

Annex 8 – Description of the current Data Model

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Introduction

This document gives a description of KB's current Data Model and how it is used in practice. This document contains the following sections:

- Description of the AIP Data Model for born-digital Publications
- Description of the SIP Data Model for digitised books, newspapers and journals
- Detailed description/data dictionary for the KB Data Model

KB has developed a logical Data Model (information model) for its digital collection. The Data Model has been implemented for part of the digital collection as an application of METS with MODS, PREMIS, MIX, ALTO and a number of its specific KB fields.

For the validation of the Metadata of the various applications, KB uses a variety of XSD schemas; see XSD for each description.

In the DAMPS Requirements Specification, more requirements are incidentally imposed on the Data Model than KB currently applies in its own Data Model. This covers (for example) information such as relationships/Versions between AIPs, a hierarchy of serial Publications, rights to all possible units distinguished and recorded in the Metadata, and possible supporting information about the environment and the recording of Collections. An update to the latest version of the standards/schemas adopted would be desirable.

The Data Models illustrated below (Figures 1 and 2) use the Entity Relationship Model with Crow's foot notation, see

https://en.wikipedia.org/wiki/Entity%E2%80%93relationship_model%23Crow.27s_foot_notation.

The rectangles represent the entities for which information is captured; this is strongly based on PREMIS. The ellipses represent Metadata entities that are used for recording that information and they can therefore also be seen as a grouping of attributes for the entities.

Description of the AIP Data Model for born-digital Publications

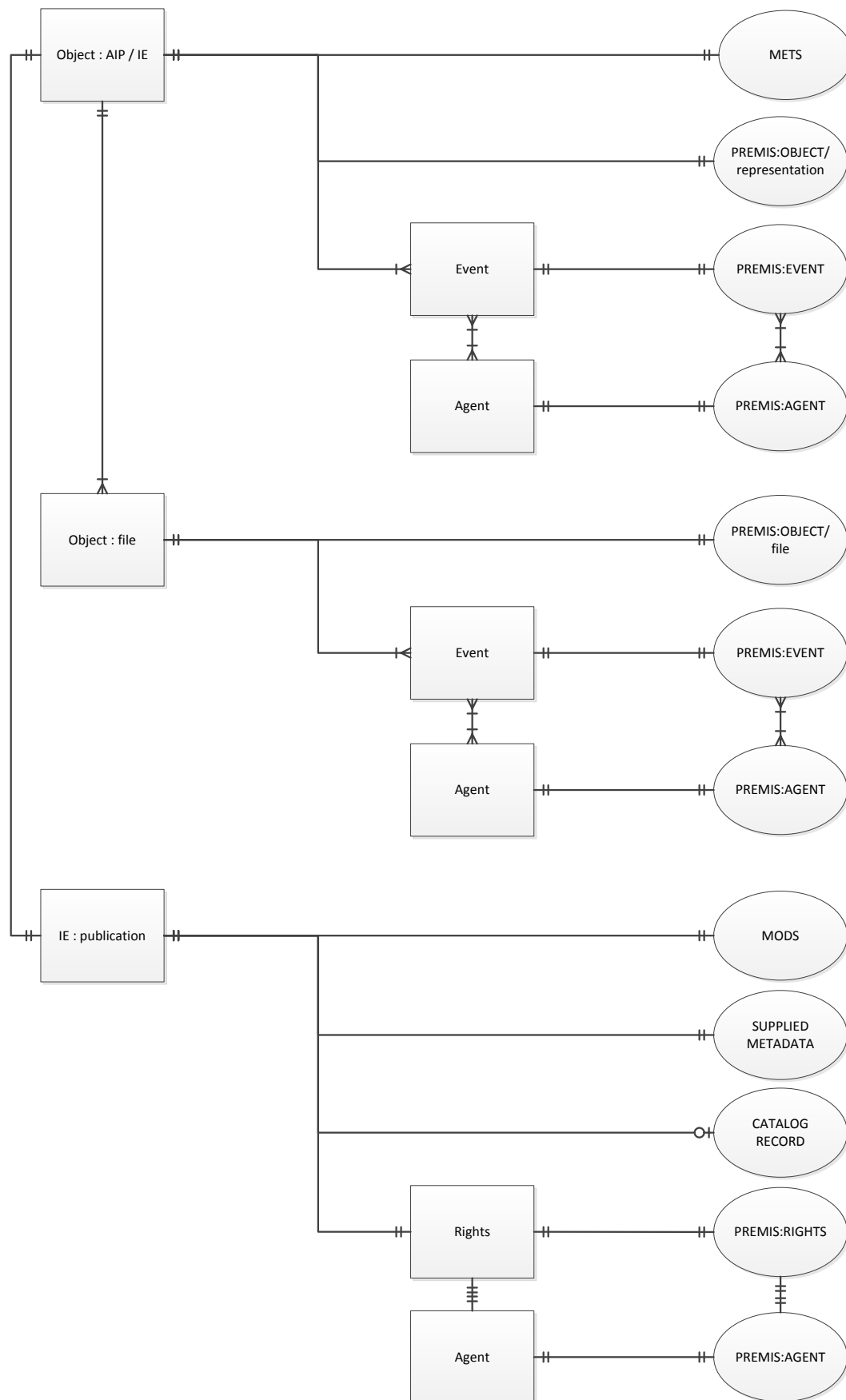


Figure 1. Data Model for born-digital Publications

For each Publication, there is precisely one AIP with an associated METS file present.

Information about the Object: AIP¹ (objectIdentifier and preservationLevel) is recorded as a PREMIS:OBJECT/representation.²

Events that are related to the AIP (such as information package creation, capture, ingestion, etc. (see <http://id.loc.gov/vocabulary/preservation/eventType.html>)) are recorded as the provenance in a PREMIS:EVENT in individual METS digiprovMD sections and related to the AIP in both METS and PREMIS. The PREMIS:EVENT metadata includes an eventIdentifier, eventType, eventDateTime, eventDetail and eventOutcomeInformation.

The Agents related to the events (such as the executing program, rightsholder and supplier) are recorded as a PREMIS:AGENT, again in separate METS digiprovMD sections. The PREMIS:AGENT metadata includes an agentIdentifier, agentName, agentType (organisation and software) and agentNote. More detailed information about the Agents is recorded in an authority file, known as the KB agent register. Being able to use the KB agent register as authority file in the new system has been stated as a wish list item in the Schedule of Requirements. Relationships between events and Agents are recorded in both METS and PREMIS.

An AIP contains one or more Files. The inventory of all Files in an AIP is recorded in METS fileSec and broken down according to function in multiple METS fileGrp entities: main files, metadata files, XML reference files, additional files and other files.

