



# MELANOQ

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Bio Informatics, University of L'Aquila, July 2019.



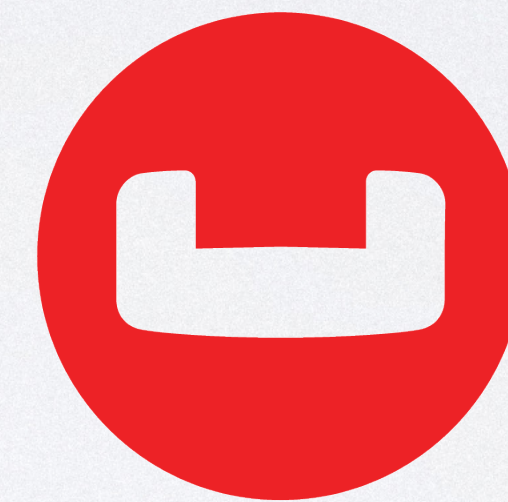
# TECHNOLOGIES

- To offer the best decoupling and deployment flexibility we decided to follow the classic **MVC** web-application architectural pattern by developing a **REST Server** and a **Web Client**, while storing the data on a **NoSQL documental database**.
- The execution flow follows the MVC paradigm: the data stored in the database is presented to the Web Client, from it it is possible to invoke functions on the REST Server that will then modify the aforementioned data, updating the Web Client view.



# DATABASE

- Is a **documental NoSQL database** whose data structure is in **json** format, that is a simple, lightweight notation, compact and human readable.
- Usually a document is a single instance of an object in the application code and can contain nested structures, that allows developers to naturally express many-to-many relationships.
- Offers the possibility **distribute** the storage.
- **NIQL** (pronounced “nickel”) is Couchbase’s query language and aims to meet the query needs of distributed document-oriented databases. It is very similar to SQL.



# Couchbase



# REST SERVER

- **Spring Boot:** makes it easy to create stand-alone, production-grade Spring based Applications that you can "just run".
- **Spring Data JPA for CouchBase:** Spring Data for Couchbase is part of the umbrella Spring Data project which aims to provide a familiar and consistent Spring-based programming model for new datastores while retaining store-specific features and capabilities.
- **Spring Security:** Spring Security is a powerful and highly customizable authentication and access-control framework.
- **Json Web Token-based authentication:** is an open standard (RFC 7519) that defines a compact and self-contained way for securely transmitting information between parties as a JSON object.





# WEB CLIENT

- **VueJS:** it is a progressive framework for building user interfaces. Unlike other monolithic frameworks, Vue is designed from the ground up to be incrementally adoptable. The core library is focused on the view layer only, and is easy to pick up and integrate with other libraries or existing projects. On the other hand, Vue is also perfectly capable of powering sophisticated Single-Page Applications when used in combination with modern tooling and supporting libraries.



