Software Requirements Specification

for

Gaia-X Federation Services

Integration & Portal

Portal
# Table of Content

Table of Content ........................................................................................................ iii
List of Figures ................................................................................................................. iv
List of Tables .................................................................................................................. vi
1 Introduction .................................................................................................................. 1
   1.1 References ............................................................................................................. 1
   1.2 User Classes and Characteristics ........................................................................ 2
   1.3 Abbreviations ........................................................................................................ 3
   1.4 User personas ....................................................................................................... 3
   1.5 Structure tree ....................................................................................................... 7
   1.6 Enterprise Architecture Model ............................................................................. 8
2 User Interfaces .............................................................................................................. 9
   2.1 Home .................................................................................................................. 10
   2.2 Registration process ............................................................................................ 15
      2.2.1 Registration process of an organization ....................................................... 15
      2.2.2 Registration process of a natural person (customer) .................................... 28
   2.3 Login Process .................................................................................................... 39
   2.4 User account ...................................................................................................... 44
      2.4.1 Provider Account ......................................................................................... 44
      2.4.2 Customer Account (Account of a natural person) ....................................... 58
   2.5 Discovery ........................................................................................................... 62
   2.6 Solution packaging ............................................................................................. 87
   2.7 Self-Description ................................................................................................. 96
   2.8 Dashboard ........................................................................................................... 103
   2.9 Admin ................................................................................................................ 107
3 API requirements & Documentation ....................................................................... 112
   3.1 Format ................................................................................................................. 112
   3.2 Latency .............................................................................................................. 112
   3.3 Fairness .............................................................................................................. 112
   3.4 Documentation ................................................................................................... 112
4 General Security Requirements ............................................................................. 113
Appendix A: Glossary ................................................................................................. 114

© 2021. This work is licensed under a [CC BY 4.0 license](https://creativecommons.org/licenses/by/4.0/).
List of Figures

Figure 1: UX Flow Structure Tree .......................................................... 8
Figure 2: Enterprise Architectural Model .................................................. 9
Figure 3: UX Flow Home ........................................................................ 11
Figure 4: Wireframe Home ..................................................................... 12
Figure 5: Wireframe Home Advanced Search .......................................... 13
Figure 6: Wireframe Home Error Message .............................................. 14
Figure 7: UX Flow Registration Process Organization ........................... 17
Figure 8: Wireframe Register Organization Step 1 ................................. 18
Figure 9: Wireframe Register Organization Step 2 ................................... 19
Figure 10: Wireframe Register Organization Step 3 Email-link .................. 20
Figure 11: Wireframe Register Organization Step 3 Submit ..................... 21
Figure 12: Wireframe Register Organization Step 2 Proof of Onboarding Authorization .......................................................... 22
Figure 13: Wireframe Register Organization Step 2 Credentials are missing .......................................................... 23
Figure 14: Wireframe Register Organization Step 2 No DID ..................... 24
Figure 15: Wireframe Register Organization Step 3 Display VC ................ 25
Figure 16: Wireframe Register Organization Step 3 Compliance Check ....... 26
Figure 17: Wireframe Register Organization Registration Status .............. 27
Figure 18: UX Flow Registration Process Participant (Natural Person) ...... 30
Figure 19: Wireframe Register Natural Person Step 1 .............................. 31
Figure 20: Wireframe Register Natural Person Step 2 .............................. 32
Figure 21: Wireframe Register Natural Person Step 3 Email Link .............. 33
Figure 22: Wireframe Register Natural Person Step 3 Submit ................. 34
Figure 23: Wireframe Register Natural Person Step 2 QR-Code ............... 35
Figure 24: Wireframe Register Natural Person Step 2 QR-Code No DID .... 36
Figure 25: Wireframe Register Natural Person Step 3 Display VC ............ 37
Figure 26: Wireframe Register Natural Person Step 3 Completed ............. 38
Figure 27: UX Flow Login process Consumer ....................................... 40
Figure 28: Wireframe Login .................................................................. 41
Figure 29: Wireframe Login Failed ......................................................... 43
Figure 30: UX Flow Provider Account ..................................................... 46
Figure 31: Wireframe Provider Account View Mode ................................ 47
Figure 32: Wireframe Provider Account Edit Mode .................................. 48
Figure 33: Wireframe Provider Account Edit Mode Dialog Upload .......... 49
Figure 34: Wireframe Provider Account Edit Mode Dialog Upload Completed .................................................. 50
Figure 35: Wireframe Provider Account Edit Mode Dialog Remove Account .................................................. 51
Figure 36: Wireframe Provider Account Login History ............................ 52
Figure 37: Wireframe Provider Account Credentials ................................ 53
Figure 38: Wireframe Provider Account Credentials Expanded View Mode .................................................. 54
Figure 39: Wireframe Provider Account Credentials Expanded Edit Mode .................................................. 55

© 2021. This work is licensed under a CC BY 4.0 license.
List of Tables

Table 1: User Classes and Characteristics ................................................................. 3
Table 2: Persona 1: Marion Schwertner (VR) ............................................................... 4
Table 3: Persona 2: Dario Perez (PCR) .................................................................. 6
Table 4: Persona 3: Luc Michaux (PPR) ................................................................. 7
Table 5: Functional Requirements Portal - Orchestration ....................................... 87
1 Introduction

To get general information regarding Gaia-X and the Gaia-X Federation Services please refer to [TAD] and [PRD].

Within the Gaia-X Federation Services Project (GXFS), a Minimal Viable Gaia-X (MVG) as a reference implementation should be designed, implemented, and deployed. The core functionalities offered by the MVG are presented as a portal with a web-based user interface. This will be the main touchpoint for everyone interested in using Gaia-X. To distinguish between different functional levels for the web user interface, there are several defined roles: visitor (VR), participant (PR), and federator (FR). There are two different roles for a PR, that of a consumer (PCR) using Gaia-X offerings and that of a provider (PPR) being able to also offer services and data.

The main functionalities of the Portal are searching, exploring, and displaying content of the Gaia-X Federated Catalogue. You can also register and onboard new PRs. The PR area allows for editing PR details and a special federator section enables the AISBL to access new Gaia-X member’s onboarding information. Eventually, they can approve a registration request and issue verified credentials. A Gaia-X PR can also orchestrate services for instantiation through the portal. This will require PPRs to offer service instantiation templates as part of the service Self Descriptions (SDs) that are accessible through the Federated Catalogue (WP2).

Next to the requirements stated in this document, the requirements regarding the Technical Environment/ Development [TDR] must be also met where applicable.

1.1 References

<table>
<thead>
<tr>
<th>Abbreviation, Title</th>
<th>Description</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>[IDM.AO]</td>
<td>Gaia-X WP1 (2021), Architecture Overview</td>
<td>Please refer to annex “GX_IDM_AO”</td>
</tr>
<tr>
<td>[IP.ORB]</td>
<td>Gaia-X Federation Services Integration &amp; Portal Orchestration</td>
<td>Please refer to annex “SRS_GXFS_IP_ORC”</td>
</tr>
</tbody>
</table>

1 Please refer to appendix B for an overview and explanation of the Work Packages (WP).
### 1.2 User Classes and Characteristics

<table>
<thead>
<tr>
<th>Roles</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Federator (FR)</strong></td>
<td>Federators are legal entities who are entitled to manage a set of Federation Services for the specific Federation according to Gaia-X standards and principles controlled by the AISBL. The AISBL MAY a Federator. A Federator approves Participants requests for accreditation, manages Participants for its specific federation, sends notifications to Participants, assures QoS of the catalogue and can offer an API Gateway to expose publicly available Gaia-X APIs.</td>
</tr>
<tr>
<td><strong>Consumer (PCR)</strong></td>
<td>A role of a Gaia-X Participant with users &amp; devices, searching/ordering services and maintaining a business relationship to Providers. A Consumer consumes Service Instances but can also provide them to their End-Users.</td>
</tr>
<tr>
<td><strong>End-User</strong></td>
<td>A natural person not being Principal, using Gaia-X Service Instances from a Consumer. End-Users own an identity within the Consumer context.</td>
</tr>
<tr>
<td><strong>Participant (PR)</strong></td>
<td>A Participant is a legal person/entity that can take on one or multiple of the following roles: Provider, Consumer</td>
</tr>
<tr>
<td><strong>Principal</strong></td>
<td>Either a natural person or a digital representation which acts on behalf of a Gaia-X Participant.</td>
</tr>
<tr>
<td><strong>Principal@Provider</strong></td>
<td>Principal of a Gaia-X Participant in the context of the Provider role.</td>
</tr>
<tr>
<td><strong>Principal@Consumer</strong></td>
<td>Principal of a Gaia-X Participant in the context of the Consumer role.</td>
</tr>
<tr>
<td><strong>Provider (PPR)</strong></td>
<td>A role of a Participant, responsible for making an Asset available to the Gaia-X ecosystem.</td>
</tr>
<tr>
<td><strong>Visitor (VR)</strong></td>
<td>Anonymous, non-registered entity (natural person, bot, ...) browsing a Gaia-X Catalogue.</td>
</tr>
</tbody>
</table>
A natural person can be part of Gaia-X as a VR or as a PR. To become a participant the person has to be accredited either by a participating organization or by the AISBL as the federator that handles accreditation requests for natural persons that are not associated with any organization.

Table 1: User Classes and Characteristics

| Natural Person (Customer) | A natural person can be part of Gaia-X as a VR or as a PR. To become a participant the person has to be accredited either by a participating organization or by the AISBL as the federator that handles accreditation requests for natural persons that are not associated with any organization. |

1.3 Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DID</td>
<td>Distributed Identifier</td>
</tr>
<tr>
<td>FR</td>
<td>Federator</td>
</tr>
<tr>
<td>PCR</td>
<td>Consumer</td>
</tr>
<tr>
<td>PPR</td>
<td>Provider</td>
</tr>
<tr>
<td>PR</td>
<td>Participant</td>
</tr>
<tr>
<td>SD</td>
<td>Self Description</td>
</tr>
<tr>
<td>SSI</td>
<td>Self Sovereign Identity</td>
</tr>
<tr>
<td>VC</td>
<td>Verifiable Credential</td>
</tr>
<tr>
<td>VR</td>
<td>Visitor</td>
</tr>
</tbody>
</table>

1.4 User personas

Personas were designed to identify characteristics of user groups that are relevant for the specification to the user interface. The results of the persona descriptions are based on assumptions, not on research data.

