



WP4 INTERLINK Platform

D4.5- Final release of INTERLINK platform and community portal



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Glossary

| ENTRY | DEFINITION |
|--|---|
| INTERLINKERs | Common building blocks, provided as software tools or in the form of knowledge offered digitally, that represent interoperable, re-usable, EU-compliant, standardized functionality for the co-production of public services |
| Public Service | Services that are publicly available and are provided by the government or on behalf of the government's residence in the interest of its citizens. In INTERLINK we focus not only on the software services (i.e., the services delivered digitally) but also the services that rely on digital technologies. |
| Software Platform / INTERLINK Platform | <p>A platform is a group of technologies that are used as a base upon which other applications, processes or technologies are developed.</p> <p>In other words, a platform is the basic hardware (computer) and software (operating system) on which software applications can be run. This environment constitutes the basic foundation upon which any application or software is supported and/or developed.</p> <p>Within the context of the INTERLINK project, we define a as a set of data storage, backend services and APIs which serve as a basis for the business logic and frontend applications to develop, integrate and function. It also includes software deployment and operational infrastructure.</p> |
| Software Backend | Is part of software services and/or applications running on server side within the client-server paradigm. It mostly dedicates to data storage, business logic, process workflow and utility functions |
| Software Frontend | Is part of the software services and/or applications running on the client side within the client-server paradigm. It mostly focuses on graphical user interface (GUI), workflow navigations and supporting business logic |
| Software API | API means Application Programming Interface, a type of software interface, offering a service to other pieces of software. |



ACRONYMS

| ABBREVIATED | EXTENDED |
|-------------|--|
| API | Application Programming Interface |
| CI/CD | Continuous Integration / Continuous Deployment |
| CE | INTERLINK Collaborative Environment |
| CEF | Connecting Europe Facility |
| CSV | Comma-separated values |
| DEMO | Staging Environment |
| eTOPIA | City of Zaragoza's Centre for Art and Technology |
| EU | Europe / European |
| GDPR | General Data Protection Regulation |
| KPI | Key Performance Indicator |
| PA | Public Administration |
| SaaS | Software as a Service |
| SOC | Service Offering Canvas |
| VARAM | Latvian Ministry of Regional Development |
| WP | Work Package |
| ZGZ | City of Zaragoza |



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Executive summary

This deliverable represents the final release of INTERLINK platform, including the community web portal ready for transfer and exploitation beyond the end of the project.

Modifications done to the platform and infrastructure compared to the second release of the platform (described in deliverable D4.3) are detailed in **Chapter 2**.

Updates to the implemented INTERLINK Community Web Portal are reported in a separate **Chapter 3** as it corresponds to Task T4.4 of the WP4 of the Project. Main updates are described under section 3.3 where the INTERLINK Collaborative Environment is illustrated.

1 Introduction

1.1 Introduction

INTERLINK is designed as a collaborative software system, which consists of numerous software components.

This deliverable describes the final release of the integration including the community web portal ready for transfer and exploitation beyond the end of the project. The document builds upon D4.3 and D4.4, first and second release of INTERLINK platform respectively, and includes the last modifications done to the platform for its final release within the project duration.

1.2 Related documents and contents

During the project, many conceptual and architectural deliverables have been created, which build the basis for the INTERLINK platform. The following enumeration lists the most relevant of them. Each of them describes aspects, which apply to a single component or idea in much greater detail. We will refer to those documents where necessary, notably:

- D4.1 (FBK, R, M6) - List and description of the socio-technical requirements. The initial list and description of the socio-technical requirements defined in T4.1.
- D3.1 (FBK, R, M10) - Identification and specifications of INTERLINKERS. Specifications of common building blocks for INTERLINK inclusive public services and their specification.
- D4.2 (TREE, OTHER, M12) - Reference architecture model and specification. The reference architecture model and specifications as defined in T4.1.
- D5.1 (DEUSTO, R, M12) - Use-case plans and guidelines v1. Result of T5.2, this document contains the specification of the use-case plan, including purpose and background, objectives and evaluation criteria, strategy, prerequisites, assumptions, risks, personnel and responsibilities, organisation, site description, methodology, schedule and test result collection. It also describes the associated trial evaluation plan and KPIs. Two releases are planned, one for each phase.
- D5.2 (VARAM, R, M12) - Community building and preliminary use-cases activities. Result of T5.3, this document contains the plan for building a community for the users and stakeholders in all the use-case sites, including details about the communication channels and contents.
- D2.1 (RU, R, M16) - Preliminary governance model. This report will include a literature review and a preliminary governance model identifying relevant variables and conditions. The model will also take into account the comparative analysis of successful and unsuccessful cases of co-production.
- D2.3 (RU, R, M16) - Governance performance indicators. This document will be a list of operationalized, non-technical performance indicators, to be used in T5.2 to develop KPI for the evaluation of the platform.



- D2.4 (CNS, R, M16) – Co-business model specification and analysis. This report will briefly describe the alternative co-business models considered for INTERLINK, present analysis results identifying the strengths and weaknesses of each candidate model and specify the best co-business model to be supported by the INTERLINK platform.
- D3.2 (FBK, OTHER, M16) - Initial repository of INTERLINKERs and partnership tools. This deliverable will provide an initial repository of common core INTERLINK enablers (INTERLINKERs) to foster Government as Platform model, and of public-private partnership governing tools such as partnership models, templates, and guidelines. The initial repository will cover a subset of the enablers targeted at the first use-case validation.
- D4.3 (TREE, OTHER, M18) - First release of INTERLINK platform and community portal. Description of the first release of INTERLINK platform, including the community portal, guidelines for instantiation and specific instantiations in the three use-cases ready for the first validation phase.
- D5.3 (DEUSTO, R, M21) - Use-case deployment and operation report v1. Details on the result of T5.4 and contains INTERLINK platform evaluation results obtained after each of the two phases of use-cases. It will report on the effort and strategy use for the deployment and the running of use-case operations.
- D5.4 (DEUSTO, R, 24) - Use-case plans and guidelines v2. Result of T5.2, this document contains the specification of the use-case plan, including purpose and background, objectives and evaluation criteria, strategy, prerequisites, assumptions, risks, personnel and responsibilities, organization, site description, methodology, schedule and test result collection. It also describes the associated trial evaluation plan and KPIs. Two releases are planned, one for each phase.
- D4.4 (TREE, DEUSTO, FBK, M28) - Second release of INTERLINK platform and community portal.
- D3.3 (FBK, OTHER, M32) - Final repository of Interlinkers and partnership tools. This deliverable provided an update to compile the final repository to that initially described in D3.2.
- D5.5 (DEUSTO, R, 33) - Use-case deployment and operation report v2. This document is the result of T5.4 and contained the INTERLINK platform evaluation results obtained after each of the two phases of use-cases. It reported on the effort and strategy use for the deployment and the running of use-case operations.

2 INTERLINK Platform and Infrastructure

The aspects detailed in deliverable D4.3 and D4.4 in relation to the structuring and use of GitHub, as well as the various CI/CD components, have not undergone any changes. Similarly, the components that were detailed in subsections 2.1.1 “Software Repository”, 2.3 “Task and Incident Management”, and 2.4 “The Servers Deployed”, along with 2.2.1 “Software Development and Deployment Procedures” remain unaltered, while some modifications have been done to the details of section 2.2 “Infrastructure Platform Components which are detailed below.

Infrastructure Platform Components

Deliverable D4.4 contemplated the use of Matomo which was ultimately discarded due to its failure to meet technical requirements. After a more detailed examination of Matomo, it was determined that it would not be included in the final architecture, because although it had the potential for providing advantages, there were a number of obstacles preventing the stabilisation of the solution. Furthermore, the process of incorporating new features into Matomo was not as smooth as expected, in consequence its effectiveness for INTERLINK project had to be reconsidered. An important factor in reaching this decision was that the key performance indicators (KPIs) needed could already be obtained without relying on the data provided by Matomo. Hence, in our endeavour to uphold a less complex and more streamlined structure, the choice to relinquish the use of Matomo was made. This decision was reached in line with the objective of enhancing and simplifying operations, guaranteeing that every element of the architecture provides substantial functional worth.

On the other hand, new functionalities were added:

- New alert dashboards have been added for the control and notification of incidents on the platform (Figure 1),
- New monitoring dashboards to oversee the status of the platform (Figure 2),
- The email server designed to notify users of events occurring within the platform was also optimised (Figure 3).

The **Mailu** project (<https://mailu.io/2.0/>) was selected as the **email server** solution for its comprehensive benefits. Being an open-source and self-hosted platform, Mailu offers transparency, full control, and customization options, differentiating it from third-party providers. It encompasses a broad range of features such as webmail, antispam, antivirus, and auto-configuration, making it versatile for various email needs. Mailu allows easy setup through docker. Mailu is particularly focused on privacy and security, providing regular updates and security protocols. Additionally, its open-source nature allows for customisation to meet specific user requirements. This cost-effective solution is especially beneficial for small businesses or individuals and is supported by an active community that contributes to continuous improvements and user support.



For these reasons, the decision was made to use Mailu as the email server software.



Figure 1. System Monitoring Dashboard

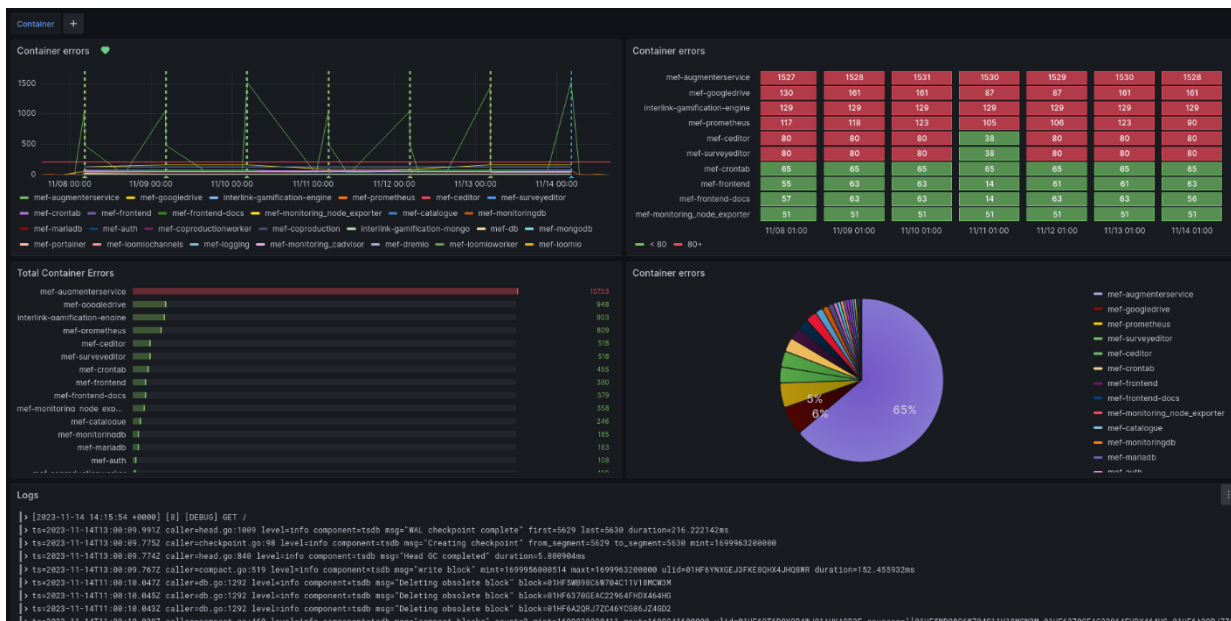


Figure 2. Service Monitoring Dashboard

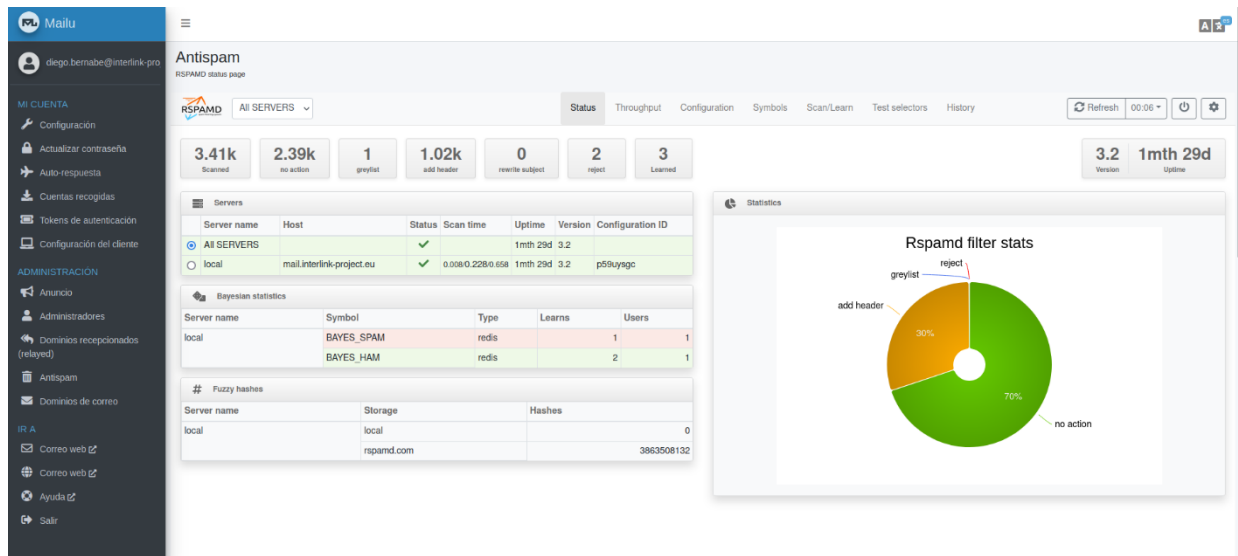


Figure 3. Email server designed to notify users of events occurring within the platform.



