made with europeana

Enriching Europeana with user transcriptions and annotations (EnrichEuropeana)

Milestone 3: First Version of Data Exchange Infrastructure

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Statement of originality

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1. Introduction

This document describes the Data Exchange Infrastructure developed within the context of the EnrichEuropeana project. Data Exchange Infrastructure (DEI) is the system component, which is preparing and importing materials used within the Transcribathon Platform (i.e. for transcription and enrichment activities). Main features of DEI system include searching for records in aggregator (i.e. Europeana or national aggregators), gathering sets of found records in packages, sending them to the Transcribathon Platform and sending the enrichments back to the aggregator. In order to fulfill the mentioned functionality, DEI implements a REST API and web user interface.

2. Terminology

Following terms and abbreviations will be used in this document:

Annotation - user enrichment or transcription sent to Europeana as a result of record processing during an event in TP

Candidate records - records associated with a project (and dataset) that were not added to the import package

Dataset - a set of documents that belong to the same project; datasets are dependent from the project and are retrieved from TP via REST API

DDB - Deutsche Digitale Bibliothek, beside Europeana it is another aggregator used for searching

DEI - Data Exchange Infrastructure application

Import Package - a package gathering records sent to TP in one batch

Keycloak - single sign-on server used to authenticate and authorize DEI users

Project - a way to organize documents for the transcribathon event; it may contain many datasets; projects are retrieved from TP

Realm - a realm manages a set of users, credentials, roles, and groups; a user belongs to and logs into a realm

TP - Transcribathon Platform used for preparing transcriptions

User - a user that works with GUI and REST API having the certain role ‘*operator*’

3. Data Exchange Infrastructure

General idea of EnrichEuropeana project is to enrich records aggregated in Europeana with user input. This input includes a variety of metadata enrichments like transcriptions, translations and metadata enhancements using named entities. First user action is the selection of documents to be used in Transcribathon event. The submission of those documents to TP is the next step in the process. After transferring the records to TP, DEI system awaits for notifications informing about the enrichments being finished and available for further processing. All the enrichments are then transferred to Europeana using Europeana Annotations API. The described workflow is shown on the picture below.

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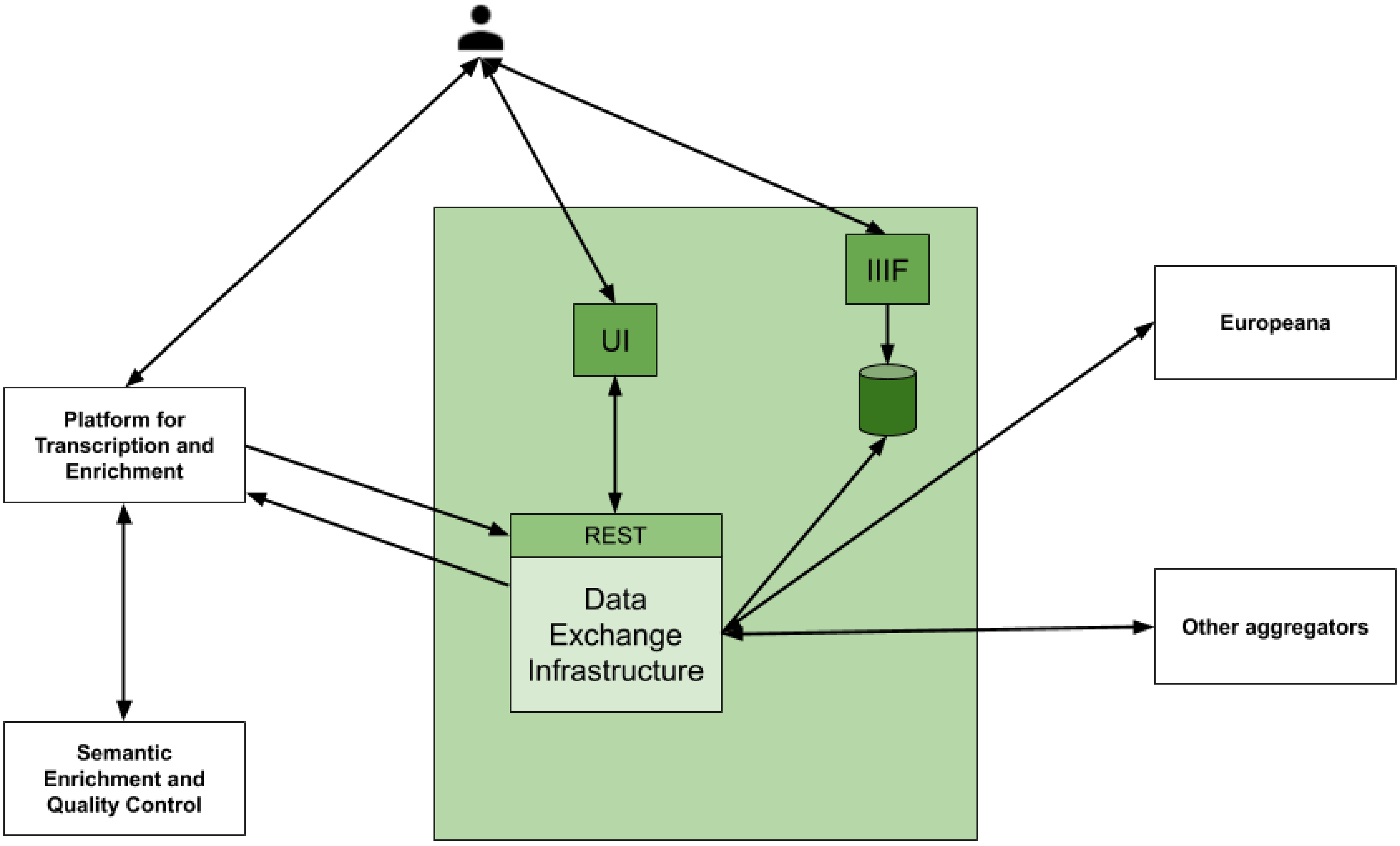
IIIF
UI
Europeana
Platform for Transcription and Enrichment
REST
Data Exchange Infrastructure
Other aggregators
Semantic Enrichment and Quality Control

Fig.1. Data workflow in EnrichEuropeana

In the following sections each phase of workflow will be described.

3.1 Authentication

Access to DEI application is restricted for logged in users with '*operator*' role. Before using GUI a user needs to authenticate via Keycloak single sign on server localized in the cloud environment used by Europeana Core Services Platform. The redirection to Keycloak server is done automatically. Login page is shown on the picture Fig. 2.

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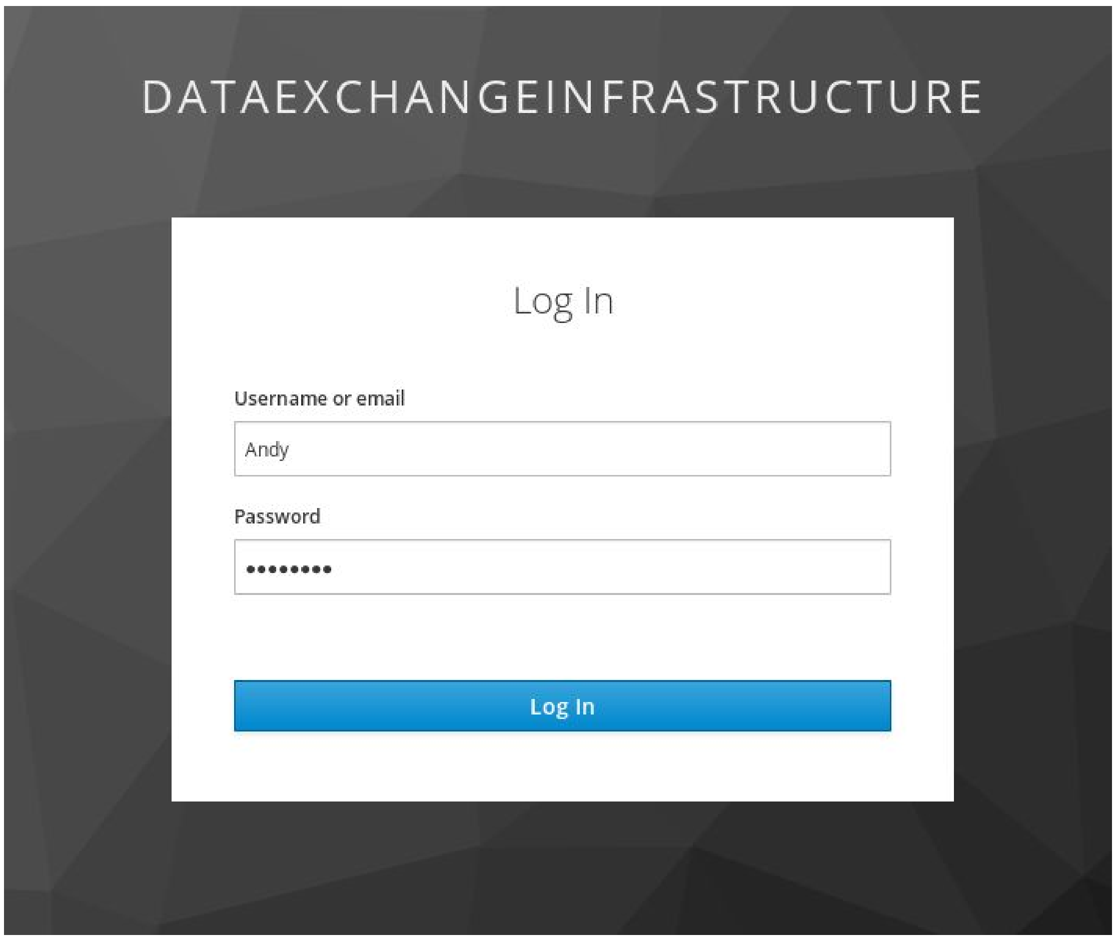

DATAEXCHANGEINFRASTRUCTURE

Log In

Username or email

Andy

Password

••••••••

Fig. 2. Login page

After successful login the user is redirected to the home page of DEI application, the user being now authorized to execute specific actions. The list of actions available on the main page of DEI, they are sketched in Figure 3 and described in the following subsections.

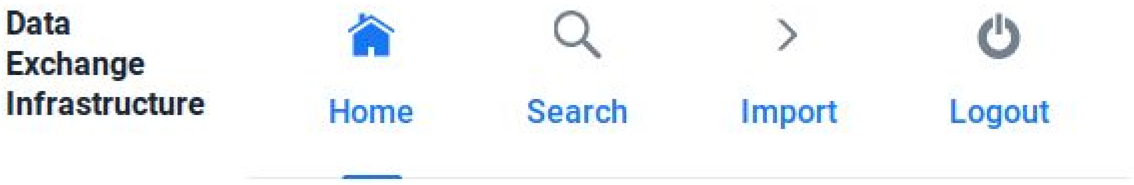

Fig. 3. Main page of DEI application

3.2 Documents selection

The most important action in DEI application is the selection of records to be used for transcription and enrichment within Transcribathon platform. This functionality is accessible by clicking the *Search* menu item, which opens the form presented in Figure 4.

