

I T H A K A

JSTOR | PORTICO | ITHAKA S+R

Metadata for Preservation

A digital object's best
friend

Implementation!





Amy Kirchhoff



Archive Service Product Manager



PORTICO



Standards

Standards

framework for thinking

Standards

framework for thinking

interchange specification

[The PREMIS
documentation has an]
emphasis on the need to
know rather than the need
to record or represent in
any particular way.

Content Type

Content Set(s)

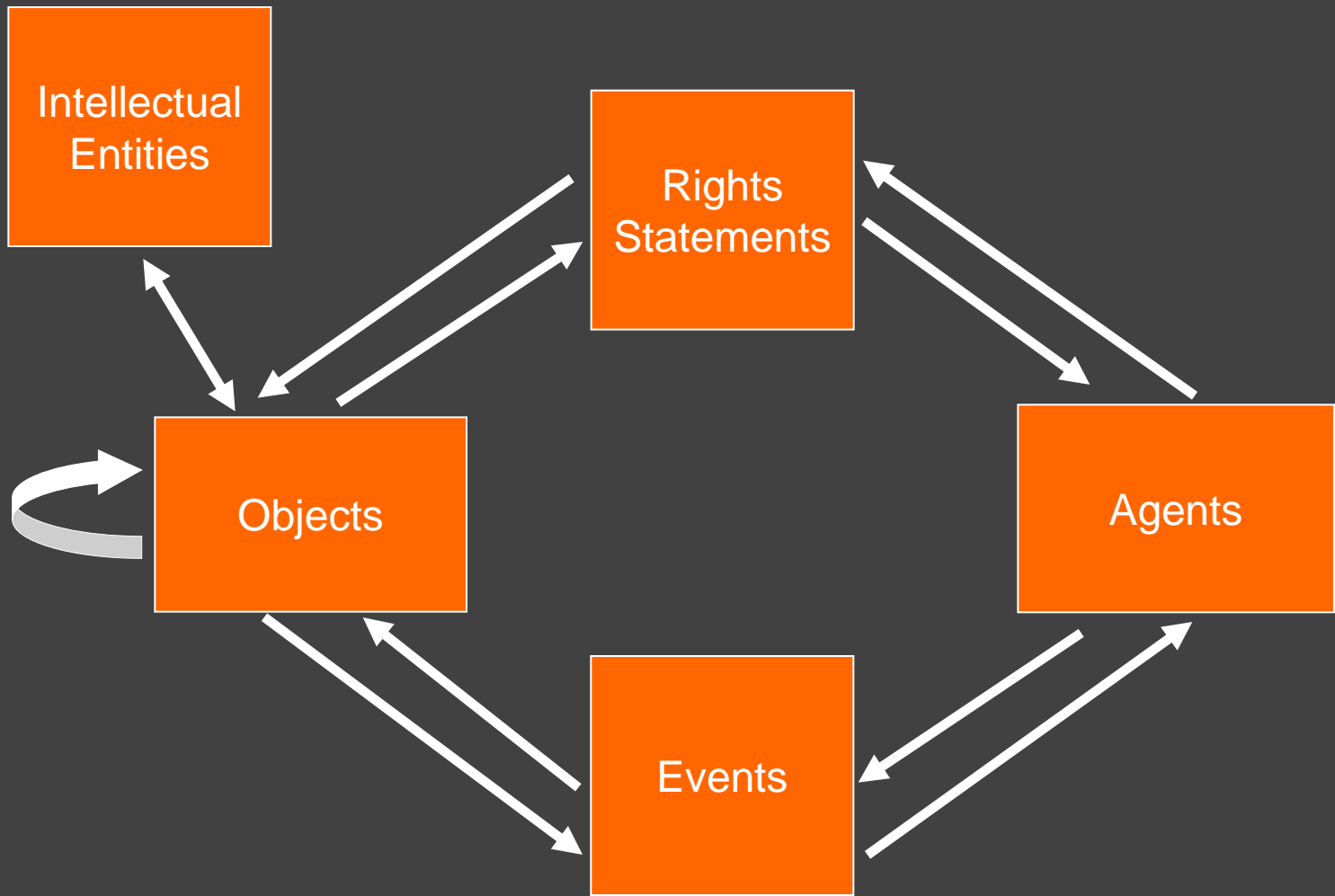
Archival Unit(s)

Content Unit(s)

Functional Unit(s)

Storage Unit(s)

- ▲ ● ArchivalUnit "ark:/27927/pf1p7zb9t2"
 - ▷ ● ProcessingRecord "ark:/27927/pgb633f18n" 2009-09-28T22:08:51.619-04:00
 - ▷ ● ProcessingRecord "ark:/27927/pgb633f1dq" 2009-09-28T22:10:48.553-04:00
 - ▷ ● ProcessingRecord "ark:/27927/pgb633f1gr" 2010-07-05T11:14:22.662-04:00
 - ▷ ● EventSet "ark:/27927/pgb633f1h8"
 - ▷ ● DescriptiveMetadata "ark:/27927/pgb633f1sd"
- ▲ ● ContentUnit "ark:/27927/pgb633f263"
 - ▷ ● EventSet "ark:/27927/pgb633f27m"
 - ▷ ● EventSet "ark:/27927/pgb633f2j8"
 - ▷ ● DescriptiveMetadata "ark:/27927/pf1p7zj2xx"
- ▲ ● FunctionalUnit "ark:/27927/pf1p7zb9vk"
 - ▲ ● StorageUnit "ark:/27927/pf1p7zhd1v"
 - ▷ ● EventSet "ark:/27927/pgb633f331"
 - ▷ ● TechnicalMetadata "ark:/27927/pf1p7zmmvh"
 - File "application/xml"
 - ▲ ● StorageUnit "ark:/27927/pf1p7zmv1g"
 - ▷ ● EventSet "ark:/27927/pgb633f3zz"
 - ▷ ● TechnicalMetadata "ark:/27927/pf1p7zzg1n"
 - File "application/xml"
 - ▲ ● FunctionalUnit "ark:/27927/pf1p7zbb1n"
 - ▲ ● StorageUnit "ark:/27927/pf1p7zhd2c"
 - ▷ ● EventSet "ark:/27927/pgb633f4ns"
 - ▷ ● TechnicalMetadata "ark:/27927/pf1p7zmqj9"
 - File "application/pdf"
 - ▲ ● MetadataStorageUnit "ark:/27927/pf1ttcp9qs"
 - File "application/xml"
 - ▲ ● MetadataStorageUnit "ark:/27927/pgb633f16m"
 - File "application/xml"



Digital preservation is the series of management policies and activities necessary to ensure the enduring usability, authenticity, discoverability and accessibility of content over the very long term.

Dublin Core

Dublin Core

DIDL (from MPEG-21)

Dublin Core

DIDL (from MPEG-21)

METS

Dublin Core

DIDL (from MPEG-21)

METS

OAIS

Dublin Core

DIDL (from MPEG-21)

METS

OAIS

...

