

Bolzano, 6 October 2021

## Market Research

### Open Data Hub Data Browser 2.0 - First MVP

The Open Data Hub Data Browser is the main visualization tool to show data provided by the Open Data Hub. All data is retrieved via Open Data Hub API and is conditioned on the frontend to be interactive and browsable. The Data Browser offers a vast set of filters, searches, lists, detailed views and functions to view and edit data from the different endpoints. Representation of all data and functionality is mainly set up directly in the views. Currently the Data Browser is in a relaunch phase, where endpoints are accessed in a standardized way and representation of data is done uniformly.

NOI aims to develop a new version of the actual Open Data Hub Data Browser. Technically it should be a collection of reusable (web) components dedicated to visualize and handle the data gathered from the Open Data Hub API.

The aim of this Market research is, find a pool of experts, developers and/or companies that can support NOI in the development of the first MVP 1 of the Open Data Hub Data Browser 2.0.

#### **NOI AG / S.p.A.**

A.-Volta-Straße 13A  
Via A. Volta, 13A  
I-39100 Bozen / Bolzano

T +39 0471 066 600  
info@noi.bz.it  
PEC: noi@pec.noi.bz.it  
www.noi.bz.it

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## 1. Introduction

The Open Data Hub Data Browser (<https://databrowser.opendatahub.bz.it/>) is the main visualization tool to show data provided by the Open Data Hub. All data is retrieved via Open Data Hub API and is conditioned on the frontend to be interactive and browsable. The Data Browser offers a vast set of filters, searches, lists, detailed views and functions to view and edit data from the different endpoints. Representation of all data and functionality is mainly set up directly in the views. Currently the Data Browser is in a relaunch phase, where endpoints are accessed in a standardized way and representation of data is done uniformly.

NOI aims to develop a new version of the actual Open Data Hub Data Browser. Technically it should be a collection of reusable (web) components dedicated to visualize and handle the data gathered from the Open Data Hub API. More detail about the tool, the requirements and the project plan are listed in the Annex 1.

## 2. Goal of the market research

The aim of this Market research is, find a pool of experts, developers and/or companies that can support NOI in the development of the first MVP 1 of the Open Data Hub Data Browser 2.0.

## 3. Constraints

In this section are listed and described the constraints that the service provider has to follow in order to work with NOI on this project.

### 3.1 Economic exploitation

Where the creation of material subject to proprietary rights, including copyrights, sui generis data rights, and related rights, including solely of photographs, industrial design, all rights of economic exploitation arising from achieved results are reserved to NOI S.p.A., excepting those expressly excluded when the order is placed.

Further, if the material includes a software development project, all source code from libraries or other modules used in the realisation of an assignment and belonging to a third party must be released under an Open Source license (opensource.org/ licenses) in a manner compatible with the scope of the "outbound" software license, without requirement for adaptation, addition, cancellation or requests for permission from third parties on the part of NOI S.p.A. In the absence of any expressly indicated license, the terms of the GPL v3 or AGPL v3 (depending on the project type) license shall apply. The use of material belonging to third parties must be expressly declared at the time of the offer, or be easily and immediately understandable from the description of the project. In the event that code is developed during the realisation of this assignment, NOI

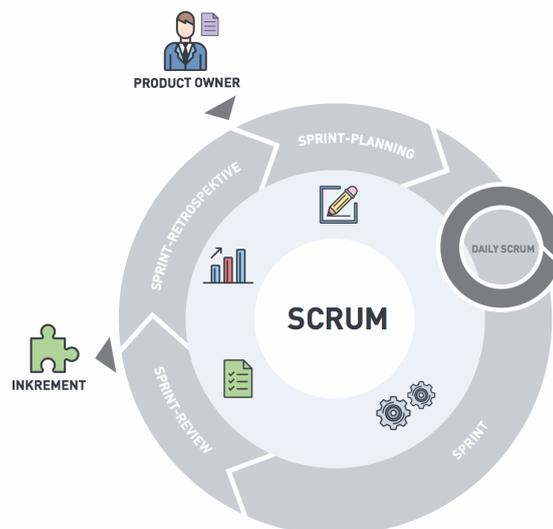
S.p.A. will initiate a Git repository on which the supplier must develop and publish the source code.

If the material consists of data, creative works (drawings, literary works, cinematographic works, figurative art, photographs), industrial design or other material which are subject in whole or in part to the proprietary rights of a third party, the use of such material is permitted provided it is licensed under conditions compatible with the license under which said material will be published, if indicated. If no license is indicated, the material will be subject to conditions compatible with the Creative Commons Zero (CC0) license.

### 3.2 Work methodology

The development of the activities covered by this market survey will follow the agile method (scrum). Two weeks sprint sessions are scheduled, unless otherwise agreed during the kick-off meeting with the core team of NOI S.p.A..

