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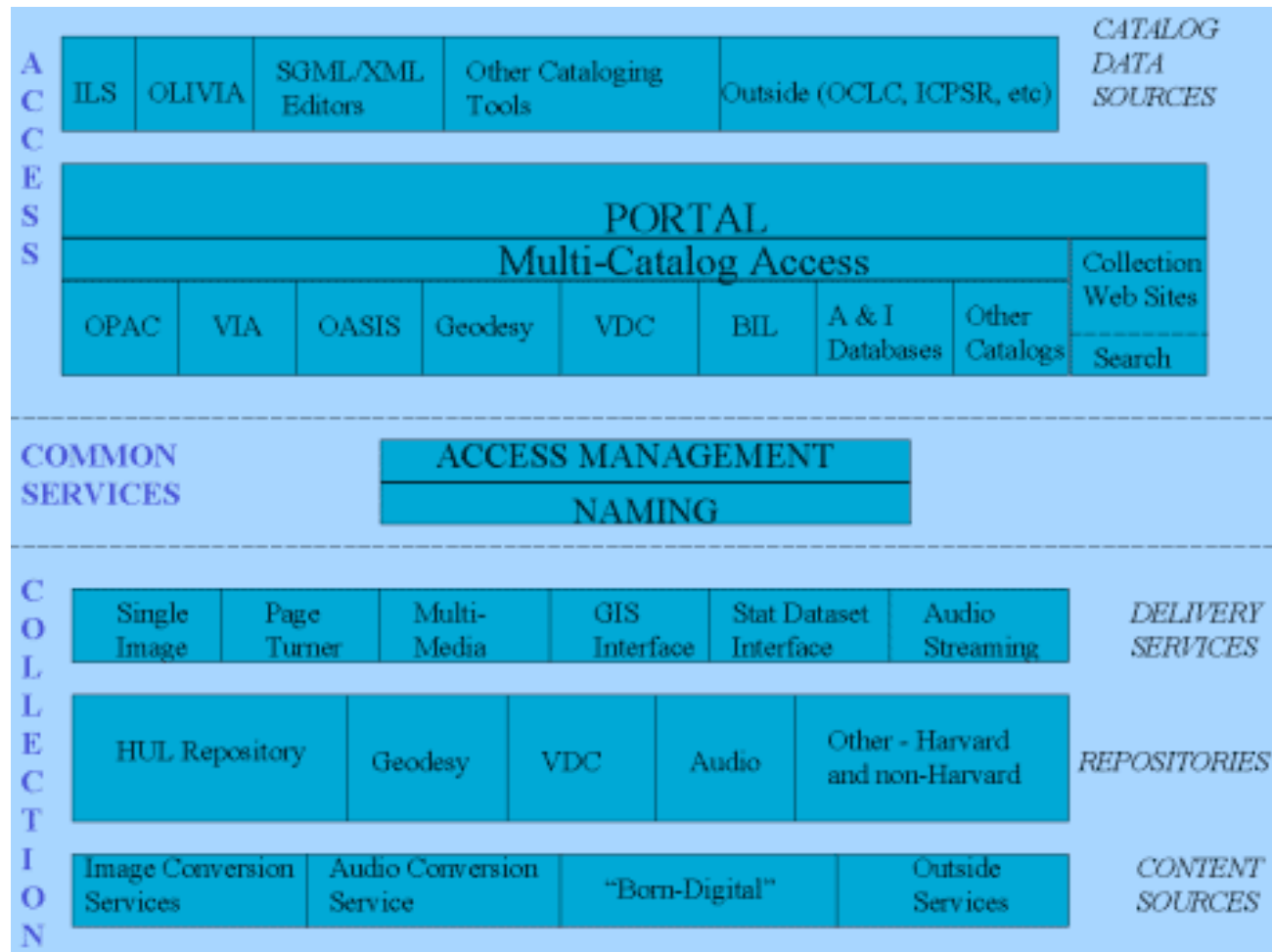
SI 640 Digital Libraries and Archives