3 Community Web Portal

The developments and updates in relation to the community web portal from a platform perspective were described in detail in section 5 of deliverable D4.4. As explained there, the INTERLINK collaborative environment offers the following core functionalities:

- Co-producer organisation, team, and process management.
- Guide for co-production process, a “how to” guide, based on a given co-production process schema, to take these partnerships towards a successful deployment of new co-delivered public services.
- Recommendation of INTERLINKERs most suitable to the problem profiles represented by the chosen co-production task.
- Selection, instantiation, and registry of usage (registering the result of using the enabler, e.g., instantiation of a Business Plan template) of a given INTERLINKER. The instantiation of an INTERLINKER, no matter if it is a software or knowledge one, usually gives place to a new resource which contributes to the completion of a co-production process task.
- INTERLINKER catalogue where imported INTERLINKERs and co-produced ones are published.
- Catalogue of Success Stories, which represents a public instantiable template of a co-production process, contains all the resources and information needed to reproduce it into an entirely new process as a starting point.
- Open Processes catalogue enables making processes public so other users in the platform can opt-in and contribute to their development.
- Modification of the co-production tree by process admins, so that a chosen co-production schema can be adapted to the specifics of the collaborative process being managed by the Collaborative Environment.
- Add teams to a whole process, apart from having the capability to add different permissions to branches of the co-production schema.
- Ease the creation of teams, allowing contact details imported from a CSV file and export emails of a given team. This has been done to streamline and speed up team configuration or the creation of complementary communication channels among team members.
- Notification functionality (in-app & by email) to allow updates in each co-production process to be seen by different team members. Now, users can see WHO has done WHAT, and WHEN within a co-production process. Besides, now the environment sends emails every time that a user is added to a team and every time that a team is assigned to a process.
- Enable users to claim contributions for tasks and be awarded points based on their relative contribution, as determined by a Gamification Engine. This new feature significantly enhances the tracking and valuation of individual contributions within co-production processes. Additionally, we have introduced a functionality that allows administrators to submit either single contributions or multiple contributions made by a team.
- Cloning of processes to promote internal replication and reuse of previously created co-production processes.



- Publication of success stories from cloned and pruned successful co-production trees, promoting third-party replication. Hence, those approaching the Collaborative Environment may review previous success stories and ground them in setting up their own collaborative processes.

With respect to v2, the following additional functionalities have also been added to the Collaborative Environment in the final version:

- 1) A shared leaderboard that shows the points obtained by every user in the coproduction process and a personal leaderboard that displays the points obtained by your user in each process task.
- 2) Creation of an open process list in which administrators of processes can publish collaboration requests to make them available for other users to opt in and collaborate.
- 3) Users can import and export a whole co-production process as a zip file. This function also serves as a method for process backup.
- 4) A roadmap guide has been created for new users, designed to teach them how to set up and understand the subsequent steps required to fully utilise the collaborative environment.
- 5) Assignment functionality allows process administrators to assign tasks related to a resource to specific users. The assignments are shown in an assignment list and as notifications.

Compared to deliverable D4.4 where version 2 of the platform was described, sections 3.1 INTERLINKERs and Enablers of the Co-production process and 3.2 Catalogue of INTERLINKERs, have not undergone additional modifications. However, most of the progress towards the final release of the platform is detailed in Section 3.3 INTERLINK Collaborative Environment, as described below.

3.1 INTERLINKERs as Enablers of the Co-production Process

INTERLINKERs, as already specified in D3.2, are common building blocks, provided as software tools or in the form of knowledge offered digitally, that offer interoperable, re-usable, EU-compliant, standardised functionality for public service co-production management. These enablers are designed to support the co-production of effective, participatory, and sustainable public services. They can be applied to the following purposes:

- *To guide co-production:* Co-production enablers that guide and support teams in the collaborative execution of the co-production initiatives.
- *To build capacity:* Partnership tools and knowledge resources, which tackle the legal, social, and business aspects to make co-delivered public services viable and feasible in time.



- *To aid service development*: Technical enablers for co-delivered services, aligned with other existing EU-wide initiatives to foster interoperable and sustainable public services.

Some examples of *software INTERLINKERS for co-production* are: a) Tools for ideas crowdsourcing and collaborative decision making; b) Tools for surveys; c) Tools for team management; d) Document sharing & File management tool. On the other hand, some exemplary *knowledge INTERLINKERS for co-production* are: a) Guidelines and canvas to perform stakeholders analysis; b) Templates for stakeholders' engagement plan; c) Templates for surveys for problem refinement; d) Guidelines and materials for workshops for service design or e) Templates for Business Plans. Some exemplary *knowledge INTERLINKERS to build capacity* are: a) Guidelines on GDPR for Data Protection; b) Information sheets and consent forms; c) Guidelines on the acquisition and reuse of software for public administrations. Some exemplary *software INTERLINKERS supporting service building* are: a) Registration and authentication component; b) Collaborative Editor for public service descriptions; c) Loyalty, incentives, and rewards component.

In order to support the continuous growth of a catalogue of INTERLINKERS to empower the co-production process, a *Specification Model for INTERLINKERS* has been defined.

The INTERLINKER specification model aims at classifying INTERLINKERS across different dimensions to guide and support the co-production process activities, comply with standards, and foster reuse. Each INTERLINKER must supply a set of metadata in the form of several categories. Regarding *usage*: a) problems it addresses; or b) Service offering type in EU CEF SOC model. Regarding *licensing*: Software and Data licences. Regarding *context*: a) Administrative: local, national, EU; b) Regulatory: standards, regulations it complies to; c) Organisational: PA, Business, Individuals as beneficiaries and d) Domain: application domains, cross-cutting concerns. Regarding *software*: a) Provisioning: SaaS, OSS; b) Interoperability; c) Security: protocols and d) Integration within the platform.

Following a design pattern similar as the one defined in Research Object Crates (RO-CRATE)¹, INTERLINK has defined an extensible declarative model, based on JSON Schemas, to easily define new either knowledge or software INTERLINKERS. The way to add new INTERLINKERS is to create a new directory per INTERLINKER that contains:

- A "*metadata.json*" file in the root of the directory.
- Optionally, a "*snapshots*" directory to store the images corresponding to the INTERLINKER.

¹ «Research Object Crate (RO-Crate)», Research Object Crate (RO-Crate).
<https://www.researchobject.org/ro-crate/>



Knowledge INTERLINKERs usually contain several representations of the template, e.g. document (docx), spreadsheet (xlsx), presentation (pptx) and so on, from which it will be instantiated so that users may view what capability they offer before instantiating them. Besides, they often include an *instructions.md* file which explains its usage.

INTERLINKERs include, on one hand, common metadata to all enablers (e.g., problem profiles targeted, difficulty, licence, name, description, logo, etc.) to allow for their exploration and searching, and, on the other hand, they also include aspects to enable its integration with the collaborative environment. Particularly, this annotation is particularly important whenever they are of co-production type, e.g., through the “capabilities” dictionary which includes elements such “instantiate”, “clone”, “view”, “edit”, “delete” or “download” among others. Figure 4 illustrates the corresponding API methods to be provided by every software INTERLINKER to be neatly integrated with the collaborative environment. On the other hand, Figure 5 shows the GitHub repository (<https://github.com/interlink-project>) where all INTERLINKERs that populate the Collaborative Environment, and more concretely its Catalogue, are published, following the mentioned Specification Model.

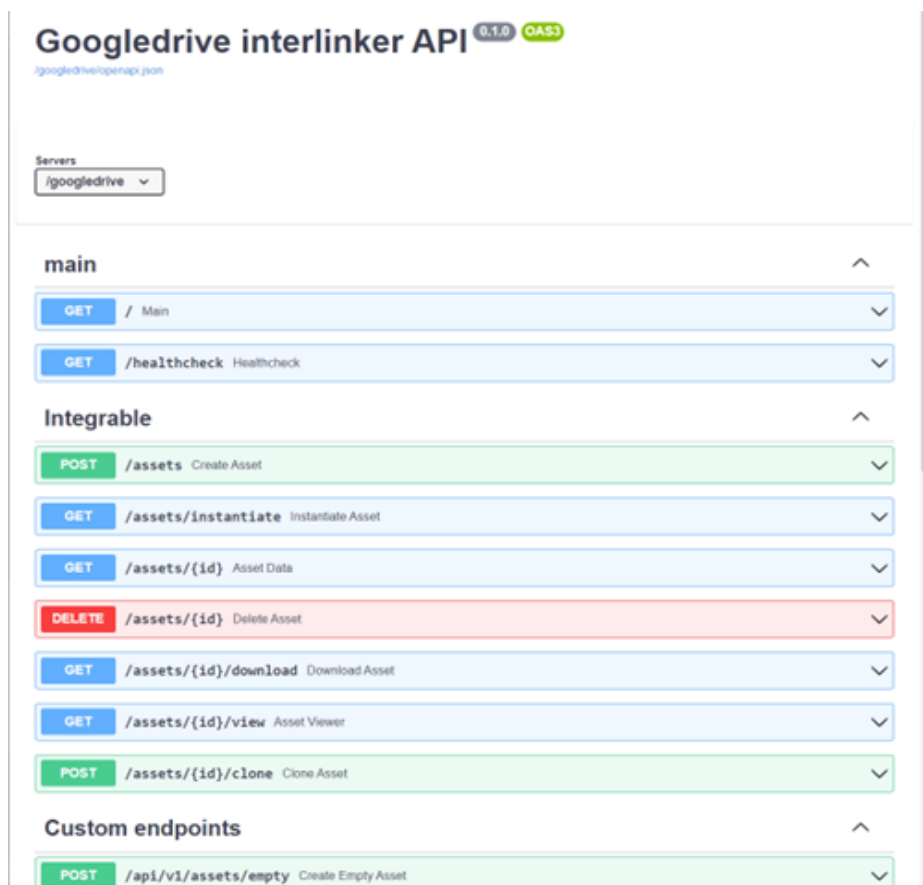


Figure 4. INTERLINK API to be integrable in the collaborative environment.

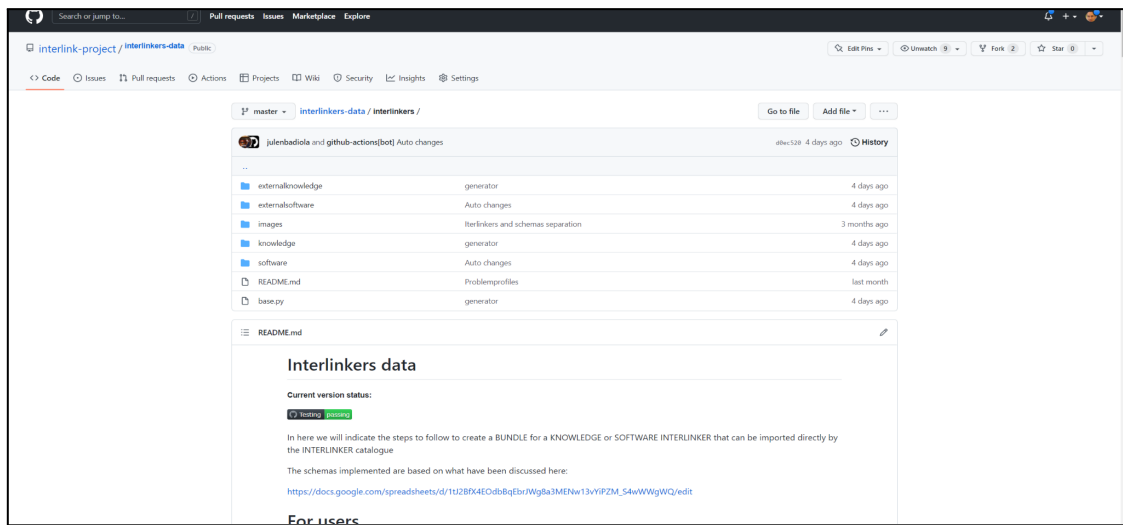


Figure 5. INTERLINKERS Catalogue data in GitHub repository.

