

Significant Properties Definition (CPP-022)

CPP-Identifier	CPP-022
CPP-Label	Significant Properties Definition
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Date of edition completed	29.08.2025
Change history	Comments
Version 1.0 - 29.08.2025	Milestone version

1. Description of the CPP

The TDA defines significant properties for sets of *Information Objects* (i.e., properties that it commits to preserve over the long term through preservation actions and rendition).

Inputs and outputs

Input(s)	
Documentation / guidance	Significant properties policy from equivalent TDAs
	Community and stakeholders needs
Output(s)	
Documentation / guidance	Significant properties policy for a given <i>Object</i> type
	Significant properties detection method

Definition and scope

Significant properties is a widely-adopted concept in the analog and digital preservation sectors¹ that can be defined as “*essential characteristics of a digital object which must be preserved over time for the digital object to remain accessible and meaningful*”². It acknowledges that digital *Objects* - just like analog *Objects* - are subject to intentional or unintentional changes and that memory organisations should identify which of their properties are significant, and should therefore be preserved by committing efforts and means.

Significant properties are declared for a certain *Object* type, although this categorisation will vary. For example, one organisation can declare significant properties for all its still images, while another will specify different significant properties for digital photographs, graphic design works and screenshots.

Significant properties are generally classified into five top-level categories:

- *Content*: the main signal(s) conveyed by the *Object* (e.g. textual, visual, audiovisual, etc.);
- *Context*: the information documenting the circumstances of creation and history of the *Object*;
- *Appearance*: the visual aspects of the *Object* (e.g. fonts, layouts, colours, etc.);

¹ For a more in-depth presentation of the concept of significant properties, see Montague, Lynne, and Eleonora Nicchiarelli. “The Concept of Significant Properties.” The National Archives, Österreichischen Nationalbibliothek, May 26, 2010. Available at https://www.planets-project.eu/docs/reports/Planets_PC3-D23A_TheConceptOfSignificantProperties.pdf (access on July 2nd, 2025).

² Digital Preservation Coalition, The British Library, JISC, “What to preserve? Significant Properties of Digital Objects”, joint workshop at the British Library Conference Centre, April 7th 2008. Recording available at <https://web.archive.org/web/20100504081357/http://www.dpconline.org/events/significant-properties.html> (accessed on August 21st 2025).

- *Structure*: the organisation of the content (e.g. pages, sections, ordering, etc.)
- *Behaviour*: all features beyond simple displaying (e.g. links, actions, navigation, etc.)

In addition to these categories, significant properties may be qualified by the possibility to be determined in an automated way, or only by manual observation. Significant properties that can be determined in an automated way are called “extractable”. For example, the visual aspect of source and target PDFs can be easily compared by means of tools like [diffpdf](#). On the other hand, those significant properties that only a human action can assess are called “observational”. The step-by-step description below focuses on extractable properties. In cases where observational properties are considered significant by the TDA, it must define a manual determination method that is incorporated in its processes.

Guidance can be provided to memory organisations on which properties of certain *Objects* are generally considered significant, but the final decision of adopting these or is still the responsibility of the TDA. Thus, the definition of significant properties is an institutional policy. Significant properties might even vary within the same organisation from one project to another. For example, the history of changes recorded as XMP internal *Metadata* in field xmpMM:History may be considered crucial for born-digital digital photographs, but negligible for album thumbnails.

The significant properties policy should be produced or at least confirmed by the TDA management, since it will influence the usability that the *Objects* will support. For this reason, significant properties are likely to be more high-level, organisational properties that will need to be mapped to technical extractable properties. For example, for a significant property “audio signal quality”, the technical properties associated will be sampling frequency, bit depth, etc. These properties might change (e.g. if a conversion from audio signal in DSD64 1 bit / 2.8224 MHz is made to PCM 24 bits / 96kHz) but their evolution should be controlled to ensure the audio signal quality is preserved.

In some cases, significant properties will be dictated by stakeholders (e.g. Producer, Consumer, etc.)³. **Community Watch** (CPP-018) must therefore ensure that its significant properties policy is aligned with the needs of its designated community.

³ Cf. the use case “Page Layout as Significant Property of Reflowable EPUBs” below.

Process description

Trigger event(s)

Trigger event	CPP-identifier
A new <i>Object</i> type is planned to be ingested by the TDA	/

Step-by-step description

No	Supplier	Input	Steps	Output	Customer
1	CPP-018 (Community Watch)	Community needs	Study Community needs and derive required <i>Object</i> property	Organisational high-level property	
2		Organisational high-level property	Map the organisational high-level property to one or several concrete extractable property(ies)	Associated concrete extractable property(ies)	
3			Gather a test set of a given <i>Object</i> type	Test set	
4		Associated concrete extractable property(ies)	Select a tool capable of extracting the concrete property(ies)	Extractor tool	
5		Test set	Run the candidate extractor tool on the test set	Candidate extractor tool output	
		Candidate extractor tool			

6		Candidate extractor tool output	Determine whether the significant property is identifiable in the candidate extractor tool output	Significant properties detection method confirmed: extractor tool chosen (step 7)	
				No detection method confirmed (resume steps 4-6)	
7		Chosen extractor tool output	Determine the interpretation of the extractor tool output (path to the property, error tolerance, etc.)	Significant properties detection method: path or expression to extract the significant properties from the tool's output	CPP-009 (Metadata Extraction)

Rationale(s)⁴ and worst case(s)

Rationale	Impact of inaction or failure of the process
If the TDA aims to do semantic / logical preservation, give access to its holdings to end users and create copies out of the original <i>Objects</i> , defining the significant properties of its <i>Objects</i> to be able to assess the success or failure of all preservation and access actions is required.	Without a significant properties policy and methods to detect that they are maintained in any modified preservation or derivative copy, the TDA may produce unnoticed faulty copies or render the <i>Objects</i> incorrectly.