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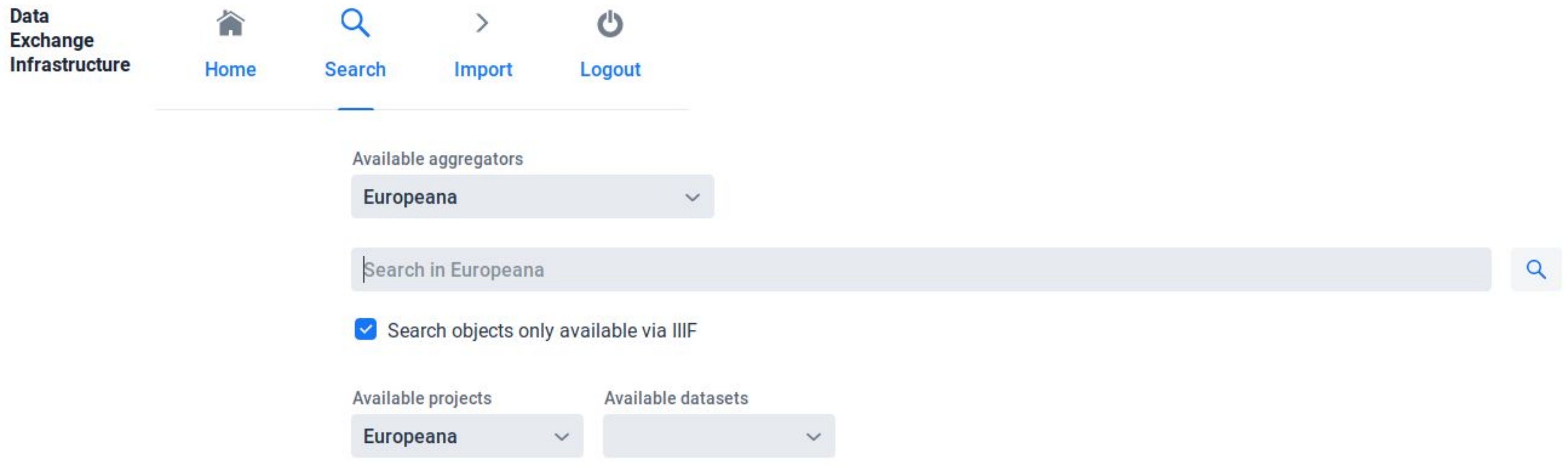


Available aggregators: Europeana

Search in Europeana

☑ Search objects only available via IIIF

Available projects: Europeana

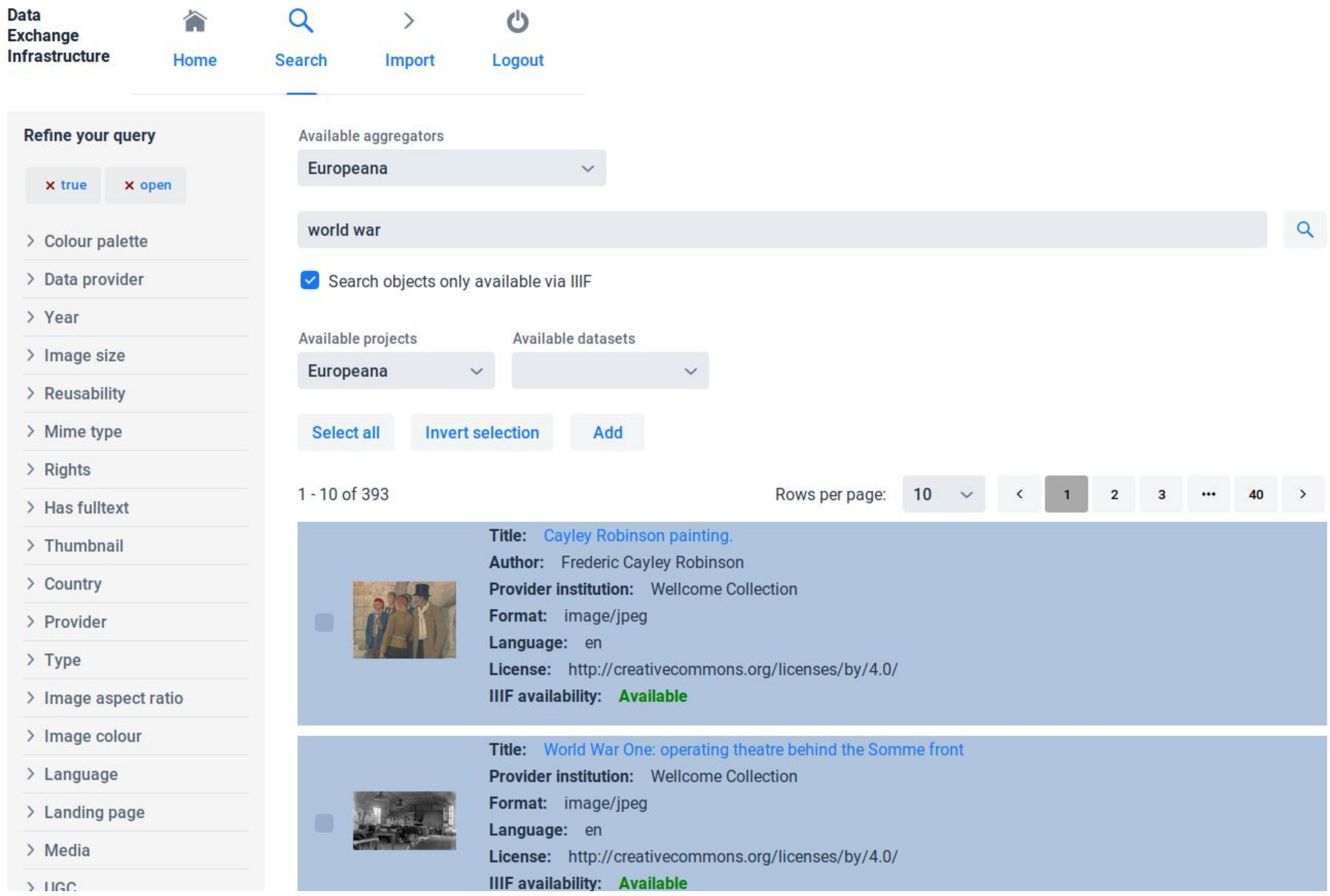
Available datasets:

Fig. 4. Search form

When the user enters the search page he/she has the possibility to specify a text phrase used for searching documents. There are also two dropdown boxes showing the project and a dataset within the selected project. Projects and datasets are created in TP, therefore, DEI retrieves them from TP using specific API calls. All the selected documents will be associated with the specified projects and datasets and this information will be propagated to TP.

TP aims at using documents available in IIIF format. Therefore, it was decided to add the "Search objects only available via IIIF" option in the first version of DEI search. It allows users to focus on records that offer the best user experience within TP. This search option is enabled by default. For records not available in IIIF, DEI has built-in conversion mechanism which exposes them as a IIIF compliant stream using the IIIF Image API. The mechanism supports objects with mime type such as "image/jpeg", "image/tiff", "image/png", "application/pdf".

After executing a query the search results are displayed to the user as shown in Figure 5.



Available aggregators: Europeana

world war

☑ Search objects only available via IIIF

Available projects: Europeana

Available datasets:

1 - 10 of 393

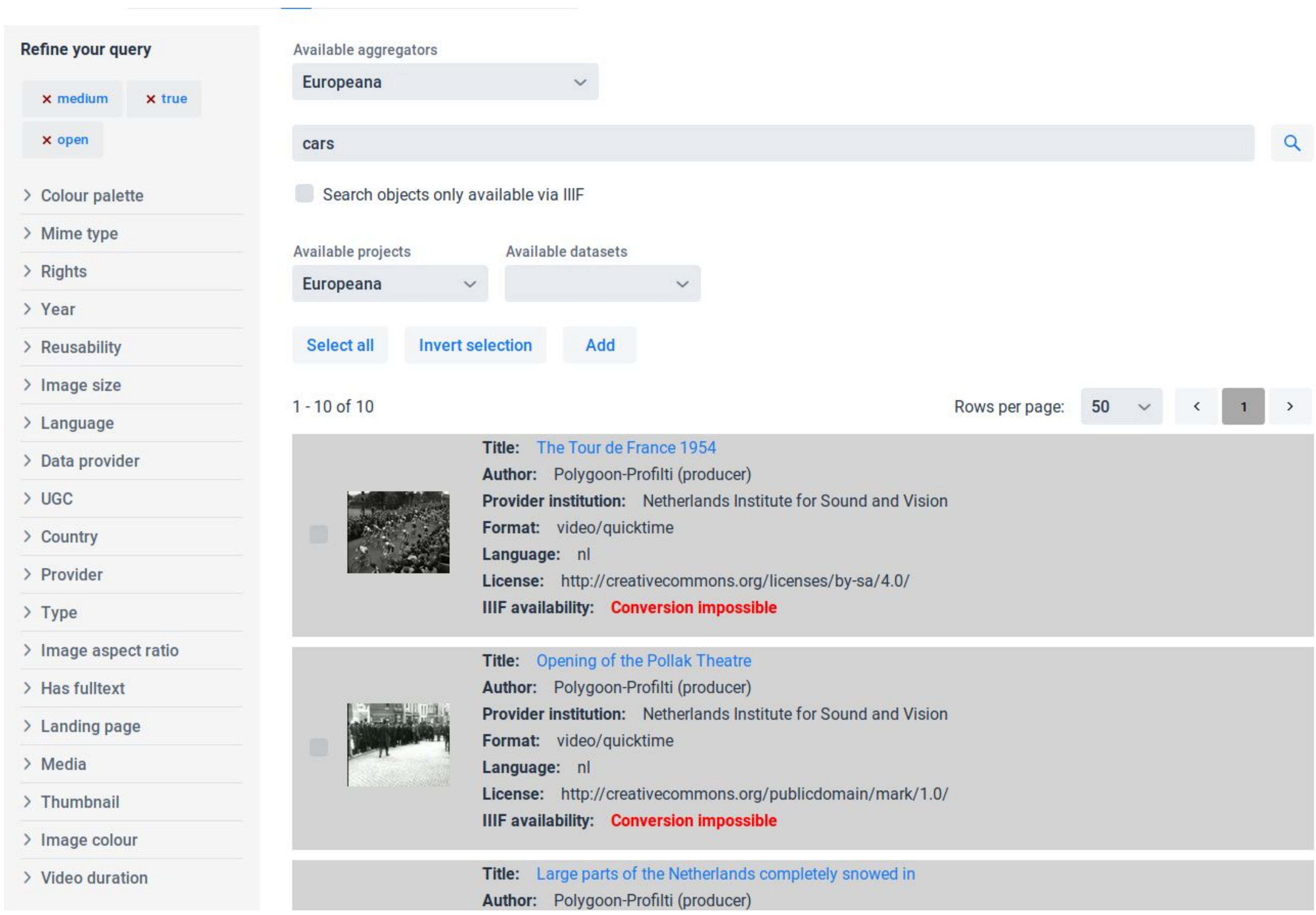
Rows per page: 10

□ **Title:** Cayley Robinson painting.
Author: Frederic Cayley Robinson
Provider institution: Wellcome Collection
Format: image/jpeg
Language: en
License: http://creativecommons.org/licenses/by/4.0/
IIIF availability: Available

□ **Title:** World War One: operating theatre behind the Somme front
Provider institution: Wellcome Collection
Format: image/jpeg
Language: en
License: http://creativecommons.org/licenses/by/4.0/
IIIF availability: Available

Fig 5. Search results

Actual search is performed by using Europeana Search API (https://pro.europeana.eu/resources/apis/search). The results presented to the user are prepared based on the information retrieved through the Search API. Each result contains a thumbnail image (if available) and basic set of metadata including title, author, provider institution, format (mime type of the main file), language and license. Additionally, for objects that cannot be automatically converted into IIIF format, an indication is displayed to the user. In Figure 6, an example of search results is displayed for which the conversion is impossible.



