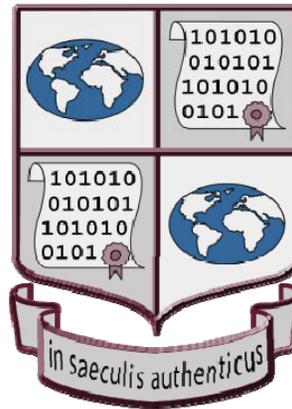


InterPARES 2 Project

International Research on Permanent Authentic Records in Electronic Systems



Manage Chain of Preservation Model

ARST 575A

The Continuing Preservation of Electronic Records

25 January 2006



InterPARES 2 Project

Randy Preston

MCP Model – ARST 575A, 25 Jan 2006

Outline

- Introduction to IDEF0 modeling process
- MCP Model summary
 - Statement of purpose
 - Viewpoint
 - Representation
 - Validation
 - Current status
- MCP Model “walk-through”



Integrated Definition Modeling (IDEFØ)

- “IDEFØ is a modeling technique based on combined graphics and text that are presented in an organized and systematic way to gain understanding, support analysis, provide logic for potential changes, specify requirements, or support systems level design and integration activities.”

Source: US Secretary of Commerce. *Draft Federal Information Processing Standards Publication 183*, 21 Dec 1993.



General Characteristics

- IDEFØ modeling process creates a “functions” model composed of a hierarchical series of diagrams that gradually display increasing levels of detail describing functions/activities and their interfaces within the context of a system.
- Models the decisions, actions and activities of a system or an organisation.
- Provides a type of "blueprint" of activities and their interfaces.
- Reflects how system activities interrelate and operate just as the blueprint of a product reflects how the different pieces of a product fit together.



IDEFØ Modeling Process

- Top-down, general-to specific modeling approach
- The most general features come first in the hierarchy, as the whole top-level activity is decomposed into sub-activities that compose it, and those sub-activities, in turn, are further decomposed until all of the relevant detail of the model's whole viewpoint is adequately exposed or described.
- Representation of activities is non-temporal.



IDEFØ Strengths

- Useful for establishing the overall scope on an analysis.
- Provides a graphic, structured representation of the activities in a system, supplemented with textual description.
- Provides a comprehensive and expressive analysis to any level of detail required.
- Helps isolate and describe what activities are performed and what is needed to perform them.



IDEFØ Weaknesses

- IDEFØ models are often so concise that they are understandable only if the reader is a domain expert or has participated in the model development.
- Because of the box & arrow interface, activity sequencing can, without intent, be imbedded into the model.
- Tendency of IDEFØ models to be interpreted temporally as representing a sequence of activities.



Top-Level Context Diagram

- Each IDEFØ model has a top-level context diagram (A-0), on which the subject of the model is represented by a single box with its bounding arrows (i.e., inputs, controls, outputs, and mechanisms = ICOMS).
- The arrows on the A-0 diagram interface with activities outside the subject area to establish the model's focus.



Top-Level Context Diagram

- A-0 diagram establishes the overall context for the model's viewpoint and purpose, which in turn helps to guide and constrain the creation of the model.
- The viewpoint determines what can be "seen" within the model context, and from what perspective.
- The statement of purpose expresses the reason why the model is created and actually determines the structure of the model.



Key Definitions

- **Activity:** A function, process, or transformation identified by a verb or verb phrase that describes what must be accomplished.
- **Box:** A rectangle, containing a name and number; used to represent an activity.
- **Parent diagram:** A diagram that contains 3-5 parent boxes.
- **Child diagram:** A diagram with 3-5 child boxes that provide additional detail about a parent box. Every parent diagram (except A-0) is also a child diagram, since by definition each details a parent box. Hence, the primary hierarchical relationship is between a parent box and the child diagram that details it.