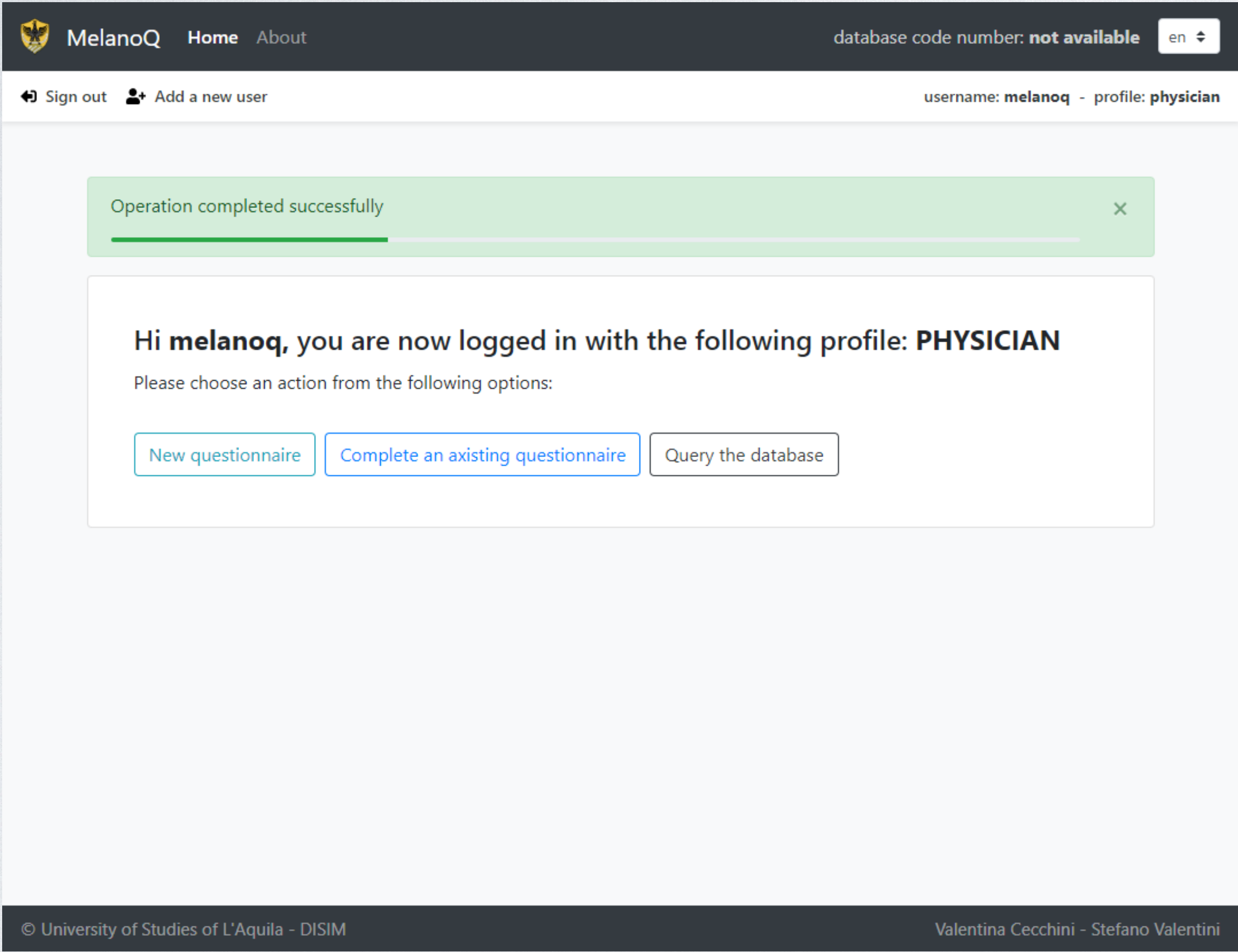


# DATA MODEL

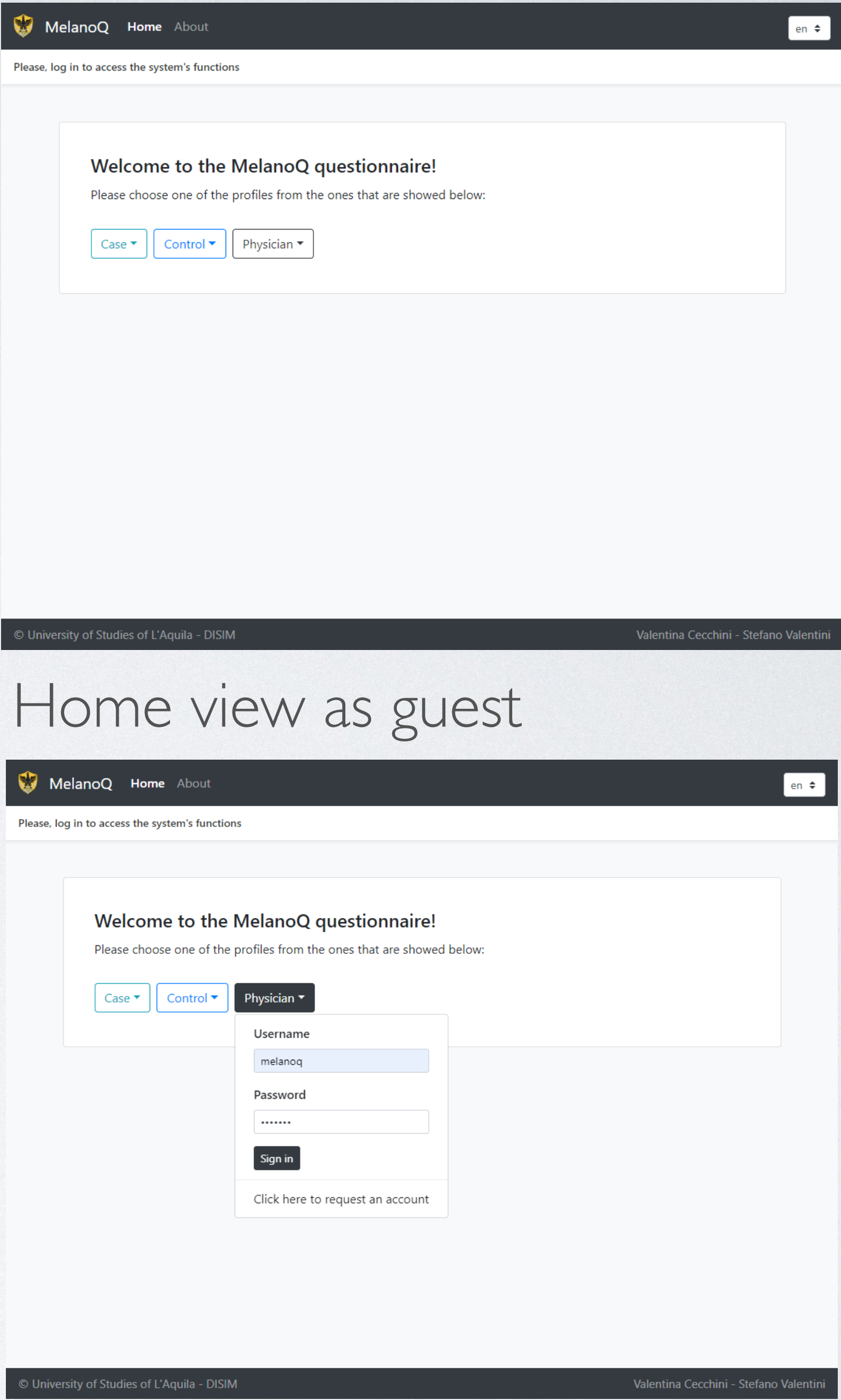
```
{
  ...
  "a2": {
    "education": "text",
    "ethnicity": "text",
    "currentOccupationalStatus": "text",
    "sex": "text",
    "weight": "numeric",
    "historyOfOccupations": {
      "occupationStartingTime": "text",
      "occupationEndingTime": "text"
    },
    "provinceOfBirth": "text",
    "countryOfBirth": "text",
    "residencies": {
      "residencyEndingTime": "text",
      "residencyStartingTime": "text",
      "residencyCountry": "text",
      "residencyCity": "text"
    },
    "height": "numeric"
  },
  ...
}
```



