

# Open Archival Information System (OAIS)

*An Introduction*

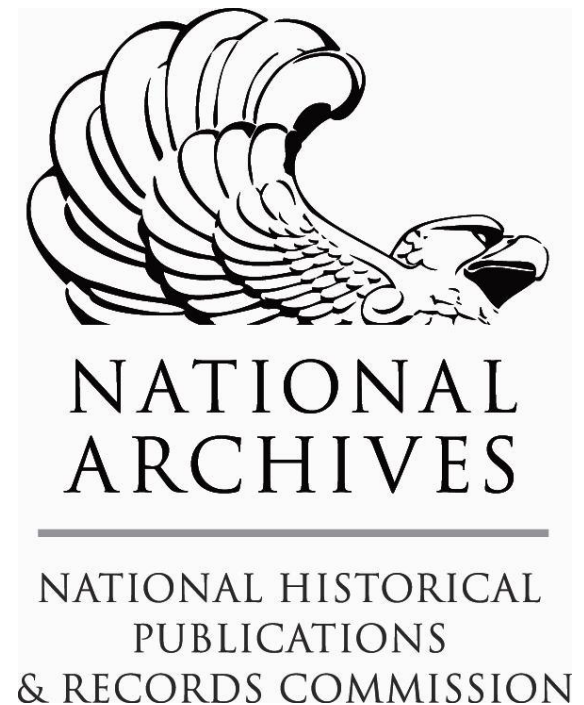
June 17, 2013

# Using iLinc

**Before we get started, let's review iLinc features**

- Ask a question by “raising” your hand
- Send a chat message (public or private)
- Please mute your phone (\*6)
- Don't put your phone on HOLD!

Brought to you by....



# Outline

- ISO 14721:2012
- What is the OAIS model?
- Parts of the OAIS model
  - Actors – the roles
  - Information Packages – the content
  - Actions – the functions
- Summary
- Sources of Information/Bibliography

# OAIS not OASIS!



# Open Archival Information System (OAIS)

- 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

# History

- NASA
  - Consultative Committee for Space Data Systems (CCSDS)
    - Established in 1982 to develop standards for data handling in support of space research
  - Began work on standard with ISO in 1994
  - Blue Book (Recommended Standard) - 2002
  - ISO standard in 2003
  - Magenta Book (Recommended Practice) - 2012

# ISO 14721:2012

- Provide a framework to:
  - Understand archival concepts needed for long term digital information preservation and access
  - Describe and compare architectures and operation of existing and future archives
  - Describe and compare different long term preservation strategies and techniques
  - Expand other efforts to cover long term preservation of information that is not in digital form (e.g. physical media and physical samples)



# ISO 14721:2012

- provides a basis for comparing the data models of digital information preserved by archives and for discussing how data models and the underlying information may change over time
- Provide the concepts needed by non-archival organizations to be effective participants in the preservation process,
- expands consensus on the elements and processes for long term digital information preservation and access, and promotes a larger market which vendors can support, and
- guides the identification and production of OAIS-related standards.