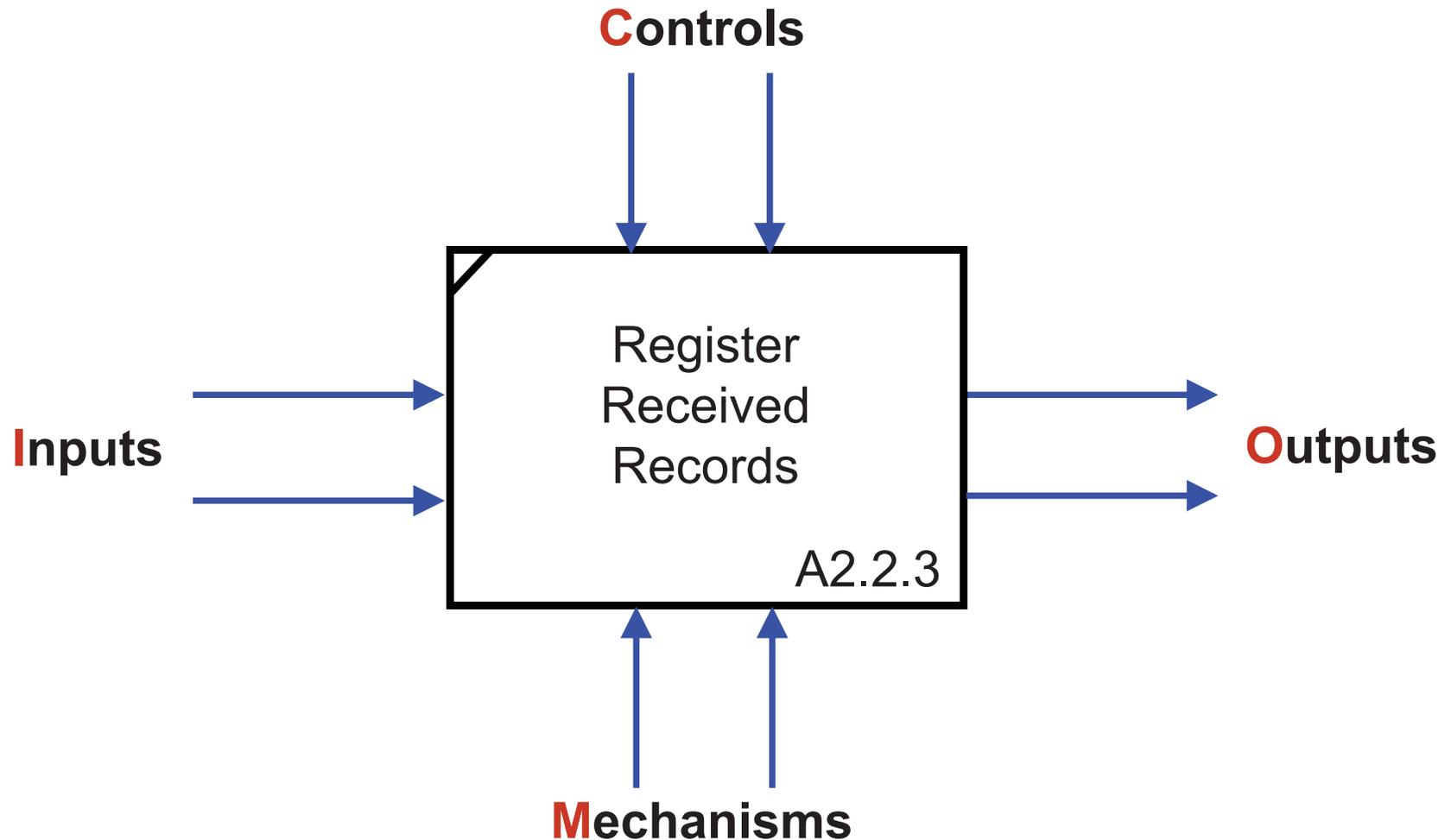


Key Definitions

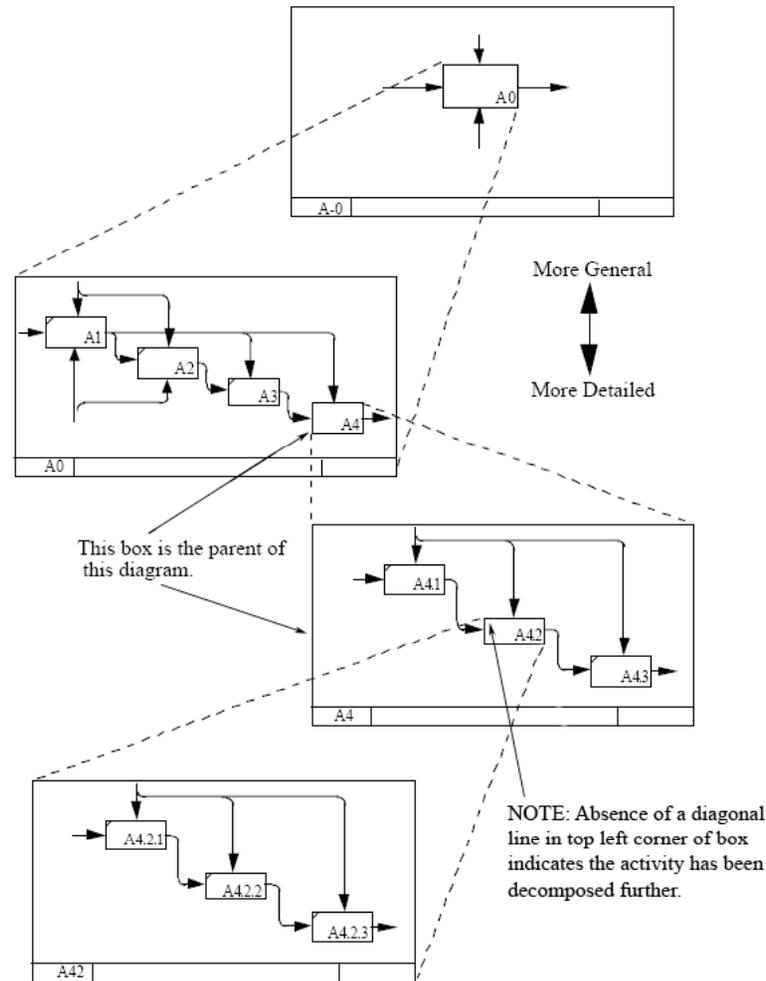
- **Arrows:** Directed lines, composed of one or more segments, that model conduits conveying data or objects from a source (no arrowhead) to a use (with arrowhead). There are 4 arrow classes: Inputs, Controls, Outputs, and Mechanisms.
- **Inputs:** Data or objects that are transformed by activities into outputs.
- **Controls:** The conditions required to produce correct outputs.
- **Outputs:** Data or objects produced by activities.
- **Mechanisms:** The means used to perform activities.