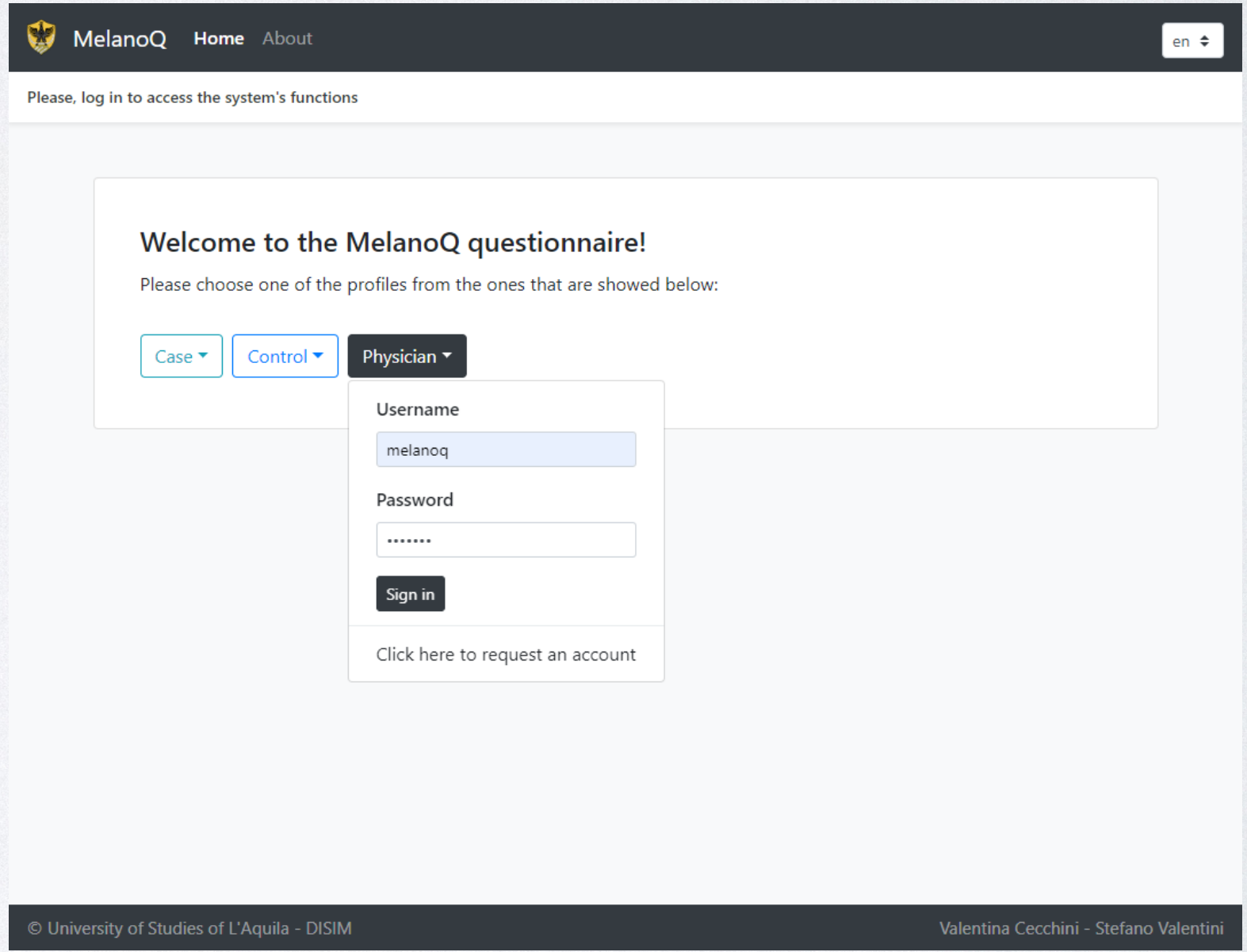
# CLIENT HOME



Home view as logged user




Home view as guest



Home view: log in



# SESSION SUBMISSION

 MelanoQ

HomeAbout

database code number: **not available**

en

Sign out

Add a new user

username: melanoq - profile: physician

Section selection

Please choose the section to create:

Section A

Section B

Section C

Section D

If a subsection is not clickable, then it means you do not have the permission to access it or it has already been inserted in this questionnaire.

