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EUROPEANA INSIDE
Use Cases

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Statement of originality:

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

Contents

0 Introduction

Europeana Inside has the vision of a European cultural eco-system where all cultural institutions collaborate by sharing and exchanging cultural data. This allows cultural institutions and other stakeholders to set up valuable products and services which give heritage an important role in today's networked society. Based on this vision the project has objectives like:

- Lowering organisational, financial and legal barriers for content providers to participate;
- Simplifying the process of contributing content to Europeana;
- Ensuring that the collection management systems (CMSs) of content providers connect to aggregation networks using the framework of standards and protocols established under previous Europeana projects;
- Re-ingestion of enriched data back into the CMSs of content providers.

To deliver concrete tools and knowledge instruments to achieve these objectives obstacles have to be analysed, solutions have to be designed and specifications have to be determined. The objective of work package 2 (WP 2) is to work on these specifications and model use case scenarios to understand technical and legal requirements of participation in Europeana and other aggregators. This deliverable describes the use cases that provide more detailed expectations of core functionality for the proposed solution, the Europeana Connection Kit (ECK). The use cases also model exemplar user scenarios which illustrate key functional elements of the ECK.

0.1 Background and role of the deliverable in the project

This deliverable is the next step in the WP 2 specification process. It examines D2.1's requirements from the perspective of future users. Use cases help to identify generic requirements, i.e. useful to all future users, and requirements that are more specifically based on use in a particular context. They also provide ground for setting priorities for what the ECK must support, should support, can support and will not support[1]. The consequences of the use case findings will be documented in deliverable *D2.4: Functional Requirements*.

D2.2. will break down the complex business case of exchanging cultural content within the Europeana ecosystem into chains of detailed use case descriptions. These detailed descriptions clarify how existing barriers can be lowered either by automation using software or by quality improvement using knowledge and best practices.

As with D2.1, the background to this second deliverable in WP 2 is the future development of the ECK. D2.1 is the starting point and background to the current deliverable.

Deliverable D2.2 will:

- Clarify which scenarios can be supported on the top level use case of exchanging cultural content within the Europeana aggregation network;
- Address and explain the main user profiles;
- Examine the requirements stated in D2.1 and the Requirement Analysis Task Assignment (RATA) input from partners to ensure these requirements are either covered by a scenario or denied, as explained with proper argumentation.

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[1] Based on the MoSCoW Method, a prioritisation method originally developed by Dai Clegg of Oracle UK in 1994.

Sources used for input on this deliverable were:

- The tacit knowledge and understanding from the Best Practice Network of the technical and functional requirements of the ECK;
- Requirement Analysis (D2.1), especially the chapter on Functional Software Requirements;
- Results of the partners RATA.

0.2 Approach

A *Requirement Analysis* (D2.1) was delivered as a first step, based on a thorough questioning of all project partners by evaluating their input on the RATA. This gave an extensive overview of expectations and requirements from different stakeholders of how the objectives for the project should be met.

User stories were gathered in the previous research stage through a dedicated section of the RATA. Partners were asked to use a standard format in providing user stories in this task assignment, which was formulated as: "*As a **<role>**, I want **<goal/desire>** so that **<benefit>***". Examples were provided to support the partners. This deliverable is therefore a continuation on the work of D2.1, and models the requirements into more specific use case scenarios that have been inspired by the user stories and assumptions resulting from D2.1.

The methodology for this use case approach follows a strict template, the origins of which are explained in more detail in the first section of this deliverable.

The approach for D2.1 was to describe and analyse the experience of all stakeholders participating in one of these scenarios. The partner input from the RATA was sorted and grouped together in potential use cases. The list was made as comprehensive as possible. Wherever necessary, missing use cases were identified. Partners were asked to fill out a use case template of their choice where they thought information was missing. Partners were asked to supplement missing and incomplete use case descriptions. A review was done allowing partners to make corrections or bring in alternative scenarios to fulfilling use cases.

0.3 Structure of the deliverable

The first section will outline the template used to describe the use case scenarios. It will also give some background to the use case scenarios by describing the user profiles they are based on and by motivating the choice of these profiles and use case scenarios in relation to the findings of the previous deliverable and the project's Description of Work (DoW).

The second section is the core of this deliverable and will outline the three main use case scenarios that are deemed most relevant for Europeana Inside, following the template methodology outlined in the first section. These scenarios are a structured approach based on the insights gathered during the research that was the basis for both D2.1 and D2.2.

The third section lists all user requirements grouped by use case scenario and subsequently by steps. These structured user requirements will form input for D2.4: Functional Requirements. The use case scenario determines by large the priorities that should be given within the functional requirements. Functional requirements that allow users (i.e. content providers) to execute the basic use case scenario can be considered as a 'must have' for the ECK. Without this scenario Europeana Inside can never fulfil its mission to transform the quantity, scope and accessibility of digital cultural heritage for the public.

1 Use Case Definition

The creation of software must be based on specifications. Use cases are particularly important when developing software tools because they give developers a practical overview of what users need. Describing how the software will be used by different actors is an important step to identify and prioritise these specifications. By defining use cases it becomes easier to develop functional requirements, on which eventual technical specifications can be based.

1.1 Use Case template

The use case template that is used in Europeana Inside was constructed from three different sources:

- A use case template provided by the project partner Knowledge Integration (K-INT), who uses this template to build and base their software solutions on;
- The template used within the ECLAP[2] project to specify user requirements for the online portal;
- The INK management model[3]. Although this model is not a use case model as such, it provides a useful context to use case modelling for the exchange of digital information.

All three were merged together in order to create a use case template that would fit the needs and purpose of describing use case scenarios for Europeana Inside. The resulting structure for the use case template is as follows:

Use Case number + name
<the use case number + a short statement which indicates the core goal of the use case>
Goal
<brief description of what the user's goal is with this specific use case>
Actor(s)
<overview of which of the target user(s) will execute the use case>
System Components
<which software systems and/or tools need to be used; e.g. CMS, ECK>
Short description
<a summary of the flow of events, which describes the essentials of the use case>
Assumptions
<definition of the organizational conditions which have to be present for the use case to be fully executed>

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[2] ECLAP: E-Library for performing Arts <http://www.eclap.eu/drupal/?q=node/3609>
[3] INK Management Model <http://www.ink.nl/nl/p4bd81e110a03e/ink-managementmodel.html>

Technical preconditions
<definition of the technical conditions (CMS, data conditions) which have to be present for the use case to be fully executed>
Steps and responsibilities
<basic flow of events: the numbered steps which make up the entire use case from beginning to end; plus an indication of the responsible actors involved>
Post-conditions
<description of the changes that will have occurred in the system when the use case is fully completed: 'system' can also refer to the content provider situation or data condition>
Remarks
<issues that need to be taken into account when developing the use case>

To ensure this deliverable constitutes a usable, legible and understandable use case overview, some simplification of the use case scenario templates was unavoidable. For example, D2.1 has pointed out a number of differences or even contradictions in user requirements related to different workflow steps. Within the use case templates, it is impossible to reflect all contradictions in detail. However, it is unavoidable that some of these contradictory views will have to be discussed again at the time when final decisions will have to be made in the project in light of the functional requirements and technical specifications.