ICOM Arrow Positions and Roles

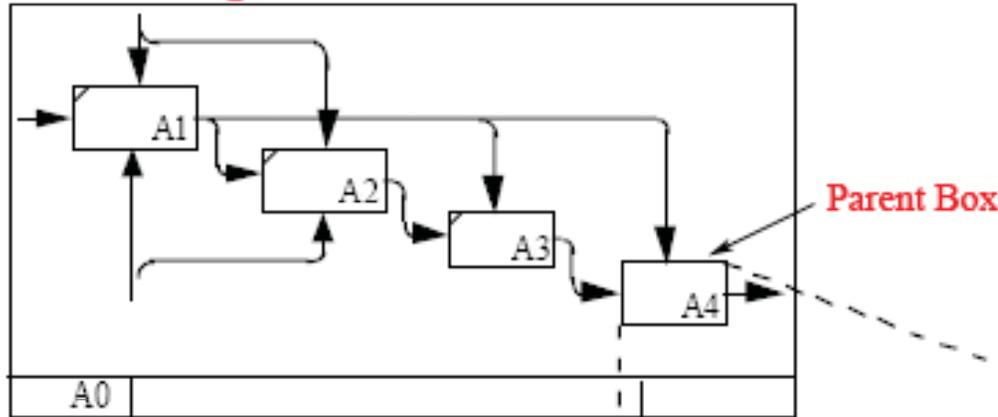


Decomposition Structure

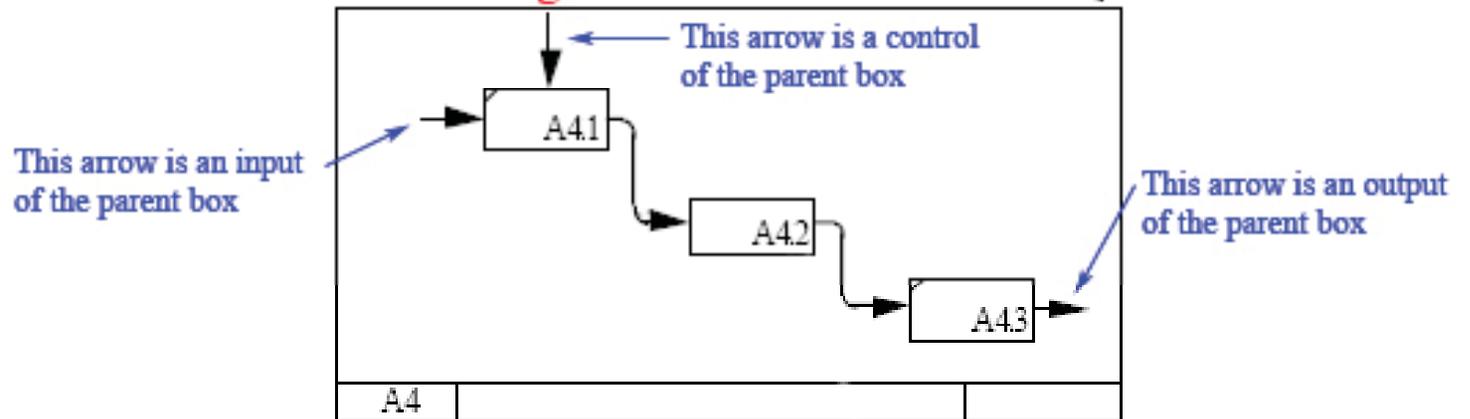


Boundary Arrow Correspondence

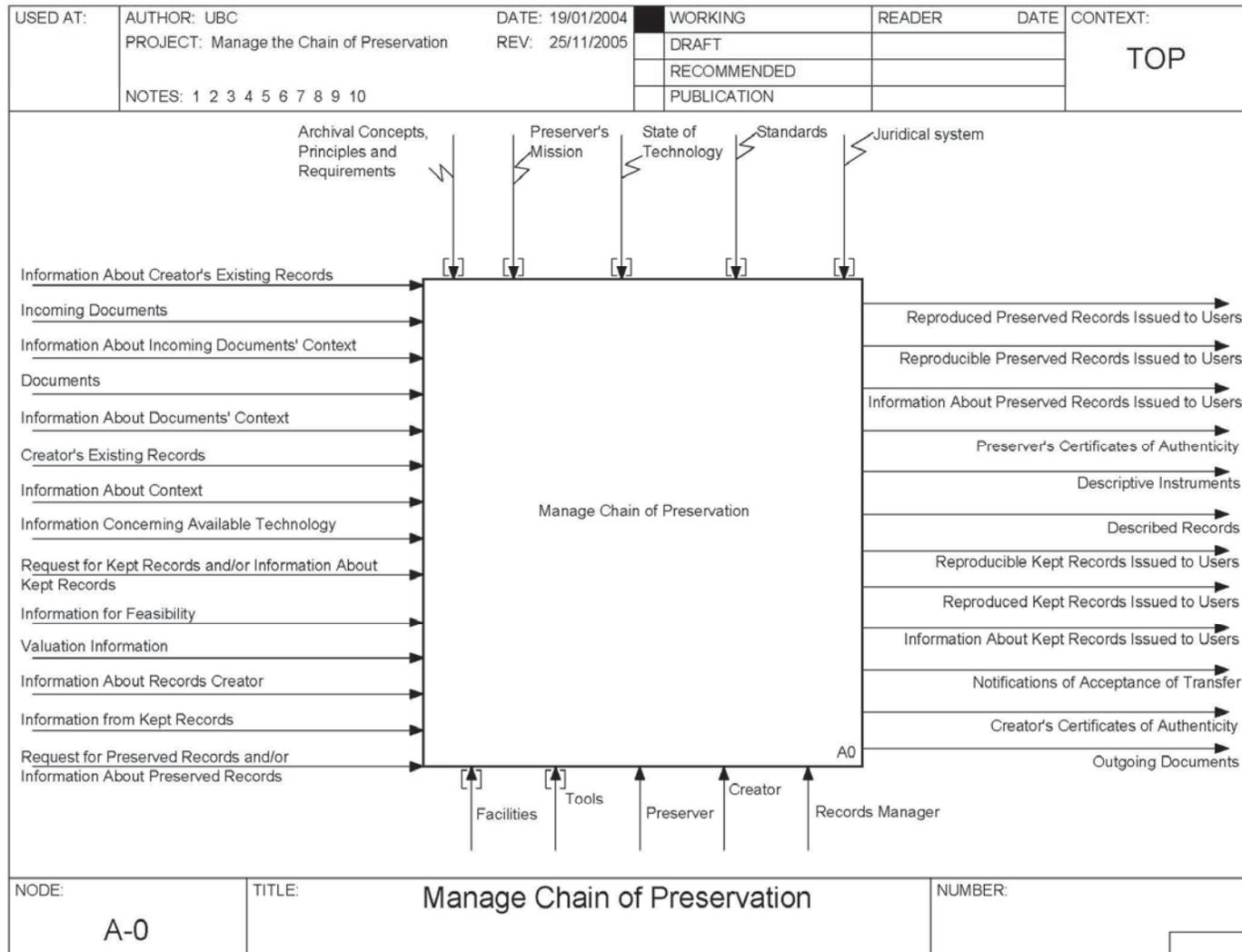
Parent Diagram



Child Diagram



Manage Chain of Preservation



Statement of Purpose

- To develop an integrated life-cycle model of creating, managing and preserving digital records.
- The model is a template for analysis; a point of reference for analysis of the life cycle of records.
- Used to analyse activities of real world creators and preservers.
- Will serve as a research tool to help develop advice about records creation, management and preservation activities.



Viewpoint

- MCP Model incorporates two viewpoints:
 - Creator's viewpoint
 - Preserver's viewpoint
- Creator and Preserver *may* be the same entity.



Representation

- MCP Model is an integration of:
 - Preservation of the Integrity of Electronic Records model (UBC Project)
 - Appraisal Task Force model (IP1)
 - Preservation Task Force model (IP1)
 - Information coming out of IP2 case studies



Validation Process

- MCP Model to be validated via:
 - Walk-throughs with data from select IP2 case studies, and