**Figure 2: the SCRUM methodology.**



The software development will take place in three phases/environments:

- **development environment:** this environment is on supplier's infrastructure and is used during the development of the software components;
- **testing environment:** on infrastructure made available from NOI Techpark. This environment is used in order to test the new working versions of the software components. For the publication of the new versions a Continuous Integration (Jenkins) pipeline will be developed by the NOI team. For this reason the new versions of the code will have to be "committed" to a dedicated Git Repository according to the instructions provided by the team of the NOI Techpark;

- **production environment:** on infrastructure made available from NOI Techpark. After the testing phase, as soon as the software produced is considered sufficiently stable, the software will be integrated in the production environment. Also this process is managed automatically with Continuous Integration pipelines.

To coordinate the project NOI S.p.A. will use a Kanban Board in Github. Each functionality or issue will be described by NOI S.p.A. in Github and put on the Kanban Board. The Kanban Board will have the following columns

- **Backlog:** contains all issues that are on hold and have to be discussed during the next sprint meeting with the supplier;
- **ToDo:** contains all issues that have to be concluded in the actual sprint;
- **In Progress:** contains all issues where the is working on;
- **To Review:** contains all issues where NOI Techpark has to make some reviews and that has to be reviewed during the sprint meeting.

All issues in the Kanban, but the one in Backlog, have to be assigned to the user that has to make the next step (e.g. the issues in ToDo will be assigned to the developer who has to develop the functionality, the issue in ToReview will be assigned to the tester, etc.). The supplier will have access to the project Kanban board and will have to check it regularly.

In order to allow the NOI S.p.A. team to properly review and test the code, for each issue in the ToDo lane the service provider has to send a pull request to the development Branch of the repository at least 5 working days before the sprint meeting.

In order to allow a better integration with the systems already in use by NOI Techpak it is required to implement all software components, where possible, using the technologies that are already in use by the Open Data Hub project. This technologies are described in the technical documentation, available at the following link:

<https://docs.opendatahub.bz.it/>

### 3.3 Repository Git

The source code has to be uploaded to the Git repositories provided by NOI Techpark. During the upload the service provider has to take particular attention to the following aspects:

- do not commit usernames or passwords. NOI Techpark uses Jenkins technology to build the code which implements password ingestion based on special keywords in the source code;
- well document the code describing at least:
  - the general architecture of the system;
  - the list of the licences of all the libraries used;
  - the installation process;

- all other useful information for people who want to fork or install and use the project.

As Open Data Hub we created some boilerplate repositories for the most common project type (es. Java project, Web Component, .Net Core project, etc.). In case you are starting a new project from scratch, before starting your project please look for the boilerplate that best fits your project and use it to initialize your repository.

### 3.3.1 Documentation

While you are documenting your code please consider that the official language of the Open Data Hub is English. So the entire documentation, including the comments in the code, has to be in English. Moreover you have to observe the following guidelines:

- use the right boilerplate of the README.md if exists;
- use only markdown or text (no binaries, no PDF, etc.);
- should be so detailed that a third person, without any connection to the developers can setup the project, run it and develop it further;
- Java Doc and similar tools for other languages should be as complete as possible;
- add the author tags incl. emails;
- README.md should be a good description of the project and should also have a usage instruction (boilerplate does not consider that). Mainly because tools like **npm** use it as homepage for each project

In general the documentation of the project (e.g. readme file, license file, etc.) should be done in order to allow third parties developers, who don't know anything about the project, to understand the whole project and also replicate, install or modify it without the need to get in contact with NOI S.p.A.

Therefore the documentation (README.md) should include also:

- a short description that allows the user to understand the overall goal and functionalities of the project;
- Longer and detailed description that includes also:
  - description of the different parts of the repository/application;
  - description of different parts of the project (also other repositories, if existing, and a link to them) and how this application is part of the overall project;
  - external services/code/framework/software that are used including their licence and copyright information;
- detailed development setup instructions (including testing);
- detailed deployment setup instructions.

### 3.3.2 Licensing and Reuse compliance

In respect to the licensing and copyright information, the service provider has to follow the guidelines defined by the Reuse project:

<https://reuse.software/>

The service provider must provide code where the Reuse linter passes without errors and the licenses must be all compatible with each other.

### 3.3.3 Pull request (PR)

As mentioned in the chapter 3.2 Work Methodology the service provider, before each sprint meeting, will deliver the source code by making a Pull Request to the Development Branch of the repository Git provided by NOI S.p.A. at the beginning of the project. In general the service provider has to observe the following guidelines to make the pull requests:

- at the beginning of each sprint the service provider will open a Pull Request (PR) with a prefix [WIP];
- during the sprint the service provider has to regularly push the commits to that PR in order to allow NOI S.p.A. to monitor the status of the project (additional information are available under: <https://opendatahub.readthedocs.io/en/latest/contributors.html>);
- at the end of the sprint (at least 5 days before the sprint meeting) the service provider will close and send the Pull Request.

