

# 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

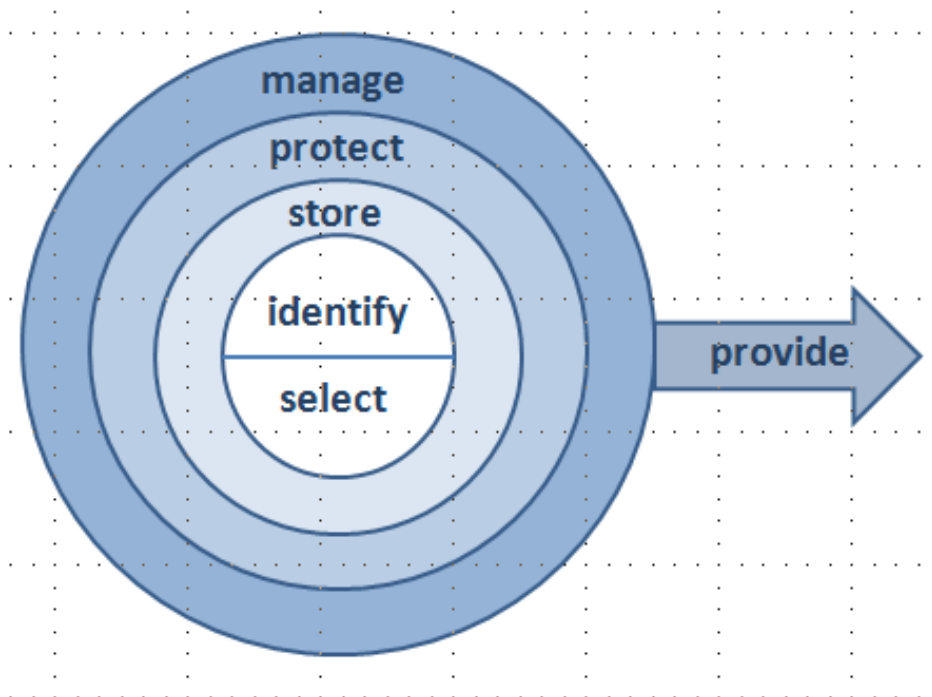
# Topics

- 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**  

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**Digital 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