Week 5 – Interface and Infrastructure

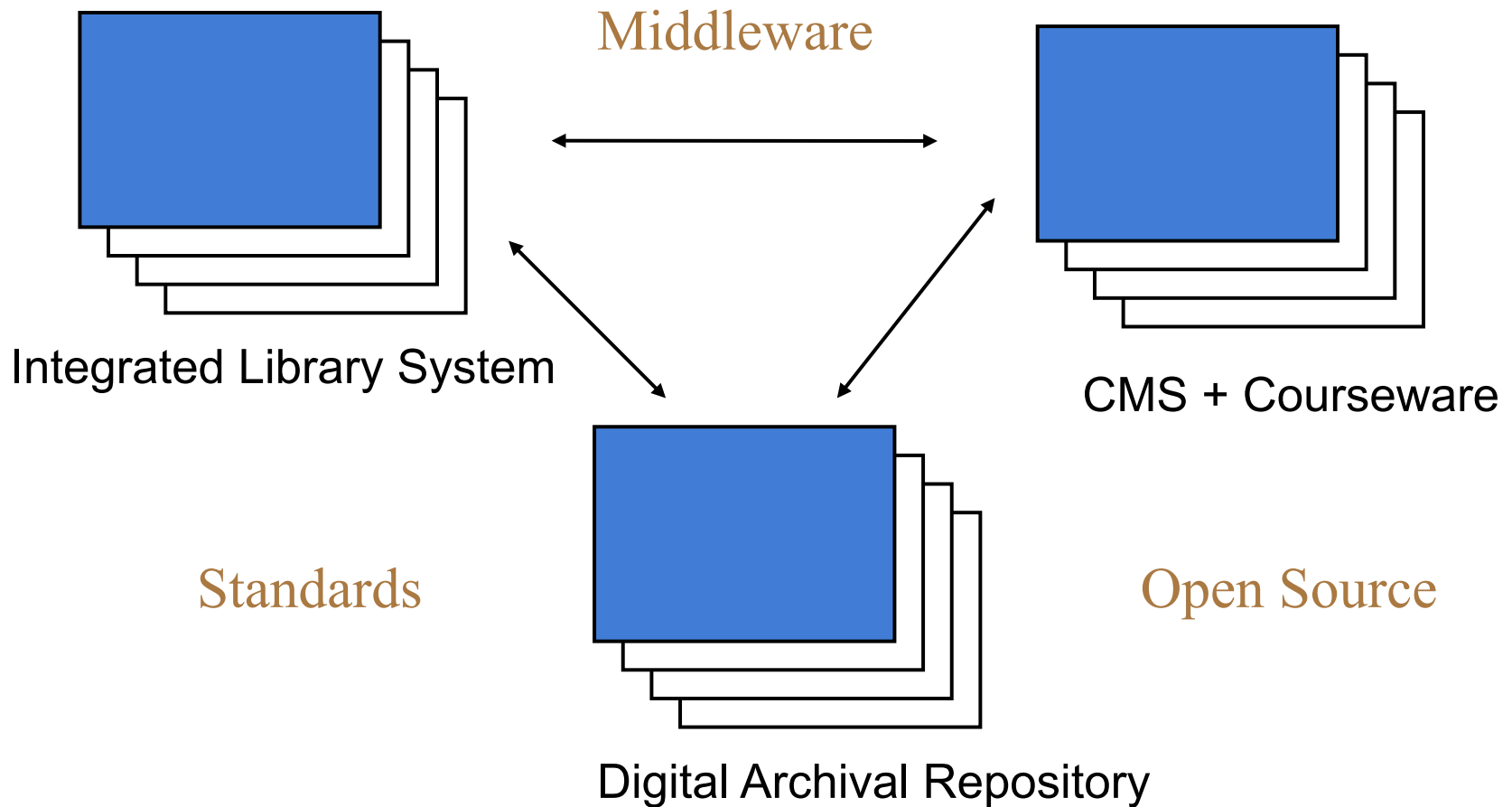
Themes of the Week

- Underlying technical infrastructure is a critical DL component
- Multiple infrastructure models
- Interface is representation of infrastructure
- Two – way communication between user and system
- Metadata schemas are increasingly complex and standardized

Harvard Library Digital Initiative Model



Systems Integration



Open Archival Information System

◆ Open

- Reference Model standard(s) are developed using a public process and are freely available

◆ Information

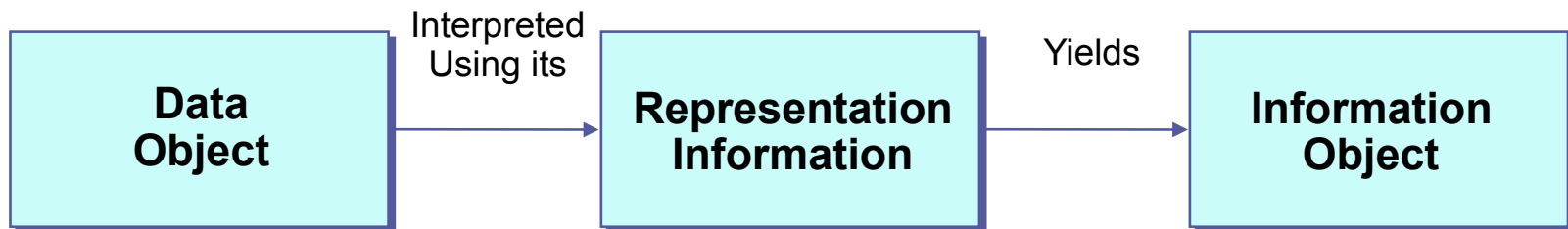
- Any type of knowledge that can be exchanged
- Independent of the forms (i.e., physical or digital) used to represent the information
- Data are the representation forms of information

◆ Archival Information System

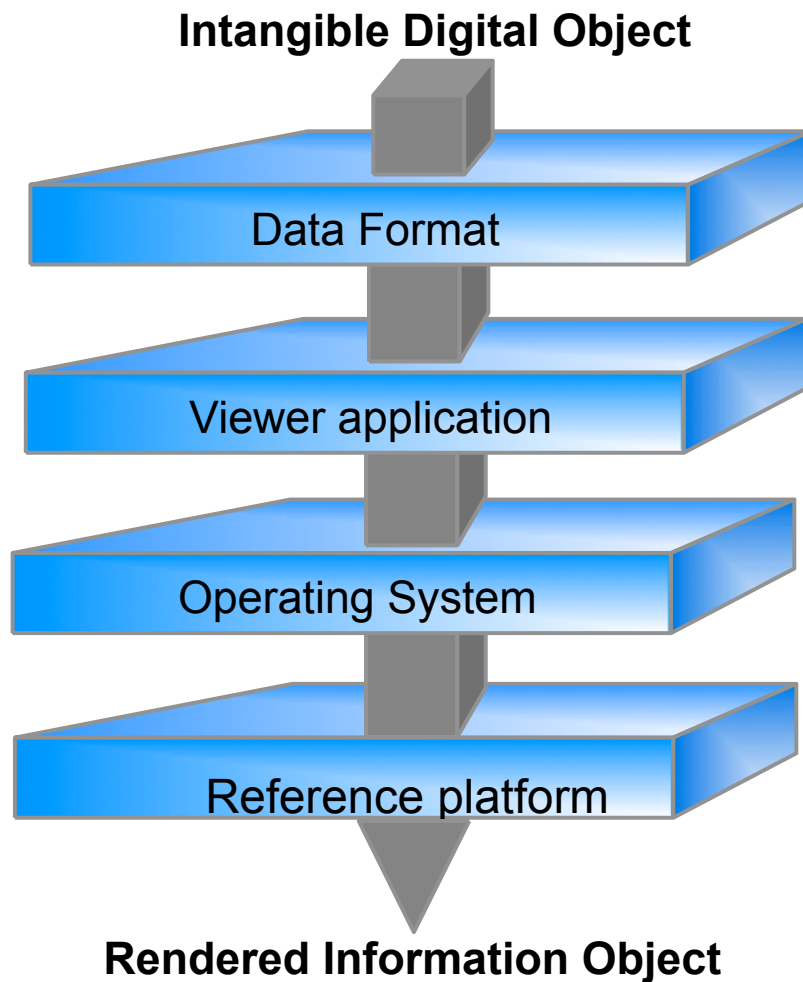
- Hardware, software, and people who are responsible for the acquisition, preservation and dissemination of the information
- Additional OAIS responsibilities are identified later and are more fully defined in the Reference Model document

