Bolzano, 28 February 2022

Market Research - Open Data Hub - Dev and DevOps support

NOI AG / S.p.A is coordinating the Open Data Project that aims to implement an innovative platform to collect and share data:

https://opendatahub.bz.it/

The Open Data Hub Team is continuously looking for talents, experts and companies to expand the community of contributors.

This market research aims to identify one or more partners (company and/or freelance) that can support NOI in the maintenance, update and development of the Open Data Hub project. Moreover, the partners could be asked to:

- support the Open Data Hub team in the design of the architecture;
- develop and test innovative solutions that could be included in the Open Data Hub Architecture;
- integrate in the infrastructure new datasets or software components;
- implement applications, or part of it, that aren't included in the core Open Data Hub architecture but that are strictly related to it (e.g. Web Component Store, Beacon, etc.).

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1. The Open Data Hub

The Open Data Hub project envisions the development and set up of a portal whose primary purpose is to offer a single access point to machine-readable (Open) Data. This will also allow everybody to use these data in digital communication channels and/or build innovative applications on top of the data offered. The Open Data Hub project aims to foster the use of Open Data and enhance the collaboration between companies and research centres.
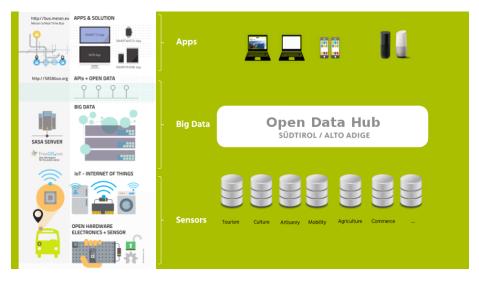

Figure 1: the Open Data Hub concept.

The data within the Open Data Hub will be easily accessible, through preferring open interfaces and APIs (where possible). The Open Data Hub will expose the data, where possible, by using built existing (open) standards like The Open Travel Alliance (OTA), The General Transit Feed Specification (GTFS), AlpineBits, SPARQL, etc.. The Open Data Hub team also strives to keep all data regularly updated, and use standard exchange formats for them like JSON and the Data Catalog Vocabulary (DCAT). Depending on the development of the project and the interest of users, more standards and data formats might be supported in the future.

1.1 Useful links

In this paragraph are listed the links to useful documentation and tools that developers can use in order to better understand the Open Data Hub project and become a contributor.

- **website:** opendatahub.bz.it/
- **documentation**: opendatahub.readthedocs.io/en/latest/index.html
- **git**: github.com/noi-techpark/
- **guideline**:
  https://opendatahub.readthedocs.io/en/latest/guidelines.html#

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- **dataset list**: opendatahub.readthedocs.io/en/latest/datasets.html

The most useful links that have to be considered within this market research are the "Project documentation" that describes the most updated version of the Open Data Hub architecture and the "dev guidelines" that contains all information dedicated to developers that will collaborate with the Open Data Hub team.

2. Goal of the market research

This market research aims to identify one or more partners (company and/or freelance) that can support NOI Techpark in the maintenance, update and development of the Open Data Hub project. Moreover, the partners could be asked to:

- support the Open Data Hub team in the design of the architecture;
- test innovative solutions that could be included in the Open Data Hub Architecture;
- implement applications, or part of it, that aren't included in the core Open Data Hub architecture but that are strictly related to it (e.g. Web Component Store, Beacon, etc.).

As a guideline we mention some examples of activities that will be included in this market research:
- setup and maintenance of different servers both Linux (Ubuntu and Centos) and Windows (installation, setup, updates);
- setup and maintenance of the central monitoring and logging infrastructure (Grafana[1], Cloud Watch, Elasticsearch[2], visual dashboards, automatic alerts);
- setting up deployments and integrations of different frontend and backend services (lots of projects from and with external contributors);
- setting up deployments and integrations of different Android and iOS apps (lots of projects form and with external contributors):
- consulting the team regarding general architectural decisions;
- teaching the team different skills and new technologies (Docker[3], Vue.js[4], Ansible[5], Terraform[6], Active MQ[7], etc.);
- develop Open Data Hub components, applications and Proof of Concept using different programming languages as for example:
  - JAVA;
  - .NET core;

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[1] https://grafana.com/
[2] https://www.elastic.co/
[3] https://www.docker.com/
[4] https://vuejs.org/
[5] https://www.ansible.com/
[6] https://www.terraform.io/
[7] http://activemq.apache.org/

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- ○ etc.
- perform performance and quality testing to compare different possible technology solutions to be included in the Open Data Hub;
- etc.

