Publishing of Qualification and Learning Opportunity Data

Documentation

Employment, Social Affairs and Inclusion

Table of Contents

1 Introduction and Policy Context

Introduction

The purpose of this manual is to provide guidance and instructions to national authorities in Member States and participating countries on provision of information on qualifications and learning opportunities to the Europass platform.

The manual is structured in two parts:

- Preparation and publication of qualifications on the Europass platform
- Preparation and publication of learning opportunities on the Europass platform

National authorities can prepare and publish qualifications and learning opportunities through the Qualifications Dataset Register (QDR) platform. The QDR is a tool developed by the Commission to support national authorities to publish their data as 'linked open data' which can be published, connected and used more easily.

This manual is intended for data managers within national authorities and awarding bodies, with responsibility for maintaining national sources of information on qualifications and learning opportunities.

2 Learning opportunities and qualifications in Europass

The provision of this information is organised to support effective implementation of the Europass Decision and the EQF Recommendation.

2.1 Policy Context

2.1.1 Information on Learning Opportunities

The 2018 Europass Decision[1] sets out that the Europass platform shall provide information on learning opportunities, notably -

> *Article 3(2) […] The Europass online platform shall provide available information or links to available information on the following topics: (a) learning opportunities; […]*
>
> *Article 7 (1) Each Member State shall be responsible for the implementation of this Decision at national level through the relevant national services and without prejudice to national arrangements in terms of implementation and organisation.*
>
> *In that regard Member States shall: […] (d) make information on learning opportunities, qualifications and recognition practices available on the Europass online platform, including through links to relevant national websites; […]*
>
> *2. The provision of information to the Europass online platform under Article 3(2) shall not create any additional obligations for Member States.*

Information on learning opportunities will be provided through the 'Search Courses' function, allowing Europass users to search for learning opportunities based on their preferences. In addition, interesting or relevant learning opportunities will also be

[1] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.112.01.0042.01.ENG&toc=OJ:L:2018:112:FULL

suggested to registered Europass users based on their skills and interests in their Europass profile.

Following discussions with the Europass Advisory Group in 2019, learning opportunities at levels 3-8 on the European Qualifications Framework (EQF) are to be submitted by participating countries. Information on learning opportunities was previously submitted by participating countries for publication on the Learning Opportunities and Qualifications in Europe (LOQ) portal. This portal will close to coincide with the launch of the Europass platform in July 2020. These information provision tasks have usually been completed by Euroguidance Centres, as part of their tasks which are co-financed. Information on learning opportunities will be uploaded into the Europass Platform through the Qualifications Dataset Register (QDR), previously used for qualifications.

2.1.2 Information on Qualifications

The 2017 EQF Recommendation[2] invites Member States in accordance with national circumstances to:

Recommendation 6: *Make the results of the referencing process publicly available at national and Union levels and, where possible, ensure that information on qualifications and their learning outcomes is accessible and published, using the data fields in accordance with Annex VI.*

Annex VI of the 2017 Recommendation contains elements for data fields for the electronic publication of information on qualifications with an EQF level which are embedded in the Euopass Learning Model for publishing qualifications.

According to recital 24 of the above Recommendation, *information on the process of referencing national qualifications frameworks or systems to the EQF and on qualifications with an EQF level should be readily accessible to the public. The use of common data structures and formats would help achieve that objective. It would also facilitate the understanding and use of published information on qualifications*.

In addition, the 2018 Europass Decision sets out that the Europass platform shall provide information on qualifications, notably -

> *Article 3(2) […] The Europass online platform shall provide available information or links to available information on the following topics: qualifications and qualifications frameworks or systems.*
>
> *Article 4(4) Europass web-based tools shall refer to the EQF in information on qualifications, descriptions of national education and training systems and other relevant topics, as appropriate and in line with national circumstances.*

Information on qualifications will be provided through the 'Search Courses' function, allowing Europass users to search for qualifications based on their preferences. It will function as a catalogue of national qualifications with their levels and learning outcomes, that can be filtered by Subject Field, EQF level and Location, with links to national databases. In addition, interesting or relevant qualifications will also be suggested to registered Europass users based on their skills and interests in their Europass profile.

[2] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32017H0615(01)

The Europass platform will also include a dedicated section on the European Qualifications Framework (EQF) to include: Information and description of the EQF; comparison of national qualifications frameworks referenced to the EQF; national qualifications frameworks and EQF referencing reports; other documentation (Legal documents, Studies, Documents agreed by the EQF Advisory Group and European Qualifications Framework Series).

3 Data Model

The Europass Learning Model is the data model used for all learning concepts in Europass, including qualifications and learning opportunities. The data model ensures a common understanding and consistent use of quality data by all stakeholders involved in the publication and use of data in Europass.

- A specific application of the model, the Qualifications Metadata Schemata (QMS), is used to support publication of information on qualifications on Europass.
- A specific application of the model, the Learning Opportuntiies Metadata Schemata (LOMS), is used to support publication of information on learning opportunities on Europass.

It is strongly recommended that all national authorities use the up-to-date QMS or LOMS to publish their data on Europass through the QDR platform (see information on the schemata annexed to this manual). The newer schemata are flexible models and can adapt to the existing situation in different Member States as well as to an international context. The use of the up-to-date QMS and LOMS will also allow national authorities or authorised providers to use the infrastructure to issue Digitally Signed Credentials.

For countries not able to use the updated QMS or LOMS, Europass will still support legacy data models used by national authorities who have previously published their data on the LOQ:

These legacy schemata include:

- EQF Schema – Qualification (typically used by applicants to a 2014 call for proposals for developing qualifications databases)
- Qualification Metadata schema 2015 (typically used by applicants to calls for proposals for developing qualifications databases from 2015).
  PLOTEUS – Learning Opportunity 2014 (typically used by national authorities to publish learning opportunities to the Learning Opportunities and Qualifications in Europe Portal (LOQ), and previously PLOTEUS).

Instructions for migration from legacy models are included in the section **Increase the quality of your data**.

The QDR offers the possibility to have both manual uploads/updates by Member States or automatic upload/update of information from national databases. **It is recommended to opt for the automatic uploads/updates of information to ensure full interoperability, ensure up-to-date information and reduce administrative burdens.**

4 Publish Qualifications on QDR

4.1 Preparation

In this section, you can find the details on how to prepare and publish your National Qualifications Databases (NQD) data on Europass.

Which information do I publish?

When deciding which information to publish, there is one important rule to follow:

***Rule**:* Unless you have the responsibility to do so - per your national laws or internal codes of conducts - publish only data of which you are the owner.

You are the 'owner' when you define, describe and manage given data. If you nevertheless publish data that you don't own, it may lead to unnecessary data redundancy.

4.2 Assign an Identifier

The first real step towards the publication is to assign an identifier to all the concepts. To do so, you may have the following questions:

4.2.1 Why do you need identifiers?

With identifiers, you can identify in a unique way the concept you publish information about. This is necessary to make sure you can link the information to other information on the web, without having the risk of losing track where the information comes from. On the web, different sources can publish information about the same concept. But how do we know they are talking about the same concepts? By looking at the identifier. If someone else wants to refer to your concept, then they will use the identifier to do so.

4.2.2 How to know which concept you must assign an identifier to?

Every 'concept' needs to get an identifier. A concept is an 'entity' you want to publish information about: a qualification, a learning opportunity, an organisation, a country, an EQF level, an awarding body, …

Some of these concepts will already have an identifier. To know which concepts have an identifier and which don't, you must check the schema: QMS. Every "instance" of a class needs an identifier.

4.2.3 Identifier example

A university awards different qualifications in the engineering department:

- Bachelor of industrial sciences;
- Master of industrial sciences: Chemical engineering;
- Master of industrial sciences: Electronic engineering.

A VET provider awards different VET qualifications in the field of ICT:

- Qualification of ICT worker
- Qualification of ICT service worker

- Qualification of ICT service desk manager.

In both cases, these three different qualifications will each get a different identifier.

4.2.4 What are the characteristics of the identifier?

The identifier must (optimally) be globally **unique**. This means that there is not another identifier in the world that is the same.

The identifier must be **persistent**: it should not change when the concept itself changes (for example when it changes location). Once you assign an identifier, it should always refer to the same concept (whenever, even if the concept doesn't' exist anymore). This is needed because other systems might still use the identifier to refer to the concept.

Best case the identifier is **dereferenceable**: this means that anyone who uses the identifier, can access the concept itself. However, this is not a requirement.

4.2.5 How to design identifiers?

You can design identifiers however you like if they meet the requirements of being unique and persistent.

If your organisation uses a system to assign codes to concepts, such as a national code for each qualification, then you can start from these codes to build identifiers. If you prefer to use these codes as an identifier itself, you must ensure that the identifiers are persistent and globally unique.

The best practice is to use URI's as identifiers. Uniqueness and persistence are guaranteed by the strategy of URI's. But it is possible to use identifiers other than URI's. In that case, you might have to foresee a way to build in uniqueness and persistence yourself.

Both options are explained with examples in the following pages.

Use URI as identifiers

An example of a URI structure would be the following:

http://data.domain.eu/collection/type/key		
domain (required)	Start from a domain name that your organisation owns.	University ABC has its website at http://www.universityABC.nl. They register http://data.universityABC.nl as a domain name for building identifiers. Remark: Adding "data" shows that this is to publish data, not documents. It is not required; however, you might have to register this as a new domain name.
collection (recommended)	A collection subdivides the domain into collections of entities	http://data.universityABC.nl/courses

type (recommended)	The type defines what kind of entity is described	http://data.universityABC.nl/courses/qualifications
key (required)	The key makes the entity unique	http://data.universityABC.nl/courses/qualifications/Q1234

The strategy of URI's s implicitly ensures that the URI is unique. Since only you own your domain, it is up to you to keep the identifiers unique within your domain. It is your responsibility to manage the keys within your domain and keep them unique.

Use identifiers other than URIs

If your organisation already uses a system to assign codes to the concepts you want to identify, you can use these codes as identifiers. In that case, you should foresee a mechanism to make the codes persistent and unique.

Remark: *best practice is to use these codes to build URI's. URI's ensure the uniqueness and persistence are guaranteed. See Use* ***URI's as identifiers****.*

Example Q*: In the Netherlands, qualifications get a CROHO code when they are officially recognised by the government. When you study arts & crafts e.g., the qualification you obtain is "Associate Degree Arts & Crafts" with code 80078. Everyone can consult these codes in the online CROHO register. These codes are unique and persistent because they are managed on a national level. You could use these codes – as they are – as identifiers for the qualifications you want to publish information about.*

In cases where you have your own codes, make sure you keep them unique and persistent at all times.

4.3 Apply the Metadata Schema to your data.

This manual provides a model that you can use to model the information that you want to publish.

The QMS is a RDF[3] vocabulary with an RDF schema. Additionally, there are XML[4] schemata available to support the encoding of information in XML. The schemata also define controlled vocabularies as fixed value lists for some properties in the schema.

QMS is applicable in many contexts. They can be applied to encode, publish and exchange qualification metadata in many technologies, including:

- RDF accessible via SPARQL[5] endpoints.
- RDF embedded in HTML[6] pages.

[3] https://www.w3.org/RDF/
[4] https://www.w3.org/XML/
[5] https://www.w3.org/TR/rdf-sparql-protocol/
[6] https://www.w3.org/html/

- RDF serialized as RDF/XML[7] or Turtle[8].
- XML.

Investigate how the metadata schema applies to your data

Look at the classes in the QMS and compare with the classes of your own information model. Do they correspond to each other? Try to find out how the entities in your model correspond to the classes of the schema.

How are the entities in your own information model related to one another? Look at the properties in the metadata schemata to see if you can use them to express the relationships between the entities.

How to deal with required fields?

The QMS consists of classes and properties, divided into three kinds:

- Required data fields: fields that you ''must'' publish in any case;
- Recommended fields: fields that you should publish in case they are available;
- Optional data fields: fields that you can choose to publish, to give more information on the qualification or learning opportunity.

How to deal with different languages?

The language is apparent in some of the properties of a concept, for example, the title of qualification or its homepage.

***Example**: In the Netherlands, the official title of a bachelor's in chemistry is 'B Chemie' (CROHO code 34396). In English, the official title is 'B Chemistry'. But an awarding body can refer to it as 'Bachelor in de Chemie', which is an alternative Dutch title. This would be modelled as such:*

```
ex:qualification-34396 a esco:Qualification;
skos:prefLabel “B Chemie” @nl;
skos:prefLabel “B Chemistry” @en;
skos:altLabel “Bachelor in de Chemie” @nl.
```

What if you want to publish information that is not covered by one of the classes in the metadata schema?

In some cases, you may be able to fit such information into "`AdditionalNote`", if this is not possible it is better omitting to publish it. In case you believe the information is important and not represented in the schemata, you can suggest it for future improvement.

What if you don't want to publish – or simply don't have – the information that is covered in the metadata schema?

This is not a problem. It is allowed to use only a subset of the classes (and properties) of the qualification metadata schema.

[7] https://www.w3.org/TR/rdf-syntax-grammar/
[8] https://www.w3.org/TR/turtle/

What if the class or property in the schema is not the same as how you define your data?

The information that you publish needs to conform the metadata schemata and their definitions. That means you have to follow the exact definitions of the classes and properties in the schema.

- Find the right class or property for all your concepts

You need to find - for each of the concepts separately - how you can translate it into an instance of the qualification metadata schema.

- A concept can correspond to a class in the qualification metadata schema

Example: *The qualification 'Arts & Crafts' at a certain university, gets identifier* `http://data.universityABC.nl/courses/qualification/arts-and-crafts`*. In the qualification metadata schema, you will see that there is a class* `'''esco:Qualification'''`*. This is a clear match and therefore* `http://data.universityABC.nl/courses/qualification/arts-and-crafts` *is an* ***instance*** *of* `'''esco:Qualification'''`*.*

- A concept can correspond to a property in the qualification metadata schema

Example: *A certain university awards qualifications in 'Arts & Crafts', with identifier* `http://data.universityABC.nl/courses/qualification/arts-and-crafts`*. The qualification gets its own homepage on the website of the university, at* `http://universityABC.nl/arts-and-crafts`*. In the qualification metadata schema, you will see that there is a property* `'''foaf:homepage'''`*. This is a clear match: the relation between* `http://data.universityABC.nl/courses/qualification/arts-and-crafts` *and* `http://universityABC.nl/arts-and-crafts` *is* `'''foaf: homepage'''`*.*

4.4 Transform your data

Once you know how the schema maps to your data, you can start the technical part of publishing. This means you transform your current data into one of the formats proposed below.

You will need to develop a software/script/plugin that does the transformation from the data in your database. You should approach this as any other software project, in terms of analysis, requirements, development, testing and release.

4.4.1 Data Formats: QMS

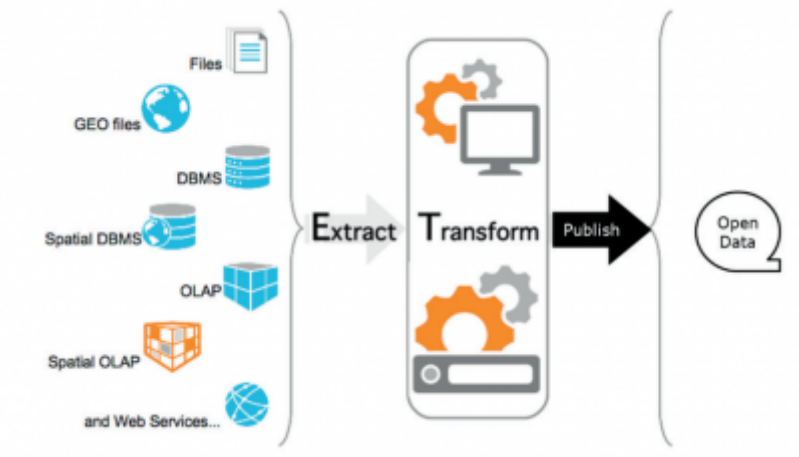
The QMS allows you to choose between two data formats to publish in:

- **RDF format**: This format is aligned with publishing Linked Open Data and is, therefore, the best choice from an interoperability point of view. On the other hand, not all systems provide support for this format.
- **XML format**: XML is a well-established format for the exchange of data. It may not be as flexible as RDF, but it will likely be better supported by used systems.

It is also possible to publish qualification information in the legacy format supporting the LOQ platform (EQF-Q). This is generally not recommended since the data in this format is less rich and less semantically structured. In order to migrate from EQF-Q to QMS please see the section **Increase the quality of your data**.

4.4.2 Publishing Process

The publishing process follows a similar paradigm to typical Business Intelligence (BI) or Data Warehousing processing. You first need to access your data in your current systems, extract it and transform it (while clean it and ensuring consistency).



One difference is that instead of doing a classic Extract – Transform – Load (ETL) you will need to do an Extract – Transform – Publish. Tools, techniques and processes can be re-used from traditional ETL.

In case your development team does not use ETL tools, you need a custom-built solution. This solution will use a set of libraries to access your current systems, and libraries to transform the data in either RDF or XML.

4.5 Announce your work in QDR

To make your data reusable in the European infrastructure you must let the European Commission know that you want to publish a dataset. This is done in the Qualifications Dataset Register (QDR).

4.5.1 What is the Qualification Dataset Register?

The Qualifications dataset Register (QDR) is an online register that will store information about your datasets (i.e. the format of your data, location of your data, a license of your data, contact person, ...) for publication in the new Europass.

Publishing data in the QDR involves several steps: (1) first you need to register, (2) then you specify the metadata of your datasets and finally (3) you publish actual data in form of different version for these datasets.

4.5.2 How to announce the data to QDR?

The QDR offers different ways to provide the files containing the datasets so that any infrastructure approach you may have is supported. As indicated above, automatic update of data hosted on national servers is the recommended option.

The possibilities are:

Hosted on your server - Automatic Update

With this method, you host the data on your server and have the data automatically retrieved by the QDR. You specify a URL where the data will be continuously maintained and where the QDR can regularly check for updates.

Hosted on your server - API update

With this method, you host the data on your server and notify the QDR using an API call any time there is an update. You would be given an API key by QDR which authenticates your calls.

Hosted on your server - Manual Update

With this method, you host the data on your server and manually notify the QDR using the web platform user interface any time there is an update. You need to provide a unique URL of the hosted dataset every time you publish new data.

Manual upload

With this method, you host the data only on the QDR server and upload it manually using the web platform user interface. You would need to upload a unique file every time you publish new data.

The first two options above are preferable over the last two, as they will ensure that information publisghed through Europass is updated information. It is therefore strongly recommended to to use one of the first two options.

4.5.3 How many datasets am I supposed to have?

As a publisher, it is recommended to maintain one dataset for Qualifications, but you can decide to publish more than one if necessary.

4.6 Keep your data stable

When you publish data, it is important to keep your data stable by:

- Keeping your data accessible;
- Keeping your identifiers persistent;
- Keeping your data up to date;
- Keeping your data versioned.

4.7 Increase the quality of your data: Adapting to the new Europass Learning Model for qualifications

Here, we present a way to increase the quality of your data by upgrading from the legacy EQF-Q. The new QMS schema provides further opportunities to structure your metadata and annotate it with machine-readable information.

