

BS EN 15981:2011
Incorporating corrigendum May 2013



BSI Standards Publication

European Learner Mobility — Achievement information (EuroLMAI)

bsi.

...making excellence a habit.™

National foreword

This British Standard is the UK implementation of EN 15981:2011, incorporating corrigendum May 2013.

The start and finish of text introduced or altered by corrigendum is indicated in the text by tags. Text altered by CEN corrigendum May 2013 is indicated in the text by AC1 AC1.

The UK participation in its preparation was entrusted to Technical Committee IST/43, Information technology for learning, education and training.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2013. Published by BSI Standards Limited 2013

ISBN 978 0 580 83143 0

ICS 35.240.99

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 June 2011.

Amendments/corrigenda issued since publication

Date	Text affected
31 July 2013	Implementation of CEN corrigendum May 2013

English Version

European Learner Mobility - Achievement information (EuroLMAI)

Mobilité des apprenants européens - Informations relatives
aux résultats obtenus (EuroLMAI)

Europäisches Model für Lernermobilität - Angaben über die
Leistung (EuroLMAI)

This European Standard was approved by CEN on 24 March 2011.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents		Page
Foreword		4
Introduction.....		5
1 Scope		7
2 Normative references		8
3 Terms and definitions		9
4 Symbols and abbreviated terms		12
5 Conventions		14
6 Conformance.....		15
6.1 Conforming instances.....		15
6.2 Conforming bindings		15
6.3 Conforming applications		15
7 European Learner Mobility Achievement Information Model		16
7.1 General		16
7.2 Domain model		16
7.3 EuroLMAI Resources		17
7.3.1 Classes		17
7.3.2 Association properties.....		18
7.3.3 Attribute properties		18
7.4 Resources included from CWA 15903:2008		19
7.4.1 Classes		19
7.4.2 Association properties.....		19
7.4.3 Attribute properties		20
7.5 Properties included from ISO 15836.....		20
7.6 Properties included from DCMI Metadata Terms		20
7.7 Properties included from IETF RFC 2426.....		20
7.8 Properties included from the CWA 16077:2010.....		20
8 The EuroLMAI Description Set Profile		21
8.1 General		21
8.2 EuroLMAI Report		21
8.3 Learner.....		21
8.4 Issuer		21
8.5 Learning Opportunity Specification		22
8.6 Learning Opportunity Instance		22
8.7 Qualification		23
8.8 Credit		23
Annex A (normative) Europass Diploma Supplement Application Profile of the EuroLMAI (EuroLMAI Europass DS AP).....		24
A.1 General		24
A.2 Europass DS Refinements of the EuroLMAI.....		24
A.2.1 Classes		24
A.2.2 Association properties.....		24
A.2.3 Attribute Properties		24
A.3 The Europass DS Description Set Profile		26
A.3.1 General		26
A.3.2 Diploma Supplement Document		26
A.3.3 Learner.....		26
A.3.4 Issuer		26

A.3.5	Learning Opportunity Specification: Programme Level.....	27
A.3.6	Learning Opportunity Instance: Programme Level.....	27
A.3.7	Learning Opportunity Specification: Transcript Level	28
A.3.8	Learning Opportunity Instance: Transcript Level	29
A.3.9	Qualification	29
A.3.10	Credit	30
Annex B (informative) The EuroLMAI conceptual model.....		31
Annex C (informative) Mapping of the Europass DS to EuroLMAI		33
Annex D (informative) Illustrative uses of the EuroLMAI Model and the Europass DS Application Profile		36
D.1	General	36
D.2	Report on completed parts of a programme of study	36
D.3	Transcript information for a period of learning.....	37
D.4	Report on qualification obtained for a completed programme of study	39
D.5	EuroLMAI Europass DS document.....	39
Annex E (informative) Application Profiling.....		41
E.1	DCMI Abstract Model	41
E.2	Application Profiles and their roles and usage	41
E.3	Extensions to properties	41
E.4	Graceful degradation	42
Bibliography.....		43

Foreword

This document (EN 15981:2011) has been prepared by Technical Committee CEN/TC 353 "Information and Communication Technologies for Learning, Education and Training", the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2011, and conflicting national standards shall be withdrawn at the latest by November 2011.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

The European Learner Mobility Achievement Information Model (EuroLMAI) addresses the identified need for a harmonized solution to the recording and exchange of learner mobility information within the European Education Area. The results of this work will contribute to the effort towards interoperable European-wide IT systems that manage and exchange learner achievement information.

The "European Learner Mobility" Working Item was initiated by the Hellenic Organization for Standardization (ELOT), Greece. The development of the proposed model has been carried out within the context of the CEN WS-LT project on "Guidelines for a European Learner Mobility Model", funded under the 2008 ICT Standardization Work Programme. The project was initiated and led by the Hellenic Organization for Standardization (ELOT) and the Technological Educational Institute of Athens (Greece). The document has been developed through the collaboration of a number of contributing partners, representing a wide mix of interests, among others JISC-CETIS (UK), Hypatia AS (Norway), KION (Italy), the Manchester Metropolitan University (UK), University of Duisburg Essen/eLC (Germany), USIT/UiO (Norway), Digitary (Ireland), University of Vigo (Spain), ISFOL (Italy), Alan Paull Services (UK). The close collaboration and substantial support of the Rome Student Systems and Standards Group of software implementers regarding the European Learner Mobility (EuroLM) standardization efforts is highly acknowledged.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

The establishment of Europass as a common framework which is accepted throughout Europe demonstrates that European education has reached a maturity stage where the demand for the recording and exchange of learner mobility information needs to be efficiently supported by technical interoperability standards.

At the initiation point of this Working Item several relevant standardization efforts were identified and significant national expertise had already been accumulated. However, harmonization was deemed necessary towards a European solution, in order to provide viable support for emerging European student management information systems and dissuade service providers from developing proprietary services and platforms.

The results of the current and future European Learner Mobility (EuroLM) work aspire to support the development of a new generation of technology-enhanced services for learners (learning and employment opportunities exploration), higher education institutions (certification or augmentation of learner information), employers (work-place descriptions, recruiting and development of learners' competences) and other stakeholders of learning, education, and training throughout Europe, as the European Union and Commission, the Member States and their governments and ministries, etc.

The EuroLM Achievement Information (EuroLMAI) model directly addresses the European requirement for rapid implementation and dissemination of the institution-owned transparency information tools throughout Europe. It has been developed as a generic model for representing the institution attested achievements of a learner within a formal learning setting, resulting from the learner's participation in one or more learning opportunity instances and including any available associated results.

This European Standard specifies a subset (skeleton) of the generic EuroLMAI model that supports the expression of institution-owned learner achievement information and the formation of official achievement reports (e.g. the learner's Transcript of records) and transparency documents (e.g. Europass Diploma Supplement). The need for supporting of additional learner mobility achievement structures and tools (e.g. that of Europass Mobility) calls for the enhancement of the skeleton model with additional standardized information entities (e.g. intended learning outcomes, assessment processes) and relevant standardization activities are underway in order to provide other important extensions to EuroLMAI.

In addition to EuroLMAI, this European Standard provides an Application Profile of the EuroLMAI model, introducing necessary refinements and constraints for the accurate representation of the Europass Diploma Supplement (DS).

The Europass DS is considered one of the most important documents of the Europass framework, which significantly contributes to the transparent interpretation and recognition of academic and professional qualifications (diplomas, degrees, certificates) across the diverse European educational systems. In essence, the Europass DS aims at:

- promoting transparency within and between higher education systems;
- providing accurate and up-to-date information on an individual's qualifications;
- aiding mobility and access to further study and employment abroad;
- providing fair and informed information relating to qualifications;

- facilitating academic and professional recognition and thus increasing the transparency of qualifications.

The Europass DS constitutes an instrument upon which a high level of agreement on the content and structure has been achieved among the EU member states. The European countries have taken up the DS initiative and have specified their national variants, in most cases being minor variations of the Europass DS. However, currently the DS is mostly issued in paper-based format. In cases where it is issued electronically, the DS is represented in a proprietary manner. A major problem has been the lack of interoperable tools, impeding the recording and/or reuse of data in existing student management systems for the production of an electronic DS and the exchange of information among interested parties.

The EuroLMAI model and its Europass DS Application Profile have been developed as:

- a lightweight standard taking into consideration existing and emerging educational practice processes and the relevant European policies;
- an easy-to-implement standard in order to ensure a rapid uptake by stakeholders of learning, education and training throughout Europe (higher education institutions, learners, employers, service providers, etc.)

1 Scope

This European Standard specifies a model for the recording and exchange of learner achievement information among student management information systems, as well as the aggregation of information by third party suppliers.

The model proposed within this European Standard is not intended to define the representation of the entire spectrum of Learner Mobility information - the scope of the standard is restricted to the definition of the electronic representation of official, institutionally attested achievement information for learners engaged in formal learning processes, in order to facilitate its recording and subsequent exchange within the European education area.

Achievement Information structured and presented in compliance with this standard may, of course, be used for other purposes - for instance, to provide descriptions of achievement to enrich a learner-owned report, in terms of an e-portfolio. However, guidance on the specification and the organisation of information for purposes other than the representation of formal achievement reports is outside the scope of this European Standard.

In addition, this European Standard defines refinements to the EuroLMAI model for representing the Europass DS.

The Europass Diploma Supplement Application Profile of EuroLMAI, in full compliance with the Europass requirements, focuses on the expression of information regarding the qualification awarded to a learner upon completion of a formal educational programme. The proposed profile is needed for the general purposes of:

- the exploitation of academic achievements abroad: in continuing education or in seeking job opportunities;
- the admission of students or graduates in home and European universities: acknowledgment of credits or transfer of credits accumulated in home institutions moving from one university to another;
- the expression of the level, content and nature of qualifications to potential employers both nationally and at a European level;
- the enhancement of internal and European student mobility, from a university to another, or from one branch of studies to another;
- the proper integration of foreign workers into a country's employment setting;
- the normalisation of higher education qualifications, either in academic or non-academic paths;
- the establishment of good practices in the recognition procedures of qualifications among Higher Education Institutions.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CWA 15903:2008, *Metadata for Learning Opportunities (MLO) — Advertising*

CWA 16077:2010, *Educational Credit Information Model*

CWA 16076:2010, *ECTS Information Package/Course Catalogue MLO Application Profile*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

assessment result

result

recorded result of an assessment process

3.2

awarding body

organisation that awards credit or qualifications

NOTE The same organisation may also be a learning opportunity provider or an issuer.