For reasons of readability it was also decided to describe the detailed actions and requirements per step in a separate section (*3: User requirements*) instead of listing them all in the template in section 2.

1.2 User profiles

The ways of working to exploit the potential of creating added value based on bigger exposure, re-use and enrichment of cultural heritage by aggregation and collaboration are still in their infant stages. From the experiences so far it is clear that it is no easy undertaking. It requires fundamental changes to the administration and management of collections under stewardship, based on large investments in knowledge and new technical skills. Exchanging rich data, as it might be called, needs skilled human effort, advanced ICT infrastructure and sophisticated tools to map from source to target data. Many institutions within the Europeana Network share the vision that this is the way forward. However, at the moment their limited resources result in a limitation of the effort needed for exchanging data through Europeana or other aggregators.

Initially the DoW stated that the profiles for the use cases would be: a small institution, a large institution and an aggregator. However, during the first specification task, the requirement analysis showed no clear distinction between small and large institutions or rather institutions with small collections or big collections in relation to their potential for exchanging digital information. What it did show was that it is not the size of an institution or the size of the digital collection that matters, but that it is a question of resource investment, in-house expertise (or the willingness to invest in it) and ambition or expectations.

Furthermore, it showed that aggregators' needs in the user scenarios were not different from content providers' needs within the different scenarios. Even though an aggregator can act as a local point of contact for Europeana, can take care of the registration process of the museum and can enrich the metadata before passing it on to Europeana, it still has the same requirements as a content providing institution who would take all these organisational and technical steps themselves. As a result, the intended structuring of the use cases from the description of work was replaced with an alternative approach. It was decided to differentiate use case descriptions on (technical) capabilities, wishes and needs of content providers, based on the quality of their infrastructure and their digital strategy.

Based on these findings, the two main profiles were identified:

1.2.1 Basic profile

Europeana provides cultural heritage institutions an option to increase the discovery and exposure of their public digital collections. The basic profile represents institutions that wish to keep the steps that are needed to contribute content to Europeana as basic, simple and automated as possible. Automation in this context means that use of the ECK requires only a few steps to supply data to Europeana. This includes the precondition that the local CMS functionality delivers the data in a basic 'Europeana-ready' state. In addition, the institutions which choose the basic profile may want the option to re-ingest and re-use (part of) their enriched data.

Institutions may have different motivations to operate within the basic profile. Probably most of the time this decision will be made due to limited resources (think of lack of in-house knowledge, technical capability or infrastructure). But an institution may also prefer this because its digital strategy sets the priority on something else. Since the aim of this profile is to use a basic workflow, the barriers should be kept very low for the institutions.

An advantage of operating within the basic profile is that the requirements are to a large extent similar across different target platforms, which means that the content prepared for basic exchange can be contributed to either Europeana or any other platform of the institution´s choice.

Typically this is the profile of smaller collections and institutions that will supply data to Europeana, preferably but not always through an aggregator.

Ideally, institutions who operate within this profile, will one day feel the need and necessity to change to a more advanced profile to gain more control over the process and the enrichment, supply and re-ingestion of their data. For instance, they may want to choose at a later stage for re-ingestion and re-use of (part of) their enriched data. The change to an advanced profile could and should be encouraged and assisted by aggregators and Europeana. These parties should also inform institutions who operate within the basic profile about the added value of choosing for and investing in switching to the advanced profile in the long run.
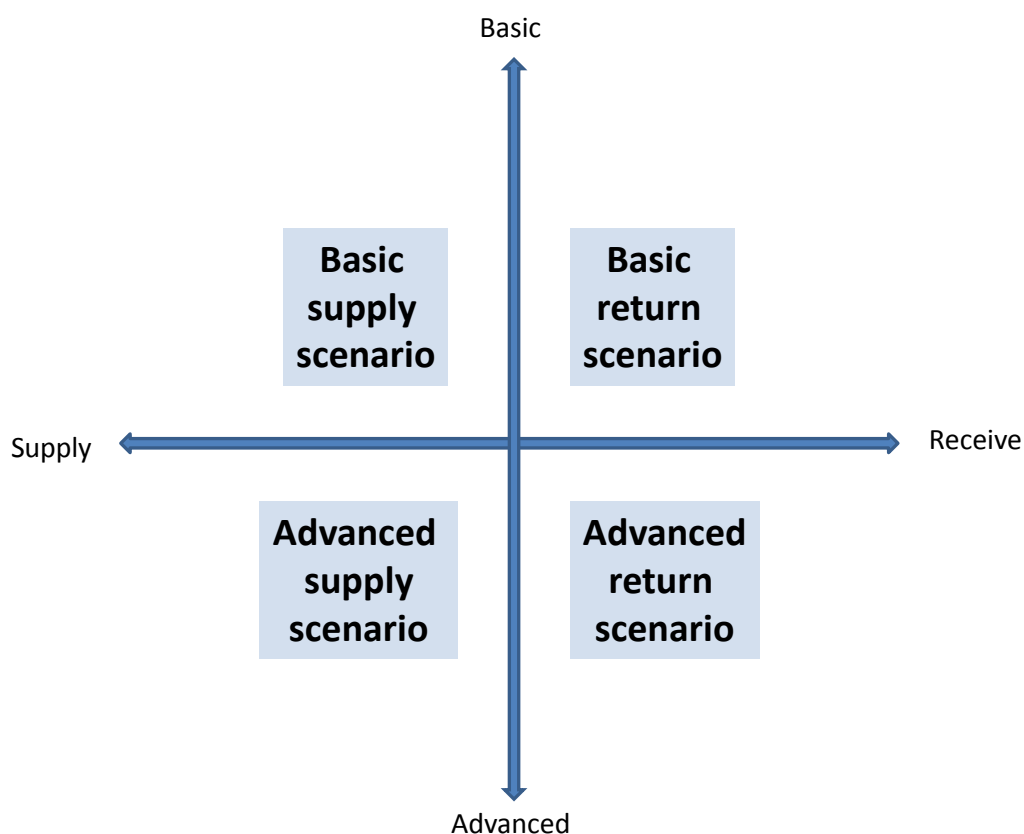
1.2.2 Advanced Profile

Institutions experienced with and aiming at creating rich data intended for valuable re-use (e.g. in thematic portals or enabled by third parties that build apps and services), wish to be in full control of the data providing process. Due to first hand experience they have knowledge on a technical and/or semantic level about data mapping, data transformation and data enrichment. Normally speaking, they also have a clear digital strategy and an advanced ICT infrastructure with sophisticated tools from which they can deduct detailed specifications for the ECK. They will most likely also prefer to have the opportunity to re-ingest and re-use (part of) their enriched data, either on a basic or an advanced level.