4.7.1 EQF-Q to QMS

Both EQF-Q and QMS schemata are compliant with the EQF Recommendation Annex VI and therefore refer to the same core data. The difference between the two is the approach to the structure. Below is a list of the main points that should be considered during the migration:

- QMS indicates awarding bodies as a separate class in the data:
  - in EQF-Q the awarding bodies are indicated among the metadata of the qualification itself (e.g. property `<tns:AwardingBody language="el">Υπουργείο Πολιτισμού, Παιδείας και Θρησκευμάτων</tns:AwardingBody>`). While QMS uses a dedicated class for all types of organisations – being it awarding body, publisher, or owner of the qualification (e.g. class `<Agent><Name lang=" el ">Υπουργείο Πολιτισμού, Παιδείας και Θρησκευμάτων</Name></Agent>`)
- QMS allows to indicate structure information on learning outcomes:
  - In QMS the learning outcomes can be annotated with machine-readable data by linking to ESCO skills (e.g. property `<LearningOutCome><target><URI> http://data.europa.eu/esco/skill/814f3782-62cb-4af8-8b13-98a71c5f60a2</URI></target></LearningOutCome>`)

***Note**:* The Commission offers technical support to all Member States for the publishing of Qualifications and Learning Opportunity data. You can utilise this support by emailing specific questions regarding an update of your data to qdrsupport@ext-ec-europa.eu

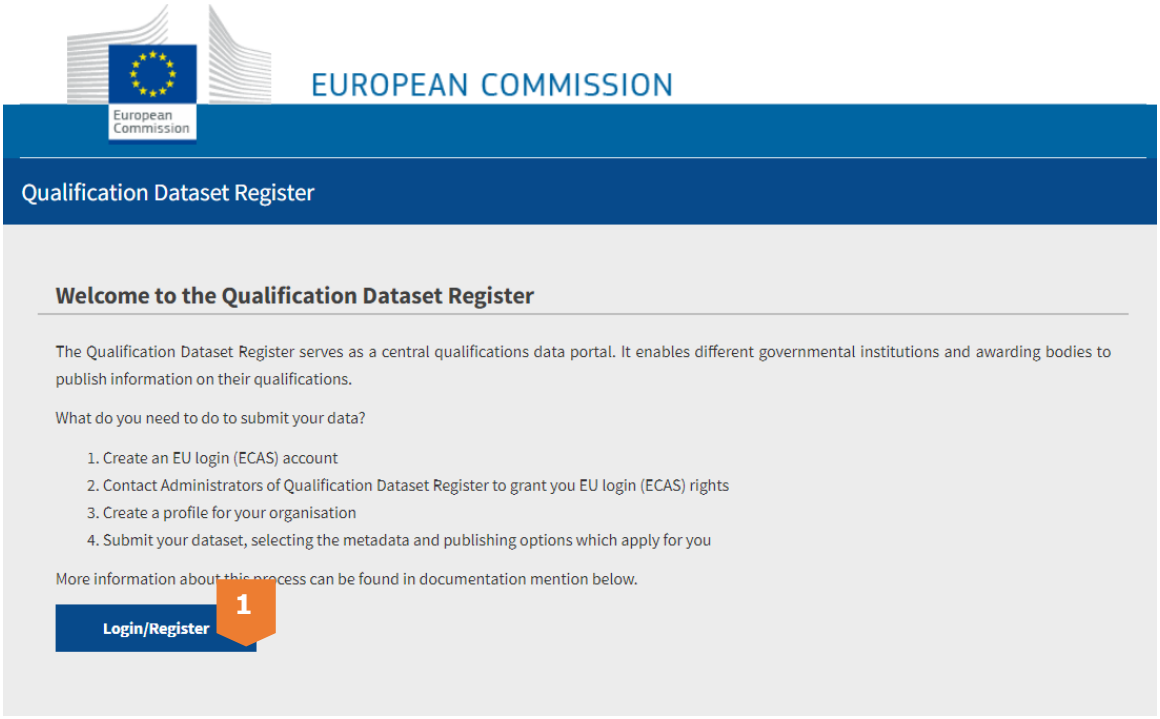
4.8 Publish Qualifications on the QDR: step-by-step

This section provides information on how to publish qualifications data on QDR and sets preferences for uploading and updating your data.

4.8.1 Login

You can log in [1] to the platform using your ECAS login account.

If you have not yet registered on the platform and created a profile for your organisation, please find the user manual for registration, follow the described steps, and then return here to find out how to publish your data.



4.8.2 User Interface (UI) QDR platform

The UI of the organisation's profile page is shown in the figure below. You can find several navigation elements:

- **[1] 'Show/Edit data'** – Allowing you to modify information about your organisation.
- **[2] 'Published datasets'** – Here, you can find the datasets you have published and have the possibility to modify them.
- **[3] 'Accreditation'** – Allowing you to delegate the publication rights of your organisation to another organisation.
- **[4] 'Publish new dataset'** – Adding a new dataset with qualification, learning opportunity or accreditation data
- **[5] 'Logout'** – To leave the application

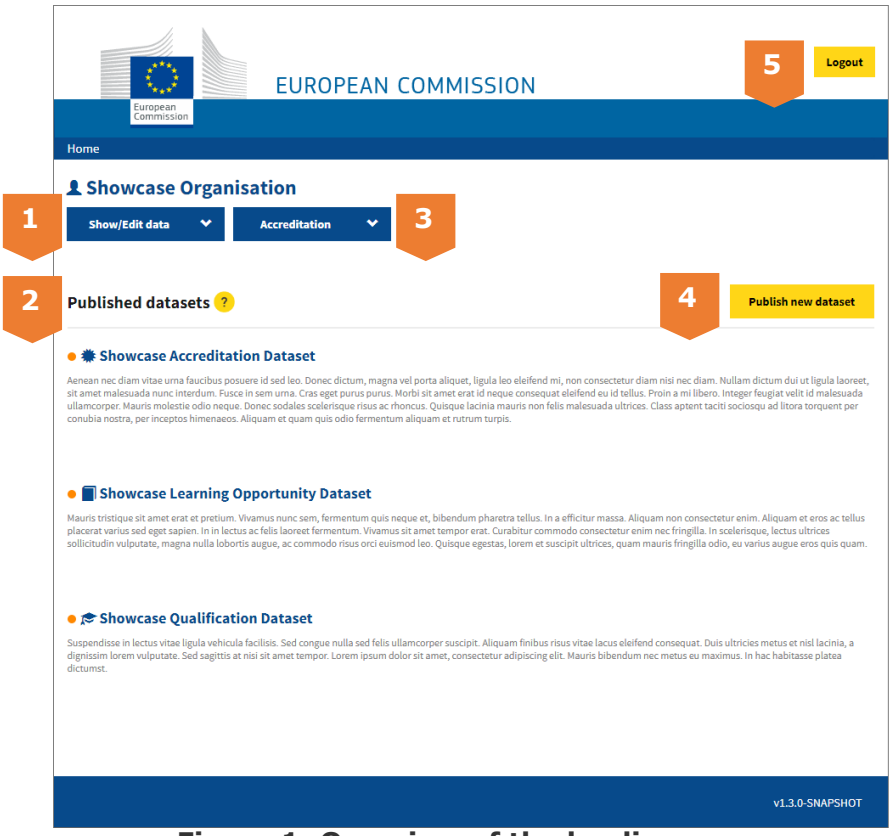


Figure 1: Overview of the landing page

4.8.3 Publish New Datasets

On the right side of the landing page, click on the yellow **'Publish new dataset'** button to upload a new dataset. This will take you to a pop-up page where you can fill out the information of this dataset, as well as decide how you want your data to be updated:

The following information should be indicated during the publication:

- First, fill out the **[1] 'Title'** of your data, then add a brief **[2] 'Dataset description'**.
- Then you should indicate what type of data will be published in this dataset in **[3] 'Type of data contained'**. The data contained in your dataset should be:
    1. **Qualification dataset** - Containing qualifications, which represent the 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. Contained qualifications may also contain information on accreditation, licencing or authorisation, if relevant.

- In the field '**Publishing scheme' [3]**, select the right option from a top-down menu to indicate which schema is your data published in. This can be different depending on what you've previously selected for '**Type of data contained':**
    a. **Qualification dataset** –
        - If you applied for the call for proposals of 2014, please select "EQF Schema - Qualification (2014)";
        - If you applied for the call for proposals of 2015 to 2018, please select "Qualification metadata schema (2015) -QMS1.0.x";

- If you follow the data model outlined in this document or you are preparing your data after year 2019, please select "Qualification metadata schema (2019) -QMS2.0.x".

Figure 2: creating a new dataset

- **[5] 'Namespace'** The namespace is used in order to transform your local identifiers into globally unique ones. Please specify here a globally unique string which will be used to represent a namespace of contained qualifications. The namespace has to be formed in a URL structure (e.g. "http://example.com/"). This can be represented for example by the URL of your organisation or the base URI of your concepts.

- For the **[6] 'Publishing method'**, there are two main distinctions: **Hosted or Upload**. This defines whether you wish to upload your data as a manual upload in a file to QDR, or automatically to provide a URL from which the platform fetches your data, which is further explained in the following sections.

Hosted: you don't need to manually add a file in the platform. It is a method which requires to host a qualification dataset on a server and provide the URL pointing to the data during dataset creation on the QDR portal. QDR then downloads the qualification data from the provided URL whenever a new version is created. The data must be hosted through http or https and only port 80, 443.There are three options available for the hosted options listed below:

a. **Hosted on your server - Automatic Update:** the updates will happen automatically. You will then indicate a URL where you are planning continuously to maintain your dataset. Using this method, you should make sure that the HTML header of your indicated URL is updated every time you want to release a new dataset version. You are provided with the following setting with this option:

    - In the field **'Download URL'**, a field will appear where you can paste the URL from which we will create the new versions as your website is updated.
    - In the field **'Update Frequency',** you can control the frequency of the updates, namely: Monthly, Weekly and Daily.
    - In the field **'Type of provided file',** you can see which file types are supported, and you can indicate the option that applies to you.

b. **Hosted on your server - API update:** you will be able to push each update of your dataset to QDR using an API call. If you plan to use this method, please contact the administrators of QDR to provide you with an API key.

c. **Hosted on your server – Manual Update:** you will provide a new URL from which the platform can fetch the updated data every time a new version is released.

Upload: you will need to manually add a file in the platform to publish new datasets. This also means you will upload a new file every time your data is updated.

Note: *If you select the publication method 'hosted - automated fetching', you will not be able to create new versions manually; they will always be created automatically with a daily refresh.*

Note: *If you select the publication method 'hosted – manual update', you will need to create a dataset version manually and provide a URL each time you want to release a new version.*

Note: *You can change the publishing method of a specific dataset at any time in case you decide that you want to provide future versions using a different method.*

Then, you can save everything by clicking '**save**' at the bottom of the page.

a. After you save, you will be redirected to the previous page.
b. If at any point you wish to close the page, you can find the **[7] 'x'** button on the top right.

4.8.4 Creating Dataset Version

Once you have created a new dataset, you can now upload your data. For this you will need to create a version. First you have to access the dataset, by **clicking on its name** on your profile page. Depending on which Publishing method you've selected for the dataset, the creation of a version may look slightly different. Below we explain 'How to create a dataset version?' for each of the dataset publishing methods.

How to create a dataset version for "Hosted on your server - Automatic Update"?

During the initial publishing phase, if you chose 'Hosted – Automated Fetching', the version updates will be done for you and you will not have to update the version using any dialogue, so this option is no longer applicable.

How to create a dataset version for "Hosted on your server - API update"?

During the initial publishing phase, if you chose 'Hosted on your server - API update', the version updates will be done via an API and you will not have to update the version using any dialogue. In this case, the dataset page will show detailed information on how to perform an API call required to push the data to QDR:

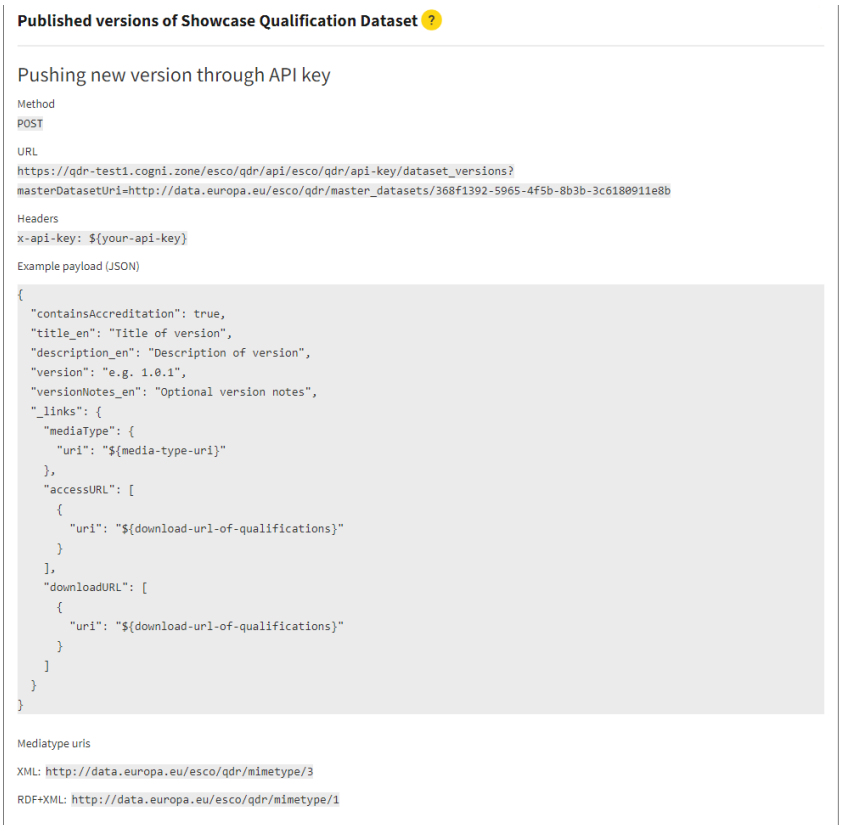


Figure 3: creating a new version: Hosted on your server - API update

***Note**: If you plan to use this method, please contact the administrators of QDR to provide you with an API key.*

How to create a dataset version for "Hosted on your server - Manual Update" ?

To create a new version with this publishing method simply click on the **'Publish new version'** button. This will show a pop-up page similar to the page for creating new datasets. The page looks like this:

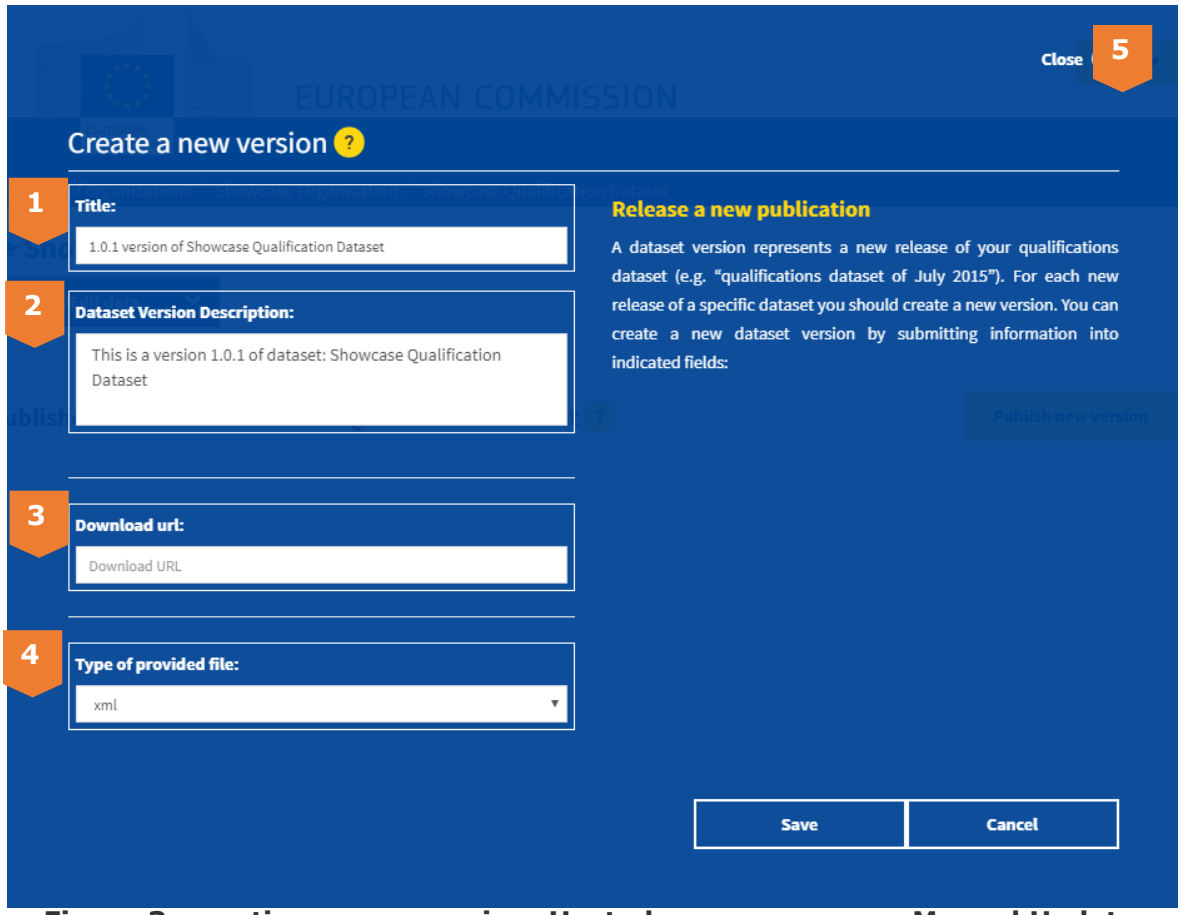


Figure 3: creating a new version: Hosted on your server - Manual Update

The following information should be indicated during the publication:

- First, fill out the **[1] 'Title'** of the version, then add a brief **[2] 'Dataset Version Description'**.
- For **[3] 'Download URL**, you will be asked to indicate the URL from where QDR can retrieve the data.
- Finally, in **[4] 'Type of provided file'** you should indicate what is the type of the file you are providing.
- Then, you can save everything by clicking '**save**' at the bottom of the page.
    a. After you save, you will be redirected to the previous page.
    b. If at any point you wish to close the page, you can find the **[5] 'x'** button on the top right.

How to create a dataset version for "Upload"?

To create a new version with this publishing method simply click on the **'Publish new version'** button. This will show a pop-up page similar to the page for creating new datasets. The UI looks like this:

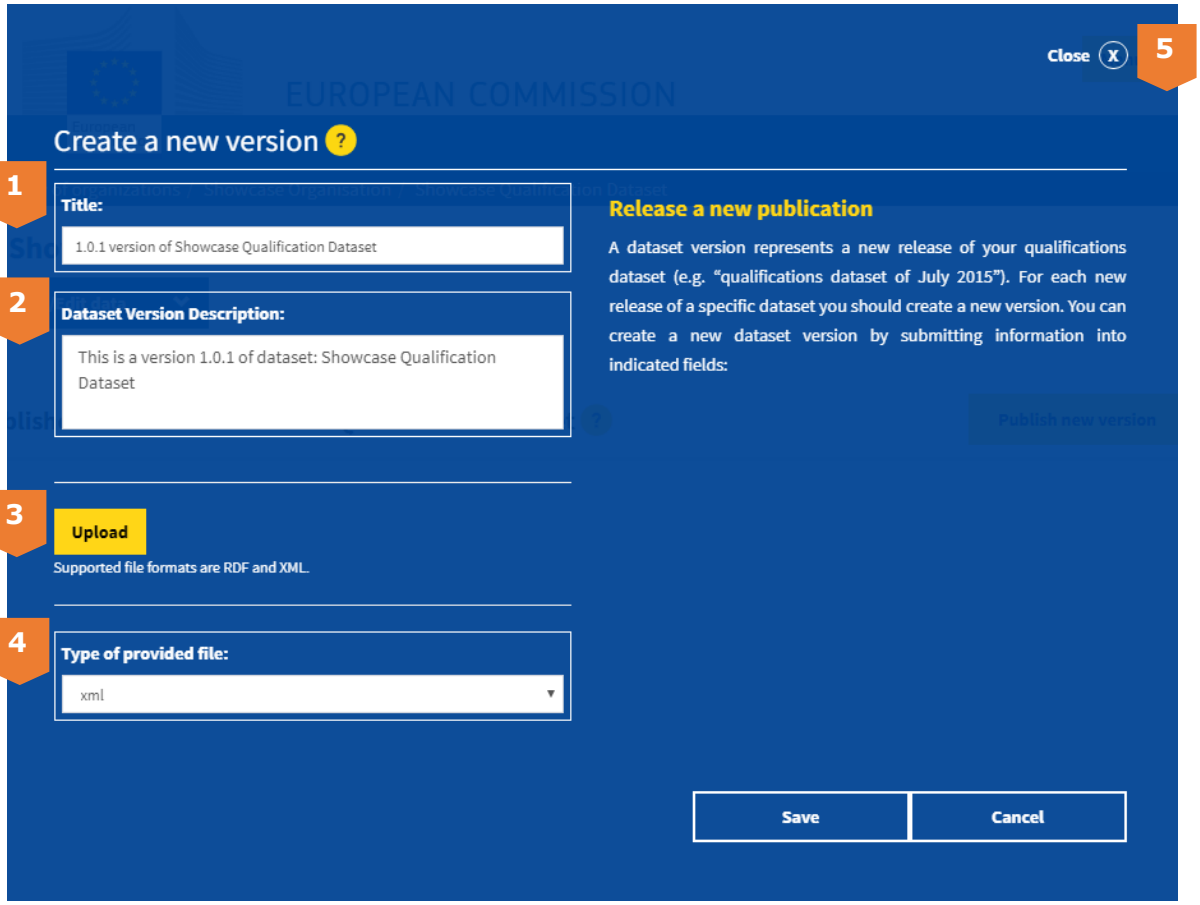


Figure 5: creating a new version: Upload

The following information should be indicated during the publication:

- First, fill out the **[1] 'Title'** of the version, then add a brief **[2] 'Dataset Version Description'**.
- For **[3] 'Upload'**, you will be asked to upload a file containing your data.
- Finally, in **[4] 'Type of provided file'** you should indicate what is the type of the file you are providing.
- Then, you can save everything by clicking '**save**' at the bottom of the page.
    a. After you save, you will be redirected to the previous page.
    b. If at any point you wish to close the page, you can find the **[5] 'x'** button on the top right.

