Shanoir NG – Dataset

Software Design Description

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# Microservice context

## Microservice presentation

This microservice is a part of the Shanoir-NG application and is responsible for datasets, dataset acquisitions and examinations.

## Main functionalities

Shanoir NG main functionalities are:

* Managing datasets
* Managing datasets acquisitions
* Managing examinations

## Application users

Target population is:

* Shanoir administrators
* Shanoir users of any level

# Functional architecture

## Dataset

### Name

Text. Obligatory

### Comment

Text. Optional.

### Creation date

Date. Obligatory (automatically inserted)

### Dataset acquisition id

Reference to dataset acquisition. Obligatory

### Dataset processing id

Reference to dataset processing id

### Processed dataset typ

Obligatory

* ReconstructedDataset
* ….

### Dataset modality type

Obligatory

* Mr Dataset
* Pet Dataset
* …

### Cardinality of related subjects

Obligatory

* Single-Subject Dataset
* …

### Explored entity

Optional

* …

### Dataset Processing

### Study

Reference to Study. Obligatory

### Subject

Reference to Subject. Obligatory

## Dataset – functionalities

### View datasets

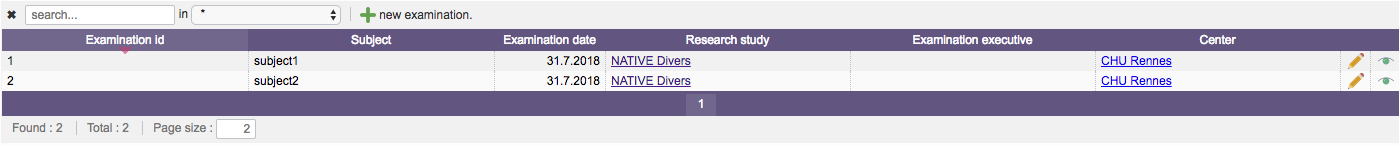
Users attached to studies can see their datasets, except for the users who *Cannot see or download datasets.*

List of datasets shows:

* Id
* Name
* Type
* Subject (in a link to dataset’s details page)
* Is result of (link)
* Creation date
* Comment
* Actions:
  + delete (for users with rights *Can modify the study parameters* or *Is responsible for the research study*)
  + edit (for users who can import)
  + details (for users who can see and download)
  + download (for users who can download)

Today in the Neurinfo database around 200.000 datasets are listed in the MySQL database. As users with the role ADMIN can see all datasets it is impossible to get all datasets within one JSON response, as the response will become to big. As we really want to prepare Shanoir-NG for population imaging the dataset overview table will be the **reference table** for all other overview tables in Shanoir-NG, especially regarding performance and usability.

1. We need to add paging to the backend DatasetsApiController (see example examinations, in datasets ms, ExaminationsApiController: *findExaminations(final* ***Pageable pageable****)* on using Pageable and the ExaminationRepository extends PagingAndSortingRepository)
2. Please see below screenshot, that shows the examinations table today.
3. The paging should be limited to 1.000 elements max. per page (to be tested) to avoid to big JSON responses, that could create problems (Page size: (limit 1.000 max.). Each user should be able to choose his page size as possible today.
4. The paging should work, and display in row 5 the correct number of available pages
5. Rename in the first row: search... to filter...
6. The page size indicates how many elements are called from the backend, when opening the page. With the first row only results already loaded in the displayed table can be filtered. Elements remaining in the database will not be found, therefore we name it "filter".
7. For deeper searches Solr and a search field in the header line will be used in the future, as Solr allows us to search rapidly in millions of datasets.



### View details of one dataset

Users added to study with minimum rights *Can see datasets*.

On the page appear:

* Id
* Details about dataset (see 2.1)
* Actions:
  + View Dicom images
  + View Nifti images
  + Download Nifti images
  + (Re)generate Nifti images
  + Download Dicom images
  + Download xml
* Link to dataset acquisition from this dataset
* Dataset expression

### Edit dataset

Users added to study with rights *Can import datasets.*  
Details from point 2.1 can be edited.

