

OAIS: What is it and Where is it Going?

***Presentation on the
“Reference Model for an Open Archival Information System (OAIS)”***

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Organizational Background

- **National Space Science Data Center**
 - NASA's first digital archive
 - Experienced many technology changes since 1966
- **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
- **ISO suggested that SC 13 should develop archive standards**
 - Address data used in conjunction with space missions
 - Address intermediate and indefinite long term storage of digital data

Response

■ Response to Consultative Committee for Space Data Systems (CCSDS) and ISO TC 20/SC 13

- No framework widely recognized for developing specific digital archive standards
- 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

What is a Reference Model?

■ A framework

- for understanding significant relationships among the entities of some environment, and**
- for the development of consistent standards or specifications supporting that environment.**

■ A reference model

- is based on a small number of unifying concepts**
- is an abstraction of the key concepts, their relationships, and their interfaces both to each other and to the external environment**
- may be used as a basis for education and explaining standards to a non-specialist.**

Resulting Model

- **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
- **Already 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)

Reference Model Status

- **Completed two CCSDS and two ISO reviews**
- **Recently approved for publication as final CCSDS and ISO standards**
- **Current draft, which will have a small number of editorial updates in final publications, is available at:**
 - **http://ssdoo.gsfc.nasa.gov/nost/isoas/ref_model.html**

***Reference Model for an
Open Archival Information System
Technical Overview***

Open Archival Information System (OAIS)

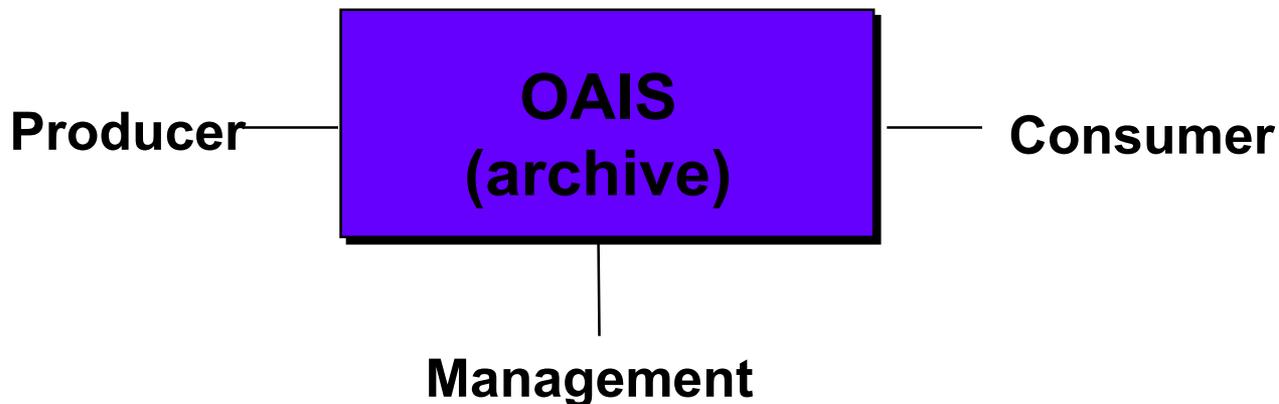
- **Open**
 - **Reference Model standard(s) are developed using a public process and are freely available**
- **Information**
 - **Any type of knowledge that can be exchanged**
 - **Independent of the forms (i.e., physical or digital) used to represent the information**
 - **Data are the representation forms of information**
- **Archival Information System**
 - **Hardware, software, and people who are responsible for the acquisition, preservation and dissemination of the information**

Purpose, Scope, and Applicability

- **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 OAIIS 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**
- **Applicable to all long-term archives and those organizations and individuals dealing with information that may need long-term preservation**
- **Does NOT specify any implementation**

Model View of an OAIS Environment

- **Producer** is the role played by those persons, or client systems, who provide the information to be preserved
- **Management** is the role played by those who set overall OAIS policy as one component in a broader policy domain
- **Consumer** is the role played by those persons, or client systems, who interact with OAIS services to find and acquire preserved information of interest