3.3

credit

quantified means of expressing the volume of learning based on the workload students need in order to achieve the expected outcomes of a learning process at a specified level [1]

3.4

credit scheme

credit transfer scheme

see 3.9

3.5

credit value

particular amount of credit

NOTE Credit value is only meaningful within a framework or credit scheme, and the framework or scheme may require the specification of a level. The European Credit Transfer System (ECTS) is one such scheme. Credit value is an abstract amount that can be applied in several circumstances.

3.6

diploma

official documentary record of the awarding of a qualification

NOTE This is equivalent to the ECTS Users' Guide Glossary [1] term Qualification: "Any degree, diploma or other certificate issued by a competent authority attesting the successful completion of a recognised programme of study." Here, the preferred usage of the term "qualification" (q.v.) is for the status conferred, not the documentation.

3.7

Diploma Supplement

EuroLMAI report that contains Europass Diploma Supplement Information

3.8

EuroLMAI report

report that contains achievement information for a single learner within a formal educational setting

3.9

framework

credit scheme

system of concepts, definitions and provisions through which educational practices are ordered, related and articulated

3.10

issuer

body that issues the EuroLMAI report

NOTE The same body may also be a learning opportunity provider or an awarding body.

3.11

learner

individual currently or formerly enrolled in a formal learning opportunity

NOTE The learning opportunity may be a part or whole programme of study, a seminar, work experience, a single course, etc.

3.12

learning opportunity

formally specified education or training process

NOTE This is close to the ECTS Users' Guide Glossary [1] definition of Educational Component: "A self-contained and formally structured learning experience (such as: course unit, module, seminar, work placement)." There are other opportunities to learn that are less structured, but these are of less interest in the context of European learner mobility. Within the Diploma Supplement context, a learning opportunity is seen as either the formal educational programme the learner has successfully completed or a component of this programme.

3.13

learning opportunity instance

single presentation of a learning opportunity

NOTE "Unlike a learning opportunity specification, a learning opportunity instance is not abstract, may be bound to particular dates or locations, and may be applied for or participated in by learners" as in CWA 15903:2008.

3.14

learning opportunity provider

organisation that validates or advertises learning opportunity specifications, or that runs learning opportunity instances

NOTE The same organization may also be an issuer or an awarding body.

3.15

learning opportunity specification

description of a learning opportunity, consisting of information that will be consistent across multiple instances of the learning opportunity

[CWA 15903:2008]

3.16

level

educational level

one of a set of terms, properly defined within a framework or scheme, applied to an entity in order to group it together with other entities relevant to the same stage of education

NOTE This is similar in intention to the definition of level in CWA 15903:2008 which in turn refers to the Dublin Core term with name "educationLevel" and label "Audience Education Level". Level terms are typically consecutive small integers.

3.17

module

course unit in a system in which each course unit carries the same number of credits or a multiple thereof [1]

3.18

programme

set of learning opportunities for successful completion of which the learner can be awarded a specified qualification

NOTE ECTS Users' Guide Glossary [1] defines "Programme (educational)" as a "set of educational components, based on learning outcomes that are recognised for the award of a specific qualification". In a learner mobility document (including Diploma Supplement), the programme refers to the top level learning opportunity whose results are represented in the document.

3.19

qualification

status awarded to or conferred on a learner by an awarding body

NOTE This is compatible with the Qualification property of CWA 15903:2008. A qualification is identified and represented by its name, and possibly also its subject. To be of value, a qualification needs to be meaningful within the system of education and within the society in which it is embedded. The European Qualifications Framework (EQF) defines a qualification as "a formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards", which says a lot about the process, but little about the nature of the outcome.

3.20

student

see 3.11

3.21

transcript

collection of information, represented in a learner mobility achievement report, about learning opportunity instances taken by a learner, including any available associated results for that learner

4 Symbols and abbreviated terms

The following symbols and abbreviated terms are used in this European Standard.

4.1

AP

Application Profile

4.2

DCAM

Dublin Core Abstract Model

4.3

DCMI

Dublin Core Metadata Initiative

4.4

DS

Diploma Supplement

4.5

DSP

Description Set Profile

4.6

ECTS

European Credit Transfer and accumulation System

4.7

EQF

European Qualifications Framework

4.8

EuroLM

European Learner Mobility

4.9

EuroLMAI

European Learner Mobility Achievement Information

4.10

MLO-AD

Metadata for Learning Opportunities - Advertising

4.11

RDF

Resource Description Framework

4.12

SF

Singapore Framework

4.13

UML

Unified Modelling Language

4.14

URI

Uniform Resource Identifier

4.15

URL

Uniform Resource Locator

4.16

W3C

World Wide Web Consortium

5 Conventions

Base URIs for classes and properties defined in this European Standard are introduced with the "elm:" and "eds:" prefixes.

NOTE The namespaces for classes and properties defined in this European Standard are currently <http://purl.org/net/elm> (prefix "elm:") and <http://purl.org/net/eds> (prefix "eds:"). CEN has initiated a process for the establishment of a Namespace policy and the provision of related services. Upon resolution of this issue the text of this clause will be amended as appropriate.

Base URIs for classes and properties included from CWA 15903:2008 are introduced with the "mlo:" prefix.

6 Conformance

6.1 Conforming instances

A *strictly conforming instance* is a set of structured information constituted only of objects and statements defined by the classes and properties of this European Standard and fully qualified refinements of the properties defined in this European Standard.

A *fully qualified refinement* is defined for the purpose of conformance as a property that explicitly extends a property defined by this European Standard. A fully qualified refinement shall be capable of being processed according to the semantics of the property it extends.

A *conforming instance* may contain additional objects and properties.

6.2 Conforming bindings

A *strictly conforming binding* is constituted only of bindings to an exchange format of the classes and properties defined by this European Standard and fully qualified refinements of the properties defined in this European Standard.

A *conforming binding* may contain additional properties that do not necessarily extend or map to the properties defined in this European Standard.

Both strictly conforming bindings and conforming bindings shall be capable of generating and validating instances that can be automatically converted to a strictly conforming instance of this European Standard.

Both strictly conforming bindings and conforming bindings may impose additional constraints upon the values of properties defined in this European Standard.

Both strictly conforming bindings and conforming bindings may impose cardinality constraints on properties defined in this European Standard.

6.3 Conforming applications

A conforming application shall have at least one of the following capabilities:

- generating conforming instances and/or instances conforming to a conforming binding;
- processing conforming instances, and/or instances that conform to a conforming binding.

7 European Learner Mobility Achievement Information Model

7.1 General

This European Standard has been developed following the principles of the Singapore Framework (SF) methodology for application profiles defined by the Dublin Core Metadata Initiative (DCMI) [2], [3]. The EuroLMAI Model is defined in terms of:

- a Conceptual model (informative, see Annex B), aiming at the description of the semantics of the achievement information field through the representation of the participating entities and a series of assertions about its inherent processes, and
- a Domain model (normative, see 7.2), providing a detailed description of the EuroLMAI Instance (report) resources and their associations.

7.2 Domain model

The EuroLMAI model is concerned with specific sets of learner achievement information arising from the different administrative processes carried out at the institutions throughout the implementation of educational practice, as well as with the associations amongst them. It builds upon:

- information about the learner currently or formerly enrolled in a formal learning opportunity;
- information about the issuer of the report (institution attesting the learner's achievements and/or awarding the learner with a qualification);
- information about the learning opportunity the learner has taken, any associated results obtained, and the qualification possibly achieved;
- information about the components studied as well as the result and credits in those components;
- other achievement information.

This sub-clause defines the domain model of the skeleton EuroLMAI model. More specifically, it defines a EuroLMAI Instance (Report) as an assemblage pattern of such information, namely:

- a *learner* instance, representing the individual enrolled in a formal learning opportunity (part or full programme of study, course, work experience, etc.);
- an *issuer* instance, representing the authority that awards credits and/or qualifications and/or attests learner participation in the described learning opportunities including any associated results gained;
- at least one *Learning Opportunity Specification* instance, which, depending on its function and level, may comprise any or all of the following information:
 - description of a learning opportunity or period of learning the learner currently or formerly enrolled in (with reference to provider and – if specified – to related credit information), and in case of successful completion, of the qualification achieved, including the actual result for the specific learner;

- description of possible component units (each of which may contain provider, credit, and result information for the specific learner);
- and optionally, a set of additional information properties.