OAIS Information Definition

- Information is defined as any type of knowledge that can be exchanged, and this information is always expressed (i.e., represented) by some type of data
- In general, it can be said that “Data interpreted using its Representation Information yields Information”
- In order for this Information Object to be successfully preserved, it is critical for an archive to clearly identify and understand the Data Object and its associated Representation Information

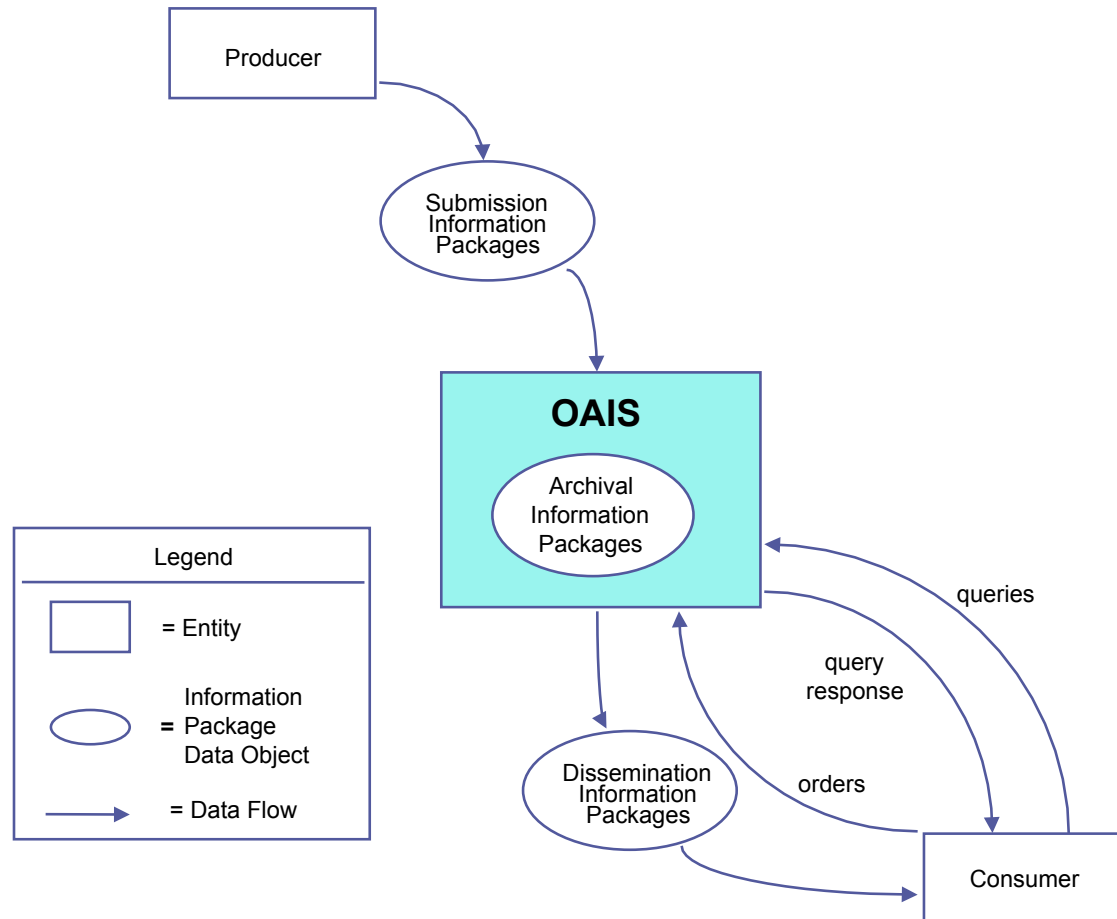


On a abstract level a PLM roughly identifies 4 abstraction levels

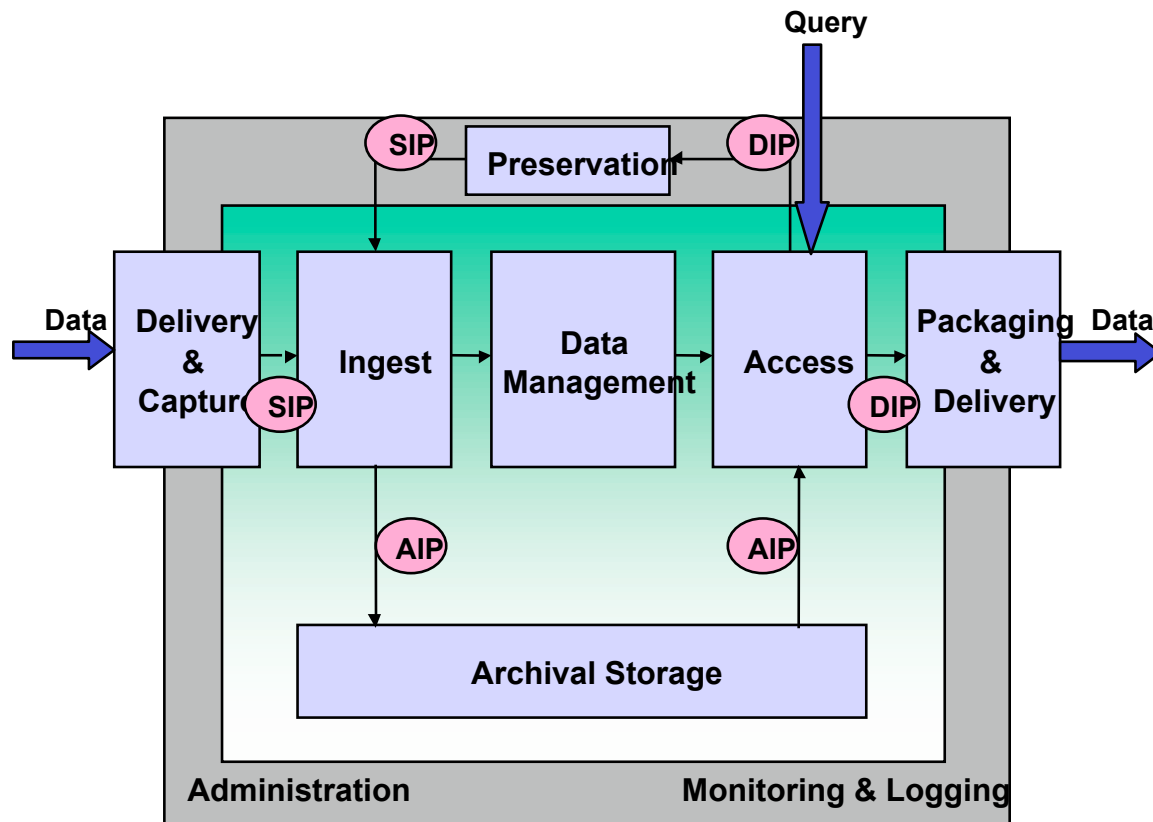


- **Data format** identifies the structuring and meaning of raw bit stream, i.e. the intangible digital object.
