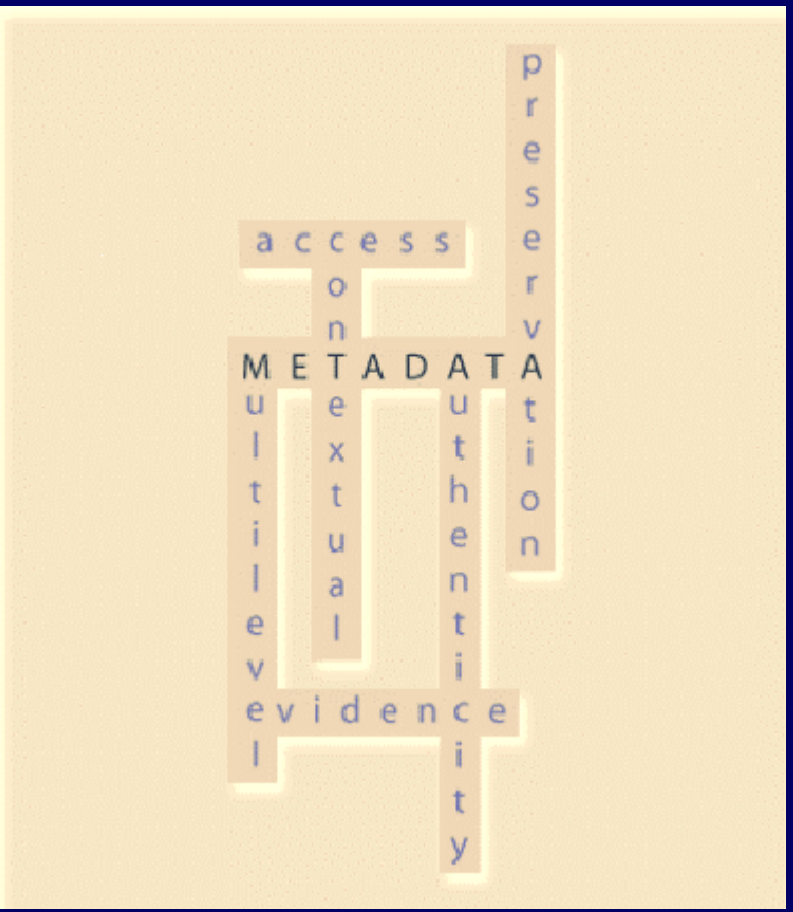

Metadata :

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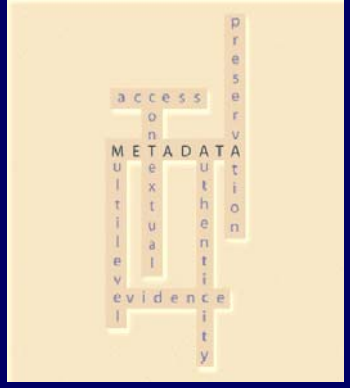
Outline

- Definitions
- Purpose and Functions
- MetaMap
- Principles and Practicalities
- A Few Schemes
- Processes
- Issues

Definitions

- “Data about data”
  - Data “factual information (as measurement of statistic) used as a basis for reasoning, discussion or calculations.” (Webster) Can be numbers, words, sentences, and/or records.
  - The prefix "meta" comes from the Greek and means "among, with, after" or "change" (Webster).



Recordkeeping Metadata

- Structured or semi-structured information which enables the creation, management, and use of records through time and within and across domains in which they are created.

- Recordkeeping metadata can be used to identify, authenticate, and contextualize records; and the people, processes and systems that create, manage, and maintain and use them.
  (Archiving Metadata Group)

Elements and Attributes

- Metadata are expressed as groups of elements and attributes. The grouping of elements depends upon their relationships. The elements and attributes can be mandatory or optional.

Metadata Schemas

- Schemas are a framework that specifies and describes a standard set of metadata elements and their interrelationships. Schemas provide a formal syntax (or structure) and semantics (or definitions) for the metadata elements. (ISO Metadata for Records)

Purpose and Functions
(ISO RM standard)

- Metadata support business and records management processes by:
  - protecting records as evidence and ensuring their accessibility, and usability through time
  - facilitating the ability to understand records
  - supporting and ensuring the evidential value of records
  - helping to ensure the authenticity, reliability, and integrity of records

Purpose (continued)

- supporting/managing access, privacy and rights
- supporting efficient retrieval
- supporting interoperability strategies - enabling capture of records created in diverse technical/ business environments and their sustainability
- providing and maintaining logical links between records and the context of their creation.