The users are classified into three groups: VRs, PCRs, and PPRs:

- VRs are not registered in the system and therefore browse the portal unlogged.
- PCRs are registered users who book offers from the catalogue.
- PPRs are also registered users who, in addition to being able to book offers, supply services, or data themselves.

Persona 1: Marion Schwertner (VR)

<table>
<thead>
<tr>
<th>Name</th>
<th>Marion Schwertner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>46</td>
</tr>
<tr>
<td>Language</td>
<td>German</td>
</tr>
<tr>
<td>Location</td>
<td>Darmstadt, Germany</td>
</tr>
<tr>
<td>Archetype</td>
<td>Details oriented, meticulous</td>
</tr>
<tr>
<td>Job domain</td>
<td>Health</td>
</tr>
<tr>
<td>------------</td>
<td>--------</td>
</tr>
<tr>
<td>Job title</td>
<td>Purchasing manager technology &amp; infrastructure</td>
</tr>
<tr>
<td>User group</td>
<td>VR</td>
</tr>
<tr>
<td>User story</td>
<td>As a VR, I want to browse through the Gaia-X Service Catalogue, compare three Services, and decide to book one.</td>
</tr>
<tr>
<td>Tech-savvy</td>
<td>Middle</td>
</tr>
<tr>
<td>Goals/ Motivation</td>
<td>The security in handling our patient data is of central importance. That's why my top priority is a secure and trustworthy data infrastructure.</td>
</tr>
<tr>
<td>Why does the persona register?</td>
<td>As a buyer for technology and infrastructure, the Gaia-X platform provides a selection of trusted cloud offers.</td>
</tr>
<tr>
<td>Why does the persona use the product?</td>
<td>I quickly get an overview of trusted PPRs who have a solution to my problem at hand. I can rely on the information at Gaia-X. That will save me a lot of headaches afterward.</td>
</tr>
<tr>
<td>Needs/ Disabilities</td>
<td>I wear glasses. The font size must fit the detailed technical information. At Gaia-X, information from different PPRs is all listed in the same fashion.</td>
</tr>
<tr>
<td>Frustrations/ Pain Points</td>
<td>I expect clear user guidance and well-structured forms. When text fields have no labels or easy to understand symbols, I just don't get it.</td>
</tr>
</tbody>
</table>

Table 2: Persona 1: Marion Schwertner (VR)

Persona 2: Dario Perez (PCR)

<table>
<thead>
<tr>
<th>Name</th>
<th>Dario Perez</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>56</td>
</tr>
<tr>
<td>Language</td>
<td>Spanish</td>
</tr>
<tr>
<td>Location</td>
<td>Sevilla, Spain</td>
</tr>
<tr>
<td>Archetype</td>
<td>Needs convincing</td>
</tr>
</tbody>
</table>

© 2021. This work is licensed under a CC BY 4.0 license.
<table>
<thead>
<tr>
<th>Job domain</th>
<th>Industry 4.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job title</td>
<td>Assistant Production Line Manager</td>
</tr>
<tr>
<td>User group</td>
<td>PCR</td>
</tr>
<tr>
<td>User story</td>
<td>As a PCR, I would like to find all the provided services of the sector &quot;Industry 4.0&quot;. I would like to be able to filter them according to certain criteria and also save them for my further searches.</td>
</tr>
<tr>
<td>Tech-savvy</td>
<td>High</td>
</tr>
<tr>
<td>Goals/ Motivation</td>
<td>I need to have a fast and cost-effective deployment of services in my processes - without the effort &amp; time to build it ourselves, and with strong security guarantees/aspects and the imminent flexibility in the choice of PPRs /easy of switching PPRs.</td>
</tr>
<tr>
<td>Why does the persona register?</td>
<td>Interest to find and potentially leverage services around analytics, IoT, AI that can help optimize production process - in a secure and trustworthy manner, so my company's competitive advantage (being the pride of the company) is not exposed by the use of such cloud-based services and the corresponding sharing of some company data by using this cloud service (with competing peer organizations in the same industry subsegment).</td>
</tr>
<tr>
<td>Why does the persona use the product?</td>
<td>I believe and expect that Gaia-X can support me in my pursuit of (a) innovative solutions, that can help my company to further strengthen our competitive leadership, combined with (b) our need for a more self-determined approach for the use and sharing of data and services (digital sovereignty) in our industry ecosystem.</td>
</tr>
<tr>
<td>Needs/ Disabilities</td>
<td>While I have a solid technical background, I expect a clear organization and representation of the services and functionalities offered in the UI - in my domain-specific language, as this provides a convincing understanding of my industry context. Focus on a business need, for which supporting underlying capabilities are shown (a &quot;business need pull&quot; view of technology) and not a wide collection of technical capabilities without the direct mapping to the business need (a &quot;technology push&quot; view or &quot;solution in search of a problem&quot; view).</td>
</tr>
</tbody>
</table>
### Frustrations/ Pain Points

I expect explicit and domain-relevant information, no generics, or high abstraction level info only. An immediate and obvious value add to my particular interest is key for my acceptance of the Gaia-X UI. Being impatient by nature, I’ll lose interest and won’t come back if I experience a simple forward linking to generic supplier websites.

Table 3: Persona 2: Dario Perez (PCR)

#### Persona 3: Luc Michaux (PPR)

<table>
<thead>
<tr>
<th>Name</th>
<th>Luc Michaux</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>35</td>
</tr>
<tr>
<td>Language</td>
<td>French</td>
</tr>
<tr>
<td>Location</td>
<td>Paris, France</td>
</tr>
<tr>
<td>Archetype</td>
<td>Quick comprehension</td>
</tr>
<tr>
<td>Job domain</td>
<td>Smart Living</td>
</tr>
<tr>
<td>Job title</td>
<td>Software Developer</td>
</tr>
<tr>
<td>User group</td>
<td>PPR</td>
</tr>
<tr>
<td>User story</td>
<td>As a PPR, I want to register my services quickly and easily and receive feedback if I have made a mistake.</td>
</tr>
<tr>
<td>Tech-savvy</td>
<td>High</td>
</tr>
<tr>
<td>Goals/ Motivation</td>
<td>Gaia-X finally allows me and my company to offer our services transparently and securely in Europe.</td>
</tr>
<tr>
<td>Why does the persona register?</td>
<td>I register to Gaia-X to provide our services in single data infrastructure.</td>
</tr>
<tr>
<td>Why does the persona use the product?</td>
<td>I have been waiting for a long time for a European alternative to the American hyperscalers.</td>
</tr>
<tr>
<td>Needs/ Disabilities</td>
<td>I expect the Gaia-X system to give me direct feedback on my actions. Being a software developer myself, I pay special attention to this. I want the content in the portal to load quickly so that I don’t lose time to reach my goal. Since I want to offer all our services via the portal, I expect a clear presentation and management.</td>
</tr>
</tbody>
</table>

© 2021. This work is licensed under a CC BY 4.0 license.
Frustrations/ Pain Points

| I get annoyed when input errors are not described correctly, let alone not even listed. |

Table 4: Persona 3: Luc Michaux (PPR)

Derived requirements

The following requirements can be derived from the persona-description of Marion Schwertner:
- The offers shall have a visual feature that indicates their certification and security.
- The font size shall be at least 14 pixels.
- The font and background color shall have high contrast.
- The presentation of information details shall be consistent for services, data sets, and PPRs.
- Forms shall be structured.
- Text fields shall always contain placeholder text
- Text fields shall have a label that is visible at least when the mouse focuses the input.
- Icons and icon buttons shall have a descriptive tooltip.

The following requirements can be derived from the persona-description of Dario Perez:
- The deployment of services or data sets should be done in two ways: automatically by the PPR or manually by the PCR.
- It shall be marked if a PPR change of services and or data set is allowed.
- The information on the offers shall not be generic.

The following requirements can be derived from the persona-description of Lux Michaux:
- The system shall provide asynchronous and synchronous feedback on user actions.
- The system shall provide asynchronous feedback by sending email notifications.
- The system shall provide synchronous feedback by using dialogs and input helper texts.

Other requirements:
- To guarantee the accessibility of the portal, the development of the interface shall be done according to WCAG 2.1 standard\(^2\).
- The portal shall be accessible in different languages and support UTF-16. Therefore, an easy-to-handle translation process shall be implemented. The default language is English.

1.5 Structure tree

The Gaia-X Portal includes the following core functions:
- Registration process
- Login process
- User account
- Discovery
- Solution packaging
- Self-Description
- Dashboard

\(^2\) [https://www.w3.org/TR/WCAG21/](https://www.w3.org/TR/WCAG21/)
The structure tree is used to create an overview of all pages, subpages, and sections relevant to the portal. At the navigation level, the pages are divided into header and side navigation. Based on the role level, they are organized into a VR, logged-in PR and FR.

![Structure tree](image)

**Figure 1: UX Flow Structure Tree**

### 1.6 Enterprise Architecture Model

The Enterprise Architectural Model is a schematic depiction of the portal components and their relationship to each other. The workflow engine serves as a central orchestration mechanism to mediate between the service functions and to manage the sequence of necessary steps to handle a specific task.

Each functional service consists of a microservice that provides the actual programming logic to process a request. This microservice is interacting with a user interface on a screen via an API. The user can access and interact with the service using this screen-based interface. There are a varying number of service functions that a specific service provides, like uploading, editing, sorting, or searching. The sum of these functions and their graphical representation on the screen make up the portal.

