequacy, and measurability   | SBUL rating: 0 = minimal awareness, 1 = awareness, 2 = basic, 3 = managed, 4 = optimized | Suggested mitigating actions   |
|----------------------------------|--|--|--|--|---|--|--|
| A. Organizational Infrastructure | A1. Governance & organizational viability        | A1.2 Repository has an appropriate, formal succession plan, contingency plans, and/or escrow arrangements in place in case the repository ceases to operate or the governing or funding institution substantially changes its scope. | contingency plans; succession plans, escrow arrangements (as appropriate)      | Organizational viability                   | informal system exit strategy; automated data backup to deep storage; loose arrangements to return data to content creators             | 1  | develop formal succession plan; public facing audited annual financial statements; create financial forecasts with multiple budget scenarios   |
| A. Organizational Infrastructure | A3. Procedural accountability & policy framework | A3.1 Repository has defined its designated community(ies) and associated knowledge base(s) and has publicly accessible definitions and policies in place to dictate how its preservation service requirements will be met.           | definition of designated community(ies), and policy relating to service levels | Policy and strategy                        | some designated communities are defined (e.g., institutional repository user community); some collections have service-level agreements | 0  | create written definition of designated community(ies); publish policies detailing SBUL's preservation strategies  |
| A. Organizational Infrastructure | A3. Procedural accountability & policy framework | A3.3 Repository maintains written policies that specify the nature of any legal permissions required to preserve digital content over time, and repository can demonstrate that these permissions have been acquired when needed.    | policies relating to legal permissions   | Legal basis                                | informal service agreements for digital project content   | 1  | implement use contracts and deposit agreements; specify which rights transfer for different types of digital content; create a policy statement on required rights for preservation purposes |
| A. Organizational Infrastructure | A3. Procedural accountability & policy framework | A3.5 Repository has policies and procedures to ensure that feedback from producers and users is sought and addressed over time.  | policies and procedures relating to feedback                                   | Policy and strategy                        | no formal process to collect feedback   | 0  | create a workflow to systematically solicit feedback regarding software and service adequacy   |
| A. Organizational Infrastructure | A4. Financial sustainability                     | A4.3 Repository's financial practices and procedures are transparent, compliant with relevant accounting standards and practices, and audited by third parties in accordance with territorial legal requirements.                    | Financial procedures   | Organizational viability                   | Licensing and software expenditures are tracked and procured through University Procurement and Library Administration                  | 2  | create reports of financial and technical audits, and certifications; annually audit financial statements; create contingency plans  |
| A. Organizational Infrastructure | A5. Contracts, licenses & liabilities            | A5.5 If repository ingests digital content with unclear ownership/rights, policies are in place to   | Policies/procedures relating to challenges to rights                           | Legal basis                                | practice since 2016 for new content to include  | 1  | define required rights, licenses, and permissions to be obtained upon deposit; publish legal   |

Table 1. Continued.

| TRAC organization section    | TRAC sub-section  | TRAC criteria   | Examples of TRAC stipulated documents | DPC RAM organizational capability category | SBUL evidence: documentation, transparency, adequacy, and measurability  | SBUL rating: 0 = minimal awareness, 1 = awareness, 2 = basic, 3 = managed, 4 = optimized | Suggested mitigating actions  |
|------------------------------|---|---|---------------------------------------|--|--|--|---|
|                              |   | address liability and challenges to those rights.   | (only if likely to be needed)         |  | <a href="https://rightsstatements.org">rightsstatements.org</a> statements; challenges managed informally  |  | liability clause; create and publish a policy on responding to challenges   |
| B. Digital Object Management | B1. Ingest: acquisition of content                      | B1. Procedures related to ingest.   | Procedures related to ingest          | Policy and strategy                        | established process for ingesting content in batch; repository-wide metadata profile that identifies SIP properties; repository creates checksums upon ingest (B1.3) | 2  | create preservation procedures based on mission statement; develop and require submission agreements  |
| B. Digital Object Management | B2. Ingest: creation of the archivable package          | B2.10 Repository has a documented process for testing understandability of the information content and bringing the information content up to the agreed level of understandability.          | Process for testing understandability | Policy and strategy                        | generate persistent, unique identifiers for all AIPs; built-in Dublin Core metadata registry; built-in file format registry  | 2  | investment in staff training to develop digital preservation expertise; conduct user-experience testing with the designated community           |
| B. Digital Object Management | B4. Archival storage & preservation/maintenance of AIPs | B4.1 Repository employs documented preservation strategies.   | Preservation strategies               | Policy and strategy                        | annual preservation assessment and report; bitstream preservation via built-in checksum creator and authenticating tool  | 1  | create a preservation implementation plan; document identified preservation risks and strategies for dealing with each risk                     |
| B. Digital Object Management | B4. Archival storage & preservation/maintenance of AIPs | B4.2 Repository implements/responds to strategies for archival object (i.e., AIP) storage and migration.  | Storage/migration strategies          | Policy and strategy                        | create checksums for each ingested digital object  | 2  | create a regular schedule to check fixity information; document how AIPs and fixity information are kept separate; create logs of fixity checks |
| B. Digital Object Management | B6. Access management                                   | B6.2 Repository has implemented a policy for recording all access actions (includes requests, orders etc.) that meet the requirements of the repository and information producers/depositors. | Policy for recording access actions   | Policy and strategy                        | no established access policies for library-created assets; use of password authentication for content creators   | 1  | record access actions; create logs and audit trails of access requests  |
| B. Digital Object Management | B6. Access management                                   | B6.4 Repository has documented and implemented access policies (authorization rules,  | Policy for access                     | Policy and strategy                        | use of embargo item and collection functions   | 2  | create written policies on third-party deposit arrangements;  |