In addition, the logical structure of the AIP is recorded in METS structMap. In the majority of cases, the structure is limited to the subdivisions “publication” and “original metadata”; in occasional cases, the structure of the Publications supplied is more complex and the “publication” is further subdivided into various “representations” and “additional materials”.

For every File that is present in METS fileSec, technical metadata (objectIdentifier, objectCharacteristics (compositionLevel, fixity, size and format) and originalName) is recorded as a PREMIS:OBJECT/file in individual METS techMD sections.

Events that are related to the Files (such as format identification, validation, message digest calculation, etc. (see <http://id.loc.gov/vocabulary/preservation/eventType.html>)) are recorded as provenance. The same application applies for these Events as for the Events that are related to the AIP.

Descriptive metadata about the stored Publication is kept in MODS in METS dmdSec. MODS is used for the descriptive metadata of all types of born-digital Publications, such as e-books, articles in e-journals and issues of e-journals. Because this Metadata is also important for long-term access,

¹ In PREMIS terms, there is no AIP object type. The Intellectual Entity object type from PREMIS 3.0 approximates what KB sees as the AIP object type.

²This is not entirely correct according to the PREMIS definitions, but it is the closest thing in PREMIS 2.3 to what we need.

roughly all permitted elements in MODS are used by KB. Specifically worth mentioning is that Persistent identifiers of Publications (NBN, DOI, HDL, ISBN and ISSN) are recorded in MODS. In addition, the Metadata originally supplied (for example ONIX, KB's own format for Publications supplied via the Web Deposit, NLM, MODS and suppliers' own formats) is entirely embedded in METS dmdSec/SUPPLIED METADATA for management and usage purposes. Note: the File with the Metadata as originally supplied is also stored as a File in AIP. For e-books and born-digital issues of periodicals delivered through the Digital Desk, also an export of the associated catalogue record (in PICA-XML and MARCXML) is embedded in its entirety in METS dmdSec/CATALOG RECORD for management and usage purposes. This File is also stored as a File in AIP.

The rights information that is recorded at this time (availability, rightsholder, copyright and licensing information) is also related to the Publication. This is stored as PREMIS:RIGHTS in a METS rightsMD section with its "own" KBMD extension.

The Agents associated with the rights are stored as a PREMIS:AGENT, again in separate rightsMD sections. Relationships between rights and Agents are recorded in both METS and PREMIS.

Versions used:

- METS 1.9
- PREMIS 2.1 and 2.3
- MODS 3.4, 3.5 and 3.6

Schemas used and example files:

- Annex 8f – AIP_schema_borndigital.zip
- Annex 8d – EXAMPLE_DATAMODEL_esp_S1476558610800636-160926-1747_1520334192128_aip_188573.xml
- Annex 8c – EXAMPLE_DATAMODEL_ebook_cb-1504863468288-180124-0200_1504863468288_aip_188658.xml

Description of the SIP Data Model for digitised books, newspapers and magazines

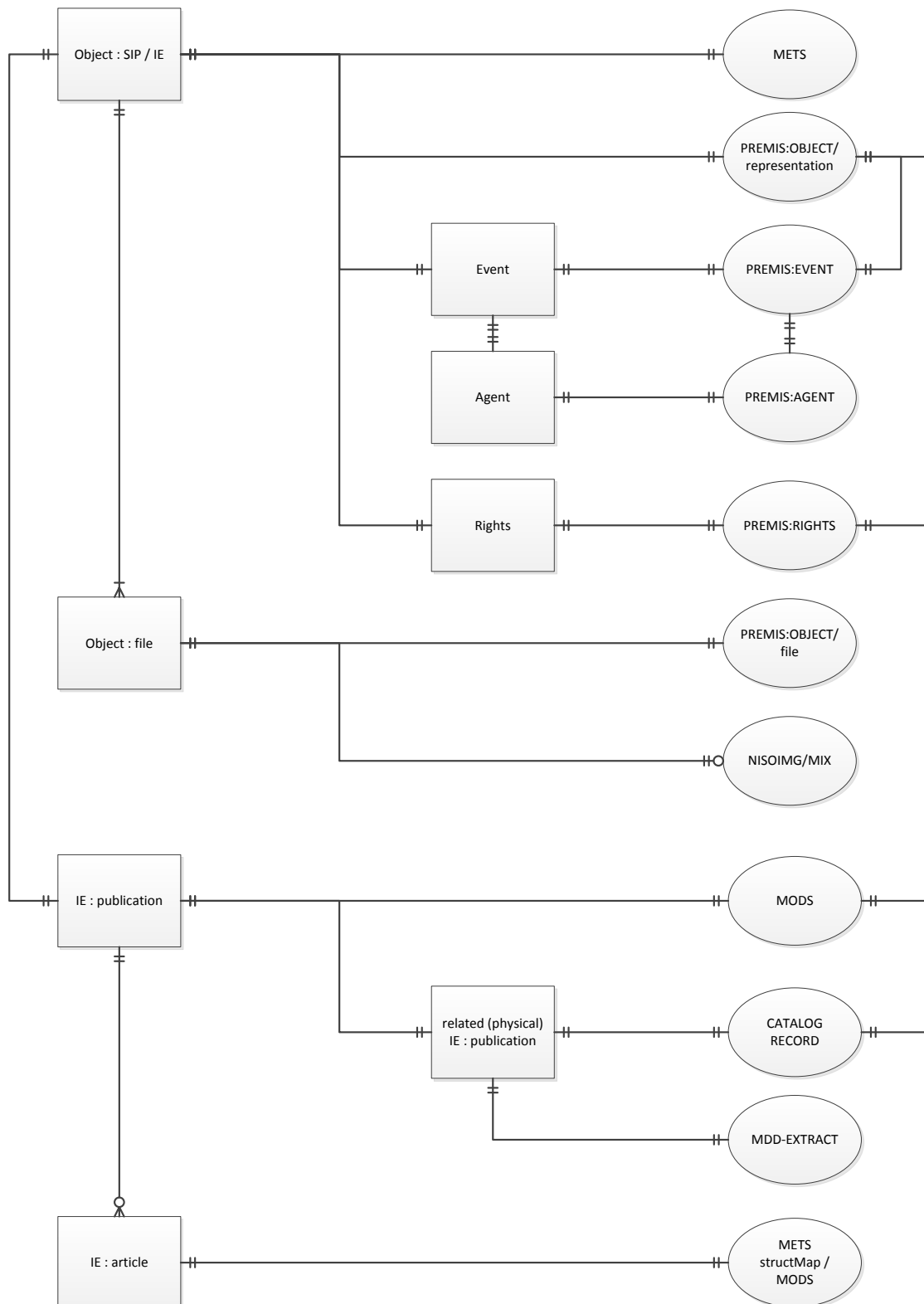


Figure 2. Data Model for digitised Publications

For each Publication, there is precisely one SIP with an associated METS file present. There is no file group of (original) Metadata present for digitised material; as a result, the SIP entity is more or less the same as the Intellectual Entity Publication.