3.2 Catalogue of INTERLINKERS

The INTERLINKER catalogue provides a one-stop-shop for know-how enabling co-production. It has been populated with knowledge and software INTERLINKERS leveraging resources generated in previous EU projects, social innovation initiatives, and service design best practices like: WeLive, Silarning.eu, servicedesigntools.org, DesignersItalia, IDEO or Engage2020. Some resources have been adapted to the specific needs of co-production; others are being created from scratch based on project research results. Figure 6 shows the INTERLINK catalogue where items can be filtered according to strings associated to their metadata, to their nature (software or knowledge), who created them and their ranking.

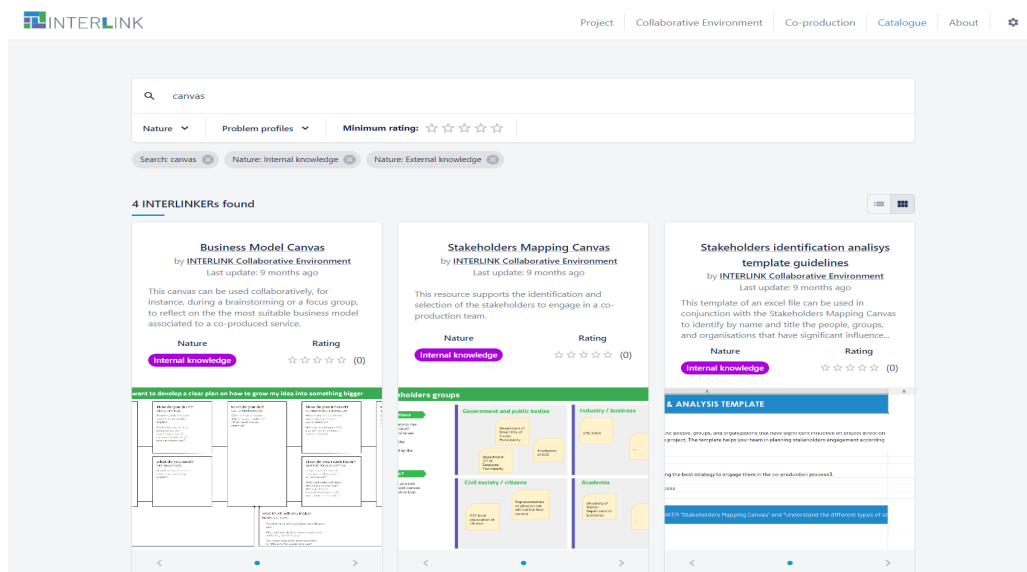




Figure 6. INTERLINKER catalogue.

3.3 INTERLINK Collaborative Environment

The INTERLINK collaborative environment has been designed to support the co-production methodology of INTERLINK (see Figure 7) and facilitate its adoption and application in the co-production of novel public services. As previously mentioned, it offers the following core functionalities: a) co-producer organization, team and process management; b) guide for co-production process; c) recommendation of INTERLINKERs most suitable to the problem profiles represented by the chosen co-production task; d) selection, instantiation, and registry of use (displaying result of using the enabler, e.g. instantiation of a Business Plan) and e) INTERLINKER catalogue already showcased in Figure 6.

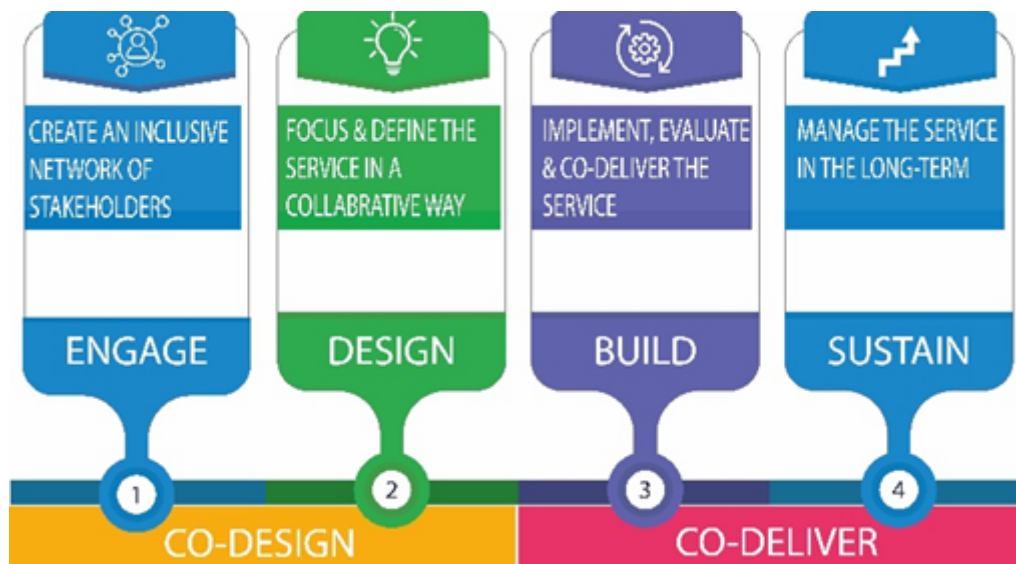


Figure 7. Generic co-production model in INTERLINK.

Notice that apart from methods required to integrate a co-production INTERLINKER with the collaborative environment, see Table 1, custom endpoints are defined by each INTERLINKER, e.g. for GoogleDrive the endpoint shown as /api/v1/assets/empty (see Figure 4).

Table 1. Co-production INTERLINKER API

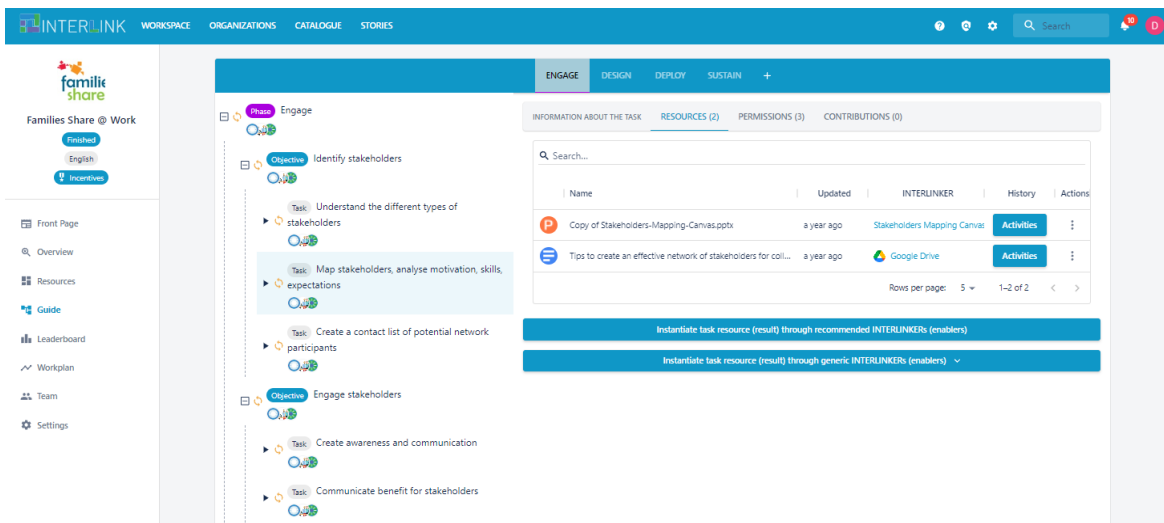
| URI | Method | Description |
|---------------------|--------|---|
| / | GET | redirects to swagger / redoc DOCS |
| /assets | POST | [OPTIONAL] Posts data for asset creation and return JSON of asset |
| /assets/instantiate | GET | GUI for asset creation |



| URI | Method | Description |
|-----------------------------|--------|---|
| /assets/{ASSET_ID} | GET | JSON data of asset |
| /assets/{ASSET_ID} | DELETE | Deletes asset and returns No content |
| /assets/{ASSET_ID}/download | GET | Download a representation of asset |
| /assets/{ASSET_ID}/view | GET | GUI for the interaction with the asset |
| /assets/{ASSET_ID}/clone | POST | [OPTIONAL] Clones the asset and returns JSON data |

An assortment of co-production INTERLINKERS has been created to provide useful functionality to the collaborative environment, e.g.: a) interlinker-google drive to deal with office like documents; b) interlinker-survey to design and host answers for surveys; c) interlinker-ceditor to collaboratively edit documents or d) description augmenter to annotate web pages.

As already mentioned, JSON Schemas have been defined to declaratively define Software and Knowledge INTERLINKERS. Likewise, co-production models can be defined which are tuned to the specifics of a co-production process, e.g. a Hackathon organisation and celebration. Indeed, although the collaborative environment is pre-loaded by default with the generic INTERLINK co-production tree, applicable in any co-production process, purpose-specific co-production trees can be defined as shown in Figure 11 and Figure 12. Notice that Figure 8 and Figure 9 show the INTERLINKERS recommendation capability of the collaborative environment, where the same task in two different co-production trees has been selected, recommending the same INTERLINKERS plus additional specific ones for the second co-production tree. Figure 10. shows how the generic build sub-phase is replaced in the custom Ethiopia-Kids co-production tree by a run sub-phase, with very different composing objectives and tasks.



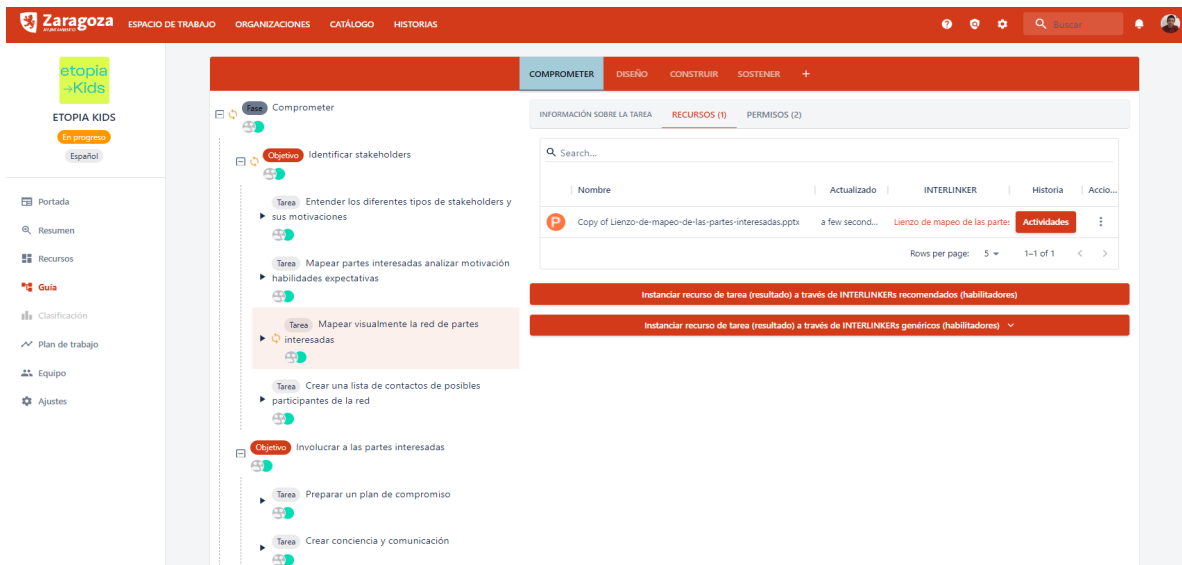


Figure 8. Comparison of INTERLINK ENGAGE in 2 co-production processes (top - family share; bottom - ZGZ etopiaKids)

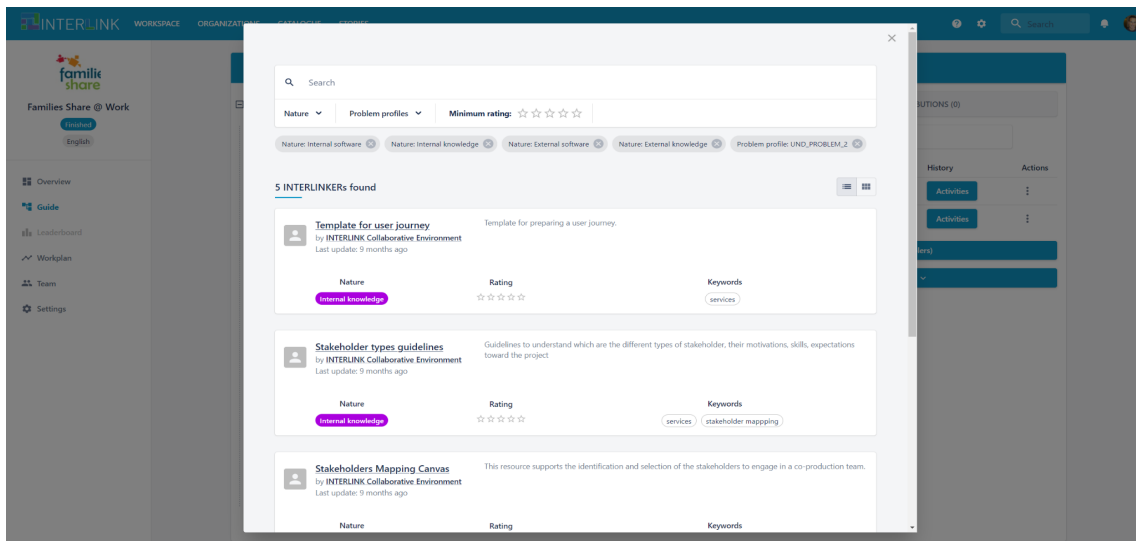


Figure 9. INTERLINKER recommendation in the Family Share co-production process.