Typically this is the profile of aggregators or of institutions with larger, articulated collections that may contribute directly to Europeana or through one or more aggregators.

2 Use Case Scenarios

Based on these two profiles and the basic operations of supplying and receiving returned data, four complementing use case scenarios can be developed to express the options for exchange of information, as shown in this diagram:

Figure 1 – Four Use Case scenarios

However, only three out of these four possible scenarios have, for now, been developed:

- Basic supply scenario (actor: institutions opting for the basic profile);
- Advanced supply scenario (actor: institutions opting for the advanced profile);
- Enriched data return scenario (actor: institutions).

For now, only one return scenario is needed for both the basic and the advanced profiles. For both, re-ingestion is mostly experimental and still somewhat controversial. Institutions consider working with returned enriched data from Europeana (e.g. with user generated content in any language or translated keywords) complicated and they expect advanced functionality to support them. They need maximum granularity and all possible mechanisms to control the return of enriched data. In time, there might be a simple scenario for data return which shows how data return can run almost fully automated. But as there will be no practical implementation of this functionality during the lifetime of the project, there is no need now to create such a use case scenario.

Also, from the point of view that institutions who choose the basic profile for supply should be encouraged, over time, to upgrade to a more advanced scenario, having the enriched data return scenario as the only return scenario provides a good opportunity for institutions with a basic profile to learn more about options to improve the quality of metadata or data.

2.1 Use Case 1: Basic automated transformation and supply scenario

Discovery has been a major objective of content providers since the beginning of digitisation and the internet. The knowledge of how to make cultural content findable is widespread among content providers and they have applied standards for structuring, interpreting and making data available to make their collections findable also outside the original context, e.g. in portals and web search engines. Europeana has given a major impulse to the available knowledge and strengthened methods due to the large number of professionals and collections involved in it. The EDM, the aggregation infrastructure and the aim to publish all its data as Linked Open Data are important results to improve discovery and exposure of cultural data on the Web. Discovery is not the only feature in this basic use case scenario, but for various institutions it may be its main and only purpose. Users who wish to supply metadata and / or metadata to Europeana and/or other aggregators for additional purposes beyond simple discovery may be expected to opt for the advanced scenario.

The basic scenario aims at content providers who can comply to a minimum quality level, consisting of a set of minimum standards and formally accepted protocols. The ECK should be designed to enable a content provider with only basic knowledge of data standards to transform data into a Europeana compliant format.

Preconditions are that:

a) The content provider knows his own data (what is the meaning of the value in a certain field in his database);

b) The content provider uses the data model in a consistent way (the same form and type of information is always provided in a certain field in his database);

b) They can make their data available to other applications (e.g. by being able to export it in a basic data format which will be defined later).

The ECK mapping tool can help with the transformation of the source format to an intermediate format or directly to the EDM format. An intermediate format might be chosen if the data is supplied first to another portal or a Europeana aggregator. Once this transformation has been achieved, the data can be supplied to Europeana by the institution itself or by the aggregator.

Use Case 1: Basic automated transformation and supply scenario
Describes the most basic scenario for delivering content to Europeana. Basic in this context means the minimum amount of workflow steps, taken with a minimum amount of resources that a content provider has to run through in order to provide data. It represents the lowest possible barrier for providing content and also meets the basic quality requirements for data.

Goal:
The content provider wants to deliver (part of) his collection data to Europeana to increase the exposure and discovery on the web. They spend a minimum of resources (time, financial investment in human capacity and technical components) on this process. Everything should be as automated as possible to save time and resources. The data transformation and supply has to be quick, smooth and with as little human intervention as possible. The content provider may compromise on the quality by focusing on minimum data requirements, but does not want to compromise on control over the process. They want to feel in charge and informed about the impact and consequence of every step taken.
Actor(s):
Content providers which fit in or choose to operate within the basic profile (1.2.1)
System Components per step:
CMS (manage, select, provide the data to the ECK); ECK (prepare, validate, supply)
Short description:
- The content provider makes a selection of records in the CMS which shall be contributed to Europeana;   - The selected records are exported from the CMS in an appropriate open and machine readable data exchange format;   - The data is loaded in the ECK;   - The ECK may recognize the user from previous interaction and suggests a mapping and necessary data enhancements (like apply license, apply unique identifier) based on input format and preferred user settings (which can be overruled by the user, if necessary);   - The ECK detects possible problems with the data structure and flags fields and/or records as problematic;   - The content provider sees the problematic record(s) and gets the possibility to fix them;   (After the fix or when no problems appear:) The content provider gets a preview of what his data will look like after the transformation;   - The content provider approves the mapping and starts the transformation with one click;   (Before or after the transformation:) The content provider can choose what license to apply to the (records in the) dataset;   - The content provider gets a preview of what his data will look like after the enhancements (e.g. with a license of choice, with a PI);   - The content provider approves the enhancements and starts the transformation with one click;   - The ECK transforms the data and the content provider gets to click trough the result and sees a preview on record base *(note: as pointed out in D2.1, whether or not the preview shows the result of the mapping exactly as in Europeana might be up for discussion);*   - The content provider is satisfied with what he sees and clicks the 'supply' button;   - The ECK supplies the data to Europeana or the preferred aggregator;   - The ECK gets an indication on how long it will take to display the data in Europeana and notifies the content provider about the expected time.

Assumptions:

- Prior to the supply process described in this use case, the content provider has logged on to the ECK (either to make a profile and save his preferred settings, like the data exchange format or because he has already supplied data with the ECK);
- The content provider has already signed the Europeana Data Exchange Agreement (DEA);
- The content provider can export a set of data in minimum standard requirements from his CMS;
- The content provider has clear guidelines about the required data and its quality regarding the export to Europeana and thus knows what his preferred data format of exchange is;
- The content provider agrees to overrule possible licenses already applied to his records in the CMS by the licenses needed for exchange with Europeana, as applied by the ECK. *Note: the licenses meant here refer to the metadata, not the objects they represent.*

Technical preconditions:

- The ECK can be used either from within the CMS which has a direct connection to the ECK or the ECK can be used as standalone web tool;
- Content providers can log on to the ECK, get recognized and only have to make their choices once;
- There is a limited amount of data formats that can be recognised by the ECK;
- The content provider receives feedback on errors and is able to correct the automatic mapping where necessary (this includes missing information or missing thumbnails);
- The content provider is able to save mappings as draft and adjust them again later;
- In case of an error the content provider is able to start the uploading process again;
- Each record exported from the CMS contains a unique identifier (e.g. record number) needed for recognising previously uploaded records in order to transfer updated records to Europeana and to prevent double records in Europeana;
- License field, license and unique identifier are given (or overruled) by the ECK;
- The ECK can be used to add semantics and project related information to the data (e.g. digital asset type: Image, Sound, Video).