Information about the Object: SIP³ (objectIdentifier) is recorded as a PREMIS:OBJECT/representation.⁴

The only Event that is related to the SIP (creation – see <http://id.loc.gov/vocabulary/preservation/eventType.html>) is recorded as provenance in a PREMIS:EVENT in an individual METS digiprovMD section and related to the SIP in both METS and PREMIS. The PREMIS:EVENT metadata includes an eventIdentifier, eventType, eventDateTime, and eventDetail.

The only Agent related to this event is recorded as a PREMIS:AGENT, again in a separate METS digiprovMD section. The PREMIS:AGENT metadata includes an agentIdentifier, agentName and agentType (organisation). More detailed information about the Agents is recorded in an authority file, known as the KB agent register. Relationships between events and Agents are recorded in both METS and PREMIS.

The rights information that is recorded at this time (rightsStatementIdentifier, rightsBasis, copyrightInformation) is also related to the SIP/Publication. This is also stored as PREMIS:RIGHTS in a METS rightsMD section.

A SIP contains one or more Files. The inventory of all Files in a SIP is recorded in METS fileSec and broken down according to function in multiple METS fileGrp entities: master images, access images, full-text ocr files, ALTO files and PDF files.

The physical structure of the digitised Publication is recorded in METS structMap for all digitised material; for digitised Newspapers and Magazines, the logical structure can also optionally be recorded.

The physical structure of the digitised Publication is subdivided into pages; there is a reference to a master image for each page, an access image, an ALTO file and for Books and Magazines a full-text ocr file.

The optional logical structure for Newspapers and Magazines has a subdivision into articles; there is a reference for each article to a full text ocr file and to the corresponding areas with one or more TextBlock and/or ComposedBlock elements in the ALTO files.

For every File that is present in METS fileSec, technical metadata (objectIdentifier, objectCharacteristics (compositionLevel, fixity, size and format)) is recorded as a PREMIS:OBJECT/file in individual METS techMD sections. For the master images, there is furthermore additional specific technical metadata (Basic Digital Object Information, Basic Image

³ In PREMIS terms, there is no SIP object type. The Intellectual Entity object type from PREMIS 3.0 approximates what KB sees as the SIP object type.

⁴ Note: this is not entirely correct according to the PREMIS definitions, but it is the closest thing in PREMIS 2.3 to what we need.

Information, Image Capture Metadata, Image Assessment Metadata and Image Processing) that is recorded in NISOIMG/MIX, once again in separate METS techMD sections.

Descriptive metadata about the digitised Publication is kept in MODS in METS dmdSec. MODS is used for the descriptive metadata of all types of stored Publications. Because this Metadata is also important for the long-term access, roughly all permitted elements in MODS are used by KB.

For digitised Publications, also an export of the catalogue record of the related physical source (in PICA-XML and MARCXML) is embedded in METS sourceMD as CATALOG-RECORD for management and usage purposes. Other information about the related physical source is also recorded in a separate METS sourceMD as MDD-EXTRACT.

For digitised issues of Newspapers and Magazines, also optionally bibliographical information about the Intellectual Entity article can be recorded, because KB has chosen a METS/ALTO application of article segmentation. The title and genre of article can be recorded in METS structMap in the current application and the author or authors of the article in MODS in a separate METS dmdSec.

Versions used:

- METS 1.10
- PREMIS 2.3
- MODS 3.5
- NISOIMG / MIX 2.0
- ALTO 2.0

Schemas used and example file:

- Annex 8e – SIP_schema_digitizedmaterial.zip
- Annex 8b - EXAMPLE_DATAMODEL_KRANTEN_MMKB23_001961004_mets.xml

Detailed description/data dictionary for the KB Data Model

Explanation of the table - columns

attributes per entity: by KB used attributes per entity; the data of KB should be accommodated in the new System without loss of information

description: description of the attribute; because KB uses a METS / MODS / PREMIS / MIX application, we refer to these standards for a description of the standard attributes in use:

- METS <http://www.loc.gov/standards/mets/>
- MODS <http://www.loc.gov/standards/mods/> (version 3)
- PREMIS <http://www.loc.gov/standards/premis/> (version 2.3)
- NISOIMG/MIX <http://www.loc.gov/standards/mix/> (version 2.0)

O/R: Obligation / Repeatability:

- M=Mandatory
- MA=Mandatory if Applicable
- O=Optional
- R=Repeatable
- NR=Non-Repeatable

restriction/remarks: more information about the attribute; most about values in use or controlled vocabularies

ENTITY: Object/AIP/Intellectual Entity

attributes per entity	description	O / R	restrictions/remarks
ENTITY: Object/AIP/Intellectual Entity	[PREMIS]		
objectIdentifier	[PREMIS]	M,NR	<i>container</i>
objectIdentifierType	[PREMIS]	M,NR	Values in use: - local
objectIdentifierValue	[PREMIS]	M,NR	Original values should be kept
preservationLevel	[PREMIS]	O,NR	<i>container ; only in use for born digital Publications</i>
preservationLevelValue	[PREMIS]	M,NR	Current default value "collectiebehoudsniveau 1"
preservationLevelDateAssigned	[PREMIS]	M,NR	Datetimestamp according to ISO 8601: yyyy-mm-ddThh:mm:ss.nnnnnn+ -hh:mm
RELATION: Object/AIP/Intellectual Entity <-> Object/AIP/Intellectual Entity	[PREMIS]		Relations between objects are recorded both in PREMIS and in METS; Original relations should be kept
relationship	[PREMIS]	O,NR	<i>container</i>
relationshipType	[PREMIS]	M,NR	Values according to authorityURI= http://id.loc.gov/vocabulary/preservation/relationships ; Value in use: - derivation
relationshipSubType	[PREMIS]	M,NR	Values according to authorityURI= http://id.loc.gov/vocabulary/preservation/relationships ; Value in use: - has Source
relatedObjectIdentification	[PREMIS]	M,NR	<i>container</i>
relatedObjectIdentifierType	[PREMIS]	M,NR	Values in use: - local
relatedObjectIdentifierValue	[PREMIS]	M,NR	Original values should be kept
relatedEventIdentification	[PREMIS]	M,NR	<i>container</i>
relatedEventIdentifierType	[PREMIS]	M,NR	Default value "KB-event-id"

attributes per entity	description	O / R	restrictions/remarks
relatedEventIdentifierValue	[PREMIS]	M,NR	Original values should be kept
RELATION: Object/AIP/Intellectual Entity <> Event			Relations between objects and events are recorded both in PREMIS and in METS; Original relations should be kept
linkingEventIdentifier	[PREMIS]	M,R	<i>container</i>
linkingEventIdentifierType	[PREMIS]	M,NR	Default value "KB-event-id"
linkingEventIdentifierValue	[PREMIS]	M,NR	
RELATION: Object/AIP/Intellectual Entity <> Rights			Relations between objects and rights are recorded both in PREMIS and in METS; only for digitized material; Original relations should be kept
linkingRightsStatementIdentifier	[PREMIS]	O,NR	<i>container</i>
linkingRightsStatementIdentifierType	[PREMIS]	M,NR	Default value "local"
linkingRightsStatementIdentifierValue	[PREMIS]	M,NR	