NOI S.p.A. will analyze the Pull Request before the meeting and eventually send feedback to the service provider. The minimal requirements for a Pull Request to get accepted are:

- the documentation must exist and be as complete as possible in respect to the status of the project
- commits must not contain credentials or any other sensible data
- contributions (e.g. documentation, comments, etc.) must be in english
- merge conflicts must be resolved by the contributor
- all Continuous Integration verifications must pass
- Pull request branches should possibly have a linear history, that is, they should not contain merge commits

During the development cycles the pull request comments and in general the issues and the dedicated Kanban board on Github (original repository) must be tracked by the service provider. The discussion about issues, pull requests, and other specific comments on the code development will be managed on GitHub in the project repository and NOT through email. That also involves moving user stories to the corresponding column in the Kanban and assigning them to the right user.

### 3.3.4 Commits

These paragraphs contain some guidelines that the service provider should follow while implementing the project:

- commits should contain a single thing/feature, not be too big and specially they should not be a combination of unrelated features or bug-fixes;
- each commit must be described: present tense and active (e.g. "Add logging to commons" not "commons will get logging now" and not "Added logging").

### 3.3.5 Deployment

For the deployment of the project NOI S.p.A. will use its CI/CD infrastructure, for this reason it is important that the service provider includes in the documentation of the project the information about how the application should be deployed or updated by a CD pipeline. Therefore, the documentation should point out the following things:

- What parameters must be configured? Which ones are secrets and which are not?
- What services must be used? (e.g.. PostgreSQL database, S3, ..)
- What steps must be made to package the application/project so that it can be copied to the server?
- What steps must be made on the server after deploying? (ex. database migrations executing with special command)
- What must be adjusted on the server only once? (ex. cron job, shared folder)

### 3.3.6 Testing

All projects should include unit tests and the minimal requirements for the service provider are:

- setup a test infrastructure;
- write unit tests to cover the most important features;
- the minimal test coverage should be 20%;
- tests should mainly cover own business logic (even if minimal) and not third party API's / libraries

Finally, a test driven development is appreciated.

### 3.3.7 API development

In case that within the project it is foreseen also the development or the change of APIs, the service provider should observe the following guidelines:

- all API calls must be documented in the README.md;
- Swagger UI should be used;
- in case of errors the API should return to the consumer valid and descriptive error messages;
- the API should be RESTful, if possible, but, in case of need, other formats will be considered. In case of non RESTful APIs the service provider should present to NOI S.p.A. enough documentation to allow NOI S.p.A. to decide whether to go on with the new technology or stick to RESTful;
- the API must include also:
  - Response codes,
  - HTTP methods,
  - validity errors,
  - logging: JSON format for production and plain-text for local development written to stdout

### 3.3.8 Access Control List (ACL) management

In case that the project foresees Access Control List management, the service provider should observe the following guidelines:

- every login to a webapp needs ACL;
- the passwords must be complex enough to be secure;
- OAuth 2.0 standard is required
- Session management for webapps should be present, logout after an inactivity time (the length of the inactivity time depends on the single projects and has to be agreed with NOI S.p.A.)

As an Access Management tool NOI S.p.A. uses Keycloak (<https://www.keycloak.org/>) instance. More details are available at the following links:

<https://docs.opendatahub.bz.it/en/latest/guidelines/authentication.html>

<https://docs.opendatahub.bz.it/en/latest/guidelines/authentication.html#authentication-to-internal-infrastructure>

### 3.3.9 Dockerization

NOI S.p.A. is using Docker (<https://www.docker.com/>) to automate the deployment of the application and we strongly recommend to:

- use docker for local development;
- keep local docker setup, staging and production as similar as possible (these will be provided and updated by the NOI S.p.A. team).
- use environmental variables to configure different stages (i.e., .env files)

### 3.4 Invoicing

The invoicing of the activities concluded by the supplier will be sent to NOI S.p.A via electronic invoice only after the outputs produced have been successfully tested by NOI S.p.A. Before to proceed with the testing of the outputs, the supplier must provide to NOI S.p.A.:

- the entire documentation;
- if code development is planned, the code must be uploaded to the Git repository provided by NOI S.p.A;
- in the case of multimedia contents (e.g. photos, videos, illustrations, documents), the service provider has to upload it on specific platforms (e.g. Vimeo, Flickr, etc.) and provide the source files or open versions through appropriate file hosting services indicated by NOI S.p.A.

