



*Market Orientation for
Health-RI
For the Data Catalogue*

Version: 1.1
Date: 27 March 2023

TABLE OF CONTENTS

1	GENERAL	3
1.1	HEALTH-RI FOUNDATION	3
1.2	SERVICE OF GENERAL ECONOMIC INTEREST (SGEI)	3
1.3	SCOPE, PURPOSE, AND TARGET AUDIENCE FOR THE MARKET CONSULTATION	4
2	THE PROCEDURE.....	6
2.1	REGISTRATION AND CONSULTATION	6
2.2	PROCEDURE	6
2.3	ASSESSMENT	7
2.4	GUIDING PRINCIPLES FOR THE MARKET CONSULTATION	8
2.5	PLANNING.....	9
2.6	EXPECTED EFFORTS OF PARTICIPATING PARTIES.....	9
3	CURRENT SITUATION, BOTTLENECKS, ISSUES, AND PRECONDITIONS... 	10
3.1	DESCRIPTION OF THE CURRENT SITUATION	10
3.2	ISSUES	10
3.3	PRECONDITIONS.....	11
4	FINALLY.....	12

1 General

1.1 *Health-RI Foundation*

Health-RI is a Dutch non-profit foundation that services a growing network of organisations in realizing a national health data infrastructure for research and innovation. Health-RI foundation has recently been awarded significant funding from the Dutch government (National Growth Fund) to realize a coordinated national data expertise network and infrastructure consisting of regional nodes of organisations in Health and Health related research that conform to the FAIR data standards.

It is the mission of Health-RI to build an integrated research infrastructure that is accessible for researchers, healthcare providers as well as citizens. The Health-RI team facilitates and stimulates the optimal use of knowledge, tools, facilities and health data and biological samples to make data driven health research possible and to accelerate sustainable and affordable personalized medicine and health.

Health-RI seeks to make observational health data available for research and innovation in a structured and responsible manner. This ambition calls for an integrated IT architecture in which the FAIR principles and ethical and juridical standards are incorporated by design. The design and implementation of this architecture will take place in an agile manner together with a nationwide network of stakeholders.

1.2 *Service of General Economic Interest (SGEI)*

For the activities of the entire National Growth Fund (NGF) project of Health-RI, the Ministry of Economic Affairs and Climate Policy has awarded subsidies pursuant to the Decision of the European Commission of 20 December 2011 (2012/21/EU) (SGEI exemption decision). In view of public interests and the observed market failure, the subsidy provider, the Ministry of Economic Affairs and Climate Policy, has endorsed the need for an integrated health data infrastructure to be set up. Based on this, it has been concluded that Health-RI is a suitable party to be charged with performing the activities in the Netherlands as described below.

For the period from February 11, 2022, to December 31, 2028 (and for a maximum period of 10 years), the Health-RI Foundation is charged with the following Service of General Economic Interest (SGEI), consisting of the following activities:

1. Standardized access to health data in the Netherlands via a close-knit network of eight regional nodes.
2. Developing an integrated infrastructure in the Netherlands for reliable, affordable, and secure access to health data.
3. Developing an efficient and secure service platform (one-stop-shop) in the Netherlands in the field of data-driven health research and innovation.