- The structuring and meaning of the the raw bit stream are defined within the application logic of specific **viewer applications**. These applications are used to create, modify, and present the information in its intended format.
- The **operating system** provides the shared functionality needed by all viewer applications like peripheral access and basic file management
- The **reference platform** represents the hardware on which the intangible digital objects are rendered into real world physical objects, like for instance a print out or the screen representation.

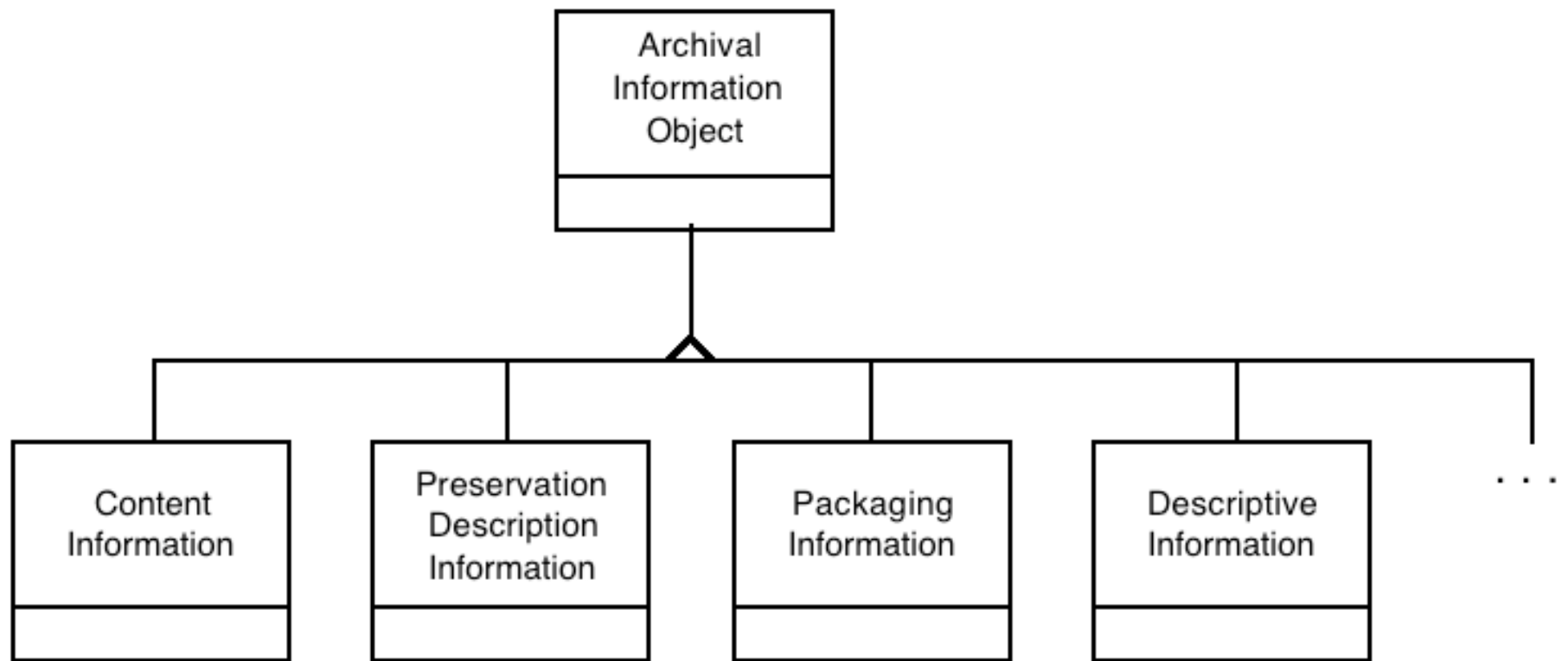
External Data Flow Diagram



Base Processes Within the OAIS Model



Types of Information Used in OAIS



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Preservation Description Information