# 1996 Report

## Preserving Digital Information (PDI)

Commission on  
Preservation and  
Access & RLG

### **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**

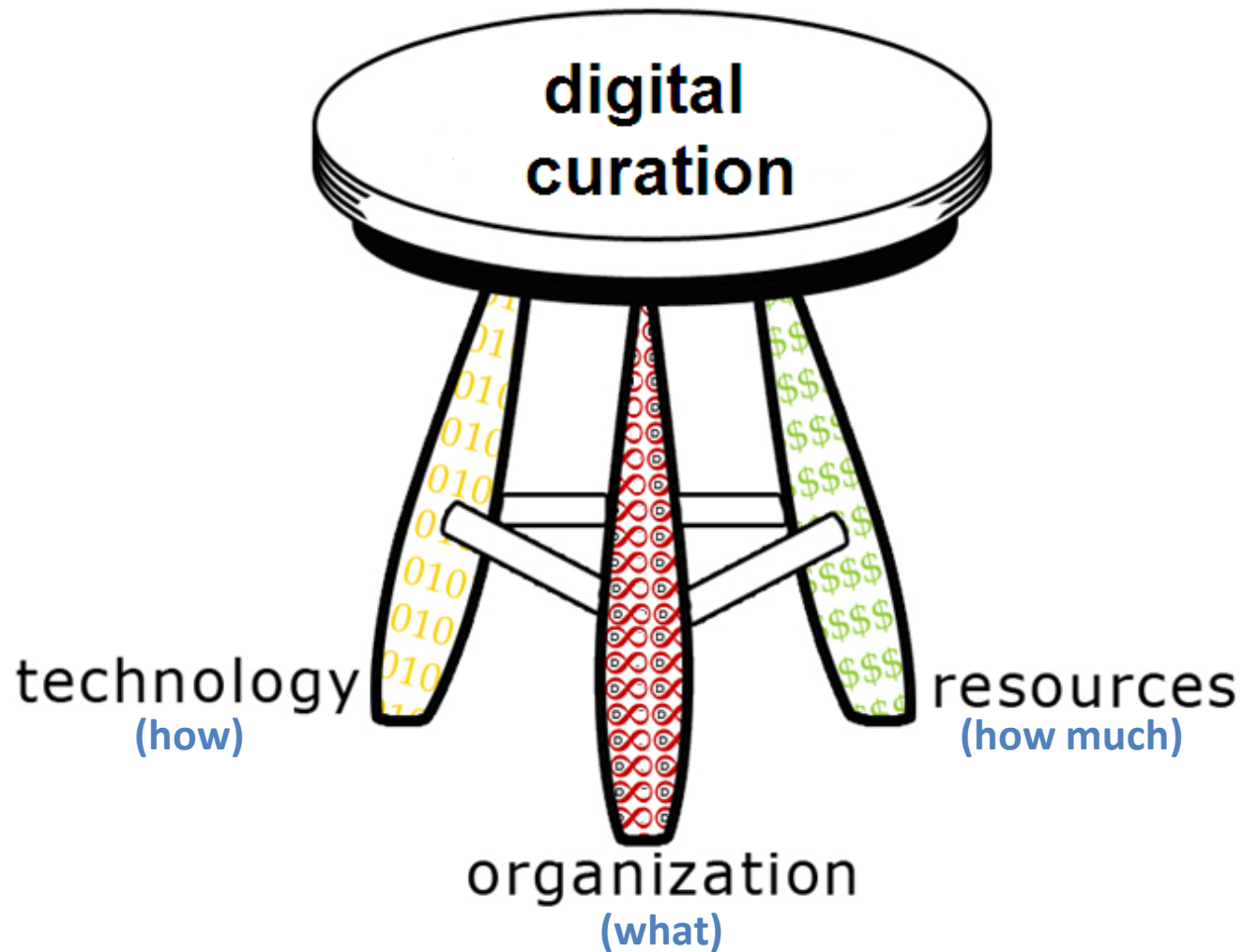
May 1, 1996

# 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...





# Organizational: TDR Attributes

- OAIS Compliance
- Administrative Responsibility
- Organizational Viability
- Financial Sustainability
- Technological and Procedural Suitability
- System Security
- Procedural Accountability