 - General comparisons with IP2 case studies data.

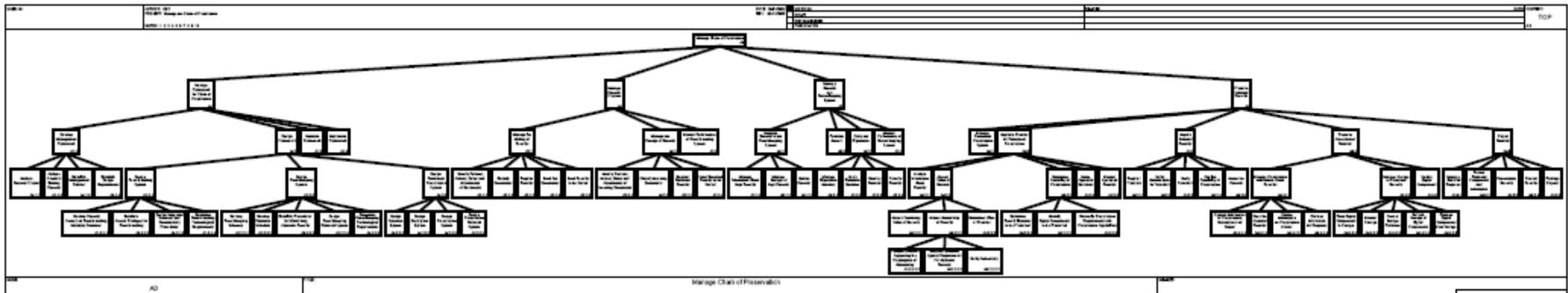


Current Status

- Data model is “complete”
- Narrative is in progress
- Mapping of metadata to activities and processes is in progress



MCP Model Walk-through



Crosswalk of Selected OAIS ↔ MCP Model Activities, Controls and Outputs

OAIS Entity	OAIS Entity Activities, Controls and Outputs	MCP Model Activities, Controls and Outputs
Ingest: This entity provides the services and functions to accept Submission Information Packages (SIPs) from Producers (or from internal elements under Administration control) and prepare the contents for storage and management within the archive.	1. Receive Submission Information Packages (SIPs) <ul style="list-style-type: none"> ● Confirmation of Receipt ● Request to Resubmit 	A4.3 Acquire Selected Records <ul style="list-style-type: none"> ● Notifications of Receipt of Transfer ● Notifications of Acceptance of Transfer ● Notifications of Rejection of Transfer
	2. Perform quality assurance on SIPs	A4.3.2 Verify Authorization for Transfers A4.3.3 Verify Transfers A4.3.4 Confirm Feasibility of Preservation
	3. Generate Archival Information Packages (AIPs) that complies with archive's data formatting and documentation standards	No closely comparable activity in MCP model
	4. Extract Descriptive Information from AIPs for inclusion in archive database	A4.4.1.1 Compile Information for Preservation, Description and Output A4.4.1.2 Describe Acquired Records
	5. Coordinate updates to Archival Storage and Data Management	A4.4.1 Manage Preservation Information About Records
Archival Storage: This entity provides the services and functions for the storage, maintenance and retrieval of AIPs.	1. Receive AIPs from Ingest and add them to permanent storage	A4.4.2 Place Digital Components in Storage
	2. Manage storage hierarchy	A4.4.2 Manage Storage of Preserved Records A4.4.3 Update Digital Components
	3. Refresh media on which archive holdings are stored	A4.4.2.4 Refresh Storage of Digital Components
	4. Perform routine and special error checking	A4.4.2.2 Monitor Storage A4.4.2.3 Correct Storage Problems
	5. Provide disaster recovery capabilities	No closely comparable activity in MCP model
	6. Provide AIPs to Access Entity to fulfill orders	A4.4.1.4 Retrieve Information for Requests A4.4.2.5 Retrieve Digital Components from Storage