OAIS Responsibilities

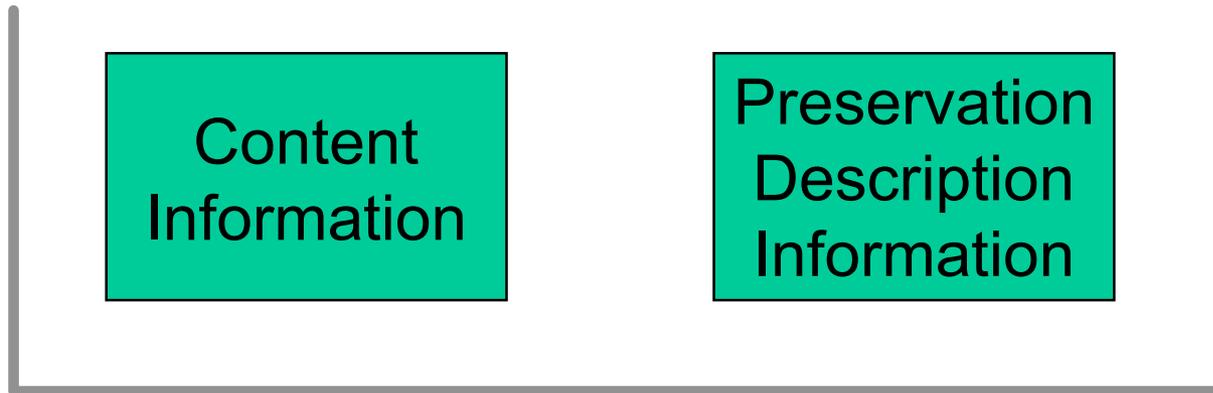
- **Negotiates and accepts Information from information producers**
- **Obtains sufficient control to ensure long-term preservation**
- **Determines which communities (designated) need to be able to understand the preserved information**
- **Ensures the information to be preserved is independently understandable to the Designated Communities**
- **Follows documented policies and procedures which ensure the information is preserved against all reasonable contingencies**
- **Makes the preserved information available to the Designated Communities in forms understandable to those communities**