4.8.5 Start dataset processing

Once you have created a new version you will see it in the listing on the dataset overview. This page looks like this:

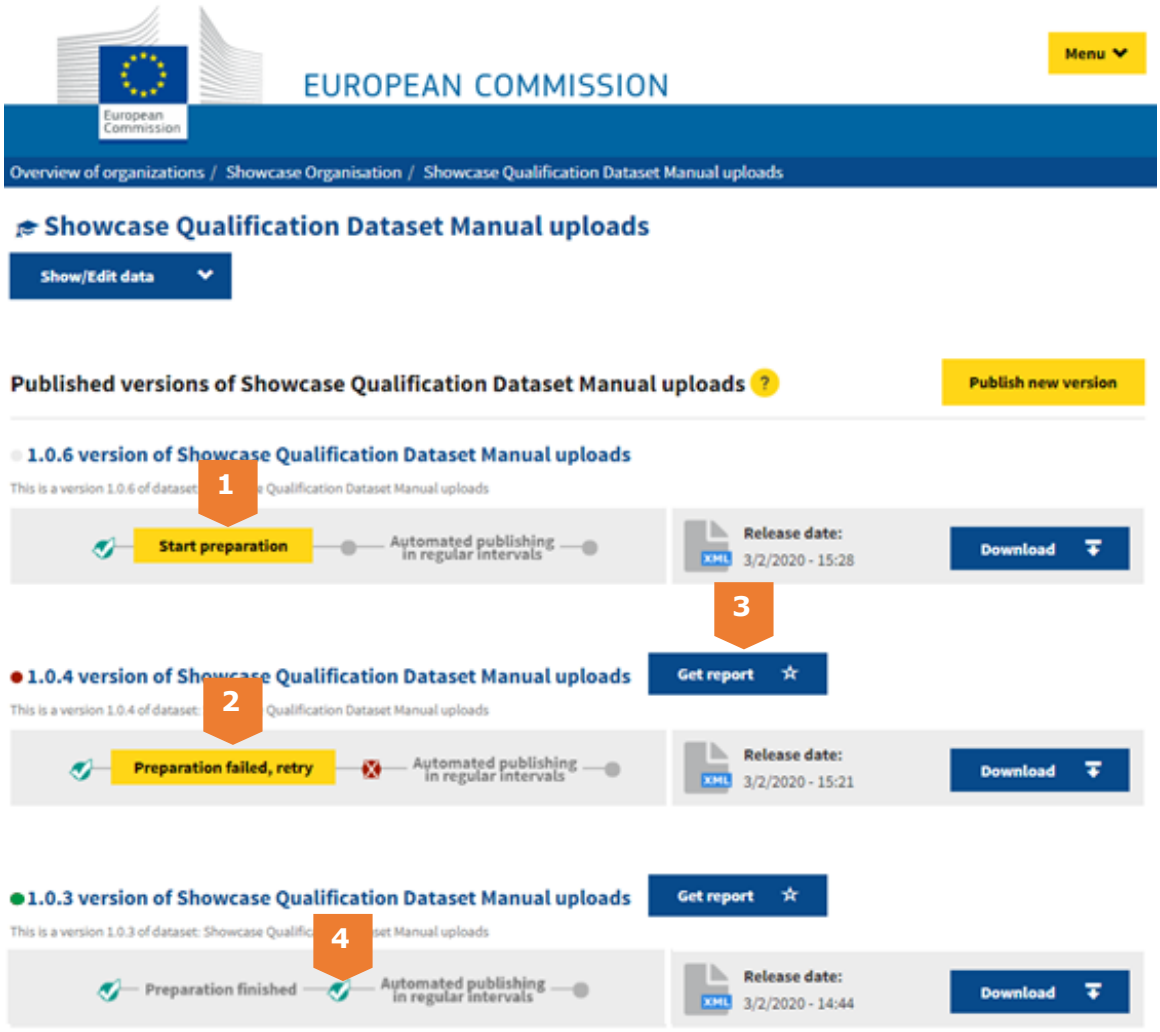


Figure 4: overview dataset and its versions

Here you are able to start the processing of the dataset by clicking **[1] 'Start preparation'**. During the processing, the platform takes your data and transforms it into a unified RDF format according to the metadata schema. This process also applies validations of the compliance of the data. The content of your data is not modified by this process.

The processing may take some time and will result in either success or failure.

1. **Successful upload of a dataset**: You will see green checkbox **[4]** for each successful processing step and will also receive a confirmation e-mail if the processing succeeded until the end.
2. **Failure to upload a dataset:** If there was a problem, you will see this warning right underneath the version as **[2] 'Preparation failed, retry'**.
   You can then perform the necessary fixes noted in the report (**[3] 'Get report'**) and retry processing. If everything went well, you will see this green confirmation instead (**[4]**).

If there are any problems with the information provided, you will receive an e-mail with a report, which will redirect you to the platform where you can see and resolve the problem.

***Note**: This is only applicable to: 'Upload' and 'Hosted on your server - Manual Update'. Other methods do not require manual initiation of the processing.*

4.8.6 Edit your datasets and dataset versions

1. Here you are able to edit the metadata about a dataset by clicking on **[1].**
You can change all the Dataset Information: Title, Dataset description, Namespace, Type of data contained, Qualification publishing scheme, publishing method and what is included in your dataset.

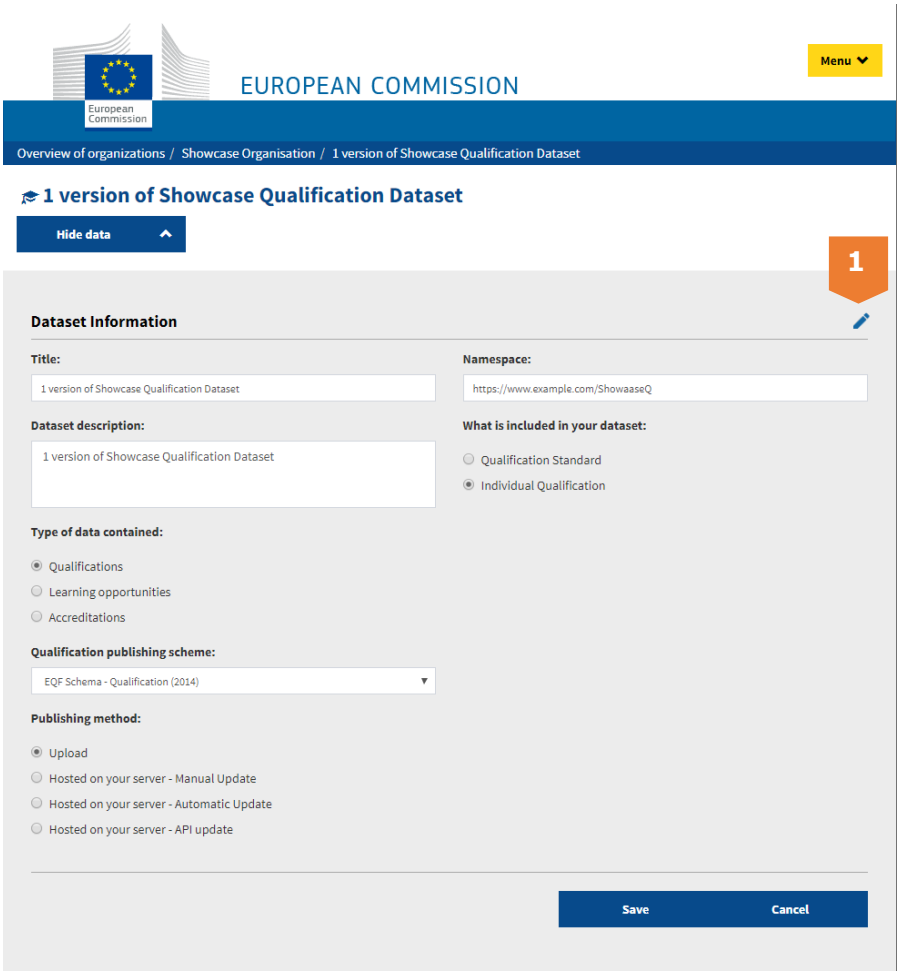


Figure 5: edit metadata of a dataset

2. To edit a dataset version for manual uploads, you can follow the following steps:
   - Click on the dataset version you want to edit.
   - In the dataset UI, click on 'Show/Edit data'. You will get a form containing the metadata of a dataset version, click on the edit pen to start changing the information **[2].**
   - You can even upload a new dataset to this version by clicking on 'upload' **[3]**

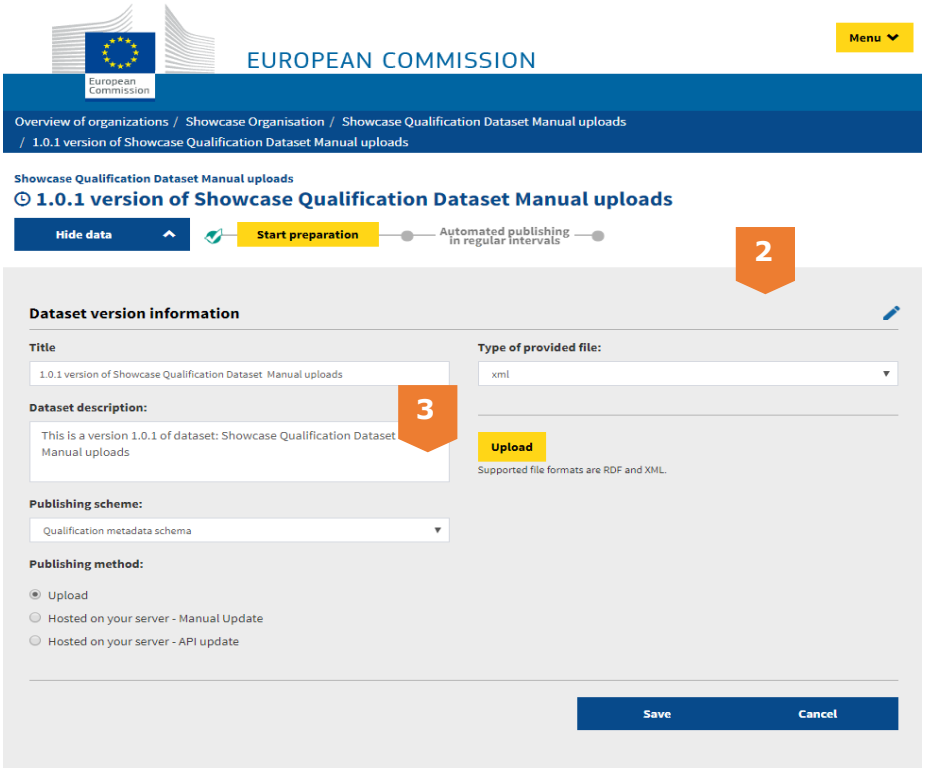


Figure 6: edit a dataset version

4.8.7 Keeping your data up to date

It is recommended to always provide the most up-to-date data. The publishing method you choose will determine how easy it is to ensure the frequency and relevance of the updates:

1. **Hosted on your server – Automatic Update:** The updates happen automatically. It is essential to ensure that the HTML header of your indicated URL is updated every time you want to release a new dataset version.
2. **Hosted on your server – API update:** The latest version could be published using an API call.
3. **Hosted on your server – Manual Update**: For every new version, you will need to add the file in the server.
4. **Upload:** with this publishing option, you will have to manually update the dataset. To update, you will need to create a new dataset version as explained in section 4.8.3 'Creating dataset versions: Upload'. The system always takes the last uploaded version of the dataset as the latest.

As we see, the automatic/API updates are more efficient and time saving for updating the dataset. It is highly recommended that these methods are used as publishing options.

5 Publishing Learning Opportunities on QDR

5.1 Preparation

In this section, you can find the details on how to prepare and publish your Learning Opportunities (Lop) data on Europass.

Which information do I publish?

When deciding which information to publish, there is one important rule to follow:

***Rule**:* Unless you have the responsibility to do so – per your national laws or internal codes of conducts – publish only data which you are the owner of.

You are the 'owner' when you define, describe, revoke and manage given data. If you nevertheless publish data that you don't own, it may lead to unnecessary data redundancy.

5.2 Assign an Identifier

The first real step towards the publication is to assign an identifier to all the concepts. To do so, you may have the following questions:

5.2.1 Why do you need identifiers?

With identifiers, you can identify in a unique way the concept you publish information about. This is necessary to make sure you can link the information to other information on the web, without having the risk of losing track where the information comes from. On the web, different sources can publish information about the same concept. But how do we know they are talking about the same concepts? By looking at the identifier. If someone else wants to refer to your concept, then they will use the identifier to do so.

5.2.2 How to know which concept you must assign an identifier to?

Every 'concept' needs to get an identifier. A concept is an 'entity' you want to publish information about: a learning opportunity, an organisation, a country, an awarding body, …

Some of these concepts will already have an identifier. To know which concepts have an identifier and which don't, you must check the schema LOMS. Every "instance" of a class needs an identifier.

5.2.3 Identifier example

A university provides foreign languages courses as the Learning Opportunities:

- Icelandic as a second language;
- Dutch for foreigners

These two different learning opportunities will each get a different identifier.

A secondary vocational education institution provides professional courses as learning opportunities:

- professional course of kitchen/pastry technician
- pofessional couse of restaurant/bar technician.

These two different learning opportunities will each get a different identifier.

5.2.4 What are the characteristics of the identifier?

The identifier should be globally **unique**. This means that there is not another identifier in the world that is the same.

The identifier must be **persistent**: it should not change when the concept itself changes (for example when an Learning Opportunity changes its name). Once you assign an identifier, it should always refer to the same concept (whenever, even if the concept doesn't' exist anymore). This is needed because other systems might still use the identifier to refer to the concept.

In the best scenario, the identifier is **dereferenceable**: this means that anyone who uses the identifier can access the concept itself (e.g. the identifier also serves as a web page). However, this is not a requirement.

5.2.5 How to design identifiers?

You can design identifiers however you like if they meet the requirements of being unique and persistent.

If your organisation uses a system to assign codes to concepts, such as a national code for each qualification, then you can start from these codes to build identifiers. If you, however, prefer to use the code as an identifier itself, you must foresee that the identifiers are persistent and globally unique.

The best practice is to use URI's as identifiers. Uniqueness and persistence are guaranteed by the strategy of URI's. But it is possible to use identifiers other than URI's. In that case, you might have to foresee a way to build in uniqueness and persistence yourself.

Both options are explained with examples in the following pages.

Use URI as identifiers

An example of a URI structure would be the following:

http://data**.domain.eu/collection/type/key**		
domain (required)	Start from a domain name that your organisation owns.	University ABC has its website at http://www.universityABC.nl. They register http://data.universityABC.nl as a domain name for building identifiers. Remark: Adding "data" shows that this is to publish data, not documents. It is not required; however, you might have to register this as a new domain name.
collection (recommended)	A collection subdivides the domain into collections of entities	http://data.universityABC.nl/courses
type (recommended)	The type defines what kind of entity is described	http://data.universityABC.nl/courses/learningopportunity
key (required)	The key makes the entity unique	http://data.universityABC.nl/courses/learningopportunity/001

The strategy of URI's s implicitly ensures that the URI is unique. Since only you own your domain, it is up to you to keep the identifiers unique within your domain. It is your responsibility to manage the keys within your domain and keep them unique.

Use identifiers other than URIs

If your organisation already uses a system to assign codes to the concepts you want to identify, you can use these codes as identifiers. In that case, you should foresee a mechanism to make the codes persistent and unique.

Remark: *best practice is to use these codes to build URI's. URI's ensure the uniqueness and persistence are guaranteed. See Use* ***URI's as identifiers****.*

Example: *In the national database, learning opportunities get a national ID code when they are officially recognised by the government. Everyone can consult these codes in the register. These codes are unique and persistent because they are managed on a national level. You could use these codes – as they are – as identifiers for the learning opportunity you want to publish information about.*

In cases where you have your own codes, make sure you keep them unique and persistent at all times.

5.3 Apply the Metadata Schema to your data.

This manual provides a model that you can use to model the information that you want to publish.

The LOMS is in RDF[9] vocabulary with an RDF schema. Additionally, there is an XML[10] schema available to support the publication of information. The schema also define controlled vocabularies as fixed value lists for specific properties in the schema.

Investigate how the metadata schema applies to your data

Look at the classes in the LOMS and compare with the classes of your own information model. Do they correspond to each other? Try to find out how the entities in your model correspond to the classes of the schema.

How are the entities in your own information model related to one another? Look at the properties in the metadata schemata to see if you can use them to express the relationships between the entities.

What if you want to publish information that is not covered by one of the classes in the metadata schema?

In some cases, you may be able to fit such information into "`AdditionalNote`", if this is not possible it is better omitting to publish it. In case you believe the information is important and not represented in the schemata, you can suggest it for future improvement.

How to deal with required fields?

The LOMS consist of classes and properties, divided into three kinds:

- Required data fields: fields that you ''must'' publish in any case;

[9] https://www.w3.org/RDF/
[10] https://www.w3.org/XML/

- Recommended fields: fields that you should publish in case they are available;
- Optional data fields: fields that you can choose to publish, to give more information on the qualification or learning opportunity.

The LOMS required data fields are provided in the UML diagram below:

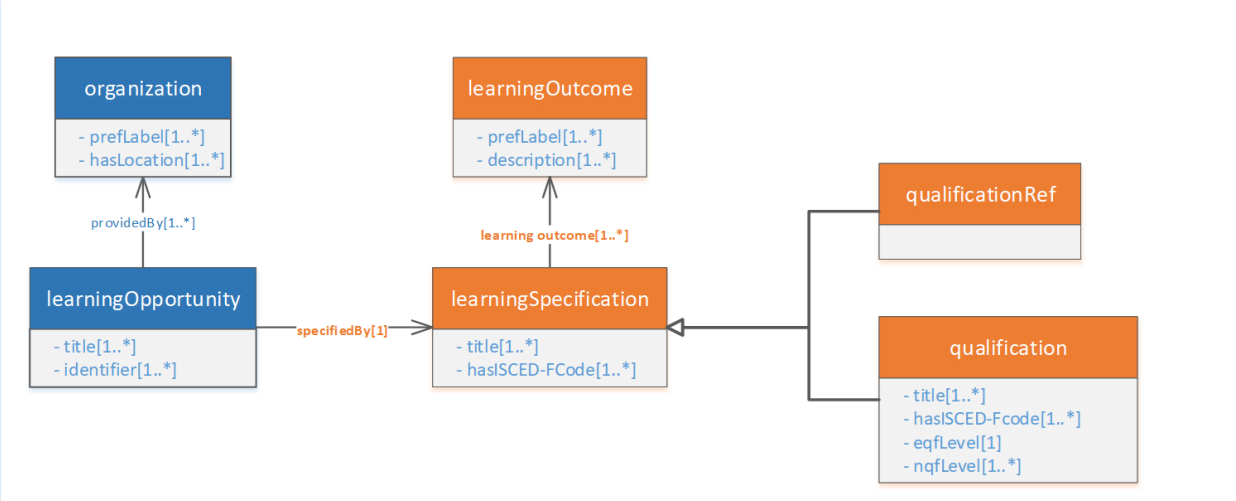


Figure 7: UML diagram with the required fields of LOMS

For all the data fields for LOMS, please refer to Annex *7.2 LOMS 1.0.0 Data Model*. The table below provides only the required data fields with the information on:

- **Label**: contains the Class (highlighted in green) and its mandatory elements;
- **Description**: contains the definition of the classes and their elements;
- **Additional Desc**: contains the additional notes for data preparation.

	Label	**Description**	**Additional Desc.** *(for Data Preparation)*
	Learning Opportunity	**A 'learning opportunity' is the opportunity for an individual to do a set of 'learning activities' where he can acquire knowledge, skills or responsibility and autonomy as proven by an assessment.**	
1	Learning Opportunity UID	The unique identifier of the Learning Opportunity.	Automatically Generated
2	Learning Opportunity Identifier	An identifier assigned to the learning opportunity by the organisation offering the opportunity.	
3	Title (Learning Opportunity)	The title of the learning opportunity (e.g. name of a course offered at a given institution).	

4	Provided By	The organisation providing or directing the learning opportunity. In the case of, e.g. joint qualifications, there may be several organisations directing the learning opportunity.	
5	Specified By	The learning specification, including the curricula, of this learning opportunity.	
	Learning Specification	**A specification or package of learning that is expressed in 1 or more learning outcomes.**	
6	Learning Specification UID	The unique identifier of the learning specification.	Automatically Generated
7	Title (Learning Specification)	The exact and official title of the learning specification.	This is often equivalent to the title of the learning opportunity
8	Thematic Area	Thematic Area according to the ISCED-F Classification	
9	Learning Outcomes	An individual (expected) learning outcome of the learning specification/qualification.	
	Qualification	**The details of a qualification that can or has been awarded such as the (expected) learning outcomes. This can be a copy or a specialisation of an existing qualification standard.**	
10	Title (Qualification)	The exact and official title of the qualification.	Required only if qualifications are being published (Learning opportunity can also exist without Qualification)
11	Thematic Area	Thematic Area according to the ISCED-F FoET 2013 Classification	Required only if qualifications are being published (Learning opportunity can also exist without Qualification)
12	EQF Level (for NQF qualifications)	The qualification level as specified by the European Qualification Framework.	Required only if qualifications are being published (Learning opportunity can also exist without Qualification) Where the opportunity is a qualification, its level as mapped to the European Qualifications Framework.