The Architectural Model consists of these services:

---

3 The Workflow Engine will be developed separately

© 2021. This work is licensed under a [CC BY 4.0 license](http://creativecommons.org/licenses/by/4.0/).
- The Workflow Engine Service as an overall orchestrator.
- The Discovery service to search for services, providers, and datasets.
- The Dashboard service to manage and monitor service usage.
- The Solution Packaging Service to create and edit service solutions consisting of services that work together to provide a more comprehensive solution.
- The User Account Service to manage PR profiles.
- The Onboarding Service to manage participant registration and accreditation.
- The SD Service to enter and edit SD of all assets in Gaia-X.
- The Compliance Service to handle the notary service process for AISBL based Verifiable Credential (VC) assignment (based on the Self Sovereign Identity (SSI) process).

![Enterprise Architectural Model](image)

**Figure 2: Enterprise Architectural Model**

## 2 User Interfaces

The user interfaces are described based on the core functions. This section includes a description of the use case, the goal, input and output, the main scenario, pre-conditions, steps, and post-conditions. Also, a UX flow and wireframes with the corresponding API input and outputs are presented for better illustration.
2.1 Home

The portal's home page offers VRs to start a search query or explore new assets or topics related to Gaia-X.

Name
Home

Goal
The system shall allow VRs to search directly from the home page.
The system shall allow VRs to get to know what's new in the Gaia-X Portal.
The system shall allow VRs to learn more about Gaia-X in general.

Input
- Search
  - Text field
  - Advanced button
  - Clickable chips
- Links to new assets (services, data, PPRs)
- Links to articles

Output
- Search query is passed to the system.
- Links direct to the “about Gaia-X” pages.
- Links direct to external websites.

Main Scenario
A VR wants to search for a PPR located in a certain country.

Pre-condition
The VR must be connected to the system with a supported web browser.

Steps
- The VR enters the URL in his browser.
- The VR enters the portal through the home screen.
- The VR clicks on the advanced button next to the search field.
- The system displays chips that the VR can click on to compose a search query.
- The VR first clicks on “provider”.
- “Provider” appears in the search field.
- The list of chips updates based on the chip selected.
- The VR clicks on “located in”.
- “Located in” appears in the search field.
- The list of chips updates based on the chip selected.
- The VR clicks on “Country”.

© 2021. This work is licensed under a CC BY 4.0 license.
● “Country” appears in the search field.
● The VR submits the search query.

Post-condition
The VR is directed to the PPR page with a list of search results.

Exceptional Scenario
In case the VR has entered a search term that could not be found in the system, a corresponding message will be displayed.

UX Flow
The following figure shows the UX Flow of home. Each step is illustrated as a screen. The arrows display the connections between the screens.

Wireframes and API
The following wireframes show a schematic representation of the content required for the home screens. To display the content, a screen size of 1440 x 1024 pixels is assumed here.

The layout of the portal is as follows:
The header is located on top. It contains three buttons: Register, login, and a help menu. If a PR is logged in, the registration and login buttons are hidden and replaced by the PRs avatar. The help menu contains the language picker, the support and about page.
The page navigation bar is positioned on the left. The following elements can be found in it: The Gaia-X logo, home, services, data, and PPR buttons. If the PR is logged in, provide and dashboard buttons are also displayed. If a FR is logged in, only the admin button is displayed.

The content area of the home page has a maximum width of 960 pixels. All other pages have a maximum width of 1280 pixels.

**Home**

The welcoming and the search field are located at the top left. The search field gets such a prominent position because searching is the main action of the home screen. Below one can find the “What’s new” and the “What is Gaia-X” section.

This search bar is intended to search for Gaia-X services.

![Figure 4: Wireframe Home](image)

**API**

- **API input**
  - n/a

- **API output**
  - “What’s new” information (text, images, etc.)

**Home – Advanced search**

By clicking on the advanced button next to the search field, the chips area is displayed below the input.
Welcome to GAIA-X
A Federated Data Infrastructure for Europe

Search

What’s new

What is GAIA-X?

API

- **API input**
  - n/a
- **API output**
  - category filter (for services)

© 2021. This work is licensed under a [CC BY 4.0 license](https://creativecommons.org/licenses/by/4.0/).
Home – Error message

In case the VR enters a search term that could not be found in the database, an error message is displayed.

Figure 6: Wireframe Home Error Message

**API**

- **API input**
  - search term, filter list

- **API output**
  - (paginated) service list (with all information needed according to the wireframes) with service id per line.
2.2 Registration process

The registration process includes the onboarding of an organization on the one hand and the onboarding of a natural person on the other. For detailed information please see the [IDM.AO].

2.2.1 Registration process of an organization

The registration process of an organization involves a person belonging to the organization and who is authorized acting on behalf of the organization.

There are two ways to register an organization:

1. In the first case, the person has no DID and therefore no VC. They must first have these created by an Identity Provider (IdP) or the FR. After acquiring both, the onboarding process can continue. The FR issues the PR credentials, when the compliance check was successful. The organization is then registered.

2. In the second case, the authorized person has already a DID for which VC have been entered. In this so-called express registration, the onboarding request must only be recognized by the FR.

Name

Registration Process: Participant (organization)

Goal

The system shall allow authorized persons, belonging to an organization, register their organizations.

Input

- Wizard steps
- PPR radio button
- Customer radio button
- Submit button
- Upload button
- Organization text field
- Email address text field
- Registration via DID button
- QR code for proof of onboarding authorization
- I don’t have a DID button
- List of Identity Providers

Output

- If the organization has to request VC first, the output by the FR would be VC.
- If the organization has a valid DID and entered VC, the FR issues PR credentials for the organization, after accepting the onboarding request.
Main scenario

An organization wants to register to act as a PPR.

Pre-condition

The VR must be connected to the system with a supported web browser. He must have valid documents of his organization (e.g. commercial register excerpt, certifications).

Steps

**Process 1 – Request of VC and DID creation**

In this process the VR has to create VC at the FR and a DID.

- The VR has access to the registration on every screen of the system.
- The VR clicks on the register button.
- The VR is shown the registration screen.
- The VR selects “provider” as his future role within Gaia-X.
- The VR submits.
- The VR uploads his organization details (e.g. commercial register excerpt, certifications).
- The VR enters his organization’s name and email address.
- The VR submits.
- The VR gets an email with a confirmation link.
- The VR confirms his email address.
- The system informs him that the FR will issue a DID with VC.
- The FR gets the request of DID and VC.
- The FR checks the organization’s details within the Notary Service.
- The FR accepts the notarization.
- The FR issues organization VC’s and a DID.
- The FR sends the onboarding status via email.
- The VR clicks on the link provided in the email.
- The VR gets to the “Proof of onboarding authorization”.
- The VR scans the QR code.
- The system checks if the organization has VC.
- The VR is shown the VC.
- The VR submits.
- The system informs him about the pending compliance check by the FR.
- The VR enters his email address to receive status updates of his onboarding.
- The FR gets the onboarding request.
- The FR accepts the request.
- The FR issues PR credentials on the organization’s DID.
- The FR sends the onboarding status via email.

**Process 2 – Registration via DID**

In this process the VR has VC and a DID.

- The VR has access to the registration on every screen of the system.
- The VR clicks on the register button.
- The VR is shown the registration screen.
- The VR selects “provider” as his future role within Gaia-X.
- The VR submits.
- The VR clicks on “Registration via DID”
- The VR is shown a QR code, which he has to scan to prove that he is an authorized person acting on behalf of his organization.
- The system checks if the organization has VC.
- The VR is shown the VC.
- The VR submits.
- The system informs him about the pending compliance check by the FR.
- The VR enters his email address to receive status updates of his onboarding.
- The FR gets the onboarding request.
- The FR accepts the request.
- The FR issues PR credentials on the organization’s DID.
- The FR sends the onboarding status via email.

**Post-condition**

The organization is registered. The VR is now a PPR.

**UX Flow**

The following figure shows the UX flow of the registration process of an organization. Each step is illustrated as a screen. The arrows display the connections between the screens.

*Figure 7: UX Flow Registration Process Organization*
Wireframes and API

The following wireframes show a schematic representation of the content required for the registration process screens. To display the content, a screen size of 1440 x 1024 pixels is assumed here. The registration process is presented within a dialog. It is divided into two areas:

On the left are the Gaia-X logo and a welcome message for brand recognition. Underneath, space is provided for descriptions of each step. The steps are placed directly to the right. Thus, they contribute to the visual separation of the two areas.

In the right area, all elements required for the current registration step are positioned. Each step starts with a headline that informs the user what to do to move forward in the registration process. To do this, at least one button to continue is provided at the bottom right of the dialog.

**Registration Process – Step 1 – Select registration type**

The VR is requested to select the registration type: PPR or Customer.

![Figure 8: Wireframe Register Organization Step 1](image-url)
Registration Process – Step 2 – Supply organization details

The VR wants to become a PPR. For this, the VR must upload details of his organization, specify the organization name and a valid email address. On submit the notary service of the FR will be triggered.

![Figure 9: Wireframe Register Organization Step 2](image)

**API**

- **API input**
  - SD (file upload)
  - organization name
  - Email address
  - “apply for AISBL membership”-flag

- **API output**
  - “success” or error codes (e.g. in case of validation errors)
Registration Process – Step 3 – Confirmation link

After the VR has successfully uploaded and entered the data, the VR gets an email with a confirmation link, on which he has to click.

Figure 10: Wireframe Register Organization Step 3 Email-link
Registration Process – Step 3
After confirming the email address, the system informs the VR that the FR will check the uploaded documents to issue VC and a DID. When the FR has issued both, the VR will receive a confirmation email with a link that redirects him to the proof of onboarding authorization.

