

# CAMSS Assessment EIF Scenario v6.0.0

Fields marked with \* are mandatory.

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**Release Date:** 14/04/2023

**Scenario Version:** 6.0.0

## INTRODUCTION

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## EIF Scenario

The European Interoperability Framework (EIF) provides guidance to public administrations on how to improve governance of their interoperability activities, establish cross-organisational relationships, streamline processes supporting end-to-end digital services, and ensure that existing and new legislation do not compromise interoperability efforts.

This CAMSS Scenario allows to assess the compliance of **interoperability specifications** with the EIF. The objective of the obtained assessment is to determine the suitability of the assessed interoperability specification for the delivery of interoperable European public services.

## Background

[CAMSS](#) is the European guide for assessing and selecting standards and specifications for an eGovernment project, a reference when building an architecture, and an enabler for justifying the choice of standards and specifications in terms of interoperability needs and requirements. It is fully aligned with the European Standardisation Regulation 1025/2012.

The main objective of CAMSS is achieving interoperability and avoiding vendor lock-in by establishing a neutral and unbiased method for the assessment of technical specifications and standards in the field of ICT. This method will be compliant with Regulation 1025/2012 on European Standardisation.

While ICT solutions have specific characteristics at the political, legal, and organisational levels; semantic and technical interoperability are based mostly on technical specifications or standards. Within the context of the elaboration of their National Interoperability Frameworks, Member States organise the assessment of technical specifications or standards, in order to establish their national recommendations. Deciding on the recommended technical specifications or standards often calls for a resource-intensive and time-consuming assessment. In order to tackle this, the [Digital Europe Programme](#) (DEP) defines an action focused on the development of a common assessment method for standards and specifications (CAMSS).

**The purpose of CAMSS is:**

- to ensure that assessments of technical ICT specifications or standards and interoperability profiles are performed according to high and consistent standards;
- to ensure that assessments will contribute significantly to the confidence in the interoperability of systems implementing these specifications and profiles;
- to enable the reuse, in whole or in part, of such assessments;
- to continuously improve the efficiency and effectiveness of the assessment process for ICT technical specifications, standards, and interoperability profiles.

**The expected benefits of the CAMSS are:**

- Ensuring greater transparency throughout the selection of standards in the context of ICT strategies, architectures, and interoperability frameworks. This will be achieved through the establishment of a commonly agreed assessment method, assessment process, and a list of assessment attributes.
- Reducing resource and time requirements and avoiding duplication of efforts. (Partial) sharing of finalised assessments of standards and specifications.
- Allowing easier and faster assessments, and reusing the ones already performed through the creation and maintenance of a library of standards.

Your compliance level of the specification assessed depends on the scores you achieved in each section of the survey. Please see below the survey score conversion table below for guidance.

Section	Compliance Level				
	Ad-hoc	Opportunistic	Essential	Sustainable	Seamless
<b>Principles setting the context for EU Actions on Interoperability</b>	20	40	60	80	100
<b>EIF Core Interoperability Principles</b>	0 to 340	341 to 680	681 to 1020	1021 to 1360	1361 to 1700
<b>EIF Principles Related to generic user needs and expectations</b>	0 to 240	241 to 480	481 to 720	721 to 960	961 to 1200

**EIF Foundation  
principles for  
cooperation  
among public  
administrations**

0 to 100

101 to 200

201 to 300

301 to 400

401 to 500

**EIF**

**Interoperability  
Layers**

0 to 200

201 to 400

401 to 600

601 to 800

801 to 1000

The following table shows the 'compliance levels' that a specification can reach depending on the assessment score.

Compliance Level	Description
<b>Ad-hoc</b>	Poor level of conformance with the EIF - The specification does not cover the requirements and recommendations set out by the EIF in this area.
<b>Opportunistic</b>	Fair level of conformance with the EIF - The specification barely covers the requirements and recommendations set out by the European Interoperability Framework in this area.
<b>Essential</b>	Essential level of conformance with the EIF - The specification covers the basic aspects set out in the requirements and recommendations from the European Interoperability Framework.
<b>Sustainable</b>	Good level of conformance with the EIF scenario - The specification covers all the requirements and recommendations set out by the European Interoperability Framework in this area.
<b>Seamless</b>	Leading practice of conformance level with the EIF - The specification fully covers the requirements and recommendations set out by the European Interoperability Framework in this area.

**Contact:** For any general or technical questions, please send an email to [DIGIT-CAMSS@ec.europa.eu](mailto:DIGIT-CAMSS@ec.europa.eu). Follow all activities related to the CAMSS on our [CAMSS community page](#).

## USER CONSENT

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**Disclaimer:**

*By no means will the Interoperability Specification assessment imply any endorsement of the EC to the assessed specification. Likewise, the use of CAMSS Assessment EIF Scenario implies that the user accepts that the EC is not liable on the assessment nor on any direct or indirect consequence/decision of such assesment.*

The CAMSS Assessment EIF Scenario is based on EU Survey, by accepting the CAMSS Privacy Statement the user also accepts EU Survey [Privacy Statement](#) and the [Terms of use](#).

\* Please, fill in the mandatory\* information to start the assessment

- ☒ \* I have read and agreed to the following CAMSS Privacy Statement: [here](#)
- ☒ I agree to be contacted for evaluation purposes, namely to share my feedback on specific DEP solutions and actions and on the DEP programme and the European Interoperability Framework in general.

This assessment is licensed under the [European Union Public License \(EUPL\)](#)

## IDENTIFICATION

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### Information on the information provider

Your Last name

Sklarß

Your First Name

Sebastian

Your Position / Role

Principal Consultant

\* Your Organisation

]init[ AG

Your Contact phone number

+49 151 689 422 98

\* Would you like to be contacted for evaluation purposes in the context of your assessment? To see how your data is handled, please check again the Privacy statement [here](#)

In case you would like to be contacted, please select "yes" and provide your email.

- ☒ Yes  
☐ No

Contact Email

sebastian.sklarss@init.de

\* Where did you learn about CAMSS?

- ☐ DEP Programme (DEP website, DEP social media)  
☐ Joinup (e.g., CAMSS Collection, Joinup social media)  
☐ European Commission  
☒ Public Administrations at national, regional or local level  
☐ Standards Developing Organizations (SDOs)

☐ Other

If you answered "Other" in the previous question, please specify how:

## Information on the specification

### \* Specification type

**Specification:** Set of agreed, descriptive, and normative statements about how a specification should be designed or made.

**Standard:** Specification that is largely adopted and possibly endorsed.

**Application Profile:** An application profile "customises one or more existing specifications potentially for a given use case or a policy domain adding an end to end narrative describing and ensuring the interoperability of its underlying specification(s)".

**Family:** A family is a collection of interrelated and/or complementary specifications, standards, or application profiles and the explanation of how they are combined, used, or both.

- ☐ Specification
- ☒ Standard
- ☐ Application Profile
- ☐ Family of Specification

### \* Title of the specification

XBildung

### \* Version of the specification

1.1

### \* Description of the specification

XBildung is a family of data exchange standards that encompasses the entire education system from first to secondary (XSchule), tertiary (XHochschule) and vocational education (XBerufsbildung). The goal of the activity is to enable stakeholders in the education system (e.g., universities, schools, educational providers) to exchange electronic data with each other in a standardised manner, thus reducing the burden on both participants and these stakeholders (fewer analog records, reduced errors, faster (testing) procedures, etc.).