13	NQF Level	Where the opportunity is a qualification, its level as mapped to the offering institution's National Qualifications Framework.	Required only if qualifications are being published (Learning opportunity can also exist without Qualification)
14	Accreditation (for issuing Europass Digital Credentials)		Required only if the interlinking beween Qualification- Learning opportunity datasets is used. Where the qualification is accredited, provide a link to the relevant accreditation record (either for institutional or programme accreditation). Preferably links should be made to records in the Europass Accreditation Database
	Qualification Reference	**Reference for a qualification from another dataset that can or has been awarded such as the (expected) learning outcomes.**	
15	Qualification Reference Identifier	The unique identifier to the reference qualification.	Required only if the interlinking beween Qualification- Learning opportunity datasets is used.
	Learning outcome	**A learning outcome (i.e. knowledge, skill, autonomy-responsibility). The details, such as the description, of a learning outcome.**	
16	Title (Learning Outcome)	A legible, descriptive name for the learning outcome. Maximum cardinality of one per language.	
	Organisation	**A legal person / registered organisation.**	
17	Organisation UID	The unique identifier of the organisation.	Automatically Generated.
18	Legal Name	The primary name of the Organisation (e.g. legally recognized name). In case of a registered organisation this is the legal name of the Organisation.	Full legal name of the Organisation, as registered with national authorities. The legal name should only be translated to languages where official translations (submitted to national authorities) exist.

19	Location	The legally registered site of the organisation. The country or region and eventually the address.	

What if you don't want to publish – or simply don't have – the information that is covered in the metadata schema?

This is not a problem. It is allowed to use only a subset of the classes (and properties) of the LOMS. This means some properties might be mandatory while the classes are optional. In this case, you could publish your dataset without the mandatory property information. For example. in the table above, the Title of the qualification is mandatory but the Qualification class itself is optional. So, you don't require to have the title if you are not adding Qualification information in your LOMS dataset.

However, a smaller set of properties is marked as mandatory and those must be always provided. For example, the Learning Outcome class is mandatory so the mandatory properties of the class such as preferred label and description should always be present while publishing LOMS.

What if the class or property in the schema is not the same as how you define your data?

The information that you publish needs to conform the metadata schemata and their definitions. That means you have to follow the exact definitions of the classes and properties in the schema.

- Find the right class or property for all your concepts

You need to find – for each of the concepts separately – how you can translate it into an instance of the qualification metadata schema.

- A concept can correspond to a class in the learning opportunity metadata schema

Example: *A language institute provides a learning opportunity 'English as foreigh language', with identifier* `http://data.languageinstituteABC.nl/courses/learning-opportunities/english`*. In the LOMS, you will see that there is a class* `'learningOpportunity'`*.*

This is a clear match and therefore `http://data.languageinstituteABC.nl/courses/learning-opportunities/english` *is an* ***instance*** *of* `'learningOpportunity'`*.*

- A concept can correspond to a property in the qualification metadata schema

Example: *A language institute provides a learning opportunity 'English as foreigh language', with identifier* `http://data.languageinstituteABC.nl/courses/learning-opportunities/english`*. The learning opportunity has its own homepage on the website of the institute, at* `http://languageinstituteABC.nl/english-foreign`*. In the LOMS, you will see that there is a property* `'homepage'`*.*

This is a clear match: the relation between `http://data.languageinstituteABC.nl/courses/learning-opportunities/english` *and* `http://languageinstituteABC.nl/english-foreign` *is* `'homepage'`*.*

How to deal with different languages?

The language is apparent in some of the properties of a concept, for example, the title of learning opportunity or its homepage.

***Example**: In the Netherlands, the official title of an opportunity is `'NL English'`. In English, the official title is `'EN English'`. But an awarding body can refer to it as `'English taught in Dutch'`, which is an alternative English title. This would be modelled as such:*

```
<learningOpportunity id="example/0001">.
<title lang="nl">NL English</title>
<title lang="en">EN English</title>
<altLabel lang="en">English taught in Dutch</altLabel>
</learningOpportunity>
```

5.4 Transform your data

Once you know how the schema maps to your data, you can start the technical part of publishing. This means you transform your current data into one of the formats proposed below.

You will need to develop a software/script/plugin that does the transformation from the data in your database. You should approach this as any other software project, in terms of analysis, requirements, development, testing and release.

5.4.1 Data Formats: LOMS

The LOMS currently allows only one data format to publish in: **XML format**.

It is also possible to publish Learning Opportunity information in the legacy format supporting the LOQ platform (PLOTEUS-LO). This is generally not recommended since the data in this format is less rich and less semantically structured. In order to migrate from EQF-LO to LOMS please see the section **Increase the quality of your data**. Use of the PLOTEUS-LO data format will be phased out by end 2020.

5.4.2 Publishing Process

The publishing process follows a similar paradigm to typical Business Intelligence (BI) or Data Warehousing processing. You first need to access your data in your current systems, extract it and transform it (while clean it and ensuring consistency).

One difference is that instead of doing a classic Extract – Transform – Load (ETL) you will need to do an Extract – Transform – Publish. Tools, techniques and processes can be re-used from traditional ETL.

In case your development team does not use ETL tools, you need a custom-built solution. This solution will use a set of libraries to access your current systems, and libraries to transform the data in XML.

5.5 Announce your work in QDR

To make your data reusable in the European infrastructure you must let the European Commission know that you want to publish a dataset. This is done in the Qualification Dataset Register (QDR).

5.5.1 What is the Qualification Dataset Register?

The Qualifications dataset Register (QDR) is an online register that will store information about your datasets (i.e. the format of your data, location of your data, a license of your data, contact person, ...) for publication in the new Europass.

Publishing data in the QDR involves several steps: (1) first you need to register, (2) then you specify the metadata of your datasets and finally (3) you publish actual data in form of different version for these datasets.

5.5.2 How to announce the data to QDR?

The QDR offers different ways how to provide the files containing the datasets so that any infrastructure approach you may have is supported. The possibilities are:

Hosted on your server – Automatic Update

With this method, you host the data on your server and have the data automatically retrieved by the QDR. You specify a URL where the data will be continuously maintained and where the QDR can regularly check for updates.

Hosted on your server – API update

With this method, you host the data on your server and notify the QDR using an API call any time there is an update. You would be given an API key by QDR which authenticates your calls.

Hosted on your server – Manual Update

With this method, you host the data on your server and manually notify the QDR using the web platform user interface any time there is an update. You need to provide a unique URL of the hosted dataset every time you publish new data.

Manual upload

With this method, you host the data only on the QDR server and upload it manually using the web platform user interface. You would need to upload a unique file every time you publish new data.

5.5.3 How many datasets am I supposed to have?

As a publisher, it is recommended to maintain one dataset (one data set for Qualifications/one data set for Learning Opportunities data), but you can decide to publish more than one if necessary.

5.6 Keep your data stable

When you publish data, it is important to keep your data stableby:

- Keeping your data accessible;
- Keeping your identifiers persistent;
- Keeping your data up to date;
- Keeping your data versioned.

5.7 Increase the quality of your data: Adapting to the new Europass Learning Model for learning opportunities

The previous chapters indicated how to establish a base on the publishing of your data. Hereunder we present a way to increase the quality of your data by upgrading from the legacy LOQ schema: PLOTEUS-LO. As the new schema LOMS provide further opportunities to structure your metadata and annotate it with machine-readable information.

5.7.1 EQF-LO to LOMS

Both EQF-LO and LOMS schemata refer to the same core data. The difference between the two is the approach to the structure. Below we present a list of the main points that should be considered during the migration:

- LOMS indicates provider organisations as a separate class in the data:
  - in EQF-LO the awarding bodies are indicated among the metadata of the qualification itself (e.g. property `<ProviderName language="en">Test LO01 provider name 'en'</ProviderName>`). While LOMS uses a dedicated class for all types of organisations – being it provider, publisher, or owner of the qualification (e.g. class `<organization><prefLabel lang="en">KU Leuven</prefLabel></organization>`)
- LOMS allows to indicate structure information on learning outcomes:
  - In LOMS the learning outcomes can be annotated with machine-readable data by linking ESCO skills (e.g. property `<LearningOutcome><relatedEscoSkill><target> http://data.europa.eu/esco/skill/814f3782-62cb-4af8-8b13-98a71c5f60a2</target></relatedEscoSkill></LearningOutcome>`)
- LOMS indicates further information as a separate class in the data:
  - `learningOpportunitySpecificationReferences`: The specification, including the curricula, of the learning opportunity, it specifies: What learners will learn; What learners will do to learn; How learners will be assessed
  - `learningSpecificationReferences`: A specification or package of learning that is expressed in one or more learning opportunities. It is used to specify what a person did learn or what a person can learn (e.g. by a given learning opportunity).
  - `learningActivitySpecificationReferences`: A specification of a process which leads to the acquisition of knowledge, skills or responsibility and autonomy. It is the specification of a learning activity that might be organised and/or implemented by a learning opportunity for an individual.
  - `assessmentSpecificationReferences`: A specification of a process assessing the extent to which a learner has attained particular knowledge, skills and competences against criteria such as learning outcomes or standards of competence.
  - `scoringSchemeReferences`: A numeric or text type of scoring methodology or convention. A grading system.

***Note**:* The Commission offers technical support to all Member States for the publishing of Qualification and Learning Opportunity data. You can utilise this support by emailing specific questions regarding an update of your data to qdrsupport@ext-ec-europa.eu

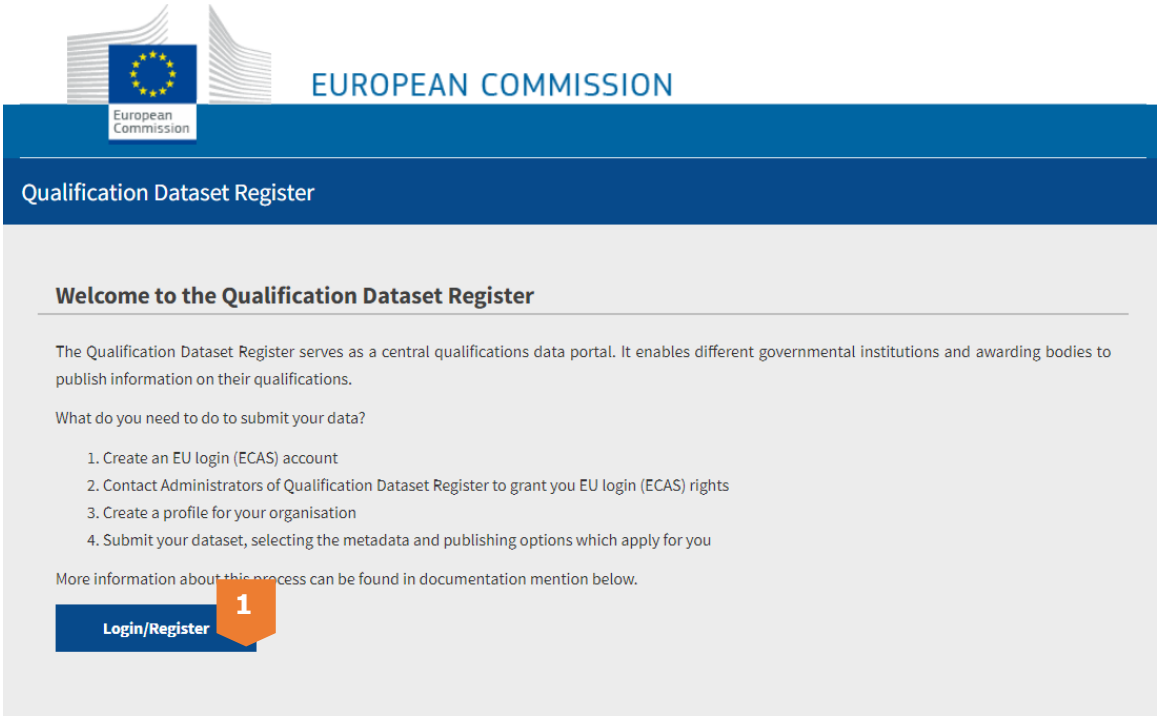
5.8 Publish Learning Opportunities on the QDR: step-by-step

This section provides information on how to publish learning opportunities data on QDR and set preferences for uploading and updating your data.

5.8.1 Login

You can log in [1] to the platform using your ECAS login account.

If you have not yet registered on the platform and created a profile for your organisation, please find the user manual for registration, follow the described steps, and then return here to find out how to publish your data.



5.8.2 User Interface (UI) QDR platform

The UI of the organisation's profile page is shown in the figure below. You can find several navigation elements:

- **[1] 'Show/Edit data'** – Allowing you to modify information about your organisation.
- **[2] 'Published datasets'** – Here, you can always find the datasets you have published and have the possibility to modify them.
- **[3] 'Autorisation'** – Allowing you to delegate the publication rights of your organisation to another organisation.
- **[4] 'Publish new dataset'** – Adding a new dataset with qualification, learning opportunity or accreditation data
- **[5] 'Logout'** – To leave the application

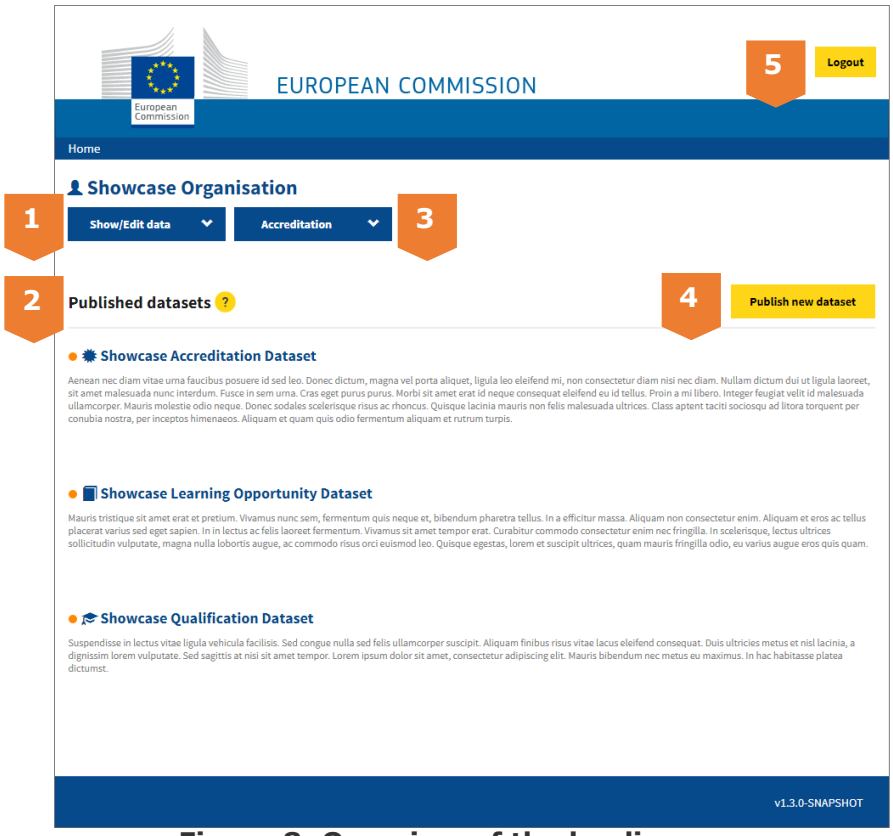


Figure 8: Overview of the landing page

5.8.3 Publish New Datasets

On the right side of the landing page, click on the yellow **'Publish new dataset'** button to upload a new dataset. This will take you to a pop-up page where you can fill out the information of this dataset, as well as decide how you want your data to be updated:

The following information should be indicated during the publication:

- First, fill out the **[1] 'Title'** of your data, then add a brief **[2] 'Dataset description'**.
- Then you should indicate what type of data will be published in this dataset in **[3] 'Type of data contained'**. The data contained in your dataset should be:
    1. **Learning opportunity dataset** – Containing learning opportunities, which represent potential formal and informal learning that can be undertaken by an individual.
- In the field '**Publishing scheme' [3]**, select the right option from a top-down menu to indicate which schema is your data published in:

    - If you've previously published data to the LOQ/Ploteus portal and you want to continue using the same schema, please select "EQF Schema – Learning Opportunity (2014)";
    - If you plan to use the new schema published in 2019, please select "Learning Opportunity metadata schema (2019)"

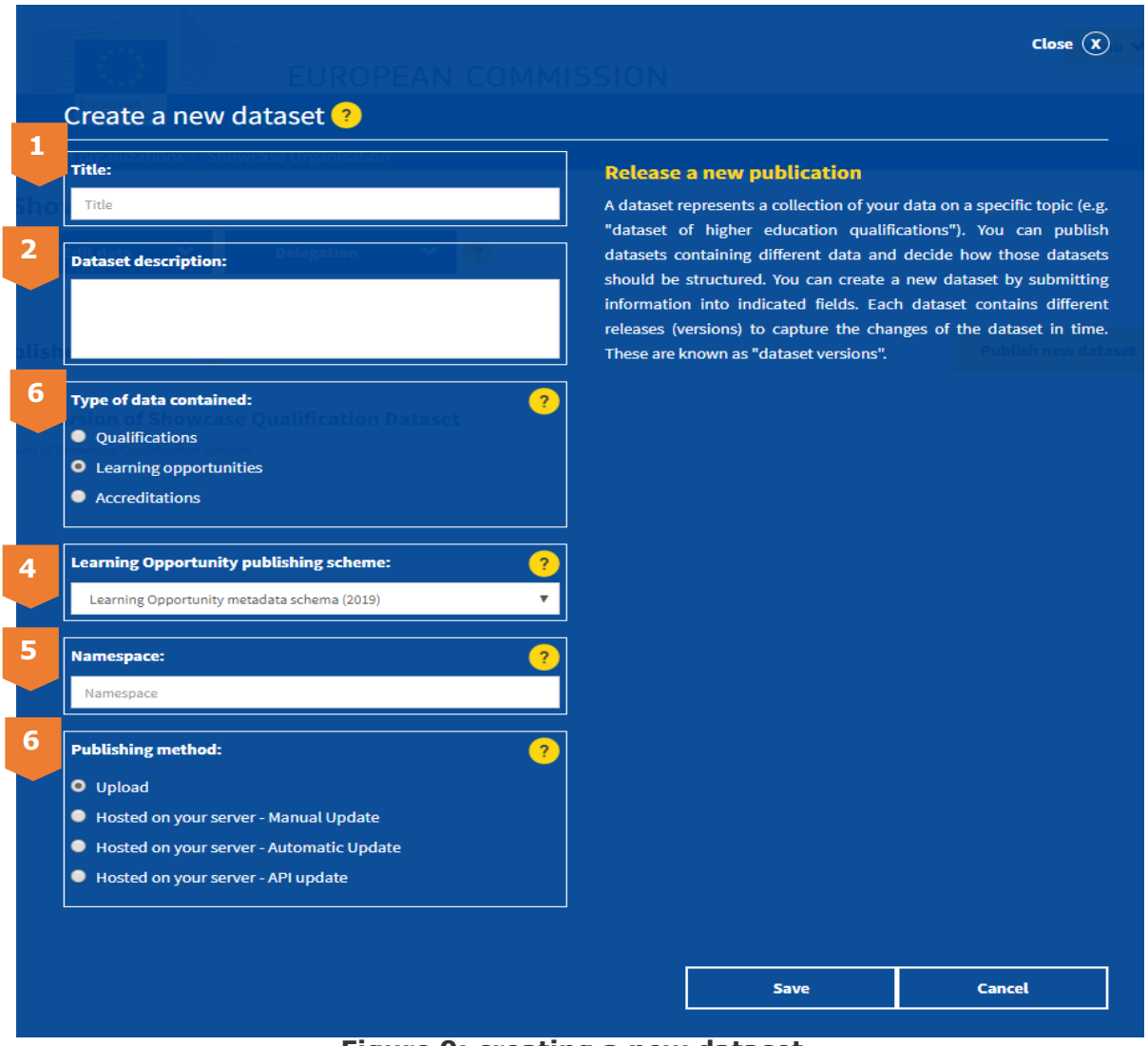


Figure 9: creating a new dataset

- **[5] 'Namespace'** The namespace is used in order to transform your local identifiers into globally unique ones. Please specify here a globally unique string which will be used to represent as a namespace of contained qualifications. The namespace has to be formed in a URL structure (e.g. "http://example.com/"). This can be represented for example by the URL of your organisation or the base URI of your concepts.