Title: The Tour de France 1954
Author: Polygoon-Profilti (producer)
Provider institution: Netherlands Institute for Sound and Vision
Format: video/quicktime
Language: nl
License: http://creativecommons.org/licenses/by-sa/4.0/
IIIF availability: Conversion impossible

Title: Opening of the Pollak Theatre
Author: Polygoon-Profilti (producer)
Provider institution: Netherlands Institute for Sound and Vision
Format: video/quicktime
Language: nl
License: http://creativecommons.org/publicdomain/mark/1.0/
IIIF availability: Conversion impossible

Title: Large parts of the Netherlands completely snowed in
Author: Polygoon-Profilti (producer)

Fig. 6. Search results with records that cannot be converted to IIIF

When the results list contains more items than the page size (i.e. default value set to 10) the navigation through result pages is available. There is also possibility of filtering the results using refinements shown on the left side of the page. This functionality is implemented using faceted search mechanism of Europeana Search API. The set of facet fields is the one returned by default from the API (see documentation of Search API). Several filters are enabled by default. These are Media (i.e. value set to “true”) and Reusability (i.e. value set to “open”). To switch off the selected filter, one needs to click on the red “x” icon next to the corresponding value.

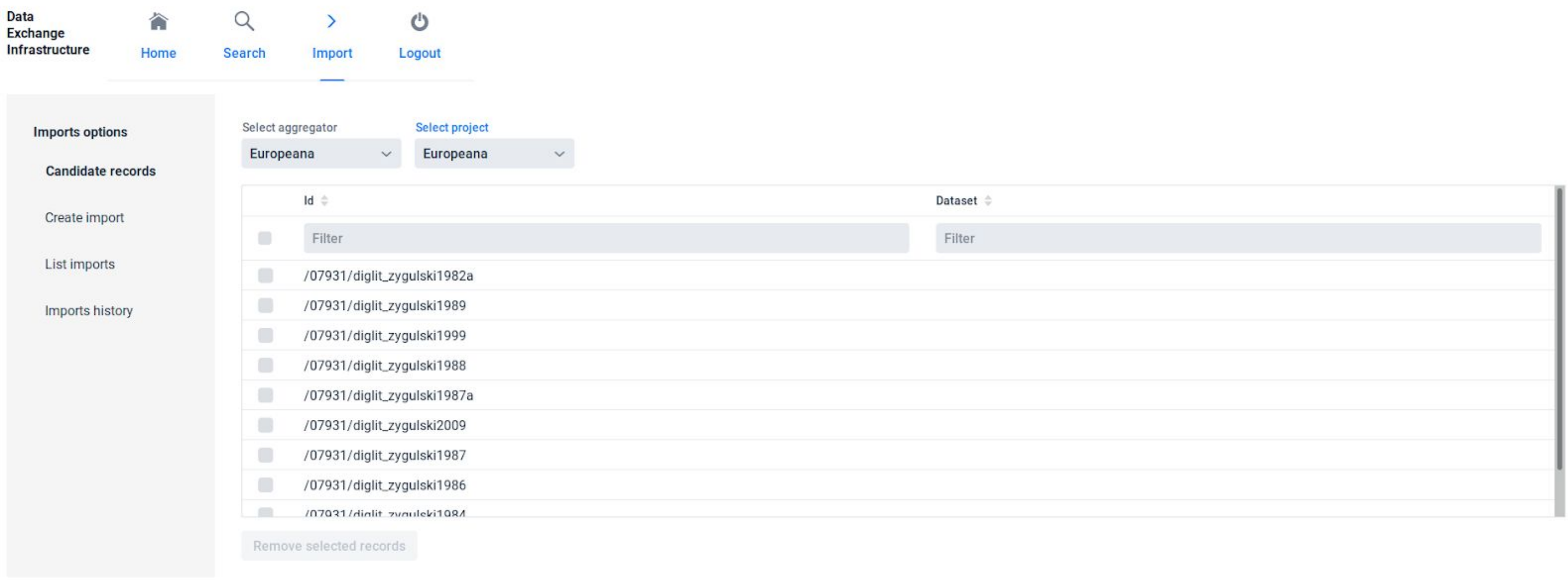
Each search result has a checkbox on its left side used for saving the record for further processing. “Select All” and “Invert selection” buttons are used for selecting all or none of the results displayed on the current page. When the page is changed without adding the selected records, the selection is lost. The *Add* button is used to associate the selected records with currently selected project (and dataset, if any). Those records are stored in the database for later use. They become the candidate records for importing at the later stage described in Import Management Section.

3.3 Import Management

An Import Package is a set of records that are sent to TP in one batch, which is identified by the name provided by the user. Each import package contains records associated to the same project. Imports management is available by clicking “Import” menu item. It is followed by displaying the *Imports* menu on the left containing options for candidate records management, import creation, listing imports and showing the imports history.

3.3.1 Candidate records

From the search page there is no possibility to remove the records that were previously added to the candidate list. This functionality is available on Import pages only. When the user selects Import menu item a view for management of candidate records is shown (see Figure 7). As the records are associated with a project - the project has to be selected before displaying the list of included records. This list has a tabular representation with two columns: Id (i.e. the record identifier) and Dataset. Both columns allow filtering candidate records. After selecting records on the list it’s possible to remove them using the *Remove selected records* button (see Figure 7).



Select aggregator: Europeana

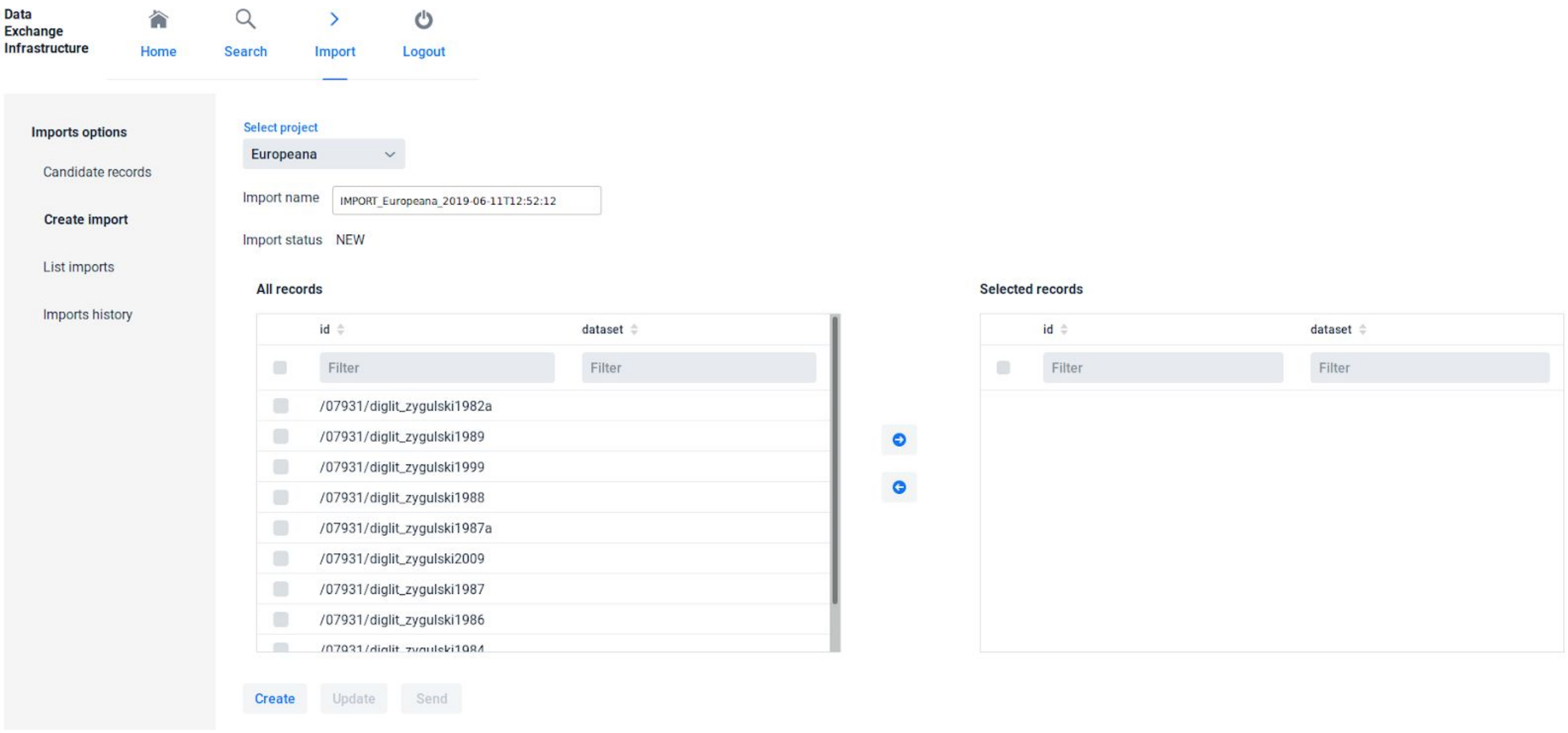
Select project: Europeana

	Id	Dataset
□	Filter	Filter
□	/07931/diglit_zygulski1982a	
□	/07931/diglit_zygulski1989	
□	/07931/diglit_zygulski1999	
□	/07931/diglit_zygulski1988	
□	/07931/diglit_zygulski1987a	
□	/07931/diglit_zygulski2009	
□	/07931/diglit_zygulski1987	
□	/07931/diglit_zygulski1986	
□	/07931/diglit_zygulski1984	

Fig. 7. Candidate records management

3.3.2 Create import package

In order to send the selected records to TP they have to be gathered in a single import package. Creating a new import package is available via Create Import menu (see Figure 8).



Select project: Europeana

Import name: IMPORT_Europeana_2019-06-11T12:52:12

Import status: NEW

All records

	id	dataset
□	Filter	Filter
□	/07931/diglit_zygulski1982a	
□	/07931/diglit_zygulski1989	
□	/07931/diglit_zygulski1999	
□	/07931/diglit_zygulski1988	
□	/07931/diglit_zygulski1987a	
□	/07931/diglit_zygulski2009	
□	/07931/diglit_zygulski1987	
□	/07931/diglit_zygulski1986	
□	/07931/diglit_zygulski1984	

Selected records

	id	dataset
□	Filter	Filter

Fig. 8. Create import package page

To start the creation of an import package the project has to be selected first. This will allow selecting records associated with it and adding them to the import package. Additionally, the selection of a project triggers automatic generation of the import name. The following pattern is used:

IMPORT_{project-name}_{current-date}

where:

{project-name} is the name of the selected project

{current-date} is the current date in UTC format.