Recommendation for Space Data System Practices

**REFERENCE MODEL FOR AN  
OPEN ARCHIVAL  
INFORMATION SYSTEM (OAIS)**

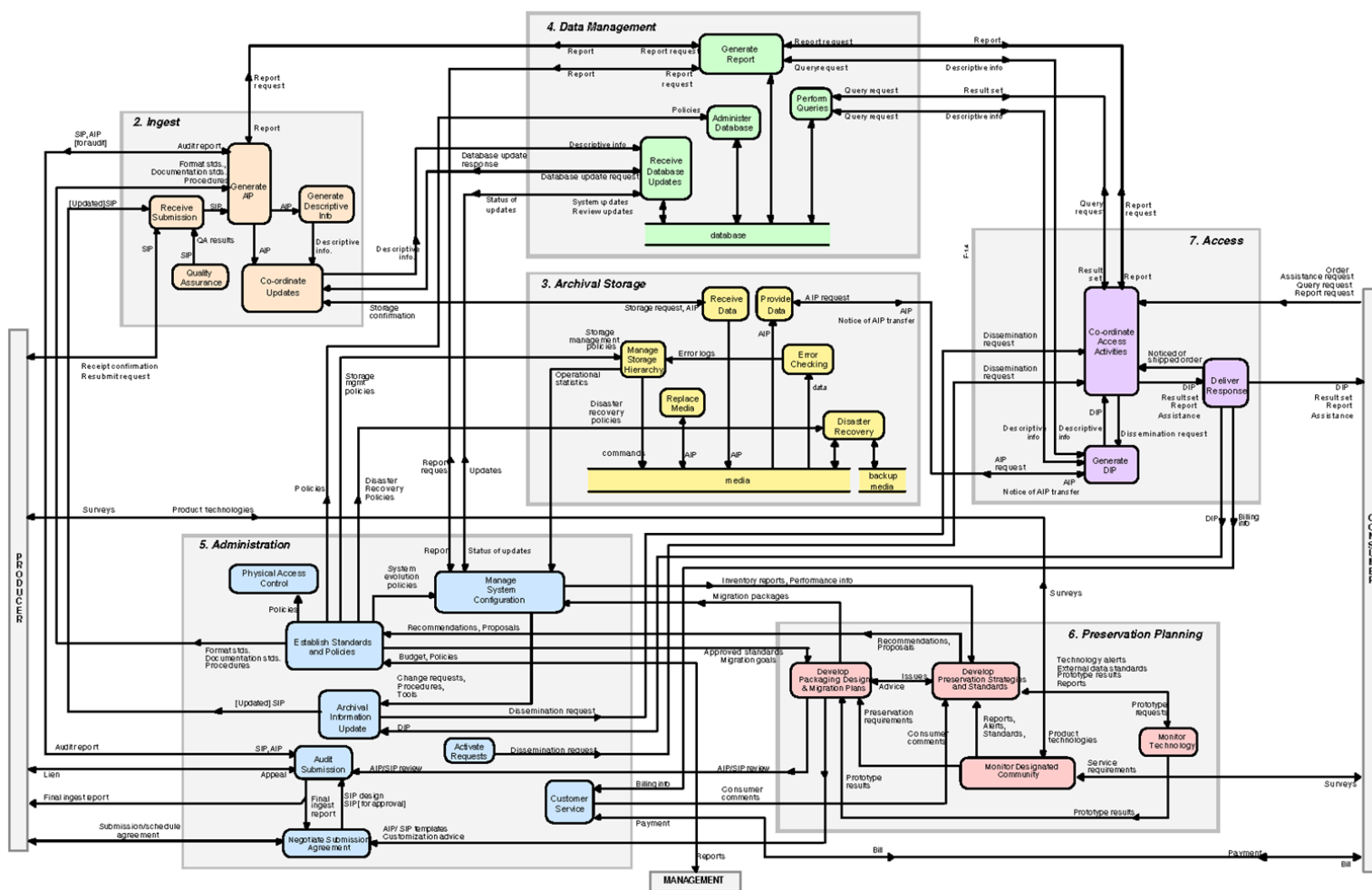
**RECOMMENDED PRACTICE**

**CCSDS 650.0-M-2**

**MAGENTA BOOK**

June 2012

# The OAIS Detailed Model



# What is the OAIS model?

- The Open Archival Information System, usually referred to as the OAIS model, is a reference model that has been widely accepted by the digital preservation community as a key standard for digital repositories.
- The OAIS model specifies how digital assets should be preserved for a community of users from the moment digital material is ingested into the digital storage area, through subsequent preservation strategies to the creation of a dissemination package for the end user.
- The OAIS reference model is a high-level reference model, which means it is flexible enough to use in a wide variety of environments.
- In other words, the OAIS model is a conceptual model of what attributes a digital archive system should possess.

# Designated Community

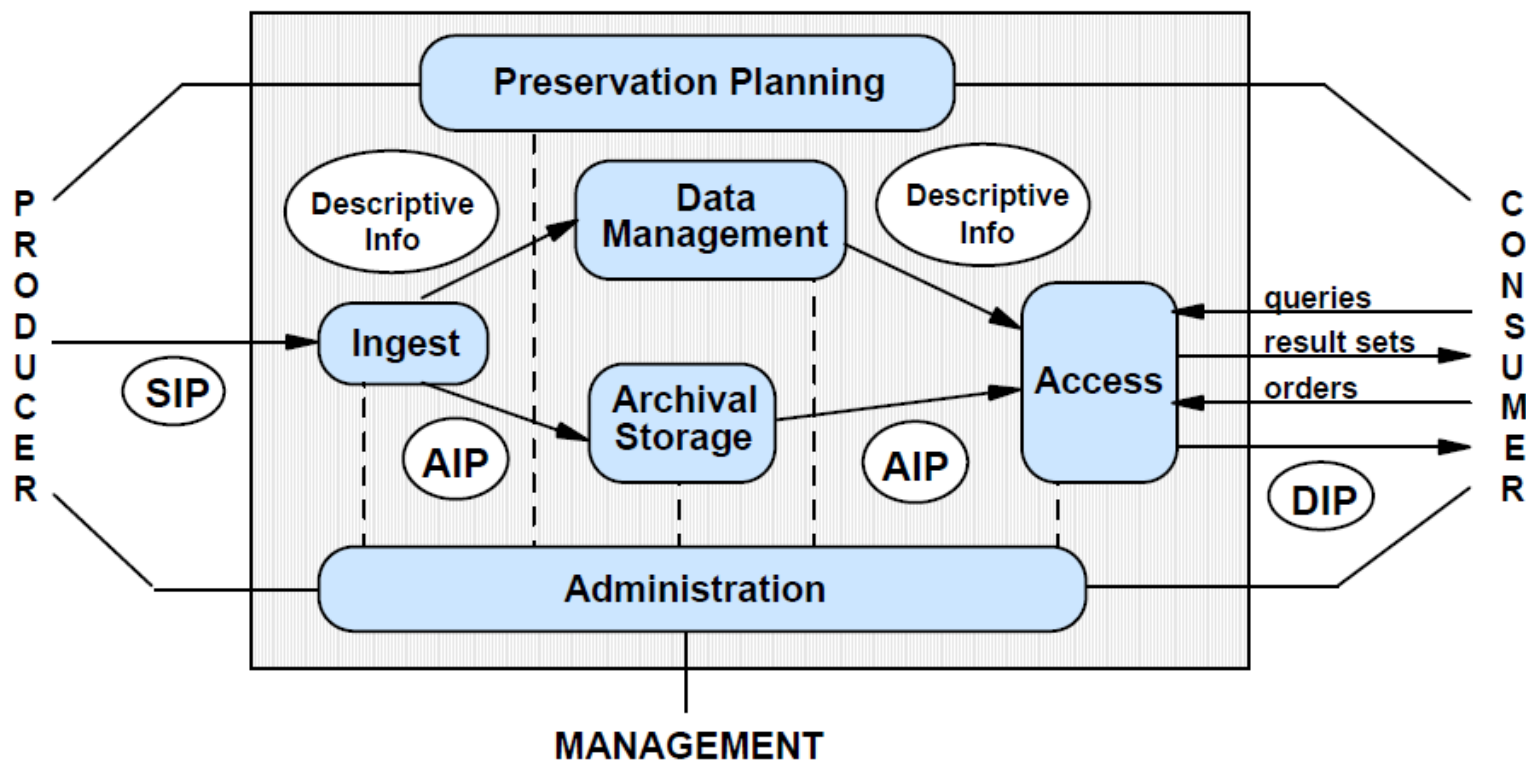
- Who are they and what are their interests?
- What is their Knowledge Base?