DEPLOY

Objetivo: Manage insurance and security issues

- Tarea:** Follow trust and safety guidelines for collaborative childcare
- Tarea:** Stipulate an insurance
- Tarea:** Manage legal issues related to the participation of children to Families Share

Objetivo: Use the app to coordinate turns among parents

- Tarea:** Customize / localize the app to coordinate collaborative childcare
- Tarea:** Provide guidance and support to app users

| Name | Updated | INTERLINKER | History | Action |
|--------------------------------------|---------------|-------------------|---------|------------|
| Trust & safety report and guidelines | 10 months ago | External resource | | Activities |

Buttons: **Instantiate task resource (result) through recommended INTERLINKERs (enables)**, **Instantiate task resource (result) through generic INTERLINKERs (enables)**

COMPROMETER

Objetivo: Identificar stakeholders

- Tarea:** Entender los diferentes tipos de stakeholders y sus motivaciones
- Tarea:** Mapear partes interesadas analizar motivación y habilidades expectativas
- Tarea:** Mapear visualmente la red de partes interesadas
- Tarea:** Crear una lista de contactos de posibles participantes de la red

Objetivo: Involucrar a las partes interesadas

- Tarea:** Preparar un plan de compromiso
- Tarea:** Crear conciencia y comunicación

Nombre: Mapear visualmente la red de partes interesadas

Descripción: ¿Es su red equilibrada e inclusiva? Cree un mapa de partes interesadas, donde se visualice el ecosistema de partes interesadas que participan en la experiencia del cliente.

Nivel de complejidad - 0 points: Ninguna

Estado actual: En progreso

Empezar: Invalid date
Terminar: Invalid date

Figure 10. Different task views' tabs in two processes (from Etopia-Kids creation process model) vs. Families Share co-production processes.

Selection of the co-production schema

| Name | Description | Creation date | Actions |
|---|--|---------------|---------|
| #1 Hackathon creation process | The INTERLINK project allows for the definition of purpose-specific co-production processes. In this case, this co-production process is designed to guide ideation, preparation, launch and exploitation of a Hackathon devised to address some societal challenges in cooperation between public administrations, citizens and other RW's stakeholders, namely, SMEs, academia or non-profit organizations. It is composed of 4 main phases: a) ENGAGE – understanding, approaching and engaging the right stakeholders; b) DESIGN – follow the guidelines to discuss together, in a balanced and inclusive way, issues, beneficiaries, and priorities for the hackathon to be designed; c) RUN – browse the catalogue of INTERLINKERs to find reusable building blocks for the implementation of the hackathon and its launch; and d) EXPLOIT – realize the results of the hackathons by reaching agreements to bring the proposed service ideas and mock-ups into reality. | 9 months ago | Preview |
| #2 Default schema | The INTERLINK project has defined a generic co-production process which can accommodate any co-production endeavor. It is composed of two main phases to be followed by co-producers: a) Co-design phase. It concerns activities that incorporate "the experience of users and their communities" into the creation, planning, or arrangements of public services. In it, the co-production team is created and starts working together to define the service to be co-produced. This phase entails two sub-phases: Engagement and Design; and b) Co-delivery phase. It is a joint effort by public authorities and stakeholders to provide and improve public services where the service is implemented and delivered in a sustainable manner. The co-delivery phase entails two sub-phases: Build and Sustain. | 9 months ago | Preview |
| #3 Co-production schema to support co-refinement of public service descriptions | Specific co-production process specially catered for co-refinement of public service descriptions where citizens, civil servants managing public service infrastructure and civil servants working at specific departments cooperate. It is composed of the following phases: a) ENGAGE – where stakeholders involved in service description refinements are understood and engagement plans are proposed; b) DESIGN – where the actual managers of a service prepare the description and preparation space to be used by those enhancing service descriptions; c) RUN – where the contributions from diverse stakeholders are gathered, moderated and validated with the support of the Description Augmenter INTERLINKER; and d) DESIGN – where the validated contributions are assessment and applied in refinements to service descriptions. | 9 months ago | Preview |
| #4 Co-refinement schema to support co-reflection and collaborative re-design of an existing solution (app, tool or service) | Specific co-production process specially catered for co-refinement of previously created solution (app, tool or service). It consists of two phases: co-reflection and re-design. Hence, an initial phase (co-reflection) is executed where after an initial retrospective analysis of what is available, new most desirable features are specified, noted, and selected. Then, a second phase (re-design) is launched to accommodate the most highly rated features. After an initial planning about future co-design workshops, new tasks are launched to focus on the collaborative re-design of some core thematic areas of the app, tool or service to refine. | 5 months ago | Preview |

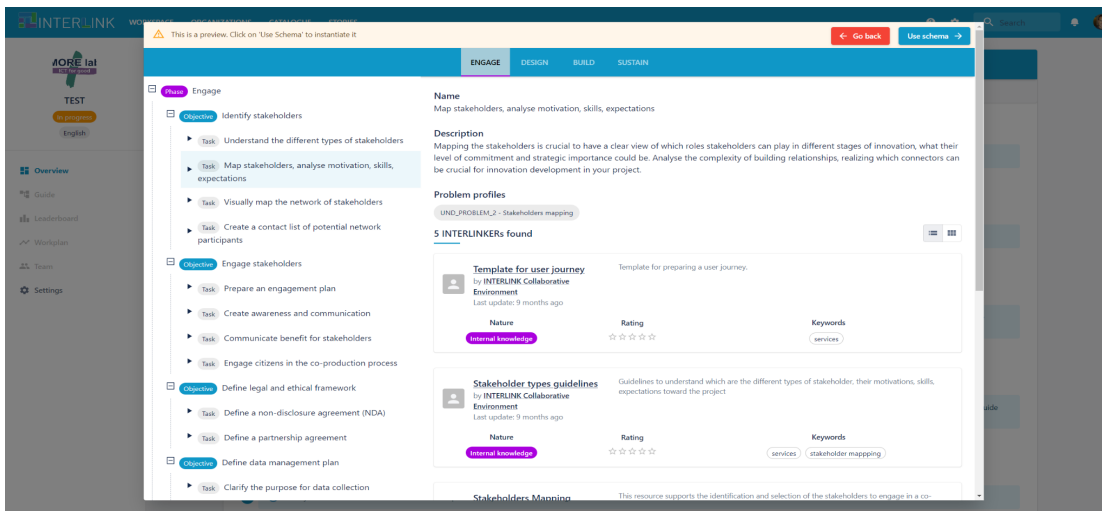


Figure 11. Selection of co-production process from 4 available models/schemas.

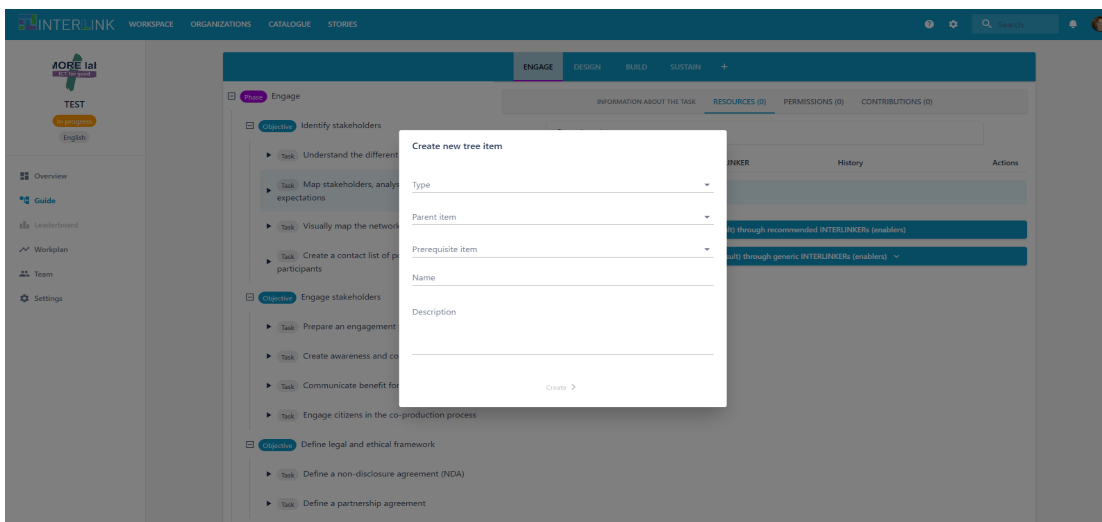


Figure 12. Customisation of existing co-production process by clicking on "+" in the phase menu (top menu).

3.3.1. INTERLINK Collaborative Environment Views

The Collaborative Environment initially offered three distinct views: Guide, Workplan, and Overview. However, following an analysis of system access and usability, the platform expanded to include or split into additional sections: Front Page, Overview, Resources, Guide, Leaderboard, Workplan, Team, and Settings.

The Front Page View

The Front Page View, as shown in Figure 13, serves as a comprehensive summary within the Collaborative Environment, offering an at-a-glance overview of the co-production process. This view includes essential details such as the creation date and the current state of the process. It is divided into several key subsections:



1. **Description of the process:** This section offers a detailed narrative of the co-production process, outlining its structure, methodologies, and the sequence of activities involved. It helps users understand the overall workflow and the key components that constitute the process.
2. **Aim of the process:** Here, the objectives and goals of the co-production process are clearly defined. It elucidates what the process intends to achieve, outlining both the short-term and long-term outcomes expected from the collaborative efforts.
3. **Challenges of the process:** This subsection identifies and elaborates on the potential obstacles and hurdles that might arise during the process. It provides insights into the complexities and difficulties, offering a realistic view of the challenges participants might encounter.
4. **Origin of the process' Idea:** This part delves into the genesis of the co-production process. It explores the initial concept or problem that led to the development of the process, offering a historical perspective and the rationale behind its inception.

Together, these subsections offer a holistic and informative overview of the co-production process, allowing users to quickly grasp its essence, objectives, challenges, and origins, enhancing the collaborative endeavour.

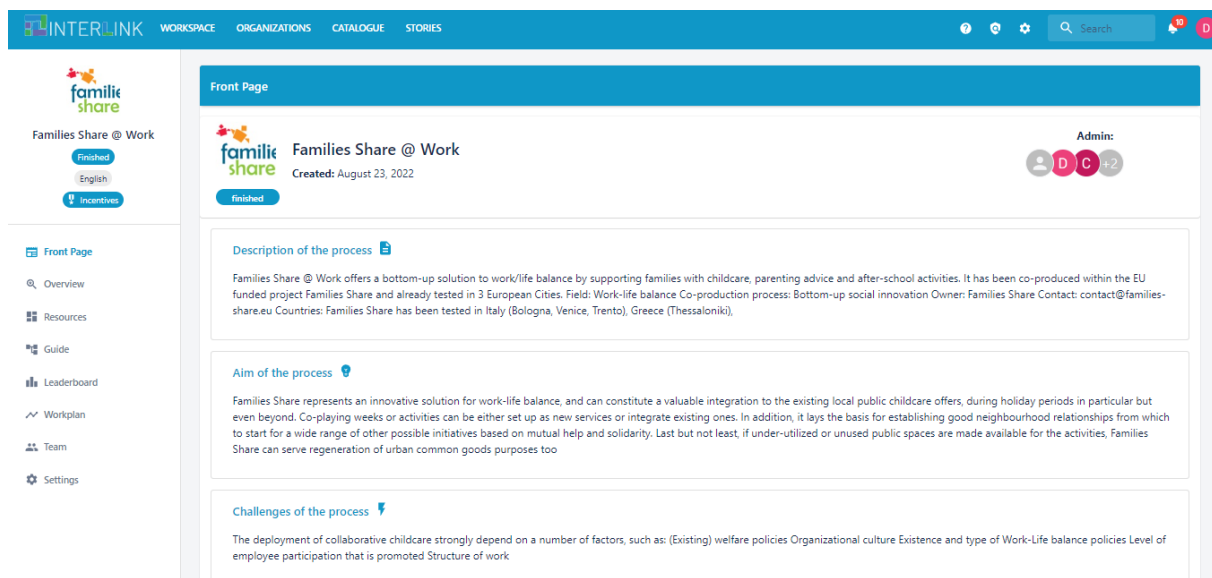


Figure 13. Front Page View.