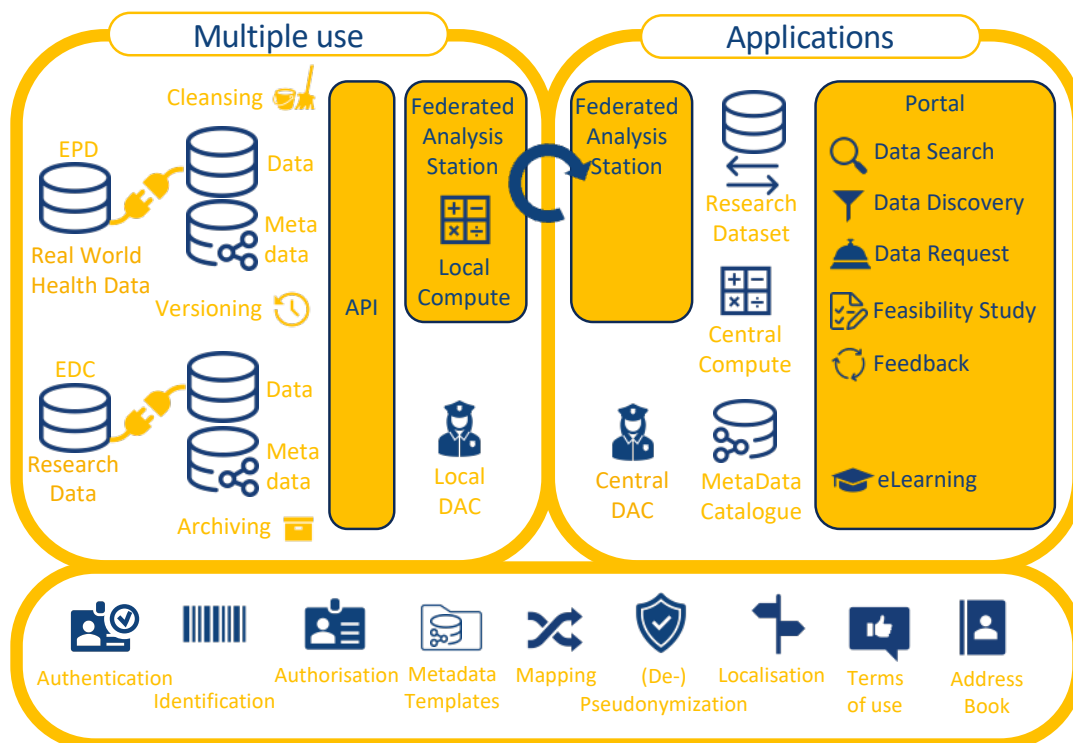
A health data infrastructure as developed by Health-RI is a precondition for excellent innovation and research.

1.3 Scope, purpose, and target audience for the market consultation

The request for information (RFI) covers the data catalogue as part of the Health-RI architecture. The following diagram shows the data catalogue as part of the Health-RI HUB. The purpose of the data catalogue is to provide a central utility where users (researchers, public, etc) can find (based on permissions) metadata about (re)useable data that have been created in routine health care and in health research. And data within the scope of this RFI defined as datasets (as in a collection of data on a particular subject, of a study or project) but also data (re)sources like cohorts, registries and biobanks.

The catalogue allows the user to find more information about the data and assess whether the data is useable for their (secondary use) purpose and request access to (part) of the data. The requesting access to (part of) the data of choice as part of the find, search and requesting access workflow will be a separate part of the loosely coupled Health-RI architecture for which another/separate RFI will follow though consulted parties can indicate with this RFI that they also can provide this functionality if loosely coupled to the catalogue. Finally, it is envisaged that the Health-RI data catalogue also functions as the Dutch data catalogue as part of European projects and infrastructures like the European Genomic Data Infrastructure (GDI) and the European Health Data Space (EHDS) as well as that it could function as local or regional data catalogue.

The data catalogue is part of a federated architecture where the eight Health-RI nodes will exchange metadata from datasets generated within the node with the central Health-RI Hub. The data catalogue will be part of the find, search and request workflow to provide access to data. The data catalogue should adhere to the FAIR principles (e.g., be findable, interoperable and content machine and human readable as well as indexable by search engines) and adhere to open industry standards and allow for generating, handling and storage of persistent identifiers.



The aim of this market orientation is to increase more insights into the market of Data Catalogue vendors and solutions and it can be seen as a preparation for a potential purchasing procedure (Request for Proposal) for the next generation of the Health-RI portal. If appropriate, the Health-RI foundation will use the information received to shape its Program of Requirements and Wishes for the Data Catalogue. The responses to this market orientation will be evaluated based on criteria in the next section.