- For the **[6] 'Publishing method'**, there are two main distinctions: **Upload or Hosted**. This defines whether you wish to upload your data as a manual upload in a file to QDR, or automatically to provide a URL from which the platform fetches your data, which is further explained in the following sections.

  Hosted: you don't need to manually add a file in the platform. It is an automated method which requires to host a qualification dataset on a server and provide the URL pointing to the data during dataset creation on the QDR portal. QDR then downloads the qualification data from the provided URL whenever a new version is created. The data must be hosted through http

or https and only port 80, 443. There are three options available for the hosted options, listed below:

a. **Hosted on your server – Automatic Update:** the updates will happen automatically. You will then indicate a URL where you are planning continuously to maintain your dataset. Using this method, you should make sure that the HTML header of your indicated URL is updated every time you want to release a new dataset version. You are provided with the following setting with this option:

   - In the field **'download URL'**, a field will appear where you can paste the URL from which we will create the new versions as your website is updated.
   - In the field **'Update Frequencey',** you can control the frequency of the updates, namely: Monthly, Weekly and Daily.
   - In the field **'type of provided file',** you can see which file types are supported, and you can indicate the option that applies to you.

b. **Hosted on your server – API update:** you will be able to push each update of your dataset to QDR using an API call. If you plan to use this method, please contact the administrators of QDR to provide you with an API key.

Note: *If you select the publication method 'hosted – manual update', you will need to create a dataset version manually and provide a URL each time you want to release a new version.*

Note: *If you select the publication method 'hosted – automated fetching', you will not be able to create new versions manually; they will always be created automatically with a daily refresh.*

Note: *You can change the publishing method of a specific dataset at any time in case you decide that you want to provide future versions using a different method.*

c. **Hosted on your server: Manual Upload:** you will provide a new URL from which the platform can fetch the updated data every time a new version is released.

Upload: you will need to manually add a file in the platform to publish new datasets. This also means you will upload a new file every time your data is updated.

Then, you can save everything by clicking '**save**' at the bottom of the page.

- After you save, you will be redirected to the previous page.
- If at any point you wish to close the page, you can find the **[7] 'x'** button on the top right.

5.8.4 Creating Dataset Version

Once you have created a new dataset, you can now upload your data. For this you will need to create a version. First you have to access the dataset, by **clicking on its name** on your profile page. Depending on which Publishing method you've selected for the dataset, the creation of a version may look slightly different. Below we explain 'How to create a dataset version?' for each of the dataset publishing methods.

How to create a dataset version for "Hosted on your server – Automatic Update"?

During the initial publishing phase, if you chose 'Hosted – Automated Fetching', the version updates will be done for you and you will not have to update the version using any dialogue, so this option is no longer applicable.

How to create a dataset version for "Hosted on your server – API update"?

During the initial publishing phase, if you chose 'Hosted on your server – API update', the version updates will be done via an API and you will not have to update the version using any dialogue. In this case, the dataset page will show detailed information on how to perform an API call required to push the data to QDR:

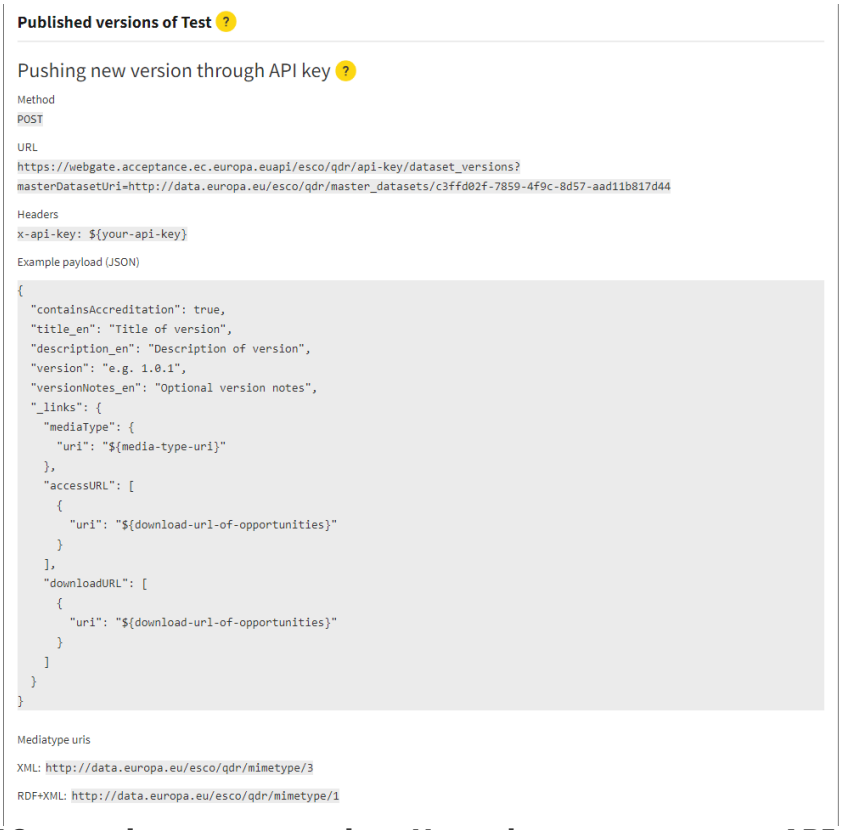


Figure 10: creating a new version: Hosted on your server – API update

***Note**: If you plan to use this method, please contact the administrators of QDR to provide you with an API key.*

How to create a dataset version for "Hosted on your server – Manual Update"?

To create a new version this publishing method simply click on **'Publish new version'** button. This will show a pop-up page similar to the page for creating new datasets. The page looks like this:

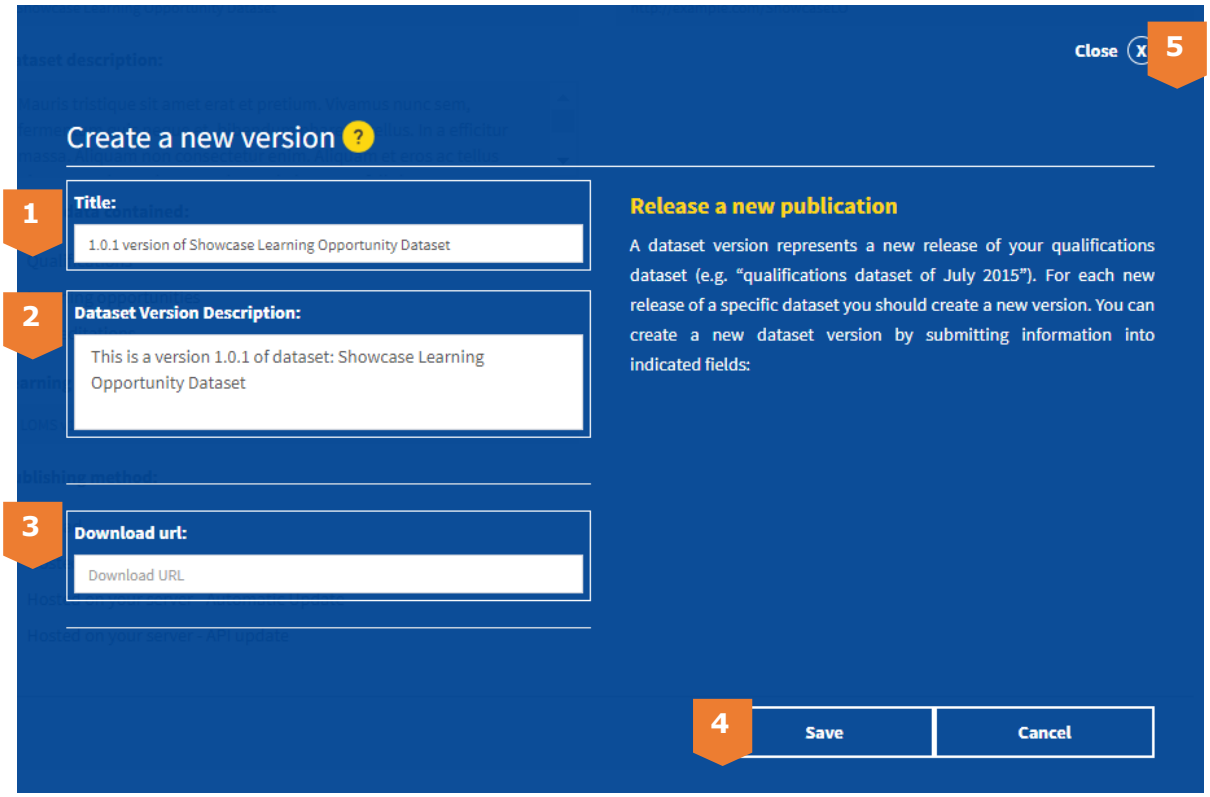


Figure 11: creating a new version: Hosted on your server – Manual Update

The following information should be indicated during the publication:

- First, fill out the **[1] 'Title'** of the version, then add a brief **[2] 'Dataset Version Description'**.
- For **[3] 'Download URL**, you will be asked to indicate the URL from where QDR can retrieve the data.
- Then, you can save everything by clicking **[4]** '**save**' at the bottom of the page.
    a. After you save, you will be redirected to the previous page.
    If at any point you wish to close the page, you can find the **[5] 'x'** button on the top right.

How to create a dataset version for "Upload"?

To create a new version with this publishing method simply click on **'Publish new version'** button. This will show a pop-up page similar to the page for creating new datasets. The UI looks like this:

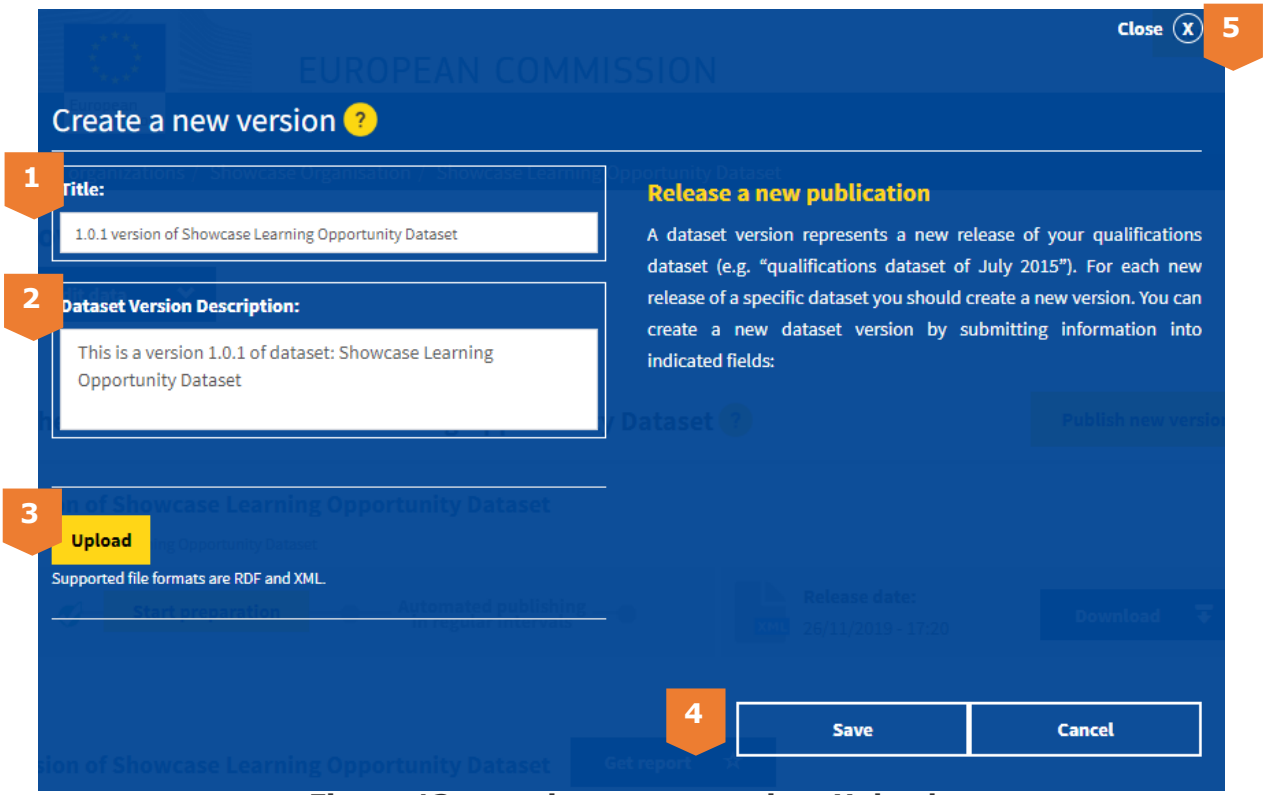


Figure 13: creating a new version: Upload

The following information should be indicated during the publication:

- First, fill out the **[1] 'Title'** of the version, then add a brief **[2] 'Dataset Version Description'**.
- For **[3] 'Upload'**, you will be asked to upload a file containing your data.
- Then, you can save everything by clicking **[4]** '**save**' at the bottom of the page.
    a. After you save, you will be redirected to the previous page.
    b. If at any point you wish to close the page, you can find the **[5] 'x'** button on the top right.

5.8.5 Start dataset processing

Once you have created a new version you will see it in the listing on the dataset overview. This page looks like this:

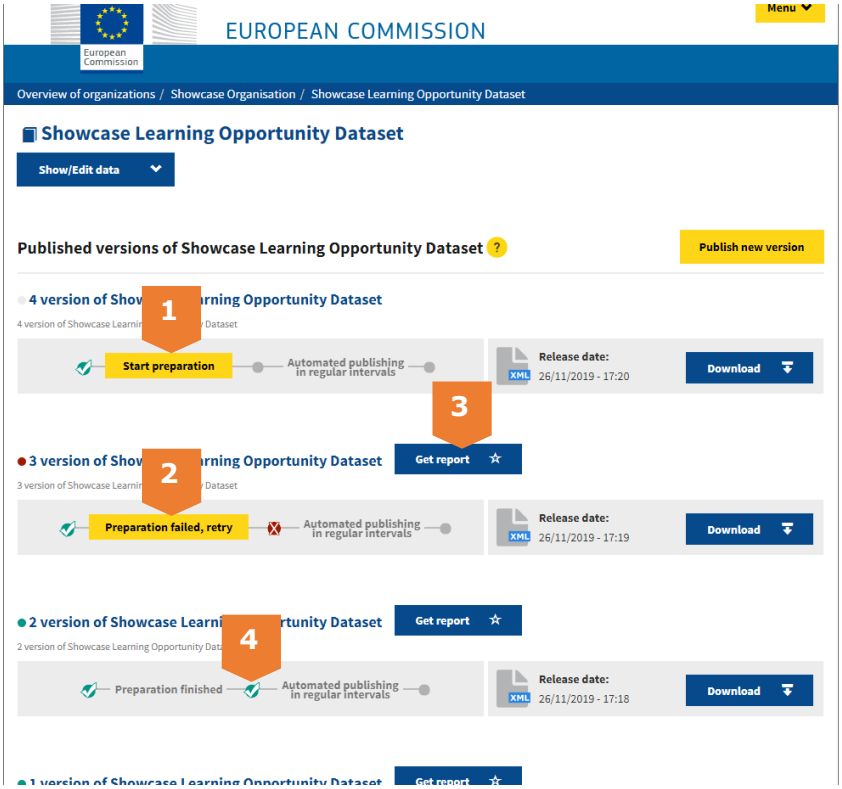


Figure 12:overview dataset and its versions

Here you are able to start the processing of the dataset by clicking **[1] 'Start preparation'**. During the processing, the platform takes your data and transforms it into a unified RDF format according to the metadata schema. This process also applies validations of the compliance of the data. The content of your data is not modified by this process.

The processing may take some time and will result in either success or failure.

1. **Successful upload of a dataset**: You will see green checkbox **[4]** for each successful processing step and will also receive a confirmation e-mail if the processing succeeded until the end.
2. **Failure to upload a dataset:** If there was a problem, you will see this warning right underneath the version as **[2] 'Preparation failed, retry'**.

   You can then perform the necessary fixes noted in the report (**[3] 'Get report'**) and retry processing. If everything went well, you will see this green confirmation instead (**[4]**).

If there are any problems with the information provided, you will receive an e-mail with a report, which will redirect you to the platform where you can see and resolve the problem.

***Note**: : This is only applicable to: 'Upload' and 'Hosted on your server – Manual Update'. Other methods do not require manual initiation of the processing.*

5.8.6 Edit your datasets and dataset versions

Here you are able to edit the metadata about a dataset by clicking on **[1].**

1. You can change all the Dataset Information: Title, Dataset description, Namespace, Type of data contained, Qualification publishing scheme, publishing method and what is included in your dataset.

2. To edit a dataset version for manual uploads, you can follow the following steps:

   - Click on a dataset version you want to edit.
   - In the dataset UI, click on 'Show/Edit data'. You will get a form containing the metadata of a dataset version, click on the edit pen to start changing the information **[2].**
   - You can even upload a new dataset to this version by clicking on 'upload' **[3].**

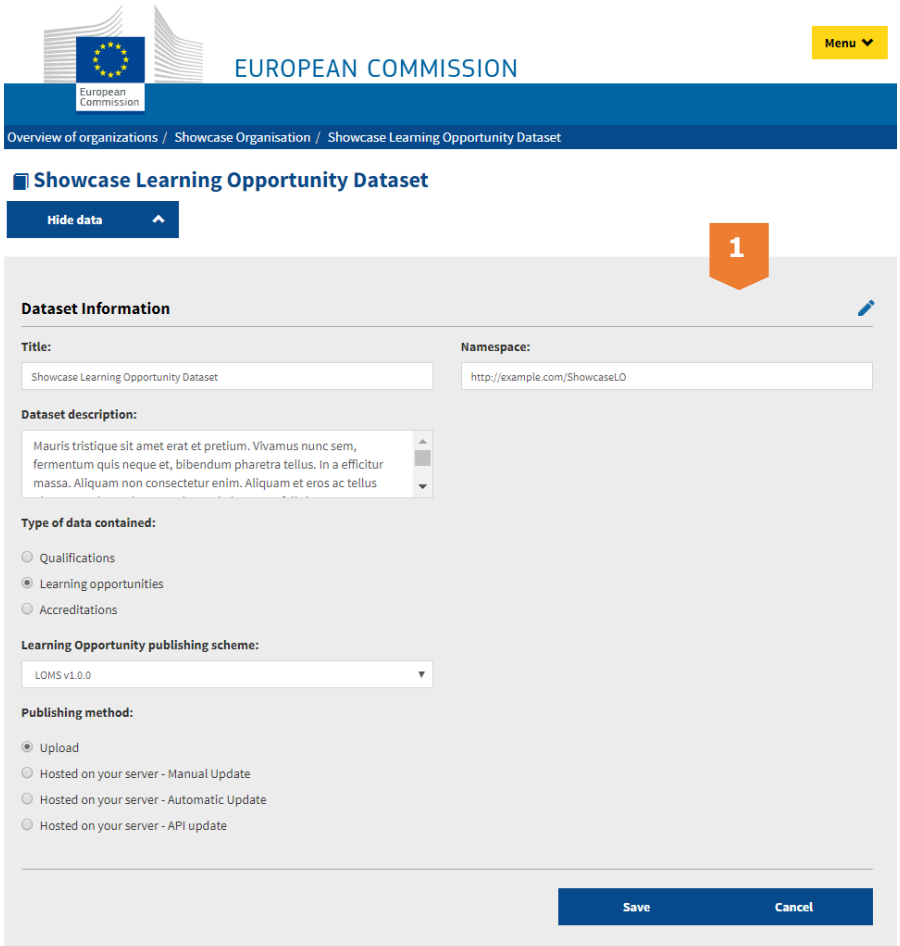


Figure 13: edit metadata of a dataset

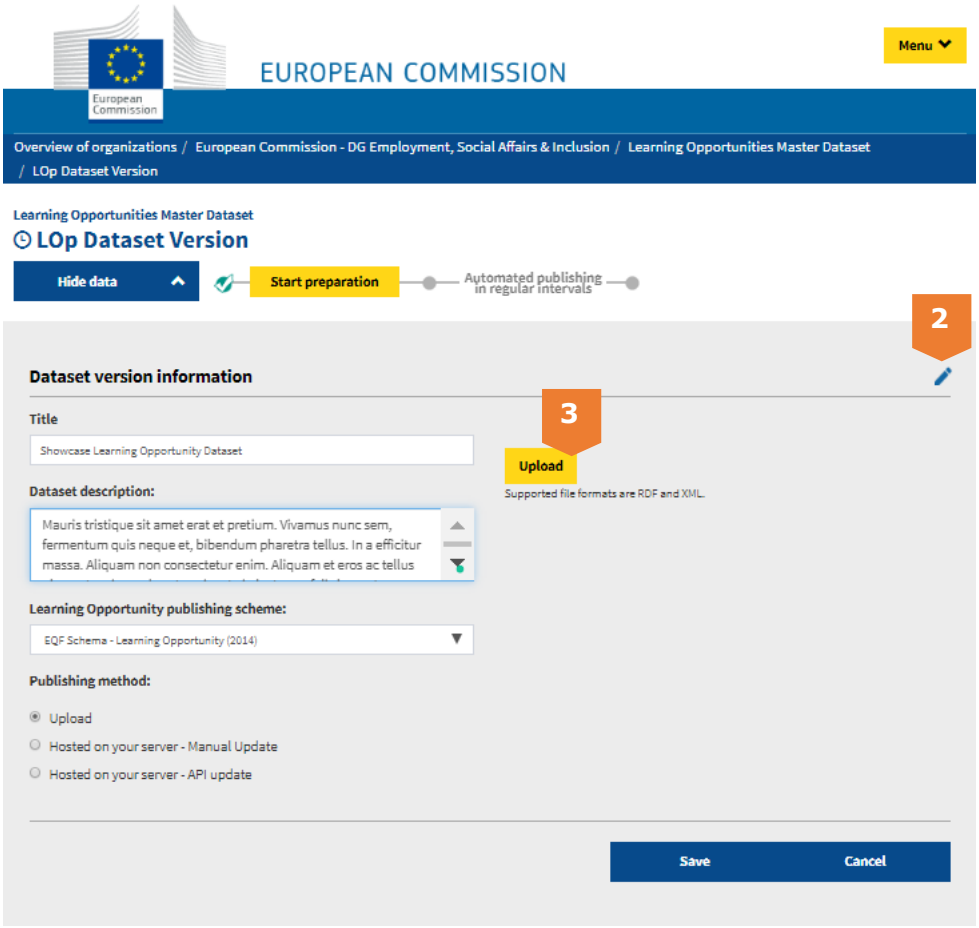


Figure 14: edit a dataset version

5.8.7 Keeping your data up to date

It is recommended to always provide the most up-to-date data. The publishing method you choose will determine how easy it is to ensure the frequency and relevance of the updates:

5. **Hosted on your server - Automatic Update:** The updates happen automatically. It is essential to ensure that the HTML header of your indicated URL is updated every time you want to release a new dataset version.
6. **Hosted on your server - API update:** The latest version could be published using an API call.
7. **Hosted on your server - Manual Update**: For every new version, you will need to add the file in the server.
8. **Upload:** If you choose this publishing option, as the name indicates, you will have to manually update the dataset. To update, you will need to create a new dataset version as explained above. The system always takes the last uploaded version of the dataset as the latest.