### \* URL from where the specification is distributed

<https://xbildung.de/web/spezifikation>

### \* Name and website of the standard developing/setting organisation (SDO/SSO) of the specification

- ☐ W3C (<https://www.w3.org>)
- ☐ OASIS (<https://www.oasis-open.org/>)
- ☐ IEEE (<https://standards.ieee.org/>)

- ☐ ETSI (<https://www.etsi.org/>)
- ☐ GS1 (<https://www.gs1.fr/>)
- ☐ openEHR (<https://www.openehr.org/>)
- ☐ IETF (<https://www.ietf.org/>)
- ☒ Other (SDO/SSO)

\* In case of Other SDO, please, provide its name:

KoSIT

\* and, provide its URL:

<https://www.xoev.de/>

Contact information/contact person of the SDO

a) for the organisation

b) for the specification submitted

<https://www.xoev.de/kontakt-2318>

## Information on the assessment of the specification

Reason for the submission, the need and intended use for the specification.

In the light of the interoperable europe act we want to self-assess our family of standards. The aim is also to prepare the standard for being included in the german national standardisation board (föderales IT-Standardisierungsboard - FIT-SB)

If any other evaluation of this specification is known, e.g. by Member States or European Commission projects, provide a link to this evaluation.

## Considerations

Is the functional area of application for the formal specification addressing interoperability and eGovernment?

- ☒ YES
- ☐ NO

Additional Information

supported use cases are certificates in the education sector (Bildungsnachweise) and pupils moving from one federal state to another changing into environments with different legal, organisational, semantical and technical settings. (Bildungsföderalismus in Deutschland)

## EIF PRINCIPLES SETTING THE CONTEXT FOR EU ACTIONS ON INTEROPERABILITY

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This category is related to the first underlying principle ([UP](#)) of the EIF Subsidiarity and Proportionality (UP1). The basis of this principle is to ensure that the EU Actions are taken or stated to improve national actions or decisions. Specifically, it aims to know if National Interoperability Frameworks are aligned with the EIF.

*Please note that some of the questions have a prefilled answer depending on the SDO. To ensure it, please see that these questions include a help message that remarks it.*

### Subsidiarity and Proportionality

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**\* A1 - To what extent has the specification been included in a national catalogue from a Member State whose National Interoperability Framework has a high performance on interoperability according to National Interoperability Framework Observatory factsheets?**

**EIF Recommendation 1:** Ensure that national interoperability frameworks and interoperability strategies are aligned with the EIF and, if needed, tailor and extend them to address the national context and needs.

This criterion assesses if the specifications have been included within the National Catalogues of Specifications of the Member States that are highly aligned with the higher level of performance in terms of interoperability.

The Digital Public Administration Factsheets use three categories to evaluate the level of National Interoperability frameworks in accordance with the EIF. The three categories are 1. CONCEPTUAL MODEL FOR INTEGRATED PUBLIC SERVICES PROVISION; 2 INTEROPERABILITY LAYERS, and 3. INTEROPERABILITY PRINCIPLES. National Interoperability Frameworks reports can be found here: <https://joinup.ec.europa.eu/collection/nifo-national-interoperability-framework-observatory/digital-public-administration-factsheets-2021>

- ☐ Not Answered
- ☐ Not Applicable
- ☒ The specification has not been included within the catalogue of any Member State.
- ☐ The specification has been included within the catalogue of a Member State with a lower performance than stated in the Digital Public Administration Factsheets from the NIFO.
- ☐ The specification has been included within the catalogue of a Member State with a middle-lower performance than stated in the Digital Public Administration Factsheets from the NIFO.
- ☐ The specification has been included within the catalogue of a Member State with a middle-upper performance than stated in the Digital Public Administration Factsheets from the NIFO.
- ☐ The specification has been included within the catalogue of a Member State with a higher performance than stated in the Digital Public Administration Factsheets from the NIFO.



\* Justification

NIFO for Germany was not updated for a long time.

## EIF CORE INTEROPERABILITY PRINCIPLES

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In this category, elements related to the core interoperability principles (UP) are encompassed, which are: openness (UP 2), transparency (UP3), reusability (UP4), technological neutrality and data portability (UP5).

### Openness

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\* **A2 - Does the specification facilitate the publication of data on the web?**

**EIF Recommendation 2:** Publish the data you own as open data unless certain restrictions apply.

Relates to the ability of the specification to publish data as open data or not.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ The specification does not support the publication of data on the web.
- ☐ The specification supports the publication of data on the web but under a non-open license.
- ☐ The specification supports the publication of data on the web with an open license, but in an unstructured format.
- ☐ The specification supports publication of data on the web with an open license and in a structured, machine-readable format.
- ☐ In addition to the previous question, the specification does not require proprietary software for the processing of its related data.
- ☒ In addition to the previous question, the specification is or incorporates open standards (e.g. W3C).

\* Justification

The specification shows how to publish codelists and data structures in XML format. Codelists are published also as RDF-files according to W3C best practices receipts for publishing vocabularies (content negotiation). It uses the W3C stack and uses an interoperable test bed to validate the data. In doing so it not only fosters seamless data exchange but also facilitates the publication of data on the web.

\* **A3 - To what extent do stakeholders have the opportunity to contribute to the development of the specification?**

**EIF Recommendation 3:** Ensure a level playing field for open-source software and demonstrate active and fair consideration of using open source software, taking into account the total cost of ownership of the solution.

Relates to in which measure the different stakeholders that a specification can benefit have the opportunity to participate in the working groups focused on the development of certain specifications.

- ☐ Not Answered

- ☐ Not Applicable
- ☐ There is no information on the working group of the specification.
- ☐ The working group is open to participation by any stakeholder but requires registration, fees, and membership approval.
- ☐ The working group is open to participation by any stakeholder but requires fees and membership approval.
- ☐ The working group is open to participation following a registration process.
- ☒ The working group is open to all without specific fees, registration, or other conditions.

**\* Justification**

It is intended and desired that as many educational stakeholders as possible participate in XBildung. Stakeholders who register via the project website will be invited to workshops. Even without registration, change requests can be submitted to XBildung via GitHub from anyone at anytime: <https://github.com/ThemenfeldBildung>

**\* A4 - To what extent is a public review part of the release lifecycle?**

**EIF Recommendation 3:** Ensure a level playing field for open-source software and demonstrate active and fair consideration of using open source software, taking into account the total cost of ownership of the solution.

A public review consists of the public availability of the specification's draft for stakeholders to provide inputs for the improvement and fix of possible bugs.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ Specification releases do not foresee public reviews.
- ☐ Public review is applied to certain releases depending on the involved changes.
- ☐ All major releases foresee a public review.
- ☐ All major and minor releases foresee a public review but, during which, collected feedback is not publicly visible.
- ☒ All major and minor releases foresee a public review during which collected feedback is publicly visible.