This market orientation is intended for market participants who want to share their knowledge with Health-RI. We kindly ask them to share with us their insights on the most appropriate solution based on proven solutions and technology.

2 The Procedure

2.1 *Registration and consultation*

The Foundation Health-RI has published the market consultation on TED/ TenderNed to get into contact with market parties that can provide a solid solution for the Health-RI data catalogue. This market orientation will primarily take place by email, but with the possibility of interviews at a later stage. Participants are asked to complete the questionnaire in the attachment to this document and submit a letter of explanation with the questionnaire. Most of the questions in the questionnaire can be answered with one of the predefined answers, but they do allow for a brief explanation.

2.2 *Procedure*

The procedure is as follows:

- This market orientation document will be published on the TED/TenderNed platform. Parties can register their interest by sending an email to procurement@health-ri.nl.
- The participants will have the opportunity to ask questions about this market orientation document. Questions should be submitted all together in a single email within the first ten working days after formal registration of participation. All registered parties will receive all the answers to all the questions at the same time.
- Health-RI can request further information from (one of) participants if certain answers are not clear.
- If Health-RI sees reason to do so, Health-RI can invite several participants to provide further information, even after the date for submitting the market orientation document has passed. Which participants are invited and the time and form in which this takes place is at the discretion of the Health-RI foundation. This assessment will be based on the quality of the information provided and the extent to which this information matches the demand.
- The information obtained in the discussions is recorded in a report and submitted to the participant concerned for approval.
- The general results and conclusions of this market orientation will be shared in a final management summary with all participants of this market orientation after this market orientation is ended. Health-RI will endeavour to ensure maximum anonymity of the participants.
- Health-RI can anonymously use the information obtained for a Program of Requirements and Requirements (PRR) if Health-RI decides to start a purchasing procedure (Request for Proposal).
- For an unambiguous specification, Health-RI asks the parties to complete the questions about issues and functionalities in the enclosed table. Health-RI asks to indicate for each item whether your solution supports this by default; if it can be made available as additional work or for an additional fee or whether it is not present. The form also provides space for a brief explanation. Health-RI asks that your

explanation is formulated concisely and to the point and advise to limit it to a maximum of one hundred words. In addition, we expect an accompanying letter of a maximum of two pages.

2.3 Assessment

Health-RI will assess all participants on the submitted documents and rank them based on a substantive score. This assessment will be based on the quality of the information provided and the extent to which this information matches the demand. Based on the scores Health-RI will define the next steps and which parties, if any, Health-RI will ask to submit a more detailed proposal for the next phase. The assessment is based on the following criteria: coverage of the required functionalities; coverage of the optional functionalities; complexity and familiarity of the software platform; sustainability of the software; and sustainability of the business operations.

To create a level playing field, Health-RI will give all parties the opportunity to request further specifications. All questions will be bundled and the answers to the questions will be provided to all parties simultaneously.

2.4 Guiding principles for the market consultation

It should be borne in mind that participation in the market orientation does not infer participation in any other market consultations or purchasing procedure. Participant can't derive any right from this. It is an aid for the Health-RI foundation to be able to draw up the design of any possible follow-up procedure and further define the requirements and wishes in an appropriate manner, considering the most up-to-date knowledge from the market.

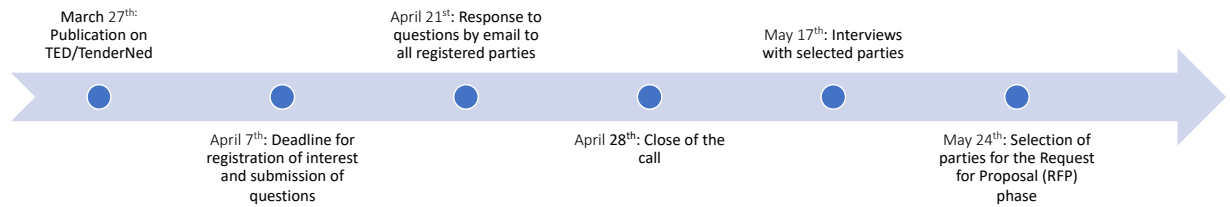
The market orientation should therefore be placed in the following legal framework:

- The market consultation has been published on TED/TenderNed. Outcomes of the market orientation are collected, anonymized, and provided or processed for a purchasing procedure (Request of Proposal).
- By participation in this market orientation, participant agrees to the dissemination of the final management summary with the general results and conclusions that are made by Health-RI at the end of this market orientation. If participant requires that (part of) its response remain confidential, participant needs to indicate this beforehand and clearly mark all confidential documents.
Participant is permitted to formally respond to the findings and conclusions drawn by Health-RI (by e-mail).
- The market orientation will primarily take place in writing by email, but Health-RI can invite participants for an interview at Health-RI's discretion.
- The market orientation is entirely without obligation for the Health-RI foundation: the participants consulted cannot derive any rights whatsoever from participation in this orientation.
- It may be decided later to continue the market orientation, whereby participation is, of course, again entirely voluntary.
- The Health-RI foundation will treat the information provided confidentially. If confidential information is involved, participant can state this in the answer to the question.
- Correspondence and information provided will not be returned afterwards. The information received will be used by the Health-RI foundation, if opportune, to shape its Program of Requirements and Wishes for a purchasing procedure (Request for Proposal). The Health-RI foundation can and may use all or part of the information obtained from the market orientation for a purchasing procedure (Request for Proposal) or drawing up a contract.
- No compensation is provided for participation in the market orientation.
- Orienting questions about pricing models and licensing are part of this market orientation but carry no rights or obligations for any party. Commercial aspects are explicitly not part of this market orientation.
- All communication regarding this market orientation will take place via the e-mail address procurement@health-ri.nl.
- The working language during this consultation is English or Dutch.

This market consultation has been compiled with care. Should you nevertheless encounter contradictions and/or imperfections, please inform the Health-RI foundation.

2.5 Planning

The planning of the process is outlined in the following graph. All planning is tentative and can be adjusted in response to the outcome of the procedure.



After the publication of the market orientation call for information we ask interested parties to register their interest by sending an email to procurement@health-ri.nl. Health-RI offers the opportunity to ask questions by email in the first ten workingdays after publication and Health-RI will answer all the questions in the third week after the publication date to all participating parties.

The call is closed four weeks after publication and interested parties are expected to submit their response before April 28th, 2023 – 5:00 pm Amsterdam time. Health-RI will study the responses and might invite interesting parties for a one-hour interview in the week after that. Two weeks after the close of the call we will inform the participants of the outcome.

2.6 Expected efforts of participating parties

The participants are expected to be prepared to share their specific knowledge on this subject with the Health-RI foundation. The effort will consist of reading this document and studying and answering the questionnaire(s). Participant may then be invited to personally explain its consultation document.

3 Current situation, bottlenecks, issues, and preconditions

3.1 *Description of the current situation*

Within the Netherlands, Europa and worldwide many initiatives have worked towards or even implemented data catalogues and data portals. Within this RFI we won't list them all. Instead, we decided to only describe our own most recent experience. In recent years we developed the COVID-19 portal in response to the emergency. Under pressure from the pandemic, several pragmatic decisions have been taken to quickly create a working product. The solution consists of several parts. 1. CEDAR for defining the metadata templates and input of metadata; 2. The Mendix platform for the website to retrieve, present and search the metadata from CEDAR; 3. Opal as a data repository for data sets. 4. Podium as a system for requesting datasets. The portal is a central platform which displays the harvested (machine readable) data manually entered in metadata forms from CEDAR. This manual data entry in CEDAR is experienced as complex and there are problems with the management of the solution in general. It is the ambition of Health-RI to work based on the lessons learned from the COVID portal, towards a federated platform in which health data is registered at the source as much as possible and made available in the central metadata catalogue for example via local data catalogues or FAIR Datapoints at the Health-RI nodes. Achieving this desired federated architecture and extending existing COVID-19 metadata to cover metadata for datasets from the entire medical/health domain, requires adjustments at all layers of the architecture (including the software currently used).