OAIS Information Definition

- 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**

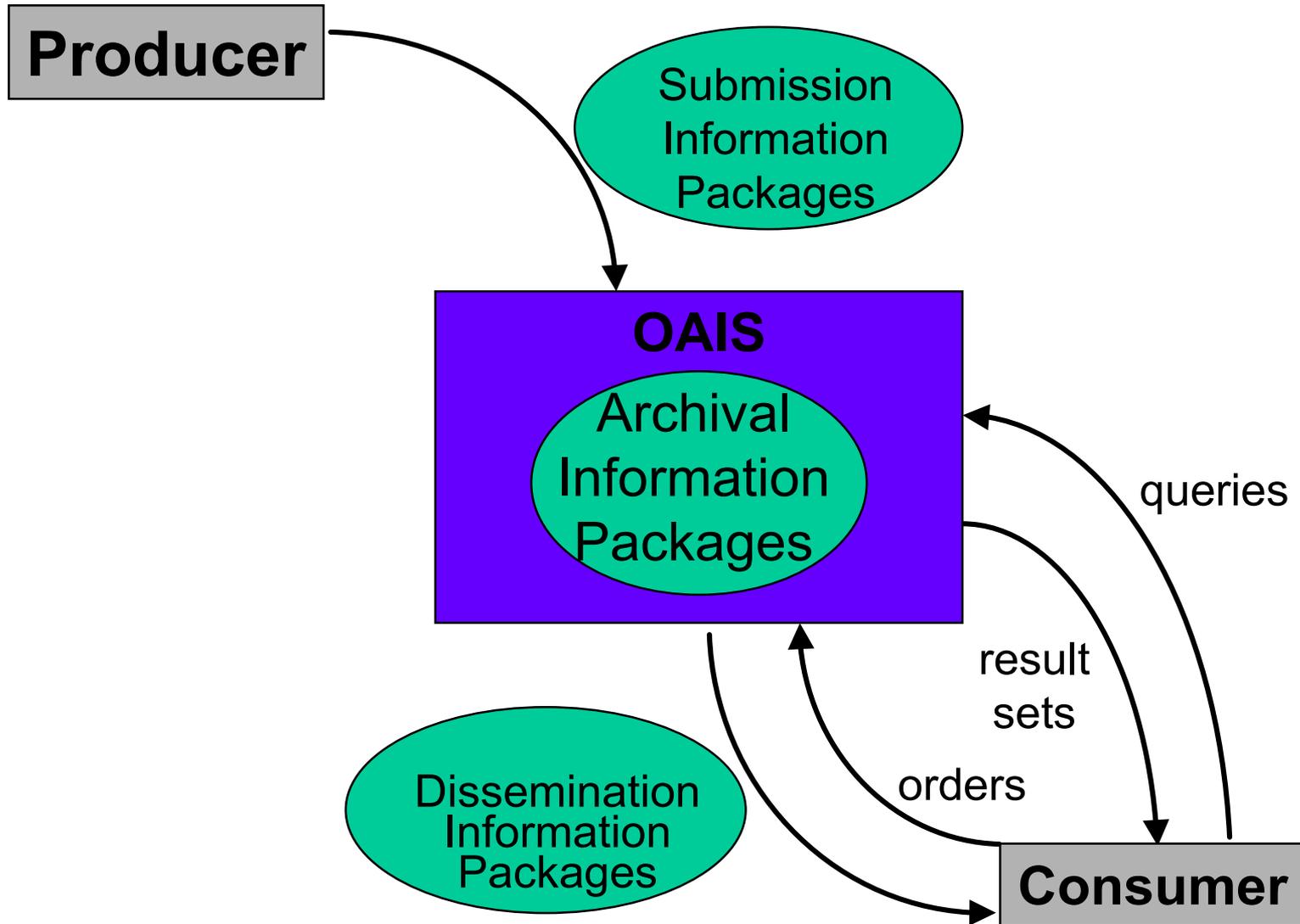


Information Package Definition

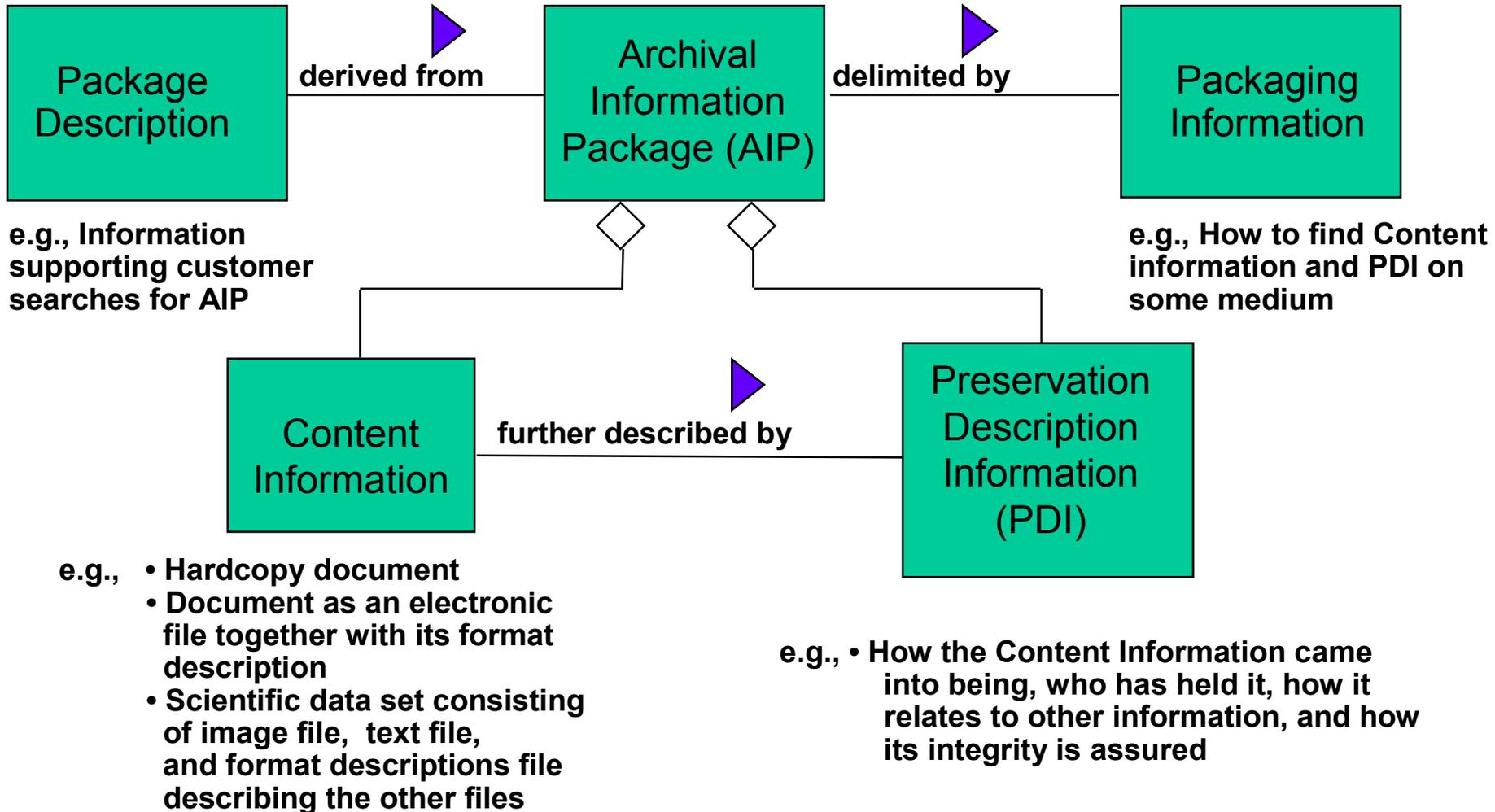


- **An Information Package is a conceptual container holding two types of information**
 - **Content Information**
 - **Preservation Description Information (PDI)**