Dublin Core

DIDL (from MPEG-21)

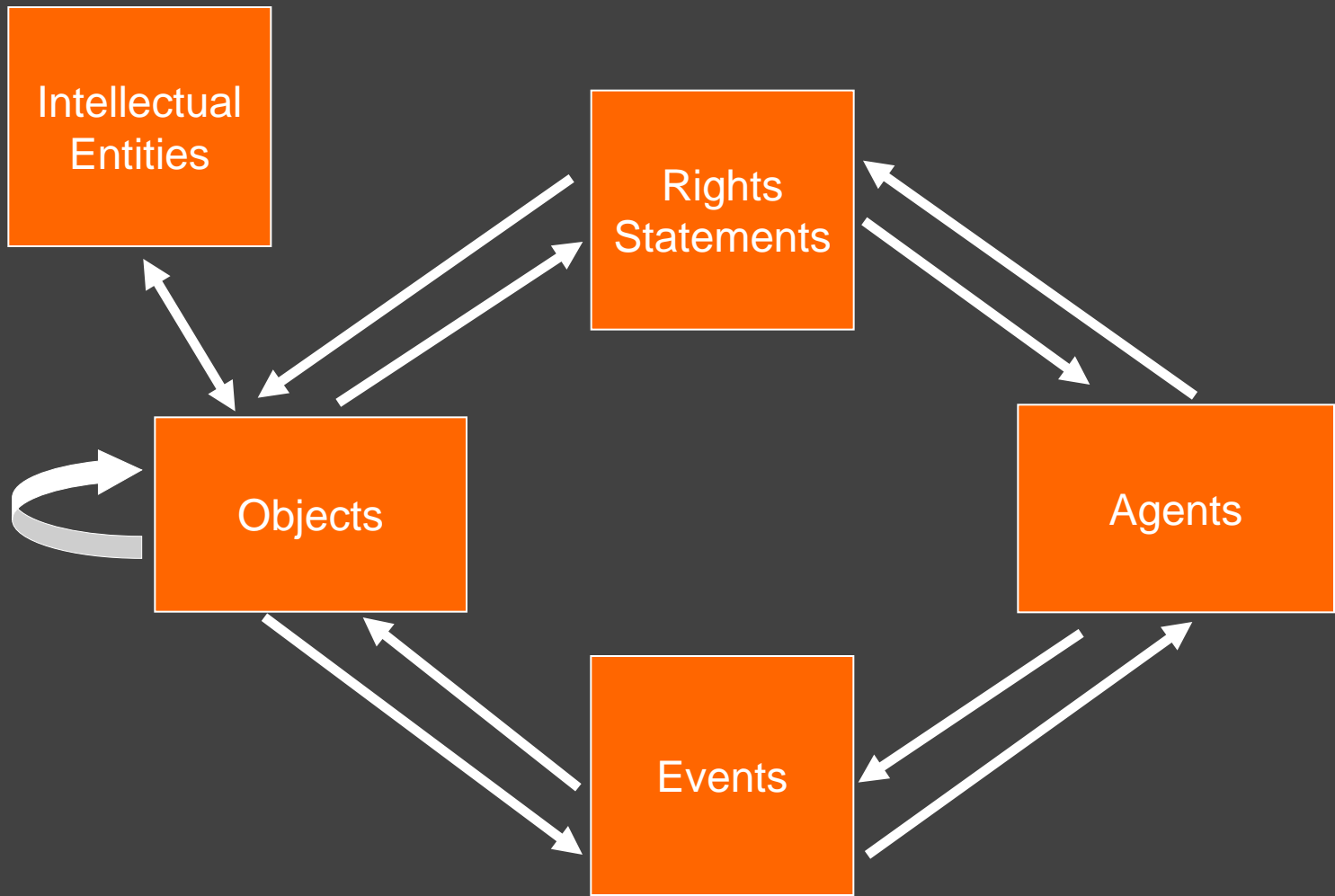
METS

OAIS

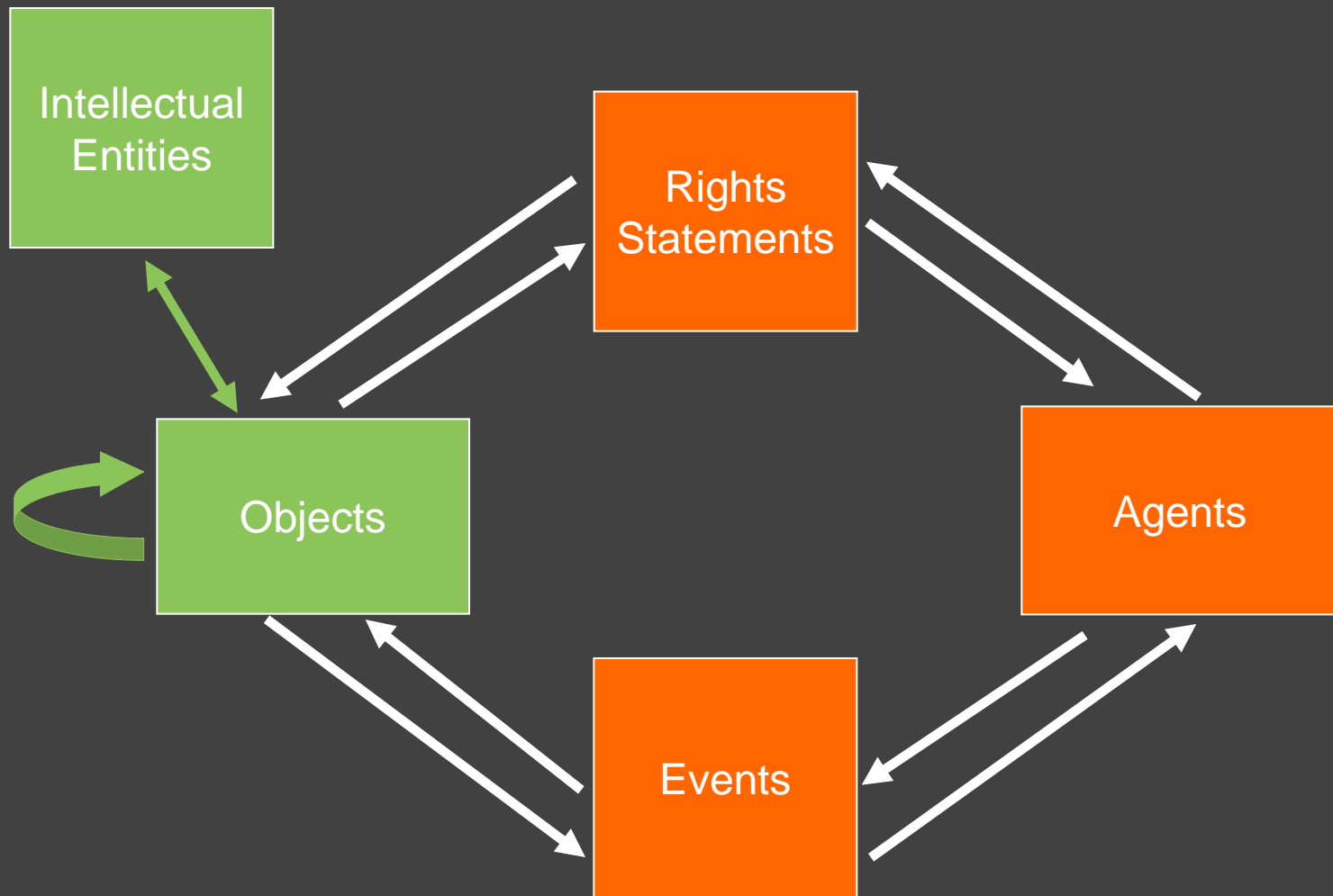
...