## Trusted Digital Repository Model

6. Procedural Accountability (Certification)

1. Administrative Responsibility

2. Organizational Viability

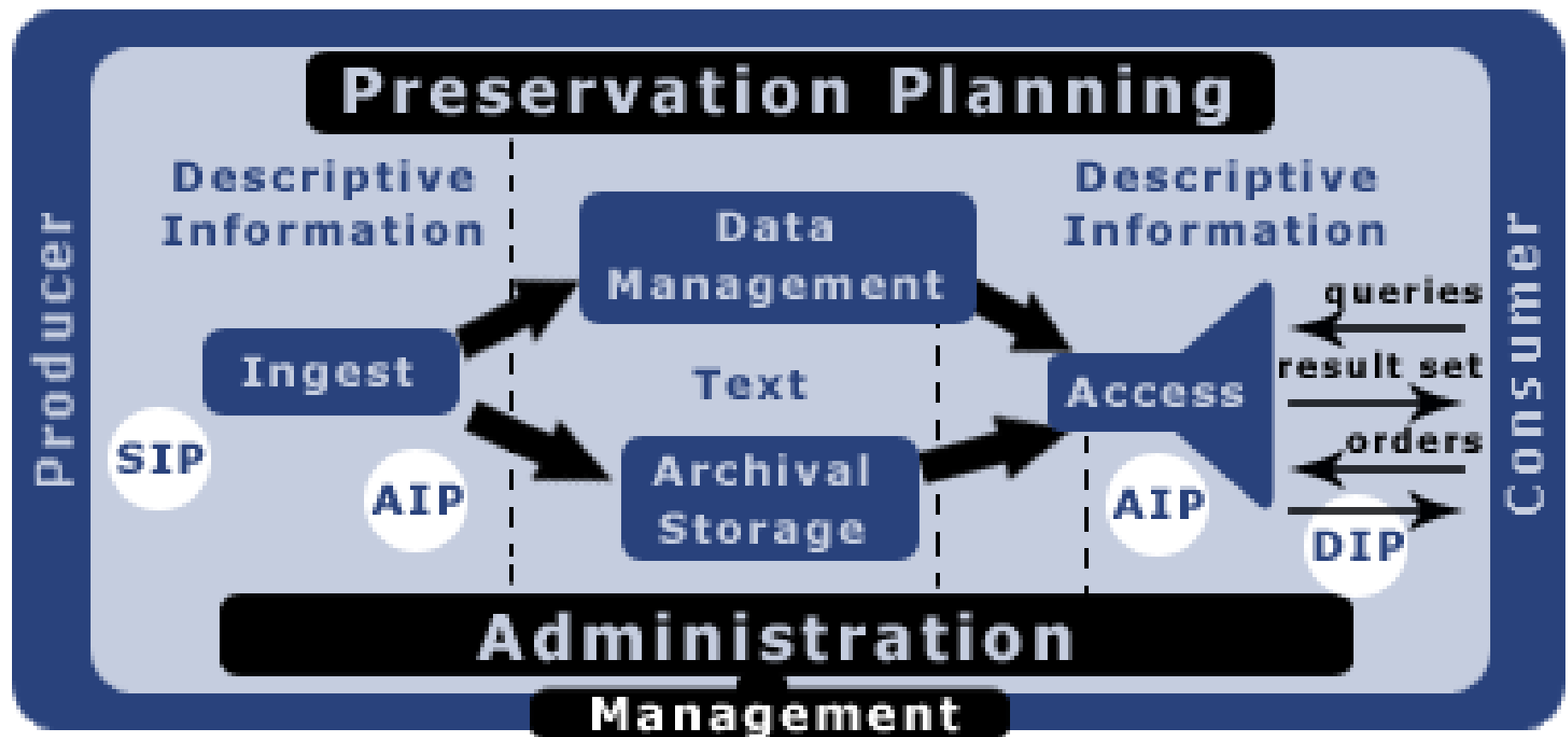
Digital Archives Border

3. Financial Sustainability

4. Technological and Procedural Suitability

5. System Security

# Technological: OAIS



**Open Archival Information System  
(OAIS) Model**



# Resources (funding): BRTF

Life Cycle perspective:

- Value – case for long-term access
- Incentives – beneficiaries & owners
- Roles – responsibilities

BRTF–SDPA Symposium