Example of the automatically generated import name is like this: *IMPORT_Europeana_2019-05-31T12:01:11*. Import name may be edited as long as the import package has not been stored in DB. After creation this property is read only.

Below the name there is the import package status indicator. Possible import states are the following:

NEW - the import package is under construction but before storing in DB

CREATED - the import package was created and stored in DB

IN_PROGRESS - sending the import package to TP is in progress

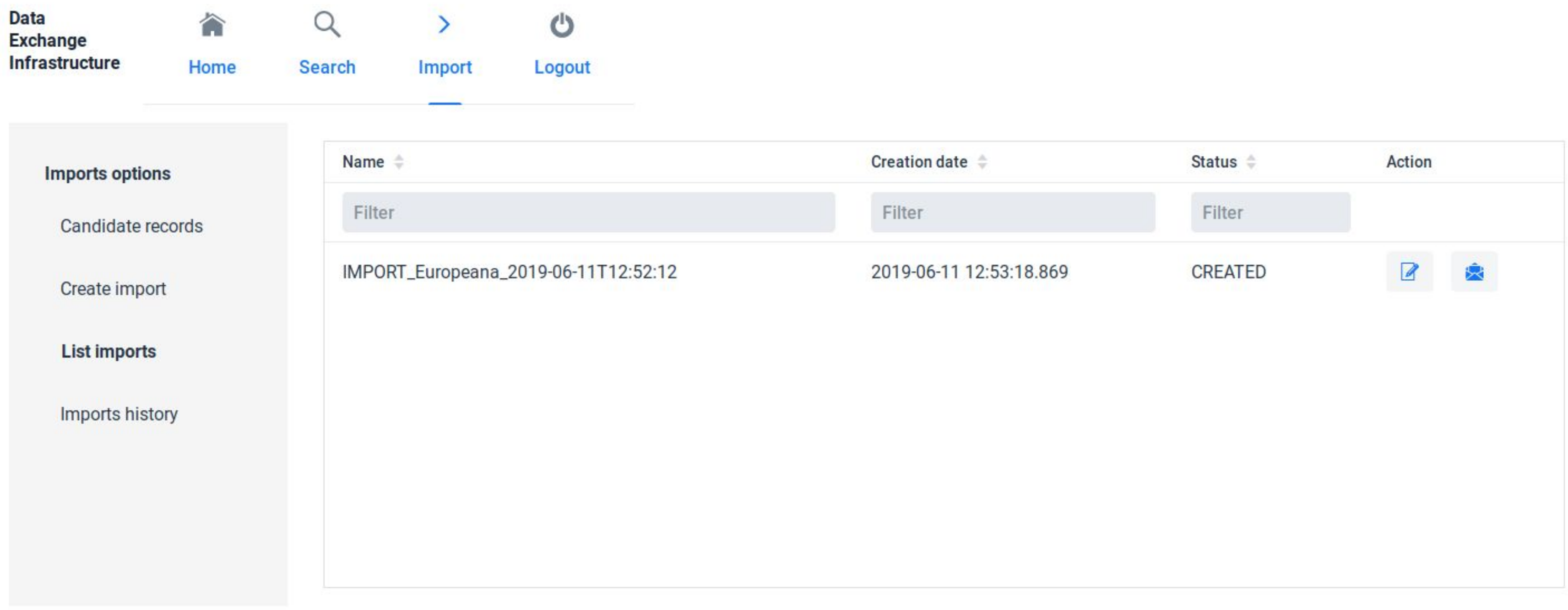
FAILED - sending the import package failed

SENT - the import package was sent successfully to TP

Import packages can be modified as long as they are in CREATED or FAILED state. Modification is related to a set of records associated with this import package. When the user clicks on the “Send” button the process of sending is initiated. The state changes to IN_PROGRESS and records are sent to TP. If all the records were successfully sent to TP the state changes to SENT, otherwise it changes to FAILED. For a failed import package it is possible to retrieve the cause of the failure. It is available in “Imports history” menu option.

3.3.3 List import packages

At any time it is possible to list all the import packages in any state. It’s achievable from “List imports” menu item. The list contains columns for import name, creation date and status. All of them allow filtering. There is also one more column “Action” with a set of buttons that allow to either open the view for editing the selected import package or initiate sending it to TP.

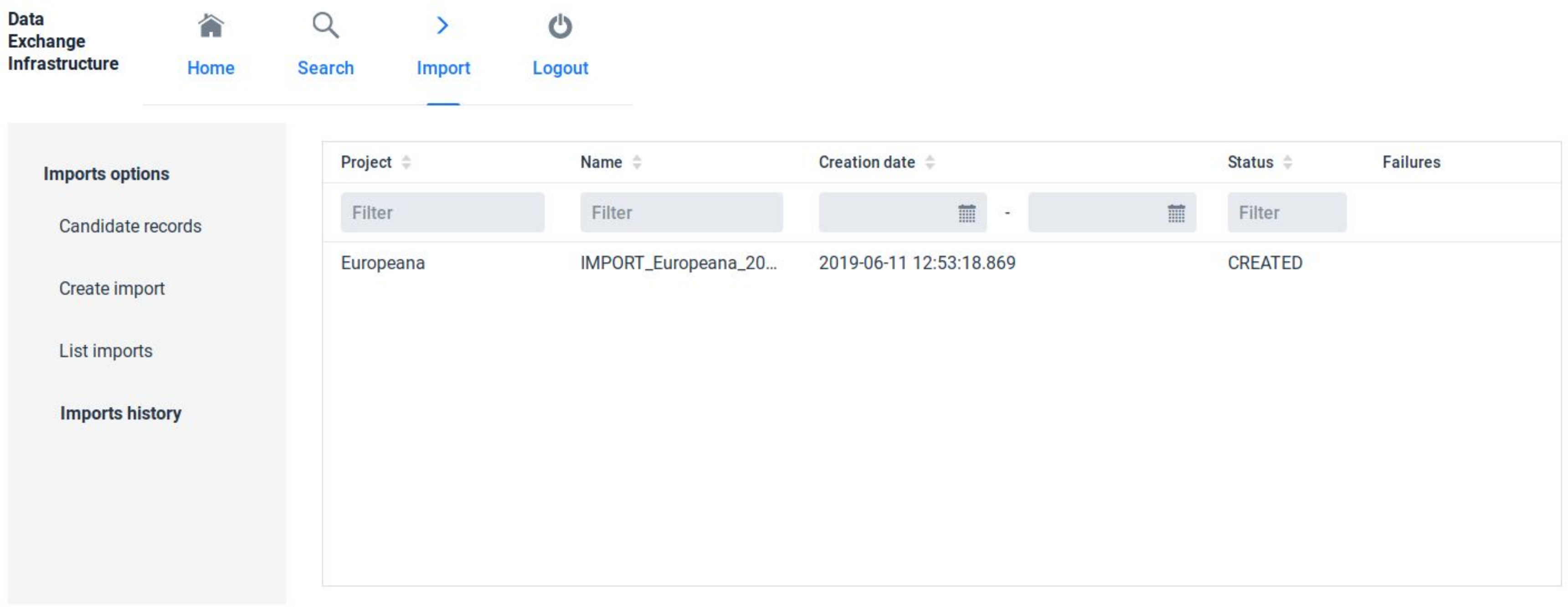


Name	Creation date	Status	Action
Filter	Filter	Filter	
IMPORT_Europeana_2019-06-11T12:52:12	2019-06-11 12:53:18.869	CREATED	

Fig. 9. List imports page

3.3.4 Import packages history

This functionality is mainly used for following the history of import tasks. By default the list shows import packages in any state, but there is a filter to narrow the list contents. This is especially useful for checking the failures that occurred during sending import packages to TP. Other columns available in this list are “project”, “import name”, “creation date” and “failures”. Import packages in the list can be filtered by any column except “failures”. In case of creation date filtering allows specifying time range.



Project	Name	Creation date		Status	Failures
Filter	Filter		-	Filter	
Europeana	IMPORT_Europeana_20...	2019-06-11 12:53:18.869		CREATED	

Fig. 10. Imports history page

3.4 Sending records to TP

When the user tries to send the import to TP, all the records associated with it are sent to TP. This process differs between records that are originally available in IIIF compliant format and those that are not. First phase of sending record process is similar for both cases. DEI application contacts Europeana via Europeana Record API (https://pro.europeana.eu/resources/apis/record) and retrieves the record metadata in JSON-LD format. An example of the record metadata sent to TP is shown in Listing 1.

```
{
   "@context":{
        "ore":"http://www.openarchives.org/ore/terms/",
        "skos":"http://www.w3.org/2004/02/skos/core#",
        "dc":"http://purl.org/dc/elements/1.1/",
        "edm":"http://www.europeana.eu/schemas/edm/",
        "rdf":"http://www.w3.org/1999/02/22-rdf-syntax-ns#",
        "dcterms":"http://purl.org/dc/terms/",
        "foaf":"http://xmlns.com/foaf/0.1/",
        "geo":"http://www.w3.org/2003/01/geo/wgs84_pos#"
   },
   "@graph":[
        {
        "@id":"http://data.europeana.eu/agent/base/36771",
        "@type":"edm:Agent",
        "http://rdvocab.info/ElementsGr2/biographicalInformation":[
               {
               "@language":"fr",
               "@value":"Frederic Cayley Robinson est un peintre anglais né à Brentford à l'ouest de Londres et mort à Londres en
1927.Après avoir étudié à la Saint John's Wood School of Art puis aux Royal Academy Schools, il poursuit sa formation de 1891 à
1894 à l'Académie Julian à Paris dans les ateliers de William Bouguereau et de Gabriel Ferrier. C'est là que naît son admiration
pour Pierre Puvis de Chavannes, Gauguin et l'art japonais. Puvis de Chavannes aura une influence très grande sur son œuvre et
jusqu'à la fin de sa vie.Il part en Italie à Florence étudier Giotto, Mantegna et Michel-Ange et découvre le travail à la
détrempe. Il séjourne à nouveau à Paris de 1902 à 1906. À partir de 1901, sa technique marie sur un enduit, le fusain, l'huile,
l'aquarelle, la gouache, le pastel etc...Il illustre des livres et conçoit des décors et costumes. On lui commande des fresques
pour la Dublin Art Gallery et le Middlesex Hospital qui constituent les œuvres décoratives les plus abouties de l'art
britannique.Ses tableaux possèdent de riches résonances symbolistes, mais leur signification est généralement implicite réservée
et crée une aura de mystère et d'ambigüité.Portail de la peinture Portail de la peinture"
               },
               {
               "@language":"nl",
               "@value":"Frederick Cayley Robinson (Brentford, 18 augustus 1862 - Londen, 4 januari 1927) was een Engels
kunstschilder en illustrator. Hij wordt wel gerekend tot het symbolisme."
               },
               {
               "@language":"en",
               "@value":"Frederick Cayley Robinson (18 August 1862 - 4 January 1927) was an English painter, decorator and
```

