

# ISO 14721:2025-03 (E)

## Space Data System Practices - Reference model for an open archival information system (OAIS)

---

Contents	Page
<b>1 INTRODUCTION</b> .....	<b>1-1</b>
1.1 PURPOSE AND SCOPE .....	1-1
1.2 APPLICABILITY .....	1-2
1.3 RATIONALE.....	1-3
1.4 CONFORMANCE .....	1-3
1.5 DOCUMENT STRUCTURE.....	1-4
1.6 DEFINITIONS .....	1-7
<b>2 OAIS CONCEPTS</b> .....	<b>2-1</b>
2.1 GENERAL .....	2-1
2.2 OAIS ENVIRONMENT .....	2-2
2.3 OAIS INFORMATION .....	2-3
2.4 PRESERVATION OBJECTIVES .....	2-8
2.5 SUPPLEMENTARY INFORMATION HELD BY THE ARCHIVE.....	2-9
2.6 OAIS HIGH-LEVEL EXTERNAL INTERACTIONS .....	2-10
<b>3 OAIS RESPONSIBILITIES</b> .....	<b>3-1</b>
3.1 OVERVIEW .....	3-1
3.2 MANDATORY RESPONSIBILITIES.....	3-1
3.3 EXAMPLE MECHANISMS FOR DISCHARGING RESPONSIBILITIES.....	3-2
<b>4 DETAILED MODELS</b> .....	<b>4-1</b>
4.1 OVERVIEW .....	4-1
4.2 FUNCTIONAL MODEL .....	4-1
4.3 INFORMATION MODEL.....	4-22
4.4 INFORMATION PACKAGE TRANSFORMATIONS.....	4-55
<b>5 PRESERVATION PERSPECTIVES</b> .....	<b>5-1</b>
5.1 OVERVIEW .....	5-1
5.2 DIGITAL MIGRATION.....	5-2
5.3 ADDING REPRESENTATION INFORMATION .....	5-11
5.4 HANDING OVER TO ANOTHER OAIS .....	5-16
<b>6 ARCHIVE INTEROPERABILITY</b> .....	<b>6-1</b>
6.1 GENERAL .....	6-1
6.2 LEVELS OF INTERACTION BETWEEN OAIS ARCHIVES .....	6-2

Section

<b>ANNEX A</b>	<b>COMPOSITE FUNCTIONAL VIEW (INFORMATIVE)</b> .....	<b>A-1</b>
<b>ANNEX B</b>	<b>RELATIONSHIP WITH OTHER STANDARDS OR EFFORTS (INFORMATIVE)</b> .....	<b>B-1</b>
<b>ANNEX C</b>	<b>BRIEF GUIDE TO THE UNIFIED MODELING LANGUAGE (UML) (INFORMATIVE)</b> .....	<b>C-1</b>
<b>ANNEX D</b>	<b>INFORMATIVE REFERENCES (INFORMATIVE)</b> .....	<b>D-1</b>
<b>ANNEX E</b>	<b>A MODEL FOR SOFTWARE USE IN REPRESENTATION INFORMATION (INFORMATIVE)</b> .....	<b>E-1</b>
<b>ANNEX F</b>	<b>SECURITY CONSIDERATIONS (INFORMATIVE)</b> .....	<b>F-1</b>

Figure

1-1	Examples of Diagram Conventions .....	1-6
2-1	Environment Model of an OAIS .....	2-2
2-2	Obtaining Information from Data .....	2-4
2-3	Information Package Concepts and Relationships .....	2-6
2-4	OAIS Archive External Data .....	2-10
4-1	OAIS Functional Entities .....	4-1
4-2	Functions of the Ingest Functional Entity .....	4-6
4-3	Functions of the Archival Storage Functional Entity.....	4-8
4-4	Functions of the Data Management Functional Entity .....	4-10
4-5	Functions of the Administration Functional Entity.....	4-12
4-6	Functions of the Preservation Planning Functional Entity.....	4-15
4-7	Functions of the Access Functional Entity.....	4-18
4-8	OAIS Data Flow Diagram.....	4-20
4-9	Administration Context Diagram .....	4-21
4-10	Information Object .....	4-23
4-11	Representation Information Object .....	4-26
4-12	Partial General RIN.....	4-27
4-13	Example of a Simplified RIN for a FITS File.....	4-28
4-14	Information Object Taxonomy.....	4-31
4-15	Information Package Contents and Its Associated Package Description and Packaging Information.....	4-39
4-16	Example of an Information Object Made Up of Content Information and PDI .....	4-39
4-17	Information Package Taxonomy .....	4-40
4-18	Archival Information Package (AIP) and Its Associated Package Description and Packaging Information.....	4-42
4-19	Preservation Description Information .....	4-43
4-20	Package Description and Its Associated AIP .....	4-44

## Figure

4-21	Archival Information Package (Detailed View) and Its Associated Package Description and Packaging Information .....	4-45
4-22	Specialization of the AIP .....	4-46
4-23	Specialization of the Package Description.....	4-47
4-24	Archival Information Unit (AIU) and Its Associated Unit Description and Packaging Information.....	4-48
4-25	Unit Description and Its Associated Archival Information Unit .....	4-48
4-26	Archival Information Collections and Its Associated Collection Description and Packaging Information Logical View.....	4-50
4-27	Collection Description and Its Associated Archival Information Collection .....	4-52
4-28	Data Management Information .....	4-55
4-29	High-Level Data Flows in an OAIS.....	4-56
5-1	Conceptual View of Relationships among Names and AIP Components .....	5-4
6-1	Cooperating Archives with Mutual Exchange Agreement .....	6-4
6-2	Cooperating Archives with Standard Ingest and Access Methods .....	6-5
6-3	An OAIS Federation Employing a Common Catalog.....	6-6
6-4	Archives with Shared Storage.....	6-10
6-5	Example of a Distributed OAIS Archive for Archival Storage .....	6-12
6-6	Another Example of a Distributed OAIS Archive for Archival Storage .....	6-14
A-1	Composite of Functional Entities.....	A-2
C-1	Key to UML Relationships .....	C-1
E-1	Layered Information Model .....	E-1

## Table

4-1	Examples of PDI .....	4-36
5-1	CDO Software Roles and Preservation Possible Actions .....	5-14