![Wireframe Register Organization Step 3 Submit](image)

**Figure 11: Wireframe Register Organization Step 3 Submit**

**API**

- **API input**
  - unique ID (from the link in the mail)

- **API output**
  - “success” or error codes (e.g. in case the unique ID is invalid or expired)
    - In the success case the API has to start the backend onboarding process.
Registration Process – Step 2 – Proof of onboarding authorization
If the VR clicks on the link in the email or on the “Registration via DID” button (Step 2 – Supply organization details, page 21), he will be asked to scan a QR code. Here the onboarding Procura credentials are requested.

![Image of QR code](image)

*Figure 12: Wireframe Register Organization Step2 Proof of Onboarding Authorization*

**API**

- **API input**
  - n/a

- **API output**
  - QR-Code
  - link for browser-based DID wallet
  - Poll URL or Session to check status of QR-Code Flow
Registration Process – Step 2 – Credentials are missing
If no Procura credentials are available, the system displays a dialog with the message below.

![Message dialog](image)

Figure 13: Wireframe Register Organization Step2 Credentials are missing

API

- **API input**
  - session information

- **API output**
  - info whether sufficient VCs are available

© 2021. This work is licensed under a [CC BY 4.0 license](https://creativecommons.org/licenses/by/4.0/).
Registration Process – Step 2 – No DID

If the VR does not have a DID and clicks on the "I don't have a DID" button, he will be provided with a list of IdP. Once he has selected an IdP, he should follow the instructions on the external website.

![Figure 14: Wireframe Register Organization Step 2 No DID](image)

API

- **API input**
  - n/a

- **API output**
  - DID service PPR list containing name, logo and link
Registration Process – Step 3 – Display organization’s details
If the VR has a DID on which VC are issued, his VC are displayed in the next step.

Figure 15: Wireframe Register Organization Step 3 Display VC

API

- **API input**
  - session information
- **API output**
  - organization details from VCs
Registration Process – Step 3 – Message regarding compliance check

The VR has to fill in his email address to receive status updates. His onboarding request will be checked by the FR. After clicking on the finish button, the VR gets directed to the home page.

![Wireframe Register Organization Step 3 Compliance Check](image)

**Figure 16: Wireframe Register Organization Step 3 Compliance Check.**

**API**

- **API input**
  - Email address
  - DID or session information

- **API output**
  - n/a
Registration Process – Registration status
The VR gets this message, if he has already triggered the compliance check.

Figure 17: Wireframe Register Organization Registration Status

API

- **API input**
  - DID

- **API output**
  - registration status
2.2.2 Registration process of a natural person (customer)

As part of the registration process of a natural person (customer), VRs who do not belong to any organization can also register.

Name
Registration process: Natural person (Customer)

Goal
The system shall allow VRs to register themselves as natural persons (customers).

Input
- Wizard steps
- PPR radio button
- Customer radio button
- Submit button
- First name text field
- Last name text field
- Email address text field
- Address text field
- Phone number text field
- Registration via DID button
- QR code
- I don’t have a DID button
- List of IdP

Output
- If the natural person (customer) has to request VC, the output by the FR would be issued VC.
- If the natural person (customer) has already a DID with entered VC, the output would be a successful registration.

Main Scenario
A natural person wants to register as a customer.

Pre-condition
The natural person must be connected to the system with a supported web browser.

Steps

Process 1 – Request of VC and DID creation
In this process the VR has to create VC at the FR and a DID at a IdP.

- The VR has access to the registration on every screen of the system.
• The VR clicks on the register button.
• The VR is shown the registration screen.
• The VR selects “customer” as his future role within Gaia-X.
• The VR submits.
• The VR enters his account details.
• The VR submits.
• The system informs him that the FR will issue VC.
• The FR gets the request of VC.
• The FR checks the account details within the Notary Service.
• The FR accepts the notarization.
• The FR issues VC’s.
• The FR sends the onboarding status via email.
• The VR clicks on the link provided in the email.
• The VR gets to the QR code.
• The VR clicks on the I don’t have a DID button.
• The VR is shown a list of IdP.
• The VR selects one and creates VC externally.
• The VR returns to the QR code screen.
• The VR scans the QR code with his wallet app.
• The system shows the VC.
• The VR finishes the onboarding.

Process 2 – Registration via DID
In this process the VR has VC and a DID.

• The VR has access to the registration on every screen of the system.
• The VR clicks on the register button.
• The VR is shown the registration screen.
• The VR selects “customer” as his future role within Gaia-X.
• The VR submits.
• The VR clicks on “Registration via DID”
• The VR is shown a QR code.
• The VR scans the code with his wallet app.
• The system checks if he has VC.
• The VR is shown the VC.
• The VR finishes the onboarding.

Post-condition
The VR is successfully onboarded as a customer.
UX Flow

The following figure shows the UX flow of the registration process for a natural person. Each step is illustrated as a screen. The arrows display the connections between the screens.

Figure 18: UX Flow Registration Process Participant (Natural Person)
Wireframes and API
The following wireframes show a schematic representation of the content required for the registration process of a natural person screens. To display the content, a screen size of 1440 x 1024 pixels is assumed here.

Registration Process – Step 1 – Select registration type
The VR is requested to select the registration type: PPR or Customer.

![Wireframe Register Natural Person Step 1](image-url)
Registration Process – Step 2 – Supply account details

The VR wants to become a customer. For this, the VR must enter its account details. On submit the system ends an email with a confirmation link.

![Figure 20: Wireframe Register Natural Person Step 2]

API

- **API input**
  - first name
  - last name
  - Email address
  - Street and number
  - ZIP and country
  - phone number

- **API output**
  - “success” or error codes (e.g. in case of validation errors)
Registration Process – Step 3 – Confirmation link

After the VR has successfully entered the data, he gets an email with a confirmation link, on which he has to click.

Figure 21: Wireframe Register Natural Person Step 3 Email Link
Registration Process – Step 3
After confirming the email address, the system informs the VR that the FR will check the uploaded documents to issue VC and a DID. When the FR has issued the VC and a DID, the VR will receive a confirmation email with a link that redirects him to the QR code scan.

![Wireframe Register Natural Person Step 3 Submit](image)

**Figure 22: Wireframe Register Natural Person Step 3 Submit**

**API**

- **API input**
  - unique ID (from the link in the mail)

- **API output**
  - “success” or error codes (e.g. in case the unique ID is invalid or expired)
    - In the success case the API has to start the backend onboarding process.
Registration Process – Step 2 – QR code scan
If the VR clicks on the link in the email or on the registration via DID button (Step 2 – Supply account details, page 33), he will be asked to scan a QR code.

![Wireframe Register Natural Person Step 2 QR-Code](image)

Figure 23: Wireframe Register Natural Person Step 2 QR-Code

### API

- **API input**
  - n/a

- **API output**
  - QR-Code
  - link for browser-based DID wallet
  - Poll URL or session to check status of QR code flow
Registration Process – Step 2 – No DID

If the VR does not have a DID and clicks on the "I don't have a DID" button, he will be provided with a list of IdP. Once he has selected an IdP, he should follow the instructions on the external website.

![Wireframe Register Natural Person Step 2 QR-Code No DID](image)

**Figure 24: Wireframe Register Natural Person Step 2 QR-Code No DID**

**API**

- **API input**
  - n/a

- **API output**
  - DID service PPR list containing name, logo and link
Registration Process – Step 3 – Display account details

If the VR has a DID on which VC are issued, his VC are displayed in the next step.

Figure 25: Wireframe Register Natural Person Step 3 Display VC

API

- **API input**
  - session information

- **API output**
  - account details from VCs
Registration Process – Last step – Onboarding completed
In the last step, the system provides a “Onboarding completed” message. From there the customer can navigate to the login screen.

Figure 26: Wireframe Register Natural Person Step 3 Completed
2.3 Login Process

To book an offering, the PR must be logged in under the premise that he has a valid account. To login, the PR can scan the provided QR code with his smartphone. His mobile wallet app opens and verifies his credentials.

The PR can alternatively click on a login button. If so, his browser wallet extension opens and verifies his credentials.

This process is implemented using SSI, which follows the Identity management from WP1\(^4\). After the system has verified the credentials successfully, the PR gets access to book the offers.

Name
Login

Goal
The system shall allow PRs and natural persons to login.

Input
- QR code
- Login button
- Register button
- FAQ & Support button

Output
The PR or natural person is either told that his login credentials are invalid or that his login has been successful.

Main Scenario
A PR wants to book a service. Before he can do so he has to login to the system.

Pre-condition
The PR must be connected to the system with a current web browser. The PR must also have a valid account.

Steps
- The PR has access to the login on every screen of the system.
- The PR clicks on login.
- The PR is shown the login screen.
- The PR either scans the QR code with his mobile device or clicks on the login button.
- The system checks the PRs VC.
- The PR is successfully logged in.

\(^4\) Please refer to appendix B for an overview and explanation of the Work Packages (WP).
Post-condition
The PR is granted access to the system.

Exceptional Scenario
In the case that the PR does not have a valid account, he will be denied access to the system. The error message will only specify that the PCR has no valid account.

UX Flow
The following figure shows the UX Flow of the login process. Each step is illustrated as a screen. The arrows display the connections between the screens.

Figure 27: UX Flow Login process Consumer
Wireframes and API

The following wireframes show a schematic representation of the content required for the login process screen. To display the content, a screen size of 1440 x 1024 pixels is assumed here.

Login Process

In the center of the login screen is a dialog in which the elements required for the user login are placed. The Gaia-X logo and welcome greeting contribute to brand recognition. As a subheading, the PCR or PPR is asked to log in. Underneath, the PR finds a QR code which he can scan and a button to login. In case he has no valid account, he can navigate to the registration page by clicking on the provided register button.

Below the login dialog is a link to the FAQ & Support page.

