



ASSESSMENT SUMMARY v1.0.0

OGC Training Data Markup Language for Artificial Intelligence (TrainingDML-AI)¹

Open Geospatial Consortium²

¹ OGC TrainingDML-AI: <https://docs.ogc.org/is/23-008r3/23-008r3.html>

² Open Geospatial Consortium: <https://www.ogc.org/>

Change Control

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1. INTRODUCTION

2. ASSESSMENT SUMMARY

The present document is a summary of the assessment of **Training DML-AI** carried out by CAMSS using the

CAMSS³ The Training Data Markup Language for Artificial Intelligence (TrainingDML-AI) Standard aims to develop or specify the UML model and encodings for geospatial machine learning training data. Training data plays a fundamental role in Earth Observation (EO) Artificial Intelligence Machine Learning (AI/ML), especially Deep Learning (DL). It is used to train, validate, and test AI/ML models. This Standard defines a UML⁵ model and encodings consistent with the OGC Standards baseline to exchange and retrieve the training data in the Web environment.

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**

According to the National Interoperability Framework Observatory (NIFO)⁶ factsheets,

WAI-ARIA

is not included in any national catalogue of any Member State.

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

:

- **Openness**

The TrainingDML-AI framework is utilized for training, validating, and testing AI/ML models, adhering to UML model standards and OGC Standards. The Technical Committee (TC) oversees the development and maintenance of OGC Standards, ensuring feedback confidentiality while fostering an open process. The evolving TrainingDML-AI standard aims to provide a universal language for describing AI models and their data, encouraging the development of AI-driven solutions among OGC members. The standard is freely available under the OGC Community Standard License, allowing for unrestricted use, modification, and distribution.

³CAMSS Assessment EIF Scenario 600: <https://joinup.ec.europa.eu/collection/common-assessment-method-standards-and-specifications-camss/solution/camss-assessment-eif-scenario/release/600>

⁴European Interoperability Framework (EIF): https://ec.europa.eu/isa2/eif_en

⁵UML: <https://www.ibm.com/docs/es/iis/11.5?topic=types-unified-modeling-language-uml-model>

⁶ <https://joinup.ec.europa.eu/collection/national-interoperability-framework-observatory-nifo/nifo-factsheets>

Transparency

The TrainingDML-AI Standard lacks explicit mention of administrative procedures, rules data, and services, focusing instead on UML model development and encodings for geospatial machine learning training data. However, its detailed metadata could inform such procedures, especially in preparing and managing AI/ML training data. While it primarily targets UML model creation, its support for web-based data exchange indirectly aids in creating essential interfaces for accessing geospatial data.

- **Reusability**

The TrainingDML-AI Standard is design for geospatial machine learning training data but extends its benefits beyond this domain. It aids in developing and deploying AI/ML applications within geospatial contexts while offering valuable guidelines applicable to diverse industries. These guidelines improve data management and AI/ML model development practices across various sectors, transcending the geospatial realm.

- **Technological neutrality and data portability**

The TrainingDML-AI Standard is technology and platform agnostic, offering a UML model and encodings adaptable to various technologies and web platforms. While partial implementations aren't explicitly mentioned, the standard allows flexibility in preparing training data and specifying metadata for different ML tasks. It permits customization and extension, accommodating external classification schemes and specific ML applications.

Additionally, the standard promotes data portability through web-based data exchange, potentially aiding the implementation and evolution of European public services utilizing AI/ML by standardizing the exchange of training data across systems and applications.

The specification fully covers the requirements and recommendations set out by the European Interoperability Framework in EIF Core Interoperability Principles:

- **User-centricity**

The TrainingDML-AI standard targets enhanced interoperability and reusability of geospatial training data by furnishing detailed metadata for formalizing the information model. It covers aspects such as preparation methods, specifying varied metadata for distinct ML tasks, and distinguishing between high-level and extended information models tailored to diverse ML applications.

- **Inclusion and accessibility**

The OGC TrainingDML-AI specification does not pertain to e-accessibility, rendering this criterion irrelevant to its purpose.

Privacy

The OGC TrainingDML-AI Standard does not address the protection of personal data managed by Public Administrations, rendering this criterion not applicable. Similarly, there is no mention of

means for restricting access to information/data, making that criterion also not applicable. Additionally, the specification's inclusion in European or National level initiatives concerning privacy aspects is not specified, thus rendering that criterion not applicable as well.