Experience

1. Content model
2. Metadata elements
3. Registries



Identifiers



Books

Journals

Digitized Newspapers

Digitized Documents

Supplied Files

Archive Management Documents

Books

Journals

Digitized Newspapers

Digitized Documents

Supplied Files

Archive Management Documents

1



Content
Type(s)





Content
Type(s)



Content
Set(s)





Content
Type(s)



Content
Set(s)



Archival
Unit(s)





Content
Type(s)



Content
Set(s)

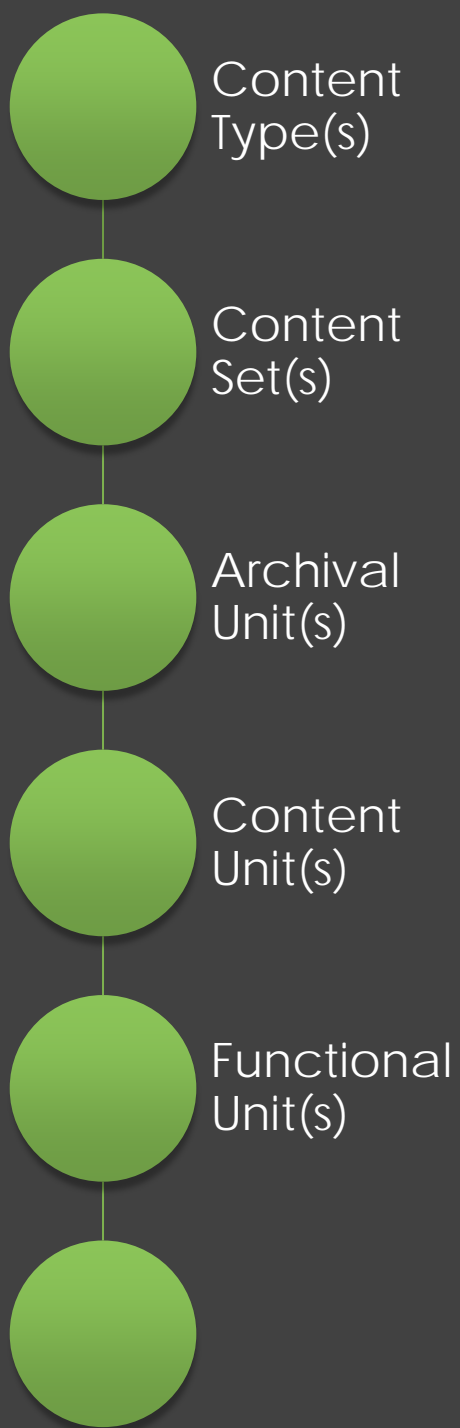



Archival
Unit(s)



Content
Unit(s)







Content
Type



Content
Set(s)



Archival
Unit(s)



Content
Unit(s)



Functional
Unit(s)



Storage
Unit(s)

Descriptive Metadata

Technical Metadata

Events Metadata

PMD

PMD

a thing of beauty

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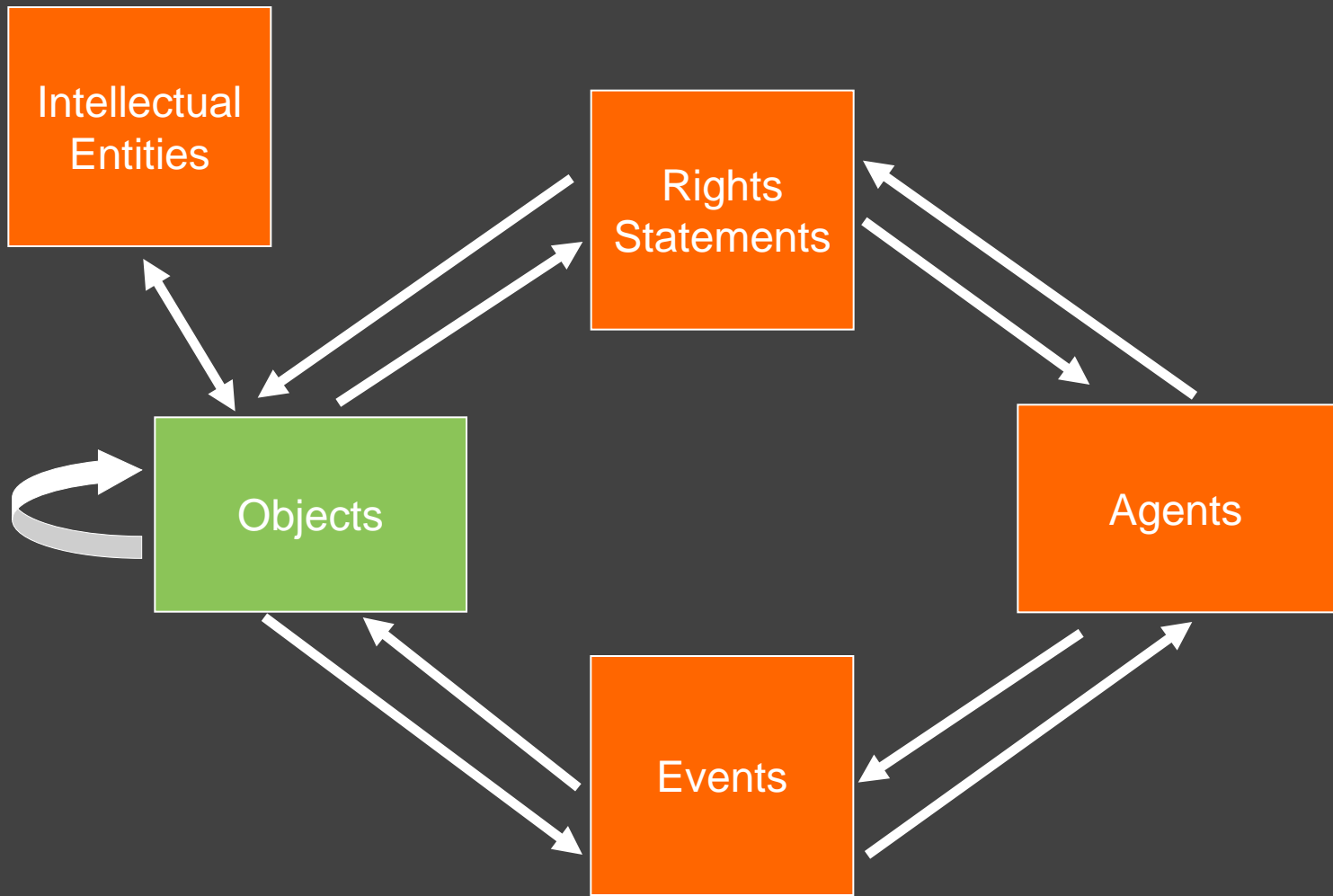