**\* Justification**

XBildung releases are made publicly available, making them accessible to everyone and subject to review. Review results can be submitted to XBildung as change requests via GitHub. In regular webmeetings the release plan is presented with former changes (<https://xbildung.de/web/releasehistorie>) that were implemented and future changes that are planned. (<https://xbildung.de/web/releaseplanung>)

**\* A5 - To what extent do restrictions and royalties apply to the specification's use?**

**EIF Recommendation 3:** Ensure a level playing field for open-source software and demonstrate active and fair consideration of using open source software, taking into account the total cost of ownership of the solution.

Additionally to the EIF's recommendation that refers to open-source software it applies to a specification in itself at any interoperability level (legal, organisational, semantic, or technical)

- ☐ Not Answered
- ☐ Not Applicable
- ☐ The specification has no public definition of its Intellectual Property Right (IPR) policy or licence.
- ☐ Use of the specification is restricted and requires the payment of royalty fees.

- ☐ Use of the specification is royalty-free but imposes an Intellectual Property Right (IPR) policy or licence that goes against Fair, Reasonable and Non-Discriminatory (F/RAND) principles.
- ☒ Use of the specification is royalty-free and its Intellectual Property Right (IPR) policy or licence is aligned with Fair, Reasonable and Non-Discriminatory (F/RAND) principles.

**\* Justification**

XBildung and its sub standards use the following open FRAND aligned licences:

XBildung - Creative Commons 4.0 Namensnennung International, "jinit[ AG im Auftrag von BMBF und Land Sachsen-Anhalt"

XSchule - Creative Commons 4.0 Namensnennung International, "jinit[ AG im Auftrag des Landes Sachsen-Anhalt"

XHochschule - Creative Commons 4.0 Namensnennung International, "jinit[ AG im Auftrag von BMBF und Land Sachsen-Anhalt"

XBerufsbildung - Creative Commons 4.0 Namensnennung International, "jinit[ AG im Auftrag des Landes Sachsen-Anhalt"

**\* A6 - To what extent is the specification sufficiently mature for its use in the development of digital solutions/services?**

**EIF Recommendation 4:** Give preference to open specifications, taking due account of the coverage of functional needs, maturity and market support, and innovation.

Maturity related to the stability of the specification, meaning that it has been evolved enough and mechanisms for its development have been put in place (Change Management processes, monitoring, etc.)

- ☐ Not Answered
- ☐ Not Applicable
- ☐ The specification has no published releases and no publicly accessible information on its development state.
- ☐ The specification is under development without published releases.
- ☐ The specification is under development with published preview releases.
- ☐ The specification has published major releases but without public documentation on its supporting processes (e.g. change management and release management).
- ☒ The specification, in addition to having major releases available, has published documentation on its supporting processes (e.g. change management and release management).

**\* Justification**

All XBildung artifacts are made publicly available. Releases include the data model, code lists, XML schema files, comprehensive documentation, etc. The specification and its artefacts are currently used in pilots preparing real world implementations. More information on the current implementing status can be seen here: <https://www.xbildung.de/web/Nachweisnavigator>

**\* A7 - To what extent has the specification sufficient market acceptance for its use in the development of digital solutions/services?**

**EIF Recommendation 4:** Give preference to open specifications, taking due account of the coverage of functional needs, maturity and market support, and innovation.

Relates to how the specification is supported by the market, taking as a reference whether or not the specifications are widely used or implemented. There is an exception, and it is when the specification is used to implement innovative solutions, then, the specification should not be considered as failing to meet the requirements of the criterion.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ There is no information about the specification's market uptake.
- ☐ The specification has known implementations but not enough to indicate market acceptance.
- ☐ The specification has widespread use indicating market acceptance.
- ☒ The specification has widespread use and relevant independent reports proving its market acceptance.
- ☐ The specification does not have market acceptance because it is directly used to create innovative solutions.

**\* Justification**

XBildung (together with XHochschule, XSchule and XBerufsbildung) is intended to act as a semantic interface between all stakeholders in the education system. The more educational institutions use XBildung, the easier data exchange will be in the future due to the agreements reached on semantic interoperability within the family of standards.

**\* A8 - To what extent has the specification support from at least one community?**

**EIF Recommendation 3:** Ensure a level playing field for open-source software and demonstrate active and fair consideration of using open source software, taking into account the total cost of ownership of the solution.

Related to whether or not communities exist around the specification at any level legal, organisational, semantic, or technical contributions to its enhancement and development.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ There is no community linked to the specification.
- ☐ Specification support is available but as part of a closed community requiring registration and possibly fees.
- ☐ There is no specific community to support the specification but there are public channels for the exchange of help and knowledge among its users.
- ☒ There is a community providing public support linked to the specification but in a best-effort manner.
- ☐ There is a community tasked to provide public support linked to the specification and manage its maintenance.

**\* Justification**

Each of the projects of XBildung activity address an own distinct community that support comes from:

- a) XHochschule: Employers working in ministries of economy, ministries of science, for higher education institutions or for software manufacturers (Wirtschafts- und Forschungsministerien, Hersteller, Hochschulen)
- b) XSchule: Employers working in ministries secondary education, software manufactures (Schulministerien, Hersteller)
- c) XBerufsbildung; Employers working in chambers, or in general in the vocational education sector (Kammern, Dachverbände)

# Transparency

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## \* A9 - To what extent does the specification enable the visibility of administrative procedures, rules data, and services?

**EIF Recommendation 5:** Ensure internal visibility and provide external interfaces for European public services.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ The specification hinders visibility.
- ☐ The specification neither promotes nor hinders visibility.
- ☒ The specification can contribute and promote the visibility of administrations, but it is not its main purpose.
- ☐ The specification can enable the visibility of administrations if combined with other specifications.
- ☐ The specification actively promotes and supports visibility.

### \* Justification

XBildung itself can be understood as a component that complements a service. By incorporating the federal IT standard, semantic interoperability between different services is ensured. The visibility of XBildung and the visibility of the services are only slightly dependent on each other. The XBildung together with its stakeholders analysed the underlying processes (admission for secondary / higher education, issuing a certificate) and where necessary reflected them in the data structure. However: XBildung is meant to define a core vocabulary (unbound data elements in a data dictionary) that in the concrete implementation gets its details (cardinality)

## \* A10 - To what extent does the specification scope comprehensibly administrative procedures, rules data, and services?

**EIF Recommendation 5:** Ensure internal visibility and provide external interfaces for European public services.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ The specification hinders comprehensibility.
- ☐ The specification neither promotes nor hinders comprehensibility.
- ☒ The specification can contribute and promote the comprehensibility of administrations, but it is not its main purpose.
- ☐ The specification can scope the comprehensibility of administrations if combined with other specifications.
- ☐ The specification actively promotes and supports comprehensibility.

### \* Justification

XBildung merely provides a semantic interface. Online services and other software manufacturers can integrate the standard and thus use it for their services. The data values chosen for the federal-wide codelists reflect administrative procedures where necessary, but it is not its main purpose.

## \* A11 - To what extent does the specification enable the exposure of interfaces to access the public administration's services?

