Life Cycle Overview

June & July 2012

http://libguides.mit.edu/lifecycle
Objectives of Overview

- Begin ongoing discussion of long-term issues
- Consider terms
- Outline core standards and practice
- Look at a few trends
- Ponder life cycle management MIT Libraries
Topics

• Some terms
• Community context – some more terms
• Organizational setting – a few more terms
• Operational mode – just a few more terms
• Pondering...
KEY TERMS
Life Cycle

“a series of stages through which something (as an individual, culture, or manufactured product) passes during its lifetime”

First known use of term: 1873
Source: Merriam Webster online
Life Cycle Management

• Connect the dots now and into the future
  – Link actions across units, **workflows**, content
  – Document ‘as is’ and define ‘to be’ workflows
  – Handshakes between stages, over time

• Document conformance with good practice (standards and community norms)

• Align practice for all content types

• Develop and maintain skills
Digital Preservation + Data Curation

Digital Curation Centre, 2004
Digital

same source as the word *digit* and *digitus* (Latin for *finger*) because fingers are used for discrete counting

Commons use: computing and electronics, especially where real-world information is converted to binary numeric form

Fun fact: Digital systems are ancient – e.g., the abacus, text in books, a signal beacon (smoke signals), Morse code, Braille, semaphore flags, sound pulses (magnetic cassette tapes)

Source: wikipedia
Data

Can be defined narrowly –

data is a result of scientific research

And broadly –

data refers to digital information of any kind
Or, data = digital content
Curator

From Latin – curare:
  1. arrange/see/attend to
  2. heal/cure
  3. provide for
  4. take care of
  5. worry/care about

Early uses:
"overseer, manager, guardian...of minors, lunatics, etc." (14c)
Religion - a curate, one responsible for the care of souls (14c)
"officer in charge of a museum, library, etc." (1660s)

Source: Online Etymology Dictionary
Curation

Curation may refer to:
• preservation and maintenance of digital assets

Curation may also be:
• Work performed by a curator (initially in a museum context)
• Archiving, historical record keeping
• Evidence Management, indexing and cataloguing evidence
• Cultural heritage management, protection of cultural sites
• Healing, medical curing of illness
• Religion, a curate is one responsible for the care (of souls)

Source: wikipedia
Data Curation

“active and on-going management of data through its life cycle of interest and usefulness to scholarship, science, and education”

enables discovery, ensures quality, adds value, and provide for re-use over time [UIUC]

• Predates the digital community
• Value-added steps by curators to enhance utility
• Intersection of data science (curators) and research (producers and consumers)
Digital Preservation

“the active management of digital content over time to ensure ongoing access” (NDIIPP*)

- Encourage quality creation by producers
- Document actions taken over the life of digital objects
- Ensure access over time
  - Handshakes across generations of technology
  - Proven technologies for preservation to contemporary for access

* National Digital Information Infrastructure and Preservation Program
Library of Congress
Digital Curation

“maintaining and adding value to a trusted body of digital information for future and current use”

- active management and appraisal over entire life cycle
- builds upon underlying concepts of digital preservation
- emphasizes opportunities for adding value through annotation and continuing resource management
- Preservation is a curation activity - both are concerned with managing digital resources with no significant (or only controlled) changes over time

Source: JISC
COMMUNITY CONTEXT

Community standards provide a Framework for Organizations
Community Context

Curation and Preservation are ongoing not new issues to manage

- **1960s**: national archives, data archives
- **1970s**: increasing interest and concern
- **1980s**: digitization developments
- **1990s**: library, museum, Web collections
- **2000s**: digital art, geospatial, e-science...
- **2010s**: research data, analog archives...

variations by nation, domain, size, complexity...
Factors

• Reliance on digital content
• Born digital content
• Near misses – content lost or almost
• Content viewed as assets or investments
• Increasing expertise
• Resources: funding, equipment
• Common practice and standards
Preserving Digital Information (PDI)

Commission on Preservation and Access & RLG

1996 Report

Preserving Digital Information

Report of the Task Force on Archiving of Digital Information

commissioned by
The Commission on Preservation and Access and
The Research Libraries Group

May 1, 1996
Standards and Practice

- **TDR**: Trusted Digital Repositories, 2002
- **OAIS**: Open Archival Information System Reference Model (ISO 14721), 2003 with 2009 pending
- **PAIMAS**: Producer Archive Interface Method Abstract Standard (ISO 20652), 2006 plus update
- **NISO Building Good Digital Collections, v3.0 2007**
- **PREMIS**: Preservation Metadata Implementation Strategies, 2005 plus updates
- **BRTF**: Blue Ribbon Task Force on Sustainable Preservation and Access, 2010
- **TRAC**: Trustworthy Repositories Audit and Certification, 2007 and ISO 16363: 2012
OAIS Development

• 1995 – development initiated (NASA)
• 2002 – TDR – how to be OAIS conformant
• 2002 – final public draft of OAIS released
• 2003 – approved as ISO standard
• 2003-on – related standards work
• 2009 – revision for public review...
adapted from: kenney and mcgovern, 2003
Organizational: TDR Attributes

- OAIS Compliance
- Administrative Responsibility
- Organizational Viability
- Financial Sustainability
- Technological and Procedural Suitability
- System Security
- Procedural Accountability
Technological: OAIS
Resources (funding): BRTF

Life Cycle perspective:
• Value – case for long-term access
• Incentives – beneficiaries & owners
• Roles – responsibilities
LIFE² Cost Model

\[ L_T = C_T + Aq_T + I_T + M_T + BP_T + CP_T + Ac_T \]

- \( L_T \): Complete lifecycle cost over time 0 to \( T \).
- \( C_T \): Creation
- \( Aq_T \): Acquisition
- \( I_T \): Ingest
- \( M_T \): Metadata Creation
- \( BP_T \): Bit-stream Preservation
- \( CP_T \): Content Preservation
- \( Ac_T \): Access
Good Practice
Decision to Action Continuum

Organizational

High-level organizational decisions
Reflect the intentions of the organization

Lower-level organizational decisions
Document the decisions of the organization

Individual decisions statements
Regulate the actions of the organization

Encoded decision statements
Translate organization’s decisions into actions

Technological
ORGANIZATIONAL SETTING

Organizations demonstrate how they map to Community Standards and practice
Stages of Development

1. **Acknowledge**: accept as a local concern
2. **Act**: initiate projects
3. **Consolidate**: shift from projects to programs
4. **Institutionalize**: incorporate larger context, rationalize
5. **Externalize**: form inter-institutional collaborations
Life Cycle Roles

- **Producer /Creator** – local and beyond
- **Curator** – overall, content-specific, each stage
- **Archivist** – big A and little a
- **Manager** – at any level, points in time
- **Funder** – local and beyond
- **Advocate** – anyone
- **Consumer** – current and future
NOTE: the Dream Team refers to the ‘67 Red Sox - of course
Open Archival Information System (OAIS) Model

Pondering...
Life Cycle: Object Level

* 2009 OAIS revision: Access Rights Information added
Real-time Workflow

Open Archival Information System (OAIS) Model
there is no on/off switch
Iterative Stages

Identify - what digital content do you have?
Select - what portion of that content will be preserved?
Store - what issues are there for long term storage?
Protect - what steps are needed to protect your digital content?
Manage - what provisions are needed for long-term management?
Provide - what considerations are there for long-term access?
GOALS
(ensuring continuing access)
DELIVERABLES
(5-year action plan)