◆ Provenance Information

- Describes the source of Content Information, who has had custody of it, what is its history

◆ Context Information

- Describes how the Content Information relates to other information outside the Information Package

◆ Reference Information

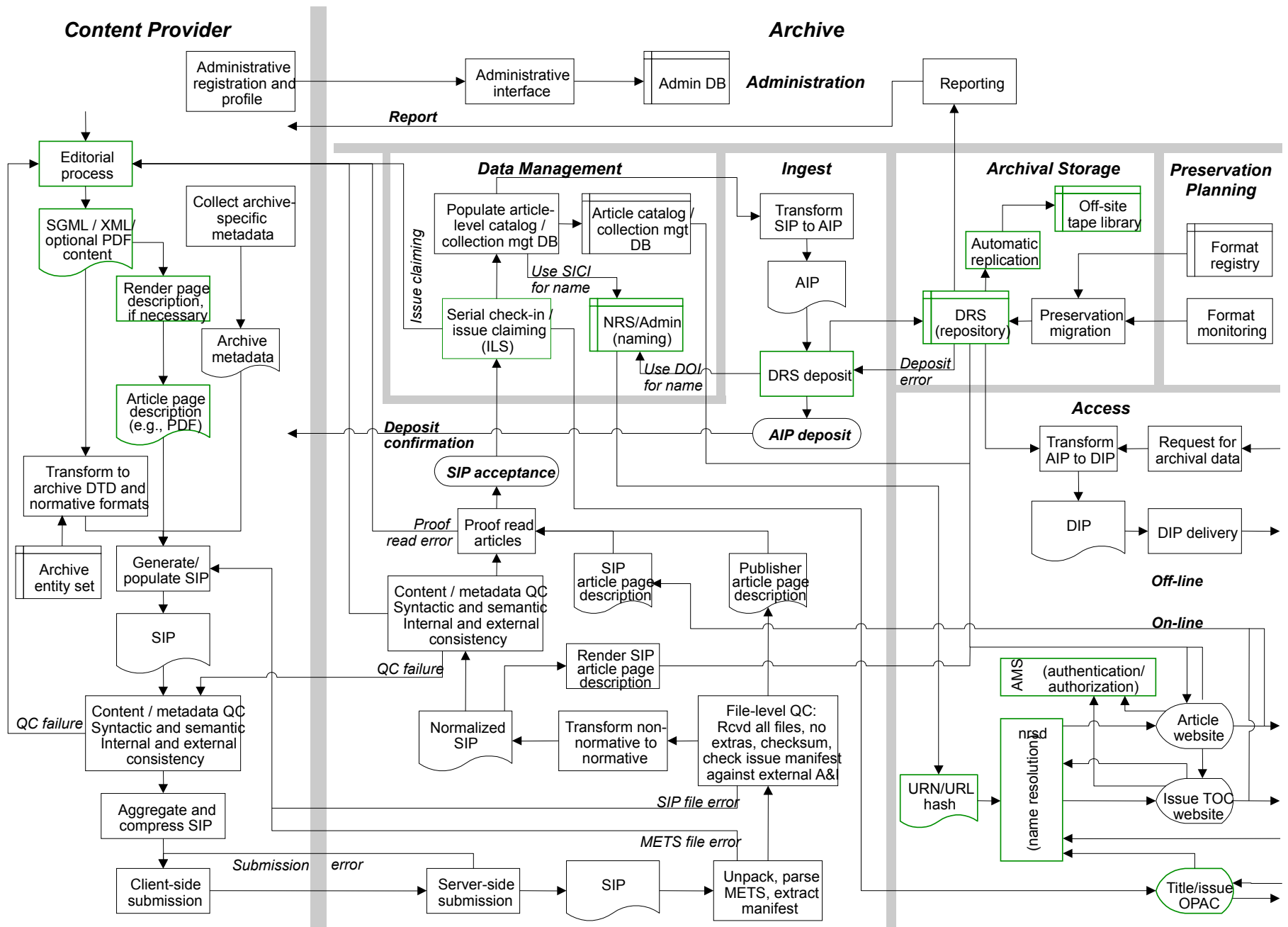
- Provides one or more identifiers, or systems of identifiers, by which the Content Information may be uniquely identified

◆ Fixity Information

- Protects the Content Information from undocumented alteration

Example of Preservation Description Information

Content Information Type	Reference	Provenance	Context	Fixity
Space Science Data	<ul style="list-style-type: none"> ■ Object Identifier ■ Journal Reference ■ Mission, instrument, and title attribute set 	<ul style="list-style-type: none"> ■ Instrument Description ■ Processing History ■ Sensor Description ■ Instrument ■ Instrument mode ■ Processing history ■ Decommunication map ■ Software Interface Specifications ■ Printing history 	<ul style="list-style-type: none"> ■ Calibration history ■ Related data sets ■ Mission ■ Funding history 	<ul style="list-style-type: none"> ■ CRC ■ Checksum ■ Reed-Solomon coding
Bibliographic Information	<ul style="list-style-type: none"> ■ ISBN ■ Title ■ Author 	<ul style="list-style-type: none"> ■ Copyright ■ Position in series ■ Manuscripts ■ References 	<ul style="list-style-type: none"> ■ Related References ■ Dewy Decimal System ■ Publishing Data ■ Publisher 	<ul style="list-style-type: none"> ■ Author Digital signature ■ Cover
Software Package	<ul style="list-style-type: none"> ■ Name ■ Author ■ Version number ■ Serial Number 	<ul style="list-style-type: none"> ■ Revision Histroy ■ License holder ■ Registration ■ Copyright 	<ul style="list-style-type: none"> ■ Help file ■ User Guide ■ Related Software ■ Language 	<ul style="list-style-type: none"> ■ Certificate ■ Checksum ■ Encryption ■ CRC