**EIF Recommendation 5:** Ensure internal visibility and provide external interfaces for European public services.

Relates to ensuring availability of interfaces with internal information systems. As the EIF defines: *Public administrations operate a large number of what are often heterogeneous and disparate information systems in support of their internal processes. Interoperability depends on ensuring the availability of interfaces to these systems and the data they handle. In turn, interoperability facilitates the reuse of systems and data and enables these to be integrated into larger systems.*

- ☐ Not Answered
- ☐ Not Applicable
- ☐ The specification prevents the exposure of such interfaces.
- ☒ The specification neither promotes nor hinders the exposure of such interfaces.
- ☐ The specification can contribute to the exposure of interfaces, but it is not its main purpose.
- ☐ The specification can enable the exposure of interfaces if combined with other specifications.
- ☐ The specification enables exposure of such interfaces.

**\* Justification**

The technical artifacts of XBildung are publicly available and thus accessible to everyone. Despite the publicly accessible semantic interface, it is not possible to access other interfaces or even entire public administration services. XBildung is more specialised on back end data interchange between the institutions. It is partly streamlined with front-end data in form applications coming from the citizen.(FIM BOB Baukasten)

## Reusability

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**\* A12 - To what extent is the specification usable beyond the business-specific domain, allowing its usage across business domains?**

**EIF Recommendation 6:** Reuse and share solutions, and cooperate in the development of joint solutions when implementing European public services.

Relates to the use of the specification beyond a specific business domain. E.g. a specification developed under the eHealth domain that can be used in other domains or not.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ The specification is tied to a specific domain and is restricted from being implemented or used in other domains.
- ☐ The specification is associated with a specific domain but its implementation and/or use in other domains is difficult.
- ☒ The specification is associated with a specific domain but could be partially implemented and/or used in other domains.
- ☐ The specification is associated with a specific domain but could be implemented and/or used 'as-is' to other domains.
- ☐ The specification is domain-agnostic, designed to be implemented and/or used in any domain.

**\* Justification**

XBildung is primarily aimed at stakeholders in the education sector, such as universities and campus management system manufacturers, schools and school software developers, vocational training institutions, as well as chambers of commerce and their IT service providers. Although this approach is specific to the field, XBildung can also be used outside of this domain. With a focus on the aspect of lifelong learning, digital educational certificates are also used in other business domains. It is imaginable to build a XWeiterbildung under the umbrella of XBildung.

## Technological Neutrality and Data Portability

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### \* A13 - Is the specification technology agnostic?

**EIF Recommendation 8:** Do not impose any technological solutions on citizens, businesses, and other administrations that are technology-specific or disproportionate to their real needs.

Technology-neutrality relates to not being dependent on any other ("sister") specifications, and platform-neutrality, not being dependent on any specific environment, web platform, operating system.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ NO
- ☒ YES

### \* Justification

The XÖV methodology applied by XBildung is deliberately developed to be technology-open and is therefore not dependent on a specific technology other than W3C stack XML technology.

### \* A14 - Is the specification platform agnostic?

**EIF Recommendation 8:** Do not impose any technological solutions on citizens, businesses, and other administrations that are technology-specific or disproportionate to their real needs.

Technology-neutrality relates to not being dependent on any other ("sister") specifications, and platform-neutrality, not being dependent on any specific environment, web platform, operating system.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ NO
- ☒ YES

### \* Justification

In addition to the technology independence of the XÖV methodology, there is also no dependency on a specific platform.

### \* A15 - To what extent does the specification allow for partial implementations?

**EIF Recommendation 8:** Do not impose any technological solutions on citizens, businesses, and other administrations that are technology-specific or disproportionate to their real needs.

Partial implementations refer to the application of specifications, not in their whole, but part of the requirements or features defined in the documentation.

It can also be understood as the implementation of different profiles, which is also related to a certain set of requirements depending on the context of implementation.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ The specification is only meant to be used as a whole.
- ☐ The specification could be partially implemented but does not make specific provisions towards this.
- ☐ The specification could be partially implemented but includes only guidelines towards this rather than sets of requirements.
- ☐ The specification explicitly foresees sets of requirements that can be implemented incrementally.
- ☒ The specification explicitly foresees sets of requirements that can be implemented incrementally or separately.

**\* Justification**

In XBildung and the associated standards, various educational certificates are mapped using the XÖV methodology. It is generally possible to implement only individual educational certificates. For example, XSchule includes the secondary education diploma, a generic certificate, a certificate from vocational preparation, a school certificate, and a notification regarding a school change. Not all five certificates need to be mapped, and it is possible, for example, to use only the secondary education diploma. The standard family is structured in evidences and allows for partial implementations.

**\* A16 - Does the specification allow customisation?**

**EIF Recommendation 8:** Do not impose any technological solutions on citizens, businesses, and other administrations that are technology-specific or disproportionate to their real needs.

A clear example of customizations is Core Vocabularies, which define a set of general requirements that could fit in any context and allow for the customization to fit specific business requirements in the implementation.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ NO
- ☒ YES

**\* Justification**

The specification together with the XÖV-Suite allows for profiling, what can be understood as customisation.

**\* A17 - Does the specification allow extension?**

**EIF Recommendation 8:** Do not impose any technological solutions on citizens, businesses, and other administrations that are technology-specific or disproportionate to their real needs.



A clear example of extension is Core Vocabularies, which are a set of general requirements fitting in different contexts that can complement each other in a sort of extensibility practice to fit specific business requirements in any implementation.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ NO
- ☒ YES

**\* Justification**

The data models are designed for extensibility. There are three levels at which users can extend the respective standards: first, a missing property can be added; second, individual code list values can be added; and third, selected certificates can be expanded more extensively using a specific class.

**\* A18 - To what extent does the specification enable data portability between systems/applications supporting the implementation or evolution of European public services?**

**EIF Recommendation 9:** Ensure data portability, namely that data is easily transferable between systems and applications supporting the implementation and evolution of European public services without unjustified restrictions, if legally possible.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ The specification prevents or does not support data portability.
- ☐ The specification neither addresses data portability nor prevents it.
- ☐ The specification addresses data portability but without specific provisions to enable it.
- ☐ The specification introduces certain aspects that can contribute to enabling data portability.
- ☒ The specification explicitly addresses and enables data portability.

**\* Justification**

This aspect is a core theme of XBildung. By integrating XBildung into the respective software, semantic interoperability is ensured for a specific use case. This goal is not only pursued in the German educational environment, but also aims at interoperability across Europe. The technology-independent methodology regulates data portability at the subject-specific level using a uniform interface.

## EIF PRINCIPLES RELATED TO GENERIC USER NEEDS AND EXPECTATIONS

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This category includes all underlying principles from the EIF which are related to user needs. Principles included here are user-centricity (UP6), inclusion and accessibility (UP7), security and privacy (UP8), and multilingualism (UP9).

### User-Centricity

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**A19 - To what extent does the specification allow relevant information to be reused when needed?**

- \* **EIF Recommendation 13:** As far as possible under the legislation in force, ask users of European public services once-only and relevant-only information.

The Once-Only Principle is related to making the operations or transactions between administrations and stakeholders more efficient. It implies avoiding the provision of certain data or information twice or more when this information is already available for public administrations.

