

# ***OAIS Reference Model Standard: Motivation, Applicability, Follow-on Efforts***

**NIST Conference on Long Term Knowledge Retention (LTKR):  
Archival and Representation Standards**

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# ***Outline of Talk***

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- **Brief OAIS Overview**
- **Motivation and Applicability**
- **Follow-on Efforts**

# ***Purpose and Scope***

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- **Framework for understanding and applying concepts needed for long-term digital information preservation**
  - Long-term is long enough to be concerned about changing technologies
  - Starting point for model addressing non-digital information
- **Provides set of minimal responsibilities to distinguish an OAIS from other uses of ‘archive’**
- **Framework for comparing architectures and operations of existing and future archives**
- **Basis for development of additional related standards**
- **Addresses a full range of archival functions**

# ***Applicability***

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- **Applicable to:**
  - **All long-term archives and**
  - **Organizations and individuals dealing with information that may need long-term preservation**
- **Does NOT specify an implementation**

# ***Document Organization***

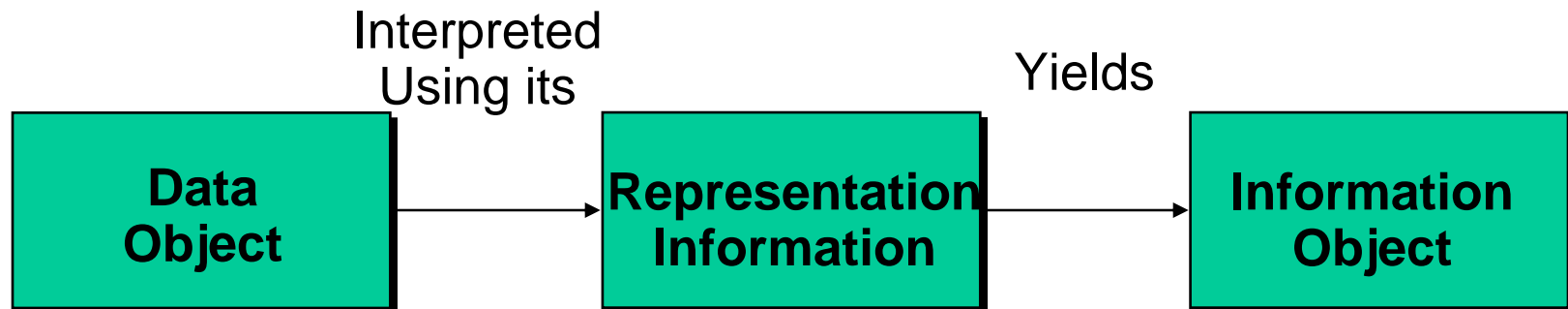
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- **Introduction**
  - Purpose and Scope, Applicability, Rationale, Road Map for Future Work, Document Structure, and Definitions of Terms
- **OAIS Concepts and Responsibilities**
  - High level view of OAIS functionality and information models
  - OAIS external environment
  - Minimum responsibilities to become an “OAIS”
- **Detailed Models**
  - Functional model descriptions and information model perspectives
- **Preservation perspectives**
  - Media migration, compression, format conversions, and access service preservation
- **Archive Interoperability**
  - Criteria to distinguish types of cooperation among archives
- **Annexes**
  - Scenarios of existing archives, compatibility with other standards