Steps:

1. Manage (in the CMS and thus not relevant for the ECK, however, the user requirements relevant to the CMS must be met by the CMS);
2. Select (in the CMS);
3. Prepare (mapping, transformation and data enhancement in the ECK);
4. Validate (validation of mapping, transformation and data enhancement in the ECK, step can be repeated until all errors are restored);
5. Supply data (one-click-operation within the ECK to supply data to Europeana);
6. Data acceptation (the content provider receives a notification about the acceptation of his data by Europeana when it has happened and when he can expect to view his data in Europeana).

Post conditions
- The content provider can view the contributed data in Europeana (asap);   - The ECK uses unique identifiers from the source data to apply persistent identifiers (Europeana conform) and to check the data in a following supply process for later operations (e.g. deletion, updating, re-ingestion, exchange with other targets);   - When the content provider logs on next time their choices are saved and can be applied again or be manually overruled if the content provider wishes to do that;   - When the content provider logs on next time with the same dataset the ECK should recognise this and update the right records in Europeana rather than offering them as new records;   - The content provider's CMS is able to export data compliant to a minimum quality level of interoperability;   - The content provider can withdraw its records from Europeana (which might be necessary in certain cases e.g. de-selected records; collections that are inherited from other institutions which cease to exist; a new CMS is acquired which provides the institution with new record numbers; collections are merged).
Remarks/Notes
Since content providers often use different databases with different structures for different collections, the source data made accessible to the ECK can have different formats. When using the tools for the first time for a certain collection, content providers need to indicate which data model is used, in order to create a mapping scheme. Errors should be used to adjust and improve the quality of the automatic mapping.

2.2 Use Case 2: Advanced configuration and supply scenario

This scenario aims at users with the advanced profile who wish to exchange richer data and have more options to configure the workflow steps and use more granular modules than the basic scenario offers. They aim at more meaningful data that can be more useful for different purposes. This use case addresses the needs and wishes of advanced profile institutions who wish to have higher granularity and more advanced settings available for the mapping, enrichment and transformation of their data.

This richer and more meaningful data needs to be converted into data that can be used and re-used by Europeana. This conversion requires decisions to be made by a data manager or other staff member who understands the provenance of the data and the working procedures of the content provider as well as the Europeana data model. This means that the conversion requires manual configuration. So in order to support this advanced scenario the ECK needs to support customisation, configuration and various modules for the most effective conversion of each content provider. On the other hand, the ECK must offer enough standardisation also within this advanced scenario in order to make the various steps of the conversion process more efficient than when they are performed without the ECK.

Use Case 2: Advanced configuration of data transformation and supply scenario
Describes an advanced scenario for delivering content to Europeana. Advanced in this context refers to a version of the ECK that enables content providers to configure the settings according to the content providers needs in order to exchange various richer data sets with Europeana, one or multiple aggregators or other platforms than Europeana.

Goal:
The content provider wants to deliver (part of) their collection data to Europeana to create new meaningful context for their collections and profit from the possibilities Europeana has to offer, such as the publishing as Linked Open Data or the creation of meaningful data visualisation. The content provider therefore invests in time, human skills and technical components for this process. His goal is to be able to customise the steps in the mapping, transformation and uploading process, including such things as the metadata scheme and the metadata fields to create the most effective and rich (or: fit) data set out of his data.
Actor(s):
Content providers which fit in or choose to operate within the advanced profile (1.2.2)
System Components:
CMS (manage, select, prepare, supply to the ECK); ECK (prepare, validate, supply, accept)
Short description:
- Content provider makes available a selection of records within his CMS;   - Content provider makes a selection of fields to be incorporated in data exchange;   - The content provider makes sure that all the licenses are correct and then logs on to the ECK (either from within the CMS: ECK has a direct connection to the CMS or can be used as separate tool);   - The CMS and/or ECK keep logs of each record processed through the ECK, so the content provider always knows which records have already been supplied to Europeana and when;   - The data is loaded into the ECK;   - The ECK detects possible problems with the data structure and flags fields and/or records as problematic;   - The content provider can fix the problematic records and then return to the ECK;   - The ECK recognises when some of the records or whole data sets are already present in Europeana and checks which ones need updating;   - The content provider can agree to the updating of his records in Europeana or decline that;   - The ECK suggests necessary data enhancements on data set and/or record level (like apply license, apply unique identifier) and gives the possibility to approve or decline them;   - The content provider points out what source format the data is in and chooses a target format;   - The content provider chooses a default mapping and opens it to edit;   - The content provider checks the settings of the default mapping and configures it further to his needs. Pilot transformations and validations help him to make further adjustments until the optimal representation is achieved;   - When the content provider is satisfied, he saves the configurations so he can use them again later;   - Content provider approves to the conversion and the enhancements and validates the converted and enhanced data again;   - The content provider supplies the data to Europeana through one click in the ECK;   - The ECK gets an indication on how long it will take to display the data in Europeana and notifies the content provider about the expected time;   - The content provider reads the notification that his data has been accepted in Europeana and goes to view his data in Europeana.

Assumptions:

- The content provider has already signed the Europeana DEA;
- The CMS can make a connection to the ECK;
- The ECK consists of different modules which can be applied by advanced users;
- The content provider has clear guidelines about the required data and its quality regarding the export to Europeana;
- The content provider applied licenses to his records in the CMS. In the ECK the content provider can have this source data translated, added or replaced by target specific licenses information;
- The ECK allows the creation of multiple sets for multiple aggregators inside and outside the Europeana context.

Technical preconditions:

- The ECK can be used either from within the CMS which has a direct connection to the ECK or the ECK can be used as standalone web tool;
- The CMS or content provider can log on to the ECK, get recognized and settings can be saved;
- The content provider receives feedback on errors and is able to correct the mapping where necessary (this includes e.g. missing information, missing thumbnails);
- The content provider is able to save mappings as draft and adjust them again later;
- The content provider is able to save mappings to use them again next time;
- In case of an error: the content provider is able to start the uploading process again;
- Each record from the CMS contains a unique identifier (e.g. record number) needed for recognizing previously uploaded records to Europeana in order to transfer updated records and to prevent double records in Europeana;
- Fields for licensing information, unique identifier and file format are present in the CMS and can only be given by the ECK if the information has to differ from the CMS;
- The CMS and / or ECK can be used to add semantics and project related information to the data (e.g. digital asset type: Image, Sound, and Video);
- Europeana can handle incremental harvesting

Steps and responsibilities:

1. Manage (in the CMS and thus not relevant for the ECK, however, the user requirements relevant to the CMS must be met by the CMS);
2. Select (in the CMS);
3. Prepare (data enhancement in the CMS and / or the ECK);
4. Connect (CMS or content provider makes connection to the ECK and loads selected data);
5. Configure (ECK settings for mapping, transformation and further enhancements);
6. Validate (validation of mapping, transformation and data enhancement in the ECK, step can be repeated until all errors are restored);
7. Supply data (one-click-operation within the ECK to supply data to Europeana or aggregator);
8. Check for updates, double records (ECK checks if records are present in Europeana, suggests updates);
9. Data acceptation (the content provider receives a notification about the acceptance of his data by Europeana or the aggregator, when it has happened and when he can expect to view his data in Europeana).