First European Data Space, Once Only Technical System (OOTS):

<https://ec.europa.eu/digital-building-blocks/wikis/display/DIGITAL/Once+Only+Technical+System>

Additional and relevant information can be found here: <https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/Once+Only+Principle>

- ☐ Not Answered
- ☐ Not Applicable
- ☐ Information needs to be provided whenever this is needed.
- ☐ There is limited reuse of provided information.
- ☐ Provided information is reused, but this is not consistently done.
- ☒ Provided information is reused, but not in all scenarios.
- ☐ Information is provided once-only and reused as needed.

\* Justification

To a certain extend the specification allows relevant information to be reused. It also supports the once-only principle by

- a) Being designed as XÖV standard (same framework as used in the German NOOTS Implementation in XNachweis, XDatenschutzcockpit and XBasisdaten)
- b) it provides IDs to identity and make referencable data items wherever possible

## Inclusion and Accessibility

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\* **A20 - To what extent does the specification enable the e-accessibility?**

**EIF Recommendation 14:** Ensure that all European public services are accessible to all citizens, including persons with disabilities, the elderly, and other disadvantaged groups. For digital public services, public administrations should comply with e-accessibility specifications that are widely recognised at the European or international level.

Examples of specifications addressing e-accessibility are, for instance, WAI-ARIA (<https://www.w3.org/WAI/standards-guidelines/aria/>) included within Web Content Accessibility Guidelines (WCAG) Overview (<https://www.w3.org/WAI/standards-guidelines/wcag/>).

- ☐ Not Answered
- ☐ Not Applicable
- ☐ The specification prevents or does not support e-accessibility.
- ☒ The specification neither addresses e-accessibility nor prevents it.
- ☐ The specification can contribute and promote e-accessibility, but it is not its main purpose.
- ☐ The specification can enable e-accessibility if combined with other specifications.
- ☐ The specification explicitly addresses and enables e-accessibility.

\* Justification

XBildung, XHochschule, XSchule, and XBerufsbildung do not affect the frontend of an application or service. The semantic interface is integrated into the system architecture and regulates semantic interoperability when exchanging data between two services. Therefore, XBD has no relevance for accessibility, nor does it reduce accessibility in any way.

## Privacy

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### \* A21 - To what extent does the specification ensure the protection of personal data managed by Public Administrations?

**EIF Recommendation 15:** Define common security and privacy framework and establish processes for public services to ensure secure and trustworthy data exchange between public administrations and in interactions with citizens and businesses.

Relates to the actions that Public Administrations establish concerning sensitive information for the proper delivery of public services. The different actions imply the reception, classification, and exchange of such information.

Securing the right to the protection of personal data, by respecting the applicable legal framework for the large volumes of personal data of citizens, held and managed by Public administrations.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ The specification hinders the protection of personal data.
- ☐ The specification does not address the protection of personal data but neither prevents it.
- ☒ The specification includes certain data protection considerations but without being exhaustive.
- ☐ The specification explicitly addresses data protection but without referring to relevant regulations.
- ☐ The specification explicitly addresses data protection and its alignment to relevant regulations.

### \* Justification

The XÖV methodology, which XBildung also applies, allows that data can be transmitted in encrypted form. Furthermore, the XÖV standard should be viewed as only one component within an application. Encryption of personal data must therefore also be developed at other levels especially the organisational and technical layer of interoperability. However, XBildung does not pose an increased security risk and can ensure the protection of personal data within its use case. It clearly marks free text fields as such. Data foreseen to be part of the pupils moving to other schools (XSchule Schulwechsel) was discussed among data protection officers of several federal states:

<https://xschule.digital/web/events/2022/datenschutzworkshop-1>

For the use in these data protection workshops, all data fields have been checked and classified according to their data protection categories and needs.

[https://xbildung.de/events/2022-04-27/220422\\_Datenfeldspezifikation\\_XSchule\\_0.2.xlsx](https://xbildung.de/events/2022-04-27/220422_Datenfeldspezifikation_XSchule_0.2.xlsx)

### \* A22 - Does the specification provide means for restriction of access to information/data?

**EIF Recommendation 15:** Define common security and privacy framework and establish processes for public services to ensure secure and trustworthy data exchange between public administrations and in interactions with

citizens and businesses.

The principle of confidentiality defines that only the sender and the intended recipient(s) must be able to create the content of a message. Confidentiality have compromised if an unauthorized person is able to create a message.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ The specification prevents or does not support the implementation of confidentiality mechanisms/features.
- ☐ The specification neither addresses confidentiality nor prevents it.
- ☐ The specification addresses confidentiality but without specific provisions to enable it.
- ☐ The specification introduces certain aspects that can contribute to enabling confidentiality.
- ☒ The specification explicitly addresses and enables the implementation of features to guarantee confidentiality.

**\* Justification**

In cases where access to information is restricted the specification can handle this. Most codelists provide a neutral option "not in list". Restriction of access to information in the residents register (Übermittlungs- und Auskunftssperren) had been discussed in the XSchule use case on moving into another federal state (Schulwechsel).

**\* A23 - Is the specification included in any initiative at European or National level covering privacy aspects?**

**EIF Recommendation 15:** Define common security and privacy framework and establish processes for public services to ensure secure and trustworthy data exchange between public administrations and in interactions with citizens and businesses.

Securing the right to the protection of personal data, by respecting the applicable legal framework for the large volumes of personal data of citizens, held and managed by Public administrations.

Relates to the actions that Public Administrations establish concerning sensitive information for the proper delivery of public services. The different actions imply the reception, classification, and exchange of such information.

For example, the ETSI (Electronic Signatures and Infrastructures) family of specifications are part of the trust establishment of the eDelivery solution, ensuring that its implementation is salient to guarantee security and privacy.

- ☐ Not Answered
- ☐ Not Applicable
- ☒ Yes, but at national or regional level.
- ☐ Yes, at European level.

**\* Justification**

XBildung follows all regulations established by KoSIT for the entire XÖV methodology, which also covers privacy issues. It also has started to work on conversions of the national format into european once: EDCI ELM and EMREX/Elmo.  
[https://xbildung.de/web/XBD\\_ELM\\_Workshop2023](https://xbildung.de/web/XBD_ELM_Workshop2023)

## Security

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## Data processing and exchange

### \* A24 - To what extent does the specification enable the secure exchange of data?

**EIF Recommendation 15:** Define common security and privacy framework and establish processes for public services to ensure secure and trustworthy data exchange between public administrations and in interactions with citizens and businesses.

This relates to the actions that Public Administrations establish concerning sensitive information for the proper delivery of public services. The different actions imply the reception, classification, and exchange of such information.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ The specification prevents or does not support the secure and trustworthy exchange of data.
- ☐ The specification introduces certain aspects that can contribute to enabling the secure exchange of data.
- ☐ The specification addresses data security and trustworthy data exchange but does not foresee specific provisions to enable them.
- ☐ The specification addresses data security and trustworthy data exchange but specific provisions to enable them are limited.
- ☒ The specification explicitly addresses and enables the secure and trustworthy exchange of data.