- **Security**

TrainingDML-AI focuses on UML model development for geospatial machine learning data, not on secure data exchange or processing, although standardized formats can aid security. While authenticity and access control aren't addressed, metadata can enhance data integrity, and standardized formats ensure data accuracy indirectly. Overall, the specification likely includes elements for data reliability and access control, though not explicitly stated.

- **Multilingualism**

While the specification doesn't explicitly mention multilingual contexts, its principles, like standardized formats and protocols, could facilitate multilingual data use. For example, it might enable managing training data for machine learning models operating with text data in various languages.

The specification fully covers the requirements and recommendations set out by the European Interoperability Framework in EIF Principles Related to Generic User Needs and Expectations.

- **Administrative Simplification**

The TrainingDML-AI Standard focuses on creating a UML model and encodings for geospatial machine learning training data. Its adoption indirectly improves the efficiency, effectiveness, and inclusivity of public service delivery by providing a standardized framework for utilizing geospatial training data in AI/ML applications.

By enabling online access and retrieval of data, the standard enhances accessibility and potentially streamlines digital service delivery channels. Moreover, it establishes a foundation for efficient AI/ML applications and ensures interoperable, high-quality data, thus fostering the advancement of digital services across various domains, including public administration and environmental management.

- **Preservation of information**

The TrainingDML-AI Standard provides detailed metadata for formalizing the information model of training data, which could potentially support the long-term preservation of data.

- **Assessment of effectiveness and efficiency**

The TrainingDML-AI Standard's effectiveness and efficiency have undergone rigorous internal review and approval processes. The standard's effectiveness depends on factors such as adoption rate, performance of AI/ML models trained with data prepared according to the standard, and feedback from the user community.

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 covers the basic aspects set out in the requirement and recommendations set out by the European Interoperability Framework in EIF Interoperability Layers:

- **Interoperability governance**

The TrainingDML-AI specification is included in the "Machine Learning" ABB under the Technical Infrastructure View and "Artificial Intelligence" ABB under the Technical Application View. The specification defines conformance requirements that are manually measurable, with an abstract test suite developed to verify conformity across multiple implementations.

However, there's no explicit endorsement of the specification by any European Union member state, nor confirmation of its involvement in European projects. While the Open Geospatial Consortium (OGC), responsible for TrainingDML-AI, operates globally, including in Europe, it's unclear if the specification is part of a European project.

- **Legal Interoperability**

The Open Geospatial Consortium (OGC) is an international Standards Development Organization headquartered in the United States. While it is based in the United States, the OGC collaborates with organizations and experts from around the world to develop its standards and specifications.

- **Organisational interoperability**

The OGC TrainingDML-AI Standard indirectly improves efficiency, reliability, and collaboration within organizations using geospatial analysis and AI/ML technologies. It could facilitate European agreements on geospatial data by providing a common framework, reducing interoperability barriers, and promoting collaboration. Integrating machine learning within this framework could enhance data analysis and innovation in geospatial applications across Europe.

- **Semantic Interoperability**

The specification facilitates community building by enabling data and results sharing on national and/or European platforms. It promotes collaboration and interoperability among stakeholders through standardized data management and exchange, fostering focused communities in geospatial topics. This enhances insights and best practice sharing while supporting the integration of data and results from diverse sources, enriching collective knowledge within these communities.

3. ASSESSMENT RESULTS

This section presents an overview of the results of the CAMSS assessments for **OGC TrainingDML-AI**. 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
Principle setting the context for EU actions on interoperability	20/100 (20%)	100%	Ad-hoc
Core interoperability principles	1460/1700 (86%)	94%	Seamless
Principles related to generic user needs <u>and</u> expectations	1060/1200 (88%)	42%	Seamless
Foundation principles for cooperation among public administrations	460/500 (92%)	100%	Seamless
Interoperability layers*	700/1000 (70%)	100%	Sustainable
Overall Score	2900/3700 (78%) ⁷	82%	

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

The Overall Automated Score of 78% (2900/3700) demonstrates that the specification supports the European Interoperability Framework in the domains where it applies. **With an 82% of assessment strength, this assessment can be considered representative of the specification compliance with the EIF principles and recommendations.**

⁷ 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>