As we see, the automatic/API updates are more efficient and time saving for updating the dataset. It is highly recommended that these methods are used as publishing options.

5.9 Linking Qualifications and Learning Opportunities

Qualifications and learning opportunities may be linked together to strengthen the network of the data and lower redundancy of information. Such links state that a given learning opportunity is specified by a qualification – i.e. the opportunity leads to awarding of given qualification.

In order to establish such a relation using QDR your organisation should the implement following steps:

1. **Publish a qualification dataset:** The qualification dataset must always be created first – the learning opportunity dataset afterwards refers to the existing qualifications from it;
2. **Note the qualification reference:** The learning opportunities must refer to the qualification data with their ID and the namespace of the dataset that the qualification is located in;
3. **Publish the reference XML:** The XML should indicate the reference to a qualification in the following way:

```
<learningSpecificationReferences>
<qualificationRef>
   <identifier schemeID="Qual. Dataset. Namespace">Qual. ID</identifier>
</qualificationRef>
</learningSpecificationReferences>
```

   a. **Qual. Dataset. Namespace:** Namespace of the dataset where the reference qualification is located;
   b. **Qual. ID:** ID of the qualification that is being referred to

4. **Example:** Example of suchs structure would be:

```
<learningSpecificationReferences>
   <qualificationRef>
      <identifier schemeID="http://proson.eoppep.gr">12445</identifier>
   </qualificationRef>
</learningSpecificationReferences>
```

6 References

De Smedt J, LeVrang M, Papantoniou A.: ESCO: Towards a Semantic Web for the European Labour Market, WWW2015 Workshop: Linked Data on the Web (LDOW2015). LDOW 2015, May 19, 2015, Florence, Italy

http://www.linkeddatatools.com/semantic-web-basics

http://5stardata.info/en/

https://en.wikipedia.org/wiki/Semantic_interoperability

Le Vrang, M., Papantoniou, A., Pauwels, E., Fannes, P., Vandensteen, D., and De Smedt, J. 2014. ESCO: Boosting Job Matching in Europe with Semantic Interoperability, Computer, vol. 47, no. 10, pp. 57–64.

Bizer, C., Heath, T., and Berners-Lee, T. 2009. Linked Data—The Story So Far, Int'l J. Semantic Web and Information Systems, vol. 5, no. 3, pp. 1–22.

European Commission, 2013. ESCO: European Classification of Skills/Competences, Qualifications and Occupations, http://bookshop.europa.eu/en/esco-european-classification-of-skills-competences-qualifications-and-occupations-pbKE0313496

Understanding Metadata, National Information Standards Organization, ISBN: 1-880124-62-9

Amrapali Zaveri, Anisa Rula, Andrea Maurino, Ricardo Pietrobon, Jens Lehmann and Sören Auer, Quality Assessment Methodologies for Linked Open Data: A Systematic Literature Review and Conceptual Framework, Semantic Web Journal, IOS Press, 2012

https://en.wikipedia.org/wiki/National_Qualifications_Framework

https://ec.europa.eu/ploteus/sites/eac-eqf/files/leaflet_en.pdf

Wang W.G., Tolk A., Wang W.P., 2009. The levels of conceptual interoperability model: Applying systems engineering principles to M&S. Spring Simulation Multiconference (SpringSim'09). San Diego, CA, USA. (Published by SCS in the SpringSim'09 Proceedings)

http://www.w3.org/DesignIssues/UI.html

http://www.w3.org/TR/2013/NOTE-ld-glossary-20130627/#linked-data-principles

Best practises for Publishing LOD: http://www.w3.org/TR/ld-bp/

License your data and metadata: https://joinup.ec.europa.eu/community/ods/document/tm25-data-metadata-licensing-en

Open Data Handboek: http://www.opendataforum.info/files/Open_Data_Handboek.pdf

LinkedData@vlaanderen: uri strategie en vocabularyrichtlijnen: http://www.opendataforum.info/Docs/URI_strategie_versie2.pdf

7 Annex

7.1 FAQ

1. What do I need in terms of resources, timing and budget?

Linked Open Data projects are not typical ICT projects as you know it. It is rather an add-on to existing systems. The exact cost and timing depend on the current state of your infrastructure and know-how, and your plan regarding the implementation details.

2. Which tools are available to support me when publishing?

We offer "data validation tool"' in QDR to support you in publishing your data on qualifications. This tool will validate your data against the model, report errors and give warnings if the information is missing or inconsistent.

3. How will my data interact with other data on the internet?

The goal of Linked Open Data is for your data to be available to other parties to create a network of information. Such relations require the data to have unique and persistent identifiers.

Example: Your data on qualifications can be linked to geo-spatial data (like city, state, country) published by geonames.org. In turn, they can be linked to skills, competences and occupations published by ESCO.

Like this, we create a network that is decentralised: the data is hosted by different organisations, but accessible to everybody.

4. What can I do to make others trust my data?

By making your qualifications public on QDR, you make your data trustful. But there's more that you can do to make users trust you and your data:

- Give information about yourself in business registers;
- Make your company web pages easily retrievable by search engines;
- Create a digital signature for your website.

5. What if you want to publish information that is not covered by one of the classes in the metadata schema?

In some cases, you may be able to fit such information into "additionalNote", if this is not possible it is better omitting to publish it. In case you believe the information is important and not represented in the schemata, you can suggest it for future improvement.

6. What if you don't want to publish – or simply don't have – the information that is covered in the metadata schema?

This is not a problem. It is possible to use only a subset of the classes (and properties) of the metadata schema.

7. What if the class or property in the schema is not the same as how you define your data?

The information that you publish needs to conform the metadata schemata and their definitions. That means you have to follow the exact definitions of the classes and properties in the schema.

- Find the right class or property for all your concepts

You need to find - for each of the concepts separately - how you can translate it into an instance of the qualification metadata schema.

- A concept can correspond to a class in the learning opportunity metadata schema

Example: A language institute provides a learning opportunity 'English as foreigh language', with identifier http://data.languageinstituteABC.nl/courses/learning-opportunities/english. In the LOMS, you will see that there is a class 'learningOpportunity'.

This is a clear match and therefore http://data.languageinstituteABC.nl/courses/learning-opportunities/english is an **instance** of 'learningOpportunity'.

- A concept can correspond to a property in the qualification metadata schema

Example: A language institute provides a learning opportunity 'English as foreigh language', with identifier http://data.languageinstituteABC.nl/courses/learning-opportunities/english. The learning opportunity has its own homepage on the website of the institute, at http://languageinstituteABC.nl/english-foreign. In the LOMS, you will see that there is a property 'homepage'.

This is a clear match: the relation between http://data.languageinstituteABC.nl/courses/learning-opportunities/english and http://languageinstituteABC.nl/english-foreign is 'homepage'.

8. When the PLOTEUS legacy model will be phased out?

There is no concrete date yet for phasing it out. The phasing out of the legacy model will be discussed with the Europass AG. As the legacy model does not allow the full use of all Europass functions, it should be seen as a temporary solution and only be used as long as it is not possible to connect with the LOMS. Countries must ensure that any data published under the legacy model are up to date.

9. Can the Commission provide feedback on national databases of learning opportunities and qualifications?

The Commission has created the *qdrsupport@ext.ec.europa.eu* channel to provide continuous feedback and support on any question related to publishing learning opportunities and qualifications on Europass.

10. Can the Commission provide feedback on national databases of learning opportunities and qualifications?

The new Europass online platform is a public product and all information that will be part of it is freely available for use and re-use. The QDR supports national authorities to publish their qualifications and learning opportunities data as 'linked open data'. Countries that are publishing their datasets must agree to the publishing agreement of QDR. The publishing agreement reflects the notion of linked open data, meaning the publication of machine-readable data under open licenses that permits data reuse. "Commercial use" refers to a possible reuse of the information published as linked open data by third parties.

11. Who is the 'publisher' of a learning opportunity/qualification? Who / which organisation is eligible? Are there formal requirements to be a publisher or can anyone be a publisher?

Publisher is the organisation registered to QDR and who publishes the information to the EU infrastructure.

12. Does 'owner' refer to the holder of the qualification or to the entity organising the learning opportunity?

Owner is the organisation that designs and sets the content of the qualification (even though they may not be the ones directly awarding it) or learning opportunity. This agent type does not exist anymore in QMS2.

13. What is the difference between a learning opportunity and a qualification in the data model? Can a LOP and a qualification be the same?

A learning opportunity is an opportunity to learn, an opportunity to achieve a given set of learning outcomes. Examples are an educational programme or a component of a programme (i.e. degree programme, a module, a course unit).

A Learning Specification is used to specify what a person did learn OR what a person can learn.

A Qualification is a generalisation of a learning specification describing details such as learning outcomes of an awarded qualification (learning specifications + EQF level + other info). In the Europass data model many elements of learning opportunities and qualifications, such as the learning outcomes, are common. A learning opportunity, when successfully concluded, can lead to a qualification but is not a qualification by itself.

14. What should be included under the class "learning outcome"? Should data providers include in the LOMS all learning outcomes that holders of the LO are expected to master after taking up a certain learning opportunity?

The content here is defined according to the Annex 6 of the **EQF Recommendation of 2017**. Learning outcomes should be either formulated in terms of knowledge, skills, and responsibility and autonomy or as an open text field describing what a learner is expected to know, understand and able to do. The text should contain either the full learning outcomes or a summary of them (expressing the essence of the learning outcomes of the qualification) if the full learning outcomes are too long.

15. Can you specify what the term accreditation means?

Accreditation is the act of granting credit or recognition to an educational institution that meets a general standard of the quality. Accreditation is generally granted to the institutions by competent authorities such as education ministries.

16. What is the Europass Accreditation Database?

The European Accreditation Database is a separate database that is populated automatically based on records in the QDR, which contains:

- information on programme accreditations that were included in qualifications uploaded to the QDR
- information on institutional accreditations which were uploaded to the QDR.

17. Will data on qualifications already published on LOQ portal/ESCO be automatically transferred on Europass?

Data already published in QDR will be maintained. The migration of any other data will require a manual action. Countries are invited to contact the helpdesk at *qdrsupport@ext.ec.europa.eu* for any questions on this. In the case that legacy models are used, countries must ensure that data are up to date.

18. Why is the term "search courses" used when searching both LOPs and qualifications in the new Europass?

In the English version the term "search courses" is used as search function in the section for individuals, allowing them to find information on learning opportunities and on qualifications. "Courses" was selected as the most appropriate term in English to access such information. The Commission will invite Member States to look into the translation of "courses" in their respective languages.

19. Can a country connect its dataset using the legacy model while developing the newer model?

Yes. This is possible for the countries that want to connect using the legacy model while preparing for the use of the LOMS model. Once the connection using the LOMS model will be tested and ready, it will replace the use of the legacy model. Countries in this situation are invited to contact the helpdesk *qdrsupport@ext-ec-europa.eu.*

20. Does the legacy model follow the XML format used to structure data on LOPs in the LOQ portal?

Yes, there is no change in the legacy model and it follows the same XML format used to structure data on Learning Opportunities in the LOQ portal.

21. What is the difference between fields 3 (Title) and 6 (Title) of the LOMS data model?

Data field no. 3 (Title) refers to the title of the Learning Opportunity.

Data field no. 6 (Title) refers to the title of the Learning Specification. A learning specification is 'a description of what a person may learn using the opportunity, expressed as learning outcomes'. It can be often equivalent to the title of the Learning Opportunities but can also have a separate title.

22. What is the difference between fields 4 (Provided by), 13 (Organization) and 15 (legal name)?

'Provided by' refers to the organisation providing or directing the learning opportunity. In the case of, e.g. joint qualifications, there may be several organisations directing the learning opportunity.

'Organisation' is a class representing a legal person or registered organisation.

'Legal name' is full legal name of the organisation.

23. Is it possible to match several ISCED fields to one qualification?

Yes, it is possible to match one or more ISCED fields to one qualification.

24. Is it correct that QMS provides only one class, i.e. < agent >, dedicated to awarding bodies, publishers, or owners of the qualification? Why?

Yes, these are indeed represented by a single class in the old QMSv1.0, because even though they have a different role, in QDR the properties of an organisation (metadata) are nevertheless the same among them. For the new QMSv2.0, in order to simplify only one Organisation class is used.

7.2 QMS 2.0.0 Data Model

Class	**Field (property/association)**	**Description (**Before**) (usage, constraints, rules…)**
qualification		The details of a qualification that can or has been awarded such as the (expected) learning outcomes. This can be a copy or a specialization of an existing qualification standard.
qualification	identifier	Identifiers are needed to identify and link resources in a unique and persistent way. A resource identifier must be unique and persistent, meaning the identifier will always refer to the same resource and cannot be reused to identify other resources. A resource identifier consists of: - a string identifier, unique and persistent within the scope of the issuing system. - a unique identifier of the publishing system that issued the string identifier for that particular resource. The combination of both, the string identifier and the unique identifier of the issuing system, makes the resource identifier globally unique. The IdentifierType is used to describe a full (alternative) identifier of an entity or resource. - The text content of the IdentifierType-element contains the character string to identify and distinguish uniquely the resource within the scope of the identification scheme. - The schemeID attribute is used to specify the identifier scheme. The identifier schema (or identifier register) refers to the agent/system that issued the identifier, it specifies where the identifier originates from. It is the namespace in which the identifier is unique and persistent. The other attributes of the IdentifierType-element provide supplementary information such as the identifier of the used code list and the agency that maintains this list.
qualification	type	The type of learning opportunity that the learning specification/qualification is a part of.
qualification	title	The exact and official title of the learning specification/qualification. Maximum one value per language is allowed.
qualification	altLabel	A character string (i.e. a finite set of characters) in the form of words of a language.

qualification	definition	Short and abstract description about the learning specification/qualification. Maximum one value per language is allowed.
qualification	description	The full learning outcome description of the learning specification/qualification. Maximum one value per language is allowed.
qualification	additionalNote	An additional free text note containing any further information about a learning specification/qualification.
qualification	homepage	The homepage (a public web document) of the learning specification/qualification. There can be only one learning specification/qualification that has a particular homepage.
qualification	supplementaryDoc	A public web document containing additional documentation about the learning specification/qualification, such as a diploma or certificate supplement. It can be any document containing further information about the learning specification/qualification. The document can be a web page that can be navigated or a downloadable file.
qualification	hasISCED-FCode	The ISCED FoET 2013 classification code. It indicates the thematic area of the learning specification/qualification.
qualification	hasEducationSubject	An associated field of education from another semantic framework than the ISCED classification.
qualification	volumeOfLearning	An indication of how many hours of learning efforts are needed, i.e. notional learning hours.
qualification	hasECTSCreditPoints	The credit points assigned to the learning specification/qualification, following the ECTS credit system.
qualification	hasCreditPoints	The credit points assigned to the learning specification/qualification, following a given credit system other than ECTS.
qualification	hasEducationLevel	An associated level of education within a semantic framework describing education levels.
qualification	language	The instruction and/or assessment language(s) used.
qualification	mode	The mode of learning and or assessment (i.e. online, blended, presential, work based)
qualification	learningSettingType	The type of learning setting (i.e. formal learning, non-formal learning).

qualification	duration	The maximum duration of a learning opportunity for which this specification/qualification is designed. The maximum duration a learning opportunity that implements this specification/qualification should take.
qualification	targetGroup	A specific target group or category for which this specification/qualification is designed.
qualification	entryRequirementsNote	Specific entry requirements or prerequisites of individuals for which this specification/qualification is designed. Maximum one value per language is allowed.
qualification	learningOutcomes	An individual (expected) learning outcome of the learning specification/qualification. It MUST refer to an existing 'LearningOutcome'-record in the 'learningSpecificationReferences'-section of this document.
qualification	learningActivitySpecification	What will or can an individual do to acquire the expected learning outcomes? The learning activities. It MUST refer to an existing record in the 'learningActivitySpecificationReferences-section of this document.
qualification	assessmentSpecification	How will a learner be assessed to proof the (expected) learning outcomes? The assessments. It MUST refer to an existing record in the 'assessmentSpecificationReferences-section of this document.
qualification	entitlementSpecification	A specification of an entitlement to which this learning specification/qualification may give rise to. A specification of a right this learning specification/qualification may give access to. It MUST refer to an existing record in the 'entitlementSpecificationReferences-section of this document.
qualification	awardingOpportunities	Refers to an activity related to the awarding of the learning specification/qualification, such as the country or region where the learning specification/qualification is or was awarded, the awarding body and optionally the awarding period now or in the past.
qualification	isPartialQualification	Indicates whether a qualification is a full qualification or part of another qualification. In the latter, the qualification is only obtained as a formal outcome of a “broader” qualification of which it is part.
qualification	eqfLevel	The qualification level as specified by the European Qualification Framework.

qualification	nqfLevel	A qualification can be part of a national qualification framework (NQF Qualification) which can be specified by the NQF level. This the qualification level as specified by a National Qualifications Framework.
qualification	qualificationCode	An identifying code from a qualification based reference semantic asset. This property is used to classify the qualification information with a qualification from a known qualification framework. (e.g. the link to the accredidated NQF qualification)
qualification	hasPart	A qualification can be part of another "broader" qualification. It MUST refer to an existing record in the 'learningSpecificationReferences'-section of this document.
qualification	specializationOf	A qualification (e.g. a standard) of which this qualification is a specialization. An opportunity can have its own specific curricula, based on or in addition to a given standard. In this case the qualification of the opportunity is a specialization of another qualification which is a standard. It MUST refer to an existing record in the 'learningSpecificationReferences'-section of this document.
qualification	hasAccreditation	An accreditation related to this qualification. It MUST refer to an existing 'accreditation'-record in the 'accreditationReferences'-section.
accreditation		An accreditation record. An Accreditation is the quality assurance or licensing of an institution.