Post-conditions:
• Log file with description of the changes that will have occurred in the system when the use case is fully completed (where 'system' can also refer to the content provider situation or data condition);   • Data exchanged by the ECK must have PIDs linked to the source data in the CMS of the content provider so that they can be used for later operations (e.g. deletion, updating, re-ingestion, and exchange with other targets).

2.3 Use case 3: Enriched data return scenario

Cultural heritage institutions that have delivered content to Europeana, using a basic or advanced profile, want to re-ingest or reuse enriched data Europeana offers in return, to be incorporated in their own system again and for other services.[4] The ECK should enable them to re-use, or get back enriched data from Europeana. Granular possibilities of integrating this data in their own system (not necessarily their CMS) should be offered. They should be able to use and/or reuse it wherever they want and for instance publish it on their own website.

As mentioned in section 2 the reason for choosing to have one return scenario for both profiles is that currently both profiles need advanced options for customisation when receiving returned enriched data from Europeana. They need to be provided with maximum granularity and given all possible mechanisms to control the enriched data return. Whether they use these or not, is up to them. An institution with an advanced profile might choose for a basic execution of this return scenario with little customisation and more basic settings because they already closely monitored the quality of the supplied data and pre-calculated the kind of data enrichment they expect to get back from Europeana. Basic profile institutions might want to control and configure the return of enriched data more closely and use more advanced settings when returning data. In doing so, basic profile institutions learn more about their own data quality from the advanced return scenario. Therefore the possibility that they might upgrade to the advanced supply scenario the next time may increase.

Use case 3: Enriched data return scenario:
A content provider who has contributed data to Europeana (whether it has been contributed directly by the institution itself or via an aggregator) wants to receive and re-use enriched data from Europeana either inside or outside their own CMS, for instance in another local or web based system or on their website.
Goal:
Using the ECK to re-ingest enriched data from Europeana for the purpose of re-use by the content provider (whether that is by reintegrating selected enriched content into their own CMS or to collect and keep it somewhere outside their CMS, like their website).
Actor(s):
Content providers, including aggregators, who have contributed data to Europeana, independent of the fact if they contributed data within the basic or advanced supply scenario.

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[4] The ECK does not have to provide extra functionality for re-using content through third parties. The reason we used the term 'parties' in this description, is that it includes heritage institutions, thus content providers, as well as aggregators and companies.

System components:

ECK, CMS or any other database that feeds into a CMS and is aimed at re-using the returned data.

Short description:

- The content provider can log on to the ECK to add settings about data re-ingestion to his profile;
- The content provider can log on to the ECK to check if (some of) his data has been enriched within the Europeana environment. If he wants to, he can tell the ECK that he wants to receive a notification if new enriched data is available;
- The content provider can view the enriched data the ECK found;
- The content provider selects which data he wants to accept directly, accept after manipulation or decline. This selection can be executed on collection level, on dataset level, on record level and on field level;
- The content provider selects the target system;
- The content provider checks the configuration setting of the target system (e.g. where the received data will be stored: as a separate dataset or integrated with the original data, e.g. a field for user generated comments that was empty in the CMS can be filled with information from the enriched data).

After the selection to accept directly:

- Data is ingested automatically in the system of the content provider.

Acceptance after manipulation:

- Content provider edits the enriched data, if necessary;
- Content provider maps fields of the enriched data to fields in his own data system of choice;
- Content provider previews the transformation, mapping and possible changes;
- Content provider is able to save the configuration settings for the next time and as a draft version;
- Content provider allows the data to be ingested in the system or content provider declines the ingestion (either for now or definitely).

Assumptions:

- The content provider wants to manipulate and control the ingestion process manually and down to field level as much as possible;
- The ECK is used as a tool for content providers to ingest enriched data from Europeana in a user-friendly way;
- The unique identifiers (record numbers or the persistent identifiers which has been supplied by the ECK or Europeana) is used as identification of records within Europeana to check for updates on both sides;
- The content provider has a policy that allows the ingestion of metadata from other sources besides the institution itself;
- The content provider is able to control which data will be re-ingested;
- The content provider will be able to edit the enriched data manually before the data is exported to its own system.

Technical preconditions:
- Content providers need to be able to log in to the ECK;   - The ECK keeps log files of previously supplied and re-ingested data per content provider;   - The content provider has an infrastructure that enables data ingestion using an appropriate protocol.;   - The ECK is capable of supplying the data in an appropriate format and protocol.;   - The selection process of enriched data in the ECK consists of a yes or no option and an option to edit the enriched data on a collection level, a record/field level;   - Log functionality is in place to record when, which records or fields have been re-ingested.

Steps:
1. Manage (ECK checks for available enriched data and data updates in Europeana); 2. Select (in the ECK; content provider selects enrichments on field level); 3. Prepare (in the ECK the enriched data is mapped to a target format which the content provider chooses, also the enriched data might be edited further: e.g. provenance of the data enrichment source added); 4. Validate (Validation of mapping, transformation and data enhancement in the ECK, step can be repeated until all errors are restored); 5. Supply data (one-click-operation within the ECK to supply or export data for the local system of the content providers' choice); 6. Data acceptation (The content provider ingests and reuses the data further outside the ECK).

Post conditions:
The content provider is able to use the enriched data in his preferred local system of choice, in online collections and websites and in other applications.

Remarks:
How to deal locally with the enrichment of records? Store the enriched record separately from the original record in another system than the CMS of the content provider. This can also be another database that feeds into the online collection website or an app. *Option 1: separation* Update the whole record with the enriched information: provided the ECK is able to keep and check logs about the last update of a record. Outcome: one original record and one record with the latest enrichments. Problem: the target system for enriched records probably needs to be extended and equipped with extra fields to store the extra content (e.g. User Generated Content).

Option 2: integration

Select certain fields that contain enrichments and add them to the appropriate records in the CMS of the content providers. So updating on fields level rather than on record level.

Problem: how to make sure that the right record gets enriched with the right data?