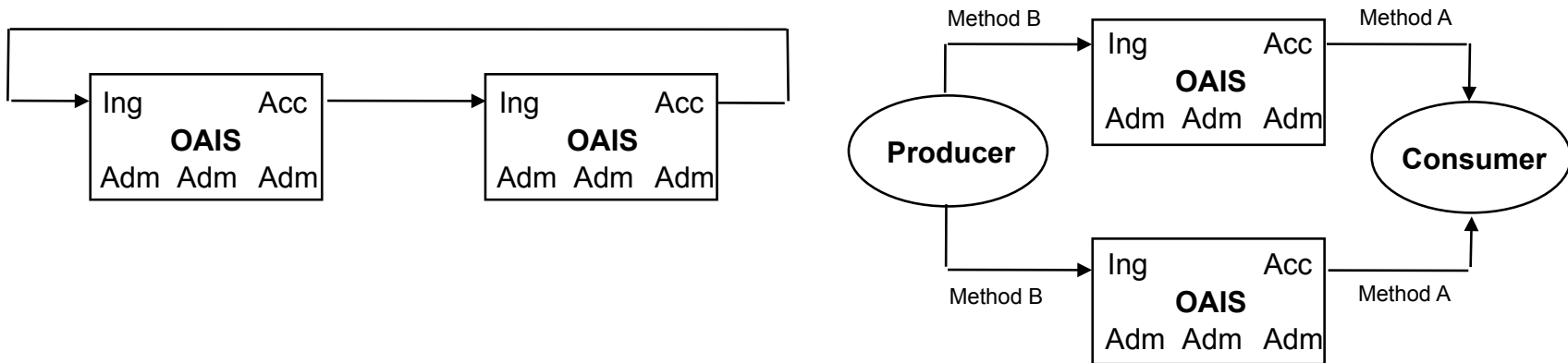


Proposed OAIS-based E-Journal Archive Mapped to Harvard's LDI Infrastructure

Categories of Archive Interactions

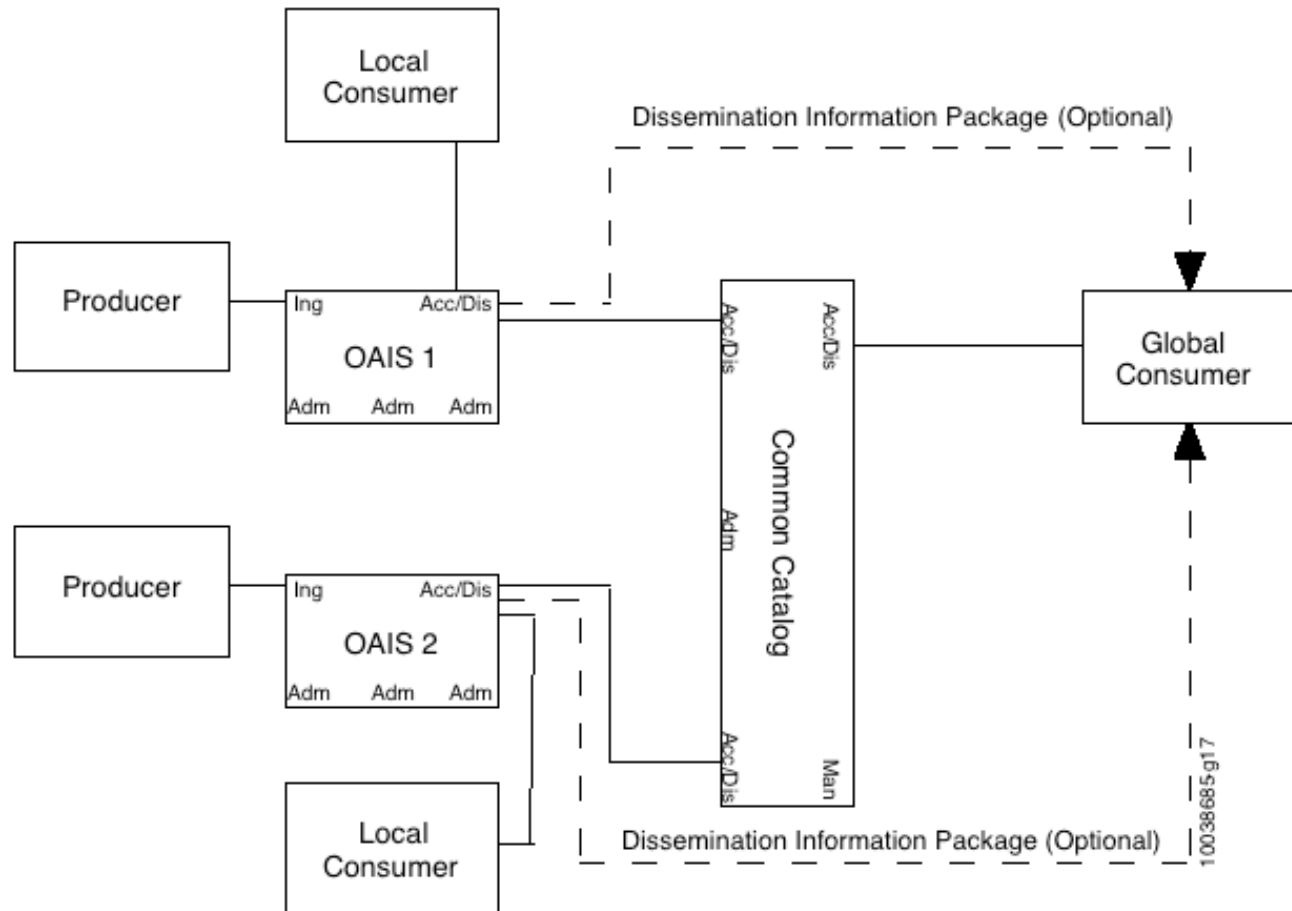
- **Independent:** no knowledge by one OAIS of Standards implemented at another
- **Cooperating:** Potentially common submission standards, and common dissemination standards, but no common access. One archive may make subscription requests for key data at the cooperating archive
- **Federated:** Access to all federated OAIS is provided through a common set of access aids that provide visibility into all participating OAISs. Global dissemination and Ingest are options
- **Shared resources:** An OAIS in which Management has entered into agreements with other OAISs is to share resources to reduce cost. This requires various standards internal to the archive (such as ingest-storage and access-storage interface standards), but does not alter the community's view of the archive