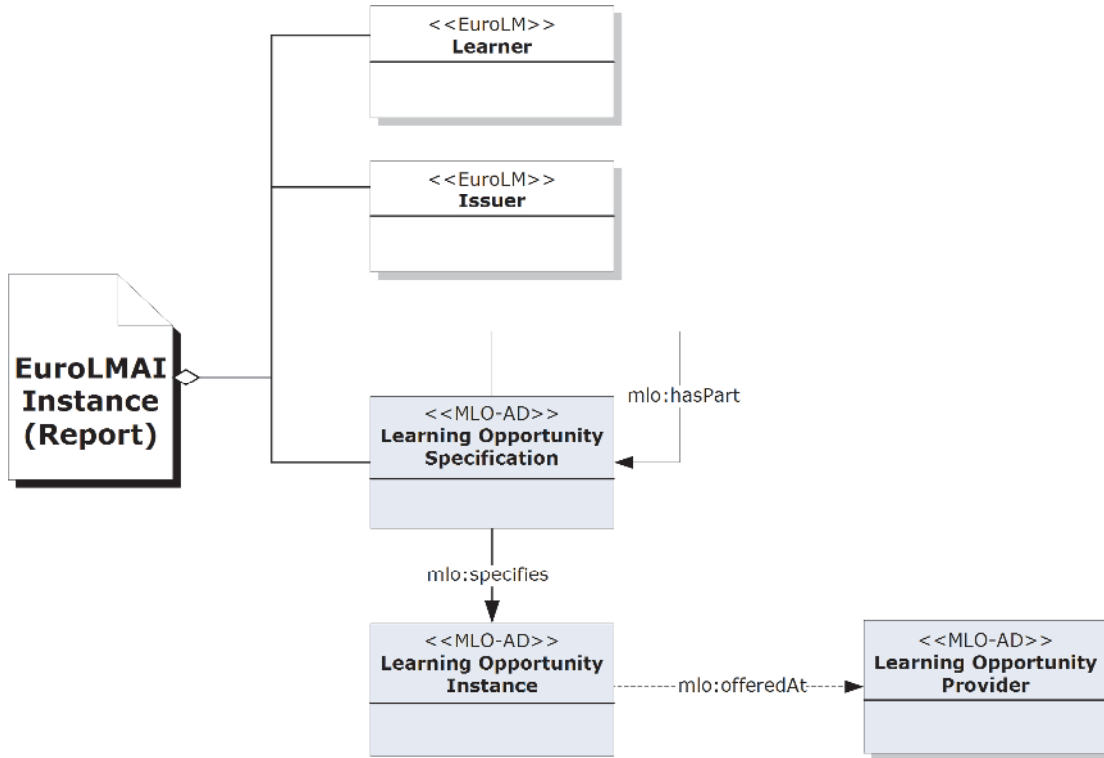


Figure 1 — Domain model of the EuroLMAI skeleton

Figure 1 illustrates the domain model in UML [4]. Attention is drawn to the UML class diagram specification for an explanation of the underlying semantics of this diagram. Each box in the diagram relates to a *Class*. Each named association (line with label) in the diagram represents an *Association Property*. The *Resources* of this model are either defined in this specification or in other standards referred to in the following sub-clauses. *Attribute Properties* from other relevant standards have also been reused. Arrows on named associations indicate the direction in which traversal between instances can occur. No cardinality is specified for any association. Lines with an unfilled diamond shape represent an association with an aggregation relationship, indicating that one class is a part of another class.

The EuroLMAI model follows an application profile approach. Application profiles can be defined as schemas which consist of elements drawn from one or more namespaces, combined together and optimised for particular applications.

7.3 EuroLMAI Resources

7.3.1 Classes

The following classes are defined for European Learner Mobility Achievement Information.

URI: elm:Learner

Label: **Learner**

Type: Class

Definition: Individual currently or formerly enrolled in a formal learning opportunity

Comments: For example, part of or full programme of study, seminar, work experience, single course, etc.

URI: elm:Issuer

Label: **Issuer**

Type: Class

Definition: The body that issues the EuroLMAI report

Comments: May be the same as the provider of the top-level learning opportunity, but the role is different

7.3.2 Association properties

This European Standard does not define any new association properties.

7.3.3 Attribute properties

The following attribute properties are defined for European Learner Mobility Achievement Information.

URI: elm:result

Label: **Result**

Domain: <http://www.w3.org/2000/01/rdf-schema#Resource>

Range: <http://www.w3.org/2000/01/rdf-schema#Resource>

Definition: The actual outcome of a learning opportunity for a learner as stated by a provider or issuer

Comments:

URI: elm:gradingScheme

Label: **Grading Scheme**

Domain: <http://www.w3.org/2000/01/rdf-schema#Resource>

Range: <http://www.w3.org/2000/01/rdf-schema#Resource>

Definition: Information on the grading scheme used for the assessment of a learning opportunity

Comments:

URI: elm:languageOfAssessment

Label: **Language of Assessment**

Domain: <http://www.w3.org/2000/01/rdf-schema#Resource>

Range: <http://www.w3.org/2000/01/rdf-schema#Literal>

Definition: The language by which a learning opportunity is assessed

Comments: Attention is drawn to ISO 639

URI: elm:additionalInformation

Label: **Additional Information**

Domain: <http://www.w3.org/2000/01/rdf-schema#Resource>

Range: <http://www.w3.org/2000/01/rdf-schema#Resource>

Definition: Additional information concerning the resource

Comments: For example, additional information related to a EuroLMAI report

URI: elm:issueDate

Label: **Issue Date**

Domain: <http://www.w3.org/2000/01/rdf-schema#Resource>

Range: <http://www.w3.org/2000/01/rdf-schema#Literal>

Sub Property Of: <http://purl.org/dc/elements/1.1/date>

Definition: The date on which the resource was formally issued

Comments: For example, the date of issue of a EuroLMAI report

URI: elm:fullName

Label: **Full Name**

Domain: [elm:Learner](#)

Range: <http://www.w3.org/2000/01/rdf-schema#Literal>

Definition: The full formatted name, in the form agreed by the Learner and the Issuer as appropriate for achievement information reports

Comments: This approximates both to the IETF RFC 2426 Formatted Name, and to the proposed SEMIC.EU Core Person [5] Full Name

URI: [elm:familyName](#)

Label: **Family Name**

Domain: [elm:Learner](#)

Range: <http://www.w3.org/2000/01/rdf-schema#Literal>

Definition: The name component typically shared with other members of the same immediate family, as on official identity documents

Comments: This is equivalent to the IETF RFC 2426 Family Name, and to the proposed SEMIC.EU Core Person [5] Family Name; it is intended to be the same as on common official identity documents, such as a passport's "Surname"

URI: [elm:givenNames](#)

Label: **Given Names**

Domain: [elm:Learner](#)

Range: <http://www.w3.org/2000/01/rdf-schema#Literal>

Definition: Name components specific to the individual, typically not shared by other members of the same immediate family, as on official identity documents

Comments: This is equivalent to (a) the concatenation of Given Name ("Given") and Additional Names ("Middle") components of the structured name as in IETF RFC 2426 and (b) the proposed SEMIC.EU Core Person [5] Given Name; it is intended to be the same as on common official identity documents, such as a passport's "Given names"

7.4 Resources included from CWA 15903:2008

7.4.1 Classes

The following classes are defined in CWA 15903:2008 (MLO-AD) and are applicable within the EuroLMAI domain.

URI: [mlo:LearningOpportunityProvider](#)

Label: Learning Opportunity Provider

URI: [mlo:LearningOpportunitySpecification](#)

Label: Learning Opportunity Specification

URI: [mlo:LearningOpportunityInstance](#)

Label: Learning Opportunity Instance

7.4.2 Association properties

The following association properties are defined in CWA 15903:2008 and are applicable within the EuroLMAI domain.

URI: [mlo:offeredAt](#)

Label: Offered At

URI: [mlo:hasPart](#)

Label: Has Part

URI: [mlo:specifies](#)

Label: Specifies

7.4.3 Attribute properties

The entire set of attribute properties defined by CWA 15903:2008 is applicable within the EuroLMAI domain.

7.5 Properties included from ISO 15836

The following Properties defined in ISO 15836 (Dublin Core Metadata Element Set) are applicable within the EuroLMAI domain.

URI: <http://purl.org/dc/elements/1.1/identifier>

Label: Identifier

Comments: The content should conform to a URI, as defined by IETF RFC 3986

URI: <http://purl.org/dc/elements/1.1/title>

Label: Title

URI: <http://purl.org/dc/elements/1.1/type>

Label: Type

URI: <http://purl.org/dc/elements/1.1/description>

Label: Description

7.6 Properties included from DCMI Metadata Terms

The following property defined in DCMI Metadata Terms [6] is applicable within the EuroLMAI domain.

URI: <http://purl.org/dc/terms/educationLevel>

Label: Education Level

7.7 Properties included from IETF RFC 2426

The following properties defined in IETF RFC 2426 (vCard MIME Directory Profile) are applicable within the EuroLMAI domain.

URI: <http://www.w3.org/2001/vcard-rdf/3.0#BDay>

Label: Birthday

7.8 Properties included from the CWA 16077:2010

The following properties defined in CWA 16077:2010 (Educational Credit Information Model) are applicable within the EuroLMAI domain.

URI: <http://purl.org/net/cm/level>

Label: Level

URI: <http://purl.org/net/cm/scheme>

Label: Scheme

URI: <http://purl.org/net/cm/value>

Label: Value

8 The EuroLMAI Description Set Profile

8.1 General

The following sub-clauses provide constraints for the resources of the EuroLMAI model.

8.2 EuroLMAI Report

A EuroLMAI Report shall comply with the following constraints.

- a) a EuroLMAI Report instance *shall* contain *exactly one* **elm:Learner** instance;
- b) a EuroLMAI Report instance *shall* contain *exactly one* **elm:Issuer** instance;
- c) a EuroLMAI Report instance *may* contain *any number of* **mlo:LearningOpportunitySpecification** instances, representing the learning opportunity for which achievement information is represented within the scope of the report;
- d) a EuroLMAI Report instance *shall not* contain *more than one* **elm:additionalInformation** property;
- e) a EuroLMAI Report instance *shall* contain *exactly one* **elm:issueDate** property.

8.3 Learner

An EuroLMAI *Learner* instance shall comply with the following constraints.

- a) an **elm:Learner** instance *shall* contain *at least one* **http://purl.org/dc/elements/1.1/identifier** property;

NOTE Identifiers may be given for a learner using a range of identifier schemes, including provider-issued student identifiers, national personal identifiers, and schemes of identifiers used by education systems in specific jurisdictions. Where multiple identifiers are used in a learner instance, each identifier should be specified by defining a sub property of **http://purl.org/dc/elements/1.1/identifier** for the scheme in use.

- b) an **elm:Learner** instance *shall not* contain *more than one* **elm:fullName** property;
- c) an **elm:Learner** instance *shall not* contain *more than one* **elm:givenNames** property;
- d) an **elm:Learner** instance *shall not* contain *more than one* **elm:familyName** property;
- e) an **elm:Learner** instance *shall not* contain *more than one* **http://www.w3.org/2001/vcard-rdf/3.0#BDay** property.

NOTE Some known weaknesses of the IETF RFC 2426 specification, such as the handling of composite names are under consideration for resolution by W3C. Attention is drawn to the Portable Contacts [7] and the UK MIAP Common Data Definitions 2.0 [8] specification.

8.4 Issuer

A EuroLMAI *Issuer* instance shall comply with the following constraints.

- a) The **elm:Issuer** instance *shall* contain *at least one* **http://purl.org/dc/elements/1.1/identifier** property.

- b) The **elm:Issuer** instance *may* contain *any number of* <http://purl.org/dc/elements/1.1/title> properties (recommendation: at most one for any given language).
- c) The **elm:Issuer** instance *may* contain *any number of* <http://purl.org/dc/elements/1.1/description> properties (recommendation: at most one for any given language).
- d) The **elm:Issuer** instance *may* contain *any* other properties allowed as defined in CWA 15903:2008 for Learning Opportunity Provider.

