



# ASSESSMENT SUMMARY v1.0.0

Extensible Forms Description Language (XFDL)<sup>1</sup>

World Wide Web Consortium (W3C)<sup>2</sup>

---

<sup>1</sup> XFDL specification: <https://www.w3.org/TR/NOTE-XFDL>

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

# Change Control

Modification		Details	
Version 1.0.0			
Initial version			

TABLE OF CONTENT

1. INTRODUCTION..... 4

2. ASSESSMENT SUMMARY ..... 4

2.1. EIF Interoperability Principles.....4

2.2. EIF Interoperability Layers .....8

3. ASSESSMENT RESULTS ..... 10

## 1. INTRODUCTION

The present document is a summary of the assessment of the **XFDL** carried out by CAMSS using the CAMSS Assessment EIF scenario<sup>3</sup>. The purpose of this scenario is to assess the compliance of a standard or specification with the European Interoperability Framework (EIF)<sup>4</sup>.

## 2. ASSESSMENT SUMMARY

The purpose of XFDL is to solve the set of problems associated with the digital representation of complex forms such as those found in business and public administration.

Moreover, the XFDL specification promotes interoperability through its use of the XML standard. However, although XFDL can promote interoperability, it is nowadays used in some niche software. In this sense, there are other technologies and specifications that are used instead of it, such as HTML5 or PDF.

Finally, this specification has its origins in the Universal Forms Description Language (UFDL)<sup>5</sup> specification. This initial specification was developed from 1993 to 1998 by the UWI.Com organisation<sup>6</sup>. In this context, the XFDL was developed by the W3C organisation, and it is the result of developing an XML syntax for the UFDL specification.

### 2.1. EIF Interoperability Principles

Interoperability principles are fundamental behavioural aspects that drive interoperability actions. They are relevant to the process of establishing interoperable European public services. They describe the context in which European public services are designed and implemented.

***The specification does not supports the principles setting context for EU actions on interoperability:***

- **Subsidiarity and proportionality**

Extensible Forms Description Language is not included in any national catalogue of recommended specifications whose Member State NIF has a high performance on interoperability according to NIFO factsheets.

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

- **Openness**

The World Wide Web Consortium (W3C) has a clear and publicly available process for developing and approving specifications as recommended standards, including a public review. This process

---

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

<sup>4</sup> Isa2 programme website: [https://ec.europa.eu/isa2/eif\\_en](https://ec.europa.eu/isa2/eif_en)

<sup>5</sup> UFDL: <https://datatracker.ietf.org/doc/html/draft-gordon-ufdl-spec-01>

<sup>6</sup> According to the U.S. Library of Congress: <https://www.loc.gov/preservation/digital/formats/fdd/fdd000580.shtml>

is supported by the W3C Patent Policy, which ensures Royalty-Free Intellectual Property Rights (IPR) licenses for all specifications.

The Extensible Forms Description Language (XFDL) originated from the Universal Forms Description Language (UFDL), developed by UWI.Com between 1993 and 1998. XFDL evolved UFDL into an XML-based syntax, enabling the creation of complex forms that promote interoperability.

Finally, XFDL is useful for creating, processing, and rendering electronic forms and documents, and addresses challenges in e-commerce by enhancing records management. However, other newer and easier-to-implement specifications have been developed to perform these functions. Therefore, although XFDL is still in use for addressing functions related to e-commerce, it is not the preferred specification.

- **Transparency**

Since XFDL is built on XML, it allows for the export and sharing of data with external systems. This enables both administrators and users to access data and gain insights into services outside of the XFDL environment, enhancing service visibility across a wider range of platforms.

In this context, the study "*Signed XML: Experiences from the Creation of XFDL*"<sup>7</sup> demonstrates how XFDL can be useful for e-commerce and digital signatures. The XFDL specification is based on an XML structure, which supports clearer, more transparent administrative procedures by improving how data is structured, processed, and shared. This makes the overall process more accessible and understandable.