---

**Figure 28: Wireframe Login**

API Step 1 (QR-Code)

- **API input**
  - n/a

- **API output**
  - QR-Code
  - link for browser-based DID wallet

© 2021. This work is licensed under a [CC BY 4.0 license](https://creativecommons.org/licenses/by/4.0/).
API Step 2 (Login successful)

- **API input**
  - DID Auth Information

- **API output**
  - Session/token
  - rights set of the authenticated user
Login Process – Login failed

When the PR clicks on the login button but has no wallet browser extension installed, the system provides the error message: “You need to install a wallet browser extension to login with your credentials.”

Figure 29: Wireframe Login Failed

API

- **API input**
  - DID Auth Information
- **API output**
  - error code
2.4 User account

The user account is separated into PPR account and account of a natural person (customer account).

2.4.1 Provider Account

A registered and logged in PPR has access to his account details. On the account page, he can view and edit his data. If the PPR changes his data, he needs to upload a new SD, which is released via an accreditation process by the FR.

Another feature is the login history. The PPR can view a detailed list, including date and time of past logins.

Furthermore, a PPR can manage his employee’s rights.

Name
Provider Account

Goal
The system shall allow PPRs to view and edit their personal account, furthermore to upload a new SD.

Input

View mode:
● Edit button

Edit mode:
● Close button
● Save button
● Cancel button
● Upload SD button

Output

In case of a newly uploaded SD, the document is checked in the background using the accreditation procedure. The PPR is then informed about the correctness or incompleteness.

Main Scenario
A PPR wants to update his SD.

Pre-condition
The PPR must be connected to the system with a supported web browser. The PPR must also have a valid account. The PPR has filled out a valid SD.

Steps
● The PPR has access to his account on every screen of the system.
● The PPR clicks on his avatar in the header.
● A menu opens.
● The PPR clicks on “My Account”.

© 2021. This work is licensed under a CC BY 4.0 license.
● The PPR is shown the account screen.
● The PPR clicks on the edit button.
● The PPR clicks on the upload SD button.
● A dialog opens.
● The PPR chooses his SD from the file system.
● The PPR clicks on OK.
● The SD is sent to the FR.
● The FR checks the SD.
● The FR approves the SD.
● An email notification is sent to the PPR.
● The PPR sees his new SD in his account.

Post-condition
After the FR has approved the new SD, the PPR sees his new SD attributes in his account.

Exceptional scenario
If the FR declines the new SD, an email notification is sent to the PPR.
UX Flow

The following figure shows the UX Flow of the PPR account. Each step is illustrated as a screen. The arrows display the connections between the screens.

Figure 30: UX Flow Provider Account
Wireframes and API

The following wireframes show a schematic representation of the content required for the PPR account screens. To display the content, a screen size of 1440 x 1024 pixels is assumed here. Also, the PPR account screen consists of a panel with three tabs.

Provider Account – Details – View mode

The first tab “Details” displays the account information. It contains a preview of the profile picture and all filled-in mandatory fields as well as optional fields that the PPR can still fill in. To enter the edit mode, the PPR must click on the edit button. It is located in the upper right corner of the panel.

API

- **API input**
  - DID Auth Information
  - DID

- **API output**
  - Account data (Id, email, name, avatar, link, ...)

---

© 2021. This work is licensed under a [CC BY 4.0 license](https://creativecommons.org/licenses/by/4.0/).
Provider Account – Details – Edit mode
When switching to the edit mode, the PPR can upload a new SD by clicking on the upload self-description button.

![Wireframe Provider Account Edit Mode](image)

**Figure 32: Wireframe Provider Account Edit Mode**

**API**

- **API input**
  - DID Auth Information
  - DID
  - Account data (Email, name, avatar, link, ...)

- **API output**
  - Account data (Email, name, avatar, link, ...)

© 2021. This work is licensed under a [CC BY 4.0 license](https://creativecommons.org/licenses/by/4.0/).
Provider Account – Details – Edit mode – Upload SD

A dialog opens where the PPR can choose his SD from his file system.

Figure 33: Wireframe Provider Account Edit Mode Dialog Upload
Provider Account – Details – Edit mode – Upload SD

After the SD has been successfully uploaded, the PPR gets the message that the AISBL first has to approve the SD. After the approval, the SD will be added to the catalogue.

![Image: Wireframe Provider Account Edit Mode Dialog Upload Completed]

Figure 34: Wireframe Provider Account Edit Mode Dialog Upload Completed

API

- **API input**
  - SD
  - DID Auth Information

- **API output**
  - Upload and verification status
Provider Account – Details – Edit mode – Remove Account

To remove his account, the PPR must press the remove account button in edit mode. A dialog will be called, which he must confirm.

Figure 35: Wireframe Provider Account Edit Mode Dialog Remove Account

API

- **API input**
  - DID Auth Information

- **API output**
  - removal status
Provider Account – Details – Login history

The second tab shows the login history in tabular form. The table consists of three columns: Date, time, and PPR name.

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.12.2020</td>
<td>10:45 am</td>
<td>Provider Name</td>
</tr>
<tr>
<td>14.12.2020</td>
<td>10:45 am</td>
<td>Provider Name</td>
</tr>
<tr>
<td>14.12.2020</td>
<td>10:45 am</td>
<td>Provider Name</td>
</tr>
<tr>
<td>14.12.2020</td>
<td>10:45 am</td>
<td>Provider Name</td>
</tr>
<tr>
<td>14.12.2020</td>
<td>10:45 am</td>
<td>Provider Name</td>
</tr>
<tr>
<td>14.12.2020</td>
<td>10:45 am</td>
<td>Provider Name</td>
</tr>
<tr>
<td>14.12.2020</td>
<td>10:45 am</td>
<td>Provider Name</td>
</tr>
</tbody>
</table>

Figure 36: Wireframe Provider Account Login History

API

- **API input**
  - DID Auth Information

- **API output**
  - Login history (List of (Id, date, time, name) triples ordered by time)
Provider Account – Credentials – Default view

In the credentials tab, the PPR can manage the users who should have access to the Gaia-X system and act on behalf of the registered organization. A table with the users already entered is displayed.

![Figure 37: Wireframe Provider Account Credentials](image)

**API**

- **API input**
  - DID Auth Information

- **API output**
  - List of all users belonging to the PPR account (Name, role)
Provider Account – Credentials – View mode
If the PPR clicks on the chevron at the end of the line, the entry is expanded and further details such as the first name, last name, email address, and role are displayed.

Figure 38: Wireframe Provider Account Credentials Expanded View Mode

API
- **API input**
  - DID Auth Information
- **API output**
  - List of all users belonging to the PPR account (Name, role)
Provider Account – Credentials – Edit mode

To edit an entry, the PPR must click on the edit button at the bottom right. The read-only text fields will change to editable text fields. The PPR can save his changes, cancel them, or delete the entry permanently.

Figure 39: Wireframe Provider Account Credentials Expanded Edit Mode

API Step 1 (load)

- API input
  - DID Auth Information
  - User Id

- API output
  - List of roles
  - User data (Id, first name, last name, email, role)

API Step 2 (save)

- API input
  - DID Auth Information
  - Changed user data (Id, first name, last name, email, role)

- API output
  - Save status

© 2021. This work is licensed under a CC BY 4.0 license.
Provider Account – Credentials – Edit mode – Remove user

When removing a user, a dialog opens which has to be confirmed.

Figure 40: Wireframe Provider Account Credentials Expanded Edit Mode Remove User Dialog
Provider Account – Credentials – Add user

To create a new user, the PPR must click on the add button at the top right. A new row will be appended to the existing table at the bottom. The empty text fields must now be filled in and saved.

![Figure 41: Wireframe Provider Account Credentials Expanded Add User](image)

**API**

- **API input**
  - DID Auth Information
  - New user data (First name, last name, email, role)

- **API output**
  - Created user data
2.4.2 Customer Account (Account of a natural person)

A registered and logged in natural person has access to his account details. On the account page, he can only view his data. The customer can’t edit his account details. If he wants to do that, he has to change his VC at his IdP.

Another feature is the login history. The customer can view a detailed list, including date and time of past logins.

Name
Customer Account

Goal
The system shall allow customers to view their personal account.

Input
- Read-only text fields of VC

Output
--

Main Scenario
A customer wants to see his account details.

Pre-condition
The customer must be connected to the system with a supported web browser. The customer must also have a valid account. And he has to be logged in.

Steps
- The customer has access to his account on every screen of the system.
- The customer clicks on his avatar in the header.
- A menu opens.
- The customer clicks on “My Account”.
- The customer is shown the account screen.

Post-condition
The customer has seen his account data.
UX Flows

The following figure shows the UX Flow of the customer account. Each step is illustrated as a screen. The arrows display the connections between the screens.

Figure 42: UX Flow Customer account (Natural person)
Wireframes and API

The following wireframes show a schematic representation of the content required for the PCR account. To display the content, a screen size of 1440 x 1024 pixels is assumed here.

Customer Account – Details

The first tab “Details” displays the account information. It contains an avatar with the first letter of the PCR’s name and all attributes of its VC.

![Customer Account Wireframe]

Figure 43: Wireframe Customer Account

API

- **API input**
  - DID Auth Information

- **API output**
  - Account data (Id, email, name, avatar, link)
Customer Account – Login history

The second tab shows the login history in tabular form. The table consists of two columns: date and time.

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.12.2019</td>
<td>10:41 am</td>
</tr>
<tr>
<td>14.12.2020</td>
<td>10:41 am</td>
</tr>
<tr>
<td>14.12.2019</td>
<td>10:41 am</td>
</tr>
<tr>
<td>14.12.2020</td>
<td>10:41 am</td>
</tr>
<tr>
<td>14.12.2019</td>
<td>10:41 am</td>
</tr>
<tr>
<td>14.12.2020</td>
<td>10:41 am</td>
</tr>
<tr>
<td>14.12.2019</td>
<td>10:41 am</td>
</tr>
<tr>
<td>14.12.2020</td>
<td>10:41 am</td>
</tr>
<tr>
<td>14.12.2019</td>
<td>10:41 am</td>
</tr>
</tbody>
</table>

Figure 44: Wireframe Customer Account Login History

API

- **API input**
  - DID Auth Information

- **API output**
  - Login history (List of (ID, date, time, name) triples ordered by time)
2.5 Discovery

A PR can either enter a simple search term (e.g., "storage") as a search query or make a complex search query (e.g., "storage located in France") that is executed in the background using an ontology. The PR can compose a complex search query based on terms dynamically suggested by the ontology.