Overview View: Tracking and Guiding Co-production Activities.

The Overview View is a pivotal tool within the Collaborative Environment, meticulously designed to track activities across the entire co-production process. It



not only monitors progress but also guides users through the initial stages, offering a well-defined roadmap. This roadmap includes several crucial steps:

- **Set Co-production Data and Administrator:** In this initial step, users define the co-production process by specifying various attributes, such as the project's objectives, challenges, and organizational structure. Additionally, this step allows for the designation of administrators, who hold the authority to update process information, adjust permissions, and onboard new administrators.
- **Complete the Co-production Information:** Acknowledging that each co-production process is distinct, this phase aids users in selecting the most fitting model. By choosing keywords that resonate with their specific process, users can tailor the platform to suit their unique needs.
- **Select the Co-production Schema:** Schemas act as blueprints, offering guidance on the process's phases, objectives, and tasks. Users can choose a schema that aligns best with their project goals, with the flexibility to revise their choice later via the settings section.
- **Organizations and Teams:** This step encourages users to establish their own organization and form teams within it. Public organizations are visible to all users on the platform, fostering an open collaborative environment. Each organization includes the option for team creation, facilitating structured collaboration.
- **Your Interlinkers/Resources:** Linking to the Guide View, this step enables users to associate resources with specific process elements. The Resources section displays these additions, providing details about each resource and its origin.
- **Grant Permissions to Teams:** Users can empower teams by assigning them permissions to contribute to various aspects of the co-production process. These permissions can be comprehensive or specific to certain elements, such as objectives and tasks.

Give Rewards to Collaborators: To incentivize collaboration, the platform includes a reward system. Users can define task difficulties and, upon completion, assess each collaborator's contribution to distribute rewards accordingly. This feature necessitates integration with an external voucher portal for reward redemption.

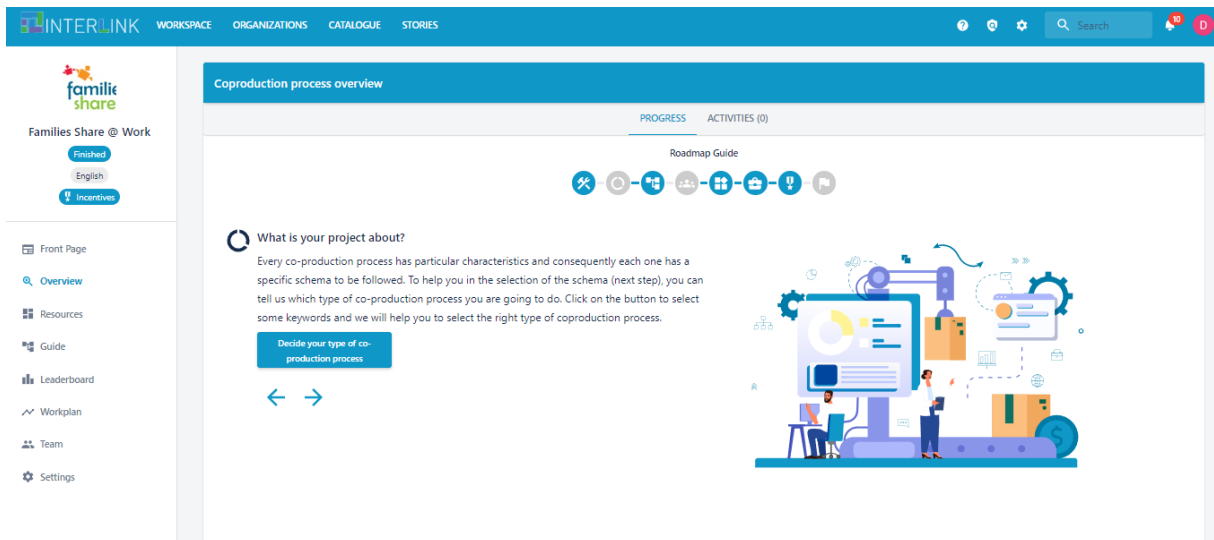


Figure 14. Overview View: Progress section.

Figures 14 and 15 show both sections of the Overview View, the first one presents the roadmap and the second shows the different activities performed in chronological order where you can navigate directly to specific sections in the co-production process, or the resources related to those activities.

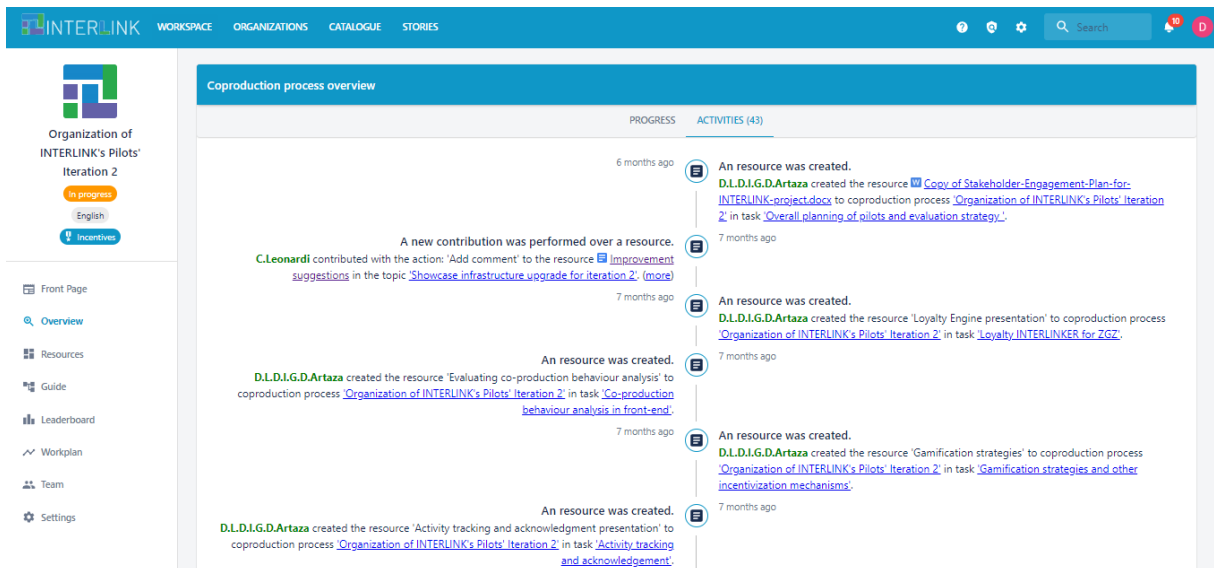


Figure 15. Overview View: Activities section.

Resources View: Comprehensive Overview of Process Resources and User Assignments

The Resources View in the Collaborative Environment is a centralised platform that showcases all the resources created throughout a co-production process, along with



the assignments allocated to specific users. This view is not just a repository of information; it actively displays relevant details about the activities conducted on each resource, enhancing user engagement and operational efficiency. Moreover, it provides direct access to these resources by seamlessly redirecting users to the Guide View for more in-depth interaction. An illustration of the Resources View is provided in Figure 16.

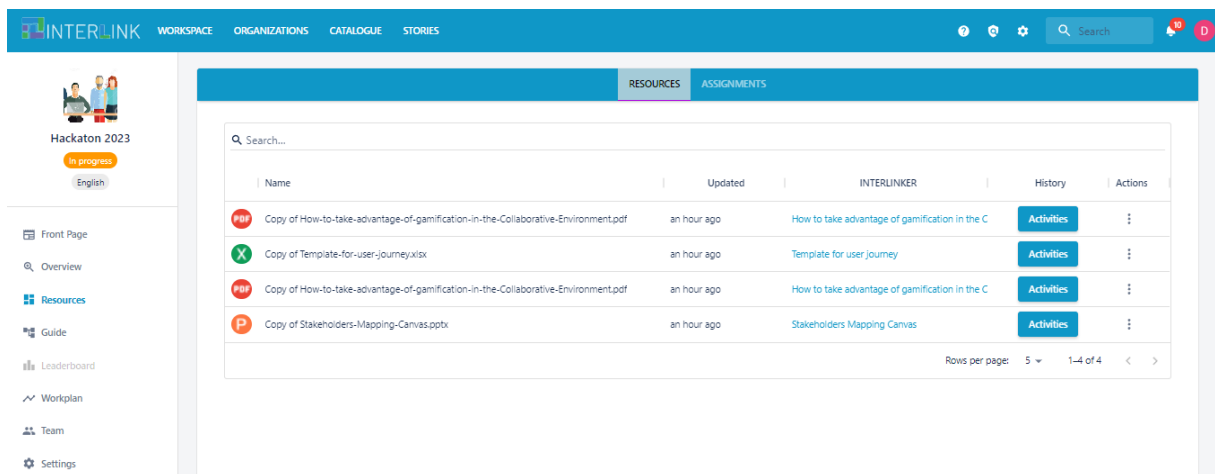


Figure 16. Resource View: Resource section.

A notable feature of this view is its functionality in tracking and managing assignments. As depicted in Figure 17, the Resources View illustrates all the assignment activities designated to a particular user. This subsection is particularly useful as it displays the current state of each assignment, enabling users to update the status of their tasks. For instance, upon the completion of an assignment, users have the ability to change its state to 'Archived', signifying that the task has been successfully accomplished.

Additionally, the Resources View is designed to facilitate better project management and resource allocation. It allows users to not only monitor their own assignments but also gain insights into the overall resource utilisation within the process. This holistic view is instrumental in identifying bottlenecks, optimising resource distribution, and ensuring that each aspect of the co-production process is adequately resourced and on track.

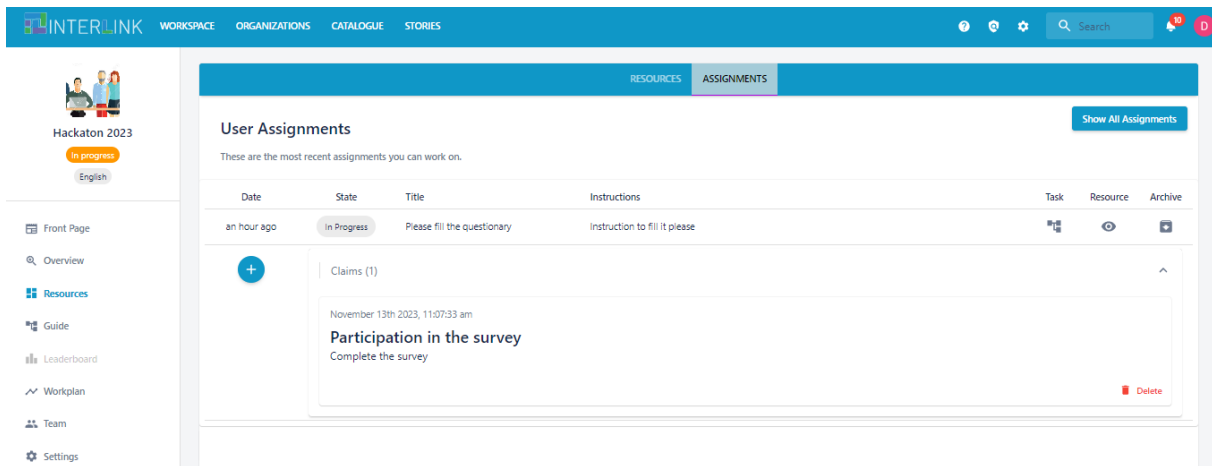
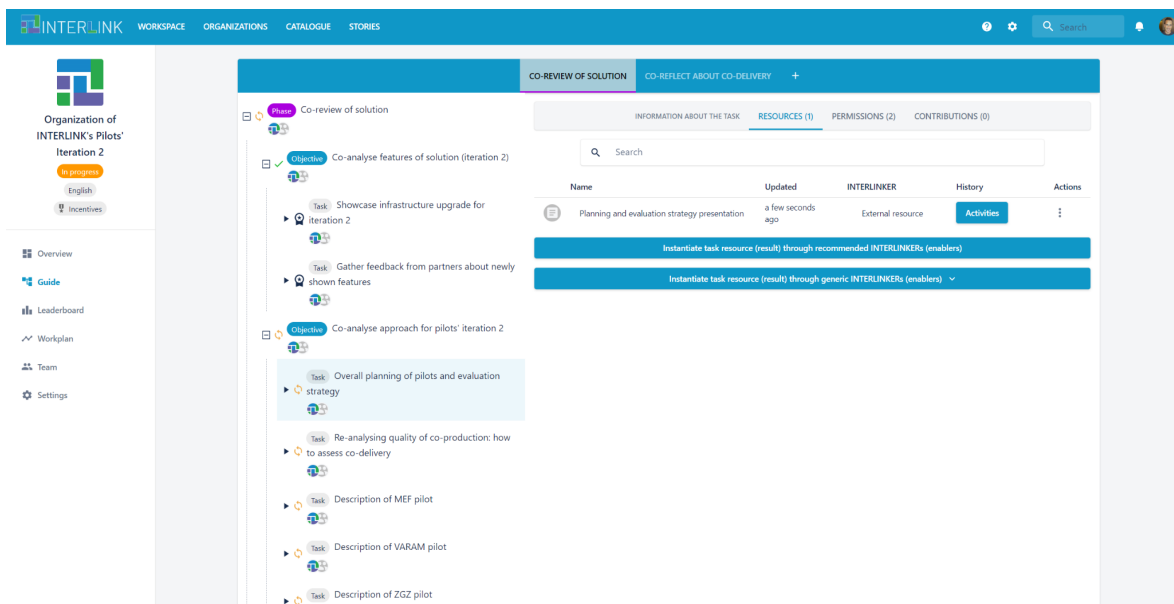


Figure 17. Resource View: Assignments section.