accreditation	identifier	Identifiers are needed to identify and link resources in a unique and persistent way. A resource identifier must be unique and persistent, meaning the identifier will always refer to the same resource and cannot be reused to identify other resources. A resource identifier consists of: - a string identifier, unique and persistent within the scope of the issuing system. - a unique identifier of the publishing system that issued the string identifier for that particular resource. The combination of both, the string identifier and the unique identifier of the issuing system, makes the resource identifier globally unique. The IdentifierType is used to describe a full (alternative) identifier of an entity or resource. - The text content of the IdentifierType-element contains the character string to identify and distinguish uniquely the resource within the scope of the identification scheme. - The schemeID attribute is used to specify the identifier scheme. The identifier schema (or identifier register) refers to the agent/system that issued the identifier, it specifies where the identifier originates from. It is the namespace in which the identifier is unique and persistent. The other attributes of the IdentifierType-element provide supplementary information such as the identifier of the used code list and the agency that maintains this list.
accreditation	type	The type of accreditation (i.e program quality assurance, institutional quality assurance, program license, institutional license)
accreditation	title	The title of the accreditation. Maximum one value per language is allowed.
accreditation	description	A free text description of the accreditation. Maximum one value per language is allowed.
accreditation	decision	The Quality Decision issued by the Quality Assuring Authority. A short description of the decision, such as "substantially compliant; awarded; gold level, etc."
accreditation	report	A publicly accessible report of the quality assurance decision. This may be held by the awarded institution, by the quality assurance institution or by an independent registry such as DEQAR.

accreditation	organization	The organization whose activities are being accredited. It MUST refer to an existing 'organization'-record in the 'agentReferences'-section.
accreditation	limitQualification	The qualification that was accredited. It MUST refer to an existing 'qualification'-record in the 'learningSpecificationReferences'-section.
accreditation	limitField	The field of education for which the accreditation is valid.
accreditation	limitEQFLevel	The european qualification level for which the accreditation is valid.
accreditation	limitJurisdiction	The jurisdiction for which the accreditation is valid.
accreditation	accreditingAgent	The Quality Assuring Authority. The competent body which administered the quality assurance process and awarded the decision. It MUST refer to an existing 'organization'-record in the 'agentReferences'-section.
accreditation	issuedDate	The date when the accreditation was formally approved/issued. If not specified it is undefined (“not known”)
accreditation	reviewDate	The date when the accreditation has to be re-viewed. If not specified it is undefined (“not known”)
accreditation	expiryDate	The date when the accreditation expires or was expired. If not specified it is undefined (“not known”)
accreditation	additionalNote	An additional free text note containing any further information about the accreditation (e.g applied standards and procedures in the assess-ment and quality assurance of the qualification).
accreditation	homepage	The homepage (a public web document) of an accreditation.
accreditation	landingpage	A web page that can be navigated to in a web browser to gain access to the accreditation and/or additional information about the accreditation. An accreditation might not have a personal homepage but instead a landing page.
accreditation	supplementaryDoc	A public web document containing supplemen-tary documentation about the accreditation (e.g applied standards and procedures in the assess-ment and quality assurance of the qualification). This can be a web page that can be navigated to or a downloadable file.
accreditation	status	The publication status of an accreditation (released, obsolete, to be reviewed)
accreditation	lastModificationDate	The date when the accreditation was last updated since it was published

learningOutcome		A learning outcome (i.e. knowledge, skill, autonomy-responsibility). The details, such as the description, of a learning outcome.
learningOutcome	identifier	Identifiers are needed to identify and link resources in a unique and persistent way. A resource identifier must be unique and persistent, meaning the identifier will always refer to the same resource and cannot be reused to identify other resources. A resource identifier consists of: - a string identifier, unique and persistent within the scope of the issuing system. - a unique identifier of the publishing system that issued the string identifier for that particular resource. The combination of both, the string identifier and the unique identifier of the issuing system, makes the resource identifier globally unique. The IdentifierType is used to describe a full (alternative) identifier of an entity or resource. - The text content of the IdentifierType-element contains the character string to identify and distinguish uniquely the resource within the scope of the identification scheme. - The schemeID attribute is used to specify the identifier scheme. The identifier schema (or identifier register) refers to the agent/system that issued the identifier, it specifies where the identifier originates from. It is the namespace in which the identifier is unique and persistent. The other attributes of the IdentifierType-element provide supplementary information such as the identifier of the used code list and the agency that maintains this list.
learningOutcome	prefLabel	A legible, descriptive name for the learning outcome. Maximum cardinality of one per language.
learningOutcome	description	A free text describing the learning outcome. Maximum cardinality of one per language.
learningOutcome	learningOutcomeType	The learning outcome type (i.e. knowledge, skill, ...).
learningOutcome	reusabilityLevel	The reusability level.
learningOutcome	relatedEscoSkill	A link/alignment to an ESCO Skill.
learningActivitySpecification		A LearningActivitySpecification is a specification of a process which leads to the acquisition of knowdledge, skills or responsibilty and autonomy.
learningActivitySpecification	identifier	An alternative identifier of the specification.

learningActivitySpecification	title	The title of the specification. Maximum one value per language is allowed.
learningActivitySpecification	altLabel	An alternative name of the specification.
learningActivitySpecification	description	A free text description of the specification. Maximum one value per language is allowed.
learningActivitySpecification	additionalNote	An additional free text note containing any further information about the specification.
learningActivitySpecification	homepage	The homepage (a public web document) of the specification. There can be only one specification that has a particular homepage.
learningActivitySpecification	supplementaryDoc	A public web document containing additional documentation about the specification. It can be any document containing further information about the specification. The document can be a web page that can be navigated or a downloadable file.
learningActivitySpecification	type	The type of activity. A concept indicating the type of activity.
learningActivitySpecification	workload	The expected workload. The expected workload in time. The expected amount of time the learner (will) spent undergoing the learning activity. The expected duration or volume of learning measured in years, days or hours of learning activity. The expected number of learning years, days or hours. This can be an indicative number (i.e. an estimated or notional number).
learningActivitySpecification	language	The language(s) of instruction.
learningActivitySpecification	mode	The mode of learning and or assessment (i.e. online, blended, presential, work based)
learningActivitySpecification	teaches	The expected learning outcomes to which this learning activity specification contributes to. This is given by a LearningSpecification. A learning activity can lead to or contribute to the acquisition of a set of skills, knowdledge, autonomy and or responsibilty. It MUST refer to an existing record in the 'learningSpecificationReferences-section of this document.
learningActivitySpecification	hasPart	An assessment specification (a "package") can be part of another "broader" assessment specification. It MUST refer to an existing record in the 'learningActivitySpecificationReferences'-section of this document.

learningActivitySpecification	specializationOf	An activity specification can be a specialization of another activity specification. It MUST refer to an existing record in the 'learningActivitySpecificationReferences'-section of this document.
assessmentSpecification		An AssessmentSpecification is a specification of a process establishing the extent to which a learner has attained particular knowledge, skills and competences against criteria such as learning outcomes or standards of competence.
assessmentSpecification	identifier	An alternative identifier of the specification.
assessmentSpecification	title	The title of the specification. Maximum one value per language is allowed.
assessmentSpecification	altLabel	An alternative name of the specification.
assessmentSpecification	description	A free text description of the specification. Maximum one value per language is allowed.
assessmentSpecification	additionalNote	An additional free text note containing any further information about the specification.
assessmentSpecification	homepage	The homepage (a public web document) of the specification. There can be only one specification that has a particular homepage.
assessmentSpecification	supplementaryDoc	A public web document containing additional documentation about the specification. It can be any document containing further information about the specification. The document can be a web page that can be navigated or a downloadable file.
assessmentSpecification	type	The type of assessment. A concept indicating the type of assessment.
assessmentSpecification	language	The language(s) of assessment used.
assessmentSpecification	mode	The mode of learning and or assessment (i.e. online, blended, presential, work based)
assessmentSpecification	gradingScheme	Used grading scheme. It MUST refer to an existing record in the 'scoringSchemeReferences'-section of this document.
assessmentSpecification	proves	Which learning outcomes are or have been prooved. It MUST refer to an existing record in the 'learningSpecificationReferences'-section of this document.
assessmentSpecification	hasPart	An assessment specification (a "package") can be part of another "broader" assessment specification. It MUST refer to an existing record in the 'assessmentSpecificationReferences'-section of this document.

assessmentSpecification	specializationOf	An assessment specification (a "package") can be a specialization of another assessment specification. It MUST refer to an existing record in the 'assessmentSpecificationReferences'-section of this document.
entitlementSpecification		The specification of a right a person has access to, typically as a result of a learning achievement. A specification may take the form of the right to be a member of an organisation, to follow a certain learning opportunity specification, or to follow a certain career. An entitlment may be prospective, i.e. awarding the right to apply for the entitlement, or actual, i.e. granting the entitlement.
entitlementSpecification	identifier	An alternative identifier of the specification.
entitlementSpecification	title	The title of the specification. Maximum one value per language is allowed.
entitlementSpecification	altLabel	An alternative name of the specification.
entitlementSpecification	description	A free text description of the specification. Maximum one value per language is allowed.
entitlementSpecification	additionalNote	An additional free text note containing any further information about the specification.
entitlementSpecification	homepage	The homepage (a public web document) of the specification. There can be only one specification that has a particular homepage.
entitlementSpecification	supplementaryDoc	A public web document containing additional documentation about the specification. It can be any document containing further information about the specification. The document can be a web page that can be navigated or a downloadable file.
entitlementSpecification	type	The type of entitlement. A concept indicating the type of entitlement.
entitlementSpecification	status	The status of the entitlement. A concept indicating the status of the entitlement. Whether the entitlement is prospective, i.e. awarding the right to apply for the entitlement; or actual, i.e. granting the entitlement
entitlementSpecification	limitOrganization	It MUST refer to an existing 'organization'-record in the 'agentReferences'-section.
entitlementSpecification	limitJurisdiction	The jurisdiction for which the entitlement is valid.
entitlementSpecification	limitOccupation	A link to an ESCO Occupcation or Occupational Category..
entitlementSpecification	limitNationalOccupation	A link to a National Occupation.

entitlementSpecification	targetName	A name or label of the associated occupation in the targeted framework.
entitlementSpecification	targetDescription	A description of the associated occupation in the targeted framework
entitlementSpecification	mayResultFrom	A LearningSpecification that may give rise to an entitlement with this specification. It MUST refer to an existing record in the 'learningSpecificationReferences'-section of this document.
entitlementSpecification	hasPart	A sub specification. An entitlement specification can be part of another "broader" entitlement specification. It MUST refer to an existing record in the 'entitlementSpecificationReferences'-section of this document.
entitlementSpecification	specializationOf	An entitlement specification can be a specialization of another entitlement specification. It MUST refer to an existing record in the 'entitlementSpecificationReferences'-section of this document.
organization		A legal organization (e.g. an awarding body, an academic or training institution,...).
organization	registration	The legal identifier of an organization. The identifier given to a registered organization by the authority with which it is registered. The legal status of a registered organization is conferred on it by an authority within a given jurisdiction. The Legal Identifier is therefore a fundamental relationship between an organization and the authority with which it is registered.
organization	vatIdentifier	The Value-added Tax ID.
organization	taxIdentifier	The Tax/Fiscal ID of the organization.

organization	identifier	Identifiers are needed to identify and link resources in a unique and persistent way. A resource identifier must be unique and persistent, meaning the identifier will always refer to the same resource and cannot be reused to identify other resources. A resource identifier consists of: - a string identifier, unique and persistent within the scope of the issuing system. - a unique identifier of the publishing system that issued the string identifier for that particular resource. The combination of both, the string identifier and the unique identifier of the issuing system, makes the resource identifier globally unique. The IdentifierType is used to describe a full (alternative) identifier of an entity or resource. - The text content of the IdentifierType-element contains the character string to identify and distinguish uniquely the resource within the scope of the identification scheme. - The schemeID attribute is used to specify the identifier scheme. The identifier schema (or identifier register) refers to the agent/system that issued the identifier, it specifies where the identifier originates from. It is the namespace in which the identifier is unique and persistent. The other attributes of the IdentifierType-element provide supplementary information such as the identifier of the used code list and the agency that maintains this list.
organization	type	The type of agent (i.e. the ESCO organization category).
organization	prefLabel	The primary name of the organization (e.g. legally recognized name). The name by which to refer to an organisation. In case of a registered organisation this is the legal name of the organization. Maximum one value per language is allowed.
organization	altLabel	An alternative name of the organization. An organization may have any number of alternative or informal names.
organization	homepage	A homepage about the organization.
organization	additionalNote	An additional free text note containing any further information about a organization.
organization	hasLocation	The legally registered site of the organisation. The country or region and eventually the address.

organization	contactPoint	The contact information of the organization. This property links to any "channel" through which the organization can be contacted. It is a means of contacting the organization. It gives the details of how to contact the organization and is repeatable for each type of contact method.
organization	hasAccreditation	The accreditation(s) (i.e the quality assurance or licensing) of an organization (i.e the issuer of the credential). It MUST refer to an existing 'accreditation'-record in the 'accreditationReferences'-section.
organization	hasUnit	Indicates a unit which is part of this Organization, e.g. a Department within a larger Organization. It MUST refer to an existing 'organization'-record in the 'agentReferences'-section within the xml document.
organization	unitOf	Indicates an Organization of which this Unit is a part, e.g. a Department within a larger Organization. It MUST refer to an existing 'organization'-record in the 'agentReferences'-section within the xml document.
organization	logo	The logo of the organization.
organization	lastModificationDate	The date when the organization was last updated since it was published
scoringScheme		A scoring scheme. A numeric or text type of scoring methodology or convention. A grading system.
scoringScheme	identifier	A scoring scheme identifier
scoringScheme	title	Maximum one value per language is allowed.
scoringScheme	description	A free text describing the scoring methodology or convention. Maximum one value per language is allowed.
scoringScheme	supplementaryDoc	A public web document containing additional documentation about the scoring/grading system. It can be any document containing further information about the scoring system. The document can be a web page that can be navigated or a downloadable file
framework		The details about a semantic framework or system. Used to describe other semantic frameworks to which resources in EDCI can be associated, tagged or aligned with
framework	identifier	An alternative identifier of the semantic framework or system.
framework	title	Maximum one value per language is allowed.
framework	description	A free text describing the semantic framework. Maximum one value per language is allowed.

framework	supplementaryDoc	A public web document containing additional documentation about the semantic framework. It can be any document containing further information about the the semantic framework. The document can be a web page that can be navigated or a downloadable file

7.3 LOMS 1.0.0 Data Model

Class	**Field (property/association)**	**Description (**Before**) (usage, constraints, rules…)**
learningOpportunity		An opportunity to learn. An opportunity to realise a given set of learning outcomes via a learning activity and/or assessment. For example a training, a degree programme or a course, provided by a given institution at a given time, to obtain a certain learning award such as a qualification, this is a learning opportunity. **A 'learning opportunity' is the opportunity for an individual to do a set of 'learning activities' where he can acquire knowledge, skills or responsibility and autonomy as proven by an assessment.** Without a learning opportunity an individual would not be able to do any learning activity. The curricula of the learning opportunity are defined by its LearningOpportunitySpecification: it specifies what can or will be learned, how it will be learned and how it will be assessed. It is the 'learning package' that's been 'offered/provided' by the LearningOpportunity. The LearningOpportunitySpecification is 'abstract' in the sense that it is not bound to any provider, location or time. It is the LearningOpportunity that can be conducted in specific time and schedule by a specific provider at a specific location. A LearningOpportunitySpecification can be realised and formalised by different opportunities. Its the opportunity that makes it tangible and provides it in a specific form(at) or type. Multiple opportunities can share the same curricula. There are many types of learning opportunities. For example a training, education and/or degree program or a component of this such as a module, a course unit, a class. Other types include entities such as a seminar, a work placement program,...
learningOpportunity	identifier	An alternative identifier of the learning opportunity.
learningOpportunity	title	The title of the learning opportunity (e.g. name of a course offered at a given institution). Maximum cardinality of one per language.
learningOpportunity	altLabel	An alternative name of the learning opportunity.

learningOpportunity	description	A free text description of the learning opportunity. Maximum cardinality of one per language.
learningOpportunity	additionalNote	An additional free text note (e.g. a comment, a remark,…) containing any further information about the learning opportunity.
learningOpportunity	homepage	The homepage (a public web document) of the learning opportunity. There can be only one learning opportunity that has a particular homepage.
learningOpportunity	supplementaryDoc	A public web document containing additional documentation about the learning opportunity. It can be any document containing further information about the learning opportunity. The document can be a web page that can be navigated or a downloadable file.
learningOpportunity	startedAtDate	The start date when the learning opportunity will take place.
learningOpportunity	endedAtDate	The end date until when the learning opportunity will take or took place.
learningOpportunity	duration	The nominal duration of the learning opportunity. The duration for which the learning opportunity will continue to be offered.
learningOpportunity	learningSchedule	The learning schedule. How often you need to go (i.e full time (more than 30 hours), PT intensive (8-30 hoours), PT light (less than 8 hours)).
learningOpportunity	scheduleInformation	A free text note about the time schedule. More detailed information about the actual timetable (e.g twice a week, mondays at 4 pm,...). Maximum one value per language is allowed.
learningOpportunity	admissionProcedure	A free text note about the admission procedure. Maximum one value per language is allowed.
learningOpportunity	priceDetails	The price details.
learningOpportunity	providedBy	The providing or directing agent. The cardinality can be more than one in case the learning opportunity is provided/organized by a collaboration of different agents, (e.g. co-awarding). It MUST refer to an existing 'organisation '-record in the 'agentReferences'-section.
learningOpportunity	providedAt	The location where the learning opportunity will take place (e.g. course location).

learningOpportunity	specifiedBy	The specification, including the curricula, of the learning opportunity. A learning opportunity is specified by it's learning opportunity specification. It specifies the curricula of the learning opportunity: - what will or can be learned: the expected learning outcomes - how will or can this be learned: the learning activities - how will or can this be proofed: the assessments In addition to the curricula the learning opportunity specification does also include properties that have to do with the concrete implementation and/or formalisation of the learning opportunity. The opportunity provides or implements the curricula in a specific form(at) or type. Multiple opportunities can share or specialise the same learning opportunity specification. A Learning opportunity specification can be a specialisation of another more general or generic learning opportunity specification (e.g. a standard designed by a national authorithy). The learning opportunity itself binds it to a specific time, schedule and provider.
learningOpportunity	hasPart	A learning opportunity can be composed of other learning opportunities. For example,a degree programme might be represented by a tree of nodes such as a modules, a course, a class. In theory the depth of such a tree is unlimited.
learningOpportunity	referenceLanguage	The language in which information about the learning opportunity is available in the NDS.
learningSpecification		A specification of learning. A specification or package of learning that is expressed in 1 or more learning outcomes. It is used to specify what a person did learn OR what a person can learn (e.g. by a given learning opportunity).

learningSpecification	identifier	Identifiers are needed to identify and link resources in a unique and persistent way. A resource identifier must be unique and persistent, meaning the identifier will always refer to the same resource and cannot be reused to identify other resources. A resource identifier consists of: - a string identifier, unique and persistent within the scope of the issuing system. - a unique identifier of the publishing system that issued the string identifier for that particular resource. The combination of both, the string identifier and the unique identifier of the issuing system, makes the resource identifier globally unique. The IdentifierType is used to describe a full (alternative) identifier of an entity or resource. - The text content of the IdentifierType-element contains the character string to identify and distinguish uniquely the resource within the scope of the identification scheme - The schemeID attribute is used to specify the identifier scheme. The identifier schema (or identifier register) refers to the agent/system that issued the identifier, it specifies where the identifier originates from. It is the namespace in which the identifier is unique and persistent. The other attributes of the IdentifierType-element provide supplementary information such as the identifier of the used code list and the agency that maintains this list
learningSpecification	type	The type of learning opportunity that the learning specification/qualification is a part of. The form(at) or type of learning opportunity for which this learning specification/qualification (curricula) is designed. It needs to have some pedalogical relevance or some logical relevance in the structure of the curricula of the learning specification/qualification. In case of a tree of learning opportunities (cfr hasPart poperty), make sure that the proper structure is followed. All types can be put on the top level but the type of the descendant nodes is limited by the types of their ancestors. e.g. 'Degree programme' > 'Module' > 'Course' > 'Class'
learningSpecification	title	The exact and official title of the learning specification/qualification. Maximum one value per language is allowed.
learningSpecification	altLabel	A character string (i.e. a finite set of characters) in the form of words of a language.
learningSpecification	definition	Short and abstract description about the learning specification/qualification. Maximum one value per language is allowed.

