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Prioritizing Storage Media for Digital Archiving and Preservation

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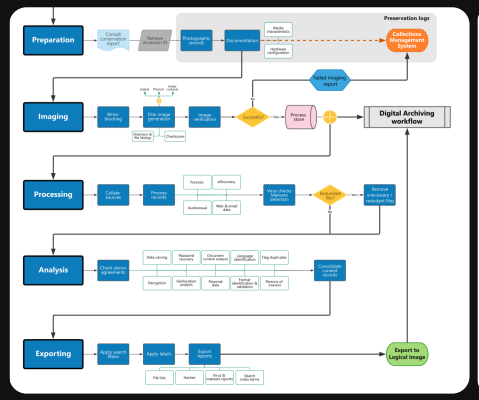
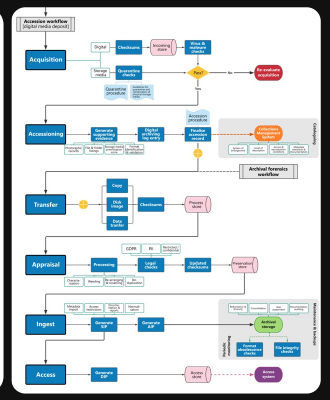
University of Glasgow

PROBLEM STATEMENT





archival forensics

digital preservation

digital archiving

quarantine & conservation

has media?

prioritizing collections

digital asset register

unregistered digital assets

prioritizing storage media:

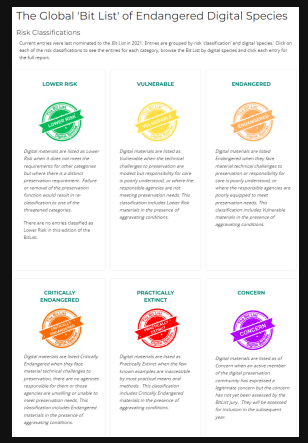
- degradation while in store
- legacy and obsolete media
- conditions of storage and handling pre-acquisition
- quality, lifespan and age of media

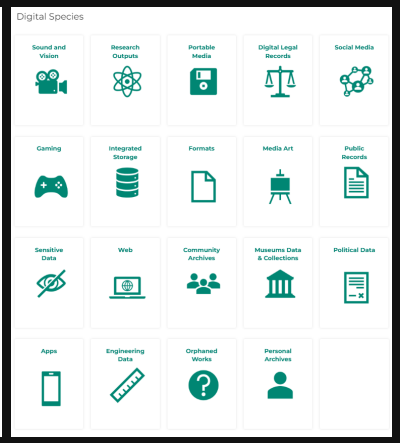
ARCHIVES & SPECIAL COLLECTIONS

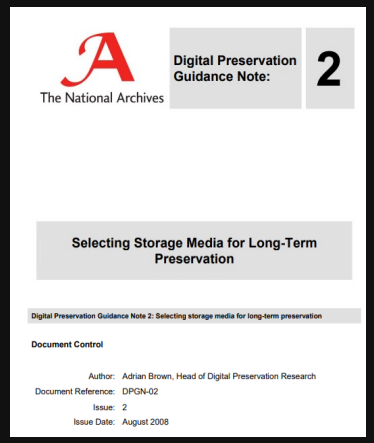
EXISTING WORK

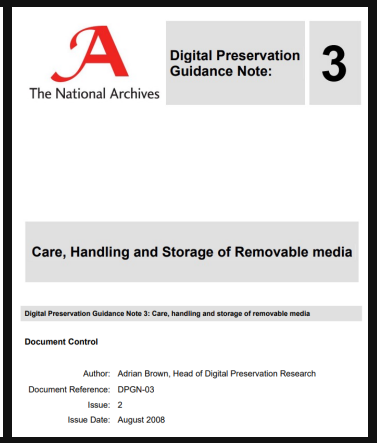
Methodology:

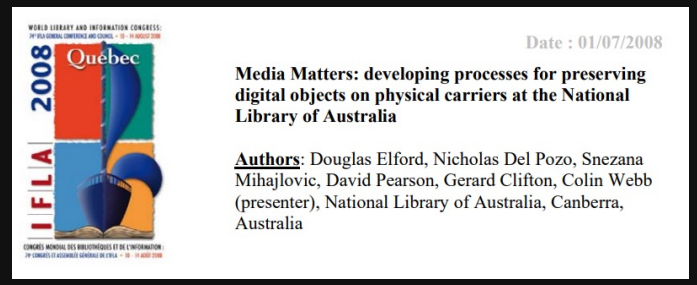
- identify criteria for prioritization
- generate score scales per criterion
- define priority score and action
- collate knowledge on average lifespan and level of endangerment
- wrap it all up in a nifty tool!