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Semantic Units for Objects

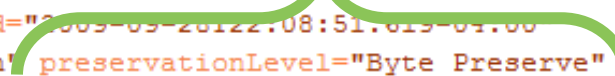
- 1.1 objectIdentifier
- 1.2 objectCategory
- 1.3 preservationLevel
- 1.4 significantProperties
- 1.5 objectCharacteristics
- 1.6 originalName
- 1.7 storage
- 1.8 environment
- 1.9 signatureInformation
- 1.10 relationship
- 1.11 linkingEventIdentifier
- 1.12 linkingIntellectualEntityIdentifier
- 1.13 linkingRightsStatementIdentifier


```
<StorageUnit objID="ark:/27927/pf1p7zhd1v" created="2009-09-28T22:08:51.619-04:00"  
status="Inactive" statusRationale="Post-Migration" preservationLevel="Byte Preserve"  
preservationLevelRationale="Post-Migration" origin="Provider"  
originRationale="Supplied Content">
```



```
<StorageUnit objID="ark:/27927/pf1p7zhd1v" created="2009-09-28T22:08:51.619-04:00"  
status="Inactive" statusRationale="Post-Migration" preservationLevel="Byte Preserve"  
preservationLevelRationale="Post-Migration" origin="Provider"  
originRationale="Supplied Content">
```

```
<StorageUnit objID="ark:/27927/pf1p7zhd1v" created="2009-09-28T22:08:51.619-04:00"
status="Inactive" statusRationale="Post-Migration" preservationLevel="Byte Preserve"
preservationLevelRationale="Post-Migration" origin="Provider"
originRationale="Supplied Content">
```



- TechnicalMetadata "ark:/27927/pf1p7zmmvh"
 - jhove "jhove" 2009-08-19T11:28:06-04:00
 - date 2009-08-19T11:28:06-04:00
 - repInfo "file:/portico/workarea/0b00862991f485:"
 - reportingModule "1.1" XML-ptc
 - lastModified 2009-08-19T11:28:05-04:00
 - size 3167
 - format XML
 - version 1.0
 - status Well-Formed and valid
 - mimeType text/xml
 - properties
 - property Parser
 - property Encoding
 - property DTD_URI
 - property Root
 - property Namespaces

- TechnicalMetadata "ark:/27927/pf1p7zmmvh"
 - jhove "jhove" 2009-08-19T11:28:06-04:00
 - date 2009-08-19T11:28:06-04:00
 - repInfo "file:/portico/workarea/0b00862991f485:"
 - reportingModule "1.1" XML-ptc
 - lastModified 2009-08-19T11:28:05-04:00
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TechnicalMetadata "ark:/27927/pf1p7zmmvh"

jhove "jhove" 2009-08-19T11:28:06-04:00

date 2009-08-19T11:28:06-04:00

repInfo "file:/portico/workarea/0b00862991f485:"

reportingModule "1.1" XML-ptc

lastModified 2009-08-19T11:28:05-04:00

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repInfo "file:/portico/workarea/0b00862991f485:"

reportingModule "1.1" XML-ptc

lastModified 2009-08-19T11:28:05-04:00

size 3167

format XML

version 1.0

status Well-Formed and valid

mimeType text/xml

properties

property Parser

property Encoding

property DTD_URI

property Root

property Namespaces



Registries


```
<File mimeType="application/xml"
format="American Economic Association Atypom NLM Journal Archiving DTD:1.0:2004-08"
formatAssessment="Well Formed and Valid"
originalFileName="atypom_link_app_10.1257%2fapp.2009.1.issue-3_20090702070633.zip/app.1.3.82/app.1.3.82.xml"
archiveFileName="pf1p7zhd1v.xml" fileSize="3166" checksumType="SHA-512"
checksum="B575854B41DB281717B6DB37D0BD4FDDDF345BC352164BB1EF9F882838B6167F1E759B22EB94961FC5902F18D21150360C240F35E5DD5AAD010565E293E99528F"
/>
```

```
<File mimeType="application/pdf" format="Portable Document Format:1.6:2004"
formatAssessment="Not Well Formed"
originalFileName="atypom_link_app_10.1257%2fapp.2009.1.issue-3_20090702070633.zip/app.1.3.82/app.1.3.82.pdf"
archiveFileName="pf1p7zhd2c.pdf" fileSize="195790" checksumType="SHA-512"
checksum="A8BB903A4E7F5CA38F14EA363D6C83CF04678A32F7BEC192FE6E5989AFD5F7206F894F1EA40CF9EEA9276B6B6588D41E4A8A41F200F646CF108434C093039398"
/>
```