- **Reusability**

The Extensible Forms Description Language (XFDL) specification plays a role in some niche software, used to create digital signatures or legally binding forms. Although it is used in niche software, it is domain-agnostic and can be implemented in any domain.

- **Technological neutrality and data portability**

The Extensible Forms Description Language (XFDL) specification is designed to be technology agnostic, meaning it does not rely on any specific technology. However, the XFDL specification might rely on specialised software such as IBM Forms to transform XFDL files into other formats such as PDF and HTML.

In addition, XFDL enables certain functions to be executed within forms, allowing procedural operations to take place. These operations are optional, which enhances the adaptability of XFDL across different scenarios. Additionally, XFDL allows for customisation, enabling the definition of

---

<sup>7</sup> "Signed XML: Experiences from the Creation of XFDL" study: <https://www.w3.org/DSig/signed-XML99/present/UWI/01.HTM>

specific characteristics for items on a form page, such as a "button" that can perform tasks like saving, printing, or cancelling.

Finally, the XFDL specification also permits extensibility, including custom items, options, and external code functions. Based on XML, XFDL benefits from XML's portability, as it is a text-based, standardised format that can be easily shared and processed across various systems and platforms. This makes XFDL a versatile tool for creating and managing forms and data in a wide range of environments.

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

- **User-centricity**

The XFDL specification is a high-level, XML-based language. In this context, the XML entities allows to store information to reuse it again and again by referring to it, avoiding writing that information multiple times.

- **Inclusion and accessibility**

The Extensible Forms Description Language specification can enable e-accessibility by its XML structure. In this context, the specification allows to structure data in a consistent, predictable way that can be easily interpreted and processed.

- **Privacy**

The XFDL specification does not directly address personal data protection, but it offers a mechanism for securing personal data through the signature item. This feature includes a digital signature that verifies the authenticity of the form and encrypts the signed data using a hash algorithm defined in the form's *signformat* option. By ensuring the integrity and authenticity of the data, XFDL helps protect personal data, especially in public administration processes where ensuring tamper-proof signed information is critical.

While XFDL itself does not provide direct access control mechanisms, it can be integrated with external systems that enforce such controls. For example, role-based permissions can be applied to XFDL forms to restrict access and modification of specific data. Furthermore, sensitive information can be secured through digital signatures, ensuring that only authorised users can verify and view the signed data. In this context, the XML Signature Syntax and Processing specification<sup>8</sup> provides a way to sign data, offering additional protection for various types of data.

- **Security**

The XFDL specification does not directly handle the authentication of role agents, but it supports digital signatures that verify the authenticity of data and the identity of the signer. This helps

---

<sup>8</sup> XML Signature Syntax and Processing: <https://www.w3.org/TR/xmlsig-core1/>

public administrations confirm that form data is untampered and signed by an authorised agent, in line with the XML Signature Syntax and Processing specification<sup>9</sup>.

XFDL also ensures data integrity by using digital signatures, which prevent unauthorised changes. The encryption in the signature's *mimedata* option further protects the data, maintaining its original state. This aligns with the XML Signature Syntax and Processing specification, which defines how digital signatures are applied to XML documents.

Additionally, XFDL's standardised format minimises data entry errors and ensures data integrity through digital signatures, guaranteeing that data remains unchanged after submission. This approach follows the XML Signature specification for reliable data verification during processing.

- **Multilingualism**

The purpose of Extensible Forms Description Language is not related to the delivery of multilingual services. Therefore this criterion is not applicable to this specification.

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

- **Administrative Simplification**

The XFDL specification is based in a XML structure, providing a standardised format for data collection and form submission. However, the specification is not addressed to simplify the delivery of public services.

On the other hand, the specification allows public administrations and service providers to collect, process, and exchange data electronically, facilitating the provision of digital services.

- **Preservation of information**

The Extensible Forms Description Language (XFDL) specification is based on XML, which allows for efficient storage and reuse of information. While the XFDL specification itself is not specifically designed for the long-term preservation of data, it can contribute to this goal through XML's inherent capabilities, such as data reuse.