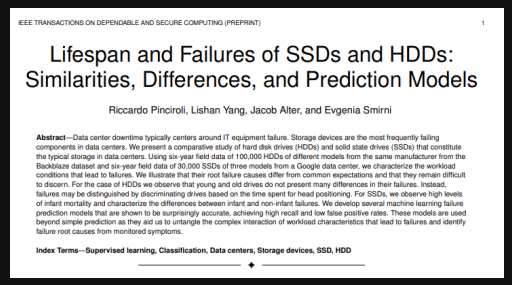


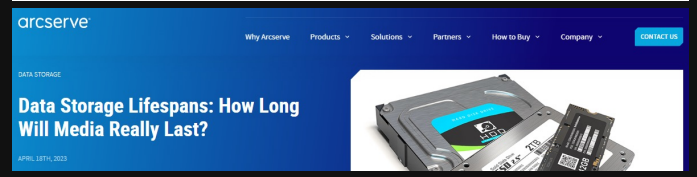


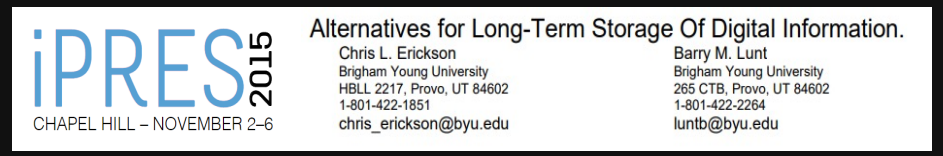


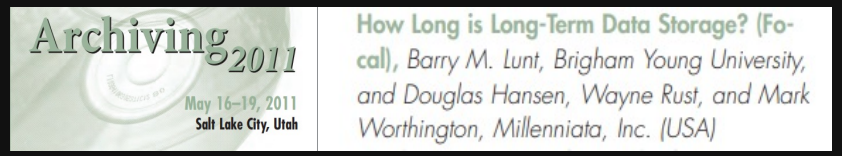












METHODOLOGY

Assumptions / constraints

- only include media we can process in archival forensics lab
- no other copy of digital assets other than in storage media → **unique records**
- storage conditions pre-acquisition will be considered as "aggravating"
- for hybrid collections, digital assets in storage media will be considered as valuable and important as the rest of the items in the collection

Storage media-specific criteria

- Average lifespan (from existing literature)
- Year of production → measure of longevity and obsolescence
- Environmental conditions of storage **post-acquisition**
- 'Bit List' of Digitally Endangered Species classification

METHODOLOGY

CRITERIA AND SCORES

Bit List' of Digitally Endangered Species	
Classification	**Score**
Lower risk	1
Vulnerable	2
Endangered	3
Critically Endangered	4
Practically extinct	5
Average lifespan	
Lifespan	**Score**
1-3 years	5
3-5 years	4
5-10 years	3
10-20 years	2
More than 20 years	1
Conditions	
Conditions	**Score**
Optimal conditions	1
Good conservation practice	2
Minimal conservation practice	3
Some aggravating conditions	4
Mostly aggravating conditions	5
Year of production	
Produced	**Score**
Within the last 5 years	1
More than 5 years ago	5

KNOWLEDGE

Medium	Produced	Bit list status	Average lifespan (years)
Current internal HDD	Within the last 5 years	Vulnerable	3-5 years
Current internal SSD	Within the last 5 years	Vulnerable	3-5 years
Non-current internal HDD	More than 5 years ago	Critically Endangered	3-5 years
Non-current internal SSD	More than 5 years ago	Critically Endangered	3-5 years
Current portable HDD	Within the last 5 years	Endangered	3-5 years
Current portable SSD	Within the last 5 years	Endangered	3-5 years
Current optical media (CD, DVD, BlueRay)	Within the last 5 years	Endangered	5-10 years
Current magnetic tape	Within the last 5 years	Endangered	10-20 years
Current Flash storage (USB stick, SD card)	Within the last 5 years	Vulnerable	3-5 years
Floppy disk	More than 5 years ago	Critically Endangered	1-3 years
Non-current magnetic tape	More than 5 years ago	Critically Endangered	10-20 years
Cassette tape	More than 5 years ago	Critically Endangered	10-20 years