ENTITY: Object/file

attributes per entity	description	O / R	restrictions/remarks
ENTITY: Object/file	[PREMIS]		
objectIdentifier	[PREMIS]	M,NR	<i>container</i>
objectIdentifierType	[PREMIS]	M,NR	Values in use: - local
objectIdentifierValue	[PREMIS]	M,NR	Must be unique in system; Original values should be kept
object Characteristics	[PREMIS]	M,NR	<i>container</i>
compositionLevel	[PREMIS]	M,NR	Values in use: - 0
fixity	[PREMIS]	M,R	<i>container</i>
messageDigestAlgorithm	[PREMIS]	M,NR	values in use: - MD5 - SHA512
messageDigest	[PREMIS]	M,NR	
messageDigestOriginator	[PREMIS]	O,NR	
size	[PREMIS]	M,NR	
format	[PREMIS]	M,R	<i>container</i>
formatDesignation	[PREMIS]	M,NR	<i>container</i>
formatName	[PREMIS]	M,NR	Value according to controlled vocabulary
formatVersion	[PREMIS]	O,NR	Value according to controlled vocabulary
formatRegistry	[PREMIS]	O,NR	<i>container</i>
formatRegistryName	[PREMIS]	M,NR	Value according to controlled vocabulary
formatRegistryKey	[PREMIS]	M,NR	Value according to controlled vocabulary
formatNote	[PREMIS]	O,NR	
objectCharacteristicsExtension	[PREMIS]	O,NR	<i>container</i>
kbmd:supplied-mimetype	Supplied mimetype	M,NR	By producer supplied mimetype ; Original values should be kept
kbmd:content-disposition	By producer supplied content- disposition	O,NR	By producer supplied content-disposition for downloaded Files; Original values should be kept

attributes per entity	description	O / R	restrictions/remarks
kbmd:content-type	By producer supplied content-type	O,NR	By producer supplied content-type for downloaded Files ; Original values should be kept
kbmd:derived-filename	Derived filename	M,NR	By KB derived filename for downloaded Files ; Original values should be kept
kbmd:downloadURL	URL where File can be downloaded	M,NR	By producer given URL where File can be downloaded ; Original values should be kept
originalName	[PREMIS]		Original values should be kept
<i>format dependent technical metadata</i>			KB uses NISOIMG/MIX for master images in JP2 but we also like to use other more specific format dependent metadata standards like documentMD and/or textMD
mix	[NISOIMG]	O,NR	Only for digitized material specific technical metadata is recorded in NISOIMG/MIX for master images in JP2 ; <i>container</i>
BasicDigitalObjectInformation	[NISOIMG]	M,NR	<i>container</i>
ObjectIdentifier	[NISOIMG]	M,NR	<i>container</i>
objectIdentifierType	[NISOIMG]	M,NR	Default value 'URN'
objectIdentifierValue	[NISOIMG]	M,NR	Must be unique in system; Original values should be kept
byteOrder	[NISOIMG]	M,NR	Default value "big endian"
Compression	[NISOIMG]	M,NR	<i>container</i>
compressionScheme	[NISOIMG]	M,NR	Default value "JPEG 2000 Lossless (reversible 5-3 wavelet filter)"
compressionSchemeLocalList	[NISOIMG]	MA,NR	
compressionSchemeLocalValue	[NISOIMG]	MA,NR	
BasicImageInformation	[NISOIMG]	M,NR	<i>container</i>
BasicImageCharacteristics	[NISOIMG]	M,NR	<i>container</i>
imageWidth	[NISOIMG]	M,NR	
imageHeight	[NISOIMG]	M,NR	
PhotometricInterpretation	[NISOIMG]	M,NR	<i>container</i>
colorSpace	[NISOIMG]	M,NR	
ColorProfile	[NISOIMG]	MA,NR	<i>container</i>
IccProfile	[NISOIMG]	MA,NR	<i>container</i>
iccProfileName	[NISOIMG]	MA,NR	
iccProfileVersion	[NISOIMG]	MA,NR	
iccProfileURI	[NISOIMG]	MA,NR	
LocalProfile	[NISOIMG]	MA,NR	<i>container</i>
localProfileName	[NISOIMG]	MA,NR	
localProfileURL	[NISOIMG]	MA,NR	
YcbCr	[NISOIMG]	MA,NR	<i>container</i>
yCbCrSubSampling	[NISOIMG]	MA,NR	<i>container</i>
yCbCrPositioning	[NISOIMG]	MA,NR	
yCbCrCoefficients	[NISOIMG]	MA,NR	<i>container</i>
ReferenceBlackWhite	[NISOIMG]	MA,NR	<i>container</i>
SpecialFormatCharacteristics	[NISOIMG]	MA,NR	<i>container</i>
JPEG2000	[NISOIMG]	MA,NR	<i>container</i>
EncodingOptions	[NISOIMG]	MA,NR	<i>container</i>
Tiles	[NISOIMG]	MA,NR	<i>container</i>
tileWidth	[NISOIMG]	MA,NR	
tileHeight	[NISOIMG]	MA,NR	