Cooperating Archives

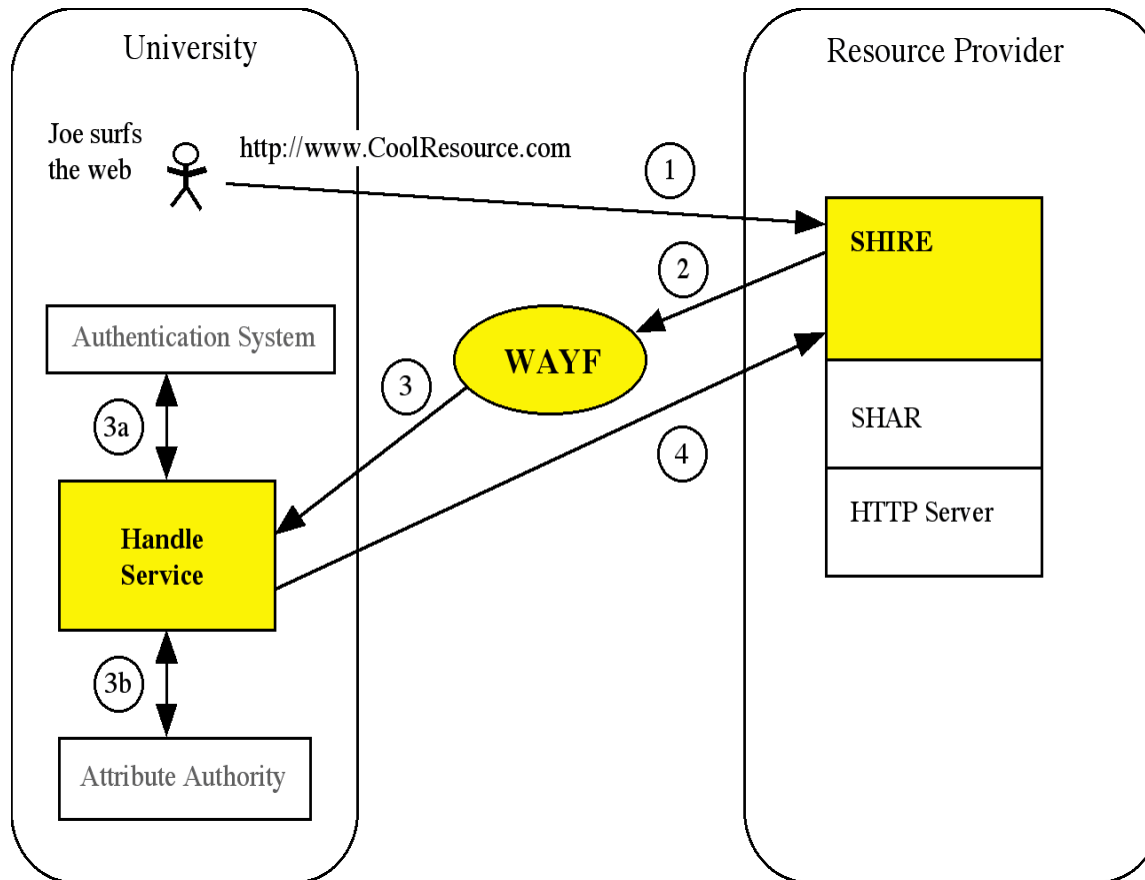


- The first set of cooperating OASIS merely have an agreement to share at least on common SIP and DIP format to enable the transfer of holdings
- The second set of cooperating OASIS have standardized their DIP and SIP formats for use by producers and consumers