PRIORITY SCORE

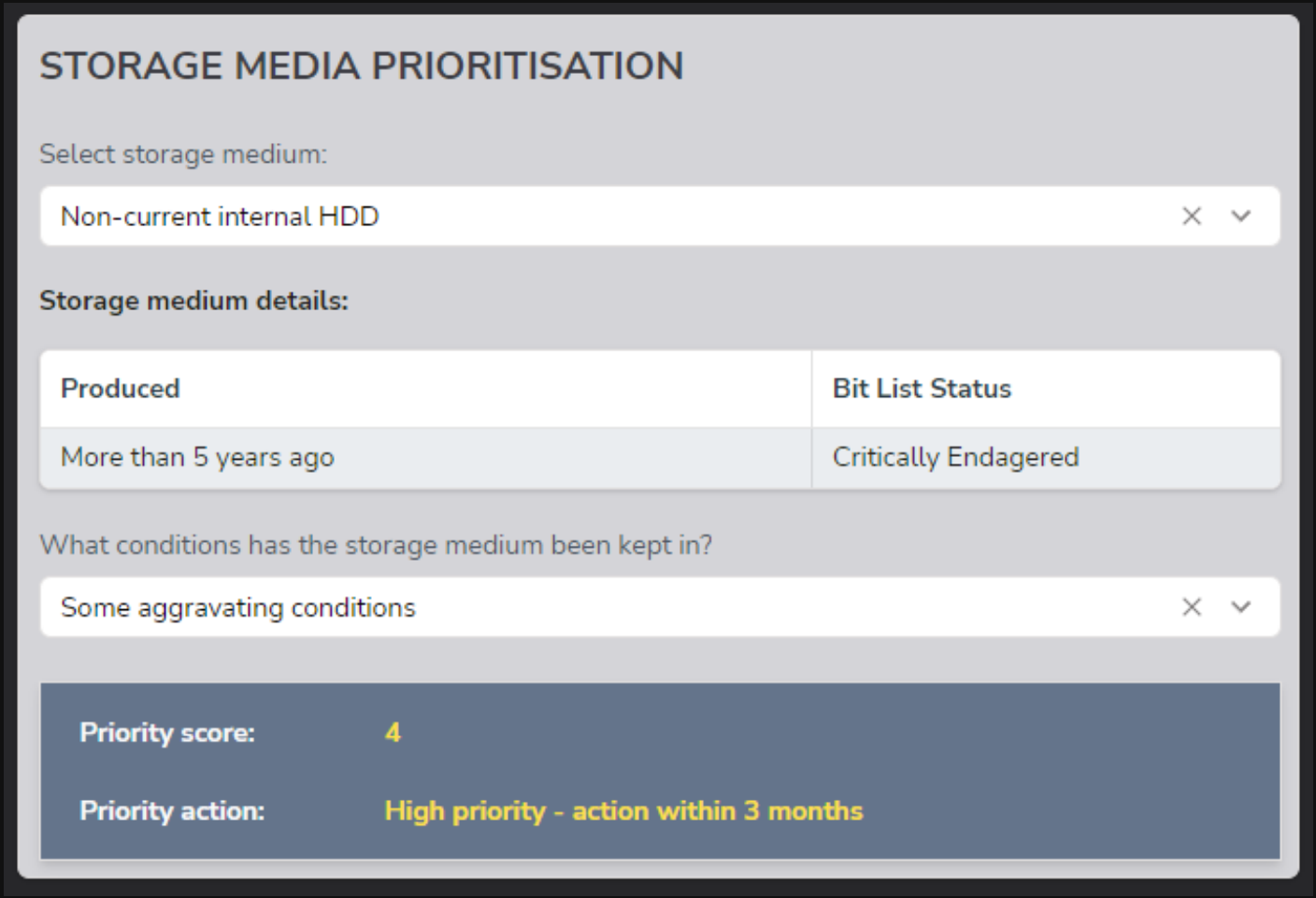
Score	Priority level
1	Low priority - action within 3 years
2	Low priority - action within 1 year
3	Medium priority - action within 6 months
4	High priority - action within 3 months
5	Extreme priority - immediate action

(bit-list x 0.25) + (lifespan x 0.25) + (YoP x 0.25) + (conditions x 0.25) = priority score

(4 x 0.25) + (4 x 0.25) + (5 x 0.25) + (4 x 0.25)

= 4.25

NIFTY TOOL!



Currently developed as:

- an AppSmith app (internal use only)
  → https://www.appsmith.com/
- an Excel spreadsheet app
- web version forthcoming

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FUTURE WORK

Work in progress
Open to discussion and community feedback

Ongoing piece of work
Bound to change as knowledge on storage media evolves

Current feedback and planned changes

- storage conditions should be given a higher weight
- integration of storage media prioritization with other selection and appraisal practices / decision-making
- automated score generation as part of other tools / processing (e.g. forensics tools)
- Community review and updates of knowledge base, potential for integration into Bit List

DISSEMINATION & FEEDBACK

Current version of the methodology:

- available for download Q1 2024
- Excel spreadsheet with formulae to allow score weighting customisation
- Includes criteria, scales and collated knowledge
- Licenced under a CC BY-NC-SA

Feedback, questions, suggestions, corrections:

- Email us! Contacts in next slide

CONTACTS

ARCHIVES & SPECIAL COLLECTIONS

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