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```
illustrator. He is perhaps best known for his series of paintings for the Middlesex Hospital entitled Acts of Mercy commissioned
around 1915 and completed in 1920."
                }
        ],
        "http://rdvocab.info/ElementsGr2/dateOfBirth":"1862-08-18",
        "http://rdvocab.info/ElementsGr2/dateOfDeath":"1927-01-04",
        "edm:end":"1927-01-04",
        "http://www.w3.org/2002/07/owl#sameAs":[
                {
                "@id":"http://nl.dbpedia.org/resource/Frederick_Cayley_Robinson"
                },
                {
                "@id":"http://yago-knowledge.org/resource/Frederick_Cayley_Robinson"
                },
                {
                "@id":"http://fr.dbpedia.org/resource/Frederic_Cayley_Robinson"
                },
                {
                "@id":"http://rdf.freebase.com/ns/m.0cmb79t"
                },
                {
                "@id":"http://wikidata.dbpedia.org/resource/Q3087071"
                },
                {
                "@id":"http://dbpedia.org/resource/Frederick_Cayley_Robinson"
                },
                {
                "@id":"http://www.wikidata.org/entity/Q3087071"
                }
        ],
        "skos:altLabel":{
                "@language":"en",
                "@value":"Robinson, Frederick Cayley"
        },
        "skos:prefLabel":[
                {
                "@language":"fr",
                "@value":"Frederic Cayley Robinson"
                },
                {
                "@language":"nl",
                "@value":"Frederick Cayley Robinson"
                },
                {
                "@language":"en",
                "@value":"Frederick Cayley Robinson"
                }
        ]
        },
        {
        "@id":"http://data.europeana.eu/aggregation/europeana/9200579/ufdtkatv",
        "@type":"edm:EuropeanaAggregation",
        "dcterms:created":"2019-06-09T12:30:33.290Z",
        "dcterms:modified":"2019-06-09T12:30:33.290Z",
        "edm:aggregatedCHO":{
                "@id":"http://data.europeana.eu/item/9200579/ufdtkatv"
        },
        "edm:completeness":"10",
        "edm:country":"United Kingdom",
        "edm:datasetName":"9200579_Ag_UK_WellcomeCollection_IIIF",
        "edm:landingPage":{
                "@id":"https://www.europeana.eu/portal/record/9200579/ufdtkatv.html"
        },
        "edm:language":"en",
        "edm:preview":{
                "@id":"https://iiif.wellcomecollection.org/image/L0051539.jpg/full/500,/0/default.jpg"
        }
        },
        {
        "@id":"http://data.europeana.eu/aggregation/provider/9200579/ufdtkatv",
        "@type":"ore:Aggregation",
        "edm:aggregatedCHO":{
                "@id":"http://data.europeana.eu/item/9200579/ufdtkatv"
        },
        "edm:dataProvider":"Wellcome Collection",
        "edm:isShownAt":{
                "@id":"https://wellcomecollection.org/works/ufdtkatv"
        },
        "edm:isShownBy":{
                "@id":"https://iiif.wellcomecollection.org/image/L0051539.jpg/full/512,/0/default.jpg"
        },
        "edm:object":{
                "@id":"https://iiif.wellcomecollection.org/image/L0051539.jpg/full/500,/0/default.jpg"
        },
        "edm:provider":"Wellcome Collection",
        "edm:rights":{
                "@id":"http://creativecommons.org/licenses/by/4.0/"
        }
        },
        {
        "@id":"http://data.europeana.eu/item/9200579/ufdtkatv",
        "@type":"edm:ProvidedCHO"
        },
        {
        "@id":"http://data.europeana.eu/proxy/europeana/9200579/ufdtkatv",
        "@type":"ore:Proxy",
        "edm:europeanaProxy":"true",
        "edm:type":"IMAGE",
        "ore:proxyFor":{
                "@id":"http://data.europeana.eu/item/9200579/ufdtkatv"
        },
        "ore:proxyIn":{
                "@id":"http://data.europeana.eu/aggregation/europeana/9200579/ufdtkatv"
        }
        },
        {
        "@id":"http://data.europeana.eu/proxy/provider/9200579/ufdtkatv",
        "@type":"ore:Proxy",
        "dc:creator":"Frederic Cayley Robinson",
        "dc:description":[
                {
                "@language":"en",
                "@value":"Lettering: Cayley Robinson, 1920."
                },
                {
                "@language":"en",
                "@value":"The painting shows men attending the hospital. They include soldiers who had returned from World War I
and were prevented from working by war wounds or psychological trauma. On the left it is morning and a nurse tolls the time of
day (as in religious houses) while on the right evening falls on a terrace of Fitzrovia townhouses. The equestrian statue
represents the service of the hospital to the state"
                }
        ],
        "dc:identifier":[
                "Iconographic Collection 672829i",
                "L0051539",
                "ufdtkatv",
                "b1672829"
        ],
        "dc:rights":"Credit: Wellcome Collection",
        "dc:source":"L0051539",
        "dc:title":"Cayley Robinson painting.",
        "dc:type":{
                "@language":"en",
                "@value":"Oil paintings"
        },
        "edm:europeanaProxy":"false",
        "edm:type":"IMAGE",
        "ore:proxyFor":{
                "@id":"http://data.europeana.eu/item/9200579/ufdtkatv"
        },
        "ore:proxyIn":{
                "@id":"http://data.europeana.eu/aggregation/provider/9200579/ufdtkatv"
        }
        },
        {
        "@id":"https://iiif.wellcomecollection.org/image/L0051539.jpg",
        "@type":"http://rdfs.org/sioc/services#Service",
        "dcterms:conformsTo":{
                "@id":"http://iiif.io/api/image"
        },
        "http://usefulinc.com/ns/doap#implements":{
                "@id":"http://iiif.io/api/image/2/level1.json"
        }
        },
        {
        "@id":"https://iiif.wellcomecollection.org/image/L0051539.jpg/full/500,/0/default.jpg",
        "@type":"edm:WebResource",
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#fileByteSize":{
                "@type":"http://www.w3.org/2001/XMLSchema#long",
                "@value":"53493"
        },
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#hasMimeType":"image/jpeg",
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#height":374,
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#orientation":"landscape",
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#width":500,
        "edm:componentColor":[
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#808080"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#BDB76B"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#2F4F4F"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#BC8F8F"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#696969"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#A0522D"
                }
        ],
        "edm:hasColorSpace":"sRGB"
        },
        {
        "@id":"https://iiif.wellcomecollection.org/image/L0051539.jpg/full/512,/0/default.jpg",
        "@type":"edm:WebResource",
        "http://rdfs.org/sioc/services#has_service":{
                "@id":"https://iiif.wellcomecollection.org/image/L0051539.jpg"
        },
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#fileByteSize":{
                "@type":"http://www.w3.org/2001/XMLSchema#long",
                "@value":"55476"
        },
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#hasMimeType":"image/jpeg",
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#height":383,
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#orientation":"landscape",
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#width":512,
        "edm:componentColor":[
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#2F4F4F"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#808080"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#BC8F8F"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#A0522D"
                },
                {
```

```
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#696969"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#BDB76B"
                }
        ],
        "edm:hasColorSpace":"sRGB"
        },
        {
        "@id":"https://wellcomecollection.org/works/ufdtkatv",
        "@type":"edm:WebResource"
        }
    ]
}
```

Listing 1. Example of the record in JSON-LD format

If the media files associated with the record are available via IIIF, it is immediately sent to TP. Otherwise, an attempt is made to convert the media files into a format that can be served via IIIF protocol. The media resources are first downloaded and stored on the local file system. They are converted to pyramidal TIFF using and external tool (vips) and sent to the storage system used in the DEI infrastructure by the IIIF server. For the whole record the manifest file is created and made available for use with any IIIF compatible viewer. The URL-s of the new generated resources are inserted in the WebResource sections of data records. Additionally, the URL of the manifest file is attached to record metadata. Example of such enhanced record together with the generated manifest file are shown in Listing 2 and Listing 3. Elements added to the record's metadata are indicated with red color.

```
{
    "@context":{
        "ore":"http://www.openarchives.org/ore/terms/",
        "skos":"http://www.w3.org/2004/02/skos/core#",
        "dc":"http://purl.org/dc/elements/1.1/",
        "edm":"http://www.europeana.eu/schemas/edm/",
        "rdf":"http://www.w3.org/1999/02/22-rdf-syntax-ns#",
        "dcterms":"http://purl.org/dc/terms/",
        "foaf":"http://xmlns.com/foaf/0.1/",
        "geo":"http://www.w3.org/2003/01/geo/wgs84_pos#"
    },
    "@graph":[
        {
        "@id":"http://data.europeana.eu/aggregation/europeana/2048128/402220",
        "@type":"edm:EuropeanaAggregation",
        "dcterms:created":"2019-03-15T19:44:11.237Z",
        "dcterms:modified":"2019-03-15T19:44:11.237Z",
        "edm:aggregatedCHO":{
                "@id":"http://data.europeana.eu/item/2048128/402220"
        },
        "edm:completeness":"10",
        "edm:country":"Hungary",
        "edm:datasetName":"2048128_Ag_HU_MaNDA_OAI",
        "edm:landingPage":{
                "@id":"https://www.europeana.eu/portal/record/2048128/402220.html"
        },
        "edm:language":"hu",
        "edm:preview":{
                "@id":"https://mandadb.hu/mandadb/webimage/4/3/5/8/3/5/wimage/lead_402220.jpg"
        }
        },
        {
        "@id":"http://data.europeana.eu/aggregation/provider/2048128/402220",
        "@type":"ore:Aggregation",
        "edm:aggregatedCHO":{
                "@id":"http://data.europeana.eu/item/2048128/402220"
        },
        "edm:dataProvider":"Csorba Győző Könyvtár - Pécs",
        "edm:hasView":[
                {

"@id":"https://mandadb.hu/common/file-servlet/document/646351/default/doc_url/csgyk_fototar_pecs_szechenyi_ter_1_2010.jpg",

"manifestFileId":"62.3.168.209/fcgi-bin/iipsrv.fcgi?IIIF=projectId/datasetId/2048128/402220/csgyk_fototar_pecs_szechenyi_ter_1_2
```

```
010.tif/full/full/0/default.jpg"
                },
                {
                "@id":"https://mandadb.hu/common/file-servlet/document/646350/default/doc_url/csgyk_fototar_pecs_dzsami_2011.jpg",

"manifestFileId":"62.3.168.209/fcgi-bin/iipsrv.fcgi?IIIF=projectId/datasetId/2048128/402220/csgyk_fototar_pecs_dzsami_2011.tif/full/full/0/default.jpg"
                }
        ],
        "edm:isShownAt":{
                "@id":"https://mandadb.hu/tetel/402220/Szechenyi_ter__kepeslapok"
        },
        "edm:isShownBy":{

"@id":"https://mandadb.hu/common/file-servlet/document/646352/default/doc_url/csgyk_fototar_pecs_szechenyi_ter_2_2010.jpg",