Logs must be kept in all cases.

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3 User Requirements

All project partners were asked to describe actual requirements for the ECK in relation to re-use of data, based on their own experience or context. They were asked specifically to look at requirements either to resolve current problems they are facing or to create optimal enhancements to their current workflow that would enable or simplify the exchange of cultural content with platforms like Europeana.

3.1 General User Requirements

Managing users and user roles:
Content providers want to have a tool for managing roles and responsibilities in the process of delivering content to Europeana, so everybody knows who is responsible for which task.

On the one hand this refers to roles and responsibilities of different persons working with the CMS at the content provider. They must inherit the roles and restrictions to work with the ECK (e.g. administrator, editor), define user roles in the ECK so that curators and system administrators (different user groups) within the same organisation can apply modifications in different areas and give their internal users relevant rights (to manage, select and prepare the data). It is important that users with more rights can overrule choices made by others with less administrative rights, who in return cannot interfere with administrator's choices in the system.

On the other hand, this functionality is also necessary in a collaborative environment, which can be used by Europeana, an aggregator and the content provider. This will help to keep lines of communication about the ingestion process as short as possible. In the case of a question about a specific part of the process (e.g. the ingestion), the content provider could contact the right Europeana technical person immediately.

Updating and deleting records in and from Europeana:
The ECK workflow needs to have an update functionality which will offer the possibility to automatically deliver modified metadata to Europeana if the content provider approves the suggested updates. An easy tool to update metadata, to correct mistakes, enhance the metadata according to new insights and change already contributed data. A "delete" function of the ECK would be necessary to remove selected records from Europeana. These can only be records which the content provider has contributed himself. It should be possible to not only supply data to Europeana, but also to remove selected records from Europeana. There are various reasons why a content provider might want to delete records, such as:
- De-selection of records (removed from the collection);
- Moving a collection from one provider to another or because the institution ceases to exist;

Withdraws the data agreement.At the moment Europeana cannot handle incremental harvesting.

Metrics:
Metrics are useful for content providers to monitor the process of data exchange and understand the added value of providing data via Europeana (or other aggregators). Content providers want to be able to understand:
- How many of their records are included in Europeana;
- When data exchanges with Europeana took place;
- How often their records are viewed in Europeana;
- How many of their records in Europeana are enhanced by Europeana users;
- How often use of Europeana has led to use of the web sites of the content providers.

These might not all be direct requirements for the ECK, some of these metrics must be delivered by Europeana. However, the ECK seems to be a logical instrument to return these metrics back to the content provider.

Guidelines:
Users want to get guidelines in his/her native language, about:
- How to prepare their metadata so that it will be presented in Europeana in the best and homogeneous way;
- Step by step documentation and tutorial of the workflow process related to the different use case scenarios;
- the ECK interface and protocols.

Additional general requirements for aggregators:
Although aggregators can be regarded as having the same needs as normal content providers, there are two additional general requirements for them:
- Aggregators want to be able to use an API to integrate their existing tools with the ECK;
- Aggregators want to keep using the tools and techniques that have worked for them until now.

3.2 User requirements per workflow step

Generally, users want to feel in full control and possession of their own data when going through the workflow steps to prepare a data exchange with Europeana or another aggregator. Below we will discuss each step separately.

Step 1: Manage

Although it is assumed that there will be no additional requirements that should be covered by the ECK, there are assumptions about and requirements for the CMS functionality[5] that the ECK will tap into and the data quality. This goes for data management by the collection holders, CMS vendors and aggregators alike. .

Users generally want to:

- Keep using their existing CMS for managing the data and thus minimize or even have no data management procedures within the ECK;
- Have clear instructions that result in an easy to follow and transparent process of data transfer;
- Clearly know what the required fields or other restrictions are;
- Know what the limitations of a desired / planned CMS customization might mean for the data exchange through the ECK;
- Provide data on a chosen data level (sufficient / good / best quality);
- Have real-time results, so there should be the possibility to push a button to upload, remove, download and see immediate results, like in a modern repository.

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[5] See also D2.1

1a) Moving data from a local to a global level

Minimal requirements:

- Make data Europeana-ready;
- Create/store thumbnails;
- Visibly mark fields and digital assets for external usage and/or for internal use only (CMS)
- Have clear instructions on what is required for Europeana (or other aggregator) and how these requirements translate to their way of recording data in their CMS;
- Guarantee that records have a unique identifier within the database;
- Have the ECK dealing correctly with special characters (e.g. the Greek Alphabet).

Advanced requirements:

- Deliver content according to the need of any project (collections, sub-collections, individual records, or groups of records based on certain criteria);
- Normalise and add data to a selection of records using batch processing;
- Enrich metadata records with extra metadata (global level metadata like country, data provider, thesaurus like AAT);
- See the whole metadata structure and then select the fields to be supplied to Europeana;
- Transfer the persistent identifier (if present) to ECK and Europeana;
- Tracking information about what is uploaded to Europeana on record level (e.g. keep log files);
- Have facilities for the management of rights in their CMS system.

1b) Requirements for data quality and management

- Users want to have a clear view on the requirements/criteria for metadata quality, because they must try to apply them during registration;
- Users want to make sure that their records in Europeana are up to date (update records which have already been uploaded earlier and/or only upload records that need updating or have not yet been uploaded);
- Users want to check whether records of a certain content provider (also themselves) are already in Europeana.

Step 2: Select

This step is about the selection of data which will be added or withdrawn to Europeana based on the value and rights of the source.

Minimal requirements:

- The CMS provides functionality to select data and fully control the selection process, including selection of any record or part of a record based on any parameter;
- The availability of selection or search options, for instance to select individual records or sets:
    - Hand-picking of record by record (e.g. by marking the records);
    - Select records on the basis of specific values in any field: e.g. by location, by object category, by theme, by section, by (part of) inventory number;
    - Composite filtering with Boolean operators;
    - Selecting specific fields from all records;
    - Selecting specific fields, but filtered according to specific content in other fields (e.g. selection of fields within subsets);
    - Cutting off at predetermined string length in some fields (make sure not to cut inside words);
    - Get a (sorted) overview of the selected items and manually include or exclude individual records;
    - Manual selection of images to be used as a thumbnail;
    - Filter records based on IPR rights on metadata, physical object and digital representation level, in order to deliver object/metadata/digital representations cleared of rights, or with clear rights statements attributed;
    - Allow content providers to create as many groups of records as necessary in their CMS.

- See which selections have been made in the past and which items are already part of Europeana (an aggregator, another platform). Already selected items should be marked in the CMS or the ECK, including for which target they have been supplied;
- Get an up to date status per record and per record group (e.g. sent, in process, validated, accepted, online, removed, deleted from Europeana, online and enriched).