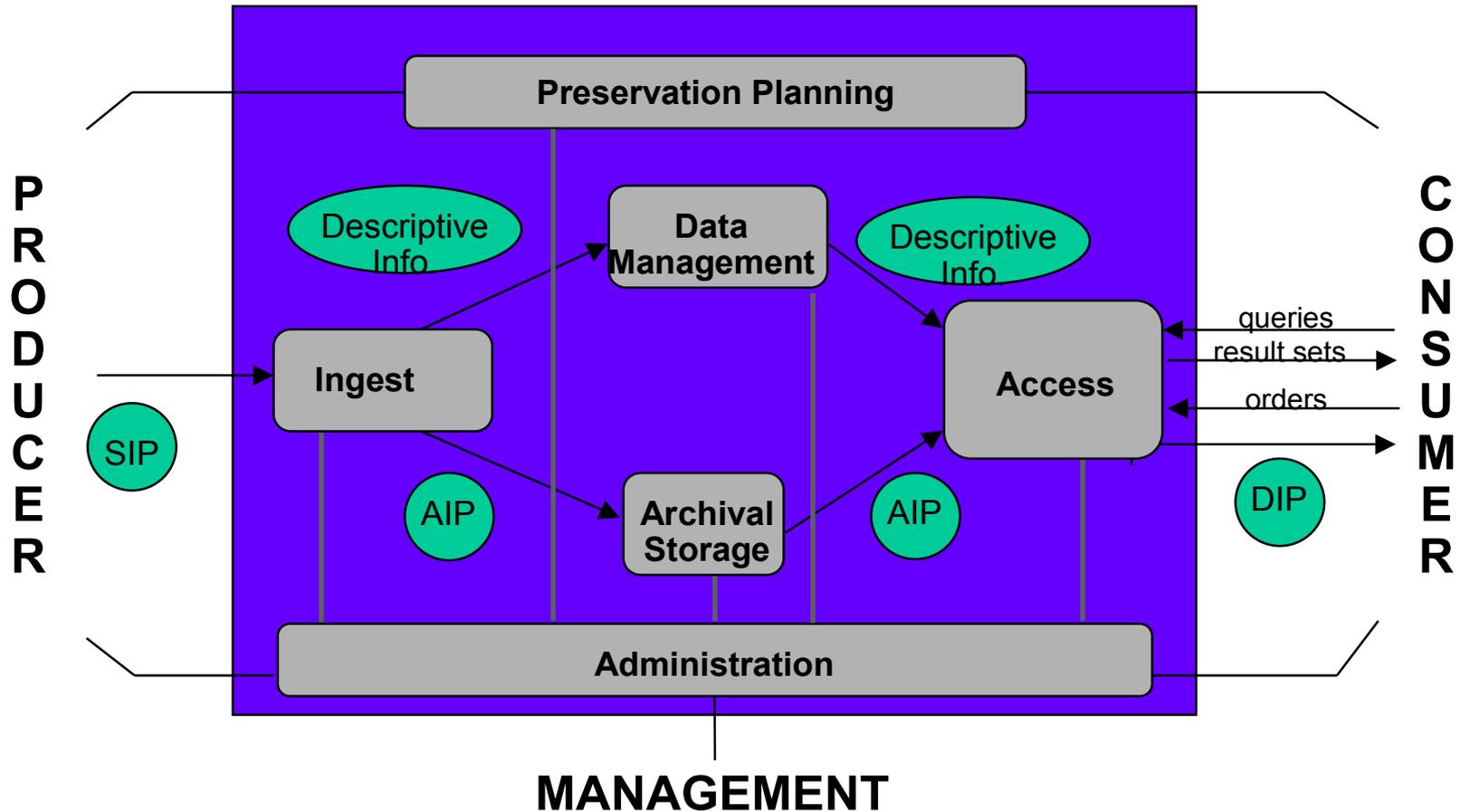
External Data Flow View



OAIS Archival Information Package



OAIS Functional Entities



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

Reference Model Summary

- **Reference model is to be applicable to all digital archives, and their Producers and Consumers**
- **Establishes common terms and concepts for comparing implementations, but does not specify an implementation**
- **Identifies a minimum set of responsibilities for an archive to claim it is an OAIS**
- **Provides detailed models of both archival functions and archival information**
- **Discusses OAIS information migration and interoperability among OAISs**

Two CCSDS/ISO Follow-on Activities

- **Producer-Archive Interface Methodology Standard**
 - Provides framework for Producer/Archive interactions
 - Identifies steps and types of information exchanged during the 'negotiation'
 - May be used as a checklist by archives
- **Certification Coordination Function**
 - Will track and summarize various archive certification efforts
 - Will attempt to extract high-level model/checklist

Reference URLs

- **July 15 OAIS RM version 2**
 - http://ssdoo.gsfc.nasa.gov/nost/isoas/ref_model.html
- **ISO Archive Standards Overview Web site**
 - <http://ssdoo.gsfc.nasa.gov/nost/isoas/overview.html>
- **Lavoie, Brian. "Meeting the challenges of digital preservation: the OAIS reference model". OCLC Newsletter. No. 243. January/February 2000. Pages 26-30.**
****An excellent overview of the OAIS RM and Workshops.****
 - <http://www2.oclc.org/oclc/pdf/news243.pdf>
- **Research Libraries Group has established a web page to track OAIS implementation efforts and issues**
 - <http://www.rlg.org/longterm/oais.html>