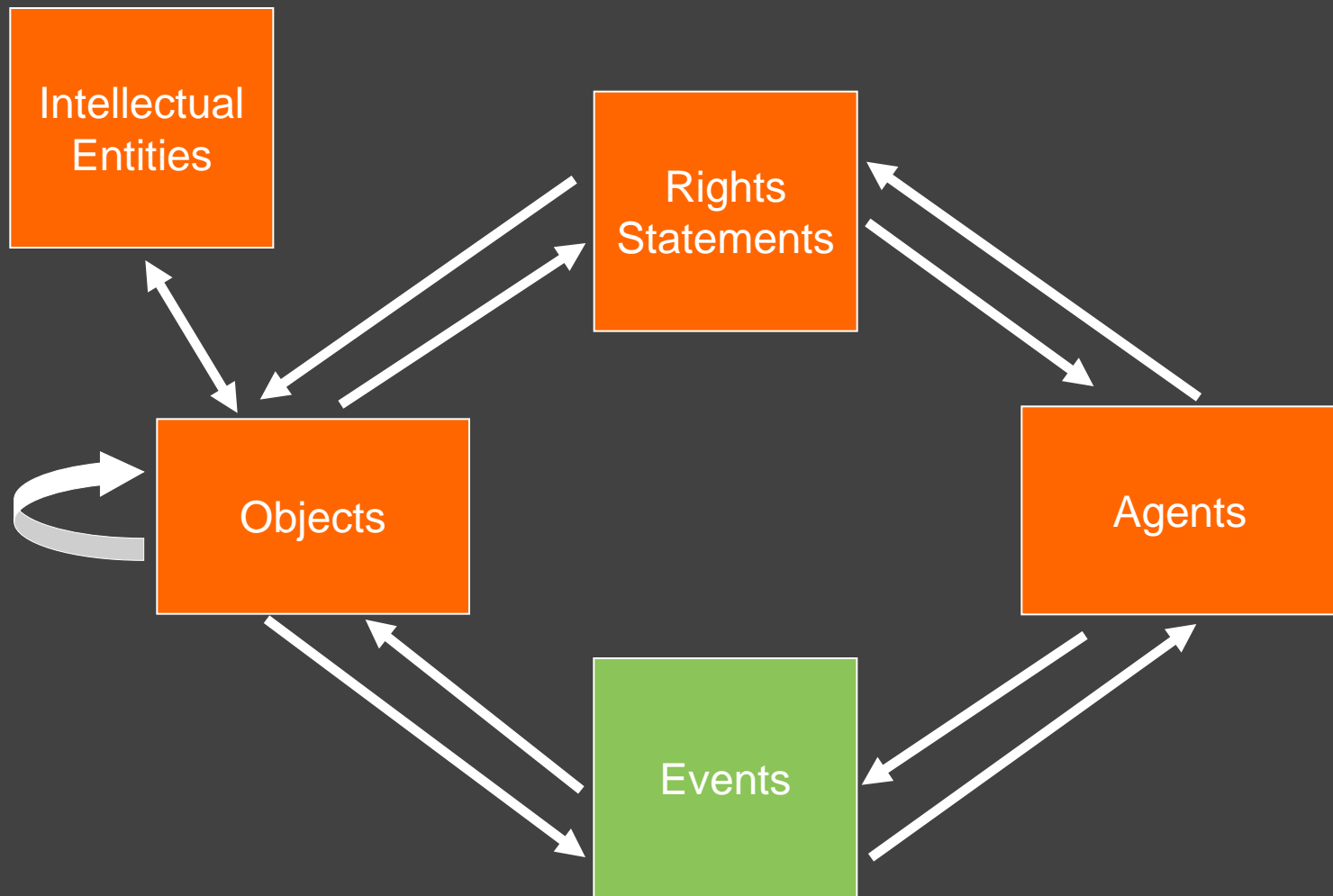
```
<File mimeType="application/xml"
format="American Economic Association Atypom NLM Journal Archiving DTD:1.0:2004-08"
formatAssessment="Well Formed and Valid"
originalFileName="atypon_link_app_10.1257%2fapp.2009.1.issue-3_20090702070633.zip/app.1.3.82/app.1.3.82.xml"
archiveFileName="pf1p7zhd1v.xml" fileSize="3166" checksumType="SHA-512"
checksum="B575854B41DB281717B6DB37D0BD4FDDF345BC352164BB1EF9F882838B6167F1E759B22EB94961FC5902F18D21150360C240F35E5DD5AAD010565E293E99528F"
/>
```

```
<File mimeType="application/pdf" format="Portable Document Format:1.6:2004"
formatAssessment="Not Well Formed"
originalFileName="atypon_link_app_10.1257%2fapp.2009.1.issue-3_20090702070633.zip/app.1.3.82/app.1.3.82.pdf"
archiveFileName="pf1p7zhd2c.pdf" fileSize="195790" checksumType="SHA-512"
checksum="A8BB903A4E7F5CA38F14EA363D6C83CF04678A32F7BEC192FE6E5989AFD5F7206F894F1EA40CF9EEA9276B6B6588D41E4A8A41F200F646CF108434C093039398"
/>
```

```
<File mimeType="application/xml"
format="American Economic Association Atypom NLM Journal Archiving DTD:1.0:
formatAssessment="Well Formed and Valid"
originalFileName="atypon_link_app_10.1257%2fapp.2009.1.issue-3_200907020706
archiveFileName="pf1p7zhd1v.xml" fileSize="3166" checksumType="SHA-512"
checksum="B575854B41DB281717B6DB37D0BD4FDDF345BC352164BB1EF9F882838B6167F1E
/>
```

```
<File mimeType="application/pdf" format="Portable Document Format:1.6:2004"
formatAssessment="Not Well Formed"
originalFileName="atypon_link_app_10.1257%2fapp.2009.1.issue-3_200907020706:
archiveFileName="pf1p7zhd2c.pdf" fileSize="195790" checksumType="SHA-512"
checksum="A8BB903A4E7F5CA38F14EA363D6C83CF04678A32F7BEC192FE6E5989AFD5F7206:
/>
```

- ▷ ● Format "ASCII" American Standard Code for Information Interchange: 1968
- ▷ ● Format "ISO-8859" ISO-8859: 1998
- ▷ ● Format "CSV" Comma Separated Values: 1968
- ▷ ● Format "TSV" Tab Separated Values
- ▷ ● Format "UTF-8" Unicode Transformation Format 8-bit: 4.1.0: 2005-03-31
- ▷ ● Format "UTF-16" Unicode Transformation Format 16-bit: 5.0.0: 2006-07-14
- ▷ ● Format "BYTESTREAM" Bytestream: 1.0
- ▷ ● Format "BITMAP_UNKNOWN_Version" Bitmapped graphics format: UNKNOWN
- ▷ ● Format "GIF_87a" Graphics Interchange Format: 87a: 1987
- ▷ ● Format "GIF_89a" Graphics Interchange Format: 89a: 1989
- ▷ ● Format "JPEG_UNKNOWN_Version" Joint Photographic Experts Group: UNKNOWN: 1994
- ▷ ● Format "JPEG_1.0" Joint Photographic Experts Group: 1: 1994
 - PorticoDefinedName Joint Photographic Experts Group: 1: 1994
 - ShortName JPEG 1.0
 - Description Coding of still images of photographic quality
 - AuthorityName ISO/IEC ITU-T
 - MaintOrgName ISO/IEC
 - DefaultMimeType image/jpeg
 - DefaultFileExtension jpg
 - DisplayOrder 0
 - Category STILL_IMAGE
 - Scope PUBLIC
 - FormatPreservationStrategySet
 - DocumentationMaterialSet
 - RequiredFileSets
- ▷ ● RegisteredNameSet
- ▷ ● Format "JPEG_1.01" Joint Photographic Experts Group File Interchange Format: 1.01: 1992
- ▷ ● Format "JPEG_1.02" Joint Photographic Experts Group File Interchange Format: 1.02: 1992
- ▷ ● Format "EXIF_2.0" Joint Photographic Experts Group Exchangeable Image
- ▷ ● Format "EXIF_2.1" Joint Photographic Experts Group Exchangeable Image
- ▷ ● Format "EXIF_2.2" Joint Photographic Experts Group Exchangeable Image
- ▷ ● Format "SPIFF_1.0" Joint Photographic Experts Group Still Picture Interchange
- ▷ ● Format "JTIP_1.0" Joint Photographic Experts Group Tiled Image Pyramid
- ▷ ● Format "JPEG-LS_1.0" Joint Photographic Experts Group Lossless/Near-Lossless: 1.0: 1998
- ▷ ● Format "JP2_1.0" Joint Photographic Experts Group 2000: 1.0: 2002
- ▷ ● Format "JPX_1.0" Joint Photographic Experts Group 2000 Extended: 1.0: 2004
- ▷ ● Format "JPM_1.0" Joint Photographic Experts Group 2000 Compound: 1.0: 2003
- ▷ ● Format "MJ2_1.0" Joint Photographic Experts Group 2000 Motion: 1.0: 2002
- ▷ ● Format "PDF_UNKNOWN_Version" Portable Document Format: UNKNOWN: 1993
- ▷ ● Format "PDF_1.0" Portable Document Format: 1.0: 1993
- ▷ ● Format "PDF_1.1" Portable Document Format: 1.1: 1993
- ▷ ● Format "PDF_1.2" Portable Document Format: 1.2: 1997
- ▷ ● Format "PDF_1.3" Portable Document Format: 1.3: 2000



Semantic Units for Events

- 2.1 eventIdentifier
- 2.2 eventType
- 2.3 eventDateTime
- 2.4 eventDetail
- 2.5 eventOutcomeInformation
- 2.6 linkingAgentIdentifier
- 2.7 linkingObjectIdentifier