A National Conversation on the  
Economic Sustainability of Digital Information  
Thursday, April 1, 2010 | Washington, D.C.

[View Event Webcast](#)

**Sustainable Economics for a Digital Planet:**  
Ensuring Long-Term Access to Digital Information

*Final Report of the Blue Ribbon Task Force on  
Sustainable Digital Preservation and Access*

[Click to download](#)

# LIFE<sup>2</sup> Cost Model

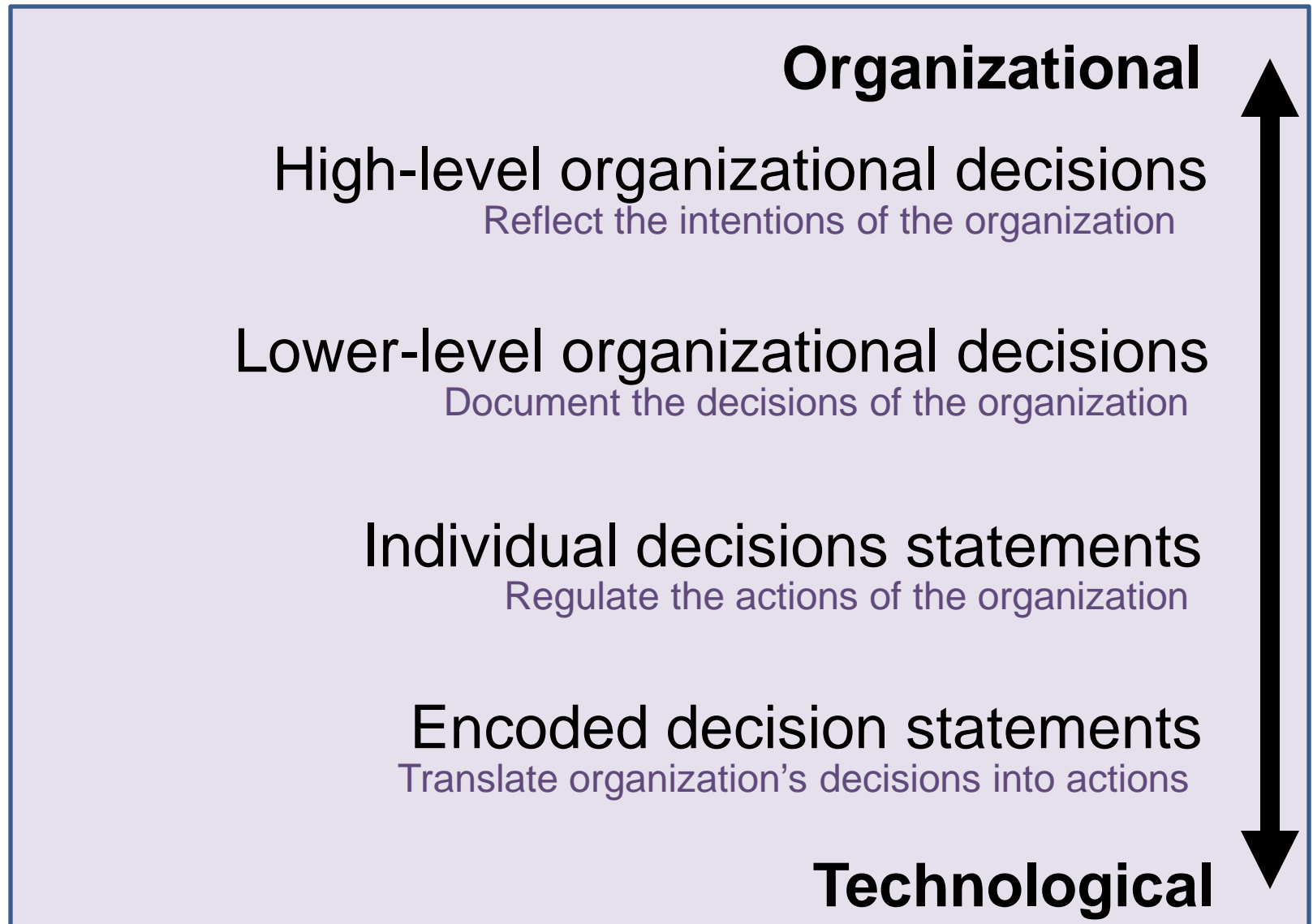
$$\boxed{L_T} = \boxed{C} + \boxed{Aq_T} + \boxed{I_T} + \boxed{M_T} + \boxed{BP_T} + \boxed{CP_T} + \boxed{Ac_T}$$