Specific vs. Broad

- Can change over time
- Monitor to ensure Content Information  
is still understandable.

# Who is YOUR Designated Community?

# The OAIS Basic Model



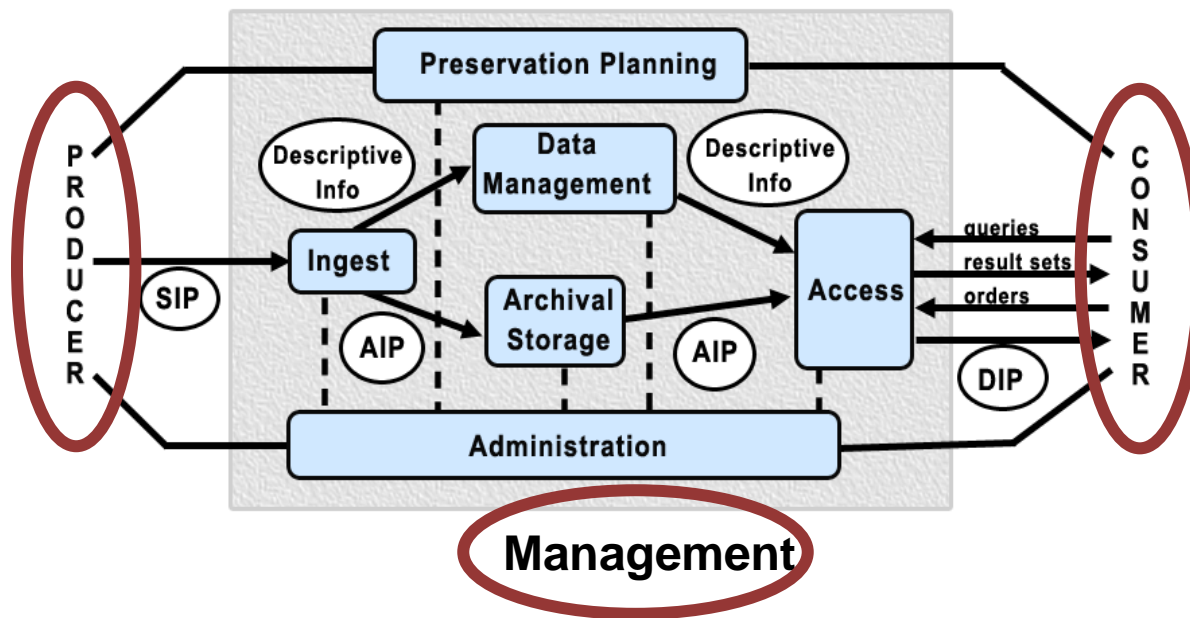
# Parts of the OAIS Model

- **Actors** – the roles
- **Information Packages** – the content
- **Actions** – the functions



# OAIS Actors – the roles

- **Producer:** delivers material to the system
- **Consumer:** obtains material from the system
- **Management:** responsible for managing the system



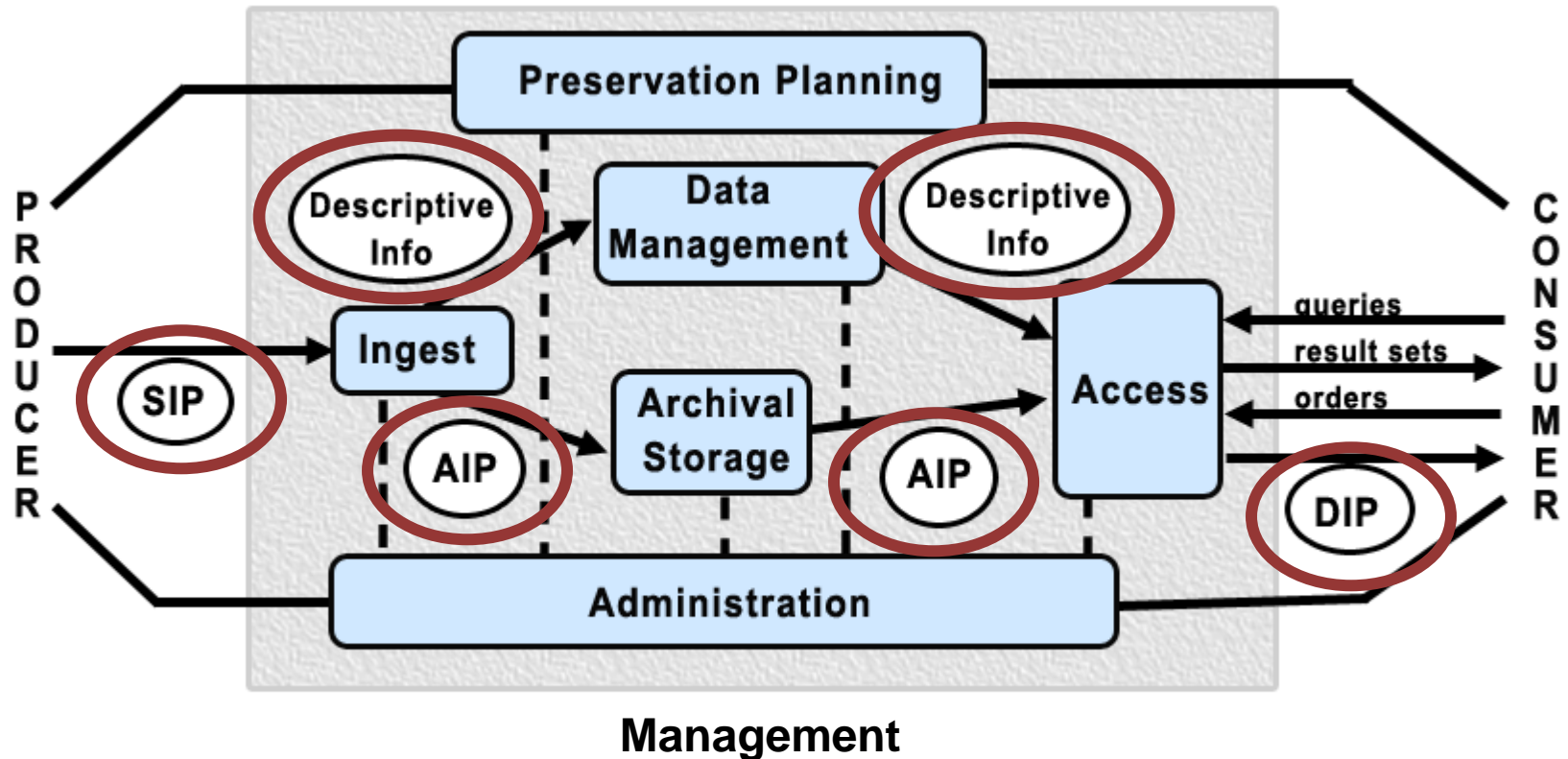
# Who are YOUR Actors?