attributes per entity	description	O / R	restrictions/remarks
qualityLayers	[NISOIMG]	MA,NR	
resolutionLevels	[NISOIMG]	MA,NR	
MrSID	[NISOIMG]	MA,NR	
zoomLevels	[NISOIMG]	MA,NR	
Djvu	[NISOIMG]	MA,NR	
djvuFormat	[NISOIMG]	MA,NR	
ImageCaptureMetadata	[NISOIMG]	M,NR	<i>container</i>
SourceInformation	[NISOIMG]	M,NR	<i>container</i>
sourceType	[NISOIMG]	M,NR	Values in use: - newspaper - journal - book - microfilm
SourceID	[NISOIMG]	M,NR	<i>container</i>
sourceIDType	[NISOIMG]	M,NR	Default value 'URN'
sourceIDValue	[NISOIMG]	M,NR	Original value should be kept
GeneralCaptureInformation	[NISOIMG]	M,NR	<i>container</i>
dateTimeCreated	[NISOIMG]	M,NR	
imageProducer	[NISOIMG]	M,NR	
ScannerCapture	[NISOIMG]	MA,NR	<i>container</i>
scannerManufacturer	[NISOIMG]	M,NR	
ScannerModel	[NISOIMG]	M,NR	<i>container</i>
scannerModelName	[NISOIMG]	M,NR	
scannerModelNumber	[NISOIMG]	M,NR	
scannerSensor	[NISOIMG]	M,NR	
ScanningSystemSoftware	[NISOIMG]	M,NR	<i>container</i>
scanningSoftwareName	[NISOIMG]	M,NR	
scanningSoftwareVersionNo	[NISOIMG]	M,NR	
DigitalCameraCapture	[NISOIMG]	MA,NR	<i>container</i>
digitalCameraManufacturer	[NISOIMG]	M,NR	
DigitalCameraModel	[NISOIMG]	M,NR	<i>container</i>
digitalCameraModelName	[NISOIMG]	M,NR	
digitalCameraModelNumber	[NISOIMG]	M,NR	
digitalCameraModelSerialNo	[NISOIMG]	M,NR	
cameraSensor	[NISOIMG]	M,NR	
orientation	[NISOIMG]	M,NR	Default value 'normal'
ImageAssessmentMetadata	[NISOIMG]	M,NR	<i>container</i>
SpatialMetrics	[NISOIMG]	M,NR	<i>container</i>
samplingFrequencyPlane	[NISOIMG]	M,NR	
samplingFrequencyUnit	[NISOIMG]	M,NR	
xSamplingFrequency	[NISOIMG]	M,NR	<i>container</i>
ySamplingFrequency	[NISOIMG]	M,NR	<i>container</i>
ImageColorEncoding	[NISOIMG]	M,NR	<i>container</i>
BitsPerSample	[NISOIMG]	M,NR	<i>container</i>
bitsPerSampleValue	[NISOIMG]	M,NR	
bitsPerSampleUnit	[NISOIMG]	M,NR	
samplesPerPixel	[NISOIMG]	M,NR	
extraSamples	[NISOIMG]	MA,NR	
Colormap	[NISOIMG]	MA,NR	<i>container</i>
colormapReference	[NISOIMG]	MA,NR	
TargetData	[NISOIMG]	M,NR	<i>container</i>
targetType	[NISOIMG]	M,NR	

attributes per entity	description	O / R	restrictions/remarks
TargetID	[NISOIMG]	M,R	<i>container</i>
targetManufacturer	[NISOIMG]	M,NR	
targetName	[NISOIMG]	M,NR	
targetNo	[NISOIMG]	M,NR	
targetMedia	[NISOIMG]	M,NR	
externalTarget	[NISOIMG]	M,R	
ChangeHistory	[NISOIMG]	M,NR	<i>container</i>
ImageProcessing	[NISOIMG]	MA,NR	<i>container</i>
dateTimeProcessed	[NISOIMG]	MA,NR	
sourceData	[NISOIMG]	MA,NR	
processingAgency	[NISOIMG]	M,NR	
processingRationale	[NISOIMG]	M,NR	
ProcessingSoftware	[NISOIMG]	M,NR	<i>container</i>
processingSoftwareName	[NISOIMG]	M,NR	
processingSoftwareVersion	[NISOIMG]	M,NR	
processingOperatingSystemName	[NISOIMG]	M,NR	
processingOperatingSystemVersion	[NISOIMG]	M,NR	
processingActions	[NISOIMG]	M,NR	
PreviousImageMetadata	[NISOIMG]	MA,NR	
RELATION: Object/file <> Object/file	[METS] [PREMIS]		Original relations between objects in structural metadata should be kept
file section	[METS]	M,NR	<i>container</i>
file group	[METS]	M,R	<i>container</i>
use	[METS]	M,NR	Values in use for born digital material - main files - metadata files - XML reference files - additional files - other files Values in use for digitized material - master images - access images - fulltext ocr files - ALTO files - PDF files Original values should be kept
file	[METS]	M,R	<i>container</i>
id	[METS]	M,NR	
admid	[METS]	M,NR	References to technical metadata and events
checksumtype	[METS]	O,NR	Only used for digitized materials SIP
checksum	[METS]	O,NR	Only used for digitized materials SIP
mimetype	[METS]	O,NR	Only used for digitized materials SIP
size	[METS]	O,NR	Only used for digitized materials SIP
file location	[METS]	M,NR	
structural map section for most born digital Publications (simple logical structural map)			
structural map section	[METS]	M,R	<i>container</i>
type	[METS]	M,NR	Values in use: - logical
division type=informationPackage	[METS]	M,NR	<i>container</i>
admid	[METS]	M,NR	References to events and technical metadata
division type=publication	[METS]	M,NR	<i>container</i>

attributes per entity	description	O / R	restrictions/remarks
dmdid	[METS]	M,NR	References to descriptive metadata section(s)
admid	[METS]	M,NR	References to rights metadata section
file pointer	[METS]	M,R	References to Files in file section
division type=original metadata	[METS]	M,NR	<i>container</i>
file pointer	[METS]	M,R	References to Files in file section
<i>structural map section for more complex born digital Publications / logical structure</i>			
structural map section	[METS]	M,R	<i>container</i>
type	[METS]	M,NR	Values in use: - logical
division type=informationPackage	[METS]	M,NR	<i>container</i>
admid	[METS]	M,NR	References to events and technical metadata
division type=publication	[METS]	M,NR	<i>container</i>
dmdid	[METS]	M,NR	References to descriptive metadata section(s)
admid	[METS]	M,NR	References to rights metadata section
division type=article	[METS]	M,NR	<i>container</i>
division type=representation	[METS]	M,R	<i>container ; to structure different types of representations</i>
label=print/download version plain-text version full-text version	[METS]	M,NR	
file pointer	[METS]	M,R	References to Files in file section
division type=additional materials	[METS]	O,NR	<i>container</i>
file pointer	[METS]	M,R	References to Files in file section
division type=original metadata	[METS]	M,NR	<i>container</i>
file pointer	[METS]	M,R	References to Files in file section
<i>structural map section for digitized materials / physical structure</i>			
structural map section	[METS]	M,R	<i>container</i>
type	[METS]	M,NR	Values in use: - physical
division type=book issue	[METS]	M,NR	<i>container</i>
admid	[METS]	M,NR	References to technical metadata, rights metadata and source metadata
dmdid	[METS]	M,NR	Reference to descriptive metadata section
file pointer	[METS]	M,NR	References to PDF file per book or issue in file section
division type=page	[METS]	M,R	<i>container</i>
id	[METS]	M,NR	Unique identifier for page in METS file
label	[METS]	M,NR	Type of page, values in use: - single - double - foldout
order	[METS]	M,NR	
orderlabel	[METS]	M,NR	
file pointer	[METS]	M,NR	References to Files per page in file section: - master images - access images - ALTO files - fulltext ocr files (if present per page)