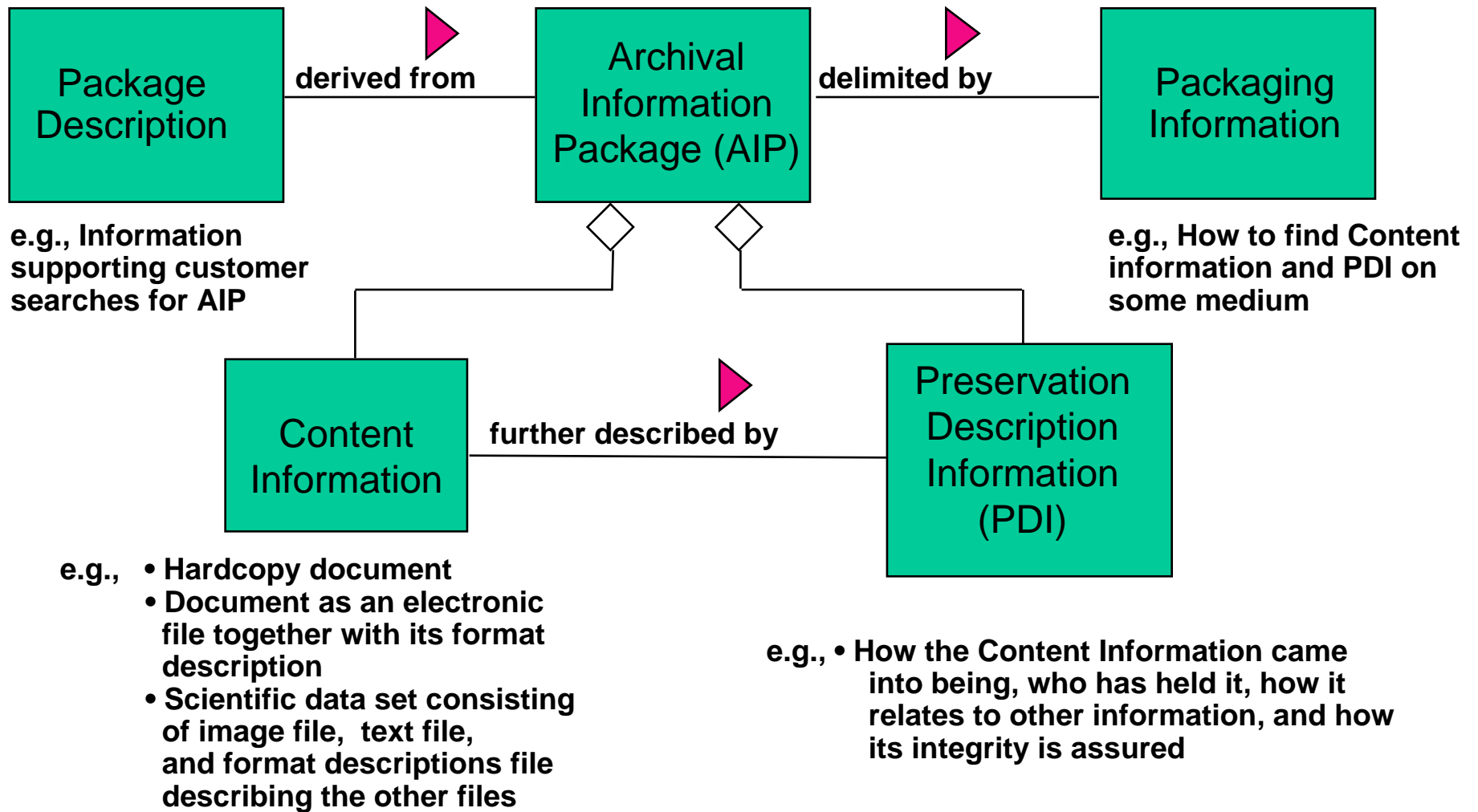
# ***OAIS Information Definition***

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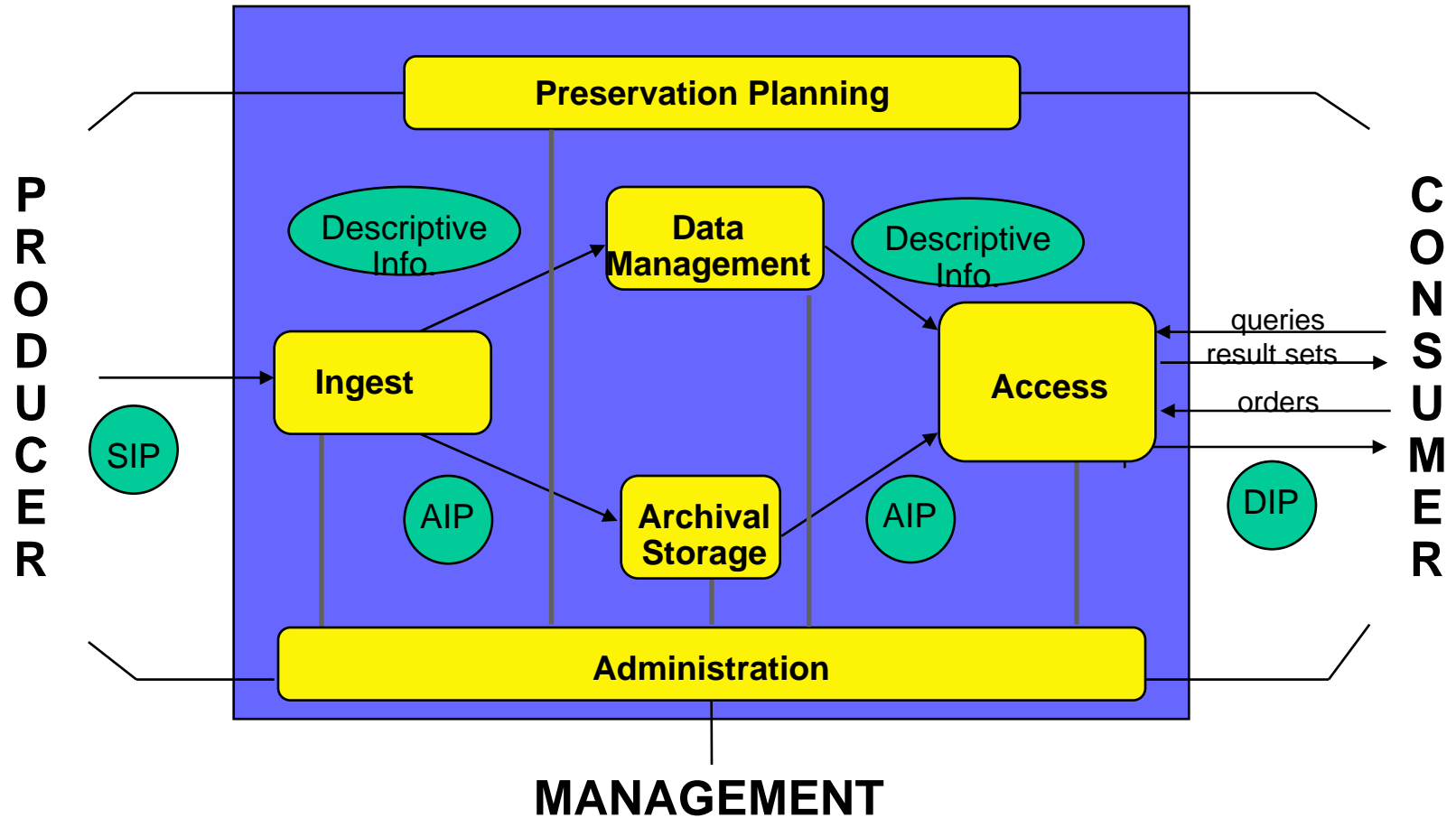
- Information is always expressed (i.e., represented) by some type of data
- Data interpreted using its Representation Information yields Information
- **Information Object** preservation requires clear identification and understanding of the **Data Object** and its associated **Representation Information**



