Bolzano/Bozen, 11th August 2023

Market research – Open Data Hub – Web Component Flight Data – UI/UX Design

This document concerns market research for the identification of a partner that can support NOI S.p.A. in the definition of the UI/UX of the web components that will render the planned and the real time flight information provided by the Open Data Hub.

Project name: IMPACT – Impacting Innovation Through Specialization
Project code: EFRE1048
Project CUP: J57H23000640009

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1. Goal of the market research

This chapter aims to explain in more detail about content included in the market research. The aim is to identify one or more partners that can support NOI S.p.A. in the definition of the UI/UX of the web components that will render the planned and the real time flight information provided by the Open Data Hub.

1.1 INTRODUCTION

NOI S.P.A. in 2022 developed the first version of a Web Component that displays:

- planned flight information;
- real time position of flights.

The first version of the web component is available at the following link:

https://webcomponents.opendatahub.com/webcomponent/flightmap

Figure 1: Flight Data Web Component screenshot.

As described in Figure 1, the main usage of the actual version, is to display arrivals and departures. By using the configuration panel of the web component, it is possible to personalize the web component (e.g., define the columns to be shown in the table, activate/deactivate real time information, upload a custom CSS, filter out the flight to be shown, etc.).

During the first half of 2023 some companies started to use and integrate the web component in their services. Thanks to those integrations, NOI S.P.A. had the opportunity to:

- collect feedback and improvement proposals, based on the real needs of its customers;

- define a set of requirements and use cases to be considered for the development of a Flight Data Web component 2.0.

During the first preliminary analysis the Open data Hub considered the possibility to split the actual Web Component into two different components, to better feed the needs of the target users that will be mentioned in the following paragraph.

1.2 TARGET USER

The target users of the Flight Data Web Components are:

- people (e.g., tourists) who want to look for destinations, flight availability and, in case of need, book their flight, following the sales path in the web component.
    - Target profile: inbound tourists
- people (e.g., taxi drivers, hotelier that must organize the transfers, parents of incoming travelers, etc.) who wants to see the flight status (e.g., scheduled, boarding, gate, baggage claim, etc.) and information (e.g., GPS position, estimated time of arrival, etc.) in real time
    - Target profile: Sky Alps clients in the airport, taxi drivers who has to pick up people at the airport, etc.
- web developers that want to integrate the Web Component on websites they are managing/developing.
    - Target profile: various websites offering flight status information.

1.3 USE CASES

This section summarizes the main use cases that emerged from the collected feedback. The use case description includes also a list of missing features that was suggested by the clients and that should be take into consideration during the UI/UX definition:

- As a web component user, I want to easily find the flight that fits my need (e.g., destination, departure date, arrival date, etc.), to better plan my trip. To fit this use case, the web component should be extended with the following features:
    - show the starting price.
    - integration of the availability.
    - Integration of a simple search function (e.g., departure date, arrival date, destinations, airports, etc.).
- As a web component user, I want to see the real time flight information to better plan my trip (Tourists) or better plan the transfer for my clients (Hotels/Taxi drivers)/relatives. To fit this use case, the web component should be extended with the following features:
    - display of the current flights (max with 3 days of advance).
    - integration of the real time information/status (e.g., delay, terminal, gate, baggage claim, boarding, etc.).

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- o real time position during the flight or show detailed information about the single flights (e.g. https://www.volotea.com/en/flight-status/).
- As a web developer I want a mobile version of the components to let the web page visitor to easily view the data in a proper way also on mobile devices. To fit this use case, it should be considered to:
  - o split the web component in 2 or 3 different components that can be also combined one with each other. A possible split could be:
    - ▪ Flight Booking component.
    - ▪ Real Time component (Planned data).
    - ▪ Real Time map (Flight sensor data).
  - o consider hide/remove features that haven't been used yet.
- As a web developer I want an easier but exhaustive web component configuration to fit the needs of my website/portal and reduce the effort to integrate the web component in my website. To fit this use case, it should be considered to:
  - o split the web component in 2 or 3 different components that can be also combined one with each other. A possible split could be:
    - ▪ Flight Booking component;
    - ▪ Real Time component (Planned data).
    - ▪ Real Time map (Flight sensor data).
- consider hide/remove features that haven't been used yet.

1.3 OTHER ENHANCEMENTS

Other enhancements that emerged during the preliminary analysis of the collected feedback that must be considered for the new version of the Web Component are:

- The mobile version of the web component should be improved, to meet the needs of the tourism agencies that want to integrate the web component in their portals/websites.
- The configuration of the web component should be simplified, to help people with a little knowledge to configure, consume and maybe integrate the web component in their website.

1.3 TASKS AND SERVICES

The task, services and activities included in this market research are:

- collection of needs and feedback from the NOI S.P.A. and the key users (max 3 users). The key users will be provided by NOI S.P.A.
- analysis and definition of the UX (in case of need to split the web component, this task must be fulfilled for each defined web component with a maximum of 3 web components).
- analysis and definition of the UI (in case of need to split the web component, this task must be fulfilled for each defined web component with a maximum of 3 web components);

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- active support during the implementation that includes also the participation in the sprint meetings.