L	=	Complete lifecycle cost over time 0 to T.
C	=	Creation
Aq	=	Acquisition
I	=	Ingest
M	=	Metadata Creation
BP	=	Bit-stream Preservation
CP	=	Content Preservation
Ac	=	Access

Good Practice



# Decision to Action Continuum



# **ORGANIZATIONAL SETTING**

Organizations demonstrate how they map to Community Standards and practice

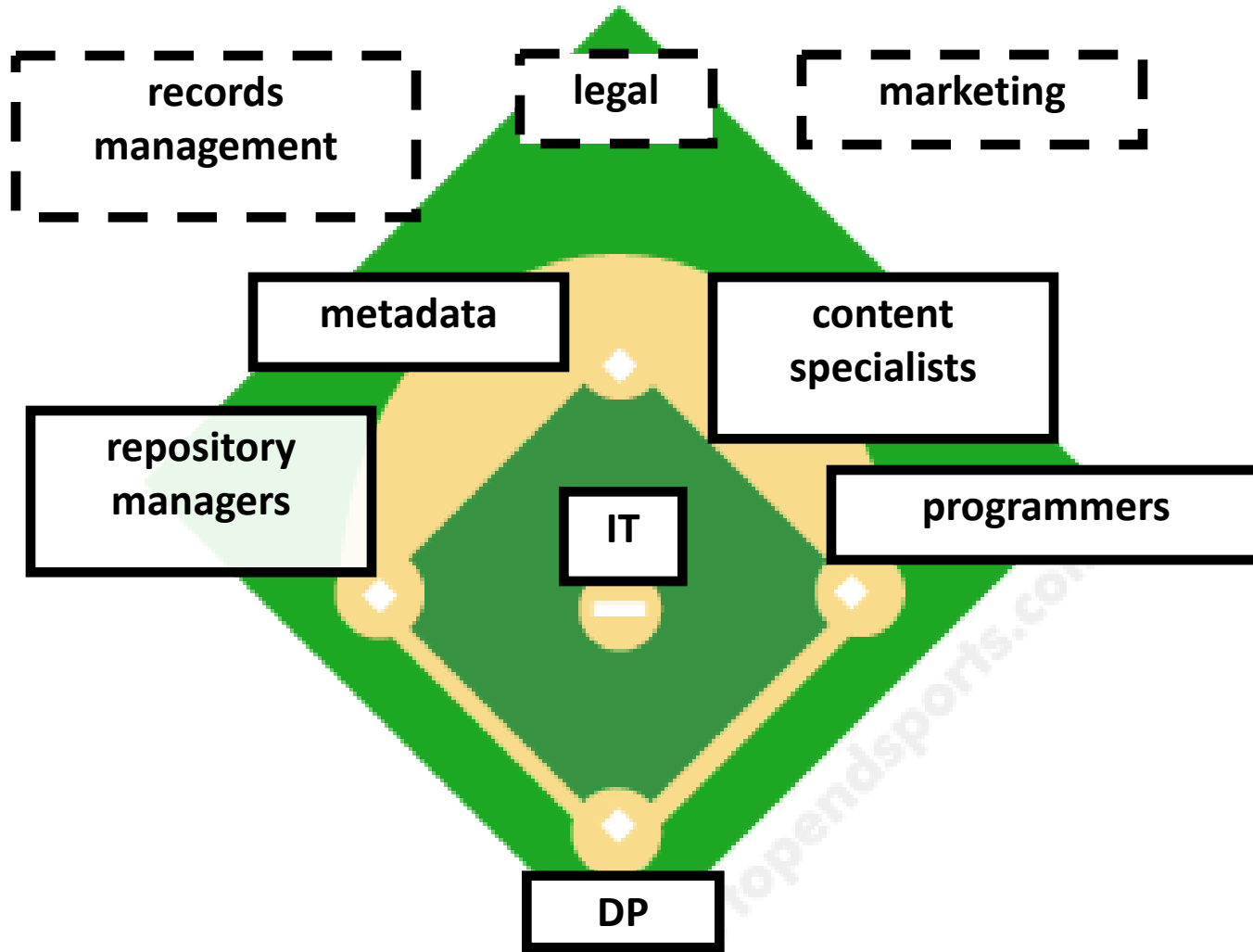
# Stages of Development

- 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

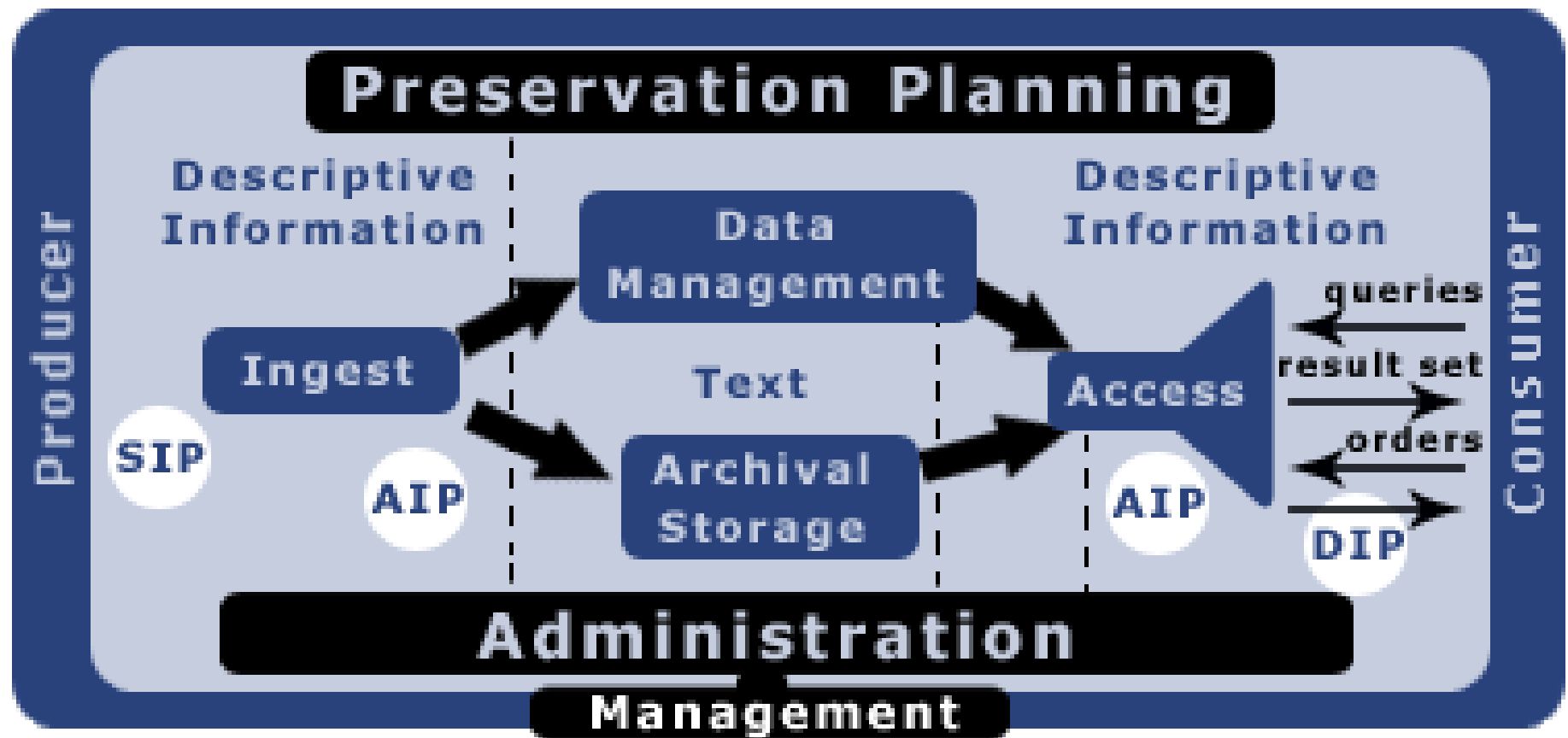
# Dream Team



NOTE: the Dream Team refers to the '67 Red Sox - of course

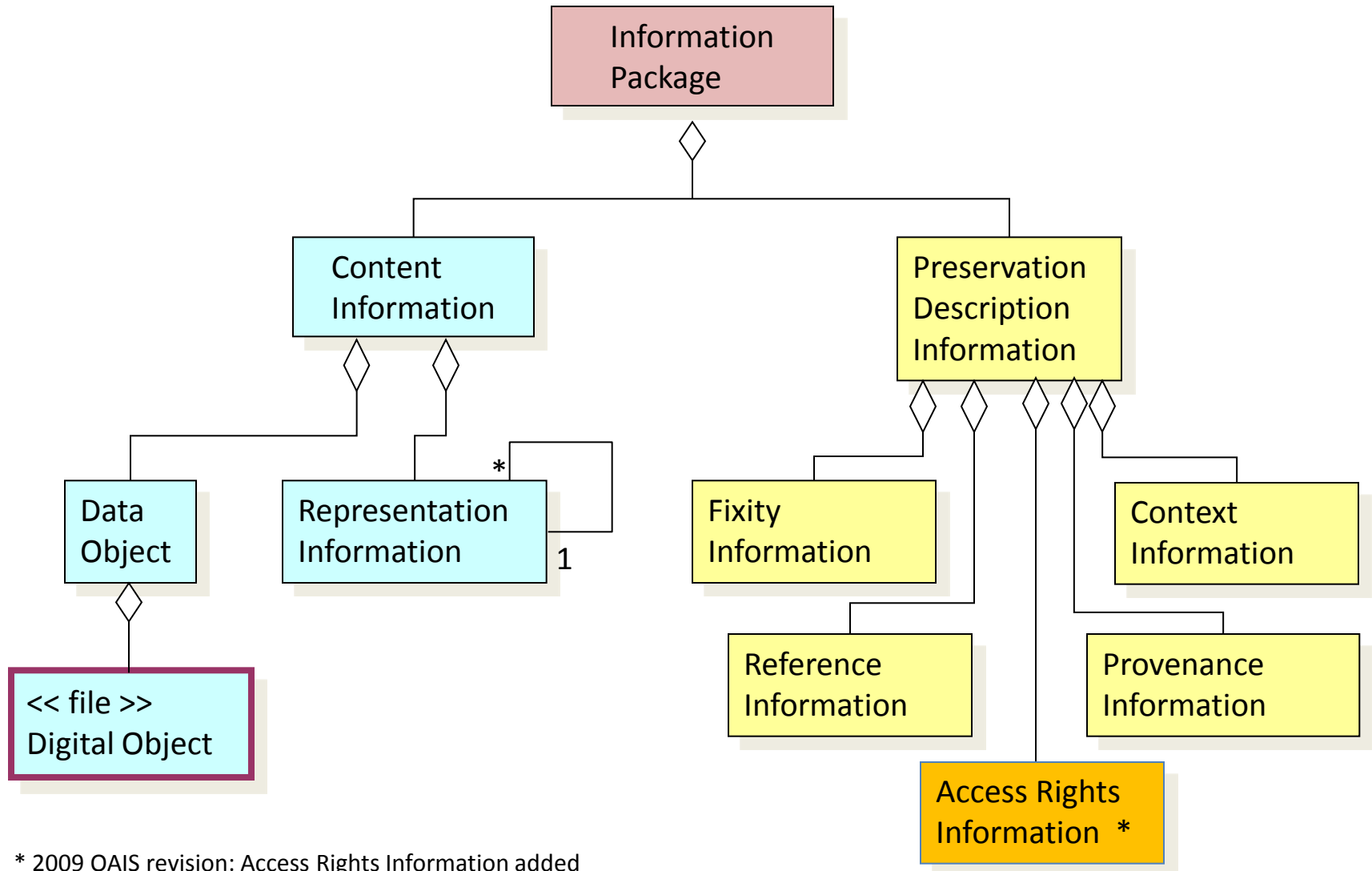


Pondering...