Crosswalk of Selected OAIS ⇔ MCP Model Activities, Controls and Outputs

OAIS Entity	OAIS Entity Activities, Controls and Outputs	MCP Model Activities, Controls and Outputs
<p>Data Management: This entity provides the services and functions for populating, maintaining, and accessing both Descriptive Information that identifies and documents archive holdings, and administrative data used to manage the archive.</p>	1. Administer archive database functions (maintain schema and view definitions, and referential integrity)	A4.1 Manage Permanent Preservation System A4.4.1 Manage Preservation Information About Records A4.4.2 Manage Storage of Preserved Records
	2. Perform database updates	A4.4.1.3 Update Information on Preservation Actions
	3. Perform queries to generate result sets	A4.5.1 Manage Retrieval Requests A4.5.2 Review Retrieved Components and Information
	4. Produce reports from these result sets	<ul style="list-style-type: none"> ● Reports on Operation of Permanent Preservation Activity (generated by all preservation activities) A4.4.2 Manage Storage of Preserved Records <ul style="list-style-type: none"> ● Information About Updated Storage A4.5.1 Manage Retrieval Requests <ul style="list-style-type: none"> ● Accounting for Unsatisfied Requests A4.5.2 Review Retrieved Components and Information <ul style="list-style-type: none"> ● Accounting for Satisfied Requests ● Information About Preserved Records Issued to Users A4.5.4 Present Records <ul style="list-style-type: none"> ● Information About Reproduced Preserved Records Issued to Users A4.5.5 Package Outputs <ul style="list-style-type: none"> ● Information About Reproducible Preserved Records Issued to Users



Crosswalk of Selected OAIS ↔ MCP Model Activities, Controls and Outputs

OAIS Entity	OAIS Entity Activities, Controls and Outputs	MCP Model Activities, Controls and Outputs
Administration: This entity provides the services and functions for the overall operation of the archive system.	1. Solicit and negotiate submission agreements with Producers	A4.2 Appraise Records for Permanent Preservation <ul style="list-style-type: none"> ● Appraisal Decisions ● Terms and Conditions of Transfer
	2. Audit submissions to ensure they meet archive standards	A4.3.2 Verify Authorization for Transfers A4.3.3 Verify Transfers A4.3.4 Confirm Feasibility of Preservation
	3. Maintain configuration mgmt of system hardware/software <ul style="list-style-type: none"> ● System Evolution Policies ● Change Requests ● Performance Information Reports 	A1 Develop Management Framework <ul style="list-style-type: none"> ● Framework Policies A1.3 Maintain Framework <ul style="list-style-type: none"> ● Recommended Revisions A4.1 Manage Permanent Preservation System <ul style="list-style-type: none"> ● Reports on Operation of Permanent Preservation Activity ● Preservation Performance Information
	4. Control physical access to elements of the archive	No closely comparable activity in MCP model
	5. Establish and maintain archive standards and policies	↓ Archival Concepts, Principles and Requirements ↓ Standards A1.2.3 Design Permanent Preservation System A4.1 Manage Permanent Preservation System <ul style="list-style-type: none"> ● Permanent Preservation Activity Directives
	6. Activate stored requests	A4.4.1.4 Retrieve Information for Requests A4.5.1 Manage Retrieval Requests
	7. Monitor and improve archive operations	A1.3 Maintain Framework <ul style="list-style-type: none"> ● Preservation Performance Information ● Recommended Revisions A4.1 Manage Permanent Preservation System <ul style="list-style-type: none"> ● Reports on Operation of Permanent Preservation Activity A4.2.5 Monitor Appraised Records <ul style="list-style-type: none"> ● Recommendations of Need for Change
	8. Provide customer support	No closely comparable activity in MCP model