Processing Records

Event Sets

Events

```
<ProcessingRecord objID="ark:/27927/pgb633f18n" created="2010-07-05T11:14:22.662-04:00">
  <Timestamp>2009-09-28T22:08:51.619-04:00</Timestamp>
  <Rationale>Processing of New Content</Rationale>
  <SuppliedFiles objID="ark:/27927/pzb248nr8"/>
  <System name="ConPrep" version="1.1.9"/>
  <Workflow name="E-Journal Workflow" version="1.9"/>
  <Batch objID="ark:/27927/pflp7ztttn0"/>
  <Profile name="AEA Profile" version="N/A"/>
  <RuntimeEnv OS="Java:Sun Microsystems Inc.:1.6.0_06" VM="SunOS:sparc:5.10"/>
</ProcessingRecord>
<ProcessingRecord objID="ark:/27927/pgb633f1dq" created="2010-07-05T11:14:22.662-04:00">
  <Timestamp>2009-09-28T22:10:48.553-04:00</Timestamp>
  <Rationale>Ingest of New Content</Rationale>
  <System name="Archive" version="1.0"/>
</ProcessingRecord>
<ProcessingRecord objID="ark:/27927/pgb633f1gr" created="2010-07-05T11:14:22.662-04:00">
  <Timestamp>2010-07-05T11:14:22.662-04:00</Timestamp>
  <Rationale>Migration of PMETS to PMD 2.0</Rationale>
  <System name="ConPrepLite" version=""/>
</ProcessingRecord>
```

```
<ProcessingRecord objID="ark:/27927/pgb633f18n" created="2010-07-05T11:14:22.662-04:00">
  <Timestamp>2009-09-28T22:08:51.619-04:00</Timestamp>
  <Rationale>Processing of New Content</Rationale>
  <SuppliedFiles objID="ark:/27927/pzb248nr8"/>
  <System name="ConPrep" version="1.1.9"/>
  <Workflow name="E-Journal Workflow" version="1.9"/>
  <Batch objID="ark:/27927/pflp7ztt0"/>
  <Profile name="AEA Profile" version="N/A"/>
  <RuntimeEnv OS="Java:Sun Microsystems Inc.:1.6.0_06" VM="SunOS:sparc:5.10"/>
</ProcessingRecord>
<ProcessingRecord objID="ark:/27927/pgb633f1dq" created="2010-07-05T11:14:22.662-04:00">
  <Timestamp>2009-09-28T22:10:48.553-04:00</Timestamp>
  <Rationale>Ingest of New Content</Rationale>
  <System name="Archive" version="1.0"/>
</ProcessingRecord>
<ProcessingRecord objID="ark:/27927/pgb633f1gr" created="2010-07-05T11:14:22.662-04:00">
  <Timestamp>2010-07-05T11:14:22.662-04:00</Timestamp>
  <Rationale>Migration of PMETS to PMD 2.0</Rationale>
  <System name="ConPrepLite" version=""/>
</ProcessingRecord>
```

```
<EventSet objID="ark:/27927/pgb633f1h8" conformanceVersion="0"
  processingRecordID="ark:/27927/pgb633f1gr">
```



```
<ProcessingRecord objID="ark:/27927/pgb633f18n" created="2010-07-05T11:14:22.662-04:00">
  <Timestamp>2009-09-28T22:08:51.619-04:00</Timestamp>
  <Rationale>Processing of New Content</Rationale>
  <SuppliedFiles objID="ark:/27927/pzb248nr8"/>
  <System name="ConPrep" version="1.1.9"/>
  <Workflow name="E-Journal Workflow" version="1.9"/>
  <Batch objID="ark:/27927/pflp7zttn0"/>
  <Profile name="AEA Profile" version="N/A"/>
  <RuntimeEnv OS="Java:Sun Microsystems Inc.:1.6.0_06" VM="SunOS:sparc:5.10"/>
</ProcessingRecord>
<ProcessingRecord objID="ark:/27927/pgb633f1dq" created="2010-07-05T11:14:22.662-04:00">
  <Timestamp>2009-09-28T22:10:48.553-04:00</Timestamp>
  <Rationale>Ingest of New Content</Rationale>
  <System name="Archive" version="1.0"/>
</ProcessingRecord>
<ProcessingRecord objID="ark:/27927/pgb633f1gr" created="2010-07-05T11:14:22.662-04:00">
  <Timestamp>2010-07-05T11:14:22.662-04:00</Timestamp>
  <Rationale>Migration of PMETS to PMD 2.0</Rationale>
  <System name="ConPrepLite" version=""/>
</ProcessingRecord>
```

```
<EventSet objID="ark:/27927/pgb633f1h8" conformanceVersion="0"
  processingRecordID="ark:/27927/pgb633f1gr" >
```

Some Portico Events

Edit Descriptive Metadata

Check Descriptive Metadata

Generate Descriptive Metadata

Ingest Into Archive

Create File

Generate Technical Metadata

Set Preservation Level

Generate Fixity

Portico Event Elements

Timestamp

Rationale

InputList

ArgList

Output

ToolWrapper

Tool Component List

Outcome

OutcomeDetailList



Content
Type



Content
Set(s)



Archival
Unit(s)