# OAIS Archival Information Package



# OAIS Functional Entities



SIP = Submission Information Package  
AIP = Archival Information Package  
DIP = Dissemination Information Package



# ***Reference Model Status***

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- **Widely adopted as starting point in digital preservation efforts**
  - Digital libraries (e.g., Netherlands National Library)
  - Traditional archives (e.g., US National Archives)
  - Scientific data centers (e.g., National Space Science Data Center)
  - Commercial Organizations (e.g., Aerospace Industries Association preservation working team)
- **Published as final CCSDS and ISO (14721:2003) standards**
- **CCSDS version is available at:**
  - <http://public.ccsds.org/publications/archive/650x0b1.pdf>

# ***How did Effort Start?***

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- **ISO TC20, SC 14 was looking for additional standards to develop**
    - Participant from NASA/Jet Propulsion Laboratory (JPL) proposed development of standard archive format
    - Was aware of extensive format standards developed by the Planetary Data System managed by JPL
  - **Assignment was transferred to ISO TC 20, SC 13 in 1995**
    - Address data used in conjunction with space missions
    - Address intermediate and indefinite long term storage of digital data
  - **Consultative Committee for Space Data Systems**
    - International group of space agencies
    - Developed variety of science discipline- independent standards
    - Became working body for an ISO TC 20/ SC 13 about 1990
- TC20: Aircraft and Space Vehicles  
SC13: Space Data and Information Transfer Systems

# ***Given to Panel 2 within CCSDS***

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## ■ **Panel 2 (Information Interchange) Analysis**

- Archives in different science domains, even within a single Space agency like NASA, used different terminology and had different format standards
- Adoption of a single archive format would not be accepted among NASA archives, let alone internationally
- Emergence of Web was enabling many data producers to make their data directly available
  - Who needs an archive?
  - My floppy disk is an archive!
- Several Panel 2 participants recognized the growing digital preservation problem
- What might be done?

# Response

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- Panel 2 responded to CCSDS and ISO TC20/SC 13
  - No framework widely recognized for developing specific digital archive standards
  - Therefore begin by developing a ‘Reference Model’ to establish common terms and concepts
  - Ensure broad participation, including traditional archives
    - (Not restricted to space communities; all participation is welcome!)*
  - Focus on data in electronic forms, but recognize that other forms exist in most archives
  - Follow up with additional archive standards efforts as appropriate

# ***Organizational Approach***

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- **Organized US contribution under a framework with NASA lead in 1995**
  - Established liaison with Federal Geographic Data Committee (FGDC) and National Archives and Records Administration (NARA)
  - Agency archives and users must be represented in this process
- **An “Open” process**
  - Important to stimulate dialogue with broad archive/user communities
  - Results of US and International workshops put on WEB
  - Support e-mail comments/critiques
- **Broad international workshops also held**
  - UK and France
  - Issue resolution at ISO/Consultative Committee for Space Data Systems international workshops

# *Results*

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- **Reference Model targeted to several categories of reader**
  - Archive designers
  - Archive users
  - Archive managers, to clarify digital preservation issues and assist in securing appropriate resources
  - Standards developers
- **Adopted terminology that crosses various disciplines**
  - Traditional archivists
  - Scientific data centers
  - Digital libraries
- **Become extremely well known as starting point for discussions addressing digital preservation**

# ***Follow-on Activities***

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- **OAIS Reference Model has stimulated follow-on activities within CCSDS and outside**
- **CCSDS/ISO Producer-Archive Interface Methodology Standard (ISO 20652)**
  - Provides framework for Producer/Archive interactions
  - Identifies steps and types of information exchanged during the 'negotiation'
  - May be used as a checklist by archives
- **CCSDS/ISO Producer-Archive Interface Specification**
  - Draft standard addressing formal modeling and instantiation of Submission Information Packages
- **RLG/NARA Digital Repository Certification Task Force**
  - Produced a draft audit checklist for Repository Certification
  - [http://www.rlg.org/en/page.php?Page\\_ID=367](http://www.rlg.org/en/page.php?Page_ID=367)