Crosswalk of Selected OAIS ↔ MCP Model Activities, Controls and Outputs

OAIS Entity	OAIS Entity Activities, Controls and Outputs	MCP Model Activities, Controls and Outputs
<p>Preservation Planning: This entity provides the services and functions for monitoring the environment of the OAIS and providing recommendations to ensure that the information stored in the OAIS remains accessible to the Designated User Community over the long term, even if the original computing environment becomes obsolete.</p>	1. Evaluate the contents of archive and periodically recommend archival information updates to migrate current archive holdings	A4.4.2 Manage Storage of Preserved Records <ul style="list-style-type: none"> ● Information About Updated Storage A4.4.2.2 Monitor Storage <ul style="list-style-type: none"> ● Decisions to Correct Storage ● Decisions to Refresh Medium
	2. Develop recommendations for archive standards and policies	A1 Develop Management Framework <ul style="list-style-type: none"> ● Framework Policies
	3. Monitor changes in technology environment	<ul style="list-style-type: none"> ● Information Concerning Available Technology A1.2.2.5 Determine Recordkeeping Technological Requirements A1.3 Maintain Framework <ul style="list-style-type: none"> ● Information About Records Creator's Technology
	4. Monitor changes in Designated Community's service requirements and Knowledge Base	A1.1.1 Analyze Records Creator A1.1.2 Analyze Creator's Existing Records A1.2.2.5 Determine Recordkeeping Technological Requirements
	5. Design IP templates and provide design assistance and review to specialize these templates into SIPs and AIPs for specific submissions	A1.1 Develop Management Framework <ul style="list-style-type: none"> ● Framework Policies A1.2.1.1 Develop Records Forms and Record-making Metadata Schemes A1.2.1.3 Design Integrated Business and Documentary Procedures A1.2.2.1 Develop Recordkeeping Schemes <ul style="list-style-type: none"> ● Recordkeeping Metadata Schemes ● Registration Scheme ● Classification Scheme
	6. Develop detailed Migration plans, software prototypes and test plans to enable implementation of Administration migration goals	A4.1 Manage Permanent Preservation System <ul style="list-style-type: none"> ● Permanent Preservation Activity Directives



Crosswalk of Selected OAIS ↔ MCP Model Activities, Controls and Outputs

OAIS Entity	OAIS Entity Activities, Controls and Outputs	MCP Model Activities, Controls and Outputs
<p>Access: This entity provides the services and functions that support Consumers in determining the existence, description, location and availability of information stored in the OAIS, and allowing Consumers to request and receive information products.</p>	1. Communicate with Consumers to receive requests	A4.5.1 Manage Retrieval Requests <ul style="list-style-type: none"> ● Request for Preserved Records and/or Information About Preserved Records ● [Accounting for Unsatisfied Requests]
	2. Apply controls to limit access to specially protected information	A1.2.3 Design Preservation Retrieval System <ul style="list-style-type: none"> ● Preservation Retrieval Strategies ● Preservation Retrieval Rules and Procedures ● Permanent Preservation Access Privileges
	3. Coordinate execution of requests to successful completion	A4.4.1 Manage Preservation Information About Records A4.5 Manage Retrieval Requests
	4. Generate responses (Dissemination Information Packages, result sets, reports)	A4.5.1 Manage Retrieval Requests <ul style="list-style-type: none"> ● Accounting for Unsatisfied Requests ● Request Specifications A4.5.2 Review Retrieved Components and Information <ul style="list-style-type: none"> ● Accounting for Satisfied Requests
	5. Deliver responses to Consumers <ul style="list-style-type: none"> ● On-line Delivery ● Notice of Shipped Order ● Off-line Delivery ● Notice of Shipped Order 	A4.5.4 Present Records <ul style="list-style-type: none"> ● Reproduced Preserved Records Issued to Users ● Information About Reproduced Preserved Records Issued to Users A4.5.5 Package Outputs <ul style="list-style-type: none"> ● Reproducible Preserved Records Issued to Users ● Information About Reproducible Preserved Records Issued to Users