Advanced requirements:

- Have a clear distinction between selecting records for a new delivery and an update of existing records (PIDs can maybe be used to detect records that are already in Europeana). Get feedback on the process of data export: e.g. errors, progress;
- Generation of a safe version of the data that is enriched in the source system;
- Save multiple selection profiles for multiple targets in the CMS which can be reused and used outside the CMS, e.g. through the use of a uniform XML schema;
- Contribute data to multiple aggregators, whereby each aggregator has its own requirements;
- Selections may overlap. This means (some of) my data can arrive at Europeana through more than one channel and in different formats;
- Provide fine-grained control to users over the selection of records to be added or removed from Europeana without vendor support, so support costs stay low;
- Possibility to request to withdraw data from Europeana (note: Europeana content can be reused by others. Removing this content may lead to some conflict!);
- Provide feedback on the value of the content the collection holder selected in order to make the data more valuable and improve the data set.

Step 3: Prepare

3a) Metadata cross mapping:

This step is about making decisions about the data format, and choose an intermediate data format or for a direct mapping from source format to Europeana format (EDM). A good analysis of whether or not to choose for an intermediate data format advantages / disadvantages is definitely required, taking into account stability, flexibility and sustainability of the intermediate format. Since most users prefer real-time responsiveness from Europeana, there is no real need to use an intermediate data format - except when the content provider has a certain goal with the intermediate format (e.g. providing it to another portal as well).

Minimum requirements:

- Load data in the ECK mapping tool (either by exporting it from the CMS or by logging on to the ECK from within the CMS);
- Store the configurations for the next login so that the ECK proceeds without asking basic questions about data format;
- Map and transform data;
- Provide a simple mapping process as automatic as possible for different user groups (Curators and CMS Administrator): no expert IT knowledge should be needed and sufficient training along with documentation and guidelines should be provided, concerning the mapping tool itself and the Europeana metadata schema;
- Select a target schema;
- Select a default mapping to the selected schema;
- Use a simple interface for the mapping which provides a preview of the result;
- Log each step of preparation so that the content providers are able to check the outcome of each sub-step;
- Explanations and probably some examples regarding the semantic content of the data applicable to each field, for instance with ScopeNotes.

Advanced requirements:

- Have more options for more detailed configuration of the metadata mapping to do conditional and sophisticated mappings to deliver records in higher quality (than the minimum requirements support);
- Map to more than one target to have maximum flexibility in choice with which services the data can be exchanged;
- Configure and store this mapping in the initial installation/configuration of the ECK-link;
- Upload existing standard XSLT transformation and save it as settings in the ECK as part of their account;
- Re-use mapping and configurations for every upload but also be able to amend this settings and configurations when needed;
- Use an API to create applications that will load mapped metadata from a local format to EDM (or other supported metadata formats);
- Have some kind of 'what if' function, by which content providers can manually adjust the input data directly (without having to go back to the CMS), for testing purposes. Once they got it right, they can then go back to the CMS and make the changes accordingly.

3b) Enhancing metadata quality

Minimal requirements:

- Enrich/enhance metadata quality (e.g. add URL references to digital representations, external sources, add constant values);
- Let the ECK check for the existence or not of Europeana-required thumbnails and suggest the creation of missing ones (creation and storing of these thumbnails in the CMS or ECK);
- Receive clear instructions for how (not) to formulate data in important fields that are subject to normalisation.

Advanced requirements:

- Have a simple way to enhance the transferred metadata by adding information that is not present in the CMS so the content provider conforms to the target's requirements;
- Rely on the ECK to add constant values for certain fields as required by Europeana (or the aggregator), that are not needed in the CMS (e.g. certain rights statements, name of collection);
- Make suggestions about the use of keywords. E.g. if synonyms are used more frequently in Europeana.

3c) Apply Persistent Identifier

Minimal requirements:

- Automatically create the URI (PID) assignment and management;
- ECK checks for the existence or not of Europeana-required PIDs, and if they do not exist create them and manage the creation of those that are missing;
- Use the URI as the key for uploads/removals/downloads of each individual record or part thereof (e.g. thumbnail);
- Store the URI in the CMS (as well as in Europeana) and include it in the metadata.

Advanced requirements:

- Provide user support about the PID generation process, particularly when restrictions occur on local identifiers that may be used in the process (e.g. avoid special characters, local IDs that must always be kept). Content providers want to know to what objects these identifiers are applied, and ideally, the PID should be visible in their own CMS system too;
- Track the different PIDs (local PIDs, Europeana PIDs or other PIDs) and relate the different records and different 'versions' of the record (the version in the local system and the version in the Europeana system).

3d) Apply License

Minimal requirements:

- Provide guidelines for the license applying process for both metadata, thumbnails and digital objects;
- Be warned by the ECK when a record doesn't have licensing information included;
- Have the ECK provide a tool which can map the organization proprietary/licensing descriptions to the European appropriate/standardized ones (map to rights schemes as defined by the Europeana Right guidelines[6].

Advanced requirements:

- Have a tool to assign copyrights (license) per collection, object, media file;
- Include licensing information in the uploaded metadata (and thus have facilities for the management of rights in their CMS system);
- Use an API to apply a license to records in an automated way. OR: It could be an element in the CMS system that stores the license and when exporting to Europeana this license is automatically applied.

Step 4: Validation and feedback

Minimal requirements:

- Have a standard way to exchange data with Europeana, so no extra development is needed;
- Get feedback from an automated tool with a preview functionality for the presentation in Europeana and a possibility to correct data;
- Notification of errors which specifically points to the concerning records or fields;
- Let the ECK perform the necessary checks and highlight which records fail and why;
- Have a status report tool to know when the work is complete;
- Provide clear information to the user what needs to be done if the validation fails;
- Failed records are stored aside for later correction while valid records can move on.

Advanced requirements

- Get examples of similar collections published within Europeana to see how they handle some of the questions they have;
- Receive conclusive validation. Any following validations that occur in the process must not yield other results;
- A preview functionality which shows how the data will be presented in Europeana after mapping but before export so that mappings can be maintained and confidence built;
- Leave the validation completely automatic and inside the ECK – therefore the ECK might be a service on the web, since validation rules might change over time and we do not want to deal with local installations of the ECK in such a case;
- Connect with the ECK (web service) for the validation;
- Receive thorough and understandable reports also in machine readable format and log files from the validation process;
- Include a software library, which contains the necessary validation functions;
- Have a well-documented preview service or API which they can integrate into the ECK for comfortable use for users.

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[6] Europeana Rights Statement <http://pro.europeana.eu/web/guest/available-rights-statements>

Step 5: Supply (push / pull)

Note beforehand: the answers indicate that push and pull are generally considered as two different steps/opportunities.