I

II


III

Evaluation

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Section selection

 MelanoQ

HomeAbout

database code number: **not available**

en

Sign out

Add a new user

username: melanoq - profile: physician

Section A.I

Section selection

Next section

1. Subject

Please select an option

2. Database code number

Use numeric coding system. First 2 numbers = country; second 2 numbers = center; M or C (melanoma case or control subject, respectively); last 4 numbers = consecutive case/control number

3. Date of questionnaire administration and phenotyping

19/Jul/2019

DD/MMM/YYYY: use a 3-letter abbreviation for month to avoid misinterpretation (US vs. European style)

5. Type of melanoma (if subject is a melanoma case)

Please select an option

Submit

Reset


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Section from example



# DATABASE CODE NUMBER RETRIEVAL



MelanoQ

Home

About

database code number: **not available**

en

Sign out

Add a new user

username: **melanoq** - profile: **physician**

Complete an axisting questionnaire

Proceed to section selection →




If the database code number is not available, insert it manually in the box below or retrieve it from the list of the questionnaires.  
Also remember to validate the code by using the dedicated button.

Insert the database code number in the box; if you do not remember it, try to retrieve it from the list of questionnaires below.

Validate

Use numeric coding system. First 2 numbers = country; second 2 numbers = center; M or C (melanoma case or control subject, respectively); last 4 numbers = consecutive case/control number

Retrieve the database code number from one of the questionnaires below.

-  click this type of button to pick the respective database code number;
-  click this type of button to open/close the questionnaire here;
-  click this type of button to open the questionnaire in a new page.

Filter 













type to search...

Clear

 Per page 

5

 # of results: 4

Database code number	Subject	Last edit (GMT)	Actions
ITAQC0007	Case	12-Jul-2019 10:42:14	  
ITAQC0001	Control	11-Jul-2019 14:23:38	  
ITAQM0002	Control	10-Jul-2019 13:32:03	  
ITAQM0004	Case	11-Jul-2019 18:13:44	  

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
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# QUERY BUILDER

 MelanoQ


HomeAbout

database code number: ITAQC0007  

 Sign out

 Add a new user

username: melanoq - profile: physician

Build your query [← Back](#)

Use the following module to build the query that will be executed on the database.

Match Type 

All


a1.dbCodeNumber

Add Rule


Submit

Reset


Retrieve the database code number from one of the questionnaires below.



click this type of button to pick the respective database code number;



click this type of button to open/close the questionnaire here;



click this type of button to open the questionnaire in a new page.

Filter


type to search...

Clear

Per page

5

# of results: 0



Database code number	Subject	Last edit (GMT)	Actions
There are no records to show.			

«

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Query builder view

 MelanoQ



HomeAbout

database code number: ITAQC0007  

 Sign out

 Add a new user

username: melanoq - profile: physician

Questionnaire ITAQC0001 

Below you can read the data inside the selected questionnaire, use the buttons at the top right corner to explode/collapse the sections.

```
▼ "questionnaire":
  "metaId": "72687439-afd1-4b0b-9c45-e679c5a39191"
  ▼ "a1":
    "subject": "Control"
    "dbCodeNumber": "ITAQC0001"
    "dateOfQuestionnaireAdministration": "08-Jul-2019"
    ► "datesOfUpdateQuestionnaire": 15 items
    "typeOfMelanoma": "Sporadic"
  ▼ "a2":
    "sex": "M"
    "dateOfBirth": "12/mar/1900"
    "cityOfBirth": "L'Aquila"
    "provinceOfBirth": "AQ"
    "countryOfBirth": "Italy"
    "weight": "80"
    "height": "182"
    "ethnicity": "White/Europe"
    ▼ "residencies":
      ▼ 0:
        "residencyCountry": "Italy"
        "residencyCity": "L'Aquila"
        "residencyStartingTime": "1994"
        "residencyEndingTime": "2019"
    "education": "University"
    "currentOccupationalStatus": "Student"
    ► "historyOfOccupations": 1 item
  ► "b1": 6 properties
  ► "b2": 11 properties
  ► "b3": 3 properties
  ► "be": 2 properties
  ► "c1": 8 properties
  ► "c2": 5 properties
  ► "c3": 3 properties
  ► "ce": 2 properties
  ► "d": 1 item
```

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Standalone view



Thanks for the attention.