- **Assessment of effectiveness and efficiency**

There are existing documentation and studies assessing the effectiveness and efficiency of XFDL. The "XFDL: Creating electronic commerce transaction records using XML"<sup>10</sup> study, discusses the issues surrounding the creation of legally-binding electronic transaction records on the Internet and outlines an XML-based solution called XFDL.

---

<sup>9</sup> XML Signature Syntax and Processing specification: <https://www.w3.org/TR/2013/REC-xmlsig-core1-20130411/>

<sup>10</sup> "XFDL: Creating electronic commerce transaction records using XML" study: <https://www.sciencedirect.com/science/article/pii/S1389128699000286>

On the other hand, the “Enterprise-level Web Forum Applications with XForms and XFDL”<sup>11</sup> study, presents the first integration of the standardised XML markup for expressing the core processing of a web-based form applications (XForms) with a host language (XFDL) that offers security, precision presentation, a document-centric capability, and other features that contribute to a more rich user experience.

However, in the “Sustainability of Digital Formats: Planning for Library of Congress Collections”<sup>12</sup> report about XFDL, it is mentioned that there are simpler technologies preferred nowadays.

## 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 partially supports the implementation of digital public services complying with the EIF interoperability model:***

- **Interoperability governance**

At the time of elaborating this assessment, this specification is included in the "Forms Management" and "Virtual Private Network" ABBs of the Technical View of the current EIRA Library of Interoperability Specifications (ELIS)<sup>13</sup>.

In addition, XFDL implementations can be assessed by checking if they follow the correct XML structure. To test this, there are many tools available to test and validate an XML document, such as *xmlvalidation*<sup>14</sup>.

- **Legal Interoperability**

The Extensible Forms Description Language specification is developed by a non-European organisation. Therefore, the specification cannot be considered a European standard.

- **Organisational interoperability**

The XFDL specification, being based on XML can facilitate organisational interoperability by providing a standardised way to represent data. Organisations and Public Administrations can

---

<sup>11</sup> "Enterprise-level Web Forum Applications with XForms and XFDL" study: [http://www.pdfpower.com/XML2005Proceedings/ship/74/XFormsAndXFDL\\_Boyer.PDF](http://www.pdfpower.com/XML2005Proceedings/ship/74/XFormsAndXFDL_Boyer.PDF)

<sup>12</sup> "Sustainability of Digital Formats: Planning for Library of Congress Collections" report about XFDL: <https://www.loc.gov/preservation/digital/formats/>

<sup>13</sup> EIRA Library of Interoperability Specifications (ELIS): <https://joinup.ec.europa.eu/collection/common-assessment-method-standards-and-specifications-camss/solution/elis/release/v610>

<sup>14</sup> Xmlvalidation platform: <https://www.xmlvalidation.com/>



easily exchange XFDL forms and data, ensuring that systems can read, process, and share information consistently across different platforms.

- **Semantic Interoperability**

There are some forums<sup>15</sup> discussing the implementation of XFDL. In addition, papers assessing the specification and offering new functionalities can be found on the internet.

---

<sup>15</sup> Stackoverflow XFDL forum: <https://stackoverflow.com/questions/tagged/xfdl>

### 3. ASSESSMENT RESULTS

This section presents an overview of the results of the CAMSS assessments for **XFDL**. 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	20/100 (20%)	100%	Seamless
Core interoperability principles	1540/1700 (91%)	100%	Seamless
Principles related to generic user needs and expectations	1060/1200 (88%)	100%	Seamless
Foundation principles for cooperation among public administrations	400/500 (80%)	100%	Seamless
Interoperability layers*	580/1000 (58%)	100%	Seamless
Overall Score	2800/3700 (76%) <sup>16</sup>	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 76% (2800/3700) demonstrates that the specification supports the European Interoperability Framework in the domains where it applies.

---

<sup>16</sup> 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>