The search results can then be customized using various filter criteria. Filtering the search results narrows down the search result list.

Each search result contains information that should enable the PR to identify particular differentiators at a glance. To see all details of an offer, the search result can be expanded.

Name
Discovery

Goal
The system shall allow PRs to search for a service, data set, or PPR, select filters and view detailed information of its search result.

Input
- Search
  - Text field
  - Advanced button (not visible on the home screen)
  - Clickable chips
- Filter categories that are dynamically loaded using the SD could be:
  - Location
  - Industry
  - Price range
  - Protocol
  - Regulation
  - Service / data provided by

The following attributes are shown in a basic service or data set search result:
- Service or data set name
- PPR logo
- PPR name
- PPR location
- Security
- Protocol
- API

The following attributes are shown in a PPR search result:
- PPR logo
- PPR name
The user can expand the search result to discover more. Each search result has different tabs that bundle information.

The search result of a basic service has the following tabs:

- **Details**
  Detailed information from the SD is displayed, such as preview image, description, features, tags, category, stack, security, location of the PPR, availability, sustainability, last updated, terms of use

- **Price**
  The pricing model from the SD is displayed. The user can book the service. The presentation of the price description needs a detailed specified procurement model. Since this has not yet been elaborated, it is advisable to hide the price tab.

- **Screenshots**
  Screenshots of the service or data set are displayed as a carousel.

- **Contact**
  Contact information of the PPR such as technical email address and phone number and support email address and phone number are displayed.

The tabs of a composite service differ in the detail tab:

- **Details**
  In addition to the data of a basic service, the services included in the solution package are listed. Furthermore, the user can navigate to the solution packaging (builder) in order to replace the included services.

The search result of a PPR has the following tabs:

- **Details**
  Detailed information from the SD is displayed, description, certificates, location, last updated, member since, availability, sustainability

- **Services**
  All services supplied by the PPR are listed.

- **Data**
  All data sets supplied by the PPR are listed.

- **Contact**
  Contact information such as technical email address and phone number and support email address and phone number are displayed.

The search result of data set has the following tabs:

- **Details**
  Detailed information from the SD is displayed, short description, description, tags, category, location of the PPR, data set source, frequency of updates, last updated, terms of use, cloud service
- **Price**
  The pricing model from the SD is displayed. The user can book the data set. The presentation of the price description needs a detailed specified procurement model. Since this has not yet been elaborated, it is advisable to hide the price tab.

- **Sample record**
  Samples of the data set is displayed.

- **Contact**
  Contact information of the PPR such as technical email address and phone number and support email address and phone number are displayed.

**Output**

The search query is passed to the system and the corresponding results are displayed. The PR can refine the search results list using filters. Each selection of filters affects the appearance, the list is narrowed down accordingly.

**Main Scenario**

A VR wants to search for GDPR compliant AI services whose PPRs are located in a certain country.

**Pre-condition**

The VR must be connected to the system with a supported web browser.

**Steps**

- The VR accesses the home page of the portal.
- The VR enters the search query “AI service” in the search field.
- The VR presses the enter key on his keyboard.
- The system searches for the query.
- The system navigates to the services page.
- The search result list contains only elements that include an “AI” in their name or are tagged with the keyword “AI”.
- The filter configuration indicates that “AI” is selected under “Categories”.
- The VR selects “GDPR” under “Regulation” in the filter configuration.
- The system narrows down the search result list.
- The VR selects “Country” under “Location” in the filter configuration.
- The system narrows down the search result list.
- The VR expands a service to see its details.
- The VR clicks on the screenshots tab to view the screenshots of the service.

**Post-condition**

The VR has successfully searched for an AI service considering the selected filters.

**Exceptional Scenario**

The system gives feedback to the user if the term he is looking for could not be found.
UX Flow

The following figure shows the UX Flow of the discovery. Each step is illustrated as a screen. The arrows display the connections between the screens.

Figure 45: UX Flow Discovery
Wireframes and API

The following wireframes show a schematic representation of the content required for the discovery screens. To display the content, a screen size of 1440 x 1024 pixels is assumed here.

Discovery – Home – Enter search query

The VR is initially on the home page. There he enters his search term into the search field.

Figure 46: Wireframe Discovery Home Enter Search Query

API (1)

- **API input**
  - n/a

- **API output**
  - “What’s new” information

API (2)

- **API input**
  - n/a

- **API output**
  - category filter (for services)
Discovery – Services

After confirming the search query with the enter key, the VR navigates to the services page. The services page consists of two areas. The left column contains the filter selection options. The filter criteria are summarized by category headings. The blocks can be expanded and collapsed individually. The filters are selected via the checkboxes. The number positioned on the right edge of the line shows the amount of available services.

In the middle, the VR will find a search field. Below that, all services are listed vertically using tiles. In this use case, a search query has already been made, so the services found are shown accordingly. Each result tile contains the SD attributes defined under "Input". The details button expands the tiles. Composite services are distinguished from basic services by two vertical lines on the left side of the tile.

Figure 47: Wireframe Discovery Service

API (step 1, filter list)
- **API input**
  - n/a
- **API output**
  - category filter

API (step 2, service list)
- **API input:**
  - search term, filter list

© 2021. This work is licensed under a CC BY 4.0 license.
API output:
  ○ (paginated) service list (with all information needed according to the wireframes) with service id per line.

Discovery – Provider

If the VR searches for a PPR, he will be redirected to the PPR page. Here, the filter bar will also be visible on the left and the PPR search results list in the center. A PPR search result differs in that other relevant attributes appear, as illustrated here “Sustainability” and “Availability”. Furthermore, only the PPR name is displayed, and no URL. The link to the PPR website is made via the logo.

![Figure 48: Wireframe Discovery Provider](image)

API (step 1, filter list)
  ● API input
    ○ n/a
  ● API output
    ○ category filter

API (step 2, PPR list)
  ● API input
    ○ search term, filter list
  ● API output
○ (paginated) PPR list (with all information needed according to the wireframes) with PPR id per line.

**Discovery – Data**

![Wireframe Discovery Data](image)

**Figure 49: Wireframe Discovery Data**

API (step 1, filter list)
- API input
  - n/a
- API output
  - category filter

API (step 2, data list)
- API input
  - search term, filter list
- API output
  - (paginated) data list (with all information needed according to the wireframes) with data id per line.
Discovery – Basic service – Details – expanded

If the VR expands a basic service, he first sees the details tab. Available SD attributes are displayed here (see "Inputs").

Figure 50: Wireframe-Discovery-Service-Basic-Expanded-Details

API

- **API input**
  - service id

- **API output**
  - service details (including dependent services)
Discovery – Provider – Details – expanded

**Figure 51: Wireframes Discovery Provider Expanded Details**

**API**

- **API input**
  - PPR id

- **API output**
  - PPR details
Discovery – Data – Details – expanded

Figure 52: Wireframe Discovery Data Expanded Details

API

- **API input**
  - data id

- **API output**
  - data details
Discovery – Basic service – Price – expanded

In the price tab can be found price information. Furthermore, the book button is located here.

Figure 53: Wireframe Discovery Service Basic Expanded Price

API

- **API input**
  - service id

- **API output**
  - service price information
Discovery – Provider – Services – expanded

![Diagram of a wireframe for a service discovery interface](image)

**Figure 54: Wireframe Discovery Provider Expanded Services**

**API**

- **API input**
  - PPR id

- **API output**
  - (paginated) servicelist (with all information needed according to the wireframes) of services from this PPR
Discovery – Data – Price – expanded

In the data asset SD is stored whether the participant is allowed to book the asset or to request it first. Depending on this, the button is adjusted.

![Diagram of Discovery Data Expanded Price]

**Figure 55: Wireframe Discovery Data Expanded Price**

**API**

- **API input**
  - data id

- **API output**
  - data price information

If the participant can book the data asset, the "Making a Contract API" is triggered. If the participant can only request, the "Contract Negotiation API" is triggered.
Discovery – Basic service – Screenshots – expanded

Service screenshots can be viewed in the third tab. The images are displayed based on a carousel.

![Wireframe Discovery Service Basic Expanded Screenshots](image)

**Figure 56: Wireframe Discovery Service Basic Expanded Screenshots**

**API**

- **API input**
  - service id

- **API output**
  - service screenshots
Discovery – Provider – Data – expanded

Figure 57: Wireframe Discovery Provider Expanded Data

API

- **API input**
  - PPR id

- **API output**
  - (paginated) data-list (with all information needed according to the wireframes) of data from this PPR
Figure 58: Wireframe Discovery Data Expanded Sample Record

API

- **API input**
  - data id

- **API output**
  - data sample records
Discovery – Basic service – Contact – expanded

The last tab contains the contact information of the provider.

Figure 59: Wireframe Discovery Service Basic Expanded Contact

API

- **API input**
  - service id

- **API output**
  - service contact list
## Discovery – Provider – Contact – expanded

![Wireframe Diagram](image)

**Figure 60: Wireframe Discovery Provider Expanded Contact**

### API

- **API input**
  - PPR id

- **API output**
  - PPR contact list

© 2021. This work is licensed under a [CC BY 4.0 license](https://creativecommons.org/licenses/by/4.0/).
Discovery – Data – Contact – expanded

Figure 61: Wireframe Discovery Data Expanded Contact

API

- **API input**
  - data id

- **API output**
  - data contact list
**Discovery – Composite service – Details – expanded**

The details tab of a composite service differs from the basic service in that it shows the additional services that are included in the solution package. At the bottom right is the build button, which is used to navigate to the solution packaging tool.