learningSpecification	description	The full learning outcome description of the learning specification/qualification. Maximum one value per language is allowed.
learningSpecification	additionalNote	An additional free text note containing any further information about a learning specification/qualification.
learningSpecification	homepage	The homepage (a public web document) of the learning specification/qualification. There can be only one learning specification/qualification that has a particular homepage.
learningSpecification	supplementaryDoc	A public web document containing additional documentation about the learning specification/qualification, such as a diploma or certificate supplement. It can be any document containing further information about the learning specification/qualification. The document can be a web page that can be navigated or a downloadable file.
learningSpecification	hasISCED-FCode	The ISCED FoET 2013 classification code. It indicates the thematic area of the learning specification/qualification.
learningSpecification	hasEducationSubject	An associated field of education from another semantic framework than the ISCED classification.
learningSpecification	volumeOfLearning	An indication of how many hours of learning efforts are needed, i.e. notional learning hours.
learningSpecification	hasECTSCreditPoints	The credit points assigned to the learning specification/qualification, following the ECTS credit system.
learningSpecification	hasCreditPoints	The credit points assigned to the learning specification/qualification, following a given credit system other than ECTS.
learningSpecification	hasEducationLevel	An associated level of education within a semantic framework describing education levels.
learningSpecification	language	The instruction and/or assessment language(s) used.
learningSpecification	mode	The mode of learning and or assessment (i.e. online, blended, presential, work based)
learningSpecification	learningSettingType	The type of learning setting (i.e. formal learning, non-formal learning).
learningSpecification	duration	The maximum duration of a learning opportunity for which this specification/qualification is designed. The maximum duration a learning opportunity that implements this specification/qualification should take.
learningSpecification	targetGroup	A specific target group or category for which this specification/qualification is designed.

learningSpecification	entryRequirementsNote	Specific entry requirements or prerequisites of individuals for which this specification/qualification is designed. Maximum one value per language is allowed.
learningSpecification	learningOutcomes	An individual (expected) learning outcome of the learning specification/qualification. It MUST refer to an existing 'LearningOutcome'-record in the 'learningSpecificationReferences'-section of this document.
learningSpecification	learningActivitySpecification	What will or can an individual do to acquire the expected learning outcomes. The learning activities. It MUST refer to an existing record in the 'learningActivitySpecificationReferences-section of this document.
learningSpecification	assessmentSpecification	How will a learner be assessed to proof the (expected) learning outcomes. The assessments. It MUST refer to an existing record in the 'assessmentSpecificationReferences-section of this document.
learningSpecification	entitlementSpecification	A specification of an entitlement to which this learning specification/qualification may give rise to. A specification of a right this learning specification/qualification may give access to. It MUST refer to an existing record in the 'entitlementSpecificationReferences-section of this document.
learningSpecification	awardingOpportunities	Refers to an activity related to the awarding of the learning specification/qualification, such as the country or region where the learning specification/qualification is or was awarded, the awarding body and optionally the awarding period now or in the past.

learningSpecification	hasPart	A learning specification can be composed of other "narrower" learning specifications. To specify the full curricula as a tree structure a LearningSpecification can be decomposed into other LearningSpecification components in which each component `has its own curricula (learning outcomes and credit points, learning activties, ,...). For example,a degree programme might be represented by a tree of nodes such as a modules, a course, a class. In theory the depth of such a tree is unlimited. Each level has an OPTIONAL type, and these types (if given) SHOULD follow a logical structure - in order of their depth. For example it is valid to include a 'Course' with a 'Degree programme' parent, but it would be invalid to include them the other way around.
learningSpecification	specializationOf	A learning specification (e.g. a standard) of which this specification is a specialization. An opportunity can have its own specific curricula, based on or in addition to a given standard. In this case the LearningSpecification of the opportunity is a specialization of another LearningSpecification which is a standard. It MUST refer to an existing record in the 'learningSpecificationReferences'-section of this document.
qualification		The details of a qualification that can or has been awarded such as the (expected) learning outcomes. This can be a copy or a specialization of an existing qualification standard.

qualification	identifier	Identifiers are needed to identify and link resources in a unique and persistent way. A resource identifier must be unique and persistent, meaning the identifier will always refer to the same resource and cannot be reused to identify other resources. A resource identifier consists of: - a string identifier, unique and persistent within the scope of the issuing system. - a unique identifier of the publishing system that issued the string identifier for that particular resource. The combination of both, the string identifier and the unique identifier of the issuing system, makes the resource identifier globally unique. The IdentifierType is used to describe a full (alternative) identifier of an entity or resource. - The text content of the IdentifierType-element contains the character string to identify and distinguish uniquely the resource within the scope of the identification scheme - The schemeID attribute is used to specify the identifier scheme. The identifier schema (or identifier register) refers to the agent/system that issued the identifier, it specifies where the identifier originates from. It is the namespace in which the identifier is unique and persistent. The other attributes of the IdentifierType-element provide supplementary information such as the identifier of the used code list and the agency that maintains this list
qualification	type	The type of learning opportunity that the learning specification/qualification is a part of. The form(at) or type of learning opportunity for which this learning specification/qualification (curricula) is designed. It needs to have some pedalogical relevance or some logical relevance in the structure of the curricula of the learning specification/qualification. In case of a tree of learning opportunities (cfr hasPart poperty), make sure that the proper structure is followed. All types can be put on the top level but the type of the descendant nodes is limited by the types of their ancestors. e.g. 'Degree programme' > 'Module' > 'Course' > 'Class'
qualification	title	The exact and official title of the learning specification/qualification. Maximum one value per language is allowed.

qualification	altLabel	A character string (i.e. a finite set of characters) in the form of words of a language.
qualification	definition	Short and abstract description about the learning specification/qualification. Maximum one value per language is allowed.
qualification	description	The full learning outcome description of the learning specification/qualification. Maximum one value per language is allowed.
qualification	additionalNote	An additional free text note containing any further information about a learning specification/qualification.
qualification	homepage	The homepage (a public web document) of the learning specification/qualification. There can be only one learning specification/qualification that has a particular homepage.
qualification	supplementaryDoc	A public web document containing additional documentation about the learning specification/qualification, such as a diploma or certificate supplement. It can be any document containing further information about the learning specification/qualification. The document can be a web page that can be navigated or a downloadable file.
qualification	hasISCED-FCode	The ISCED FoET 2013 classification code. It indicates the thematic area of the learning specification/qualification.
qualification	hasEducationSubject	An associated field of education from another semantic framework than the ISCED classification.
qualification	volumeOfLearning	An indication of how many hours of learning efforts are needed, i.e. notional learning hours.
qualification	hasECTSCreditPoints	The credit points assigned to the learning specification/qualification, following the ECTS credit system.
qualification	hasCreditPoints	The credit points assigned to the learning specification/qualification, following a given credit system other than ECTS.
qualification	hasEducationLevel	An associated level of education within a semantic framework describing education levels.
qualification	language	The instruction and/or assessment language(s) used.
qualification	mode	The mode of learning and or assessment (i.e. online, blended, presential, work based)
qualification	learningSettingType	The type of learning setting (i.e. formal learning, non-formal learning).

qualification	duration	The maximum duration of a learning opportunity for which this specification/qualification is designed. The maximum duration a learning opportunity that implements this specification/qualification should take.
qualification	targetGroup	A specific target group or category for which this specification/qualification is designed.
qualification	entryRequirementsNote	Specific entry requirements or prerequisites of individuals for which this specification/qualification is designed. Maximum one value per language is allowed.
qualification	learningOutcomes	An individual (expected) learning outcome of the learning specification/qualification. It MUST refer to an existing 'LearningOutcome'-record in the 'learningSpecificationReferences'-section of this document.
qualification	learningActivitySpecification	What will or can an individual do to acquire the expected learning outcomes? The learning activities. It MUST refer to an existing record in the 'learningActivitySpecificationReferences-section of this document.
qualification	assessmentSpecification	How will a learner be assessed to proof the (expected) learning outcomes? The assessments. It MUST refer to an existing record in the 'assessmentSpecificationReferences-section of this document.
qualification	entitlementSpecification	A specification of an entitlement to which this learning specification/qualification may give rise to. A specification of a right this learning specification/qualification may give access to. It MUST refer to an existing record in the 'entitlementSpecificationReferences-section of this document.
qualification	awardingOpportunities	Refers to an activity related to the awarding of the learning specification/qualification, such as the country or region where the learning specification/qualification is or was awarded, the awarding body and optionally the awarding period now or in the past.
qualification	isPartialQualification	Indicates whether a qualification is a full qualification or part of another qualification. In the latter, the qualification is only obtained as a formal outcome of a “broader” qualification of which it is part.
qualification	eqfLevel	The qualification level as specified by the European Qualification Framework.

qualification	nqfLevel	A qualification can be part of a national qualification framework (NQF Qualification) which can be specified by the NQF level. This the qualification level as specified by a National Qualifications Framework.
qualification	qualificationCode	An identifying code from a qualification based reference semantic asset. This property is used to classify the qualification information with a qualification from a known qualification framework. (e.g. the link to the accredidated NQF qualification)
qualification	hasPart	A qualification can be part of another "broader" qualification. It MUST refer to an existing record in the 'learningSpecificationReferences'-section of this document.
qualification	specializationOf	A qualification(e.g. a standard) of which this specification is a specialization. An opportunity can have its own specific curricula, based on or in addition to a given standard. In this case the qualification of the opportunity is a specialization of another qualification which is a standard. It MUST refer to an existing record in the 'learningSpecificationReferences'-section of this document.
qualificationRef		Reference for a qualification from another dataset that can or has been awarded such as the (expected) learning outcomes.

qualificationRef	identifier	Identifiers are needed to identify and link resources in a unique and persistent way. A resource identifier must be unique and persistent, meaning the identifier will always refer to the same resource and cannot be reused to identify other resources. A resource identifier consists of: - a string identifier, unique and persistent within the scope of the issuing system. - a unique identifier of the publishing system that issued the string identifier for that particular resource. The combination of both, the string identifier and the unique identifier of the issuing system, makes the resource identifier globally unique. The IdentifierType is used to describe a full (alternative) identifier of an entity or resource. - The text content of the IdentifierType-element contains the character string to identify and distinguish uniquely the resource within the scope of the identification scheme - The schemeID attribute is used to specify the identifier scheme. The identifier schema (or identifier register) refers to the agent/system that issued the identifier, it specifies where the identifier originates from. It is the namespace in which the identifier is unique and persistent. The other attributes of the IdentifierType-element provide supplementary information such as the identifier of the used code list and the agency that maintains this list
learningOutcome		A learning outcome (i.e. knowledge, skill, autonomy-responsibility). The details, such as the description, of a learning outcome.

learningOutcome	identifier	Identifiers are needed to identify and link resources in a unique and persistent way. A resource identifier must be unique and persistent, meaning the identifier will always refer to the same resource and cannot be reused to identify other resources. A resource identifier consists of: - a string identifier, unique and persistent within the scope of the issuing system. - a unique identifier of the publishing system that issued the string identifier for that particular resource. The combination of both, the string identifier and the unique identifier of the issuing system, makes the resource identifier globally unique. The IdentifierType is used to describe a full (alternative) identifier of an entity or resource. - The text content of the IdentifierType-element contains the character string to identify and distinguish uniquely the resource within the scope of the identification scheme - The schemeID attribute is used to specify the identifier scheme. The identifier schema (or identifier register) refers to the agent/system that issued the identifier, it specifies where the identifier originates from. It is the namespace in which the identifier is unique and persistent. The other attributes of the IdentifierType-element provide supplementary information such as the identifier of the used code list and the agency that maintains this list
learningOutcome	prefLabel	A legible, descriptive name for the learning outcome. Maximum cardinality of one per language.
learningOutcome	description	A free text describing the learning outcome. Maximum cardinality of one per language.
learningOutcome	learningOutcomeType	The learning outcome type (i.e. knowledge, skill, ...).
learningOutcome	reusabilityLevel	The reusability level.
learningOutcome	relatedEscoSkill	A link/alignment to an ESCO Skill.
learningActivitySpecification		A LearningActivitySpecification is a specification of a process which leads to the acquisition of knowdledge, skills or responsibilty and autonomy.
learningActivitySpecification	identifier	An alternative identifier of the specification.
learningActivitySpecification	title	The title of the specification. Maximum one value per language is allowed.

learningActivitySpecification	altLabel	An alternative name of the specification.
learningActivitySpecification	description	A free text description of the specification. Maximum one value per language is allowed.
learningActivitySpecification	additionalNote	An additional free text note containing any further information about the specification.
learningActivitySpecification	homepage	The homepage (a public web document) of the specification. There can be only one specification that has a particular homepage.
learningActivitySpecification	supplementaryDoc	A public web document containing additional documentation about the specification. It can be any document containing further information about the specification. The document can be a web page that can be navigated or a downloadable file.
learningActivitySpecification	type	The type of activity. A concept indicating the type of activity.
learningActivitySpecification	workload	The expected workload. The expected workload in time. The expected amount of time the learner (will) spent undergoing the learning activity. The expected duration or volume of learning measured in years, days or hours of learning activity. The expected number of learning years, days or hours. This can be an indicative number (i.e. an estimated or notional number).
learningActivitySpecification	language	The language(s) of instruction.
learningActivitySpecification	mode	The mode of learning and or assessment (i.e. online, blended, presential, work based)
learningActivitySpecification	teaches	The expected learning outcomes to which this learning activity specification contributes to. This is given by a LearningSpecification. A learning activity can lead to or contribute to the acquisition of a set of skills, knowdledge, autonomy and or responsibilty. It MUST refer to an existing record in the 'learningSpecificationReferences-section of this document.
learningActivitySpecification	hasPart	An assessment specification (a "package") can be part of another "broader" assessment specification. It MUST refer to an existing record in the 'learningActivitySpecificationReferences'-section of this document.
learningActivitySpecification	specializationOf	An activity specification can be a specialization of another activity specification. It MUST refer to an existing record in the 'learningActivitySpecificationReferences'-section of this document.

assessmentSpecification		An AssessmentSpecification is a specification of a process establishing the extent to which a learner has attained particular knowledge, skills and competences against criteria such as learning outcomes or standards of competence.
assessmentSpecification	identifier	An alternative identifier of the specification.
assessmentSpecification	title	The title of the specification. Maximum one value per language is allowed.
assessmentSpecification	altLabel	An alternative name of the specification.
assessmentSpecification	description	A free text description of the specification. Maximum one value per language is allowed.
assessmentSpecification	additionalNote	An additional free text note containing any further information about the specification.
assessmentSpecification	homepage	The homepage (a public web document) of the specification. There can be only one specification that has a particular homepage.
assessmentSpecification	supplementaryDoc	A public web document containing additional documentation about the specification. It can be any document containing further information about the specification. The document can be a web page that can be navigated or a downloadable file.
assessmentSpecification	type	The type of assessment. A concept indicating the type of assessment.
assessmentSpecification	language	The language(s) of assessment used.
assessmentSpecification	mode	The mode of learning and or assessment (i.e. online, blended, presential, work based)
assessmentSpecification	gradingScheme	Used grading scheme. It MUST refer to an existing record in the 'scoringSchemeReferences'-section of this document.
assessmentSpecification	proves	Which learning outcomes are or have been prooved. It MUST refer to an existing record in the 'learningSpecificationReferences'-section of this document.
assessmentSpecification	hasPart	An assessment specification (a "package") can be part of another "broader" assessment specification. It MUST refer to an existing record in the 'assessmentSpecificationReferences'-section of this document.
assessmentSpecification	specializationOf	An assessment specification (a "package") can be a specialization of another assessment specification. It MUST refer to an existing record in the 'assessmentSpecificationReferences'-section of this document.

entitlementSpecification		The specification of a right a person has access to, typically as a result of a learning achievement. A specification may take the form of the right to be a member of an organisation , to follow a certain learning opportunity specification, or to follow a certain career. An entitlment may be prospective, i.e. awarding the right to apply for the entitlement, or actual, i.e. granting the entitlement
entitlementSpecification	identifier	An alternative identifier of the specification.
entitlementSpecification	title	The title of the specification. Maximum one value per language is allowed.
entitlementSpecification	altLabel	An alternative name of the specification.
entitlementSpecification	description	A free text description of the specification. Maximum one value per language is allowed.
entitlementSpecification	additionalNote	An additional free text note containing any further information about the specification.
entitlementSpecification	homepage	The homepage (a public web document) of the specification. There can be only one specification that has a particular homepage.
entitlementSpecification	supplementaryDoc	A public web document containing additional documentation about the specification. It can be any document containing further information about the specification. The document can be a web page that can be navigated or a downloadable file.
entitlementSpecification	type	The type of entitlement. A concept indicating the type of entitlement.
entitlementSpecification	status	The status of the entitlement. A concept indicating the status of the entitlement. Whether the entitlement is prospective, i.e. awarding the right to apply for the entitlement; or actual, i.e. granting the entitlement
entitlementSpecification	limitorganisation	It MUST refer to an existing 'organisation '-record in the 'agentReferences'-section.
entitlementSpecification	limitJurisdiction	The jurisdiction for which the entitlement is valid.
entitlementSpecification	limitOccupation	A link to an ESCO Occupcation or Occupational Category..
entitlementSpecification	limitNationalOccupation	A link to a National Occupation.
entitlementSpecification	targetName	A name or label of the associated occupation in the targeted framework.
entitlementSpecification	targetDescription	A description of the associated occupation in the targeted framework

entitlementSpecification	mayResultFrom	A LearningSpecification that may give rise to an entitlement with this specification. It MUST refer to an existing record in the 'learningSpecificationReferences'-section of this document.
entitlementSpecification	hasPart	A sub specification. An entitlement specification can be part of another "broader" entitlement specification. It MUST refer to an existing record in the 'entitlementSpecificationReferences'-section of this document.
entitlementSpecification	specializationOf	An entitlement specification can be a specialization of another entitlement specification. It MUST refer to an existing record in the 'entitlementSpecificationReferences'-section of this document.
organisation		A legal organisation (e.g. an awarding body, an academic or training institution,...).
organisation	registration	The legal identifier of an organisation . The identifier given to a registered organisation by the authority with which it is registered. The legal status of a registered organisation is conferred on it by an authority within a given jurisdiction. The Legal Identifier is therefore a fundamental relationship between an organisation and the authority with which it is registered.
organisation	vatIdentifier	The Value-added Tax ID.
organisation	taxIdentifier	The Tax/Fiscal ID of the organisation .

organisation	identifier	Identifiers are needed to identify and link resources in a unique and persistent way. A resource identifier must be unique and persistent, meaning the identifier will always refer to the same resource and cannot be reused to identify other resources. A resource identifier consists of: - a string identifier, unique and persistent within the scope of the issuing system. - a unique identifier of the publishing system that issued the string identifier for that particular resource. The combination of both, the string identifier and the unique identifier of the issuing system, makes the resource identifier globally unique. The IdentifierType is used to describe a full (alternative) identifier of an entity or resource. - The text content of the IdentifierType-element contains the character string to identify and distinguish uniquely the resource within the scope of the identification scheme - The schemeID attribute is used to specify the identifier scheme. The identifier schema (or identifier register) refers to the agent/system that issued the identifier, it specifies where the identifier originates from. It is the namespace in which the identifier is unique and persistent. The other attributes of the IdentifierType-element provide supplementary information such as the identifier of the used code list and the agency that maintains this list
organisation	type	The type of agent (i.e. the ESCO organisation category).
organisation	prefLabel	The primary name of the organisation (e.g. legally recognized name). The name by which to refer to an organisation . In case of a registered organisation this is the legal name of the organisation . Maximum one value per language is allowed.
organisation	altLabel	An alternative name of the organisation . An organisation may have any number of alternative or informal names.
organisation	homepage	A homepage about the organisation .
organisation	additionalNote	An additional free text note containing any further information about a organisation .
organisation	hasLocation	The legally registered site of the organisation . The country or region and eventually the address.

organisation	contactPoint	The contact information of the organisation . This property links to any "channel" through which the organisation can be contacted. It is a means of contacting the organisation . It gives the details of how to contact the organisation and is repeatable for each type of contact method.
organisation	hasUnit	Indicates a unit which is part of this organisation , e.g. a Department within a larger organisation . It MUST refer to an existing 'organisation '-record in the 'agentReferences'-section within the xml document.
organisation	unitOf	Indicates an organisation of which this Unit is a part, e.g. a Department within a larger organisation . It MUST refer to an existing 'organisation '-record in the 'agentReferences'-section within the xml document.
organisation	logo	The logo of the organisation .
organisation	lastModificationDate	The date when the organisation was last updated since it was published
scoringScheme		A scoring scheme. A numeric or text type of scoring methodology or convention. A grading system.
scoringScheme	identifier	A scoring scheme identifier
scoringScheme	title	The title of the scoring scheme. Maximum one value per language is allowed.
scoringScheme	description	A free text describing the scoring methodology or convention. Maximum one value per language is allowed.
scoringScheme	supplementaryDoc	A public web document containing additional documentation about the scoring/grading system. It can be any document containing further information about the scoring system. The document can be a web page that can be navigated or a downloadable file
framework		The details about a semantic framework or system. Used to describe other semantic frameworks to which resources in EDCI can be associated, tagged or aligned with
framework	identifier	An alternative identifier of the semantic framework or system.
framework	title	Maximum one value per language is allowed.
framework	description	A free text describing the semantic framework. Maximum one value per language is allowed.
framework	supplementaryDoc	A public web document containing additional documentation about the semantic framework. It can be any document containing further information about the the semantic framework. The document can be a web page that can be navigated or a downloadable file