- Producers
- Consumers
- Management

# OAIS Information Packages – the content

- Submission Information Package (SIP)
- Dissemination Information Package (DIP)
- Archival Information Package (AIP)

# OAIS Information Packages – the content



# Submission Information Package (SIP)

- A SIP is the sub information package that contains the content and associated metadata required/necessary (as defined by the system) to manage the object over time.
- The object originally transferred to the archive.

# Submission Information Package (SIP)

- At the SIP stage, the metadata accompanying the digital object is, ideally, supplied by the Producer who is generally the original creator of the material; in the case of personal archives it is perhaps more likely that a digital archivist working with the creator will provide the metadata.
- At this stage, the metadata will probably lack structure and may not be comprehensive at all levels of the archive.
- SIPs may also be supplied to an OAIS from another digital repository. Where another digital repository has supplied SIPs, the use of interoperable metadata standards will minimize the effort required to ingest the material into the new repository.

# Dissemination Information Package (DIP)

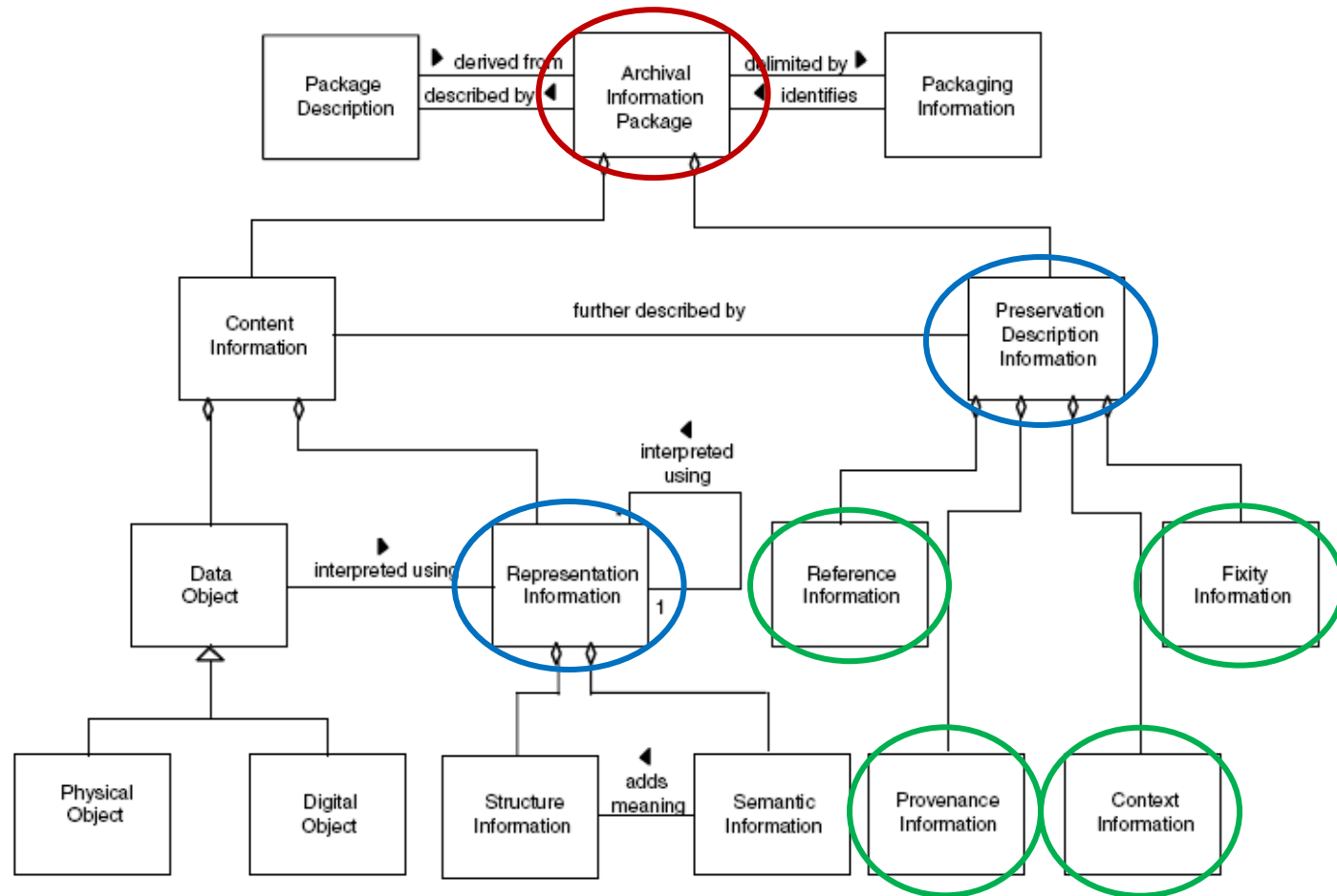
- A DIP is a dig object or group of objects requested by a user/consumer. The package includes the object(s) and relevant associated metadata.
- The object provided to the consumer.