---

**Figure 62: Wireframe Discovery Service Composite Expanded Details**

**API**

- **API input**
  - service id

- **API output**
  - service details (including dependent services)
Discovery – Composite service – Price – expanded

In the price tab can be found price information. Furthermore, the book button is located here.

Figure 63: Wireframe Discovery Service Composite Expanded Price

API

- **API input**
  - service id

- **API output**
  - service price information
Discovery – Composite service – Screenshots – expanded

Service screenshots can be viewed in the third tab. The images are displayed based on a carousel.

![Diagram of Discovery Service Composite Expanded Screenshots]

**Figure 64: Wireframe Discovery Service Composite Expanded Screenshots**

### API

- **API input**
  - service id

- **API output**
  - service screenshots
Discovery – Composite service – Contact – expanded
The last tab contains the contact information of the PPRs.

Figure 65: Wireframe Discovery Service Composite Expanded Contact

API

- **API input**
  - service id

- **API output**
  - service contact list
Discovery – No results found
In case the system couldn’t find any results, a message is displayed. This also applies to the PPR and data page.

Figure 66: Wireframe Discovery Service Error

API

API exists because of normal search flow.
2.6 Solution packaging

Solution packaging provides an interface with selection and combination functions for grouping services for the catalogue to address specific use cases. Requirements with regards to the portal can be found in Table 5. For further understanding of the packaging and orchestration process please refer to [IP.ORC].

<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-CRUD-1</td>
<td>The Portal MUST be able to fetch logs, current state, and access information of the GX Service from the LCM Engine.</td>
</tr>
<tr>
<td>P-CRUD-2</td>
<td>The Portal MUST be able to communicate with the LCM Engine to request the creation of GX Services using the orchestration instructions provided by the PPR, if provided</td>
</tr>
<tr>
<td>P-CRUD-3</td>
<td>The Portal MUST be able to communicate with the LCM Engine to request the update of GX Services using the orchestration instructions provided by the PPR, if provided</td>
</tr>
<tr>
<td>P-CRUD-4</td>
<td>The Portal MUST be able to communicate with the LCM Engine to request the deletion of GX Services.</td>
</tr>
<tr>
<td>P-DT-1</td>
<td>Before booking a GX service, the Portal MUST suggest LCM Services which support the deployments technologies supported by the GX service.</td>
</tr>
<tr>
<td>P-DT-2</td>
<td>Before booking a solution packaging, the Portal MUST suggest LCM Services which support the deployments technologies supported by each one of the GX services inside the packaging.</td>
</tr>
<tr>
<td>P-DT-3</td>
<td>The PCR MUST be able to choose from this list his/her preferred LCM service for each different GX Service.</td>
</tr>
<tr>
<td>P-Man-1</td>
<td>The PCR MAY decide not to use an LCM Service for the management of the GX Service. In that case, the management of the GX Service is done manually by the PPR.</td>
</tr>
<tr>
<td>P-Form-1</td>
<td>For each GX service, the Portal MUST be able to prepare a form for the PCR to add or modify the default deployment configuration provided by the PPR in the Self-Description file for the GX Service.</td>
</tr>
<tr>
<td>P-Form-2</td>
<td>This form MUST validate each given input with the metadata read from the GX Service's Self-Description.</td>
</tr>
</tbody>
</table>

Table 5: Functional Requirements Portal - Orchestration
The system shall allow PRs to manage services in existing solution packages, save and book them.

Input

- Used service slots
  - Each slot has a remove button
- Free service slots
  - Each slot has an add button
- Search text field
- Filter
- Service carousel
  - Each carousel has forward and back buttons
  - Each service in the carousel has a details button
  - Each service in the carousel has a select button
- Details dialog
  - Close button
  - Select button
- Save button
- Book button
- Reset button
- Dialog for assigning solution package name
  - Name text input
  - Save button

Output

After compiling services, a new solution package is created and saved in the PRs dashboard.

Main Scenario

A PR wants to book a composite service. After seeing its details, he wants to add two services to the solution package.

Pre-condition

The PR must be connected to the system with a supported web browser. The PR must also have a valid account. And he has to be logged in.

Steps

- The PR accesses the home page of the portal.
- The PR navigates to the services page.
- The PR selects various filters.
- The PR expands a composite service to see its details.
- The PR sees the services that are included in the solution package.
- The PR clicks on the build button.
- The system navigates to the solution packaging screen.
- The PR clicks on the add button in the first slot.
- The “select your service” section appears.
● The carousel loads 6 new services.
● The PR selects “GDPR” under “regulation” in the filter configuration.
● The service carousel updates the items.
● The PR clicks on the details button of a service.
● A dialog opens with the detailed service description.
● The PR clicks on the select button.
● The dialog closes.
● The selected service appears in the second slot of the composite service.
● The PR clicks on the add button in the third slot.
● The carousel loads 8 new services.
● The PR enters “AI” in the search text field.
● The carousel updates its items.
● The PR selects an AI service.
● The selected service appears in the third slot of the composite service.
● The PR clicks on the save button.
● A dialog opens.
● The PR enters a name for his solution package.
● The PR clicks on the save button.
● The system saves the solution package in his dashboard.
● The PR is now able to book the saved solution package via his dashboard.

Post-condition
The PR has customized the composite service according to his wishes and can book it after successfully saving it.

Exceptional Scenario
If the executing user is a VR, he can customize the solution package but not save it.

UX Flow
The following figure shows the UX Flow of the solution packaging. Each step is illustrated as a screen. The arrows display the connections between the screens.

![Solution Packaging](image)

*Figure 67: UX Flow Solution Packaging*
Wireframes and API

The following wireframes show a schematic representation of the content required for the solution packaging screens. To display the content, a screen size of 1440 x 1024 pixels is assumed here.

Solution Packaging – Builder – Step 1

The first screen shows the composite service in a detailed form. The SD attributes and the associated services are displayed with the available services in each case. The actions book, save and reset are located at the bottom right of the panel.

Figure 68: Wireframe Solution Packaging Step 1

API

- **API input**
  - service id

- **API output**
  - service details (with information about type of dependent services)
  - number of available services per dependent service
Solution Packaging – Builder – Step 2

The entire area below the panel appears if the PR clicks on the add button of the second slot. When the PR clicks on the add button of the second slot, the entire area below the panel appears.

![Diagram of Solution Packaging Step 2]

Figure 69: Wireframe Solution Packaging Step 2

API

- No specific API required
- APIs for service search are reused
Solution Packaging – Builder – Step 2 – Details dialog

By clicking on the details button of a service, a dialog opens with its details. The PR can choose to either close the dialog or select the service for the slot.

![Wireframe Solution Packaging Step 2 Dialog Details](image)

**Figure 70: Wireframe Solution Packaging Step 2 Dialog Details**

**API**

- No specific API required

- APIs for service search are reused
Solution Packaging – Builder – Step 3
After selecting the service, it appears in the second slot of the composite service. The number of available services to replace decreased from 6 to 5.

Figure 71: Wireframe Solution Packaging Step 3
Solution Packaging – Builder – Step 4

The PR clicks on the add button of the third slot. The service carousel updates its items. He selects one of the services and it is displayed in the third slot.

Figure 72: Wireframe Solution Packaging Step 4

API

- No specific API required
- APIs for service search are reused
Solution Packaging – Builder – Step 4 – Save dialog

Whether booking or saving, a dialog opens first in which the PR must assign a name to the composite service. The system saves the composite service in the PRs dashboard.

![Wireframe Solution Packaging Step 4 Dialog Name](image)

API

- **API input**
  - name of solution package
  - configuration of solution package (IDs of chosen services)

- **API output**
  - n/a
2.7 Self-Description

Self-Description represents the management of SDs for all PPRs, nodes, services, and data assets in the system. The registration of SDs is done via a data upload which is accompanied by a plausibility check on the data field level.

Name
Self-Description

Goal
The system shall allow PPRs to offer services, nodes, and data assets.

Input
- Provide service button
- Provide data button
- Provide node button
- Upload SD button
- Wizard steps
- Back button
- Continue button
- Show mandatory only toggle
- Read-only text fields with filled in SD attributes
- Go to dashboard button

Output
After the approval by the FR, the service or node or data SD is available.

Main Scenario
A PPR wants to supply a service.

Pre-condition
The PPR must be connected to the system with a supported web browser. He must also have a valid account. And he needs to be logged in.

Steps
- The PPR accesses the Service registration by clicking on the provide button in the side navigation bar.
- The PPR clicks on provide service in the first step.
- The PPR clicks on the upload button to upload his service SD.
- The system displays all SD attributes in read-only text fields.
- The PPR clicks on the send button.
- The SD is sent to the admin area of the FR.
- The FR has to approve the SD.

© 2021. This work is licensed under a CC BY 4.0 license.
● After the approval, the service SD is available via the catalogue and the PPR has access to it via his dashboard.

Post-condition
After the FR has approved the service SD, the service is available in the catalogue.

Exceptional Scenario 1
After uploading the service SD, the system displays all attributes in read-only text fields. The PPR can now toggle the view to all mandatory fields. If some mandatory fields were missed to fill in, the system provides visual feedback. The PPR can’t send the SD. He has to upload an updated version if it’s SD.

Exceptional Scenario 2
If the service registration is denied by the FR, the PPR will be informed via email.

Exceptional Scenario 3
If a PPR wants to edit SDs he has to navigate to his dashboard. All SDs are available there. When clicking on the edit button he gets directed to the provide page. There he is asked to upload a new SD.
UX Flow

The following figure shows the UX Flow of the self-description. Each step is illustrated as a screen. The arrows display the connections between the screens.

Figure 74: UX Flow Self-Description
Wireframes and API

The following wireframes show a schematic representation of the content required for the self-description screens. To display the content, a screen size of 1440 x 1024 pixels is assumed here.