attributes per entity	description	O / R	restrictions/remarks
<i>structural map section for digitized materials / logical structure</i>			Logical structure for digitized material is only recorded for newspapers and journals with article segmentation in METS/ALTO.
structural map section	[METS]	M,R	<i>container</i>
type	[METS]	M,NR	Values in use: - logical
division type=issue	[METS]	M,NR	<i>container</i>
admid	[METS]	M,NR	References to technical metadata, rights metadata and source metadata
dmdid	[METS]	M,NR	Reference to descriptive metadata section
division type=article: *	[METS]	M,R	<i>container</i> ; specific recorded article types are: - article: artikel - article: illustratie met onderschrift - article: advertentie - article: familiebericht - article: inhoudsopgave - article: register - article: colofon - article: omslag
label	[METS]	M,NR	Title of the article
dmdid	[METS]	O,NR	Reference to descriptive metadata section of the article
file pointer	[METS]	M,NR	First file pointer references to fulltext ocr file per article in file section
file pointer	[METS]	M,NR	<i>container</i> ; Second file pointer holds information about area(s) which references to TextBlock(s) and/or ComposedBlock(s) in ALTO file(s) in file section
sequence of files	[METS]	M,NR	<i>container</i>
area	[METS]	M,R	<i>container</i> ; holds information about references to TextBlock(s) and/or ComposedBlock(s) in ALTO file(s) in file section
begin	[METS]	M,R	Holds values for TextBlock or ComposedBlock with betype=IDREF in ALTO file in file section
<i>RELATION: Object/file <> Event</i>	[PREMIS]		Relations between objects and events are recorded both in PREMIS and in METS; Original relations should be kept
linkingEventIdentifier	[PREMIS]	O,R	<i>container</i>
linkingEventIdentifierType	[PREMIS]	M,NR	Default value "KB-event-id"
linkingEventIdentifierValue	[PREMIS]	M,NR	

ENTITY: Event

attributes per entity	description	O / R	restrictions/remarks
<i>ENTITY: Event</i>	[PREMIS]		
eventIdentifier	[PREMIS]	M,NR	<i>container</i>
eventIdentifierType	[PREMIS]	M,NR	Default value "KB-event-id"
eventIdentifierValue	[PREMIS]	M,NR	

attributes per entity	description	O / R	restrictions/remarks
eventType	[PREMIS]	M,NR	Values in use: - message digest calculation - normalization - SIP creation - capture - format identification - validation - filename change - creation Original values should be kept; Most values according to http://id.loc.gov/vocabulary/preservation/eventType
eventDateTime	[PREMIS]	M,NR	Datetimestamp according to ISO 8601: yyyy-mm-ddThh:mm:ss.nnnnnn+ -hh:mm; Original values should be kept
eventDetail	[PREMIS]	O,NR	Value according to controlled vocabulary or pattern; Original values should be kept
eventOutcomeInformation	[PREMIS]	O,NR	<i>container</i>
eventOutcome	[PREMIS]	O,NR	Value according to controlled vocabulary; Original values should be kept
eventOutcomeDetail	[PREMIS]	M,NR	<i>container</i>
eventOutcomeDetailExtension	[PREMIS]	M,NR	<i>container</i> Extension for embedding semantic units defined outside of PREMIS, like complete output from tools like epubcheck; Original values should be kept
RELATION: Event <> Agent	[PREMIS]		Relations between events and Agents are recorded both in PREMIS and in METS; Original relations should be kept
linkingAgentIdentifier	[PREMIS]	M,R	<i>container</i>
linkingAgentIdentifierType	[PREMIS]	M,NR	Default value "KB-agent-id"
linkingAgentIdentifierValue	[PREMIS]	M,NR	Identifier according to KB agent registry
linkingAgentRole	[PREMIS]	M,NR	Values in use - executing program - supplier KB prefers to use values according to http://id.loc.gov/vocabulary/preservation/rightsRelatedAgentRole
RELATION: Event <> Object	[PREMIS]		Relations between events and objects (both type AIP and file) are recorded both in PREMIS and in METS; Original relations should be kept
linkingObjectIdentifier	[PREMIS]	M,NR	<i>container</i>
linkingObjectIdentifierType	[PREMIS]	M,NR	Default value "local"
linkingObjectIdentifierValue	[PREMIS]	M,NR	

ENTITY: Agent

attributes per entity	description	O / R	restrictions/remarks
ENTITY: Agent	[PREMIS]		
agentIdentifier	[PREMIS]	M,R	<i>container</i>
agentIdentifierType	[PREMIS]	M,NR	Default value "KB-agent-id" but also a deprecated identifier type "KB-owner-id" is still in use
agentIdentifierValue	[PREMIS]	M,NR	Identifier according to KB agent registry
agentName	[PREMIS]	M,NR	Normalized name according to KB agent registry

attributes per entity	description	O / R	restrictions/remarks
agentType	[METS]	M,NR	values according to METS enumeration in use: - ORGANIZATION
	[PREMIS]	M,NR	values according to http://id.loc.gov/vocabulary/preservation/agentType in use: - organization - software
agentNote	[PREMIS]	O,R	
agentAlternativeName	Alternative name of an Agent	O,R	Recorded in KB agent registry
agentAlternativeIdentifier	Alternative identifier of an Agent	O,R	Recorded in KB agent registry
agentAlternativeIdentifierType	Type of alternative identifier of an Agent	M,NR	Recorded in KB agent registry
agentAlternativeIdentifierValue	Value of alternative identifier of an Agent	M,NR	Recorded in KB agent registry
agentPeriodofActivity	Period of activity of an Agent	O,NR	Period of activity of an Agent, most used for organizations ; Recorded in KB agent registry
relatedAgent	Related Agent	O,R	<i>container</i> ; Recorded in KB agent registry
relatedAgentIdentifier	Identifier of the related Agent	M,NR	<i>container</i> ; Recorded in KB agent registry
relatedAgentIdentifierType	Type of identifier of the related Agent	M,NR	Default value "KB-agent-id"; Recorded in KB agent registry
relatedAgentIdentifierValue	Value of the identifier of the related Agent	M,NR	Recorded in KB agent registry
relatedAgentName	Normalized name of the related Agent	M,NR	Normalized name according to KB agent registry
relationshipType	Type of relation between Agents	M,NR	Relationship according to controlled vocabulary RDA RELATIONSHIP DESIGNATORS http://access.rdatoolkit.org/document.php?id=rdaappk ; Recorded in KB agent registry
agentLocation	Location associated with Agent	O,NR	Recorded in KB agent registry
agentLocationPlace	Place of Agent	O,NR	Recorded in KB agent registry
agentLocationCountry	Country of Agent	O,NR	Recorded in KB agent registry

attributes per entity	description	O / R	restrictions/remarks
agentAnnotation	Any remarks about Agent	O,NR	Recorded in KB agent registry
agentUse	Use of agentName in particular services	O,R	Recorded in KB agent registry
RELATION: Agent <> Event	[PREMIS]		Relations between Agents and events are recorded both in PREMIS and in METS; Original relations should be kept
linkingEventIdentifier	[PREMIS]	M,R	<i>container</i>
linkingEventIdentifierType	[PREMIS]	M,NR	Default value "KB-event-id"
linkingEventIdentifierValue	[PREMIS]	M,NR	