### Delete dataset

For users added to study with rights *Can modify the study parameters* or *Is responsible for the research study.*

Dataset is deleted. If there is an acquisition equipment linked only to this dataset it is deleted automatically as well.

### Download dataset(s)

Zipped DICOM files, Nifti and XML can be downloaded

## Dataset processing

For processed datasets linked to another datasets (dicom or nifti). Is characterized by:

* Comment (Name)
* Processing label
* Processing date
* Input dataset id
* Output dataset id

## Dataset processing – functionalities

### View dataset processings

### Details on dataset processing

### Edit dataset processing

### Delete dataset processing

## Dataset acquisition

### Dataset acquisition type

Obligatory

* Mr
* Pet
* ..

### Software release

Text. Optional

### Rank

Number (int 10). Optional

### Sorting index

Number (int 10). Optional

### Acquisition equipment

Reference to equipment id. Mandatory

### Examination

Reference to examination id. Mandatory

## Dataset acquisition – functionalities

### View dataset acquisitions

List all dataset acquisitions if the user has access to study and rights Can see datasets.

Lists:

* Id
* Description
* Acquisition equipment (link)
* Research study (link)
* Subject (link)
* Examination date (link)
* Rank
* Software release
* Actions:
  + View (if user Can see datasets)
  + Edit (if user Can import dataset)
  + Delete (if user Can modify the study or is responsible for the study)

### View dataset acquisition

For users added to study and with rights Can see datasets.

Shows:

* Details from 2.3
* Details from table mr\_dataset\_acquisition or ct\_dataset\_acquisition
* Examination attached to the dataset acquisition
* Datasets attached to the dataset acquisition

### Edit dataset acquisition

For users added to study with right *Can import dataset* or  *Can modify study parameters* or *Is responsible.*

Possible to edit fields from 2.3

### Delete dataset acquisition

For users added to study with right *Can modify study parameters* or *Is responsible.*

**Deletes the datasets as well.**

## Examination

### Examination date

Date. Obligatory. Default to the DICOM data.

### External examination executive

Boolean. If yes – the investigator is chosen from any center in Shanoir.

Obligatory. Default: No

### Investigator Center (Examination executive center).

If external – id of the center the external investigator is chosen from.

If internal – equal to the center the examination takes place in.

### Investigator (Examination execution).

Reference to the investigator id. If internal – can be chosen only from the center associated to the examination.

### Study

Reference to study id. Obligatory

### Center

Reference to center the examination takes place. Obligatory

### Subject

Reference to subject. Optional

### Group of subject

Reference to group of subject. Optional

### Subject weight

Double. Optional

### Subject weight unit measure

* Kg
* g

### Comment

Text. Optional

### Notes

Text. Optional

## Examinations - functionalities

### View examinations (GET /examination/all)

User can see datasets from the studies he has access to (is added to a study) and rights Can see datasets.

List of examinations includes:

* Examination id
* Subject (is a link to subject)
* Examination date
* Research Study (is a link to study)
* Examination executive (is a link to investigator)
* Center (is a link to center)
* Actions (rights are applicable the same way as for the datasets):
  + Delete
  + Edit
  + Details

### View details of one examination (GET /examination/{id})

User can see details of an examination if he has access to the study.

Shows fields from point 2.3.

### Add new examination (POST /examination)

User can create an examination if he has access to the study and (can import dataset or is responsible for the research study).

User must fill in the necessary fields from point 2.3 (must choose either a subject or a group of subjects).

### Edit examination (PUT /examination/{id})

User can edit an examination if he has access to the study and (can import dataset or is responsible for the research study).

User can change the one or all the fileds from point 2.3 (must choose either a subject or a group of subjects).

### Delete examination (DELETE /examination/{id})

User can delete an examination if he has access to the study and (can import dataset or is responsible for the research study) and no dataset is linked to this examination. If any dataset acquisition is linked but is empty, it is automatically deleted as well.