In the short term we will continue to develop the current solution, but at the same time we want to take a critical look at the best solution for the future in view of the changed wishes and requirements for the solution.

3.2 *Issues*

The solution that we seek for the Health-RI data catalogue should be flexible to fit into the overall architecture of Health-RI. We seek a solution that is built using the principles of Data protection (including Security and Privacy) by Design and by Default, FAIR and a loosely coupled architecture that allows an in and exit strategy per functional component as well as integration with other tools/functional components.

We ask special consideration for the following issues in your solution:

- The software should allow for authentication through federated AAI solutions such as SURF SRAM, LS (Life Sciences) AAI or eIDAS. Can you explain how your solution supports federated AAI solutions?
- We seek a solution that can replace the current COVID-19 portal and fit in with the other components such as the request workflow, without locking in any specific technology. Can you explain if and how your solution integrates with other data related infrastructure/ecosystem solutions (like a request workflow, data access, OpenAI ChatGPT) and for which components you already have integrations with third-party solutions?
- Which open standards does your data catalogue solution use or are proposed to be used?
 - Within Europe there is a preference for the Data Catalog Vocabulary (DCAT). The current version is v2.0, however DCAT v3.0 is expected to be finalized shortly. Which DCAT version is used in your product and how does your solution handle the transition to DCAT v3.0?

- How does the solution integrate locally recorded metadata with metadata from third parties?
- How does your solution handle different levels (e.g., aggregation) and categories (e.g., cohorts, collections, studies, projects) of metadata as well as is able to show/hide specific parts based on terms of use?
- Can you describe the architecture of your solution, both visualisation as well as textual explanation of all the individual components and clearly described interfaces (like APIs) between components?
- Can you describe how all the functionalities can be accessed both via technical interfaces like APIs as well as via a human/graphical user interface?
- Can you describe the user experience inventory of users of your products and the associated results?
- Can you explain the license-structure and costs for usage and support of the solution as well as your Service level Agreement (SLA). What are the one-time costs and what are the yearly fees? Are there any fees that are dependent on volume and/or number of users? Please explain the license structure for the software stack. If your solution uses third-party libraries or products, please, explain by which licenses these products are covered.
- Can you explain the license structure for co-development and/or independent development by the Health-RI team on your product(s)?

3.3 *Preconditions*

Software

Health-RI operates in an international environment that put additional constraints on the solution. We expect that your solution can operate in this environment and will meet the following conditions:

- The ability to read and process data from external catalogues that provide data conforming to the DCAT 2.0 or later specification and DCAT application profiles according to the DCAT 2.0 or later specification.
- Data from external catalogues can be listed along locally entered data and is handled equally to locally entered data.
- The software, user interface and documentation are available in both the Dutch and the English language.
- The software can be hosted by Health-RI itself or a hosting party of Health-RI's choice.

Health-RI seeks to host and further develop the solution (preferably via open development and in co-creation) and expect that the source code of the solution will be made available to Health-RI. We prefer open-source software, but closed-source software components are acceptable when the choice for closed-source is properly motivated. We encourage open development and external contributions.

Business

Health-RI is looking for a partnership with a sustainable company that has a proven track-record in delivering solutions for a data catalogue based on proven solutions and technology as much as possible. The company should have operating offices in the European Economic Area (EEA), preferably also in the Netherlands, and should provide a dedicated contact person to Health-RI.

4 Finally

Health-RI realizes that participation in a market orientation takes time and effort, without the security of gaining a commission. Nevertheless, participation is not only in the interest of the Health-RI foundation. After all a call for proposal with a clear Programme of Requirements and Requests that takes the current market developments and sustainability into consideration offers not only benefits to Health-RI, but also to the participating companies. By providing your knowledge in this request for information you allow the Health-RI foundation to provide a clear Programme of Requirements and Wishes.