ENTITY: Intellectual Entity/Publication

attributes per entity	description	O / R	restrictions/remarks
Descriptive metadata - MODS			
titleInfo	[MODS]	O,R	KB records different types of titles, like abbreviated, translated, alternative, uniform and uses a displayLabel to record specific information about the type of title; It's also possible to indicate if a title didn't come from the resource itself
nonSort	[MODS]	O,NR	
title	[MODS]	M,NR	
subtitle	[MODS]	O,R	
partNumber	[MODS]	O,NR	
partName	[MODS]	O,NR	
name	[MODS]	O,R	KB records both personal and corporate names
namePart	[MODS]	O,R	If possible KB distinguishes family name and given name
nameIdentifier	[MODS]	O,R	Contains nameIdentifiers like ISNI and ORCID
displayForm	[MODS]	O,NR	
role	[MODS]	O,R	
roleTerm	[MODS]	M,NR	roleTerm according to http://www.loc.gov/marc/relators/relaterm.html
typeOfResource	[MODS]	M,NR	
genre	[MODS]	O,R	Genre according to - http://www.loc.gov/standards/valuelist/marcgt.html - http://RDVocab.info/termList/RDAContentType - info:eu-repo/semantics
originInfo	[MODS]	O,R	
eventType	[MODS]	M,NR	KB distinguishes different types of origin of the resource, like publication, distribution, manufacture and production; this is recorded in an attribute @eventType
place	[MODS]	O,R	
publisher	[MODS]	O,R	

attributes per entity	description	O / R	restrictions/remarks
dateIssued	[MODS]	M,R	Values according to - marc - w3cdtf - no encoding restrictions Repeatable for journals and newspapers when startdate and enddate are recorded; It's also possible to indicate if a date didn't come from the resource itself
dateCreated	[MODS]	O,R	Values according to - marc - w3cdtf - no encoding restrictions Repeatable for journals and newspapers when startdate and enddate are recorded; It's also possible to indicate if a date didn't come from the resource itself
copyrightDate	[MODS]	O,R	Repeatable for journals and newspapers when startdate and enddate are recorded
issuance	[MODS]	O,NR	
frequency	[MODS]	O,R	Both recorded as a string and values according to http://www.loc.gov/standards/valuelist/marcfrequency.html
edition	[MODS]	O,NR	
language	[MODS]	O,R	
languageTerm	[MODS]	M,NR	Values according to http://id.loc.gov/vocabulary/iso639-2 and rfc3066
abstract	[MODS]	O,R	
note	[MODS]	O,R	Different note types are recorded, like publisher statement, original location, thesis and funding
subject	[MODS]	O,R	Repeatable for every subject entry; Some values according to authority gtt or btr; Subject types like topic, geographic, genre are used.
classification	[MODS]	O,R	Values according to UDC, BCL, NBC, BISACSH
relatedItem	[MODS]	O,R	- type=host: used for description of the journal or newspaper in which an article or issue appears - type=series: used for description of named series of which the resource (ebook) is a part - type=otherFormat: used for description of another format (Physical format) of the resource (ebook) - type= isReferencedBy: published bibliographic descriptions, reviews, abstracts, or indexes of the content of the resource - type=host: used for description of a parent KB collection the resource is part of relatedItem is a container element under which any MODS element may be used as a subelement; KB uses subelements mentioned below
relatedItem /typeOfResource	[MODS]	O,NR	See description of typeOfResource on top-level
relatedItem /titleInfo	[MODS]	M,R	See description of titleInfo on top-level
relatedItem /name	[MODS]	O,R	See description of name on top-level
relatedItem /genre	[MODS]	O,R	See description of genre on top-level
relatedItem /originInfo	[MODS]	O,R	See description of originInfo on top-level
relatedItem /language	[MODS]	O,R	See description of language on top-level
relatedItem /note	[MODS]	O,R	See description of note on top-level

attributes per entity	description	O / R	restrictions/remarks
relatedItem /subject	[MODS]	O,R	See description of subject on top-level
relatedItem /classification	[MODS]	O,R	See description of classification on top-level
relatedItem /identifier	[MODS]	O,R	See description of identifier on top-level
relatedItem /part	[MODS]	O,NR	
relatedItem /part/date	[MODS]	O,NR	Values according to - w3cdtf
relatedItem /part/detail	[MODS]	O,NR	- type=volume - type=issue
relatedItem /part/detail/number	[MODS]	M,NR	
relatedItem /part/detail/title	[MODS]	O,NR	
relatedItem /part/extent	[MODS]	O,NR	
relatedItem /part/text	[MODS]	O,NR	
identifier	[MODS]	M,R	Used types of identifiers - nbn - doi - isbn - ismn - nstc - hdl - uuid - local - issn (for relatedItem journal or newspaper)
recordInfo	[MODS]	M,NR	
recordOrigin	[MODS]	M,NR	
recordContentSource	[MODS]	O,NR	Cataloging Source ; Value according to marcorg
recordCreationDate	[MODS]	O,NR	Date entered on file in catalog ; Encoding according to marc
recordChangeDate	[MODS]	O,NR	Date and Time of Latest Transaction in catalog ; Encoding according to iso8601, yyyymmddhhmmss.f
recordIdentifier	[MODS]	O,NR	Control number in catalog assigned by the organization creating, using, or distributing the record
languageOfCataloging	[MODS]	O,NR	Language of cataloging
languageTerm	[MODS]	M,NR	Value according to iso639-2b
descriptionStandard	[MODS]	O,NR	Description conventions ; Values according to http://www.loc.gov/standards/sourcelist/descriptive-conventions.html
<i>Descriptive metadata - SUPPLIED METADATA</i>			
SUPPLIED METADATA		O,NR	Original metadata supplied with the born digital object from the producer is embedded “as is” in METS descriptive metadata section for (metadata) management and use.
<i>Descriptive metadata - CATALOG RECORD</i>			
CATALOG RECORD		O,NR	For born digital ebooks and journal issues an export of the corresponding catalog record is embedded “as is” in METS descriptive metadata section for (metadata) management and use.