2. Constraints

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

2.1 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 realization 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 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. If code is developed during the realization 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.

2.2 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 must upload it on specific platforms (e.g.,

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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).

2.3 WORK METHODOLOGY

The SFSCON is an event organized by the Tech Transfer Digital of NOI S.P.A. Since the main project of the Tech Transfer Digital is the Open Data Hub, for the development of the SFSCON App the team will follow the same work methodology as in the Open Data hub Project. This paragraph will include more details about the 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.
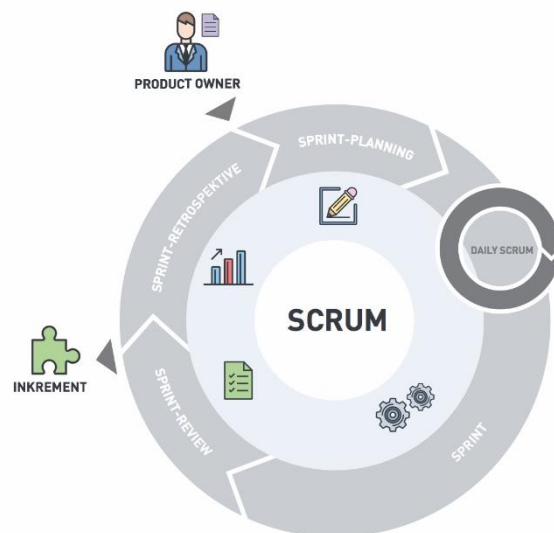
Figure 3: the SCRUM methodology.

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 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

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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 into 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 must be concluded in the actual sprint;
- **In Progress** contains all issues where that are working in progress.
- **To Review:** contains all issues that NOI Techpark has to review and that has to be reviewed during the sprint meeting.

All issues in the Kanban, apart from the one in Backlog, have to be assigned to the user that must 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 To Review will be assigned to the tester, etc.). The supplier will have access to the project Kanban board and will have to check it regularly.

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.

To allow a better integration of the systems already in use by NOI Techpark it is required to implement all software components, where possible, using the technologies that are already in use by the Open Data Hub (https://opendatahub.com/) project.

2.4 REPOSITORY GIT

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

- do not commit usernames or passwords. NOI Techpark uses GitHub Actions 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 licenses of all the libraries used;
  - the installation process;

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

As Open Data Hub (https://opendatahub.com/) we have 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.

2.4.1 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, must be in English. Moreover, you must 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 usage instructions (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 to allow third parties developers, who do not know anything about the project, to understand the whole project and replicate, install or modify it without the need to contact NOI S.p.A. Therefore, the documentation (README.md) should include also:

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

2.4.2 Licensing and Reuse compliance

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

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https://reuse.software/

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

2.4.3 Pull request (PR)

As mentioned in the previous paragraphs 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 must 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] as Work in Progress;
- during the sprint, the service provider must regularly push the commits to that PR to allow NOI S.p.A. to monitor the status of the project;
- 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 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.

2.4.4 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;

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- 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").

2.4.5 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, etc.)
- 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).

2.4.6 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 key features;
- the minimal test coverage should be 20%;
- tests should cover own business logic (even if minimal) and not third-party API's / libraries.

Finally, a test-driven development is appreciated.

2.4.7 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 modern technology or stick to RESTful;
- the API must include also:
    - Response codes,
    - HTTP methods,

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o validity errors,
o logging: JSON format for production and plain-text for local development written to stdout.

2.4.8 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 must 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://github.com/noi-techpark/documentation#oauth

2.4.9 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).

2.5 WORKING PLACE AND HOUR

2.5.1 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.

2.5.2 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 will not imply an additional cost for NOI Techpark. In any case, any travel costs that the

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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.) cannot be billed to NOI Techpark.

3. Request to the supplier

3.1 PROJECT INFORMATION

The supplier must include in all documents (e.g., offer, invoice, etc.) the following information:

Project name: IMPACT – Impacting Innovation Through Specialization
Project code: EFRE1048
Project CUP: J57H23000640009

3.2 OUTPUTS

The service provider should produce the following documentation:

- Document including:
    - Personas and use case description based on the feedback provided by NOI S.P.A. and the key user (max. 3 users) that will be provided by NOI S.P.A.;
    - Optimization of the actual web component interface and functionalities. In case that the Web Component will be split, this information must be provided for each Web Component;
- Updated UI/UX design files including:
    - UI/UX manual for technical implementation;
    - detailed briefing for the software developers;
- Quality management and coordination of queries.

4. Documentation

To participate in this market research, we kindly ask you 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 cost estimation for each single task described in the chapter 2 of the present document.;
- the hourly rate of each team member included in the project team.

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5. Contacts

The service providers who are interested in participating in this market research will have to present their estimation by the **7th of August 2023**.

The goal of the Open Data Hub team is to present the web component during the SFSCON 2023, which will take place the 10th and 11th of November 2023. For this reason the deadline for the definition of the UI/UX of the Web Component/s is the **11th of September 2023**.

In case of any question please contact:
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