The Guide View

The **guide view** shown in Figure 18 depicts a co-production team can be guided in the co-production process, by being able to navigate through the co-production process phases, and for each phase, select a co-production objective, realise the tasks associated with that objective and get recommended relevant INTERLINKERS which may support accomplishing the objective of the currently selected task. Observe in the figure the selection of the task “Overall planning of pilots and evaluation” with the corresponding suggestion of generic INTERLINKERS, which may be instantiated to give place to resources with which to make progress on the given task, e.g., “Create a Google Drive document”, “Create a discussion thread in Loomio” and so on.



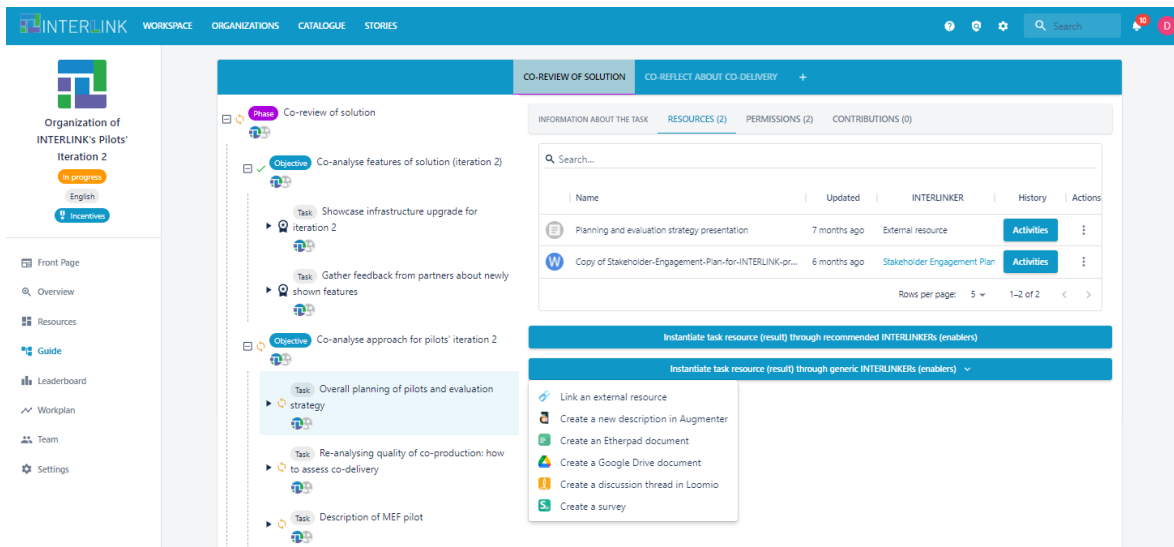


Figure 18. Guide view (top) and resource creation drop-down menu (bottom).

A significant enhancement within the Guide View is the refined process of sharing or assigning activities to users (Figure 19). To improve user experience, we have simplified the information displayed on the screen, particularly in the context of filtering options. This simplification is evident when selecting activities for a single user versus multiple teams. The streamlined interface is designed for intuitive navigation and ease of use. When selecting a single user, the system presents a tailored set of options that are relevant to individual assignments. This personalised approach ensures that the user receives only pertinent tasks, reducing clutter and enhancing focus (Figure 20). In contrast, when assigning activities to multiple teams, the system adopts a more comprehensive approach. It allows for the selection of tasks on a broader scale, suitable for collaborative efforts involving several team members. This feature is especially useful in managing large-scale projects or tasks that require collective input and collaboration (Figure 21).

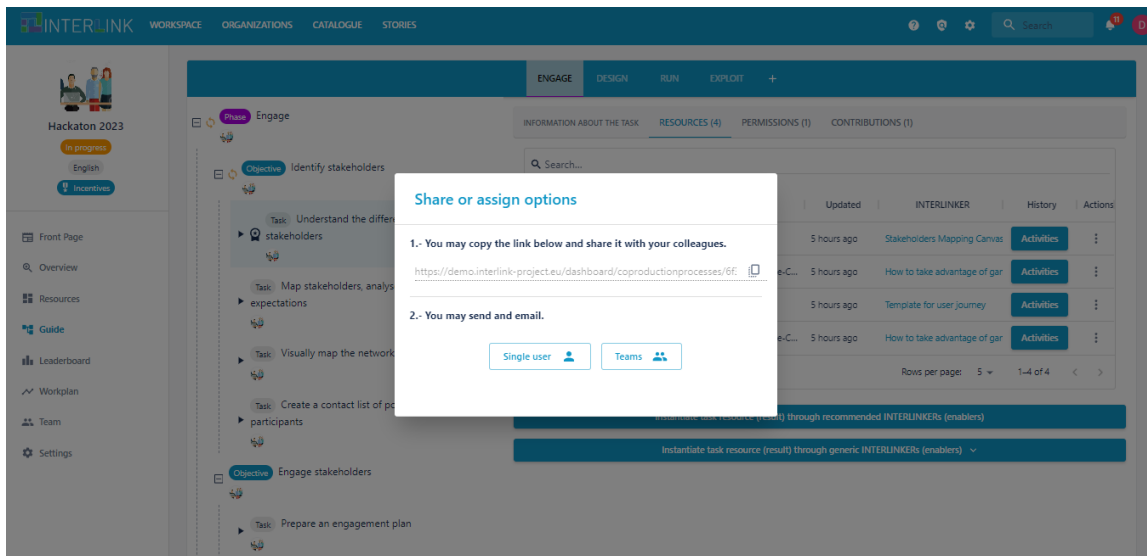


Figure 19. Selecting share or assign.

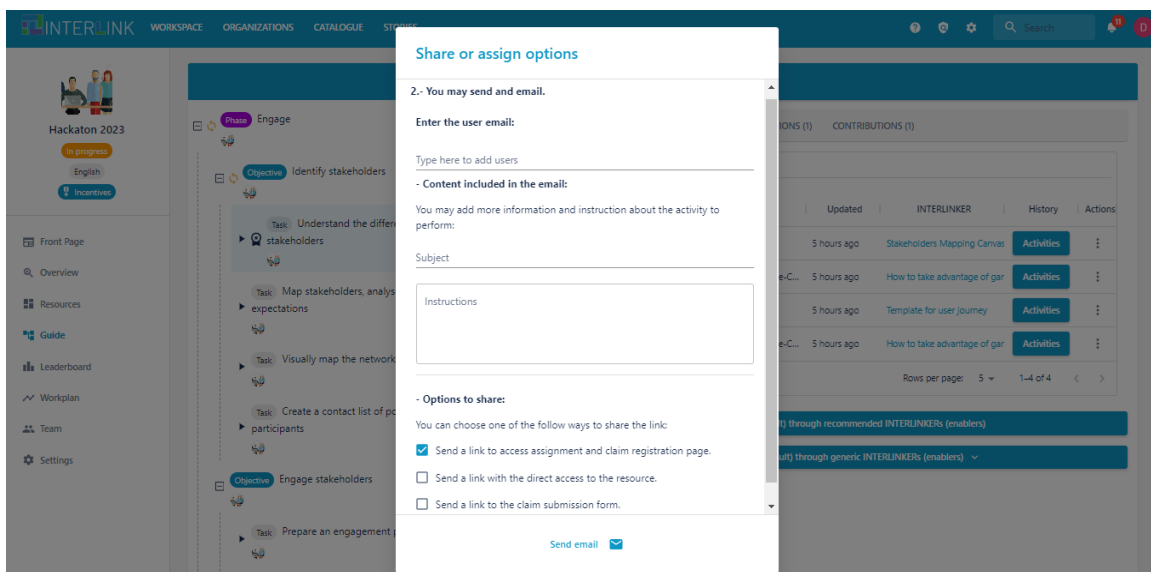


Figure 20. The form to assign a single user.

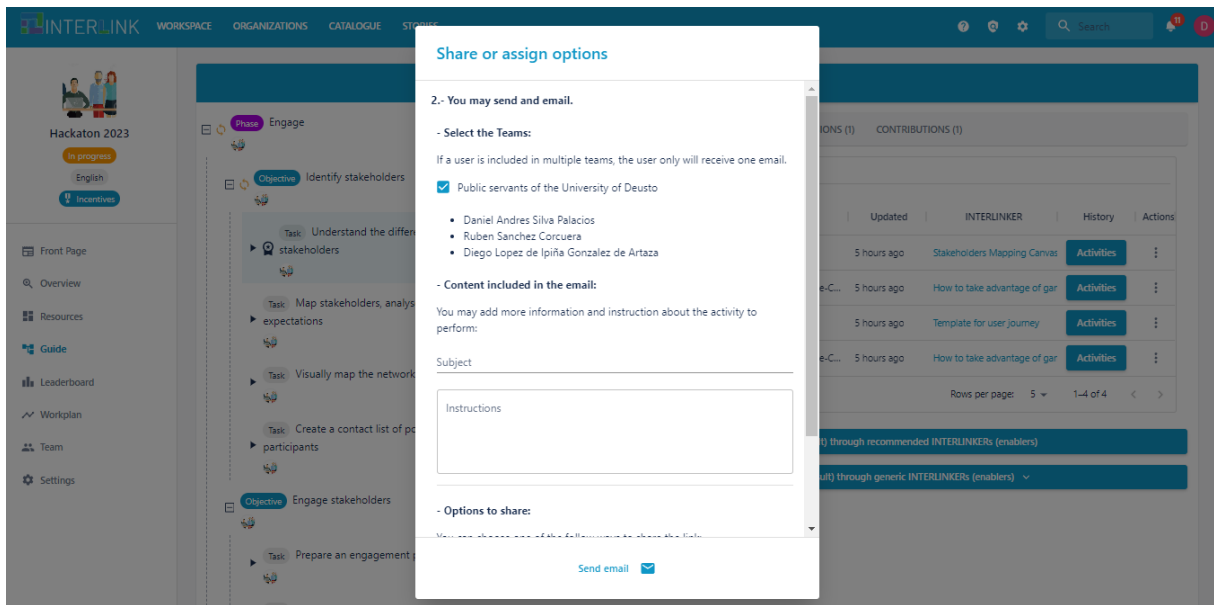


Figure 21. The form to assign one or multiple teams.

Figure 22 shows the **Workplan view**, which allows stakeholders to establish and review the durations of the tasks accomplished within a co-production process. Also, notice that navigation between the “Workplan” and “Guide” views is possible by clicking on the corresponding task name in the Workplan view (see Figure 22) or clicking on the “Time planification” link within a given task view in the “Guide” view (see Figure 23).

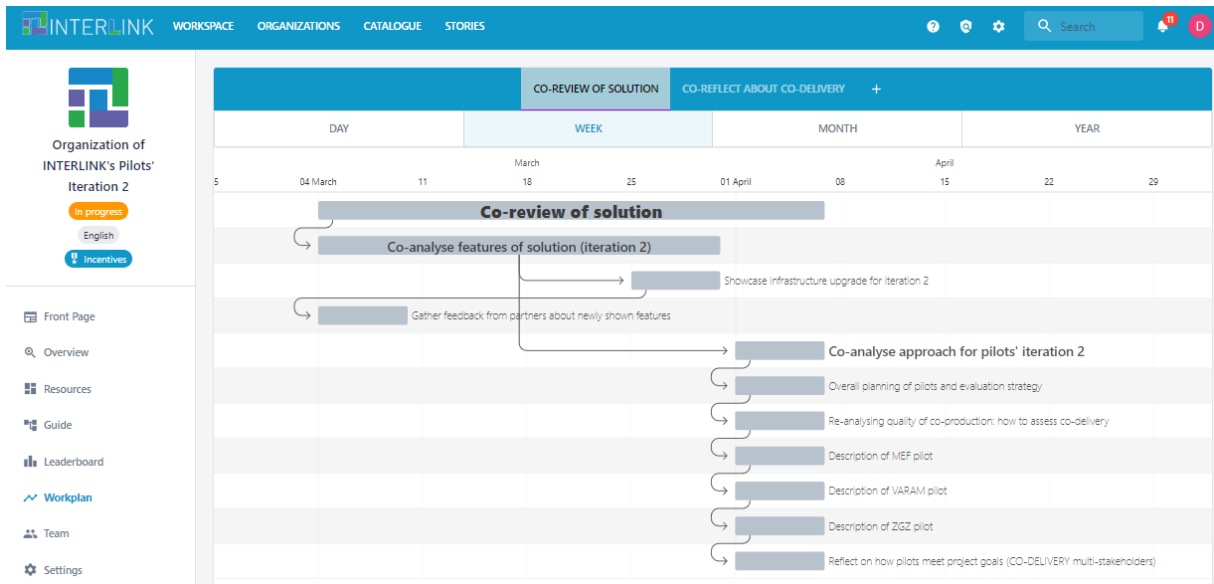


Figure 22. Workplan view.