Deciding on Metadata Requirements

- Decisions will be dependent on:
  - business needs
  - the regulatory environment, and
  - risks affecting business operations.

- Metadata assessment may identify which types of metadata need to be applied in different areas of the organisation, depending on business risks or needs. (ISO RM Standard)

RM Standard

- 2 perspectives on RM metadata
  - Metadata document content, context and structure at time of capture
  - Metadata that document RM and business processes throughout life cycle of record including changes to structure or context

RM Standard

- Structure includes
  - Physical or technical structure
  - Logical structure – relationship between records

Levels of Applications

- Individual Records (also components of records – e.g. separate documents)
- Groups of records, e.g. series
- Entire record systems

Modifying Metadata

- Modifications necessary because:
  - Business activity takes place
  - Personnel change
  - RM instruments are adopted or changed
  - Record locations are changed
  - Organizational terminology evolves
  - New business systems are obtained.

MetaMap

- Mapping metadata initiatives, to try to show relationships among them, and to connect them with the various players involved in their creation and use.

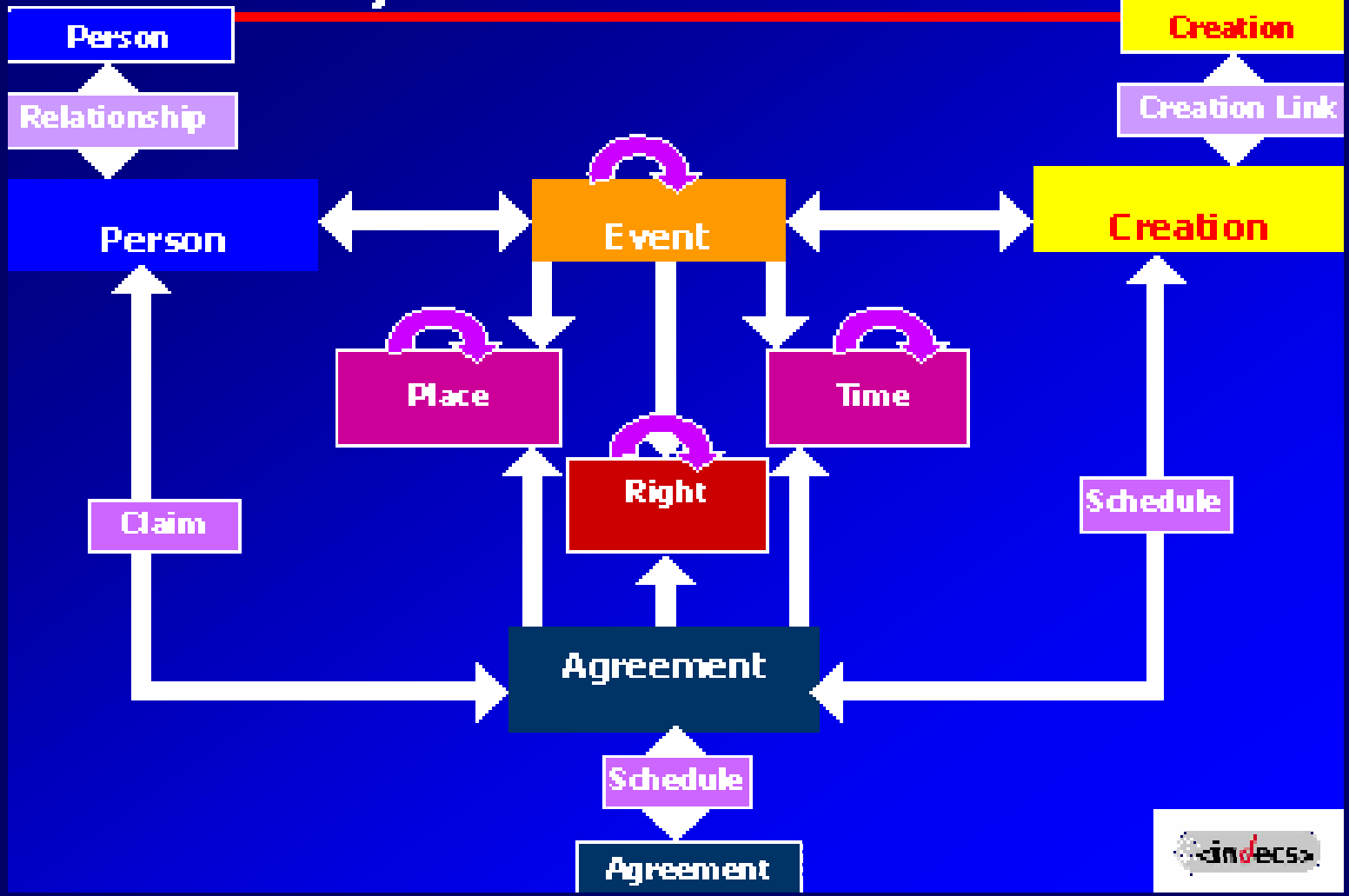
- http://mapageweb.umontreal.ca/turner/meta/english/metamap.html