# Dissemination Information Package (DIP)

- The DIP stage happens when a user (or Consumer in OAIS terms!) requests a digital object or group of objects from the OAIS. The OAIS supplies the object(s) packaged as a DIP comprising the object and relevant metadata.
- It is likely that the metadata accompanying the object at this stage will be more descriptive than technical; the end user is unlikely to want to see complicated metadata relating to fixity or representation.
- In all instances, the Knowledge Base of the OAIS' Designated Community will guide the type and extent of metadata supplied.



# Archival Information Package (AIP)



# Archival Information Package (AIP)

- An AIP is the object along with its descriptive, structural, administrative, and preservation metadata that is required to manage the object over the long-term.
- The object stored in the archive.
- Parts of the AIP
  - Preservation Description Information (PDI)
  - Representation Information

# Preservation Description Information (PDI)

- At the AIP stage, the SIPs are prepared for preservation. During this process, the digital materials submitted for preservation are known as Content Data Objects and they are combined with the Preservation Description Information (PDI) needed to administer their preservation.
- OAIS breaks the PDI down into four sections.

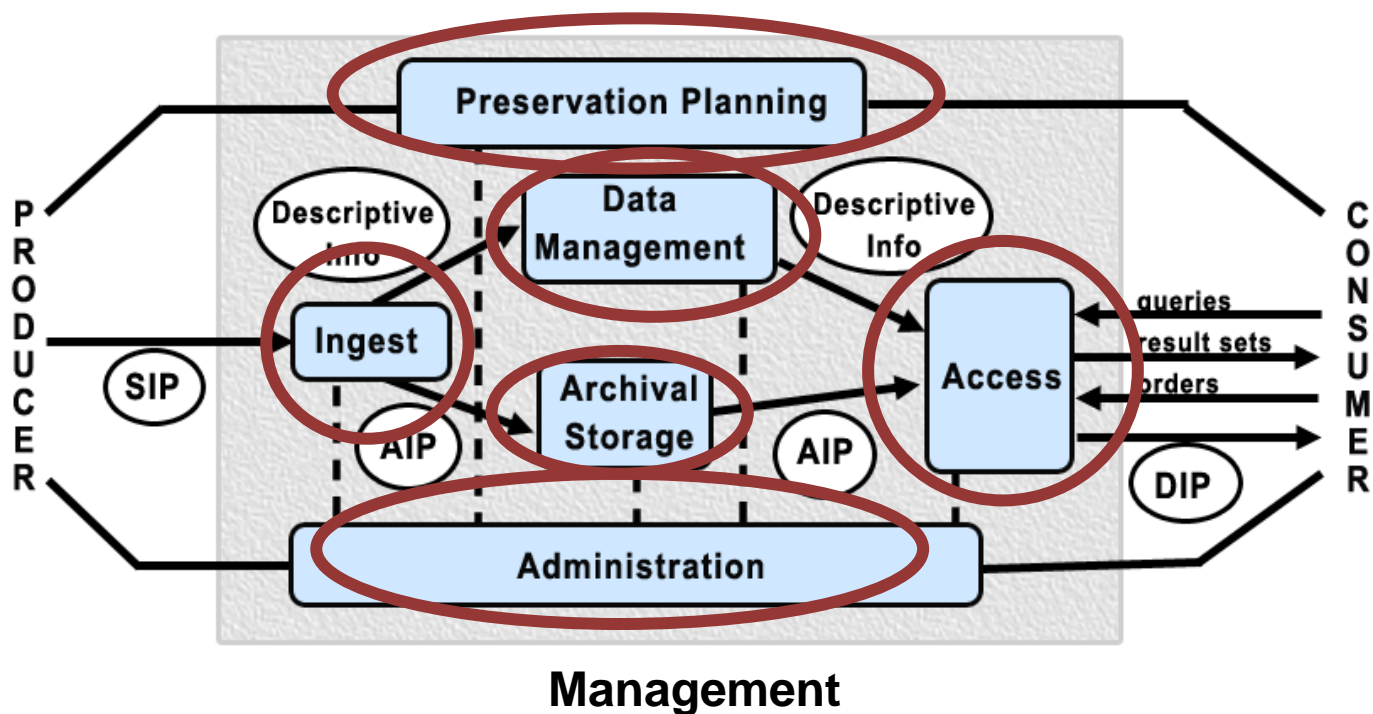
# Preservation Description Information (PDI)

- Reference Information
  - Unique and persistent identifier(s) for Content Information
- Fixity Information
  - Documents authentication mechanisms used to protect the Content Information from undocumented alteration
  - Checksum or digital signature
- Provenance Information
  - Origins of the Content Information
  - Chain of custody
  - Preservation actions history
  - Key to maintaining authenticity
- Context Information
  - Relationship to other objects

# Representation Information

- OAIS also requires the archive to maintain the Representation Information required to render the object intelligible to its designated community. This might include information regarding the hardware and software environment needed to view the content data object.
- Representation Information is an important part of the OAIS information model. Representation Information is used to interpret a Data Object so that it can be rendered into a useful Information Object. Representation Information permits the expression of dependencies within a digital archive. Since many repositories contain broadly similar objects, central Representation Information registries that can be used by several repositories are being developed.