Federated Archives

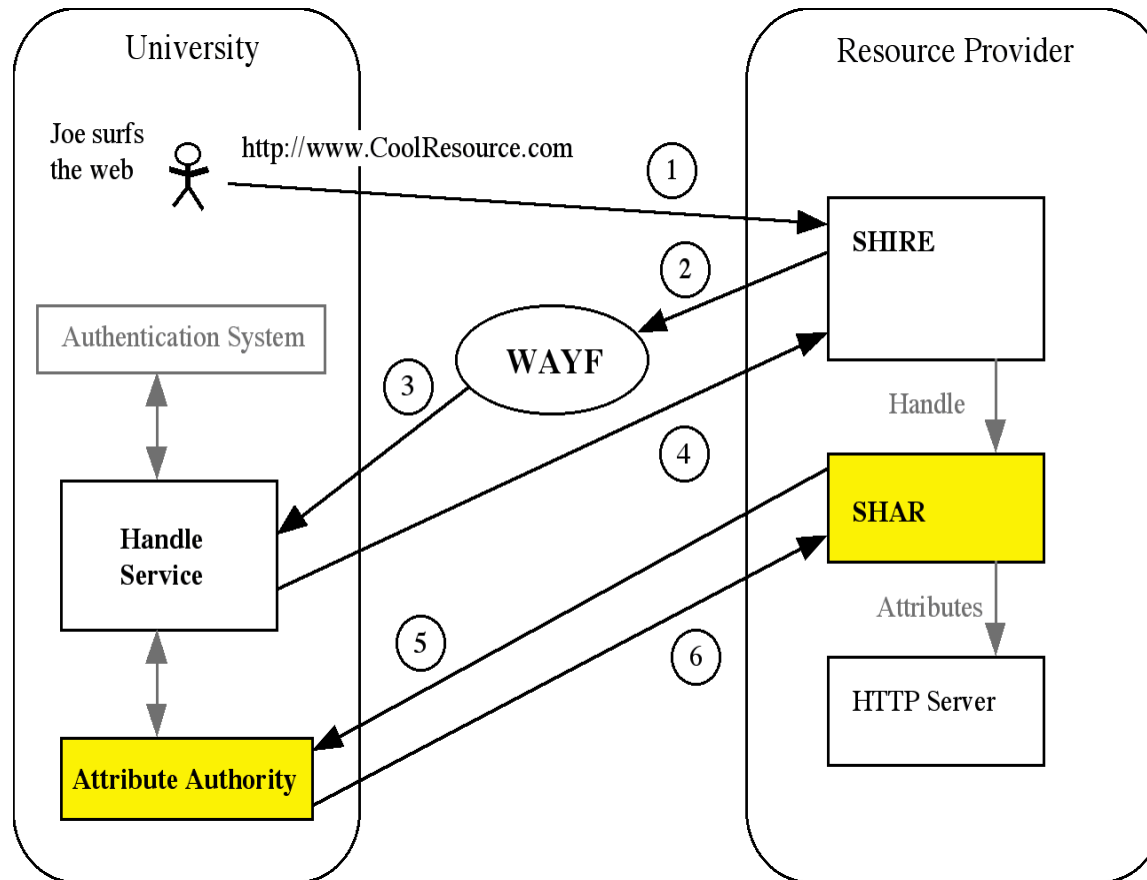


Establishing a User Context



From: Internet2 (<http://www.internet2.edu/>)

Getting Attributes and Determining Access



From: Internet2 (<http://www.internet2.edu/>)



Attribute Authority -- Management of Attribute Release Policies

The AA provides ARP management tools/interfaces.

Different ARPs for different targets

Each ARP Specifies which attributes and which values to release

Institutional ARPs (default)

- *administrative default policies and default attributes*
- *Site can force include and exclude*

User ARPs managed via "MyAA" web interface

Release set

determin

e

d by "combining" Default and User ARP for the specified resource

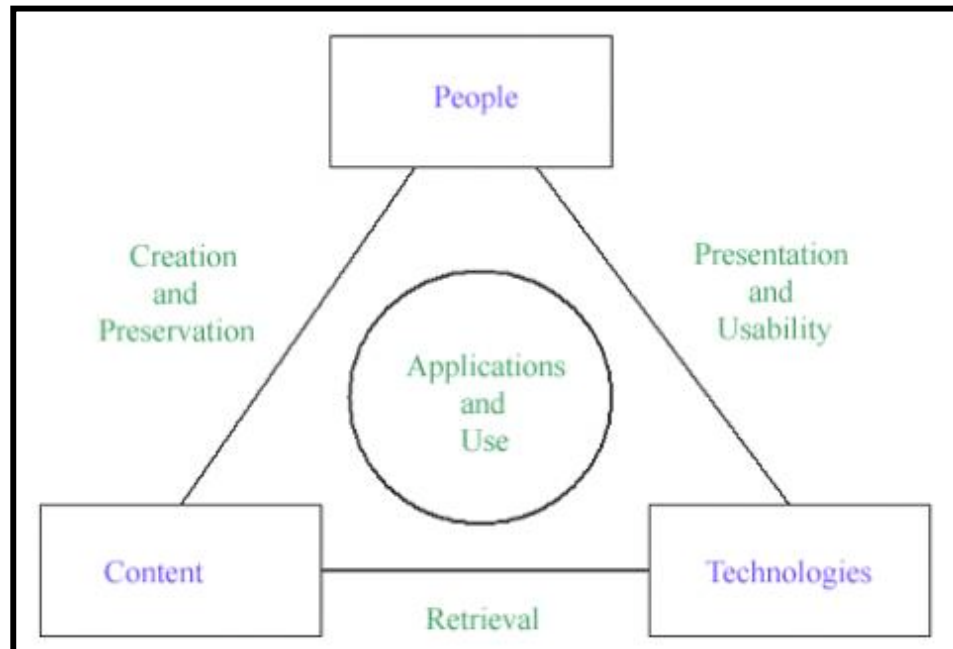


Authorization Attributes

Typical Attributes in the Higher Ed Community

Affiliation	“active member of the	Member@washington.edu
EPPN	community”	gettes@georgetown.edu
Entitlement	identity	Urn:mace:infovendor:contract1234
OrganizationalUnit	An agreed upon opaque string	Economics Department
EnrolledCourse	Department	Physics 201
	Opaque course identifier	

From: Internet2 (<http://www.internet2.edu/>)



NSF/DELOS. (2003) Working Group on Digital Imagery for Significant Cultural and Historical Materials.

http://www.dli2.nsf.gov/internationalprojects/working_group_reports/digital_imagery.html

From: Internet2 (<http://www.internet2.edu/>)

Thank you!

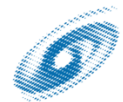
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