All invoices must include that the transaction is subject to the Split Payment discipline as mentioned in the art.17-ter del DPR 633/197 and must be issued exclusively in electronic format (Unique Office code: T04ZHR3).

### 3.5 Deadline

The deadline to close all activities included in this market research is the **31st December 2021**.

### 3.6 Working place and hour

#### 3.6.1 Working Hours

The execution of the works that involve collaboration with the staff of NOI Techpark or other entities involved in the project, must be carried out within a timeframe ranging from 9.00 to 12.00 and from 15.00 to 17.00. Depending on the needs, different times may be agreed via email between the service provider and the entities involved.

#### 3.6.2 Working Place

The meetings that will be agreed during the project will take place in the NOI Techpark offices:

- Via Alessandro Volta, 13, Bolzano.

Any expenses that the supplier will have to incur to reach these locations won't imply an additional cost for NOI Techpark.

In any case, any travel costs that the supplier will have to incur to ensure the natural performance of the project activities (e.g. extraordinary coordination meetings, interventions that require presence on site, development activities to be carried out in agreement with the one or more entities / suppliers involved in the project, etc.) can't be billed to NOI Techpark.

## 4 Other useful information

In this section are listed and described all other useful information that the service provider has to consider in order to provide an offering for this project.

### 4.1 Documentation

In order to participate to this market research, we kindly ask to provide the following documentation:

- a short company description that includes also a list of references in similar projects;
- a short description of the team that will be assigned to the project including a short description of the competences of each team member;
- the hourly rate of each team member included in the project team;
- the maximal availability of time available before the 31st December 2021.

## 5. Contact

In case of question please contact:

Stefano Seppi

Email: [s.seppi@noi.bz.it](mailto:s.seppi@noi.bz.it)

Tel.: 0471-066 674

## Annex 1 - Data Browser 2.0

The Open Data Hub Data Browser (<https://databrowser.opendatahub.bz.it/>) is the main visualization tool to show data provided by the Open Data Hub. All data is retrieved via Open Data Hub API and is conditioned on the frontend to be interactive and browsable. The Data Browser offers a vast set of filters, searches, lists, detailed views and functions to view and edit data from the different endpoints. Representation of all data and functionality is mainly set up directly in the views. Currently the Data Browser is in a relaunch phase, where endpoints are accessed in a standardized way and representation of data is done uniformly.

### Goal

Main goal is to develop a new version of the actual Open Data Hub Data Browser. Technically it should be a collection of reusable (web) components dedicated to visualize and handle the data gathered from the Open Data Hub API.

Therefore the requirements are to:

- create a Data Browser that includes views that are automatically generated out of the data without the need to code in case of adding new dataset;
- create a configurable Data Browser (e.g. filters, searchfields, etc.) to allow the single user or users group to autonomously configure their view according to their needs;
- provide the possibility to export in a CSV or spreadsheet the content of each view using the what you see is what you get approach.

A long term goal is to include the Data Browser and the Analytics Web interface in the new Data Browser and align the design and usability of the two applications in order to provide to the user a better experience.

### User interface

NOI is developing the user interface of the Open Data Hub Data Browser in collaboration with a graphical agency. This means the NOI will provide to the developers the screen designs and the graphical guidelines that must be followed.

### Project status and next steps

In the first iteration a working lightweight prototype has been implemented. It will be the base for the next Data Browser version. This prototype is able to connect to the various endpoints in the tourism domain of the Open Data Hub, automatically retrieve and represent its structure and data in default configuration. Since the goal was to check if the architecture was fine, in the development of this first proof of concept graphical and usability aspects hasn't taken into consideration.

You can see the Proof of Concept version of the data browser at the following link:

<https://databrowser.opendatahub.testingmachine.eu/>.

Moreover at the following link you find the source code of this first PoC:

<https://github.com/noi-techpark/it.bz.opendatahub.databrowser>.

In the meantime NOI in collaboration with a graphical agency is making an usability study and developing the user interface of the new Open Data Hub Data Browser. The usability study is ending in the first half of October and the first graphical interface results are planned to be delivered before the end of October. Based on these results the next steps will be the definition and the assignment of various development working packages for the first MVP in order to develop each component of the new Data Browser.

### **Required competences**

In order to have the necessary manpower for developing each single component in different work packages, the NOI Techpark is looking for developers with experience in frontend/backend web application development.

Required experiences are:

- experience in frontend and/or backend web application development;
- experience in developing single webcomponents;
- experience in integrating web components in existing web applications.

Considering the general architecture of the entire project it is required the knowledge of the following programming languages and/or technologies:

- JavaScript;
- Vue.js;
- HTML/CSS.

Considering the general architecture of the entire project it is preferably required the knowledge of the following programming languages and/or technologies:

- Java;
- .Net core;
- PostgreSQL;
- ElasticSearch.