8.5 Learning Opportunity Specification

A EuroLMAI *LearningOpportunitySpecification* instance shall comply with the following constraints.

- a) A **mlo:LearningOpportunitySpecification** instance *may* be associated with *any number of* child **mlo:LearningOpportunitySpecification** instances through the **mlo:hasPart** association, representing modules or sub-components of the parent learning opportunity specification.
- b) Each **mlo:LearningOpportunitySpecification** instance *shall* be associated with *at least one* **mlo:LearningOpportunityInstance** instance through the **mlo:specifies** association.
- c) A **mlo:LearningOpportunitySpecification** instance *shall not* contain *more than one* **mlo:qualification** property.
- d) A **mlo:LearningOpportunitySpecification** instance *may* contain *any number of* **mlo:credit** properties.
- e) Attention is drawn to the optional, though recommended use of the following properties:
 - 1) a **mlo:LearningOpportunitySpecification** instance *should* contain *at least one* <http://purl.org/dc/elements/1.1/identifier> property;
 - 2) an **mlo:LearningOpportunitySpecification** instance *should* contain *at least one* <http://purl.org/dc/elements/1.1/title> property;
 - 3) an **mlo:LearningOpportunitySpecification** instance *should* contain *at least one* <http://purl.org/dc/elements/1.1/description> property (if applicable);
 - 4) an **mlo:LearningOpportunitySpecification** instance *should* contain *at least one* <http://purl.org/dc/elements/1.1/type> property (if applicable).

NOTE In some models adopted by particular educational systems, there is an identified need of expressing grouping information for specific sets of learning opportunities. To address this need, apart from the representation of the individual opportunities, a parent learning opportunity can be defined, acting as a module-level component or a grouping component (e.g. semester, programme year, level or subject of a collection of courses). The <http://purl.org/dc/elements/1.1/type> property should be used to indicate the type of such components.

- f) Each **mlo:LearningOpportunitySpecification** instance *may* contain *any* other properties allowed as defined in CWA 15903:2008 or in CWA 16076:2010.

8.6 Learning Opportunity Instance

A EuroLMAI *LearningOpportunityInstance* instance shall comply with the following constraints.

- a) Each **mlo:LearningOpportunityInstance** instance *shall not* be associated with *more than one* **mlo:LearningOpportunityProvider** instance through the **mlo:offeredAt** association.
- b) Each **mlo:LearningOpportunityInstance** instance *shall not* contain *more than one* **elm:result** property.
- c) Each **mlo:LearningOpportunityInstance** instance *shall not* contain *more than one* **elm:gradingScheme** property.
- d) Each **mlo:LearningOpportunityInstance** instance *may* contain *any number of* **elm:languageOfAssessment** properties.
- e) Each **mlo:LearningOpportunityInstance** instance *may* contain *any other* properties allowed as defined in CWA 15903:2008 or in CWA 16076:2010.

8.7 Qualification

The use of the *Qualification* property within the EuroLMAI model shall comply with the following constraints.

- a) Each **mlo:qualification** property *may* contain *any number of* **http://purl.org/dc/elements/1.1/identifier** properties.
- b) Each **mlo:qualification** property *shall* contain *at least one* **http://purl.org/dc/elements/1.1/title** property.
- c) Each **mlo:qualification** property *may* contain *any number of* **http://purl.org/dc/terms/educationLevel** properties.

NOTE 1 Levels of qualifications are usually expressed in the context of a qualification framework, for example the European Qualifications Framework [9]. Rather than use a single integer or text for the EducationLevel property, implementers are encouraged to make use of Uniform Resource Identifiers (as in IETF RFC 3986) to identify both the level of the qualification and the framework from which the level is derived. For example, CWA 16077:2010 defines EQF levels using the form <http://purl.org/net/cm/terms/EQF#n>, where n is the number of the EQF level.

NOTE 2 Other frameworks for which a standard URI is not defined may be represented using a similar convention, whereby the URL of the framework precedes the level value separated using a URI fragment identifier. For example, the following would represent level 5 of the Scottish Credit and Qualifications Framework: <http://www.scqf.org.uk/#5>.

- d) An **mlo:qualification** property *may* contain *any number of* **http://purl.org/dc/terms/1.1/description** properties.

8.8 Credit

The use of the *Credit* property within the EuroLMAI model shall comply with the constraints expressed in CWA 16077:2010.

Annex A (normative)

Europass Diploma Supplement Application Profile of the EuroLMAI (EuroLMAI Europass DS AP)

A.1 General

This annex defines the Europass Diploma Supplement (DS) Application Profile (AP) of the EuroLMAI, following the principles of the Dublin Core Metadata Initiative Singapore Framework for Application Profiles [2], [3]. It refines the EuroLMAI model, so as to represent the Europass Diploma Supplement information structure defined in OJ L 390, 31.12.2004, consisting of:

- information about the learner/holder of the qualification;
- information about the authority that issues the Diploma Supplement;
- information about the programme of study leading to the described qualification, as well as the actual result for the specific learner;
- information about the component programme units studied, as well as the result and credits in those components (transcript information), and optionally, provider information for modules delivered by an institution different from the awarding one;
- additional information.

A.2 Europass DS Refinements of the EuroLMAI

A.2.1 Classes

This AP does not define any new classes. All classes specified in the EuroLMAI standard are applicable.

A.2.2 Association properties

This AP does not define any new association properties. All association properties specified in the EuroLMAI standard are applicable.

A.2.3 Attribute Properties

All attribute properties specified in the EuroLMAI standard are applicable. The following are attribute properties defined for the Europass DS Application Profile of the EuroLMAI.

URI: eds:placeOfBirth

Label: Place of Birth

Domain: elm:Learner

Range: http://www.w3.org/2000/01/rdf-schema#Literal

Definition: The place of birth of the Learner the Diploma Supplement is issued for

Comments: As defined in OJ L 390, 31.12.2004

URI: eds:countryOfBirth

Label: **Country of Birth**

Domain: elm:Learner

Range: <http://www.w3.org/2000/01/rdf-schema#Literal>

Definition: The country of birth of the Learner the Diploma Supplement is issued for

Comments: As defined in OJ L 390, 31.12.2004. The content of this property should be a country code as defined in ISO 3166

URI: eds:qualificationInfoSource

Label: **Qualification Info Source**

Domain: mlo:qualification

Range: <http://www.w3.org/2000/01/rdf-schema#Resource>

Definition: Information sources and references where more details on the qualification could be sought [10]

Comments: For example, the Higher Education Institute web site; the department in the issuing institution; a national information centre; the European Union National Academic Recognition Information Centres (NARIC); the Council of Europe/UNESCO European National Information Centres on academic recognition and mobility (ENIC) [10]

URI: eds:qualificationMainStudyField

Label: **Qualification Main Study Field**

Domain: mlo:qualification

Range: <http://www.w3.org/2000/01/rdf-schema#Literal>

Definition: Major fields of study (disciplines) that define the main subject area(s) for the qualification [10]

Comments: For example, Politics and History, Human Resource Management, Business Administration, Molecular Biology etc. [10]

URI: eds:qualificationHolderTitle

Label: **Qualification Holder Title**

Domain: mlo:qualification

Range: <http://www.w3.org/2000/01/rdf-schema#Literal>

Definition: The nationally accepted title conferred to the holder of the qualification [10]

Comments: For example, Doctor, Ingénieur, etc. [10]

URI: eds:professionalStatus

Label: **Professional Status**

Domain: <http://www.w3.org/2000/01/rdf-schema#Resource>

Range: <http://www.w3.org/2000/01/rdf-schema#Resource>

Definition: Information about any rights to practice, or professional status accorded to the holders of the qualification [10]

Comments: Indicate what specific access, if any, does the qualification give in terms of employment or professional practice, which competent authority allows this, if the qualification gives access to a 'regulated profession' [10]

The following properties defined in CWA 16076:2010 (ECTS Information Package/Course Catalogue MLO Application Profile) are applicable for the Europass DS AP of the EuroLMAI.

URI: http://purl.org/net/mlo_ects_ipcc/InstitutionStatus

Label: **Institution Status**

URI: http://purl.org/net/mlo_ects_ipcc/DegreeProgrammeAccessToFurtherStudies

Label: **Degree Programme Access To Further Studies**

A.3 The Europass DS Description Set Profile

A.3.1 General

The following sub-clauses provide constraints for the resources of the Europass DS Application Profile of the EuroLMAI.

A.3.2 Diploma Supplement Document

A Diploma Supplement Document shall comply with the following constraints:

- a) a Diploma Supplement Document instance *shall* contain *exactly one* **elm:Learner** instance;
- b) a Diploma Supplement Document instance *shall* contain *exactly one* **elm:Issuer** instance;
- c) a Diploma Supplement Document instance *shall* contain *exactly one* **mlo:LearningOpportunitySpecification**, representing the programme of study the specific learner has successfully completed;
- d) a Diploma Supplement Document instance *shall not* contain *more than one* **elm:additionalInformation** property;
- e) a Diploma Supplement Document instance *shall* contain *exactly one* **elm:issueDate** property.

A.3.3 Learner

A Europass DS AP *Learner* instance shall comply with the following constraints:

- a) an **elm:Learner** instance *shall* contain *at least one* **http://purl.org/dc/elements/1.1/identifier** property;

NOTE Identifiers may be given for a learner using a range of identifier schemes, including provider-issued student identifiers, national personal identifiers, and schemes of identifiers used by education systems in specific jurisdictions. Where multiple identifiers are used in a Learner instance, each identifier should be specified by defining a sub property of **http://purl.org/dc/elements/1.1/identifier** for the scheme in use.

- b) an **elm:Learner** instance *shall* contain *exactly one* **elm:givenNames** property;
- c) an **elm:Learner** instance *shall* contain *exactly one* **elm:familyName** property;
- d) an **elm:Learner** instance *shall* contain *exactly one* **http://www.w3.org/2001/vcard-rdf/3.0#BDay** property;

NOTE Some known weaknesses of the IETF RFC 2426, such as the handling of composite names are under consideration for resolution by W3C. Attention is drawn to Portable Contacts [7] and the UK MIAP Common Data Definitions 2.0 [8] specification.

- e) an **elm:Learner** instance *shall not* contain *more than one* **eds:placeOfBirth** property;
- f) an **elm:Learner** instance *shall not* contain *more than one* **eds:countryOfBirth** property.