Different Schemas

- People, professions, associations and organizations with biases and various world views develop metadata schema

- "categories are historically situated artifacts, and like all artifacts, are learned as part of membership in a community of practice" Geoffrey C. Bowker, and Susan Leigh Star, *Sorting things out: Classification and its Consequences* (Cambridge, Mass.: MIT Press, c1999.), p. 287

Primary entities and link entities



Bibliographic Model

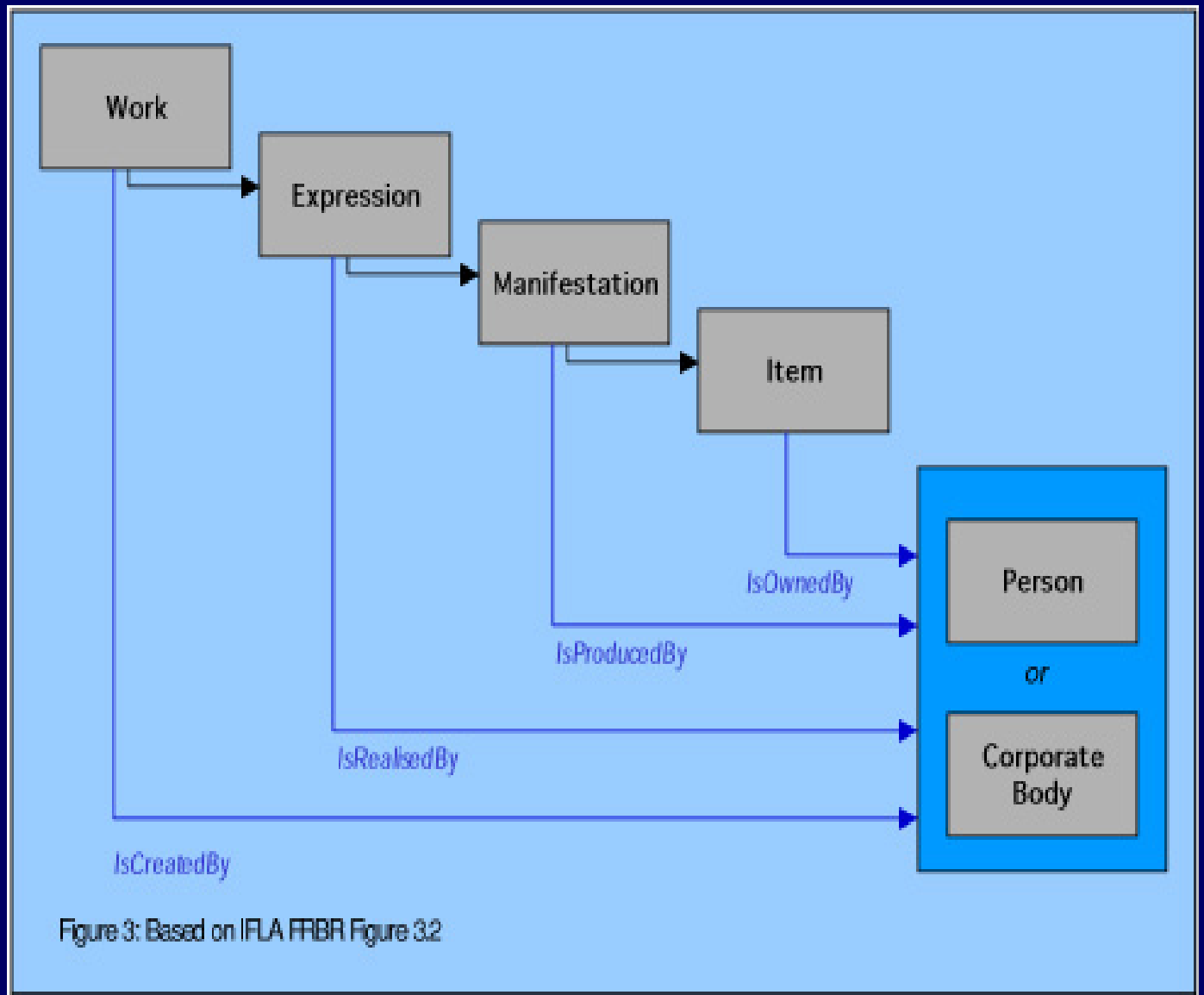


Figure 3: Based on IFLA FRBR Figure 3.2

The View of Metadata for Discovery and Retrieval

- “A metadata record is something which describes, manages, and catalogues these resources in a consistent and efficient way. This means that someone looking for the resource is more likely to find it.”
  - (The New Zealand Locator Service (NZGLS) Metadata Standard and Reference Manual)

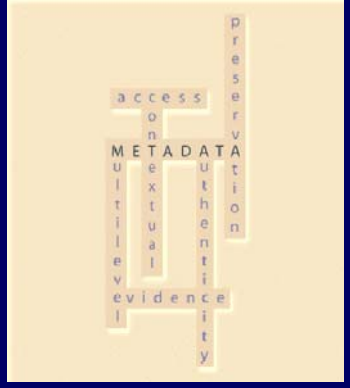
The View of Metadata for Preservation