"manifestFileId":"62.3.168.209/fcgi-bin/iipsrv.fcgi?IIIF=projectId/datasetId/2048128/402220/csgyk_fototar_pecs_szechenyi_ter_2_2010.tif/full/full/0/default.jpg"
        },
        "edm:object":{
                "@id":"https://mandadb.hu/mandadb/webimage/4/3/5/8/3/5/wimage/lead_402220.jpg"
        },
        "edm:provider":"Forum Hungaricum Non-profit Ltd.",
        "edm:rights":{
                "@id":"http://creativecommons.org/licenses/by-nc/4.0/"
        }
        },
        {
        "@id":"http://data.europeana.eu/item/2048128/402220",
        "@type":"edm:ProvidedCHO"
        },
        {
        "@id":"http://data.europeana.eu/proxy/europeana/2048128/402220",
        "@type":"ore:Proxy",
        "dc:identifier":"402220",
        "edm:europeanaProxy":"true",
        "edm:type":"IMAGE",
        "edm:year":[
                "2011",
                "2010"
        ],
        "ore:proxyFor":{
                "@id":"http://data.europeana.eu/item/2048128/402220"
        },
        "ore:proxyIn":{
                "@id":"http://data.europeana.eu/aggregation/europeana/2048128/402220"
        }
        },
        {
        "@id":"http://data.europeana.eu/proxy/provider/2048128/402220",
        "@type":"ore:Proxy",
        "dc:description":[
                {
                "@language":"en",
                "@value":"The Local History Collection of Csorba Győző Library has been collecting photos and postcards related to
Baranya County since January 1966. \nAccording to the data updated on 1st February 2016, the collection consists of 11,565
copies. \nAs the result of the digitisation project that started in 2012, the Collection includes about 59,000 black-and-white
and coloured records of different sizes and types, which are searchable through the electronic catalogue."
                },
                {
                "@language":"hu",
                "@value":"A Csorba Győző Könyvtár Helyismereti Gyűjtemény 1966 januárja óta gyűjti a Baranya megyére vonatkozó
fotókat és képeslapokat. A 2016. február 1-i adatok szerint az állomány 11565 példányból áll. A 2012-ben elkezdődött
digitalizálás eredményeként mintegy 59000 különféle méretű, típusú, fekete-fehér és színes felvétel található a Gyűjtemény
digitális fotótárában, amely az elektronikus katalóguson keresztül kereshető."
                },
                {
                "@language":"hu",
                "@value":"Képeslapok a Széchenyi térről 2010-2011-ből. A 2010-es képeslapokon az \"Európa kulturális fővárosa\"
felirat olvasható."
                },
                {
                "@language":"en",
                "@value":"Postcards of Széchenyi Square from 2010-2011. In the postcards of 2010 the 'European Capital of Culture'
label is visible."
```

```
                }
        ],
        "dc:format":[
                "színes",
                "jpeg"
        ],
        "dc:language":"hun",
        "dc:publisher":"Ismeretlen",
        "dc:rights":[
                "CC BY-NC",
                "Ingyenes hozzáférés",
                "Csorba Győző Könyvtár - Pécs"
        ],
        "dc:source":[
                "Dél-dunántúli Regionális Könyvtár és Tudásközpont, Csorba Győző Könyvtár - Pécs",
                "Helyismereti Osztály, Baranyai MédiaTár",
                "Magyarország, Pécs"
        ],
        "dc:subject":[
                "képeslap",
                "Belvárosi templom",
                "Gázi Kászim pasa dzsámija",
                "utcák, terek",
                "Szentháromság szobor"
        ],
        "dc:title":"Széchenyi tér - képeslapok",
        "dc:type":"kép",
        "dcterms:extent":"14 cm x 9 cm",
        "dcterms:medium":"papír",
        "dcterms:spatial":[
                "Pécs, Széchenyi tér",
                "Magyarország, Baranya megye"
        ],
        "dcterms:temporal":[
                "2010",
                "2011"
        ],
        "edm:europeanaProxy":"false",
        "edm:type":"IMAGE",
        "ore:proxyFor":{
                "@id":"http://data.europeana.eu/item/2048128/402220"
        },
        "ore:proxyIn":{
                "@id":"http://data.europeana.eu/aggregation/provider/2048128/402220"
        }
        },
        {
        "@id":"http://semium.org/time/2010",
        "@type":"edm:TimeSpan",
        "dcterms:isPartOf":{
                "@id":"http://semium.org/time/20xx_1_third"
        },
        "edm:begin":"Fri Jan 01 01:00:00 CET 2010",
        "edm:end":"Fri Dec 31 01:00:00 CET 2010",
        "skos:prefLabel":"2010"
        },
        {
        "@id":"http://semium.org/time/2011",
        "@type":"edm:TimeSpan",
        "dcterms:isPartOf":{
                "@id":"http://semium.org/time/20xx_1_third"
        },
        "edm:begin":"Sat Jan 01 01:00:00 CET 2011",
        "edm:end":"Sat Dec 31 01:00:00 CET 2011",
        "skos:prefLabel":"2011"
        },
        {
        "@id":"http://semium.org/time/20xx",
        "@type":"edm:TimeSpan",
        "dcterms:isPartOf":{
                "@id":"http://semium.org/time/AD2xxx"
        },
        "edm:begin":"Mon Jan 01 01:00:00 CET 2001",
        "edm:end":"Fri Dec 31 01:00:00 CET 2100",
        "skos:prefLabel":[
                {
                "@language":"en",
                "@value":"21st"
                },
                {
                "@language":"fr",
                "@value":"21er siècle"
                },
                "21e",
                {
                "@language":"nl",
                "@value":"21ste eeuw"
                },
                "21..",
                {
                "@language":"en",
                "@value":"21-st"
                },
                {
                "@language":"ru",
                "@value":"21й век"
                },
                "21??",
                {
                "@language":"en",
                "@value":"21st century"
                }
        ]
        },
        {
        "@id":"http://semium.org/time/20xx_1_third",
        "@type":"edm:TimeSpan",
        "dcterms:isPartOf":{
                "@id":"http://semium.org/time/20xx"
        },
        "edm:begin":"Mon Jan 01 01:00:00 CET 2001",
        "edm:end":"Sat Dec 31 01:00:00 CET 2033",
        "skos:prefLabel":[
                {
                "@language":"en",
                "@value":"Early 21st century"
                },
                {
                "@language":"ru",
                "@value":"Начало 21-го века"
                }
        ]
        },
        {
        "@id":"http://semium.org/time/AD2xxx",
        "@type":"edm:TimeSpan",
        "dcterms:isPartOf":{
                "@id":"http://semium.org/time/ChronologicalPeriod"
        },
        "skos:prefLabel":[
                {
                "@language":"fr",
                "@value":"2e millénaire après J.-C."
                },
                {
                "@language":"en",
                "@value":"Second millenium AD, years 1001-2000"
                },
                {
                "@language":"en",
                "@value":"Second millenium AD"
                }
        ]
        },
        {
        "@id":"http://semium.org/time/ChronologicalPeriod",
        "@type":"edm:TimeSpan",
        "dcterms:isPartOf":{
                "@id":"http://semium.org/time/Time"
        },
        "skos:prefLabel":{
                "@language":"en",
                "@value":"Chronological period"
        }
        },
        {
        "@id":"http://semium.org/time/Time",
        "@type":"edm:TimeSpan",
        "skos:prefLabel":{
                "@language":"en",
                "@value":"Time"
        }
        },
        {
        "@id":"https://mandadb.hu/common/file-servlet/document/646350/default/doc_url/csgyk_fototar_pecs_dzsami_2011.jpg",
        "@type":"edm:WebResource",
        "dc:description":[
                {
                "@language":"en",
                "@value":"Postcards of Széchenyi Square from 2010-2011. In the postcards of 2010 the 'European Capital of Culture'
label is visible."
                },
                {
                "@language":"hu",
                "@value":"Képeslapok a Széchenyi térről 2010-2011-ből. A 2010-es képeslapokon az \"Európa kulturális fővárosa\"
felirat olvasható."
                },
                {
                "@language":"en",
                "@value":"The Local History Collection of Csorba Győző Library has been collecting photos and postcards related to
Baranya County since January 1966. \nAccording to the data updated on 1st February 2016, the collection consists of 11,565
copies. \nAs the result of the digitisation project that started in 2012, the Collection includes about 59,000 black-and-white
and coloured records of different sizes and types, which are searchable through the electronic catalogue."
                },
                {
                "@language":"hu",
                "@value":"A Csorba Győző Könyvtár Helyismereti Gyűjtemény 1966 januárja óta gyűjti a Baranya megyére vonatkozó
fotókat és képeslapokat. A 2016. február 1-i adatok szerint az állomány 11565 példányból áll. A 2012-ben elkezdődött
digitalizálás eredményeként mintegy 59000 különféle méretű, típusú, fekete-fehér és színes felvétel található a Gyűjtemény
digitális fotótárában, amely az elektronikus katalóguson keresztül kereshető."
                }
        ],
        "dc:format":"jpg",
        "dc:rights":[
                "Ingyenes hozzáférés",
                "Csorba Győző Könyvtár - Pécs",
                "CC BY-NC"
        ],
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#fileByteSize":{
                "@type":"http://www.w3.org/2001/XMLSchema#long",
                "@value":"701164"
        },
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#hasMimeType":"image/jpeg",
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#height":1000,
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#orientation":"landscape",
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#width":1427,
        "edm:componentColor":[
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#B0C4DE"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#808080"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#A9A9A9"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#6495ED"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#2F4F4F"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#696969"
                }
        ],
        "edm:hasColorSpace":"sRGB"
        },
        {

"@id":"https://mandadb.hu/common/file-servlet/document/646351/default/doc_url/csgyk_fototar_pecs_szechenyi_ter_1_2010.jpg",
        "@type":"edm:WebResource",
        "dc:description":[
                {
                "@language":"en",
                "@value":"The Local History Collection of Csorba Győző Library has been collecting photos and postcards related to
Baranya County since January 1966. \nAccording to the data updated on 1st February 2016, the collection consists of 11,565
copies. \nAs the result of the digitisation project that started in 2012, the Collection includes about 59,000 black-and-white
and coloured records of different sizes and types, which are searchable through the electronic catalogue."
                },
                {
                "@language":"hu",
                "@value":"Képeslapok a Széchenyi térről 2010-2011-ből. A 2010-es képeslapokon az \"Európa kulturális fővárosa\"
felirat olvasható."
                },
                {
                "@language":"hu",
                "@value":"A Csorba Győző Könyvtár Helyismereti Gyűjtemény 1966 januárja óta gyűjti a Baranya megyére vonatkozó
fotókat és képeslapokat. A 2016. február 1-i adatok szerint az állomány 11565 példányból áll. A 2012-ben elkezdődött
digitalizálás eredményeként mintegy 59000 különféle méretű, típusú, fekete-fehér és színes felvétel található a Gyűjtemény
digitális fotótárában, amely az elektronikus katalóguson keresztül kereshető."
                },
                {
                "@language":"en",
                "@value":"Postcards of Széchenyi Square from 2010-2011. In the postcards of 2010 the 'European Capital of Culture'
label is visible."
                }
        ],
        "dc:format":"jpg",
        "dc:rights":[
                "Ingyenes hozzáférés",
                "CC BY-NC",
                "Csorba Győző Könyvtár - Pécs"
        ],
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#fileByteSize":{
                "@type":"http://www.w3.org/2001/XMLSchema#long",
                "@value":"862919"
        },
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#hasMimeType":"image/jpeg",
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#height":1000,
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#orientation":"landscape",
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#width":2049,
        "edm:componentColor":[
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#4682B4"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#556B2F"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#6495ED"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#2F4F4F"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#D3D3D3"
                },
                {
```

```
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#000000"
                }
        ],
        "edm:hasColorSpace":"sRGB"
        },
        {