2. Dependencies and relationships with other CPPs

Dependencies

CPP-ID	CPP-Title	Relationship description
CPP-018	Community Watch	The Significant Properties Definition is fundamental to ensure that information and features supported by the <i>Objects</i> are those that the TDA's designated community is expecting.

Other relations

Relation	CPP-ID	CPP-Title	Relationship description
Affinity with	CPP-019	Data Quality Assessment	As Data Quality Assessment identifies quality properties whose value will determine whether the <i>Objects</i> are ingested or not, these quality properties will likely be also considered significant by the TDA.
Affinity with	CPP-016	Metadata Ingest and Management	A TDA defines significant properties for digital <i>Objects</i> . These are then translated to <i>Technical metadata</i> that is ingested. The significant properties definition process also influences

⁴ Term derived from PREMIS.

			which <i>Technical metadata</i> standards are applied.
Required by	CPP-013	Object Management Reporting	To report on the characteristics of <i>Objects</i> for deeper analysis, the significant properties must have been defined in the first place.
Required by	CPP-014	Filemigration	Format migration implies the production of a <i>Representation</i> supposed to act as a preservation copy and must rely on significant properties to determine its success or failure.
Required by	CPP-015	Emulation and Rendering Tools	Rendering should be evaluated based on significant properties. The faulty rendering of an <i>Object</i> because of unsuitable hardware or software may go unnoticed and produce wrong interpretations from the TDA's community.
Required by	CPP-026	File Normalisation	Like Format migration, Normalisation should be evaluated based on significant properties.
Required by	CPP-027	File Repair	Modifying the <i>File's Bitstream</i> in order to correct faulty structures can cause unexpected changes to the rendering and behaviour of an <i>Object</i> . Thus, file repair should also be evaluated based on significant properties.
Required by	CPP-028	Creation of Derivatives	Although derivatives may not be subject to the same requirements as preservation <i>Representations</i> , a TDA might consider providing access through copies that do not convey significant properties as a failure.

3. Links to frameworks

Certification

Certification framework	Term used in framework to refer to the CPP	Section
CTS Link	Compar[ing] the essential properties	R07 Provenance and Authenticity/

Nestor Seal Link	Identification and documentation of significant properties	C13 Significant properties
ISO 16363 Link	Identification of transformational information properties	4.1.1 “The repository shall identify the Content Information and associated Preservation Objectives and the Transformational Information Properties that the repository will preserve.”

Other frameworks and reference documents

Reference Document	Term used in framework to refer to the process	Section
OAIS Link	Transformational information properties	5.2.4.5 “Transformation” and 5.3.4.2 Preservation of Access and Use Services
PREMIS Link	Significant properties	<i>significantProperties</i> semantic unit p. 50.

4. Reference implementations

Example use case(s)

Page Layout as Significant Property of Reflowable EPUBs

Institutional Background	
Institution	Ebooks publishers / digital books service provider
Hyperlink	/
Description	
Trigger event	Users of reflowable EPUBs may change their visual aspect by zooming or switching to another font.
Problem statement	In 2009-2010, French publishers were implementing workflows to produce digital books. Initially, they were concerned by the users’ ability to change the digital books’ visual aspect and page layout. They were tempted to use exclusively the EPUB 3 fixed-layout format to prevent users from doing so.
Proposed solution	An EPUB production service provider had to convince publishers of the benefits of reflowable EPUBs. The publishers had to

	<p>accept that reflowable ebooks' visual aspect and page layout were not significant.</p> <p>In this example, a stakeholder - a service provider, followed by an industry sector - determined explicitly that a property of a specific <i>Object</i> (digital books in reflowable EPUB format) should not be considered significant. TDAs should then acknowledge this and make no attempt at preserving this property.</p>
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Publicly available documentation

Institution	Organisation type	Language	Hyperlink
TIB – Leibniz Information Centre for Science and Technology and University Library, Germany	National library	English	https://wiki.tib.eu/confluence/spaces/lza/pages/93608961/Significant+Properties
	Non-commercial digital preservation service		
	Research infrastructure		
	Research performing organisation		
CSC – IT Center for Science Ltd., Finland	Non-commercial digital preservation service	English	https://urn.fi/urn:nbn:fi-fe2025040925236 (section 6.2.1)
Bibliothèque nationale de France, France	National library	French	https://bnf.hal.science/hal-03374030v2 (sections titled “Propriétés...”)
National Archives and Records Administration, USA	National archive	English	https://github.com/usnationalarchives/digital-preservation/tree/master/Digital_Preservation_Record_Categories