### \* Justification

Strong security measures are particularly important here, as sensitive personal data is often transferred. IT security objectives ensure that:

1. the data originates from a trusted source and has not been tampered with (authenticity)
2. the data is protected from unauthorized access to ensure citizens' privacy (confidentiality)
3. the data is not altered during transmission (integrity)

In addition, it is possible to trace the origin and history of the data transmission (traceability).

XBildung - as XÖV compliant standard family features the separation of concerns (Transport layer vs payload) and its artefacts can be encompassed by signature frameworks (attached or enveloped XML signature)

### \* A25 - To what extent does the specification enable the secure processing of data?

**EIF Recommendation 15:** Define common security and privacy framework and establish processes for public services to ensure secure and trustworthy data exchange between public administrations and in interactions with citizens and businesses.

Relates to the actions that Public Administrations establish concerning sensitive information for the proper delivery of public services. The different actions imply the reception, classification, and exchange of such information.

- ☐ Not Answered
- ☒ Not Applicable
- ☐ The specification prevents or does not support the secure and trustworthy processing of data.
- ☐ The specification introduces certain aspects that can contribute to enabling the secure processing of data.
- ☐ The specification addresses data security and trustworthy data processing but does not foresee specific provisions to enable them.
- ☐ The specification addresses data security and trustworthy data processing but specific provisions to enable them are limited.
- ☐ The specification explicitly addresses and enables the secure and trustworthy processing of data.

### \* Justification

Data processing is only of limited relevance to XBildung. XBildung is a central component, especially for data transmission. Secure data processing must primarily be ensured by other components within the system architecture. However, XBD does not pose a security risk in this regard.

### Data authenticity

#### \* A26 - To what extent the specification guarantees the authenticity and authentication of the roles agents involved in the data transactions?

**EIF Recommendation 15:** Define common security and privacy framework and establish processes for public services to ensure secure and trustworthy data exchange between public administrations and in interactions with citizens and businesses.

Authentication defines that users are who they request to be. Availability defines that resources are available by authorized parties; “denial of service” attacks, which are the subject matter of national news, are attacks against availability. The concerns of information security professionals are access control and Nonrepudiation. Authorization defines the power that it can have over distinguishing authorized users from unauthorized users, and levels of access in-between. Authenticity defines the constant checks that it can have to run on the system to make sure sensitive places are protected and working perfectly.”

- ☐ Not Answered
- ☐ Not Applicable
- ☐ The specification prevents or does not support the implementation of authentication features.
- ☐ The specification neither addresses authenticity nor prevents it.
- ☐ The specification addresses the implementation of authenticity features but without specific provisions to enable it.
- ☒ The specification introduces certain aspects that can contribute to enabling authenticity features.
- ☐ The specification explicitly addresses and enables the implementation of authenticity features.

### \* Justification

IT security objectives ensure that the data originates from a trusted source and has not been tampered with, which is a central component of the XÖV methodology. XBildung cares for identifying a certificate provider by describing metadata of an education institution and its different parts of the organisation. It therefore supports the ongoing setup of a "register of education institutions in Germany" (Bildungseinrichtungsregister) <https://ozg.sachsen-anhalt.de/umsetzung-im-land/themenfeld-bildung/das-themenfeld-bildung-informiert/bildungseinrichtungsregister>

### Data integrity

#### \* A27 - To what extent information is protected against unauthorised changes?

**EIF Recommendation 15:** Define common security and privacy framework and establish processes for public services to ensure secure and trustworthy data exchange between public administrations and in interactions with citizens and businesses.

Integrity defines that information is protected against unauthorized changes that are not perceptible to authorized users; some incidents of hacking compromise the integrity of databases and multiple resources.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ The specification prevents or does not support the implementation of data integrity mechanisms /features.
- ☐ The specification neither addresses data integrity nor prevents it.
- ☐ The specification addresses data integrity but without specific provisions to enable it.
- ☐ The specification introduces certain aspects that can contribute to enabling data integrity.
- ☒ The specification explicitly addresses and enables the implementation of features to guarantee data integrity.

**\* Justification**

The XÖV methodology provides protection against unauthorized access in the sense of confidentiality, integrity and authenticity. It allows for XML signatures and provides validation facilities (in march 2025 not yet allowing to validate signatures (Interop Test Bed: <https://www.itb.ec.europa.eu/xbildung/upload> )

**Data accuracy**

**\* A28 - To what extent does the specification ensure and enable data processing accuracy?**

**EIF Recommendation 15:** Define common security and privacy framework and establish processes for public services to ensure secure and trustworthy data exchange between public administrations and in interactions with citizens and businesses.

The accuracy and completeness of information systems and the data supported within the systems should be an administration concern. The information which has been inappropriately changed or destroyed (by external or employees) can impact the organization. Each organization should make controls to provide that data entered into and saved in its automated files and databases are complete and accurate and provide the accuracy of disseminated data.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ The specification prevents or does not support the implementation of data accuracy mechanisms/features.
- ☐ The specification neither addresses data accuracy nor prevents it.
- ☐ The specification addresses data accuracy but without specific provisions to enable it.
- ☐ The specification introduces certain aspects that can contribute to enabling data accuracy.
- ☒ The specification explicitly addresses and enables the implementation of features to guarantee data accuracy.

**\* Justification**

By involving stakeholders including manufacturers from the education sector early on, XBildung and the other projects can ensure very precise semantic data transfer. Representatives being subject matter experts were involved right from the development stage. Through comprehensive feedback, the specification was continually refined, so that the standard accurately reflects the subject matter even before regular operation.

**Access Control**

**\* A29 - To what extent does the specification provide an access control mechanism?**

**EIF Recommendation 15:** Define common security and privacy framework and establish processes for public services to ensure secure and trustworthy data exchange between public administrations and in interactions with

citizens and businesses.

The principle of access control decides who must be able to access what. For example, it must be able to define that user A can view the data in a database, but cannot refresh them. User A can be allowed to create updates as well. An access-control mechanism can be installed to provide this. Access control is associated with two areas including role management and rule management. Role management applies on the user side, whereas rule management targets the resources side.

- ☐ Not Answered
- ☒ Not Applicable
- ☐ The specification does not provide access control mechanisms.
- ☐ The specification neither addresses nor prevents access control mechanisms.
- ☐ The specification addresses access control mechanisms but without specific provisions to enable them.
- ☐ The specification introduces certain aspects that can contribute to enabling access control mechanisms.
- ☐ The specification explicitly foresees a set of requirements for the enabling of access control mechanisms.

\* Justification

There are no access control mechanisms that are explicitly supported by XBildung.

## Multilingualism

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\* **A30 - To what extent could the specification be used in a multilingual context?**

**EIF Recommendation 16:** Use information systems and technical architectures that cater to multilingualism when establishing a European public service. Decide on the level of multilingualism support based on the needs of the expected users.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ The specification cannot be used in a multilingual context.
- ☐ The specification could be used in a multilingual context but has no specific provisions to facilitate this.
- ☐ The specification foresees limited support for multilingualism.
- ☒ The specification foresees support for multilingualism but this is not complete.
- ☐ The specification is designed to fully support multilingualism.