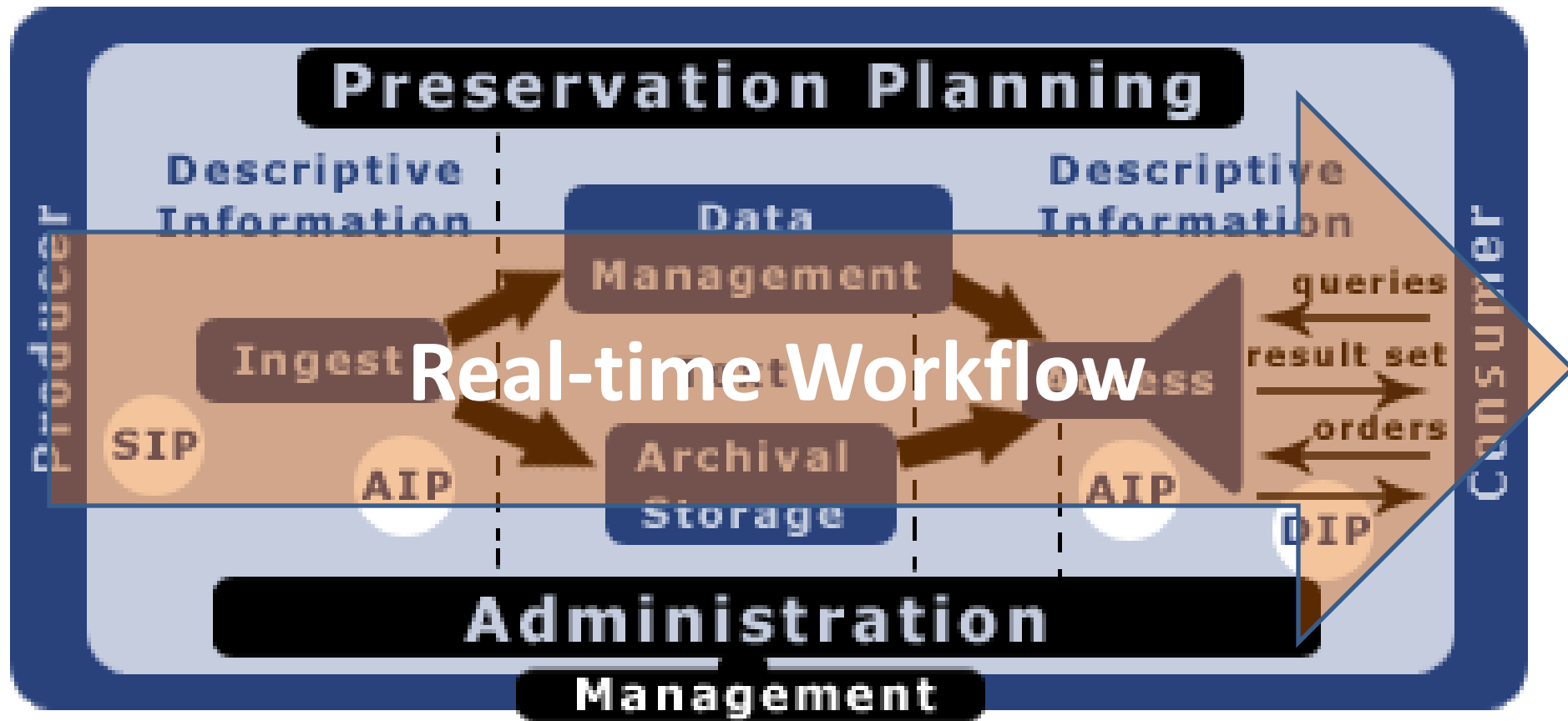


**Open Archival Information System  
(OAIS) Model**

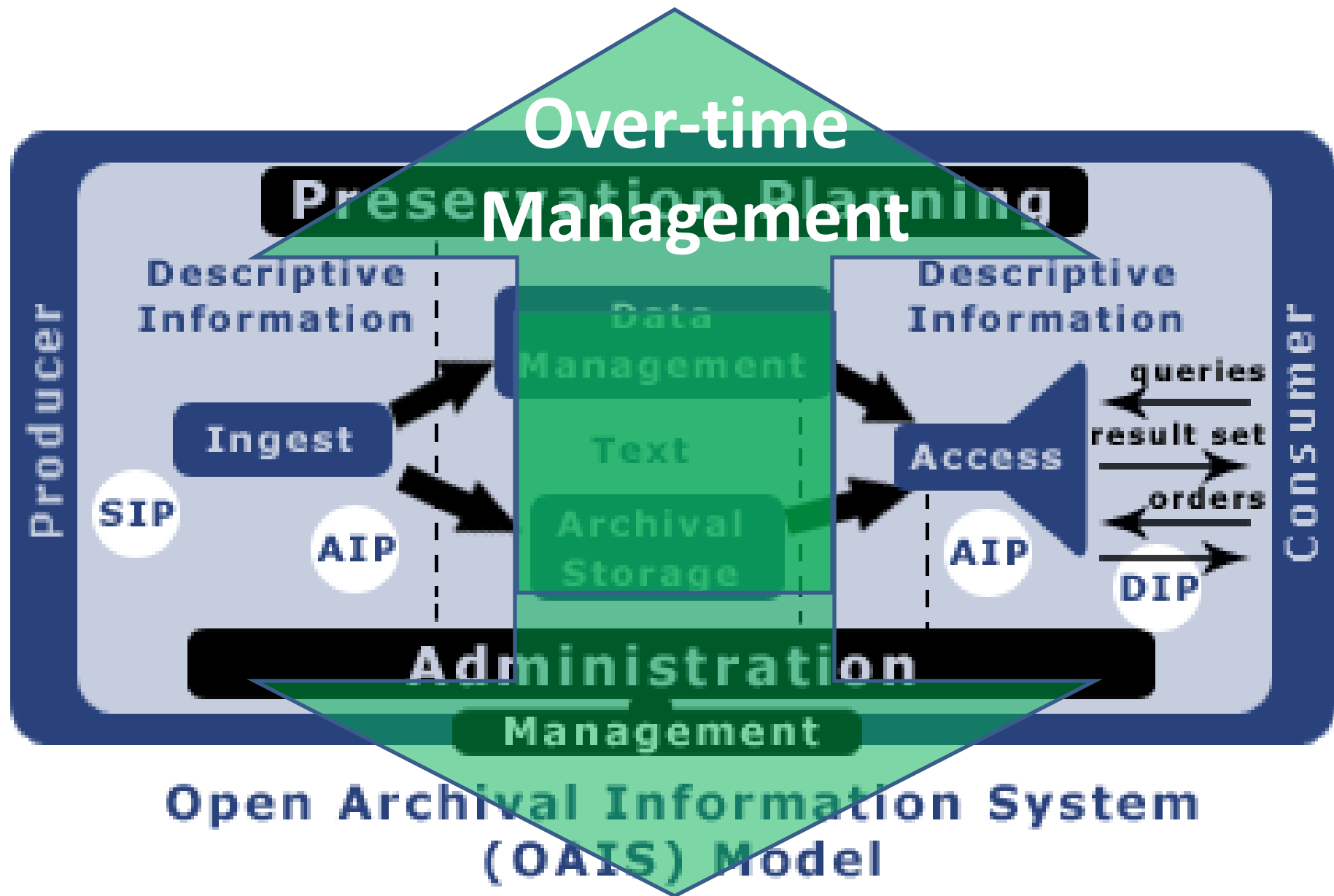
# Life Cycle: Object Level



\* 2009 OAIS revision: Access Rights Information added



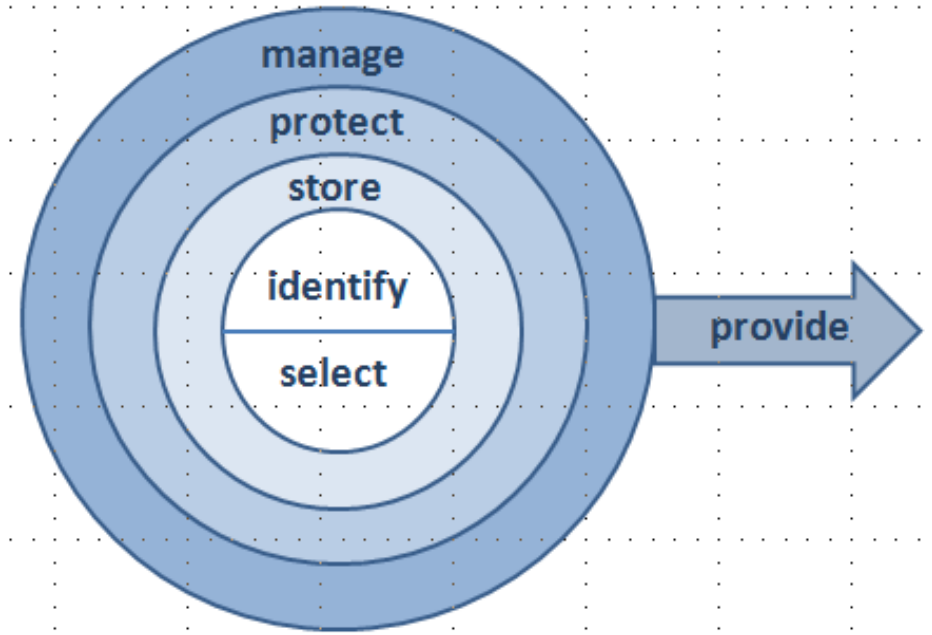
**Open Archival Information System  
(OAIS) Model**



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?