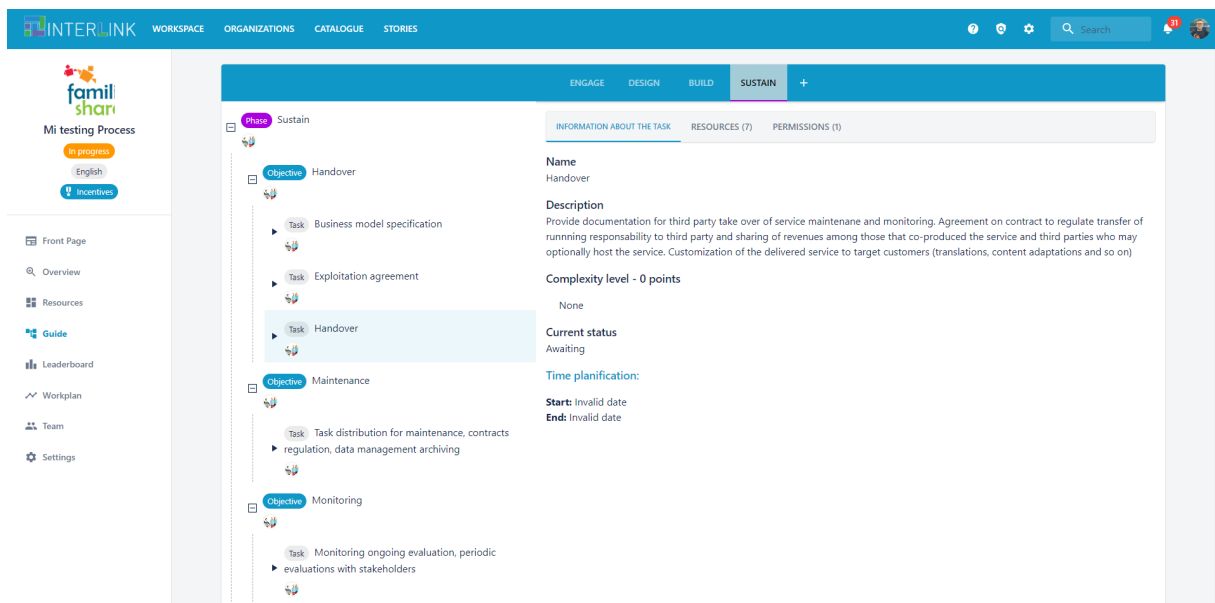


Figure 23. Guide view to note the “Time Planification” tag on the centre of the screen.

Leaderboard View: Gamified Engagement in Co-production Processes

The Leaderboard View in the Collaborative Environment is designed to enhance user engagement through a gamification framework. This view provides insightful information about a user's participation in a co-production process, showcasing their achievements and contributions from a game-like perspective. Depending on the configuration settings, it can display the performance and standings of multiple users within a game-like environment. A significant aspect of this view is the 'My Profile' section (Figure 24). This subsection serves as a comprehensive summary of each user's contributions, detailing the points they have accumulated throughout the co-production process. It allows users to not only view their own standings and achievements but also compare their progress with others. This competitive yet constructive environment fosters a sense of motivation and accomplishment among users. Additionally, the Leaderboard View offers detailed insights into the various activities of the co-production process (Figure 25). It provides information on the potential points a user can earn by completing specific assignments associated with each activity. This feature helps set clear goals and expectations for users, encouraging them to engage more actively and efficiently with the tasks at hand. Moreover, this view is instrumental in fostering a dynamic and interactive environment. By visualising progress and achievements in a game-like format, it adds an element of fun and competition to the co-production process. Users can track their progress, strive for higher rankings, and gain a sense of accomplishment as they complete tasks and climb up the leaderboard. In essence, the Leaderboard View not only serves as a tool for monitoring participation and performance but also plays a crucial role in motivating users through gamified elements. It enhances the overall user experience in the co-production process, making it more engaging and rewarding.

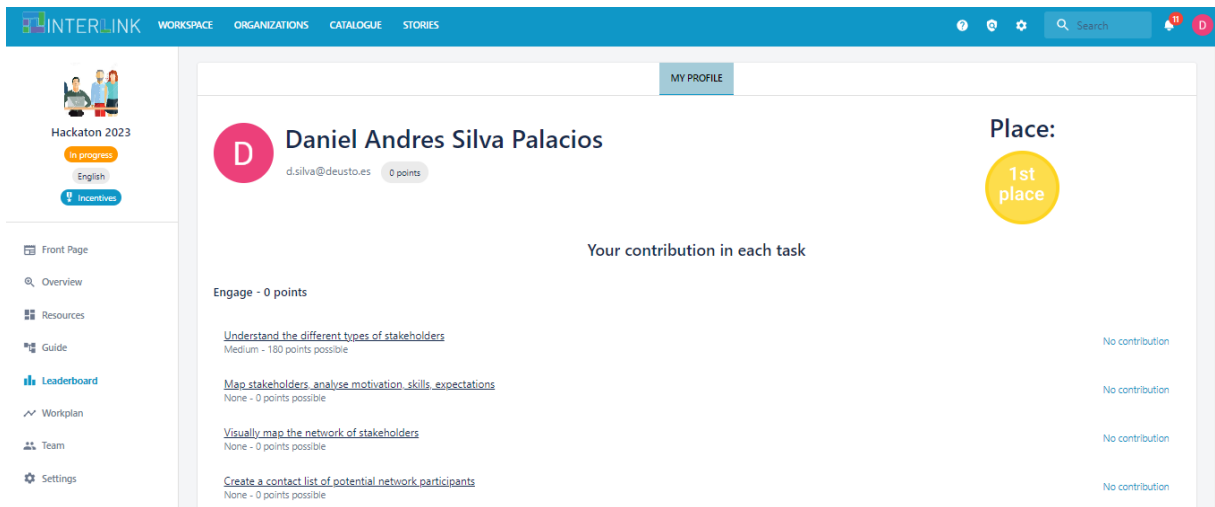


Figure 24. Leaderboard View: My profile section.

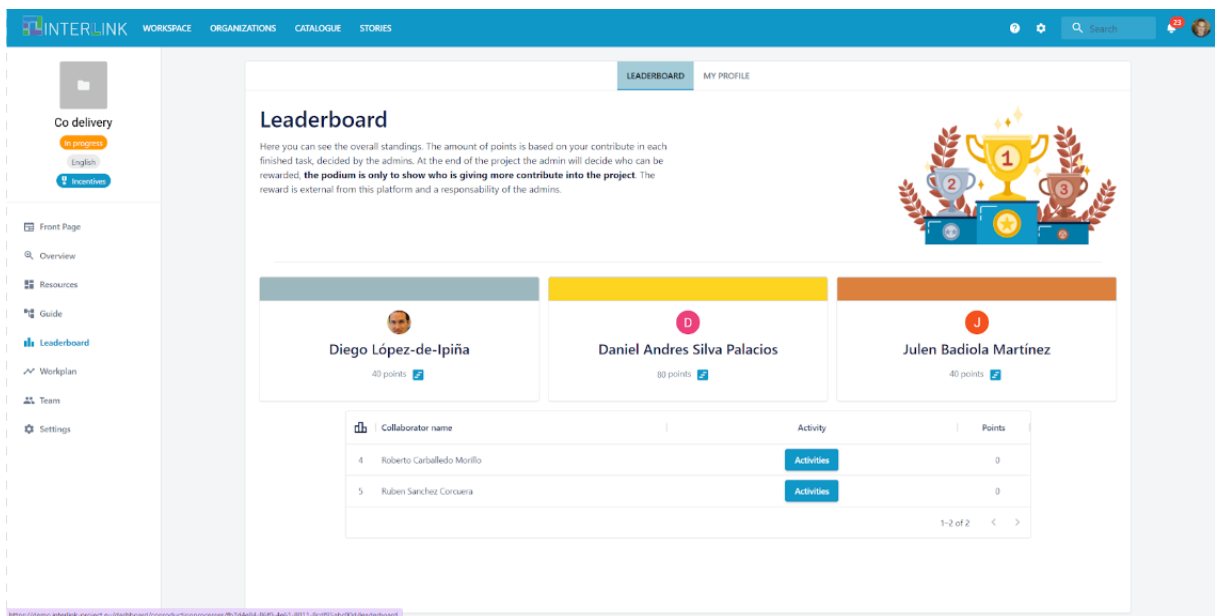


Figure 25. Leaderboard View: General section.

Catalogue Views: Navigating Knowledge and INTERLINKERS

As previously illustrated in Figure 6, the Catalogue View enables users to effectively navigate through an extensive set of knowledge and software INTERLINKERS. This view is particularly user-friendly, offering several search criteria to streamline the browsing experience. Users can filter their search based on: a) the type of INTERLINKER; b) the problem profile addressed by the INTERLINKER; c) keywords in the title or description of the INTERLINKERS.



A notable enhancement to this view is the integration of the 'Open Process Catalogue' as a new subsection. This addition enriches the Catalogue View by providing users with an additional layer of interactivity and accessibility. The Open Process Catalogue broadens the scope of available resources, allowing users to explore and engage with processes that are currently open for participation. This expansion not only increases the diversity of resources accessible to users but also facilitates greater collaboration and knowledge sharing within the platform.

Enhancing Collaboration through the Open Process Catalogue

The platform's capabilities have been significantly expanded with the introduction of an 'Open Process Catalogue'. This innovative feature is tailored to facilitate user engagement in co-production activities by showcasing processes that are actively recruiting participants. It is a gateway for eager users to contribute to various co-production endeavours. Within this catalogue, each listed item provides a wealth of information about the respective co-production process. Users can delve into detailed descriptions, gaining an understanding of the general scope and objectives of each process. A key highlight of each listing is the emphasis on why the process is essential, coupled with a clear outline of the specific skills and expertise required for participation. This level of detail ensures that users can easily identify processes that align with their skills and interests. Another interactive aspect of the Open Process Catalogue is the user feedback system. Participants who have previously engaged in a process can leave ratings and reviews, offering valuable insights and firsthand experiences. This feature allows potential new participants to gauge the effectiveness and appeal of a process based on the experiences of their peers. The open processes catalogue is depicted in Figure 26.

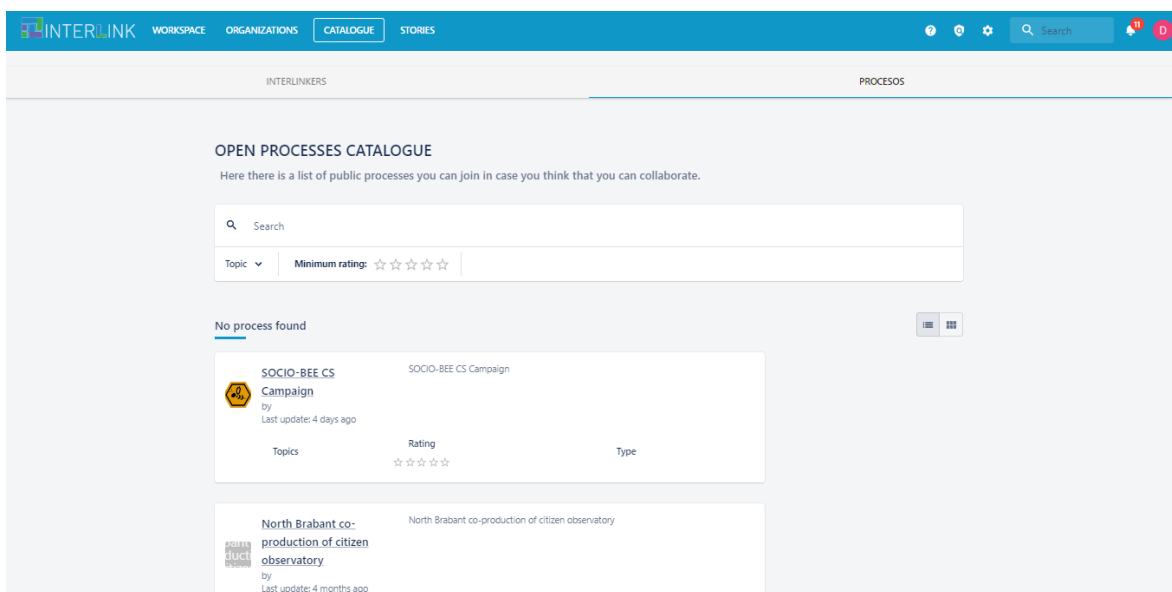


Figure 26. Open Processes Catalogue.

