



ASSESSMENT SUMMARY v2.0.0

Extensible Stylesheet Language Transformations (XSLT)¹

World Wide Web Consortium (W3C)²

¹ XHTML Specification: <https://www.w3.org/TR/xslt-30/>

² W3C organisation: <https://www.w3.org>

Change Control

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1. INTRODUCTION

The present document is a summary of the assessment of the **XSLT** carried out by CAMSS using the CAMSS Assessment EIF scenario³. The purpose of this scenario is to assess the compliance of a standard or specification with the European Interoperability Framework (EIF)⁴.

2. ASSESSMENT SUMMARY

The Extensible Stylesheet Language Transformations (XSLT) is a language originally designed for transforming XML documents into other XML documents, or other formats such as HTML for web pages, plain text, or XSL Formatting Objects. These formats can be subsequently converted to formats such as PDF, PostScript, and PNG. Support for JSON and plain-text transformation was added in later updates to the XSLT 1.0 specification.

XSLT 3.0 implementations support a variety of programming languages including Java, .NET, C/C++, Python, PHP, and NodeJS. Additionally, an XSLT 3.0 JavaScript library can be hosted within web browsers, which also include native support for XSLT 1.0. The XSLT document transformation defines how to convert an XML document into a new format, typically XML, but also other formats like plain text. While XML files are the most common input, any source from which the processor can create an XQuery and XPath Data Model, such as relational database tables or geographic information systems, can be used.

The specification has been developed by World Wide Web Consortium (W3C), which is an international community concerned with evolving the World Wide Web by developing protocols and guidelines to ensure and enhance its growth.

2.1. EIF Interoperability Principles

The specification fully supports the principles setting context for EU actions on interoperability:

- **Subsidiarity and proportionality**

XSLT is included in 6 national catalogues, this Member States are: Cyprus, France, Germany, Greece, Poland, Portugal and Sweden. They belong to Member States which are aligned with at least 3 out of 4 scoreboards of the EIF Monitoring according to the National Interoperability Framework Observatory (NIFO⁵) factsheets.

³ CAMSS Assessment EIF Scenario: <https://ec.europa.eu/eusurvey/runner/CAMSSAssessmentEIFScenario6>

⁴ Isa2 programme website: https://ec.europa.eu/isa2/eif_en

⁵ National Interoperability Framework Observatory Factsheets:

<https://interoperable-europe.ec.europa.eu/collection/nifo-national-interoperability-framework-observatory/digital-public-administration-factsheets-2024>

The specification supports the principles setting context for EU actions on interoperability:

- **Openness**

XSLT is a specification developed by W3C. It follows a public availability approval process and is supported by royalty-free licences. XSLT is widely used for digital solutions and services, with extensive features and compatibility with formats like HTML⁶, PDF⁷, and JSON⁸. It demonstrates market acceptance through rigorous testing and is known for its interoperability with standards such as XPath⁹ and XDM¹⁰. Real-world use cases include tasks like EFT/EDI transformations, where it processes large XML datasets for tasks like grouping, sorting, and calculations.

- **Transparency**

XSLT specification enhances the visibility of administrative procedures, rules, data, and services by enabling the transformation of XML data into various formats. Its support for multiple output formats and JSON handling makes it a valuable tool for presenting information in an accessible manner. For instance, XSLT can transform administrative data into JSON, making it easier to use in web applications and APIs. This capability is particularly useful for building user-friendly interfaces.

- **Reusability**

XSLT specification is a language designed for transforming XML data. This functionality is applicable to any domain that uses XML as a data representation, generating different output formats for different use cases.

- **Technological neutrality and data portability**

XSLT specification is technology-agnostic, focusing on data transformation and manipulation without being tied to any specific platform. It supports a range of implementations, from basic functionality to full-featured versions, allowing flexibility for developers. XSLT also includes extension capabilities to maintain interoperability.

The addition of JSON processing is particularly important, as it enhances data portability by enabling direct transformation between XML and JSON, a widely used data exchange format, across different environments.

⁶HTML: <https://html.spec.whatwg.org/multipage/>

⁷PDF: <https://pdfa.org/resource/iso-32000-2/>

⁸JSON: <https://www.rfc-editor.org/rfc/rfc8259.html>

⁹xPath: <https://www.w3.org/TR/xpath-31/>

¹⁰XDM: <https://www.w3.org/1999/09/xml/xdm>

The specification partially supports the principles related to generic user needs and expectations:

- **User-centricity**

XSLT is a language for transforming XML documents offering various features that allows the reuse of the information when needed, consequently it can be concluded that through this features it promotes the once-only principle.

- **Inclusion and accessibility**

The purpose of XSLT is not related to e-accessibility. Therefore this criterion is considered not applicable specification.

- **Privacy**

The XSLT specification does not provide mechanisms for restricting access to information or data, nor does it directly address the protection of personal data or privacy concerns. As a result, these criteria are considered not applicable to the specification.

- **Security**

The "xsl:evaluate" feature in XSLT lets you dynamically evaluate XPath expressions, offering more flexibility. However, to keep things secure, it's important to check and clean the input expressions, only allow dynamic evaluation from trusted sources, and set up the processor to block unsafe actions. This helps prevent risks like code injection attacks. Security can be achieved by integrating it with other technologies, such as XML Signature¹¹, to digitally sign XML data and ensure its integrity and authenticity.

Digital Signature Service¹² project, aimed at providing implementation of the standards for Advanced Electronic Signature creation, augmentation and validation in line with European legislation and the eIDAS Regulation in particular.

- **Multilingualism**

XSLT include facilities for adapting the output of a transformation to meet local expectations: examples include the formatting of numbers and dates, and the choice of collations for sorted output.