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 licence (opensource.org/ licences) in a manner compatible with the scope of the "outbound" software licence, 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 licence, the terms of the GNU GPL v3 licence 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 licence under which said material will be published, if indicated. If no licence is indicated, the material will be subject to conditions compatible with the Creative Commons Zero (CC0) licence.

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3.2 Work methodology

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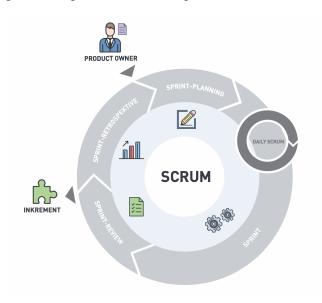

Figure 2: *the SCRUM methodology.*

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

- **development environment**: this environment is on the supplier's infrastructure and is used during the development of the software components;
- **testing environment**: this environment is provided by NOI. It is used in order to test the new working versions of the software components. For the publication of the software components, Continuous Integration pipelines 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 NOI team;
- **production environment**: this environment is provided by NOI. 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.
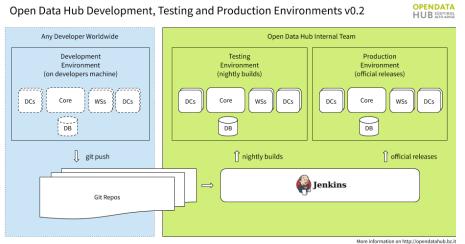
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Figure 3: the three development environments.

More details about how to contribute to the Open Data Hub project are available on the project documentation at the following link:

https://opendatahub.readthedocs.io/en/latest/guidelines/dtp.html

The Open Data Hub team in order to manage the source code uses GitHub and at the following link you can find a quick introduction on how to contribute on GitHub:

https://opendatahub.readthedocs.io/en/latest/contributors.html

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

https://opendatahub.readthedocs.io/en/latest/index.html .

3.3 Invoicing

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

- the entire documentation;
- if code development is planned, the code must be uploaded to the Git repository provided by NOI;

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- 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.

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

3.4 Required skills

The partner in order to participate in this market research must guarantee one or more of the following skills:

- at least 3 years of experience in:
    - server administration (both Linux and Windows)
    - continuous integration
    - continuous delivery
    - continuous deployment
    - the design and implementation of software architecture
    - Infrastructure as a Code
    - the automation of the entire pipeline of software testing and publication
    - the central monitoring and logging of application and software architectures
    - the realisation of monitoring dashboards
    - the design and the realisation of big data analytics dashboards
    - agile project management
- know-how of the following programming languages:
    - Java
    - C#
    - Python
    - Javascript
    - Objective-C
    - Swift
- experience contributing to Open Source projects
- know-how about the main Open Source Licences

3.5 Working place and hour

3.5.1 Working Hours

Activities that involve collaboration and communication with the NOI staff must be carried out during working days from Monday to Friday and business hours from 9.00 to 12.00 and from 15.00 to 17.00 CET/CEST. Depending on special needs, exceptional times may be agreed between the service provider and the NOI staff.

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3.5.2 Working Place

The meetings that will be agreed during the project will take place, according to the needs of the project team, online or 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.
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.

3.6 Repository Git

The source code has to be uploaded to the Git repositories provided by NOI. During the upload we kindly ask to keep particular attention to the following aspects:
- to not commit sensitive data like usernames or passwords. NOI uses continuous integration pipelines to inject usernames and passwords during the deployment on the production environment;
- to well document the source 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.

In general a developer who wants to replicate one of the Open Data Hub related projects, should be able to do it without the the help of the Open Data Hub team.

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 offer for this project.

4.1 Documentation

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

- list of references and projects
- CV or company description
- CV of all team members involved

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- hourly or daily rate of each team member involved

5. Contact

In case of any questions please contact:
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