- Preservation Metadata will be used to:
  - store information supporting preservation decisions and actions
  - document preservation processes, such as migrations, transformations and emulations
  - record the effects of preservation processes
  - ensure the authenticity of Preservation Masters over time
  - enable objects for which the library has assumed preservation responsibility to be identified. Preservation metadata
    - (National Library of New Zealand's metadata standard framework)

Metadata Principles for Discovery and Retrieval

- Modularity
  - Namespaces
- Extensibility
- Refinement
- Multilingualism

- Do these principles apply to preservation metadata also?



Practicalities

- No one schema will accommodate all the functional requirements of all applications.

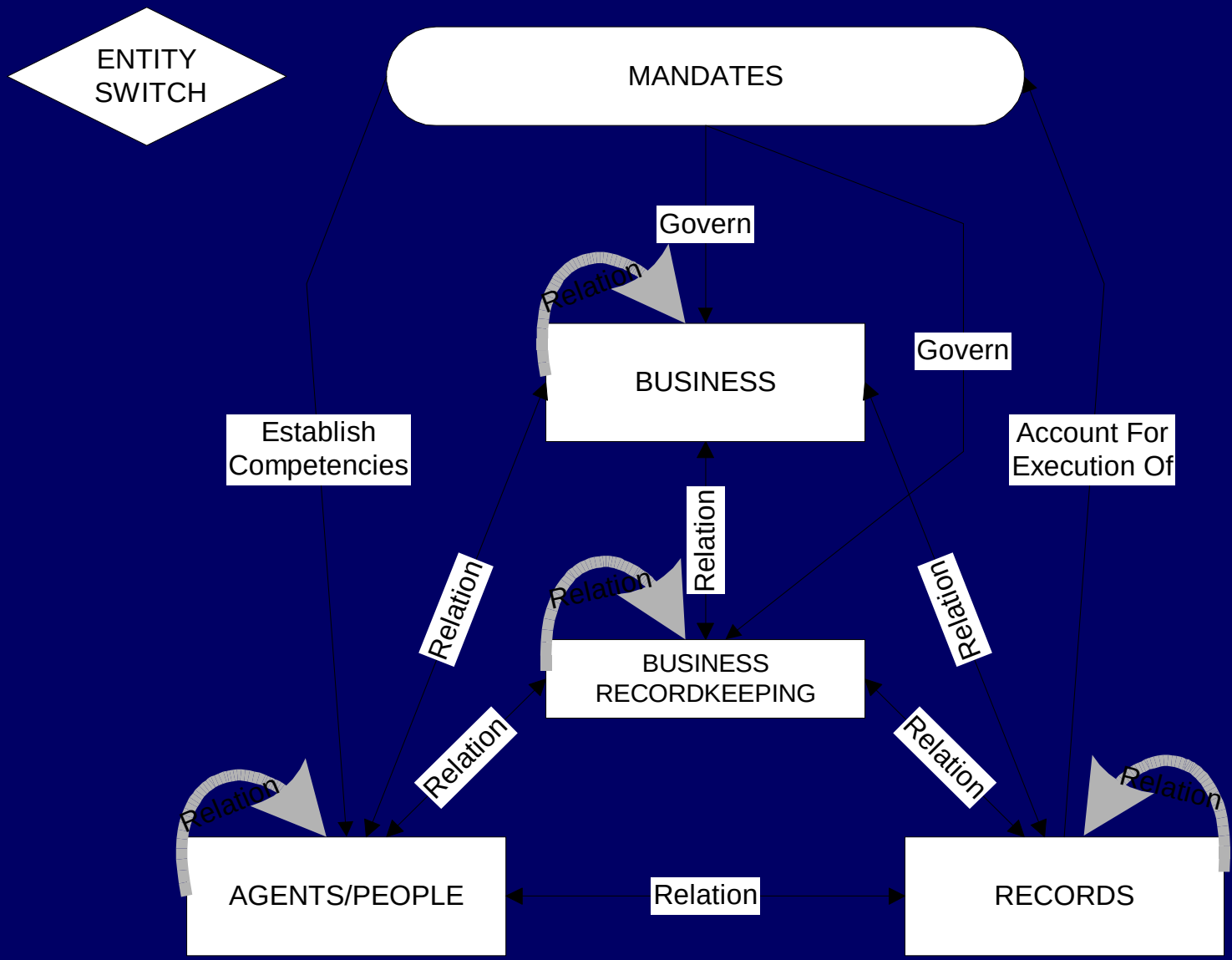
- Metadata needed for preservation will overlap with metadata needed for discovery and retrieval but they will also differ in content and level of granularity.