On behalf of the project group, we thank you for your contribution.

Attachments:

Market Orientation Feedback Form

Block to address the issues raised in paragraph 3.2

Functional requirements

	Supported	Explanation (max 100 words)
Search functionality Search by name, filtering on basic properties of the dataset. It is possible to 1) search on free text, 2) search on standardized metadata properties and 3) search the data catalogue utilizing ontology-based search using a hierarchical structure, such as SNOMED CT, to allow for more efficient and accurate searches. This includes the ability to search for a concept and retrieve all its descendants in the hierarchy without needing to know every possible variant or term. This will enable users to easily retrieve all	☐ Yes ☐ No ☐ Other, please explain	

relevant information related to a concept, improving the overall usability and accessibility of the data catalogue. The search will return a list of datasets that match the search.		
Request functionality The ability to select one or more datasets and place the selection in a shopping basket to be able to initiate/start a request of these datasets (in a loosely coupled request workflow module)	☐ Yes ☐ No ☐ Other, please explain	
Data catalogue management Administrative access to the data catalogue that unlocks functionality to monitor and manage the service. This includes management of the metadata, management of metadata templates, management of search indices and search engine optimization (SEO).	☐ Yes ☐ No ☐ Other, please explain	
Data catalogue usage dashboard Administrative dashboard to show usage statistics, including search statistics	☐ Yes ☐ No ☐ Other, please explain	
Data holder dashboard A dashboard that provides the data holder insights and management tools. The dashboard allows the data holder	☐ Yes ☐ No ☐ Other, please explain	

to monitor how their datasets are performing in the search; to manage the metadata of the datasets; and access to requests for access to their datasets.		
User dashboard The user dashboard provides a user access to their searches and requests for access to datasets.	☐ Yes ☐ No ☐ Other, please explain	
Request workflow (not the primary scope of this RFI but if available as part of a loosely coupled architecture) A closed loop workflow for handling requests for access to one or more datasets. The workflow manages the requestor facing process. All parties can add documents to the request. From the point of view of a requestor a request that involves multiple organisations is handled as one request.	☐ Yes ☐ No ☐ Other, please explain	
Metadata management service The ability to manage metadata for a dataset, version management, use of metadata templates. Import and export of metadata. Support for DCAT and FAIR data points.	☐ Yes ☐ No ☐ Other, please explain	

Authentication, Authorisation, and Identity Service Support for AAI services such as eIDAS, SURF SRAM and LS-AAI. OpenID Connect / SAML. The management of users and permissions. Please explain the permission model of your data catalogue.	☐ Yes ☐ No ☐ Other, please explain	
Licensing and cost structure		
Are there one-time licensing fees required for your solution?	☐ Yes, please explain ☐ No ☐ Other, please explain	
Are there yearly licensing fees required for your solution	☐ Yes, please explain ☐ No ☐ Other, please explain	
Are there any licensing fees that are based upon volume and/or number of users?	☐ Yes, please explain ☐ No ☐ Other, please explain	
Does your solution depend on third-party software that requires a licensing fee	☐ Yes, please explain ☐ No ☐ Other, please explain	
What are your licensing terms for co-development and/or independent development?	☐ Yes, please explain ☐ No ☐ Other, please explain	
Are there service fees required for your software?	☐ Yes, please explain ☐ No ☐ Other, please explain	

Company information and aspects of sustainability		
Where is your business located	☐ The Netherlands ☐ Other countries within the European Economic Area ☐ Elsewhere	
Dedicated contact person	☐ Yes ☐ No ☐ Other, please explain	
Number of internal developers / external contributors working on the product	☐ Internal developers ☐ External contributors	
For how long the software has been available (specify per component if necessary)		
Link to the software code repository (if publicly available)		
Number of current/active users in The Netherlands and the European Economic Area	☐ The Netherlands ☐ European Economic Area ☐ Elsewhere	