Minimal requirements:

● Submission of the selected data can be done with a single button as the final approval of the content provider;
● Get a report or log files on the exchange from an automated tool. This report or log file can be implemented by a CMS vendor to provide information about the exchanged data within the CMS. And thus: mark records within the CMS as already contributed;
● Choose for updating records on a regular basis;
● Undo, delete or edit the already uploaded data from Europeana in case they find an error in a package that has already been harvested;
● Set the frequency of harvested by Europeana (pull) or of supplying data to Europeana (via push);
● Receive reports about "where my data is right now".

Advanced requirements:

● Choose the method of data transfer to a target, if there are options, in order to manage the process and thus choose alternatives to OAI-PMH that are easier to implement and opt out from OAI-PMH harvesting. That way they cannot be obliged to install and maintain a web server to enable OAI-PMH harvesting. Alternatives are for instance FTP. Costs and implications of alternatives have to be explained as well;
● Upload via OAI-PMH or FTP:
  ○ OAI-PMH - to automatically exchange new and/or updated data to Europeana or another aggregator to always have the most recent and best possible data displayed on the portal. Use cloud servers for OAI-PMH harvesting instead of having to install and maintain their own OAI-PMH server;
  ○ FTP upload (for aggregators/portals using other protocol than OAI) to (with some manual interference) exchange new and/or updated data to Europeana or another aggregator to always have the most recent and best possible data displayed on the portal.
● Select the exchange method and push/pull data to aggregator/Europeana:
  ○ Only transfer new data/records to aggregator/Europeana;
  ○ Transfer new and updated data/records to aggregator/Europeana;
  ○ Transfer all data/records to aggregator/Europeana.

● Use a push system so that their customers can run their CMSs inside their firewalls and control when connections are made.

Step 6: Data acceptation

Minimal requirements:

● Receive a notification of the acceptance of the data set together with an approximate time schedule for the publishing of the data set;
● Rely on Europeana for accepting the request and performing this task.

Advanced requirements:

- Have Europeana ingesting (uploading) a record by its URI and check if the URI is already present in Europeana. If so, the existing record will be updated with the metadata from the content provider;
- Have the result of these processes sent back (in XML) to the CMS for presentation and logging.

Step 7: Enrich and Return (including Return and Re-use)

Minimal requirements:

- Accept or decline Europeana enriched metadata into ECK;
- Decide where to store data for re-ingestion (e.g. CMS, other database);
- Enriched metadata may be stored separately from the original record or additional fields;
- Know the source of every enrichment so they can decide if the resource is authoritative or not;
- Accept or decline (parts of) Europeana enriched metadata into ECK in order to decide whether the enriched content can get back (to CMS or any other system) or not so that they can benefit from the latest enrichment technologies without having to invest in these types of technologies and resources;
- Decide on a field / record / collection / data set level if they want the enriched data back;
- Keep, apply, change or override the settings for re-ingesting data within the ECK as a whole or one-by-one;
- Have the opportunity to use the enriched metadata in various applications (e.g. CMS, website);
- Preview the enriched data and see the metadata loaded in the appropriate fields before anything gets fed back into the CMS;
- Receive a notification when new data enrichments for re-ingestion are ready for review.

Advanced requirements:

- Check the data for re-ingestion through a preview and a report tool;
- Visualize all the data that has been associated with the provider's own data;
- Access a log of all data re-ingested, with details and date of re-ingestion;
- Decide on a field / record / collection / data set level if they want the enriched data back;
- Select which records they want to receive on field level, so that accepting whole records is not always required. For example for translation of subjects, it should be possible to accept only translations that are useful within the provider's own context;
- Re-ingest data separately:
    - Select the system where the enrichments will be stored, so it is possible to store the enrichments in the presentation system and not the CMS (flexibility is important);
    - Decide where to store data while re-ingesting;
    - Have the enriched "pulled" metadata kept separately from the original metadata (i.e. outside the CMS), and edit and exploit it whenever they decide to, and in the way they think it's appropriate;
    - Download records from Europeana, who will send the requested records by their URIs back in EDM format including the metadata enhancement. These should be in additional fields that are not part of the content providers' metadata. The CMS will take care of handling the download and provide features for incorporating this data in the CMS;
    - If their customers decide to "ingest" then this shall be an automated process as much as the institution wants it to be;
    - Go back to the previous stage of data before re-ingestion (so restore to situation before re-ingestion in case something went wrong);
    - Be able to tell their customers;
    - Have the result of these processes sent back (in XML) to the CMS for presentation and logging;
    - Register / log interactions with Europeana in the CMS;
    - Have a preview and choose to ingest or not. Keep this step transparent for their customers.

- Re-ingestion of "Europeana-enhanced" data on an automatic basis, but to the conditions the content provider chooses (e.g. time, occasion, amount);
- Plan the management of the enriched "pulled" metadata, according to the frequency, the number and the nature of the harvesting.

4 Conclusions

This document is a follow up to the deliverable on a requirements analysis (D2.1) by providing a use context to the requirements. This has been done first by proposing two profiles to potential users (a basic profile and an advanced profile) and then presenting three use case scenarios. The document ends with the listing of the user requirements for the ECK, following the workflow steps that together give shape to the use case scenarios.

The distinction between the basic profile and the advanced profile is made on the assumption that some content providers are not interested or capable to do a lot of customisation before their collection information can be supplied to Europeana or other aggregators, while others with more advanced systems and knowledge may want to have full control over all kinds of modifications.

Based on these two profiles, three use case scenarios have been developed that follow the flow of data:

- Supply of data to another service (Europeana or another aggregator) without much customisation;
- Supply of data to another service (Europeana or another aggregator) with options to customise the supply;
- Receiving enriched data back from the service after the data has been supplied. The enrichment can take many shapes: e.g. user comments or tags may have been added, keywords may have been translated, links to related sources may have been added.

These use case scenarios are described in a fixed format to support easy comparison of the scenarios. The descriptions are fairly generic. A more detailed description is provided in an overview of user requirements according to the workflow that has been defined for the ECK in D2.1. The overview is meant as an addition to section 3 in D2.1, where the workflow has been explained. The more detailed description in this document is entirely based on the user perspective.

The use case scenarios determine by large the priorities that should be given within the functional requirements. Functional requirements that allow users (i.e. content providers) to execute the basic use case scenario can be considered as a 'must have' for the ECK. Without this scenario Europeana Inside can never fulfil its mission to transform the quantity, scope and accessibility of digital cultural heritage for the public.

It should be noted that there may still be some contradictory views and uncertainties in the detailed descriptions of the workflow steps. This will be solved during the decision making process to establish the final functional requirements (D2.4). During that process the expectations from all partners (as recorded D2.1) will held against the user requirements (this deliverable) and the technical audit (D2.3). It should also be noted that opportunities will be offered to review the requirements and suggest additional modifications later on during the project.