\* Justification

Currently, the specifications are available exclusively in German.  
The markup used is mostly German. The XML content can be marked with BCP47 compliant language tags.  
Some codelists were mapped to English versions of European Learning model vocabularies.



This category includes the criteria aiming to evaluate principles related to collaboration amongst public organisations, business, and citizens. This is related to the underlying principles of administrative simplification (UP10), preservation of information (UP11), and assessment of effectiveness and efficiency (UP12).

## Administrative Simplification

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### \* A31 - Does the specification simplify the delivery of European public services?

**EIF Recommendation 17:** Simplify processes and use digital channels whenever appropriate for the delivery of European public services, to respond promptly and with high quality to users' requests and reduce the administrative burden on public administrations, businesses and citizens.

A positive answer would cover every specification easing digitalisation and administrative simplification by for example helping an Identification service access a Digital Portfolio with citizens information.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ NO
- ☒ YES

#### \* Justification

By mapping the respective classes and attributes within a European framework, a standardized data exchange can be enabled. Such semantic interoperability simplifies the provision of European services, as only a single semantic interface needs to be implemented. Developers of these services thus no longer have to ensure compatibility with countless other systems; instead, they can simplify this process by using XBildung. Mapping to ELM was part of the activities of XBildung since 2022.

### \* A32 - Does the specification enable digital service delivery channels?

**EIF Recommendation 17:** Simplify processes and use digital channels whenever appropriate for the delivery of European public services, to respond promptly and with high quality to users' requests and reduce the administrative burden on public administrations, businesses and citizens.

A positive answer would cover that a specification eases or provides better means of delivering public services as a good asset for digitalisation and administrative simplification. For instance, a specification directly related to API performance easing and improving the delivery of a Digital Public Service through an API.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ NO
- ☒ YES

#### \* Justification

The specification is agnostic to technical interoperability issues. It allows the provision of services among several channels, including "DeutschlandID" Account, Wallets or other means to store or transport digital certificates.

## Preservation of Information

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### \* A33 - To what extent does the specification enable the long-term preservation of data/information /knowledge (electronic records included)?

**EIF Recommendation 18:** Formulate a long-term preservation policy for information related to European public services and especially for information that is exchanged across borders.

Relates to the capacity of the specification to contribute to the long-term preservation of information.

- ☐ Not Answered
- ☒ Not Applicable
- ☐ The specification prevents or does not support long-term preservation.
- ☐ The specification neither addresses the long-term preservation nor prevents it.
- ☐ The specification addresses the long-term preservation of electronic resources (information, data, etc) in a limited manner.
- ☐ The specification addresses long-term preservation of electronic resources (information, data, etc), but not in a complete manner.
- ☐ The specification explicitly addresses and enables long-term preservation.

### \* Justification

The long-term storage of educational certificates is currently out of scope of XBildung. However, the different PDF-A versions were checked (<https://www.bundesarchiv.de/assets/bundesarchiv/de/Downloads/Erklaerungen/beratungsangebote-grundl-sgv-empfehlungen-pdf-a-versionen.pdf>) and advice was given which one to choose.

## Assessment of Effectiveness and Efficiency

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### \* A34 - To what extent are there assessments of the specification's effectiveness?

**EIF Recommendation 19:** Evaluate the effectiveness and efficiency of different interoperability solutions and technological options considering user needs, proportionality, and balance between costs and benefits.

Related to the degree to which the specification is effective while using it. There are indirect methods to determine that the specification is effective, for instance when a solution that has an effective performance and uses the specification to deliver the expected service.

Effectiveness: *the extent to which the specifications reach the expected action according to its purpose.*

- ☐ Not Answered
- ☐ Not Applicable
- ☒ There are no such assessments.
- ☐ There are such assessments that indirectly address the specification.
- ☐ There are such assessments evaluating digital solutions' effectiveness that involve the specification.
- ☐ There are such assessments addressing the specification and its effectiveness together with other specifications.
- ☐ There are such assessments directly addressing the specification.

\* Justification

Currently the effectiveness of the specification is not assessed.

\* **A35 - To what extent are there assessments of the specification's efficiency?**

**EIF Recommendation 19:** Evaluate the effectiveness and efficiency of different interoperability solutions and technological options considering user needs, proportionality, and balance between costs and benefits.

Related to the good use of time and resources not wasted unnecessarily by a specification being used. There are indirect methods to determine that the specification is efficient, for instance, a solution delivering a service with an efficient performance that uses the specification.

Efficiency: times and means needed to achieve the results using the specification.

- ☐ Not Answered
- ☐ Not Applicable
- ☒ There are no such assessments.
- ☐ There are such assessments that indirectly address the specification.
- ☐ There are assessments evaluating digital solutions' efficiency that involve the specification.
- ☐ There are such assessments addressing the specification and its efficiency together with other specifications.
- ☐ There are such assessments directly addressing the specification.

\* Justification

Currently the efficiency of the specification is not assessed.

## EIF INTEROPERABILITY LAYERS

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This category is aligned with the related interoperability models described in the EIF and apply to all the public services. It includes six layers: interoperability governance, integrated public service governance, legal interoperability, organisational interoperability, semantic interoperability, and technical interoperability covered by criteria A2 to A10 under the Openness category.

### Interoperability Governance

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\* **A36 - Is the (or could it be) specification mapped to the European Interoperability Architecture (EIRA)?**

**EIF Recommendation 20:** Ensure holistic governance of interoperability activities across administrative levels and sectors.

The EIRA defines the required capabilities for promoting interoperability as a set of Architecture Building Blocks (ABBs). The association of specification to these ABBs means the capacity to enable Legal, Organisational, Semantic, or Technical aspects needed for the development of interoperable public services. This association can be taken from ELIS the EIRA Library of Interoperability Specifications (ELIS) but also can be established ad-hoc.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ NO
- ☒ YES

**\* Justification**

Parts of the specification could be mapped to the EIRA. The specification supports content in semantic repositories.

**\* A37 - To what extent can the conformance of the specification's implementations be assessed?**

**EIF Recommendation 21:** Put in place processes to select relevant standards and specifications, evaluate them, monitor their implementation, check compliance and test their interoperability.

Relates to the implementation of the specification being conformant with the requirements established in the text of the specification. There are different methods to ensure the conformance of an implementation: check manually if the implementation meets the requirements in the specification text (if any), use additional methods or resources provided to this purpose or use specific tools provided by the SDO developing the specification.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ The specification does not include a definition of conformance.
- ☐ The specification defines conformance but not as a set of measurable requirements.
- ☐ The specification defines conformance as requirements that can be measured manually.
- ☐ The specification defines conformance as requirements with resources to enable automated measurement.
- ☒ The specification is complemented by a conformance testing platform to allow testing of implementations.

**\* Justification**

The Interoperable Test bed can be used to assess XBildung conformance in an early stage.  
The source code of the test bed is also provided by github to allow for data sensitive local validation of data but also features a free to use webservice of the European Commission.

**\* A38 - Is the specification recommended by a European Member State?**

**EIF Recommendation 23:** Consult relevant catalogues of standards, specifications, and guidelines at the national and EU level, in accordance with your NIF and relevant DIFs, when procuring and developing ICT solutions.