A.3.4 Issuer

A Europass DS AP *Issuer* instance shall comply with the following constraints:

- a) the **elm:Issuer** instance *shall* contain *at least one* <http://purl.org/dc/elements/1.1/identifier> property;
- b) the **elm:Issuer** instance *shall* contain *at least one* <http://purl.org/dc/elements/1.1/title> property;
- c) the **elm:Issuer** instance *shall* contain *at least one* <http://purl.org/dc/elements/1.1/description> property;
- d) the **elm:Issuer** instance *shall not* contain *more than one* http://purl.org/net/mlo_ects_ipcc/InstitutionStatus property;
- e) the **elm:Issuer** instance *may* contain *any other properties* allowed as defined in CWA 15903:2008 for Learning Opportunity Provider.

A.3.5 Learning Opportunity Specification: Programme Level

A Europass DS AP *LearningOpportunitySpecification* instance at programme level shall comply with the following constraints:

- a) the **mlo:LearningOpportunitySpecification** instance at programme level *may* be associated with *any number of* child **mlo:LearningOpportunitySpecification** instances, through **mlo:hasPart** associations, representing modules or sub-components (transcript components) of the programme of study (parent learning opportunity specification);
- b) the **mlo:LearningOpportunitySpecification** instance at programme level *shall* be associated with *exactly one* **mlo:LearningOpportunityInstance** instance, through the **mlo:specifies** association;
- c) the **mlo:LearningOpportunitySpecification** instance at programme level *shall* contain *exactly one* **mlo:qualification** property;
- d) the **mlo:LearningOpportunitySpecification** instance at programme level *shall* contain *at least one* <http://purl.org/dc/elements/1.1/identifier> property;
- e) the **mlo:LearningOpportunitySpecification** instance at programme level *shall* contain *at least one* <http://purl.org/dc/elements/1.1/title> property;
- f) the **mlo:LearningOpportunitySpecification** instance at programme level *shall* contain *at least one* <http://purl.org/dc/elements/1.1/description> property;
- g) the **mlo:LearningOpportunitySpecification** instance at programme level *shall not* contain *more than one* http://purl.org/net/mlo_ects_ipcc/DegreeProgrammeAccessToFurtherStudies property;
- h) the **mlo:LearningOpportunitySpecification** instance at programme level *shall not* contain *more than one* **eds:professionalStatus** property;
- i) each **mlo:LearningOpportunitySpecification** instance at programme level *may* contain *any other properties* allowed as defined in CWA 15903:2008 or in CWA 16076:2010.

A.3.6 Learning Opportunity Instance: Programme Level

A Europass DS AP *LearningOpportunityInstance* instance at programme level shall comply with the following constraints:

- [AC1]** a) the **mlo:LearningOpportunityInstance** instance at programme level *shall not* be associated with *more than one* **mlo:LearningOpportunityProvider** instance through the **mlo:offeredAt** association; **[AC1]**
- b) the **mlo:LearningOpportunityInstance** instance at programme level *may* contain *any number of* **mlo:prerequisite** properties;
- c) the **mlo:LearningOpportunityInstance** instance at programme level *shall* contain *at least one* **mlo:languageOfInstruction** property;
- d) the **mlo:LearningOpportunityInstance** instance at programme level *shall* contain *at least one* **elm:languageOfAssessment** property;
- e) the **mlo:LearningOpportunityInstance** instance at programme level *shall* contain *at most one* **elm:gradingScheme** property;
- f) the **mlo:LearningOpportunityInstance** instance at programme level *shall not* contain *more than one* **mlo:duration** property;
- g) the **mlo:LearningOpportunityInstance** instance at programme level *shall* contain *at least one* **mlo:engagement** property;
- h) each **mlo:LearningOpportunityInstance** instance at programme level *shall* contain *exactly one* **elm:result** property;
- i) each **mlo:LearningOpportunityInstance** instance at programme level *may* contain *any other* properties allowed as defined in CWA 15903:2008 or in CWA 16076:2010.

A.3.7 Learning Opportunity Specification: Transcript Level

[AC1] A Europass DS AP *LearningOpportunitySpecification* at transcript level shall represent:

- EITHER one of the component modules of the programme of study the specific learner has completed,
- OR a grouping component for a specific period of learning (semester, year) within the programme of study. **[AC1]**

NOTE A transcript consists of a hierarchy of components, each of which may have results and credits associated with it. The actual structure of a transcript depends on the model adopted by a particular education system. For example, in the UK the standard convention is a series of "year of study" components, each of which has a collection of modules.

A Europass DS AP *LearningOpportunitySpecification* instance at transcript level shall comply with the following constraints:

- a) each **mlo:LearningOpportunitySpecification** instance at transcript level *may* be associated with *any number of* **mlo:LearningOpportunitySpecification** instances, through the **mlo:hasPart** association;
- b) each **mlo:LearningOpportunitySpecification** instance at transcript level *shall* contain *at least one* **http://purl.org/dc/elements/1.1/identifier** property;

- c) each **mlo:LearningOpportunitySpecification** instance at transcript level *shall* contain at least one **http://purl.org/dc/elements/1.1/title** property;
- d) each **mlo:LearningOpportunitySpecification** instance at transcript level *shall* contain at least one **http://purl.org/dc/elements/1.1/type** property;

NOTE The **http://purl.org/dc/elements/1.1/type** property should be used to indicate the type of component, such as a module-level component or a grouping component such as semester, programme year, level or subject of a programme.

- e) each **mlo:LearningOpportunitySpecification** instance at transcript level *may* contain any number of **mlo:credit** properties;
- f) each **mlo:LearningOpportunitySpecification** instance at transcript level *shall* be associated with at least one **mlo:LearningOpportunityInstance** instance, through the **mlo:specifies** association;
- g) each **mlo:LearningOpportunitySpecification** instance at transcript level *may* contain any other properties allowed as defined in CWA 15903:2008 or in CWA 16076:2010.

A.3.8 Learning Opportunity Instance: Transcript Level

A Europass DS AP *LearningOpportunityInstance* instance at transcript level shall comply with the following constraints:

- a) each **mlo:LearningOpportunityInstance** instance at transcript level *shall not* contain more than one **elm:result** property;
- AC1 b) each **mlo:LearningOpportunityInstance** instance at transcript level *shall not* be associated with more than one **mlo:LearningOpportunityProvider** instance, through the **mlo:offeredAt** association; AC1
- c) each **mlo:LearningOpportunityInstance** instance at transcript level *may* contain any other properties allowed as defined in CWA 15903:2008 or in CWA 16076:2010.

A.3.9 Qualification

A Europass DS AP *Qualification* property shall comply with the following constraints:

- a) an **mlo:qualification** property *shall* contain at least one **http://purl.org/dc/elements/1.1/identifier** ;
- b) an **mlo:qualification** property *shall* contain at least one **http://purl.org/dc/elements/1.1/title** property;
- c) an **mlo:qualification** property *shall* contain at least one **http://purl.org/dc/terms/educationLevel** property;
- d) an **mlo:qualification** property *may* contain any number of **http://purl.org/dc/terms/1.1/description** properties;
- e) a **mlo:qualification** property *may* contain any number of **eds:qualificationHolderTitle** properties;
- f) a **mlo:qualification** property *may* contain any number of **eds:qualificationInfoSource** properties;

- g) a mlo:qualification property *may* contain *any number of* eds:qualificationMainStudyField properties

A.3.10 Credit

A Europass DS *Credit* property shall comply with the constraints expressed in CWA 16077:2010.

Annex B (informative)

The EuroLMAI conceptual model

The CWA 16133:2010, Guidelines for a European Learner Mobility Model, specifies a high-level developing model of the educational practice relevant to the learner mobility domain (see Figure B.1), in the context of which information arises - that is, the practice that generates information, parts of which are gathered together in mobility documents and reports.

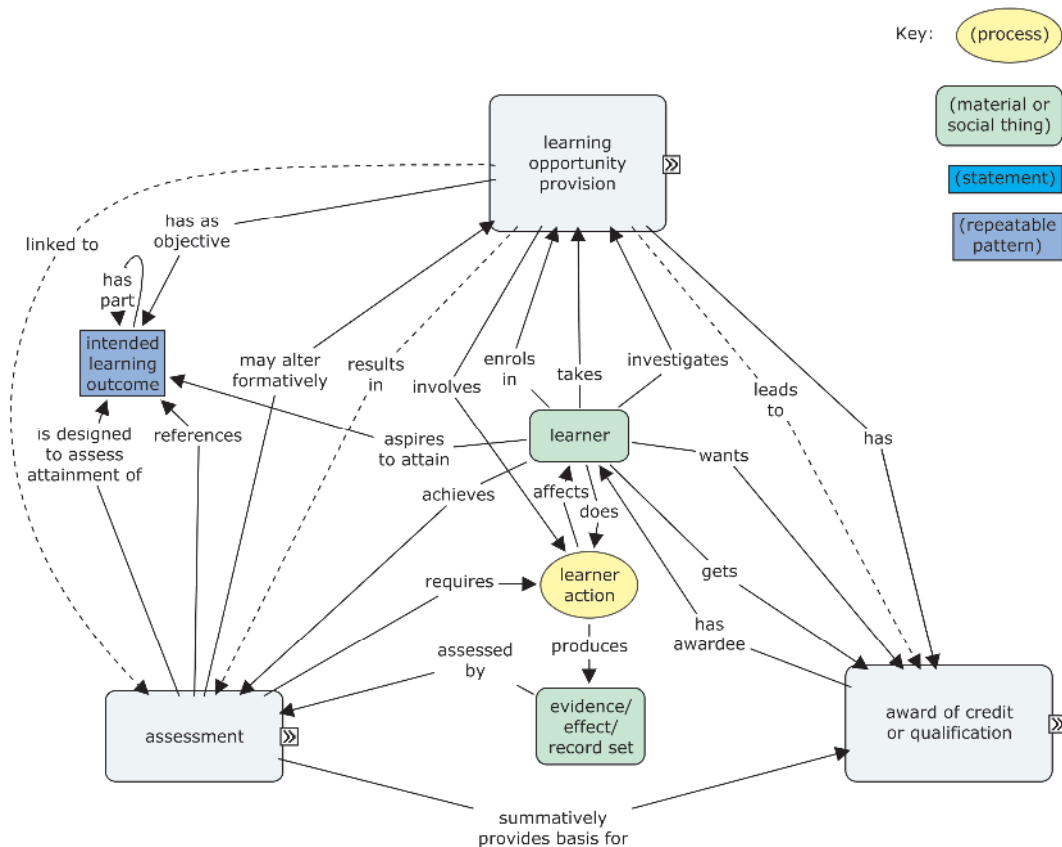


Figure B.1 — Conceptual model of educational practice within EuroLM

The conceptual model illustrates the rough division of the subject matter into three distinctive parts: learning opportunity provision, award of credit or qualification, and assessment. Between these parts sits the learner, the learner's actions, and their results as evidence, which provide the basis for the rest of the system. Intended learning outcomes act as the proper bridge between learning opportunity provision and assessment. Without this bridge, the connections are more tenuous.