Metadata Schema

- The content, semantic and syntax of a metadata schema will depend upon the domain that promulgates it, the function or purpose of the schema, and the level of aggregation, the type of objects and the type of entities to which it relates

- Represent different types of entities including artifacts, persons, functions, business processes, events, record systems.

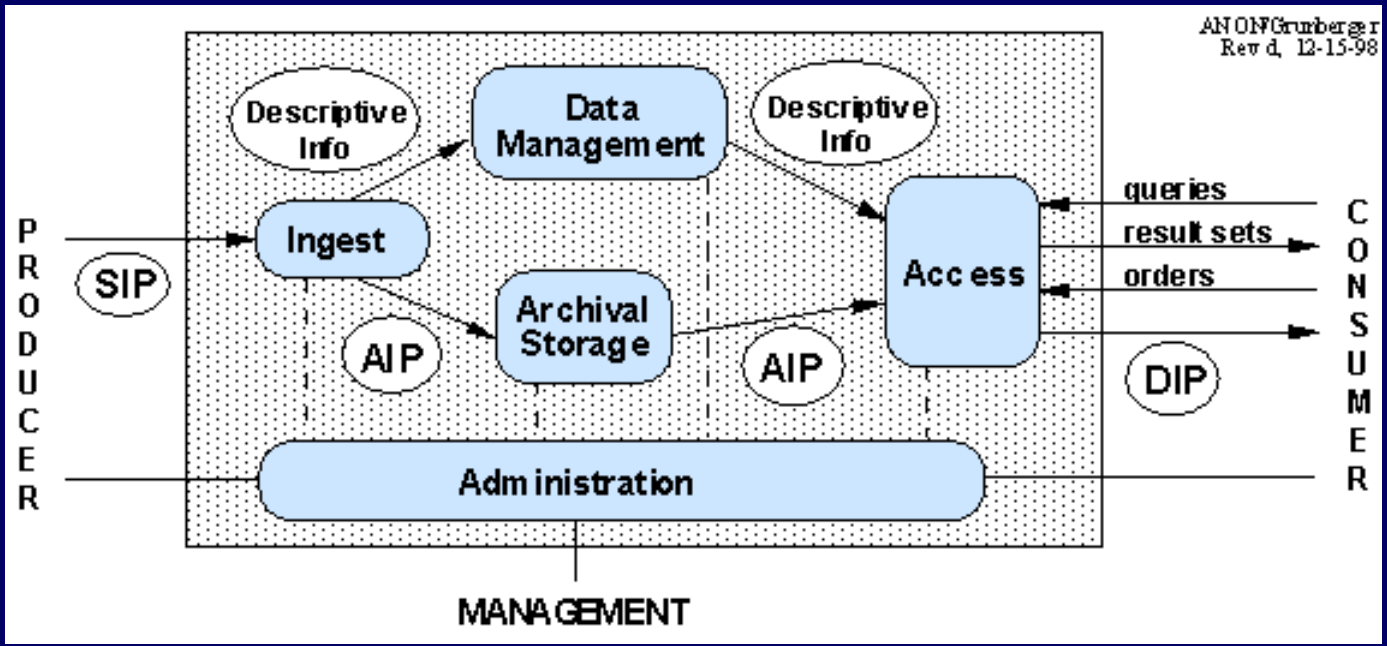
Figure 5: Recordkeeping Metadata Elements