attributes per entity	description	O / R	restrictions/remarks
<i>RELATION: Intellectual Entity/Publication <> related (physical) IE/Publication</i>	[METS] [PREMIS]		For digitized materials only; Relation between IE/Publication and related (physical) IE/Publication is recorded in METS; Original relations should be kept
ADMID	[METS]	O,NR	Relation is recorded from descriptive metadata section with MODS to source metadata section with CATALOG RECORD

ENTITY: related (physical) Intellectual Entity / Publication

attributes per entity	description	O / R	restrictions/remarks
<i>Source metadata - CATALOG RECORD</i>			
CATALOG RECORD		O,NR	For digitized materials an export of the catalog record of the related physical source is embedded "as is" in METS source metadata section for (metadata) management and use.
<i>Source metadata - MDD-EXTRACT</i>			
MDD-EXTRACT		O,NR	For digitized materials some other metadata about the related physical source is embedded in METS source metadata section for (metadata) management and use.
EPN	"Exemplaar ProductieNummer"	M,NR	"Exemplaar ProductieNummer" ; System control number assigned to the holdings part of the catalog record of the related physical source
shelfmark	shelfmark	M,NR	Shelfmark of the related physical source
sourceProvider	sourceprovider	M,NR	Library or institution that owns the related physical source
yearsRangeStart		O,NR	For periodicals only: date of first issue in the related physical source.
yearsRangeEnd		O,NR	For periodicals only: date of last issue in the related physical source.
sequenceNo		M,NR	Number that indicates the order of a physical part in the related physical source
volumeYear		M,NR	For periodicals only: year of the volume the issue is part of

ENTITY: Intellectual Entity / article (for digitized material / newspapers and journals with article segmentation)

attributes per entity	description	O / R	restrictions/remarks
titleInfo	[MODS]	O,R	<i>container</i>
title	[MODS]	M,NR	For articles in digitized materials the article title is now recorded in METS
name	[MODS]	O,R	
displayForm	[MODS]	O,NR	

attributes per entity	description	O / R	restrictions/remarks
genre	[MODS]	M,NR	Default value "article: *" with specific recorded article types for *: - article: artikel - article: illustratie met onderschrift - article: advertentie - article: familiebericht - article: inhoudsopgave - article: register - article: colofon - article: omslag Values are now recorded in METS
identifier	[MODS]	M,NR	For articles in digitized materials the article identifier is now generated when a DIP is published

ENTITY: Rights

attributes per entity	description	O / R	restrictions/remarks
ENTITY: Rights	[PREMIS]		
rightsStatement	[PREMIS]	O,NR	<i>container</i> ; only used for digitized materials
rightsStatementIdentifier	[PREMIS]	M,NR	<i>container</i>
rightsStatementIdentifierType	[PREMIS]	M,NR	Default value 'local'
rightsStatementIdentifierValue	[PREMIS]	M,NR	
rightsBasis	[PREMIS]	M,NR	Values according to http://id.loc.gov/vocabulary/preservation/rightsBasis
copyrightInformation	[PREMIS]	M,NR	<i>container</i>
copyrightStatus	[PREMIS]	M,NR	Values according to http://id.loc.gov/vocabulary/preservation/copyrightStatus
copyrightJurisdiction	[PREMIS]	M,NR	Values according to http://www.iso.org/iso/country_codes
copyrightStatusDeterminationDate	[PREMIS]	M,NR	Datetimestamp according to ISO 8601: yyyy-mm-ddThh:mm:ss.nnnnnn+ -hh:mm; Original values should be kept
rightsExtension	[PREMIS]	O,NR	<i>container</i> ; only used for born digital Publications
availability	Terms of access for Consumers	M,NR	Used values: - free - restricted - noaccess
copyright	Copyright status of the object(s)	O,NR	<i>container</i>
copyrightHolder	Owner of copyright	O,NR	A person or a company who owns any one of the Exclusive Rights of copyright in a work
copyrightYear	The year of a copyright	O,NR	
copyrightStatement	Copyright notice or statement	O,R	Copyright notice or statement, suitable for printing or display

attributes per entity	description	O / R	restrictions/remarks
license	License or other agreement granting permissions related to an object.	O,NR	
licenseIdentifier	Identifier of license	O,NR	A designation used to uniquely identify documentation supporting the specified rights granted by license within the repository system ; KB uses license URI according to https://wiki.creativecommons.org/wiki/License_Properties
licenseStatement	License in textual form	O,NR	Text describing the license or agreement by which permission was granted.
RELATION: Rights <> Agent	[PREMIS]		Relations between rights and Agents are recorded both in PREMIS and in METS; Original relations should be kept
linkingAgentIdentifier	[PREMIS]	O,NR	<i>container</i> ; only recorded for born digital Publications
linkingAgentIdentifierType	[PREMIS]	M,NR	Default value "KB-agent-id"
linkingAgentIdentifierValue	[PREMIS]	M,NR	Identifier according to KB agent registry
linkingAgentRole	[PREMIS]	M,NR	Values in use - rightsHolder - supplier KB prefers to use values according to http://id.loc.gov/vocabulary/preservation/rightsRelatedAgentRole
RELATION: Rights <> Object	[PREMIS]		Relations between rights and objects are recorded both in PREMIS and in METS; Original relations should be kept
linkingObjectIdentifier	[PREMIS]	O,NR	<i>container</i> ; only recorded for digitized materials
linkingObjectIdentifierType	[PREMIS]	M,NR	Default value "local"
linkingObjectIdentifierValue	[PREMIS]	M,NR	

ENTITY: Metadata (METS)

attributes per entity	description	O / R	restrictions/remarks
ENTITY: Metadata	[METS]		
createDate	[METS]	M,NR	Datetimestamp according to ISO 8601: yyyy-mm-ddThh:mm:ss.nnnnnn+ -hh:mm
lastModDate	[METS]	M,NR	Datetimestamp according to ISO 8601: yyyy-mm-ddThh:mm:ss.nnnnnn+ -hh:mm
metsDocumentID	[METS]	M,NR	Original values should be kept
metsDocumentIDType	[METS]	M,NR	values in use: - ID - LOCAL
RELATION: Metadata <> Agent	[METS]	M,R	
role	[METS]	M,NR	values in use according to METS: - CREATOR - IPOWNER
name	[METS]	M,NR	Normalized name according to KB agent registry

attributes per entity	description	O / R	restrictions/remarks
note	[METS]	O,R	Annotation to record any additional information regarding the Agent's activities with respect to the METS document