Fulfilling Statistical Policies with Data Curation Practices

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Overview

- About Us
- Statistical Laws & Practices
- About Data Curation
- Data Curation for Transparent Statistics: Suggestions
- Conclusions
- Questions
- Supplemental Slides

About Us

Leighton:

- MLIS, CAS Data Curation (UIUC) 2012
- Library Director and Data Governance Committee (Iowa DOT) 2012 – 2016
- NTL Data Curator, May 2016
    - Public Access Implementation Lead
    - BTS Data Curation
    - DOT representative to White House OSTP Subcommittee on Open Science

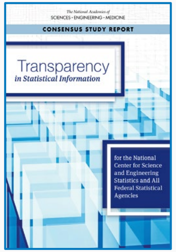
Jesse:

- MLIS (Syracuse), 2019
- NTL Data Management and Data Curation Fellow, June 2019
    - Preservation of Legacy BTS data
    - NTL lead on Persistent Identifiers in federal consortia and working groups
    - Research Data Management training

Statistical Laws & Practices

Foundations for Evidence-Based Policymaking Act: Title III - Confidential Information Protection and Statistical Efficiency[9]

- Safeguard the confidentiality of individually identifiable information acquired under a pledge of confidentiality for statistical purposes;
- Statistical agencies should continuously seek to improve their efficiency;
- More sharing of data among designated statistical agencies;
- Increase access to data for evidence


The National Academies of
SCIENCES · ENGINEERING · MEDICINE
CONSENSUS STUDY REPORT
Transparency
in Statistical Information
for the National Center for Science and Engineering Statistics and All Federal Statistical Agencies

Transparency in Statistical Information for the National Center for Science and Engineering Statistics and All Federal Statistical Agencies[10]

https://doi.org/10.17226/26360

"…envision a future where…"

- greater care in the documentation of methods, the use of uniform processes for archiving of input data and all official statistics, and the greater use of metadata standards.
- archived and documented materials will be retained in permanent Web locations and code will be fully commented….
- Identical machine-readable metadata standards will be used by all statistical programs, which will make sharing of methods and data easier among the statistical community

About Data Curation Actions

Reactive

Curation & Preservation

- Repository Ingest
- **Access & Reuse**
- **Preservation/Mitigation**
- Format Migration
- Disposition

Proactive

Creation & Collection

- Standard Workflows: ***File Naming***
- **Data Management & Training**: ***DMPs***
- **Robust Documentation**: ***Readme & Codes***
- Controlled Vocabularies: ***Data Dictionaries***
- Metadata Standards: ***Choose & Publicize***
- **Persistent Identification**: ***DOI, ORCID, ROR***
- **Preservation Planning**: ***Repository & Backups***

Benefits of Data Curation

- Protects Unique Data from Loss
- **Improves Data Search & Retrieval**
- **Enables Reuse**
- **Facilitates Longitudinal and/or Meta Analyses**
- Avoids Duplication of Effort & Spending
- Increases Verifiability
- **Opens New Lines of Scientific Discovery**
- Satisfies Public Access & Open Government & Legal Requirements

Data Curation: Definitions

- **Data Management:**
  - deliberate planning, creation, storage, access and preservation of data produced from a given investigation[1, 2]
- **Data Curation**
  - enables data discovery and retrieval, maintains data quality, adds value, and provides for re-use over time[3]
- **Data Science**
  - drawing useful conclusions from large and diverse data sets through exploration, prediction, and inference[4]