"@id":"https://mandadb.hu/common/file-servlet/document/646352/default/doc_url/csgyk_fototar_pecs_szechenyi_ter_2_2010.jpg",
        "@type":"edm:WebResource",
        "dc:description":[
                {
                "@language":"hu",
                "@value":"A Csorba Győző Könyvtár Helyismereti Gyűjtemény 1966 januárja óta gyűjti a Baranya megyére vonatkozó
fotókat és képeslapokat. A 2016. február 1-i adatok szerint az állomány 11565 példányból áll. A 2012-ben elkezdődött
digitalizálás eredményeként mintegy 59000 különféle méretű, típusú, fekete-fehér és színes felvétel található a Gyűjtemény
digitális fotótárában, amely az elektronikus katalóguson keresztül kereshető."
                },
                {
                "@language":"en",
                "@value":"The Local History Collection of Csorba Győző Library has been collecting photos and postcards related to
Baranya County since January 1966. \nAccording to the data updated on 1st February 2016, the collection consists of 11,565
copies. \nAs the result of the digitisation project that started in 2012, the Collection includes about 59,000 black-and-white
and coloured records of different sizes and types, which are searchable through the electronic catalogue."
                },
                {
                "@language":"hu",
                "@value":"Képeslapok a Széchenyi térről 2010-2011-ből. A 2010-es képeslapokon az \"Európa kulturális fővárosa\"
felirat olvasható."
                },
                {
                "@language":"en",
                "@value":"Postcards of Széchenyi Square from 2010-2011. In the postcards of 2010 the 'European Capital of Culture'
label is visible."
                }
        ],
        "dc:format":"jpg",
        "dc:rights":[
                "Csorba Győző Könyvtár - Pécs",
                "CC BY-NC",
                "Ingyenes hozzáférés"
        ],
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#fileByteSize":{
                "@type":"http://www.w3.org/2001/XMLSchema#long",
                "@value":"524361"
        },
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#hasMimeType":"image/jpeg",
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#height":1468,
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#orientation":"portrait",
        "http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#width":1000,
        "edm:componentColor":[
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#4682B4"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#BC8F8F"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#808080"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#696969"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#4169E1"
                },
                {
                "@type":"http://www.w3.org/2001/XMLSchema#hexBinary",
                "@value":"#FFFAFA"
                }
```

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```
        ],
        "edm:hasColorSpace":"sRGB"
        },
        {
        "@id":"https://mandadb.hu/mandadb/webimage/4/3/5/8/3/5/wimage/lead_402220.jpg",
        "@type":"edm:WebResource"
        },
        {
        "@id":"https://mandadb.hu/tetel/402220/Szechenyi_ter__kepeslapok",
        "@type":"edm:WebResource"
        }
    ],
    "iiif_url":"https://fresenia.man.poznan.pl/dei/api/transcription/iiif/manifest?recordId=2048128/402220"
}
```

Listing 2. Record enhanced with information on image files converted to IIIF compliant format

```
{
   "@context":"http://iiif.io/api/presentation/2/context.json",
   "@id":"https://fresenia.man.poznan.pl/dei/api/transcription/iiif/manifest?recordId=2048128/402220",
   "@type":"sc:manifest",
   "sequences":[
       {
       "@type":"sc:Sequence",
       "canvases":[
              {
              "@id":"62.3.168.209/canvas/projectId/datasetId/2048128/402220/csgyk_fototar_pecs_szechenyi_ter_2_2010.tif",
              "@type":"sc:canvas",
              "label":"projectId/datasetId/2048128/402220/csgyk_fototar_pecs_szechenyi_ter_2_2010.tif",
              "width":"1000",
              "height":"1000",
              "images":[
              {
                     "@type":"oa:Annotation",
                     "motivation":"sc:painting",
                     "on":"62.3.168.209/canvas/projectId/datasetId/2048128/402220/csgyk_fototar_pecs_szechenyi_ter_2_2010.tif",
                     "resource":{

"@id":"62.3.168.209/fcgi-bin/iipsrv.fcgi?IIIF=projectId/datasetId/2048128/402220/csgyk_fototar_pecs_szechenyi_ter_2_2010.tif/ful
l/full/0/default.jpg",
                     "@type":"dctypes:Image"
                     }
              }
              ]
              },
              {
              "@id":"62.3.168.209/canvas/projectId/datasetId/2048128/402220/csgyk_fototar_pecs_szechenyi_ter_1_2010.tif",
              "@type":"sc:canvas",
              "label":"projectId/datasetId/2048128/402220/csgyk_fototar_pecs_szechenyi_ter_1_2010.tif",
              "width":"1000",
              "height":"1000",
              "images":[
              {
                     "@type":"oa:Annotation",
                     "motivation":"sc:painting",
                     "on":"62.3.168.209/canvas/projectId/datasetId/2048128/402220/csgyk_fototar_pecs_szechenyi_ter_1_2010.tif",
                     "resource":{

"@id":"62.3.168.209/fcgi-bin/iipsrv.fcgi?IIIF=projectId/datasetId/2048128/402220/csgyk_fototar_pecs_szechenyi_ter_1_2010.tif/ful
l/full/0/default.jpg",
                     "@type":"dctypes:Image"
                     }
              }
              ]
              },
              {
              "@id":"62.3.168.209/canvas/projectId/datasetId/2048128/402220/csgyk_fototar_pecs_dzsami_2011.tif",
              "@type":"sc:canvas",
              "label":"projectId/datasetId/2048128/402220/csgyk_fototar_pecs_dzsami_2011.tif",
              "width":"1000",
              "height":"1000",
              "images":[
              {
                      "@type":"oa:Annotation",
                      "motivation":"sc:painting",
                      "on":"62.3.168.209/canvas/projectId/datasetId/2048128/402220/csgyk_fototar_pecs_dzsami_2011.tif",
                      "resource":{

"@id":"62.3.168.209/fcgi-bin/iipsrv.fcgi?IIIF=projectId/datasetId/2048128/402220/csgyk_fototar_pecs_dzsami_2011.tif/full/full/0/
default.jpg",
                      "@type":"dctypes:Image"
                      }
               }
               ]
               }
       ]
       }
   ]
}
```

Listing 3. Example of the manifest.json file created for the record converted to IIIF format.

3.5 Sending enrichments to Europeana

The records are sent to TP being ready to be used for transcription and / or enrichment activities. The results of those actions are first saved within the TP and are transferred to Europeana when the transcription is completed and verified. DEI system exposes a REST API for communication between TP and DEI. It allows transferring the results back to DEI and further to Europeana. The whole process is initiated in TP by calling DEI API method notifying that the enrichments are made available for a certain record. When the DEI application receives such requests, it pulls all the enrichments from TP and prepares the proper requests to deliver them to Europeana. On Europeana side Europeana Annotations API is used. After successful submission of an annotation its identifier is sent back to TP. This is done to allow TP sending updates of previously created annotations. API calls used for all the communication between TP and DEI are described in the following Section of this document.

3.6 Data Exchange Infrastructure system API

DEI system is by default supplied with GUI application. However in the background there is a REST API used for different actions both internal and external.

3.6.1 Authorisation

All the requests are authorized with the access token that belongs to the user having “operator” role.

3.6.2 Mandatory request headers

The following parameters always need to be part of the request. These are not defined for specific API calls.

Header	Type	Description
`Authorization`	`String`	Authentication information. It has the following format: `Authorization: Bearer {access_token}`

3.6.3 Header information

DEI API defines a set of request headers that may or must be specified in the HTTP header. The following tables describe the usage of those.

Header	Description
	Request
`Accept`	Contains the mime type of the serialisation format to be used in the response.
`Content-Type`	Contains the mime type of the request body.
	Response
`Content-Type`	The mime type corresponding to the format asked in the request. The charset should be added for json and json-ld responses.

3.6.4 Supported formats

The default and only format for representing responses is JSON-LD.

Format	Extension	Mimetype
`JSON-LD`	`jsonld`	`application/ld+json, application/json`

3.6.5 Error handling

The following table lists the error codes that are supported by the API.

Code	Description
400	The Client sent a request which the DEI API cannot process due to the request not following the appropriate specifications.
401	The Client is not authorized to perform the requested operation as it did not supply correct information.
404	The resource(s) requested does not exist.
405	The requested HTTP method is not allowed for the resource.
406	The requested format for the DEI response representation is not available.
415	The Client sent a request body in an unsupported form.
500	Internal server error, when an unexpected (not listed above - Runtime or Regular) exception occurs.

All error responses should return the following information:

Field	Description
timestamp	The timestamp when the request was processing by the server.
status	The HTTP status of the response.
error	A label indicating the type of error.
message	A message explaining the error and if possible indicating what is needed

3.6.6 API endpoints

3.6.6.1 Search service

The search service from the DEI API executes a search query using Europeana Search API or DDB API. It can be also used to refine the search results.

3.6.6.1.1 Search for records

`GET /api/search`	
Header:	• Accept: application/json • Content-Type: application/json
Parameters:	• query (mandatory): query string used for searching the objects in the aggregator, must have syntax compatible with query parameter used in Europeana Search API • qf (optional): query filter used to narrow and / or refine search results • cursor (optional): Solr cursor used for paging the results • only_iiif (optional): used for searching only for records originally available in IIIF
Processing	
• Check credentials, otherwise respond with HTTP 401. • Check if requested format is supported, otherwise respond with HTTP 406; • Check if given query is properly specified, otherwise respond with HTTP 400. • Send query to Europeana Search API • Return response from Europeana Search API and respond with HTTP 200	
Response	
Success:	A HTTP 200 response is returned containing body with the search results.
Headers:	The following headers are returned in response: `Content-Type: application/ld+json; charset=utf-8`
Errors:	HTTP 400, 401, 404, 406 see section on error handling.

3.6.6.2 Import service

DEI is also equipped with API related to import packages, so that it is possible to manage them.

3.6.6.2.1 Create an Import package

`POST /api/import`	
Header:	• Accept: application/json • Content-Type: application/json
Parameters:	• projectId (mandatory): project identifier • name (optional): import name
Body:	Set of Record objects serialized as Json
Processing	
• Check credentials, otherwise respond with HTTP 401. • Check if requested format is supported, otherwise respond with HTTP 406; • Check if the request is properly specified, otherwise respond with HTTP 400. • Create Import package object and associate all the Record objects with it • Return created Import package object in the response with HTTP 200	
Response	
Success:	An HTTP 200 response is returned containing body with the created Import package
Headers:	The following headers are returned in response: `Content-Type: application/ld+json; charset=utf-8`
Errors:	HTTP 400, 401, 406 see section on error handling.

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3.6.6.2.2 Retrieve set of candidate records

`GET /api/import/candidates`	
Header:	● Accept: application/json ● Content-Type: application/json
Parameters:	● projectId (mandatory): project identifier ● datasetId (optional): dataset identifier
Processing	
● Check credentials, otherwise respond with HTTP 401. ● Check if requested format is supported, otherwise respond with HTTP 406; ● Check if the request is properly specified, otherwise respond with HTTP 400. ● When datasetId is empty query database for Record objects associated with the given project but not assigned to any Import package; otherwise query for Record objects associated with the given project and dataset but not assigned to any Import package ● Return set of Record objects serialized as Json in the response with HTTP 200	
Response	
Success:	An HTTP 200 response is returned containing body with the created Import package
Headers:	The following headers are returned in response: `Content-Type: application/ld+json; charset=utf-8`
Errors:	HTTP 400, 401, 406 see section on error handling.