The above model provides the basis for the definition of a complete EuroLMAI model, under the condition of existence of the ingredients as standardised models, for the representation of each of the constituent components taking part into the educational practice. At the current point of maturity, standardisation advances within the learner mobility context can support modelling of practice and processes regarding the recording of the institution attested information about a learner's participation in a single or a set of learning opportunities and the associated qualifications and/or results obtained. Information representation concerning

assessment processes or intended learning outcomes cannot yet be considered, given that relevant specifications are expected by future developments.

The above restrictions taken into account, a subset of the overall model is defined and illustrated in Figure B.2 (marked in bold, in a detailed version of representation).

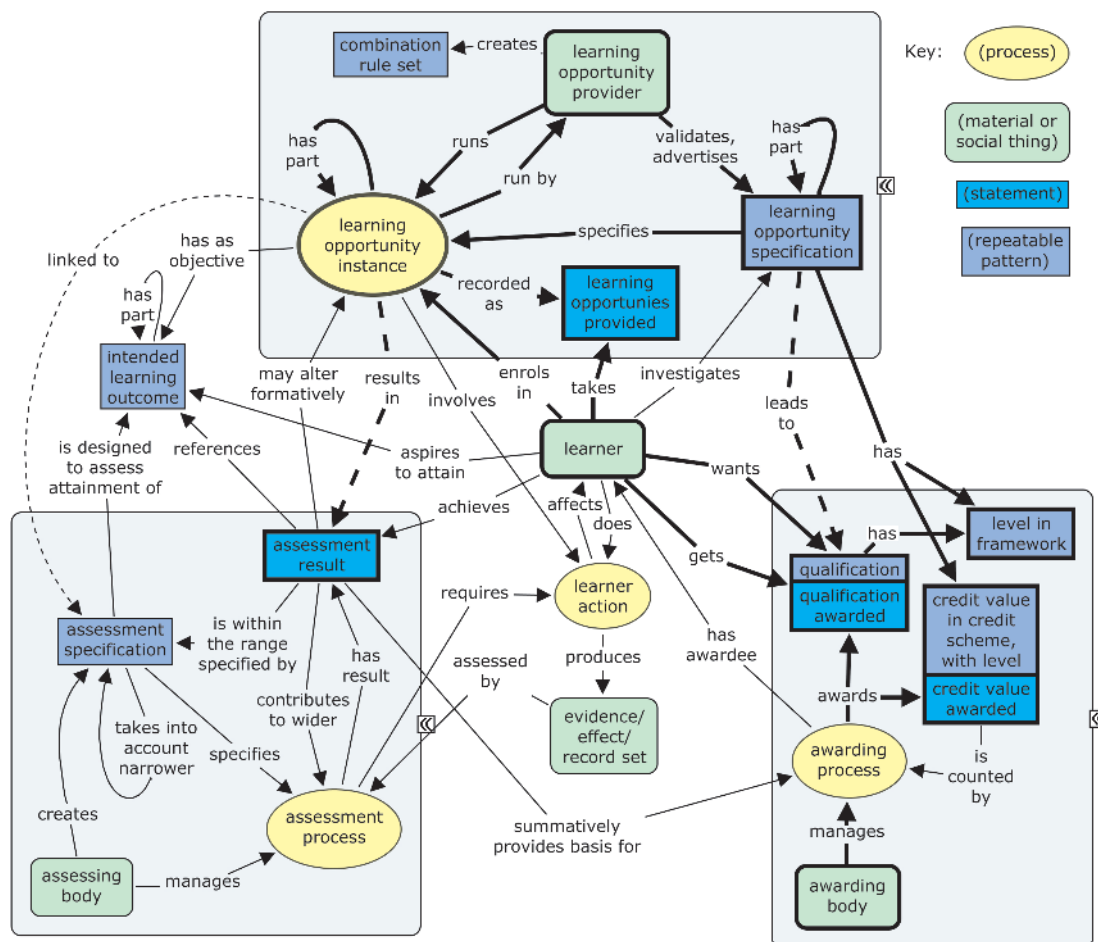


Figure B.2 — Conceptual model ingredients relevant to EuroLMAI

This subset can be assumed as the conceptual foundation for the development of the EuroLMAI skeleton model, regarding mainly the representation of institution attested achievement information on learning opportunities taken by a learner and the possible associated awarding and/or results obtained, within a formal learning setting supporting a wide range of delivery and assessment practices (CWA 16133:2010), such as:

- traditional, single institution delivery and assessment in terms of a full programme of study;
- provision of lesser learning opportunities (single courses, or learning streams);
- awarding with experience components;
- shared programmes between different institutions.

Exchange of learners with a sequential or parallel plan of delivery and assessment.

Annex C (informative)

Mapping of the Europass DS to EuroLMAI

[10] provides an outline summary of the Europass Diploma Supplement information structure as published at the Official Journal of the European Union by the European Parliament and the Council in OJ L 390, 31.12.2004. Table C.1 recommends how each item on this structure should be represented using the EuroLMAI Europass DS Application Profile defined in the previous sub-clauses of this annex.

Table C.1 — Mapping of the DS elements to the EuroLMAI Europass DS AP

DS Structure Items	Class	Property of associated Class	Property of associated Property
1. Information Identifying the Holder of the Qualification (Programme Level)			
1.1 Family Name	elm:Learner	elm:familyName	
1.2 First Name	elm:Learner	elm:givenNames	
1.3.1 Date of Birth	elm:Learner	http://www.w3.org/2001/vcard-rdf/3.0#BDay	
1.3.2 Place of Birth	elm:Learner	eds:placeOfBirth	
1.3.3 Country of Birth	elm:Learner	eds:countryOfBirth	
1.4 Student Number or Code	elm:Learner	http://purl.org/dc/elements/1.1/identifier	
2. Information identifying the Qualification (Programme Level)			
2.1.1 Name of Qualification	mlo:LearningOpportunity Specification (Programme Level)	mlo:qualification	http://purl.org/dc/elements/1.1/title
2.1.2 Name of Title	mlo:LearningOpportunity Specification (Programme Level)	mlo:qualification	eds:qualificationHolder Title
2.2 Main Field(s) of Study for the Qualification	mlo:LearningOpportunity Specification (Programme Level)	mlo:qualification	eds:qualificationMain StudyField
2.3 Name of Institution Awarding Qualification	elm:Issuer	http://purl.org/dc/elements/1.1/title	
2.3.1 Status of the Institution Awarding Qualification *	elm:Issuer	http://purl.org/net/mlo_ects_ipcc/InstitutionStatus	
2.4 Name of Institution Administering Studies	mlo:LearningOpportunity Provider	http://purl.org/dc/elements/1.1/title	

* Though not explicitly defined in the Europass DS information structure, the Status of Institutions Awarding Qualification or Administering Studies is referred to at the Europass DS template developed by CEDEFOP [13]

Table C.1 (continued)

2.4.1 Status of the Institution Administering Qualification *	mlo:LearningOpportunity Provider	http://purl.org/net/mlo_ects_ipcc/InstitutionStatus	
2.5.1 Language(s) of Instruction	mlo:LearningOpportunity Instance (Programme Level)	mlo:languageOfInstruction	
2.5.2 Language(s) of Assessment	mlo:LearningOpportunity Instance (Programme Level)	elm:languageOfAssessment	
3. Information on the Level of the Qualification (Programme Level)			
3.1 Level of Qualification	mlo:LearningOpportunity Specification (Programme Level)	mlo:qualification	http://purl.org/dc/terms/educationLevel
3.2 Official Length of Programme	mlo:LearningOpportunity Instance (Programme Level)	mlo:duration	
3.3 Access Requirement(s)	mlo:LearningOpportunity Instance (Programme Level)	mlo:prerequisite	
4. Information on the Contents and Results gained			
4.1 Mode of Study	mlo:LearningOpportunity Instance (Programme Level)	mlo:engagement	
4.2 Programme Requirements	mlo:LearningOpportunity Specification (Programme Level)	http://purl.org/dc/elements/1.1/description	
4.3 Programme Details	mlo:LearningOpportunity Specification (Transcript Level)	Usage and Properties as recommended at the Description Set Profile (see A.3.7 and A3.8)	
4.4 Grading Scheme, Grade distribution Guidance	mlo:LearningOpportunity Instance (Programme Level)	elm:gradingScheme	
4.5 Overall Classification	mlo:LearningOpportunity Instance (Programme Level)	elm:result	
5. Information on the Function of the Qualification			
5.1 Access to Further Study	mlo:LearningOpportunity Specification (Programme Level)	http://purl.org/net/mlo_ects_ipcc/DegreeProgrammeAccessToFurtherStudies	
5.2 Professional Status	mlo:LearningOpportunity Specification (Programme Level)	eds:professionalStatus	
6. Additional Information			
6.1 Additional Information	mlo:LearningOpportunity Specification (Programme Level)	mlo:qualification	http://purl.org/dc/terms/description

Table C.1 (continued)

6.2 Additional Information Sources	mlo:LearningOpportunity Specification (Programme Level)	mlo:qualification	eds:qualificationInfo Source
7. Certification of the Supplement ¹			
8. Information on the National Higher Education System			
8 Description (containing information 8.1 to 8.10 as outlined in the Europass DS structure)	<Diploma Supplement Document>	elm:additionalInformation	

¹ Coverage of this item is out of the scope of this standard. Implementers should apply digital signature technologies as appropriate.