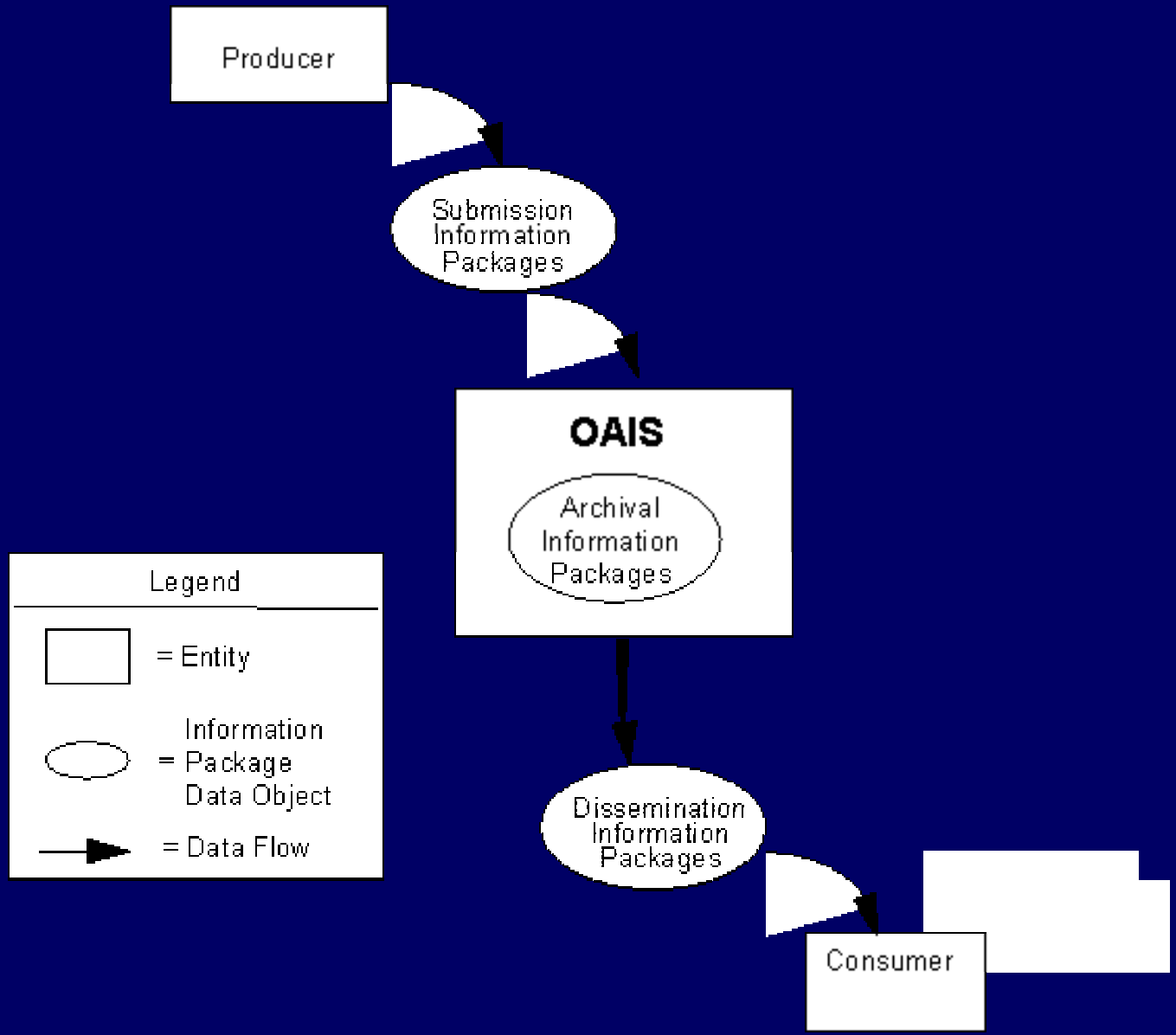


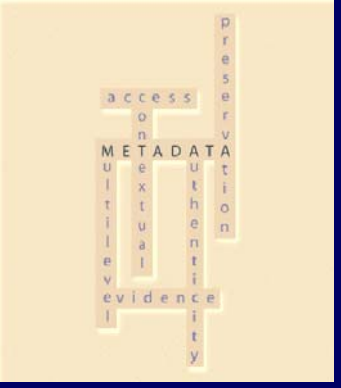
Metadata Schemas and Models that Work Together

- OAIS
  - A reference model
- Metadata Encoding and Transmission Standard
  - (METS) developed by the library community, provides a data structure for exchanging, displaying, and archiving digital objects
- NISO Z39.87 Technical Metadata for Digital Still Images
  - describes what fields are necessary in a database for preserving digital images.