The specification partially supports the foundation principles for cooperation among public administrations:

- **Administrative Simplification**

By transforming XML data, XSLT allows the interoperability between different systems. In European public services, where diverse systems and data formats are common, XSLT helps

¹¹XML Signature: <https://www.w3.org/TR/xmlsig-core1/>

¹²Digital Signature Service:

convert data between formats, ensuring smooth information exchange. For example, it is used in the European Single Procurement Document (ESPD)¹³ to transform documents into formats like PDF or HTML, making them accessible across various platforms and devices.

- **Preservation of information**

The purpose of XSLT is not related to the long-term preservation of electronic records and other kinds of information. Therefore, this criterion is not applicable to the specification.

Assessment of effectiveness and efficiency

XSLT specification includes several mechanisms for assessing its effectiveness and efficiency, primarily through testing and implementation reports. There are document of the European Commission assessing the suitability of XSLT specification, such as the Digital Signature Service¹⁴.

2.2. EIF Interoperability Layers

The interoperability model which is applicable to all digital public services includes:

- Four layers of interoperability: legal, organisational, semantic and technical;
- A cross-cutting component of the four layers, 'integrated public service governance';
- A background layer, 'interoperability governance'.

The Specification supports the implementation of digital public services complying with the EIF interoperability model:

- **Interoperability governance**

XHTML can be mapped to the EIRA Library of Interoperability Specifications (ELIS)¹⁵ in the "Data Mapping", "Data Mapping Catalogue", "Metadata Catalogue" and "Software Components Catalogue" under the Semantic View.

A test suite¹⁶ for XSLT, containing over 11,000 test cases, is available. The metadata for each test case describes any dependencies on optional or implementation-defined features of the specification, and provides expected results for each test.

¹³European Single Procurement Document (ESPD): <https://github.com/OP-TED/ESPD-EDM>

¹⁴Digital Signature Service: https://ec.europa.eu/cefdigital/DSS/webapp-demo/doc/dss-documentation.html#_xades_profiles

¹⁵ EIRA Library of Interoperability Specifications (ELIS): <https://joinup.ec.europa.eu/collection/common-assessment-method-standards-and-specifications-camss/solution/elis/release/v610>

¹⁶ Test Suite Page: <https://dvcs.w3.org/hg/xslt30-test/>

At least 7 Member States recommends the use of XSLT specification, this Member States are: Cyprus, France¹⁷, Germany, Greece, Poland, Portugal and Sweden¹⁸.

Several projects, such as "A Prototype Cross-Border GML Data Service¹⁹", have created opportunities for integrating cross-border spatial data services using Geography Mark-up Language (GML) and XSLT for schema transformations. The INSPIRE²⁰ Directive, part of the EU's cross-border initiative supported by the ISA programme, is being implemented by EU Member States. These projects involve the use of XSLT in each member state to facilitate the integration and exchange of spatial data across borders.

- **Legal Interoperability**

XSLT, developed by the W3C, is not classified as a European Standard but is widely used across European Union Member States for web and data interoperability.

- **Organisational interoperability**

XSLT specification does not address or provide insights into the modelling of business processes, nor does it facilitate organizational interoperability agreements. Therefore, this criterion is not applicable to the specification.

- **Semantic Interoperability**

XSLT has an open community²¹ where stakeholders can participate in discussions and contribute to the evolution of the standard. Community engagement can foster the sharing of best practices, use cases, and insights related to the implementation of XSLT.

¹⁷ National Catalogue of France:

https://www.numerique.gouv.fr/uploads/Referentiel_General_Interoperabilite_V2.pdf

¹⁸ National Catalogue of Sweden:

https://www.avropa.se/globalassets/dokument/open-it-standards.pdf?t_id=1B2M2Y8AsgTpgAmY7PhCfg%3d%3d&t_q=standards&t_tags=language%3asv%2csiteid%3a95d515a5-23ca-47bf-87a9-

¹⁹ A Prototype Cross-Border GML Data Service:

<https://www.isprs.org/proceedings/XXXV/congress/comm4/papers/338.pdf>

²⁰ Infrastructure for Spatial Information in Europe:

https://ies-svn.jrc.ec.europa.eu/projects/registry-development/wiki/Re3gistry_1_0_documentation#_cp3

²¹ XQuery and XSLT Extensions Community Group: <https://www.w3.org/groups/cg/xslt-40/>

3. ASSESSMENT RESULTS

This section presents an overview of the results of the CAMSS assessments for **XSLT**. The CAMSS “Strength” indicator measures the reliability of the assessment by calculating the number of answered (applicable) criteria. On the other hand, the number of favourable answers and the number of unfavourable ones is used to calculate the “Automated Score” per category and an “Overall Score”.

Category	Automated Score	Assessment Strength	Compliance Level
EIF Principle setting the context for EU actions on interoperability	100/100 (100%)	100%	Seamless
Core interoperability principles	1640/1700 (96%)	100%	Seamless
Principles related to generic user needs and expectations	1040/1200 (87%)	100%	Seamless
Foundation principles for cooperation among public administrations	420/500 (84%)	100%	Seamless
Interoperability layers*	920/1000 (92%)	100%	Seamless
Overall Score	3020/3400 (89%) ²²	100%	

**The technical interoperability layer is covered by the criteria corresponding to the core interoperability principle "Openness".*

With an 100% of assessment strength, this assessment can be considered representative of the specification compliance with the EIF principles and recommendations.

The Overall Automated Score of 89% (3020/3400) demonstrates that the specification supports the European Interoperability Framework in the domains where it applies.

²² See the “results interpretation” section of the CAMSS Assessment EIF Scenario Quick User Guide:

<https://joinup.ec.europa.eu/collection/common-assessment-method-standards-and-specifications-camss/solution/camss-assessment-eif-scenario/results-visualisation-and-interpretation>