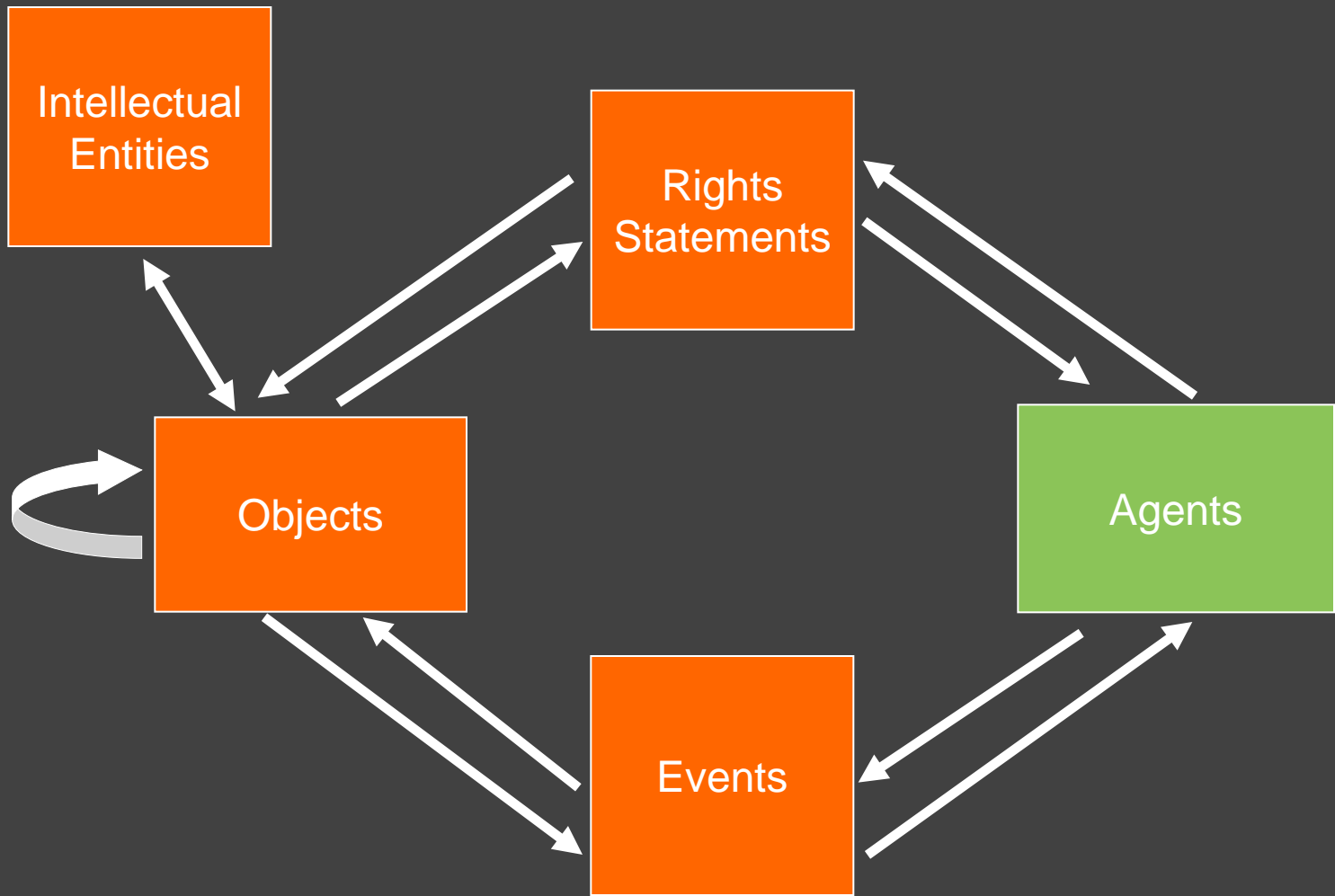
Content
Unit(s)



Functional
Unit(s)



Storage
Unit(s)