OAIS model – Conceptual framework




Producer
Submission Information Packages
OAIS
Archival Information Packages
Legend
= Entity
Information = Package Data Object
= Data Flow
Dissemination Information Packages
Consumer


access
one
METADATA
preservation
contextual
authenticity
evidence
utility

OAIS
METS
Header
Descriptive MD
Administrative MD
File Section
Structural Map
Behavioral MD
Structural Links

METS

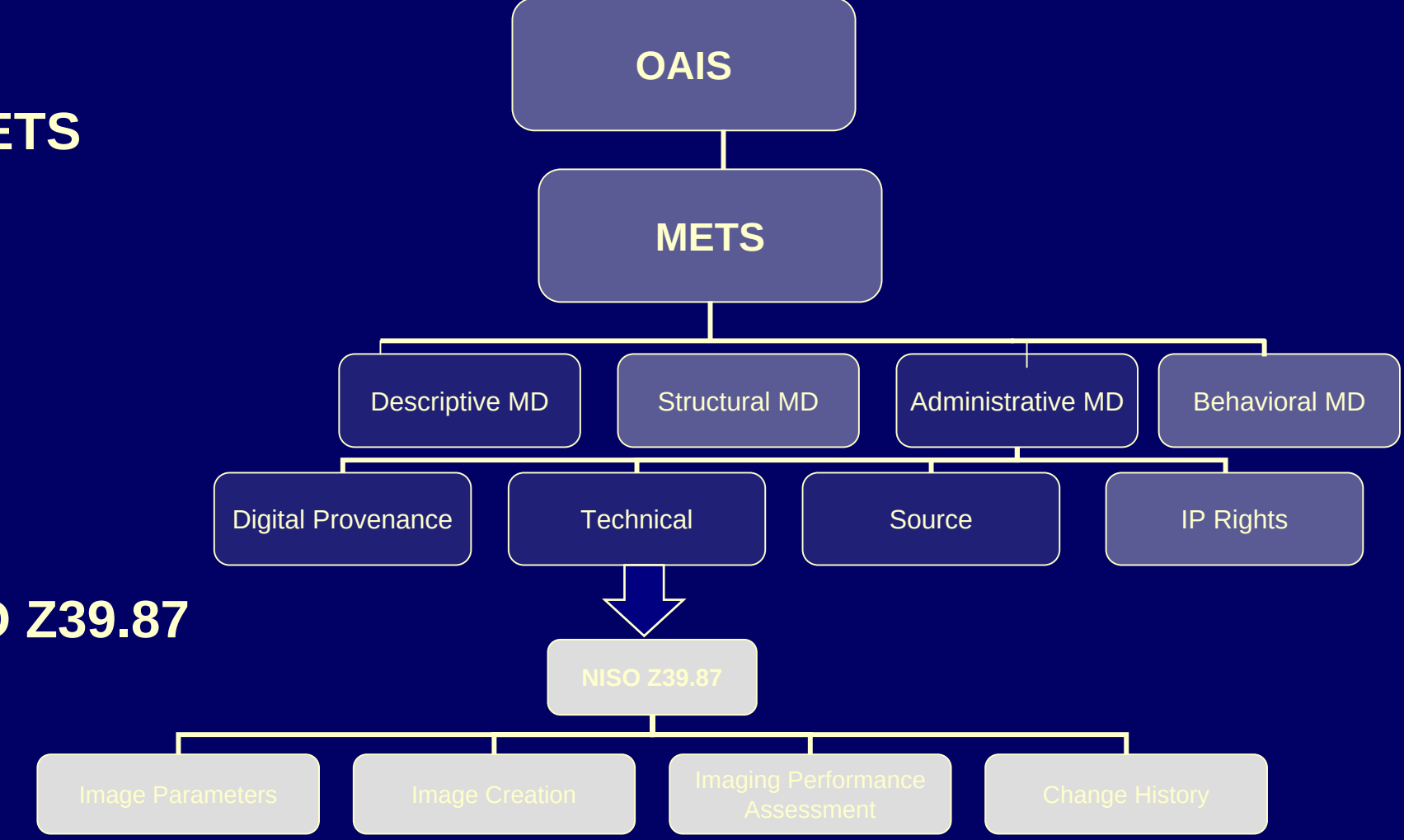
(Metadata Encoding & Transmission Standard)

1. The Header - metadata describing the document.
2. **Descriptive** - This section may point to external descriptive metadata (e.g., a MARC record or an EAD finding aid), or contain internally embedded descriptive metadata, or both.
3. **Administrative Metadata-** This section provides information regarding how the files were created and stored, intellectual property rights, etc.