# OAIS Actions – the functions

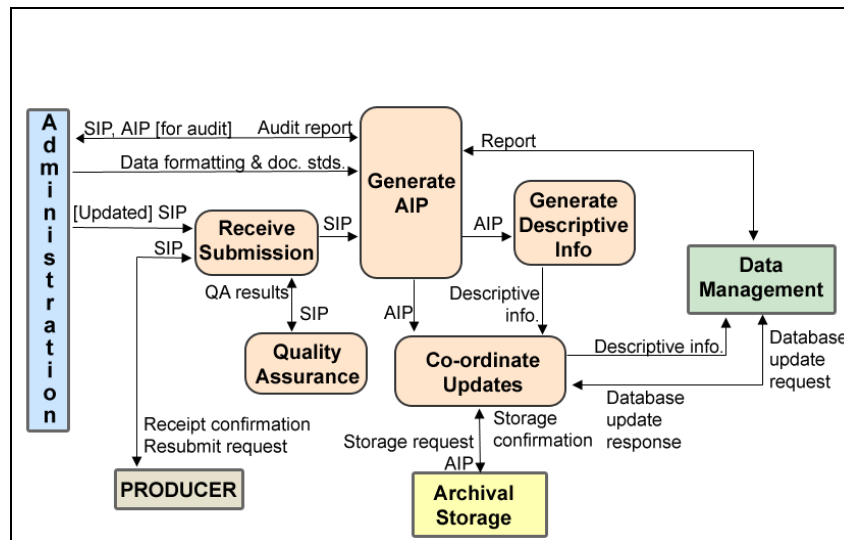


# OAIS Actions – the functions

The seven functions outlined by OAIS are:

- Ingest
- Archival Storage
- Data Management
- Administration (includes policies)
- Access
- Preservation Planning
- Common Services

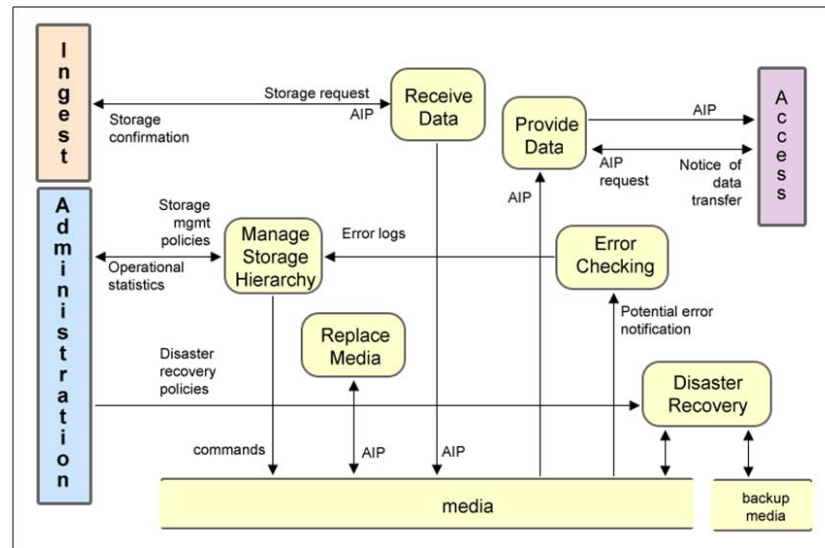
# Ingest Functions



- Receive submission
- Quality Assurance
- Generate archival information package
- Generate descriptive information
- Coordinate updates