3.6.6.2.3 Get import package status

`GET /api/import/status`	
Header:	● Accept: application/json ● Content-Type: application/json
Parameters:	● importName (mandatory): name of the import package
Processing	
● Check credentials, otherwise respond with HTTP 401. ● Check if requested format is supported, otherwise respond with HTTP 406; ● Check if the request is properly specified, otherwise respond with HTTP 400. ● Get ImportReport object for the specified import name serialized as Json or return HTTP 404 when import package not found. ● Return ImportReport serialized as Json in the response with HTTP 200	
Response	
Success:	An HTTP 200 response is returned containing body with the ImportReport
Headers:	The following headers are returned in response: `Content-Type: application/ld+json; charset=utf-8`
Errors:	HTTP 400, 401, 404, 406 see section on error handling.

3.6.6.2.4 Send import package to TP

`POST /api/import/send`	
Header:	● Accept: application/json ● Content-Type: application/json
Parameters:	● importName (mandatory): name of the import package
Processing	
● Check credentials, otherwise respond with HTTP 401.	

● Check if requested format is supported, otherwise respond with HTTP 406; ● Check if the request is properly specified, otherwise respond with HTTP 400. ● Get Import package object for the specified import name from the database. Return HTTP 404 when import package not found. Otherwise change the status to IN_PROGRESS and initiate sending records that belong to this import package. Import package state changes to SENT or FAILED after all the records were sent to TP. ● Return HTTP 200	
Response	
Success:	An HTTP 200 response is returned with empty body
Headers:	The following headers are returned in response: `Content-Type: application/ld+json; charset=utf-8`
Errors:	HTTP 400, 401, 404, 406 see section on error handling.

3.6.6.2.5 Update import package

`PUT /api/import`	
Header:	● Accept: application/json ● Content-Type: application/json
Parameters:	● importName (mandatory): name of the import package
Body:	● Set of Record objects serialized as Json
Processing	
● Check credentials, otherwise respond with HTTP 401. ● Check if requested format is supported, otherwise respond with HTTP 406; ● Check if the request is properly specified, otherwise respond with HTTP 400. ● Get Import package object for the specified import name from the database. Return HTTP 404 when import package not found. Otherwise update the associated records according to the Record objects sent in the request body. ● Return HTTP 201	
Response	
Success:	An HTTP 201 response is returned with updated Import package in the body
Headers:	The following headers are returned in response: `Content-Type: application/ld+json; charset=utf-8`
Errors:	HTTP 400, 401, 404, 406 see section on error handling.

3.6.6.3 Transcriptions service

In order to manage transcriptions DEI exposes transcription service API described in this section.

3.6.6.3.1 Indicate the transcription as ready

`POST /api/transcription`	
Header:	● Accept: application/json ● Content-Type: application/json
Parameters:	● recordId (mandatory): record identifier ● name (optional): import name
Processing	
● Check credentials, otherwise respond with HTTP 401. ● Check if requested format is supported, otherwise respond with HTTP 406; ● Check if the request is properly specified (including the record identifier validation), otherwise respond with HTTP 400. ● Find Record in database and change its state to waiting for enrichment. Return HTTP 404 in case the record was not found. ● Return response with HTTP 200	

Response	
Success:	An HTTP 200 response is returned with empty body
Headers:	The following headers are returned in response: `Content-Type: application/ld+json; charset=utf-8`
Errors:	HTTP 400, 401, 404, 406 see section on error handling.

3.6.6.3.2 Update Transcription

`PUT /api/transcription`	
Header:	• Accept: application/json • Content-Type: application/json
Parameters:	• annotationId (mandatory): annotation identifier • recordId (mandatory): record identifier • transcriptionId (mandatory): transcription identifier
Processing	
• Check credentials, otherwise respond with HTTP 401. • Check if requested format is supported, otherwise respond with HTTP 406; • Check if the request is properly specified (including the record identifier validation), otherwise respond with HTTP 400. • Find Record in database and change its state to retrieving transcriptions from TP. Return HTTP 404 in case the record was not found. While processing retrieve transcriptions from TP and send them to Europeana Annotation Service. • Return response with HTTP 200	
Response	
Success:	An HTTP 200 response is returned with empty body
Headers:	The following headers are returned in response: `Content-Type: application/ld+json; charset=utf-8`
Errors:	HTTP 400, 401, 404, 406 see section on error handling.

3.6.6.3.3 Get IIIF manifest

`GET /iiif/manifest`	
Header:	• Accept: application/json • Content-Type: application/json
Parameters:	• recordId (mandatory): records identifier
Processing	
• Check credentials, otherwise respond with HTTP 401. • Check if requested format is supported, otherwise respond with HTTP 406; • Check if the request is properly specified, otherwise respond with HTTP 400. • Get Record from the database, return HTTP 404 if not found. • Return the manifest contents serialized as Json in the response with HTTP 200	
Response	
Success:	An HTTP 200 response is returned containing body with the iiif manifest
Headers:	The following headers are returned in response: `Content-Type: application/ld+json; charset=utf-8`
Errors:	HTTP 400, 401, 404, 406 see section on error handling.

3.7 System architecture

DEI system in production consists of the following components:

- DEI application
- IIIF server
- Keycloak authentication server
- Transcribathon Platform

The architecture of DEI System is presented in Figure 10.

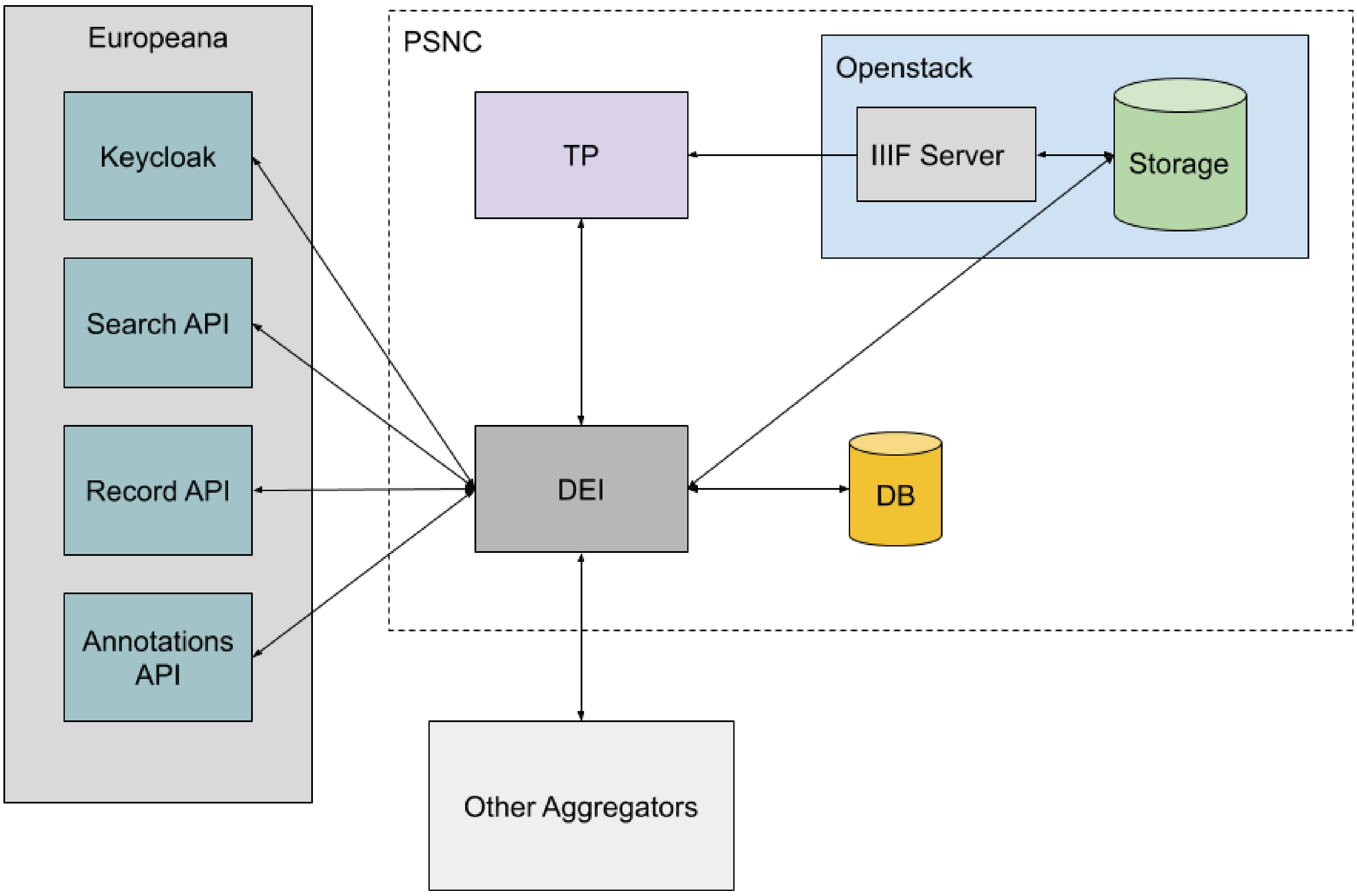

Fig. 10. DEI System architecture

3.7.1 DEI application

DEI application is a Spring Boot application served by Tomcat. It is located at https://fresenia.man.poznan.pl/dei. It uses internal MariaDB database located in PSNC.

3.7.2 IIIF Server

IIIF server located at http://62.3.168.209. It is a virtual machine within Openstack environment. IIIF server implementation working on that machine is IIP Image Server. Image files are stored in the Ceph storage system available in Openstack. In the standard use case

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there is no need to access this server directly in the browser. It will be used by the IIIF viewer developed in WP1 of this project in case of images not being originally available via IIIF and were converted to IIIF compliant format.

3.7.3 Keycloak authentication server

Keycloak authentication server is located at https://keycloak-server-test.eanadev.org. It is Cloud Foundry environment used by Europeana. The realm used for EnrichEuropeana project is called DATAEXCHANGEINFRASTRUCTURE. In order to authenticate a user, only username and password are necessary. The user with certain role has to be added by the Keycloak admin.

3.7.4 Transcribathon Platform

Transcribathon Platform is based on Wordpress. It is located on the same server as DEI application at https://fresenia.man.poznan.pl.

4. Further development

Currently implemented functionality of DEI system covers most of the requirements described in the grant agreement document. The remaining functionalities will be implemented in the subsequent versions. Those include improved support for DDB aggregator, integration with updated Europeana Annotation API as well as improvements based on the test results. One of the most important phases in further development and maintenance will be addressing issues or suggestions that might appear during the first Transcribathon event.

5. Summary

Data Exchange Infrastructure platform has been developed in the framework of EnrichingEuropeana project as an integration component between Transcribathon Platform and aggregators (e.g. Europeana or other national aggregators like DDB). DEI allows users to search, select and convert objects available in aggregators, preparing them for transcription and enrichment with the Transcribathon Platform. It is currently deployed in PSNC using virtual servers and object storage. It is also integrated with external authentication and authorization services (Keycloak).