Annex D **(informative)**

Illustrative uses of the EuroLMAI Model and the Europass DS Application Profile

D.1 General

This annex includes diagrammatic representations of illustrative uses of the EuroLMAI skeleton model, for facilitating a number of processes in the context of educational practice involving different levels of achievement information reporting (interim study reports, qualification achievement reports, transcripts, courses taught at other institutions, etc.).

Within the context of the European Higher Education Area, Higher Education Institutions need to issue achievement reports on qualifications obtained by learners upon successful completion of a programme of study. This annex also includes an illustrative use of the EuroLMAI Europass DS Application Profile for the representation of a Diploma Supplement Document.

D.2 Report on completed parts of a programme of study

This case represents achievement information about a learner who has enrolled in an official programme of study and has completed part of the programme offered by a single or multiple providers (interim report). The learner has not yet obtained the corresponding qualification.

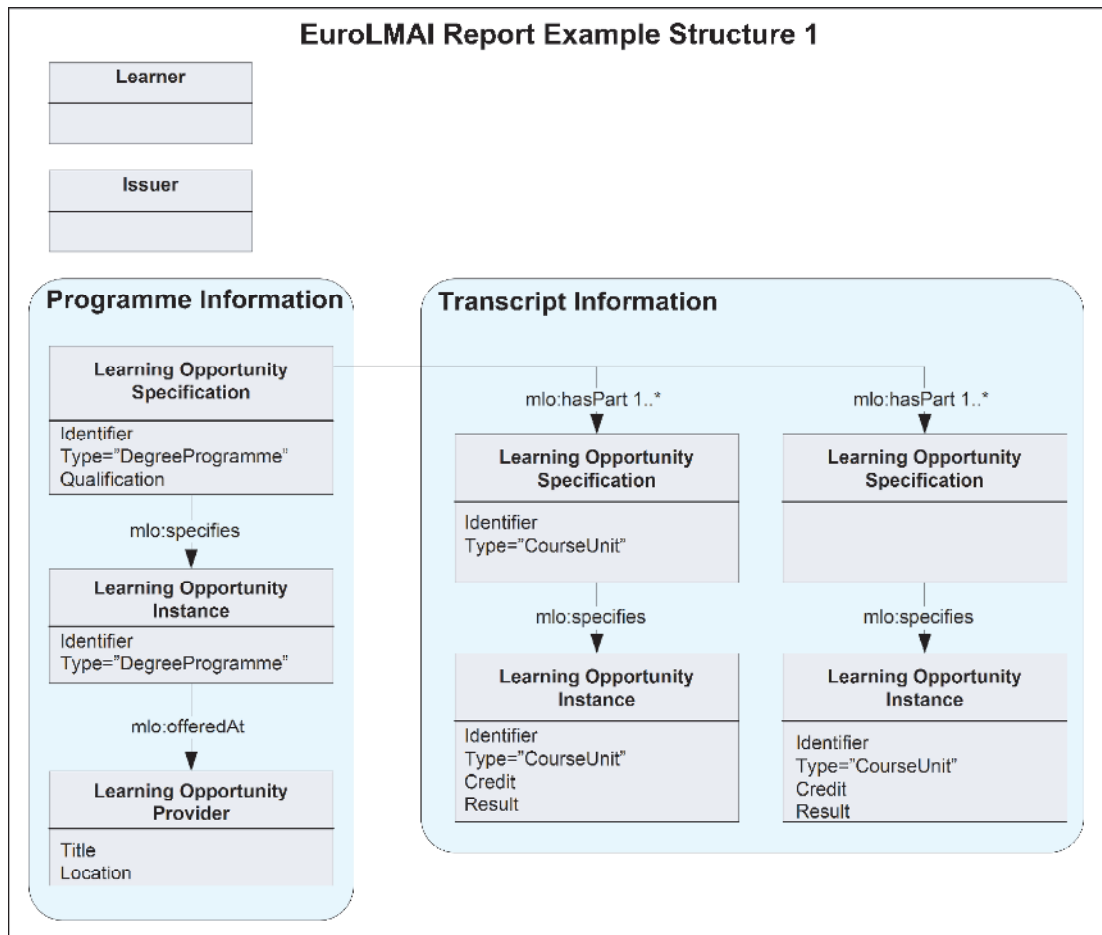


Figure D.1 — EuroLMAI report instance for completed part of programme of study

The EuroLMAI instance for this case includes the descriptions of:

- a Learning Opportunity at the programme level, containing information on the programme the learner has enrolled in, without including any result information, since the qualification has not yet been obtained by the learner;
- Learning Opportunities as component units of the described programme (transcript level), which the learner has taken and achieved specific credits and results;
- where a unit of the programme is offered by another institution, the corresponding learning opportunity makes reference to the Provider that offered the unit (course, work experience, etc.) To represent this, the Learning Opportunity Instance of the component contains the basic details of the other institution such as the institution name.

Figure D.1 provides an example structure of a EuroLMAI report for a learner that has completed two course units, both at the institution offering the programme the learner has enrolled in.

D.3 Transcript information for a period of learning

This case represents achievement information about a learner who has enrolled in an official programme of study and has completed a specific period of learning, like a semester or year.

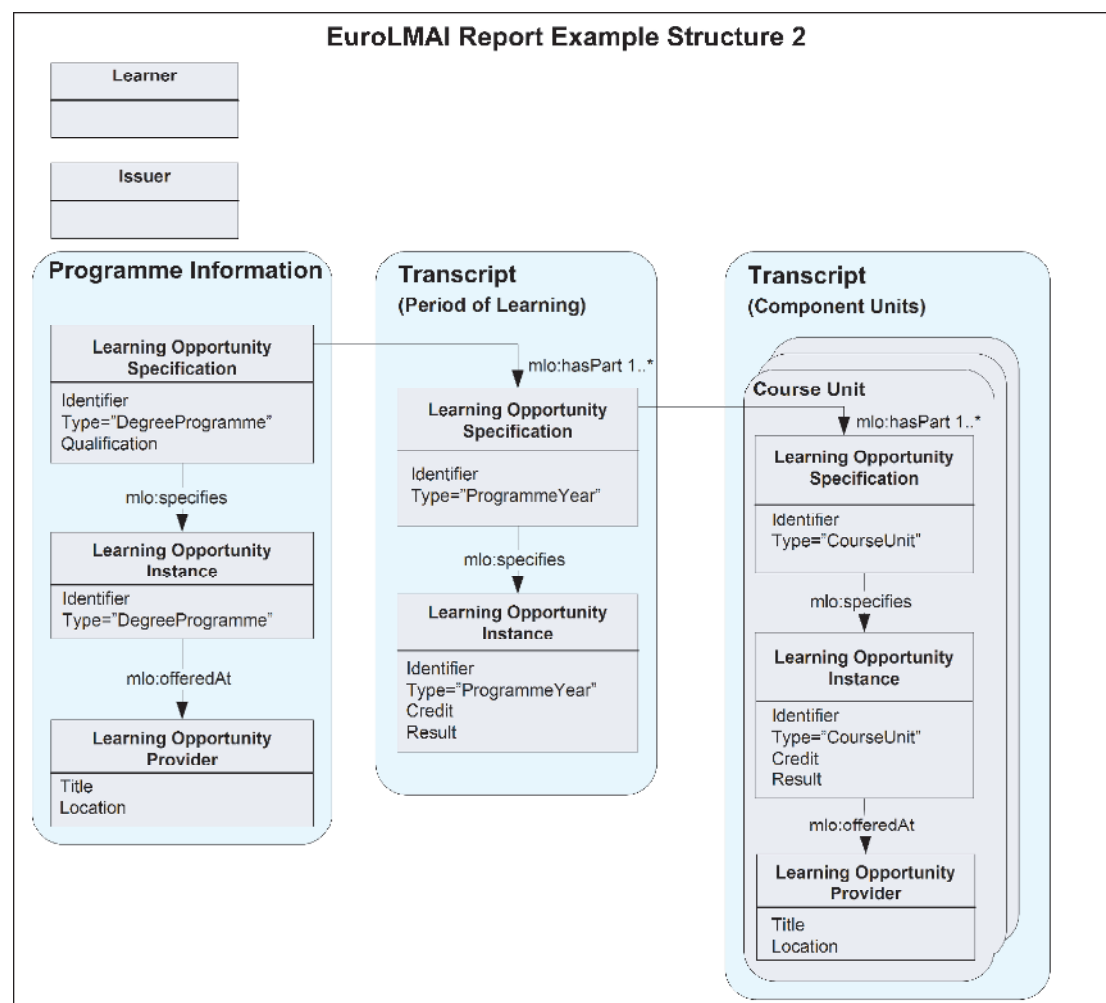


Figure D.2 — EuroLMAI report instance with transcript information for a period of learning

A EuroLMAI report of this nature may be structured as follows:

- including three levels of learning opportunities, the topmost representing the programme of study, the next offering a grouping placeholder for the components units that relate to the specific period of learning, while the third comprising detailed information about each of the component units;
- including, at the top level, a learning opportunity which represents the period of learning of the programme of study and at a second level, the associated component units.

The Learning Opportunity Instance representing the period of learning may have associated overall credit or result information, as required by the specific educational system.

Figure D.2 illustrates a EuroLMAI report instance for a learner that has completed all the course units of a programme year and has obtained an overall result and credit for this period of learning.

D.4 Report on qualification obtained for a completed programme of study

In the case of an achieved qualification obtained by the learner upon successful completion of a programme of study, the EuroLMAI report can be structured in any of the following ways:

- comprise the information sections illustrated in 8.2. Learning opportunities and associated credits and results gained by the learner are represented for each component unit of the programme;
- represent only the information concerning the learning opportunity corresponding to the programme of study with explicit reference to the qualification and the overall result obtained.

The Learning Opportunity Instance at the programme level makes reference to the Provider that offered the programme.

D.5 EuroLMAI Europass DS document

The Diploma Supplement Document records information of the learner and the document issuing body, as well as information about the programme of study and obtained qualification in any of the following structures:

- corresponds to the programme of study, with mandatory reference to the qualification and the overall result obtained by the learner. In such a case, there is not explicit representation of the programme details within the DS document and transcript information may be referred to through a separate EuroLMAI document;
- the DS document may include two levels of learning opportunities, the topmost representing the programme of study (as above) and the second comprising detailed information about each of the programme component units;
- the DS document may include three levels of learning opportunities, the topmost representing the programme of study (as above), the next offering a grouping placeholder for the components units that relate to a specific period of learning (year, semester, etc.), and the third comprising detailed information about each of the programme component units within the corresponding period of learning. The Learning Opportunity Instance representing the period of learning may have associated overall credit or result information, as required by the specific educational system.