Linked Processes

DM is **Necessary** element of DC

DC **Enables** DS

Data Management ∈ Data Curation

Data Curation ⇒ Data Science

Data Curation Dependencies Model

Data Management ∈ Data Curation ⇒ Data Science

$$DM \in DC \Rightarrow DS$$

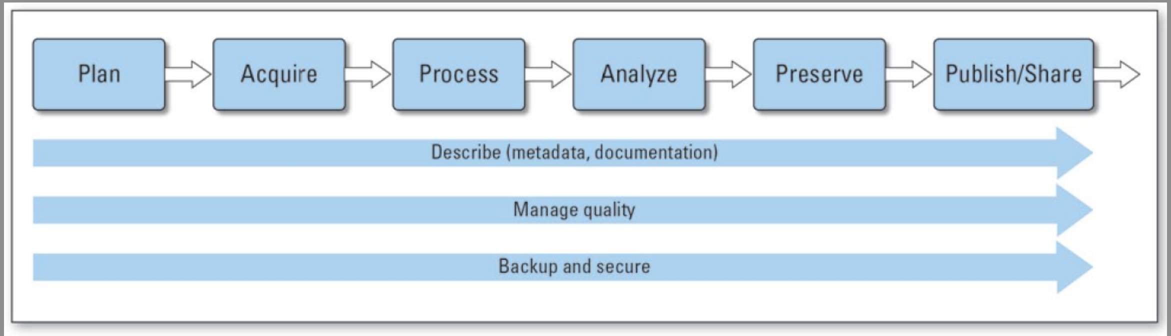
Data Curation & the Data Lifecycle

- Data Curation
  - Enables data discovery and retrieval, maintains data quality, adds value, and provides for re-use over time[3]

- Data Lifecycle
  - All the phase of data's existence from planning to collection, through preservation, to reuse and potential destruction

USGS Data Lifecyle Model[6]

- Plan FIRST!!
- Collect second
- Curation steps throughout



Data Curation for Transparent Statistics: Three Main Suggestions

Data Management & Sharing Plans

Plan for FAIR & to Share

Embed Data Curators & Curation Practices

Suggestion 1:
Data Management [& Sharing] Plans

- **Explicit** documentation of knowledge
    - Sets project standards
    - Plan for data capture
    - Links to policies
- **Living document**: review and update

Potential DMP Sections

- Project Title and Information
- **Data Description**
- **Roles & Responsibilities**
- Standards Used
- Access Policies
- **Sensitive Data Policies**
- Sharing Policies
- **Archiving and Preservation Plans**
- Applicable laws and policies

Suggestion 2:
Plan for **FAIR**[7] and to Share

Findable
Accessible
Interoperable
Reusable

https://www.force11.org/group/fairgroup/fairprinciples

Sharing Data

- Last step of USGS Data Lifecycle: Publish/Share
- Sharing: Culture Change that affects decisions
- Encourages new discovery & efficiencies
- Consistent with developing U.S. policy and law

FAIR Challenge

JISC Report:
FAIR in Practice[8]

Tools are needed,
remain elusive

While there is "[s]trong support for growing the body of tools and resources available that reduced the burden of data management," there is also a "[l]ack of good tooling to support metadata capture at data generation."

Jisc

FAIR in practice

Jisc report on the Findable Accessible Interoperable and Reuseable Data Principles

May 2018

http://doi.org/10.5281/zenodo.1245568

Suggestion 3:
Embed Data Curators & Curation Practices

- Necessary skills other team members may not possess
- Fresh eyes for workflows and implicit knowledge
- Assume preservation and sharing
- Improve team efficiency around sharing and preservation
- Lifecycle view of data
- End of lifecycle planning

Conclusions & Suggestions Review

- Data curation enables data science
- Data Curation lifecycle view defaults to transparency
- Data management and sharing planning is ***THE*** first step
- FAIR data principles apply to metadata, data, and paradata
- Plan for sharing; create a sharing culture
- Embed data curators and curation practices into projects from the start for best results and most transparent statistics

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Thank you!

Questions?

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About BTS

Founded in 1991

Preeminent source of statistics, and statistical datasets, on:

- Commercial Aviation,
- Multimodal Freight Activity, and,
- Transportation Economics,

Provides context to decision makers and the public for understanding transportation statistics

BTS Director is, by law, the senior advisor to the Secretary of Transportation on data and statistics

https://www.bts.gov/

About NTL

NTL is an **open access** digital repository of transportation information

All collection materials are in the **public domain,** available for reuse **without restriction**

NTL is one of five national libraries

NTL is the only national library within a Principal Federal Statistical Agency

NTL **provides access** to:

- Digital collections
- Data services
- Reference services
- Knowledge networking

https://ntl.bts.gov/

NTL's Guiding Mandates

Transportation Equity Act for the 21st Century (TEA-21) 1998

Established NTL to provide national and international access to transportation information

Moving Ahead for Progress in the 21st Century (MAP-21) 2012

Expanded NTL role as a central clearinghouse for transportation research publications and data

US DOT Public Access Plan 2016

Requires NTL **host** repository for research and datasets; **provide** searchable DMP collection, and, **assign** persistent identifiers

Foundations for Evidence-Based Policymaking Act 2018

Codifies efforts to ensure public access to federally-funded research reports and datasets

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