Self-Description – Provide

The PPR must click on "Provide" in the left navigation bar to register a service, node, or data set. The system will ask him what he wants to provide.

![Wireframe Self-Description Provide](image)

Figure 75: Wireframe Self-Description Provide

API

- **API input**
  - n/a
- **API output**
  - n/a
Self-Description – Provide – Step 1

In the first step, the PPR is requested to upload his service, node, or data set SD.

![Figure 76: Wireframe Self-Description Provide Template Step 1](image)

**API**

- **API input**
  - PR id, self-description

- **API output**
  - n/a
Self-Description – Provide – Step 2

After uploading the document, the text fields are filled in with the provided data from the SD. Since the attributes are divided into different categories, several steps are displayed in the wizard. It ensures clarity. On the last preview of the SD, the PPR must click on the send button.

![Figure 77: Wireframe Self-Description Provide Template Step 2](image)

**API**

- **API input**
  - PR id, self-description

- **API output**
  - n/a
Self-Description – Provide – Final step

When all mandatory fields have been filled in, the SD is sent to the admin area of the FR, who has to approve it. After the approval the PPR finds his services, nodes, or data sets in the dashboard.

Figure 7B: Wireframe Self-Description Provide Template Step Final

API

- **API input**
  - PR id, self-description

- **API output**
  - n/a
2.8 Dashboard

The dashboard is a representation of all active and inactive offers that a PR accesses in the system. It contains a monitoring feature of his booked services, data sets, or solution packages. The PR is greeted with a welcome message to personalize the dashboard. The date and time are also displayed. Furthermore, there is an area where all his recent transactions are listed. The system provides news and the latest offers to emphasize the marketing aspect of the portal.

Name
Dashboard

Goal
The system shall allow PRs to get an overview of their booked offers and to retrieve monitoring data.

Input
If available the dashboards displays the following sections:
- My services
- My data sets
- My solution packages
- Reporting
- News
- My transactions
- Organization link: directs to the user account (if the logged in user is a natural person, the organization link is not displayed)
- Activate button
- Edit button (only visible for PPRs)
- Sort select input

Output
- Activation of asset
- If clicking on the edit button as a PPR, the system redirect to the provide page.
- Booking of saved solution package

Main Scenario
A PR wants to activate a service.

Pre-condition
The PR must be connected to the system with a supported web browser. He must also have a valid account with which he has already booked a service. And he needs to be logged in.

Steps
- The PR navigates to his dashboard by clicking on the dashboard button in the side navigation bar.
- The PR clicks on the activate button which is located in his booked service card.
Post-condition
The PR can access the offer after he has activated it.
UX Flow

The following figure shows the UX Flow of the dashboard. Each step is illustrated as a screen. The arrows display the connections between the screens.

Figure 79: UX Flow Dashboard
Wireframes and API

The following wireframes show a schematic representation of the content required for the dashboard. To display the content, a screen size of 1440 x 1024 pixels is assumed here.

Dashboard

The dashboard is divided into three sections:
On the left side, the PR will find personal data, such as his name, his last transactions, and the time and date.
In the middle, all his booked services, data sets, solution packages, and related statistics are displayed.
On the right side, he will find news about the Gaia-X portal.
In this case, the PPR sees booked services/data sets and own services/datasets. Own assets are recognizable by the edit button at the bottom right of the asset card. Furthermore, the assets have no traffic light icon to show whether the asset is activated or not.

![Figure 80: Wireframe Dashboard](image-url)
2.9 Admin

The administration serves the FR to keep track of request for participation, approval of participation, managing PR interaction, assign/approve PR credentials and additionally track QoS of SD.

Name
Admin

Goal
The system shall allow FRs to see an overview of all Gaia-X PRs.
The system shall allow FRs to accept onboarding requests, issue VCs and release SDs.

Input
- PRs button
- Management button
- Filter
  - PPR checkbox
  - PCR checkbox
  - Natural person checkbox
  - PR credentials checkbox
  - VC checkbox
  - SD checkbox
  - Checkboxes for all locations found in the database
- List items
  - Details button on list items
  - Approve button
  - Deny button
  - Attachment preview button
- Sort by select input

Output
After the FR issues PR credentials to the organizations, the organization's onboarding is completed.
After the FR issues organizations VC, organizations can continue their registration process.
After the FR has approved the SDs, they are published in the catalogue.

Main Scenario
A FR wants to issue PR credentials to an organization.

Pre-condition
The FR must be connected to the system with a supported web browser. The FR must also have a valid account.
Steps

- The FR accesses the admin area by clicking on the admin button in the side navigation on the left.
- The FR navigates to the management area by clicking on the management button.
- The FR selects “participant credentials” in the filter section.
- The FR expands a list entry from the request list.
- The FR reviews the provided organization data.
- The FR clicks on the approve button.

Post-condition

The FR has successfully issued PR credentials to the organization. The organization receives an email notification. The organization can now login.
UX Flow

The following figure shows the UX Flow of the admin user interface. Each step is illustrated as a screen. The arrows display the connections between the screens.

Figure 81: UX Flow Admin
Wireframes and API

The following wireframes show a schematic representation of the content required for the admin screens. To display the content, a screen size of 1440 x 1024 pixels is assumed here. The admin area is divided into two sections. On the left side, two buttons navigate to the list or the management. Below are filter options. In the middle, either the list or the management area is displayed.

Admin – List of PRs

The first screen of the admin area shows a list of all Gaia-X PRs. The FR can expand a list item to view more details about the PR.

![Figure 82: Wireframe Admin Participants](image)

API (step 1, load filters)
- API input
  - n/a
- API output
  - filter list

API (step 2, load PRs)
- API input
  - filters
- API output
  - (paginated) PR list (with all information needed according to the wireframes)
Admin – Management

The second screen shows the management. It includes onboarding requests, the notary service and SD approval. All items can be filtered. Expanding an entry, allows the FR to either issue PR credentials, issue organization VC or approve SDs. The SD attributes and attachments depend on what the future participant has uploaded. The required uploads depend on the requirements defined by WP45.

---

Figure 83: Wireframe Admin Management

API (step 1, load filters)

- API input
  - n/a

- API output
  - filter list

API (step 2, load onboarding requests)

- API input
  - filters

- API output
  - (paginated) onboarding requests list (with all information needed according to the wireframes)

---

5 Please refer to appendix B for an overview and explanation of the Work Packages (WP).
API requirements & Documentation

There are some general requirements on the provided APIs to make them usable by the Portal.

3.1 Format

The APIs should be REST APIs accessible via http(s). The responses should be formatted as JSON.

In case of errors, the specific reason should be signaled by the appropriate HTTP status code. If applicable, an additional error code should be provided in the response body.

If an endpoint can potentially return more than one item, there should be a mechanism to paginate the requested items.

3.2 Latency

To provide a great user experience, the API calls have to return their results within a specific time. Unless otherwise stated, 98% of the requests issued to a specific endpoint should complete within 500ms.

3.3 Fairness

In case any measures regarding fairness have to be taken, this has to be done by the APIs. For example, this could mean randomizing the order of the result items.

3.4 Documentation

For every API endpoint, there should exist at least human-readable documentation. All supported query parameters and all possible response types (including all error codes) should be described.

Documentation MUST be provided for the usage of the Workflow Engine and the Business Process Management as well as for the deployment, configuration and operation of the same. It MUST allow users and developers to understand the mode of operation of the Workflow Engine and its configuration as well as the operation during runtime. Same for the business process management. It MUST be easily understandable to further develop add-ons, as well as integrate and connect into a wider systems landscape via APIs. It MUST also allow a business user to understand how to start and use the Workflow Engine and Business Process Management.

Documentation MUST be provided for each of the relevant components. It MUST also allow a user to understand how to develop a client or a server using the respective API specifications.
The documentation MUST follow best practices in the software engineering field, such as keeping language simple, using plain English, explaining technical terms and jargon if they must be used, and making sure that individual needs are catered.

Further requirements regarding the documentation can be found in [TDR].

4 General Security Requirements

The Portal MUST meet the requirements stated in the document “Specification of non-functional Requirements Security and Privacy by Design” [SPBD].
Appendix A: Glossary
The glossary is part of the Gaia-X Architecture Document [TAD].

Appendix B: Overview GXFS Work Packages
The project “Gaia-X Federation Services” (GXFS) is an initiative funded by the German Federal Ministry of Economic Affairs and Energy (BMWi) to develop the first set of Gaia-X Federation Services, which form the technical basis for the operational implementation of Gaia-X.

The project is structured in five Working Groups, focusing on different functional areas as follows:

Work Package 1 (WP1): Identity & Trust
Identity & Trust covers authentication and authorization, credential management, decentralized identity management as well as the verification of analogue credentials.

Work Package 2 (WP2): Federated Catalogue
The Federated Catalogue constitutes the central repository for Gaia-X Self-Descriptions to enable the discovery and selection of Providers and their Service Offerings. The Self-Description as expression of properties and Claims of Participants and Assets represents a key element for transparency and trust in Gaia-X.

Work Package 3 (WP3): Sovereign Data Exchange
Data Sovereignty Services enable the sovereign data exchange of Participants by providing a Data Agreement Service and a Data Logging Service to enable the enforcement of Policies. Further, usage constraints for data exchange can be expressed by Provider Policies as part of the Self-Description.

Work Package 4 (WP4): Compliance
Compliance includes mechanisms to ensure a Participant’s adherence to the Policy Rules in areas such as security, privacy transparency and interoperability during onboarding and service delivery.

Work Package 5 (WP5): Portal & Integration
Gaia-X Portals and API will support onboarding and Accreditation of Participants, demonstrate service discovery, orchestration and provisioning of sample services.
All together the deliverables of the first GXFS project phase are specifications for 17 lots, that are being awarded in EU-wide tenders:

Further general information on the Federation Services can be found in [TAD].