Recommended specifications are these specifications that the Member States provide as examples for the implementation of certain digital public services or for being used when procuring these digital public services or solutions.

- ☐ Not Answered
- ☐ Not Applicable
- ☒

NO  
☐ YES

\* Justification

XBildung is not yet used by another Member State. It is clearly guided by German requirements that in some cases can not be found anywhere else in the world. ("German Angst", Kooperationsverbot, Bildungsföderalismus, Trennung von Pädagogik und Schulverwaltung)

\* **A39 - Is the specification selected for its use in a European Cross-border project/initiative?**

**EIF Recommendation 23:** Consult relevant catalogues of standards, specifications, and guidelines at national and EU level, in accordance with your NIF and relevant DIFs, when procuring and developing ICT solutions.

The European Commission set up a process for the identification and assessment of specifications for its use in the development of IT solutions and also when procuring them. Find here the commission implementing decisions that include the specifications identified by the European Commission: [https://ec.europa.eu/growth/single-market/european-standards/ict-standardisation/ict-technical-specifications\\_en](https://ec.europa.eu/growth/single-market/european-standards/ict-standardisation/ict-technical-specifications_en)

Additionally, there could be other situations where a specification can be selected for European projects or initiatives out of the scope of the above-mentioned context. These specifications can be considered positively in this assessment.

☐ Not Answered  
☐ Not Applicable  
☒ NO  
☐ YES

\* Justification

No, the specification is not yet used in a European cross-border project although transformations from and to ELM format had been created.

\* **A40 - Is the specification included in an open repository/catalogue of standards at national level?**

**EIF Recommendation 23:** Consult relevant catalogues of standards, specifications, and guidelines at the national and EU level, in accordance with your NIF and relevant DIFs, when procuring and developing ICT solutions.

**EIF Recommendation 6:** Reuse and share solutions, and cooperate in the development of joint solutions when implementing European public services.

☐ Not Answered  
☐ Not Applicable  
☐ NO  
☒ YES

\* Justification

The specification is published  
a) on the website <https://xbildung.de/web/spezifikation>

- b) in github and <https://github.com/ThemenfeldBildung>
- c) in XRepository [https://www.xrepository.de/details/urn:xoev-de:xbildung-de:def:standard:xbildung\\_1.1#version](https://www.xrepository.de/details/urn:xoev-de:xbildung-de:def:standard:xbildung_1.1#version)
- d) in the XÖV-Suite: <https://suite.xoev.de/>

**\* A41 - Is the specification included in an open repository/catalogue of standards at European level?**

**EIF Recommendation 23:** Consult relevant catalogues of standards, specifications, and guidelines at the national and EU level, in accordance with your NIF and relevant DIFs, when procuring and developing ICT solutions.

**EIF Recommendation 6:** Reuse and share solutions, and cooperate in the development of joint solutions when implementing European public services.

- ☐ Not Answered
- ☐ Not Applicable
- ☒ NO
- ☐ YES

**\* Justification**

No, XBildung is not additionally published at European level

## Legal Interoperability

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**\* A42 - Is the specification a European Standard?**

**EIF Recommendation 27:** Ensure that legislation is screened by means of 'interoperability checks', to identify any barriers to interoperability. When drafting legislation to establish a European public service, seek to make it consistent with relevant legislation, perform a 'digital check', and consider data protection requirements.

European Standards are those standards developed by certain organisations dedicated to this purpose. CEN, CENELEC, and ETSI are the principal organisations and all of them are developing their standards under the basis of meeting the requirements established within the European Standardisation Regulation. CEN-CENELEC homepage: <https://www.cencenelec.eu/>

- ☐ Not Answered
- ☐ Not Applicable
- ☒ NO
- ☐ YES

**\* Justification**

XBildung is not a European standard, but it uses international standards (OASIS Genericcode, W3C stack)

## Organisational Interoperability

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### \* A43 - Does the specification facilitate the modelling of business processes?

**EIF Recommendation 28:** Document your business processes using commonly accepted modelling techniques and agree on how these processes should be aligned to deliver a European public service.

- ☐ Not Answered
- ☐ Not Applicable
- ☐ NO
- ☒ YES

#### \* Justification

XÖV compliant Specifications do feature UML activity diagrams clearly pointing out the moment, when data is exchanged. This facilitates the modelling of bussiness processes e.g. with BPMN.

### \* A44 - To what extent does the specification facilitate organisational interoperability agreements?

**EIF Recommendation 29:** Clarify and formalise your organisational relationships for establishing and operating European public services.

Relates to specifications' capacities to help and ease the creation and formalisation of Interoperability agreements. E.g. Memorandums of Understanding (MoUs), Services Level Agreements (SLAs).

- ☐ Not Answered
- ☐ Not Applicable
- ☐ The specification's definition hinders the drafting of such agreements.
- ☐ The specification makes no provisions that would facilitate the drafting of such agreements.
- ☒ The specification defines certain elements to facilitate such agreements.
- ☐ The specification defines most elements to facilitate such agreements.
- ☐ The specification explicitly identifies all elements to be used in drafting such agreements.

#### \* Justification

In some cases the specification allows for own federal codelists in addition or as a replacement for the central-wide ones. In these cases it facilitates the mapping respecting different organisational aspects (XSchule: pädagogischer Förderbedarf; XBildung: Äquivalenzbemerkung auf Zeugnissen)

## Semantic Interoperability

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### \* A45 - Does the specification encourage the creation of communities along with the sharing of their data and results in national and/or European platforms?

**EIF Recommendation 32:** Support the establishment of sector-specific and cross-sectoral communities that aim to create open information specifications and encourage relevant communities to share their results on national

and European platforms.

Relates to specifications that are narrowly related to the data/information being exchanged, its format, and structure. It would allow a common method/mechanism to improve its reuse and exchange removing possible limitations. An example of it could be RDF, which is used to describe information and its metadata using specific syntax and serialisation.

- ☐ Not Answered
- ☐ Not Applicable
- ☒ Yes, but at national or regional level.
- ☐ Yes, at European platforms.

**\* Justification**

Yes, in national platforms

## Useful links

[CAMSS Joinup Page \(https://joinup.ec.europa.eu/collection/common-assessment-method-standards-and-specifications-camss\)](https://joinup.ec.europa.eu/collection/common-assessment-method-standards-and-specifications-camss)

[CAMSS Library of Assessments \(https://joinup.ec.europa.eu/collection/common-assessment-method-standards-and-specifications-camss/camss-assessments-library\)](https://joinup.ec.europa.eu/collection/common-assessment-method-standards-and-specifications-camss/camss-assessments-library)

[CAMSS Assessment EIF Scenario - User Guide \(https://joinup.ec.europa.eu/collection/common-assessment-method-standards-and-specifications-camss/solution/camss-assessment-eif-scenario/camss-assessment-eif-scenario-quick-user-guide\)](https://joinup.ec.europa.eu/collection/common-assessment-method-standards-and-specifications-camss/solution/camss-assessment-eif-scenario/camss-assessment-eif-scenario-quick-user-guide)

## Contact

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