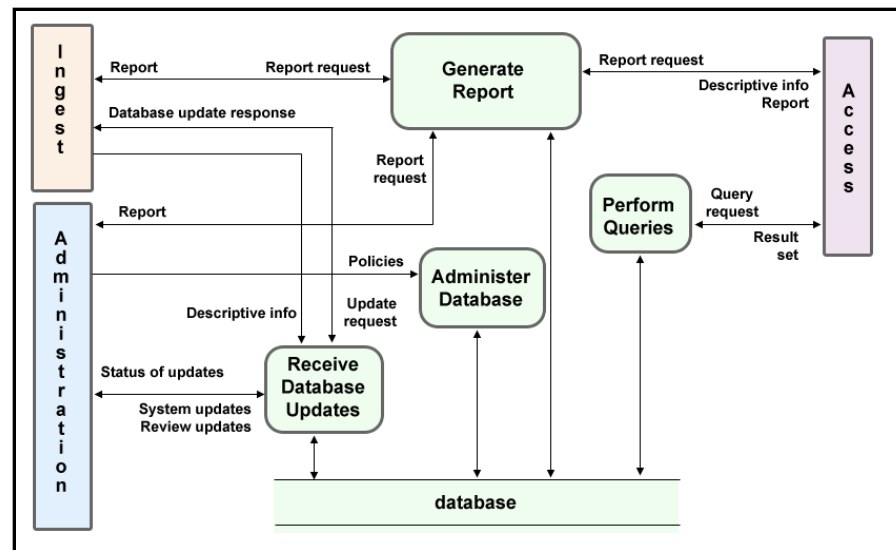


# Archival Storage Functions



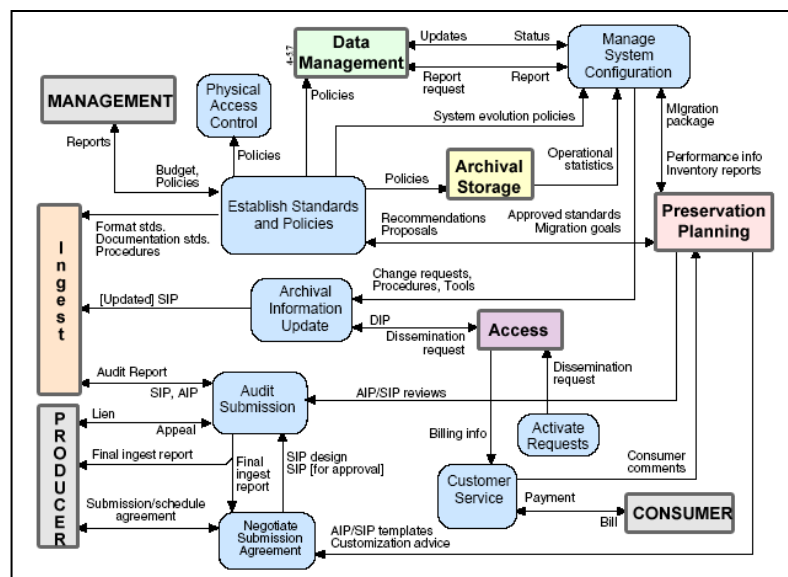
- Receive data
- Manage storage hierarchy
- Replace media
- Error checking
- Disaster recovery
- Provide data

# Data Management Functions



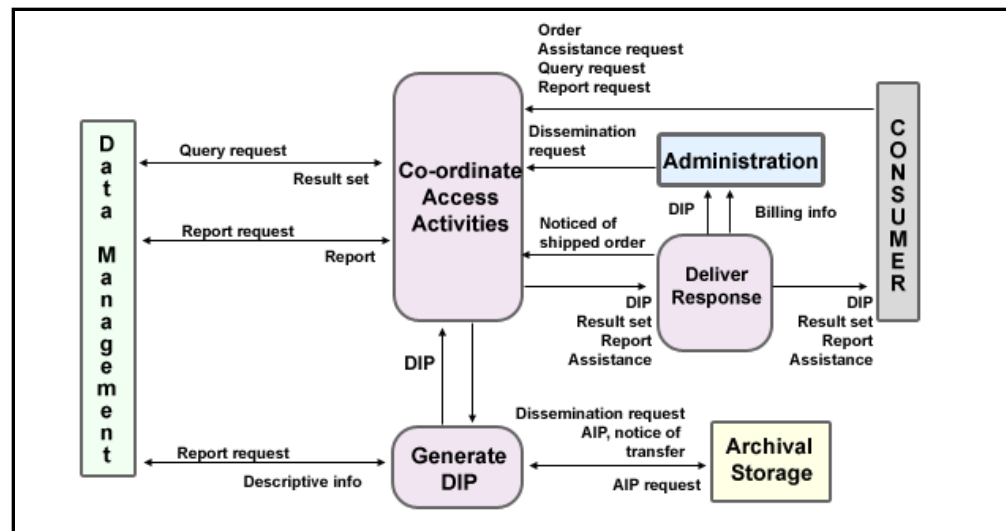
- Administer database
- Generate report
- Perform queries
- Receive database updates

# Administration Functions



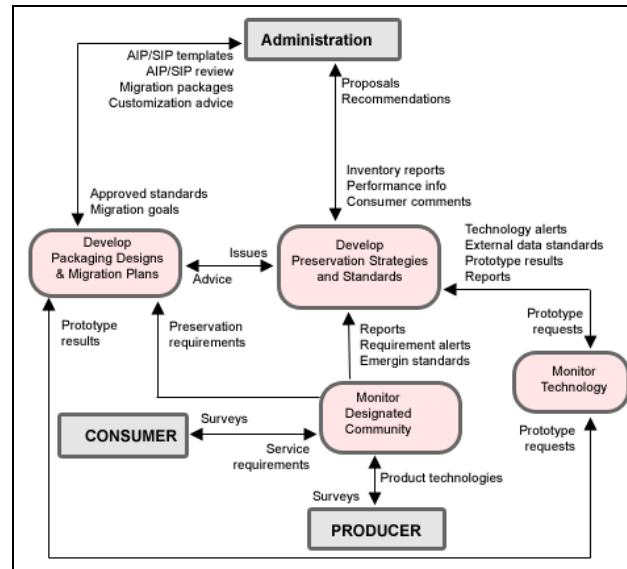
- Manage system configuration
- Physical access control
- Establish standards and policies
- Archival information update
- Audit submission
- Activate requests
- Customer service
- Negotiate submission agreement

# Access Functions



- Coordinate access activities
- Generate dissemination information package
- Deliver response

# Preservation Planning Functions



- Develop preservation strategies and standards
- Monitor designated community
- Develop packaging designs and migration plans
- Monitor technology