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Table 1. Continued.

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|---|--|--|---------------------------------------|--|---|--|--|
|   |  | authentication requirements) consistent with deposit agreements for stored objects.  |                                       |  |   |  | create definitions of service levels and permitted uses  |
| C. Technologies, Technical Infrastructure, & Security | C1.7 Repository has defined processes for storage media and/or hardware change (e.g., refreshing, migration).  | C1.7 Repository has defined processes for storage media and/or hardware change (e.g., refreshing, migration).  | Processes for media change            | IT capability                              | limited processes for assessment and migrations; no refreshing  | 2  | create documentation for migration processes; embed systemic and scheduled work for assessing refreshing, migrations, and storage capacity; create policies related to hardware support, maintenance, and replacement; document hardware manufacturer's expected support life cycles |
| C. Technologies, Technical Infrastructure, & Security | C1.8 Repository has a documented change management process that identifies changes to critical processes that potentially affect the repository's ability to comply with its mandatory responsibilities. | C1.8 Repository has a documented change management process that identifies changes to critical processes that potentially affect the repository's ability to comply with its mandatory responsibilities. | Change management process             | Continuous improvement                     | mechanism shows the automated process of system changes using the Graphical User Interface                        | 1  | document the change management process; conduct a risk assessment of the change management process   |
| C. Technologies, Technical Infrastructure, & Security | C1.9 Repository has a process for testing the effect of critical changes to the system.  | C1.9 Repository has a process for testing the effect of critical changes to the system.  | Critical change test process          | IT capability                              | some system upgrades are done in a test environment but are undocumented  | 2  | document results in a report; analyze the impact of a process change   |
| C. Technologies, Technical Infrastructure, & Security | C1.10 Repository has a process to react to the availability of new software security updates based on a risk-benefit assessment  | C1.10 Repository has a process to react to the availability of new software security updates based on a risk-benefit assessment.   | Security update process               | IT capability                              | there is evidence of update processes in the Graphical User Interface in the Really Simple Syndication (RSS) feed | 2  | document system update installations; create a risk register   |
|   |  |  |                                       | IT capability                              | inventory of hardware   | 2  |  |

(continued)

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|---|------------------------------|--|---|--|---|--|--|
| C. Technologies, Technical Infrastructure, & Security | C2. Appropriate technologies | C2.1 Repository has hardware technologies appropriate to the services it provides to its designated community(ies) and has procedures in place to receive and monitor notifications, and evaluate when hardware technology changes are needed. | Process to monitor required changes to hardware |  |   |  | maintain currency of hardware and of new technology changes  |
| C. Technologies, Technical Infrastructure, & Security | C2. Appropriate technologies | C2.2 Repository has software technologies appropriate to the services it provides to its designated community(ies) and has procedures in place to receive and monitor notifications, and evaluate when software technology changes are needed. | Process to monitor required changes to software | IT capability                              | inventory of software   | 1  | invest in the access and preservation software required for the designated community; develop procedures to receive and monitor notification; maintain currency of software technology |



# Discussion

- Organizational infrastructure
  - “The retrieval and functionality of digital assets is dependent on sound organizational planning and an infrastructure driven by well-formed written policies and procedures, and with an institutional investment in and commitment to its sustainability and growth.”
- Digital object management
  - “Digital object management would benefit greatly from participation of current staff members who possess technical expertise, credentials in the domain of digital archives, and historical information about legacy collections.”
- Technologies, technical infrastructure, and security
  - “Considerations for technologies, technical infrastructure, and security emphasize the critical processes for maintaining compliance of systems, assessing hardware and software, and creating procedures to survey and maintain technology.”



# Conclusion

Integrate organizational accountability in the paradigm of digital asset stewardship.

- Balance aspirations with capacity; demonstrates a commitment to the standards that embody a TDR.
- Libraries can lead and actively contribute to programs that ensure the long-term preservation of cultural heritage and research.
- Sustainability of digital assets depends on investment in resources and requires reaffirming commitments to maintain them.
- Connect digital asset preservation to mission-driven goals and objectives.
- Institutions facing DR environments similar to SBUL can model this study:
  - use a modified version of the TRAC list of minimum required documents and DPC RAM rating scale.
  - fuller design process could then ensue, particularly at organizations where little documentation and historical information exists.



## Article

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