Semantic Units for Agents

3.1 agentIdentifier

3.2 agentName

3.3 agentType

3.4 agentNote

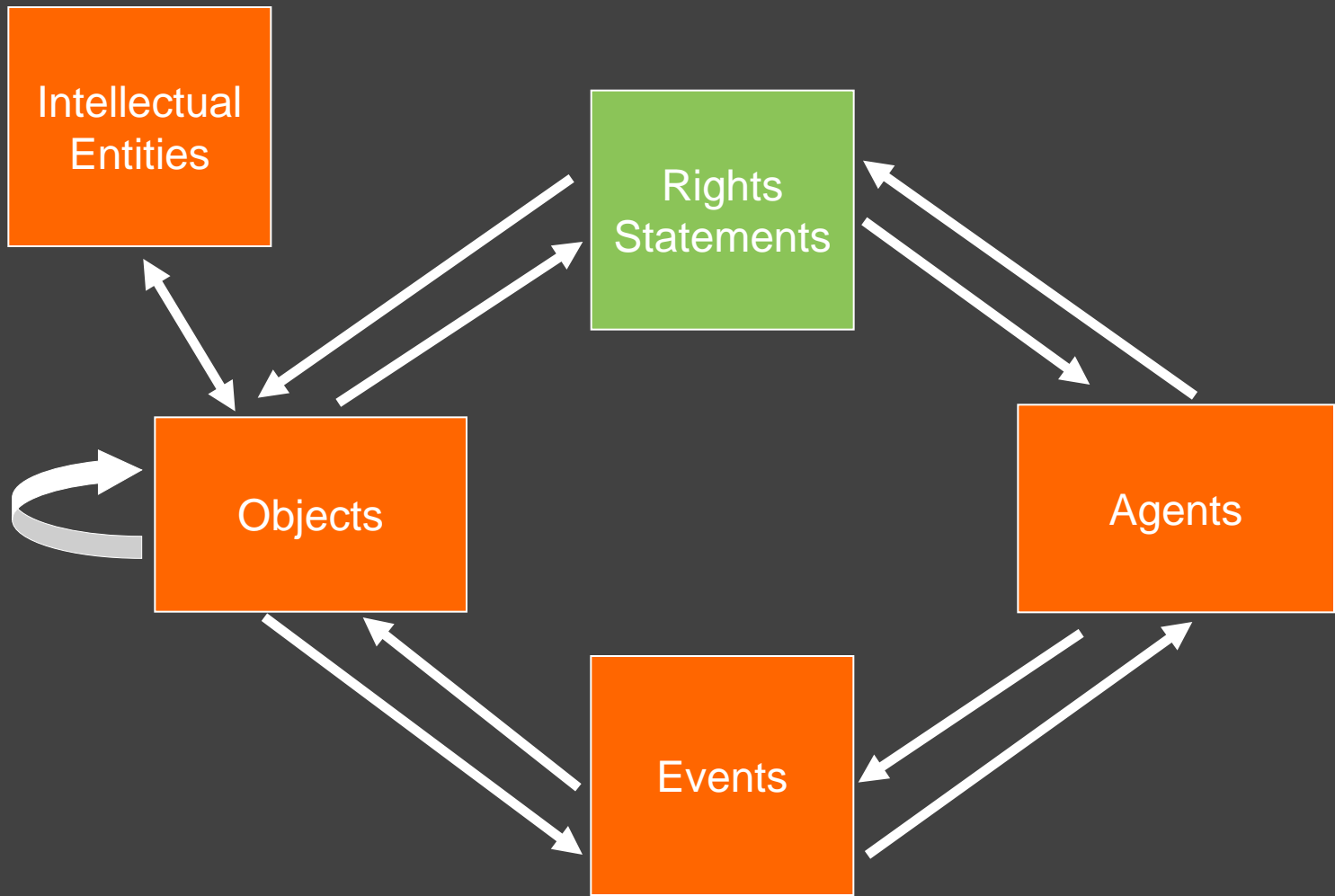
3.5 agentExtension

3.6 linkingEventIdentifier

3.7 linkingRightsStatementIdentifier

```
<ProcessingRecord objID="ark:/27927/pgb633f18n" created="2010-07-05T11:14:22.662-04:00">
  <Timestamp>2009-09-28T22:08:51.619-04:00</Timestamp>
  <Rationale>Processing of New Content</Rationale>
  <SuppliedFiles objID="ark:/27927/pzb248nr8"/>
  <System name="ConPrep" version="1.1.9"/>
  <Workflow name="E-Journal Workflow" version="1.9"/>
  <Batch objID="ark:/27927/pflp7ztt0"/>
  <Profile name="AEA Profile" version="N/A"/>
  <RuntimeEnv OS="Java:Sun Microsystems Inc.:1.6.0_06" VM="SunOS:sparc:5.10"/>
</ProcessingRecord>
<ProcessingRecord objID="ark:/27927/pgb633f1dq" created="2010-07-05T11:14:22.662-04:00">
  <Timestamp>2009-09-28T22:10:48.553-04:00</Timestamp>
  <Rationale>Ingest of New Content</Rationale>
  <System name="Archive" version="1.0"/>
</ProcessingRecord>
<ProcessingRecord objID="ark:/27927/pgb633f1gr" created="2010-07-05T11:14:22.662-04:00">
  <Timestamp>2010-07-05T11:14:22.662-04:00</Timestamp>
  <Rationale>Migration of PMETS to PMD 2.0</Rationale>
  <System name="ConPrepLite" version=""/>
```

```
<ProcessingRecord objID="ark:/27927/pgb633f18n" created="2010-07-05T11:14:22.662-04:00">
  <Timestamp>2009-09-28T22:08:51.619-04:00</Timestamp>
  <Rationale>Processing of New Content</Rationale>
  <SuppliedFiles objID="ark:/27927/pzb248nr8"/>
  <System name="ConPrep" version="1.1.9"/>
  <Workflow name="E-Journal Workflow" version="1.9"/>
  <Batch objID="ark:/27927/pf1p7ztt0"/>
  <Profile name="AEA Profile" version="N/A"/>
  <RuntimeEnv OS="Java:Sun Microsystems Inc.:1.6.0_06" VM="SunOS:sparc:5.10"/>
</ProcessingRecord>
<ProcessingRecord objID="ark:/27927/pgb633f1dq" created="2010-07-05T11:14:22.662-04:00">
  <Timestamp>2009-09-28T22:10:48.553-04:00</Timestamp>
  <Rationale>Ingest of New Content</Rationale>
  <System name="Archive" version="1.0"/>
</ProcessingRecord>
<ProcessingRecord objID="ark:/27927/pgb633f1gr" created="2010-07-05T11:14:22.662-04:00">
  <Timestamp>2010-07-05T11:14:22.662-04:00</Timestamp>
  <Rationale>Migration of PMETS to PMD 2.0</Rationale>
  <System name="ConPrepLite" version=""/>
```

Semantic Units for Rights

4.1 rightsStatement

4.1.1 rightsStatementIdentifier

4.1.2 rightsBasis

4.1.3 copyrightInformation

4.1.4 licenseInformation

4.1.5 statuteInformation

4.1.6 otherRightsInformation

4.1.7 rightsGranted

4.1.8 linkingObjectIdentifier

4.1.9 linkingAgentIdentifier

4.2 rightsExtension

Easy

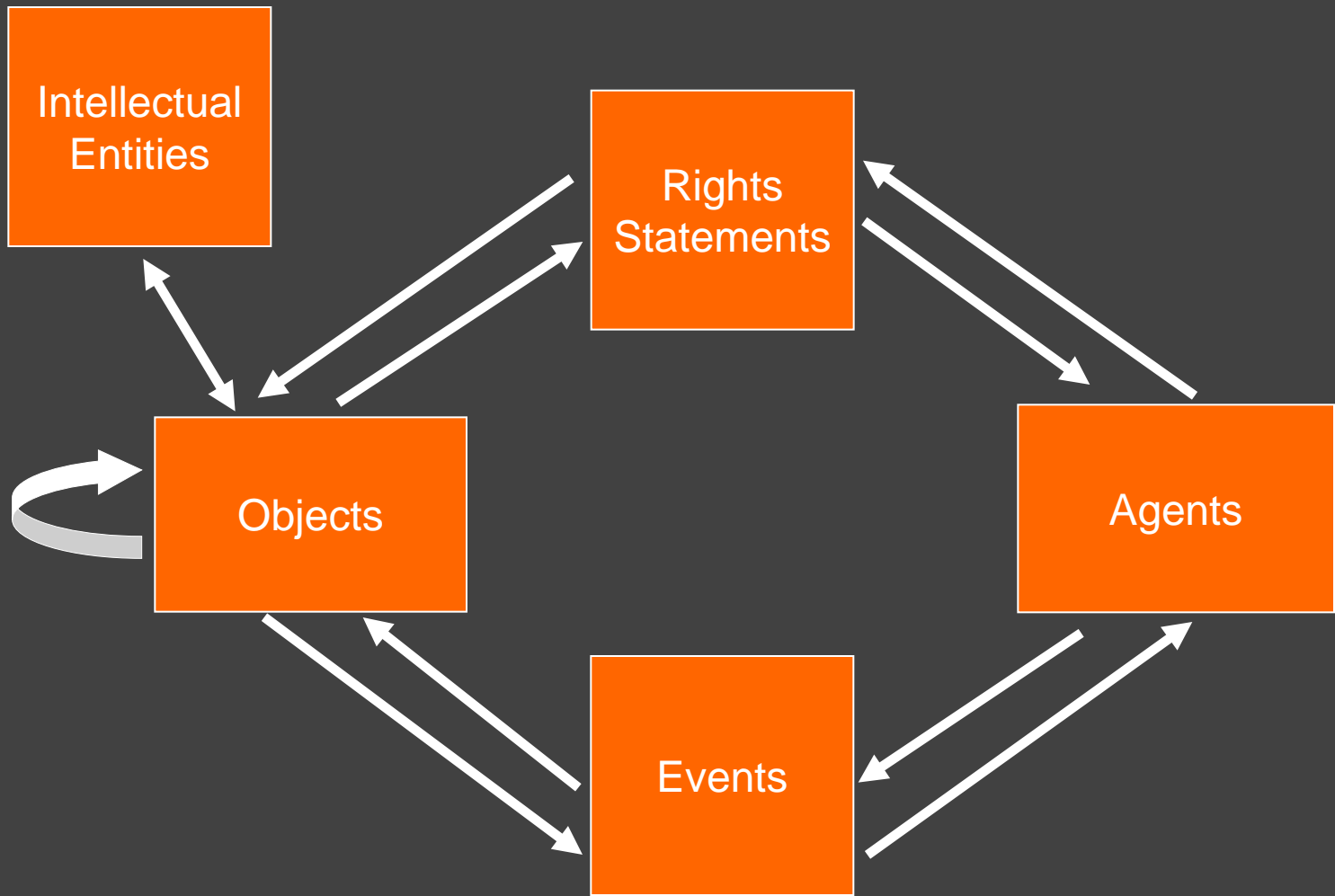
Easy

For Portico

For the moment

```
<ArchivalUnit objID="ark:/27927/pf1p7zb9t2" created="2009-09-28T22:08:51.619-04:00" status="Active"
statusRationale="" preservationObjective="Fully Supported"
preservationObjectiveRationale="Business Policy" contentType="E-Journal Content"
contentSetName="ISSN_19457782" contentUnitType="Article" agreementID="ark:/27927/pt0zdm"
agreementName="American Economic Association Agreement, Version 1.0 (January 11, 2008)">
```

```
<ArchivalUnit objID="ark:/27927/pf1p7zb9t2" created="2009-09-28T22:08:51.619-04:00" status="Active"
statusRationale="" preservationObjective="Fully Supported"
preservationObjectiveRationale="Business Policy" contentType="E-Journal Content"
contentSetName="ISSN_19457782" contentUnitType="Article" agreementID="ark:/27927/pt0zdm"
agreementName="American Economic Association Agreement, Version 1.0 (January 11, 2008)">
```







PORTICO

THANK YOU.

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amy.kirchhoff@ithaka.org

<http://www.portico.org>