Where a programme unit is offered by an institution different than the one administering the overall programme, the corresponding learning opportunity makes reference to the Provider that offered the unit (course, work experience, etc.) To represent this, the Learning Opportunity Instance of the component contains the basic details of the other institution such as the institution name.

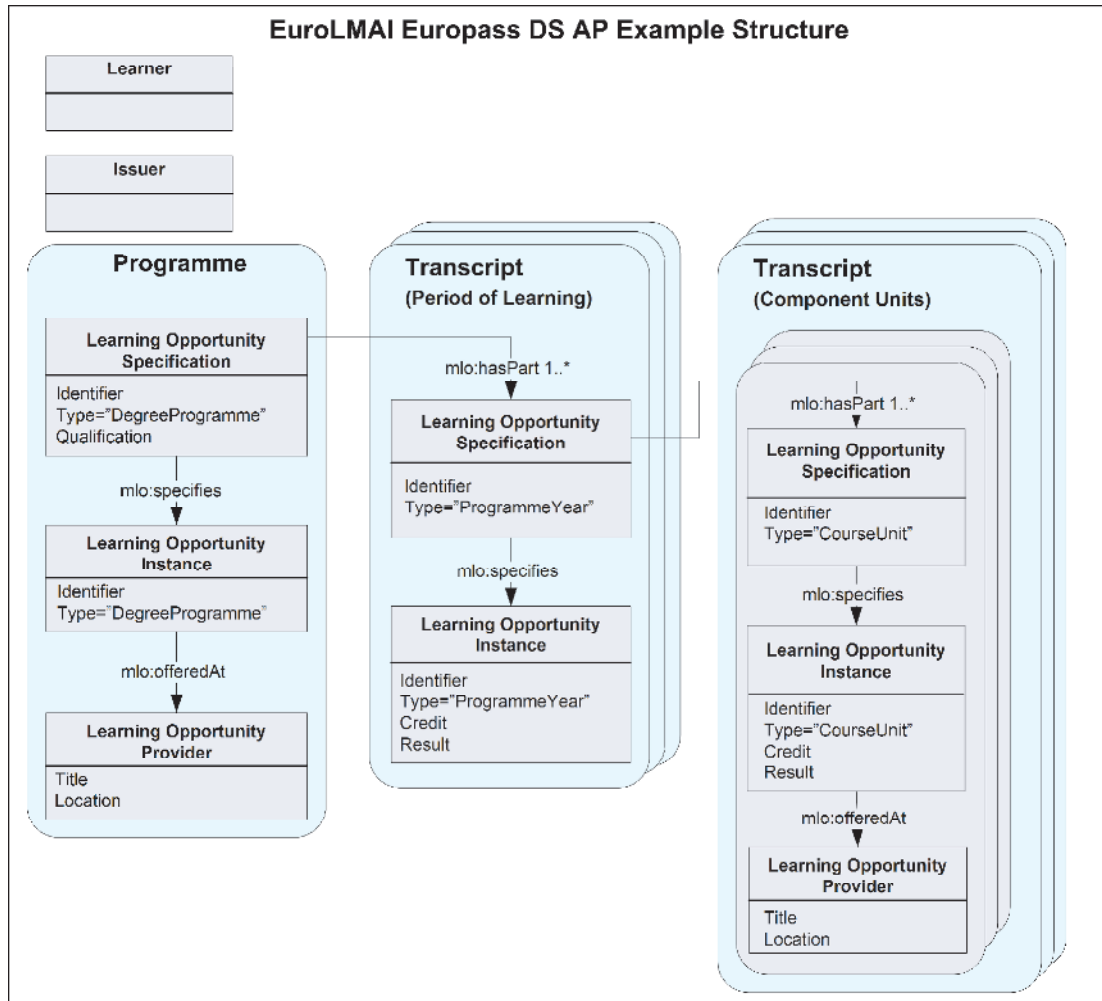


Figure D.3 — EuroLMAI Europass DS document with Transcript information including periods of learning

Figure D.3 illustrates an example DS structure for the case of explicit Transcript representation, including periods of learning.

Annex E (informative)

Application Profiling

E.1 DCMI Abstract Model

Attention is drawn to the DCMI Abstract Model (DCAM); this European Standard is inspired by, and conforms to, DCAM [11].

E.2 Application Profiles and their roles and usage

Communities are encouraged to develop application profiles of this European Standard. Attention is drawn to the Singapore Framework for application profiles developed by the Dublin Core Metadata Initiative [2], [3].

E.3 Extensions to properties

Application profiles may extend the specification in the following ways:

a) Inclusion of additional properties

A compliant application profile may define additional properties in the domain of EuroLMAI classes.

b) Refinement of properties using sub-properties

A compliant application profile may refine a property defined within this specification by defining a new sub-property. Refinements must be defined as semantically contained within the original property definition, such that the statement "elm:additionalInformation subPropertyURI value" can also be expressed as "elm:additionalInformation parentPropertyURI value".

c) Refinement of properties using vocabulary encoding schemes

A compliant application profile may refine a property defined within this specification by defining a vocabulary encoding type that restricts the values of statements that use the property.

d) Refinement of properties using syntax encoding schemes

A compliant application profile may refine a property defined within this specification by defining a syntax encoding type that restricts the values of statements that use the property:

- **Literal** - Any literal value such as a string or a number;
- **Description Encoding Type** - A description encoding type contains either:
 - plain unescaped text with an optional language qualifier attribute;
 - valid XHTML markup with an optional language qualifier attribute;

- empty, with a href attribute containing a URL for remote content.
- **Date Encoding Type** - A Date or DateTime literal conforming to ISO 8601;
- **Label Encoding Type** - A String literal with an optional language qualifier attribute.

e) Constraining the use of properties within the profile model

A compliant application profile may constrain the use of properties defined within this specification, such as defining the minimum and maximum occurrence of statements using the specified property for a resource.

Attention is drawn to the DCMI Description Set Profile [3].

E.4 Graceful degradation

Where refinements of properties are used, it should be possible for implementations to be able to identify and use their supertypes.

For example, if "foo" refines "bar" then an XML serialization may use XML Schema Instance refinement of the form:

```
<bar xsi:type="foo">value</bar>
```

In this way both the refined type and original type are available for the processing system, enabling graceful degradation from subtype to supertype.

Where RDF [12] serialization is used, the use of RDF Schema and/or OWL should enable such dynamic supertype substitution to occur.

Bibliography

CWA 15555:2006, *Guidelines and support for building application profiles in e-learning*

IETF RFC 3986, Uniform Resource Identifier (URI): Generic Syntax, available at <http://www.ietf.org/rfc/rfc3986.txt>

IETF RFC 2426 vCard MIME Directory Profile, available at <http://www.ietf.org/rfc/rfc2426.txt>

ISO 8601, *Data elements and interchange formats — Information interchange — Representation of dates and times*

- [1] ECTS User's Guide, available at http://ec.europa.eu/education/lifelong-learning-policy/doc/ects/guide_en.pdf
- [2] DCMI Singapore Framework, available at <http://dublincore.org/documents/singapore-framework/>
- [3] DCMI Description Set Profile, available at <http://dublincore.org/documents/2008/03/31/dc-dsp/>
- [4] Unified Modelling Language (UML), v2.1.2, available at <http://www.omg.org/spec/UML/2.1.2/>
- [5] Semantic Interoperability Centre Europe (SEMIC.EU) Core Person – Specification (Short Version), available at http://www.semic.eu/semic/view/documents/SEMIC-EU_Core_Person_specification_short.pdf
- [6] DCMI Metadata Terms, available at <http://dublincore.org/documents/dcmi-terms/>
- [7] Portable Contacts, The Portable Contacts project, available at <http://portablecontacts.net/>
- [8] Managing Information Across Partners (MIAP) Common Data Definitions (CDD), available at <http://www.miap.gov.uk/products/cdds/>
- [9] European Qualifications Framework, available at http://ec.europa.eu/education/lifelong-learning-policy/doc44_en.htm
- [10] European Commission Education & Training - Online Structure of the Diploma Supplement and Explanatory Notes on Completing Supplements, available at http://ec.europa.eu/education/policies/rec_qual/recognition/ds_en.pdf
- [11] DCMI Abstract Model, available at <http://dublincore.org/documents/abstract-model/>
- [12] W3C RDF Vocabulary Description Language 1.0: RDF Schema, available at <http://www.w3.org/TR/rdf-schema/>
- [13] CEDEFOP Europass Diploma Supplement templates, available at <http://europass.cedefop.europa.eu/europass/home/vernav/InformationOn/EuropassDiplomaSupplement/Restricted/DIPDownload/DSTemplate.csp>
- [14] OJ L 390, 31.12.2004 DECISION No 2241/2004/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 December 2004 on a single Community framework for the transparency of qualifications and competences (Europass)
- [15] CWA 16133:2010, *Guidelines on a European Learner Mobility model*
- [16] ISO 639 (all parts), *Codes for the representation of names of languages*
- [17] ISO 15836, *Information and documentation — The Dublin Core metadata element set*

British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards-based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at bsigroup.com/standards or contacting our Customer Services team or Knowledge Centre.

Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at bsigroup.com/shop, where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to bsigroup.com/subscriptions.

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

PLUS is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit bsigroup.com/shop.

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email bsmusales@bsigroup.com.

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

Copyright

All the data, software and documentation set out in all British Standards and other BSI publications are the property of and copyrighted by BSI, or some person or entity that owns copyright in the information used (such as the international standardization bodies) and has formally licensed such information to BSI for commercial publication and use. Except as permitted under the Copyright, Designs and Patents Act 1988 no extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI. Details and advice can be obtained from the Copyright & Licensing Department.

Useful Contacts:

Customer Services

Tel: +44 845 086 9001

Email (orders): orders@bsigroup.com

Email (enquiries): cservices@bsigroup.com

Subscriptions

Tel: +44 845 086 9001

Email: subscriptions@bsigroup.com

Knowledge Centre

Tel: +44 20 8996 7004

Email: knowledgecentre@bsigroup.com

Copyright & Licensing

Tel: +44 20 8996 7070

Email: copyright@bsigroup.com



...making excellence a habit.™