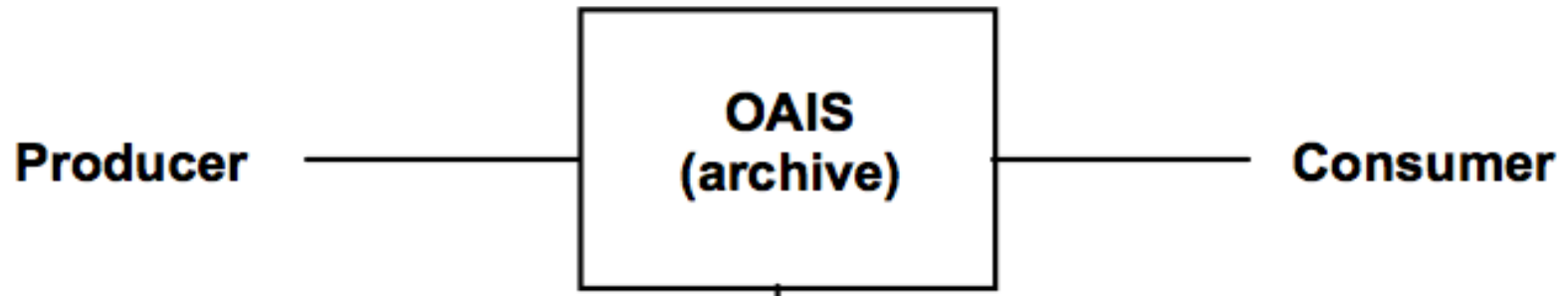
# Summary

- **OAIS** is an operation of functions that assist with the long-term preservation and management of digital objects and make it available for a Designated Community.
- **Designated Community** shares a Knowledge Base, may change over time and must be monitored

# Summary

- Three parts of OAIS
  - Actors
  - Information Packages
  - Actions/Functions

# OAIS

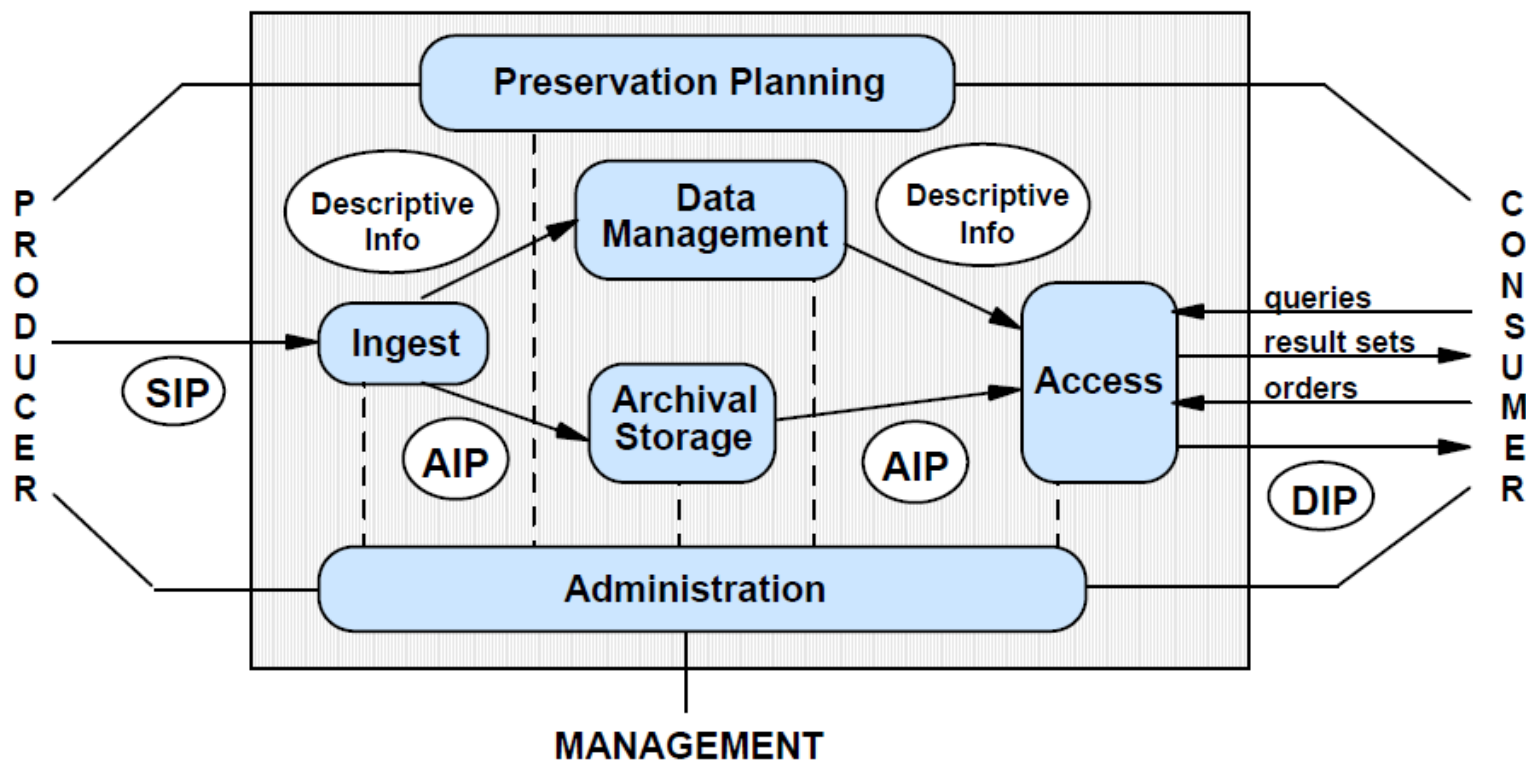


SIP → AIP → DIP

Ingest → Archival Storage → Access



# The OAIS Basic Model



# Question & Answer (Q&A)

Opportunity to ask questions



# Bibliography

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# *Thank you for attending!*