METS

4. The file section lists all files containing content which comprise the digital object.
5. The structural map outlines a hierarchical structure for the object, links elements to content files and related metadata .
6. The structural links section records the existence of hyperlinks between nodes in the hierarchy outlined in the Structural Map.
7. A behavior section can be used to associate executable behaviors with content in the METS object.

METS



NISO Z39.87

VERS

- A VEO includes metadata that supports the management, finding, and retrieval of the electronic record.
- A VERS record contains one or more documents, each of which may be stored as one or more encoding (physical file formats).

VERS Encapsulated Object

VEO Format Description
Version

Signed Object

Object Metadata

Object Type
Object Type
Descrition
Object Creation
Date

Object Content

Signature Block

Signature Format
Description
Signature Date
Signer
Signature

Certificate Block
Signers Certificate
Certificate Reference

Signature Block

Signature Format
Description
Signature Date
Signer
Signature

Certificate Block
Signers Certificate
Certificate Reference

Record Metadata

Record Metadata

Handle

Description
Language
Coverage
Record Identifier
VEO Identifier

Context

Agent
Title
Subject
Relation
Function
Type
Aggregation Level
Format
Location
Transaction

Policy

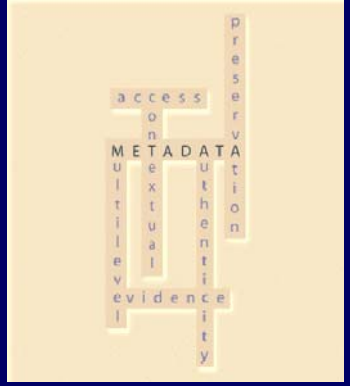
Rights Management
Disposal
Mandate

History

Date
Management History
Use History
Preservation History

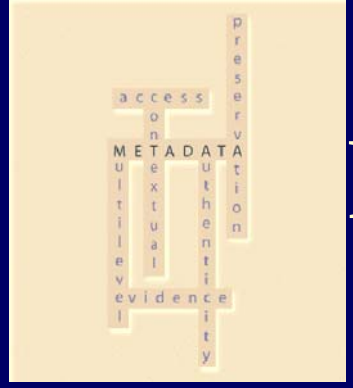
Roles and Responsibilities

- Records management professionals - define schemes, write policies, train and monitor.
- Employees ensure the accuracy and completeness of metadata for which they are responsible.
- Executives ensure internal controls are in place so people can access and use records
- IT personnel ensure the reliability, integrity, etc. of systems that capture and manage metadata.



Process for Metadata Management

- Defining policies and methods
- Creating and maintaining metadata and structures for managing metadata
- Determining how metadata should be captured – automate as much as possible
- Documenting and enforcing standard definitions
- Storage of metadata



Processes for Metadata Maintenance

- Monitoring to ensure integrity of metadata
- Security measures and recovery mechanisms incase of system failure – back up procedures
- Migration through technological change
- Metadata registries

Issues

- No one metadata schema will fulfill all functions. Need to ensure interoperability across schemes
  - Crosswalks not a panacea - Role of RDF – supports the reuse and exchange of vocabularies
  - How much standardization do we need? Can intelligent agents overcome the need to standardize? OAI – search across different metadata schemes
  - Need criteria for identifying appropriate metadata schemes

More Issues

- Who is responsible for metadata creation?
  - People need to understand benefits of creating metadata. Managers need to understand benefits of metadata. Need business cases for metadata stewardship program.

- Costs and Benefits of Metadata
  - How much does metadata cost to create, to manage?
  - How to reduce the cost while increasing the benefits?
    - Limit the types of file formats?
    - Tools for metadata extraction?
    - Reuse metadata from other sources?
    - Repurposing digital objects?

Issues

- Getting the vendors involved. Ex. Digital camera complying with metadata standards for digital cameras
- Significant properties - Leeds
- Link between authenticity and metadata