Additionally, the Open Process catalogue streamlines the process of joining co-production activities (Figure 27). With the 'Request to Join' function, users can express their interest in participating in a specific process. This action triggers a notification to the administrators of the process, effectively communicating the user's willingness to contribute. It simplifies the recruitment process, making it more efficient for both potential participants and process administrators.

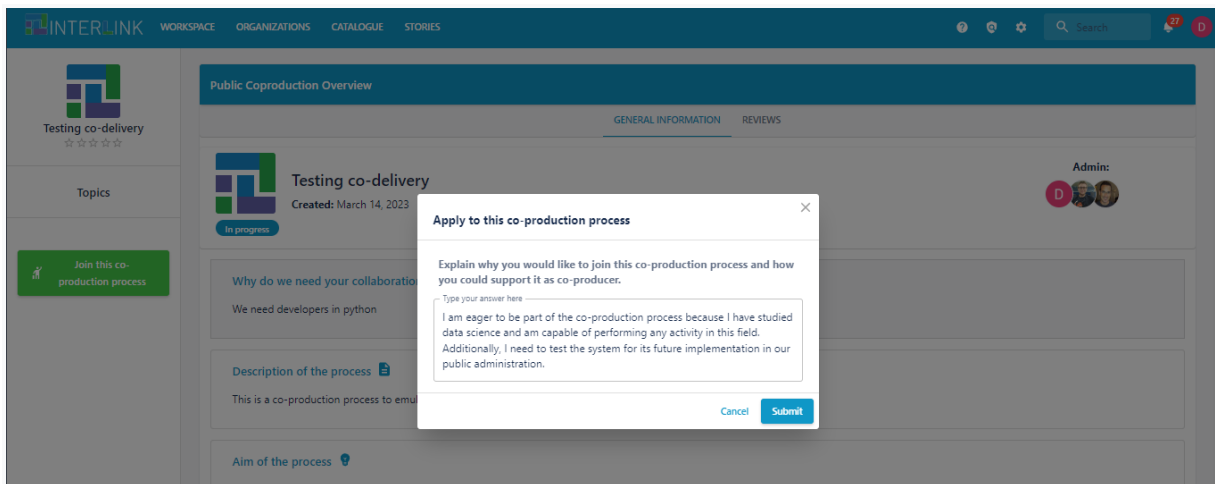


Figure 27. Open Processes Catalogue.

Overall, the Open Process Catalogue not only serves as a repository of available co-production activities but also enhances the user experience by fostering a community-driven approach. It encourages active participation, facilitates skill-based matching, and promotes transparency through user-generated feedback, thereby enriching the collaborative ecosystem of the platform.

Success Stories Catalogue

When a co-production process reaches its end and has achieved all the proposed objectives, it becomes an example of how to achieve success for other users. Therefore, we have created a catalogue to store and visualise the projects that have been catalogued as success-stories as shown in Figure 28. For each success case, the following metadata is published: objectives, lessons learnt, materials generated or licensed, apart from the co-production process in which it is based. Notice that the view of success story provides a “Clone process” button to be able to create a brand-new co-production process from the associated process to such a success story (Figure 29).

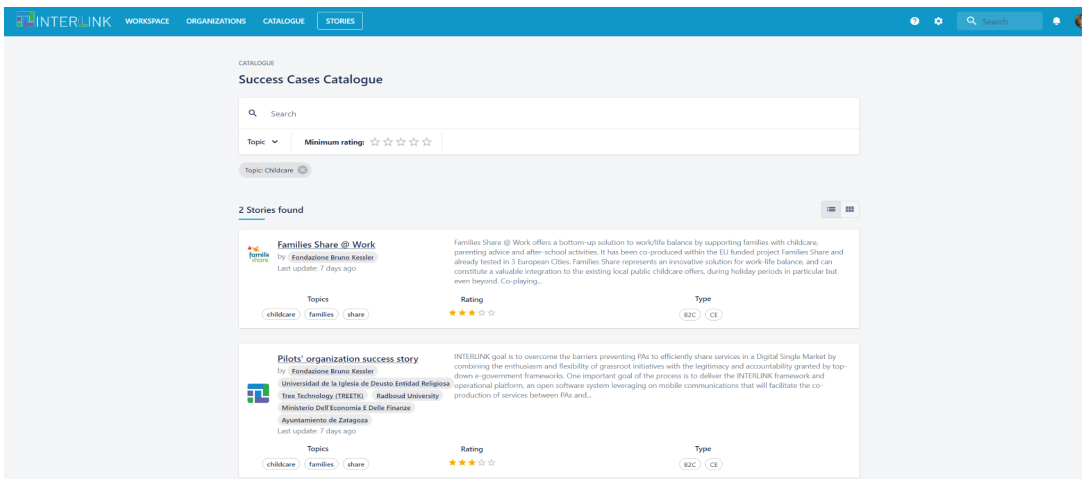


Figure 28. Success Stories Catalogue.



Figure 29. Success stories' view.

Likewise, in the Settings view of coproduction processes, amendments have been performed to allow a given co-production process to clone it or to publish a success story from it. Figure 30 shows the new appearance of this screen, allowing the cloning of processes and the publication of success stories from it.

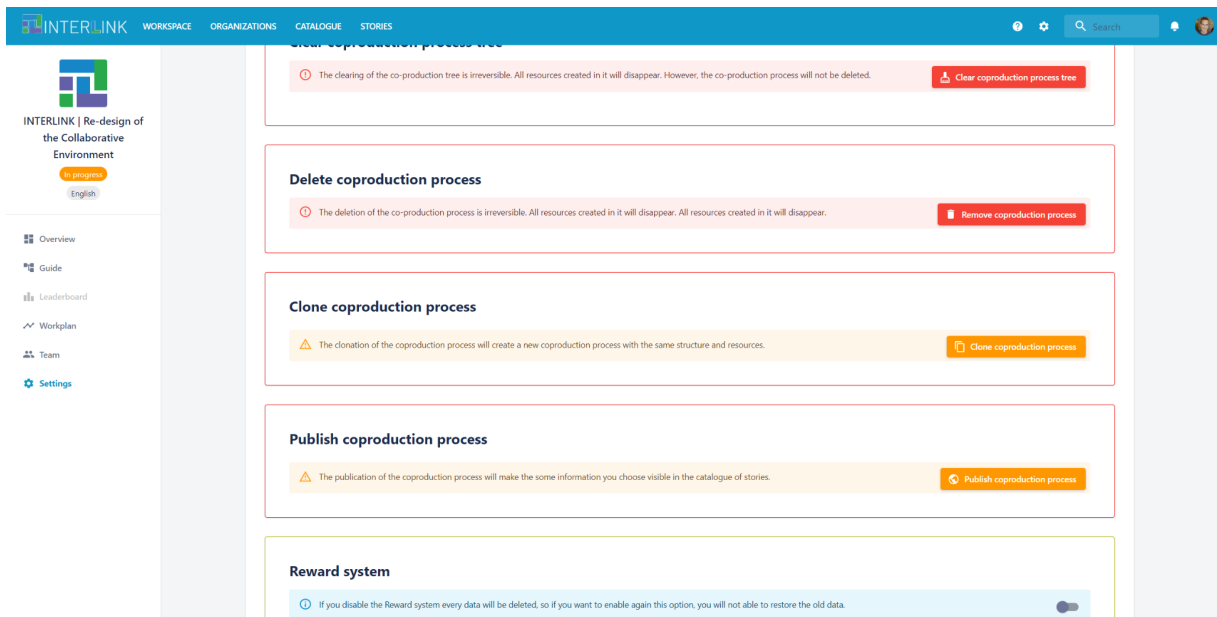


Figure 30. Settings view.

Other Improvements in the Collaborative Environment Platform

Responding to feedback from pilot users, a redesign of the welcome page was essential to enhance user-friendliness, particularly for new users (Figure 31). On the main page, we have introduced easily accessible links to tutorials and videos. Additionally, users can conveniently navigate to their list of co-production processes.

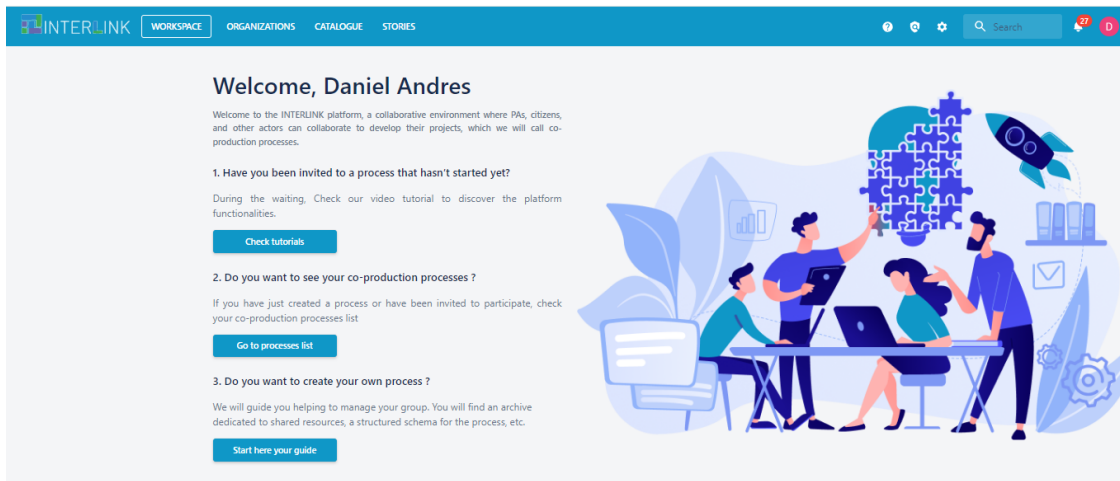


Figure 31. Welcome Page.

These features are provided through a web and mobile-accessible responsive portal for all stakeholders involved in the INTERLINK community (PA, citizens, and private actors). Such a portal is freely accessible at <https://demo.interlink-project.eu/>.



Enhancements to the Settings of the Process

In the latest update to the settings view (Figure 32), a minor yet impactful change has been implemented: the division of settings options into multiple tabs, enhancing the organization and accessibility within the main view. These new subsections are: Info, Admins, Actions, and Extra.

- **Info Section:** This section is a comprehensive repository of all the essential details of the co-production process, including its name, description, tags, and other relevant information. It serves as the central point for understanding the core aspects of the process.
- **Admins Subsection:** Here, users are empowered with the capability to manage administrative roles within the co-production process. It allows for the addition and removal of administration users, enabling efficient control over who has access to critical process management functions.
- **Actions Subsection:** This part of the settings view is particularly dynamic, encompassing all the possible actions applicable to a co-production process. Users can access various functions here, such as clearing the tree, deleting the process, cloning, publishing, and downloading it. Additionally, this subsection provides an option to include the process in the Open Process Catalogue, further extending its visibility and accessibility.
- **Extra Subsection:** (Suggested addition) This subsection could potentially include advanced settings and additional features that enhance the customization and functionality of the co-production process. It could offer options for integrating with other tools, setting up notifications, or other specialized actions that provide users with a more tailored experience.

These enhancements to the settings view not only streamline the management of the co-production process but also ensure that users can navigate and modify settings with greater ease and precision. By categorizing settings into these distinct subsections, the platform significantly improves user experience, making process customization and management more intuitive and efficient.

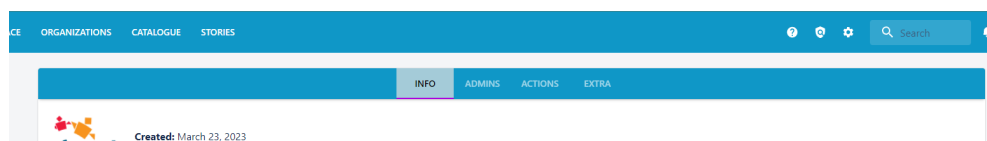


Figure 32. Settings view tabs.

Enhanced Mobile Responsive Interface

The previous version of the mobile interface posed significant usability challenges for users, particularly due to overflow issues when displaying information. This problem was effectively addressed by refining the screen navigation process. A key enhancement in this update is the improved navigation mechanism within the guide view. Prior to this, users found the co-production tree cumbersome to manipulate. To



resolve this, a flexible feature was introduced, allowing users to compress or expand the tree according to their needs. This enhancement greatly improves user interaction, making the interface more intuitive and efficient. The effectiveness of these improvements is clearly demonstrated in the accompanying Figure 33, which showcases the interface's new layout and functionality.

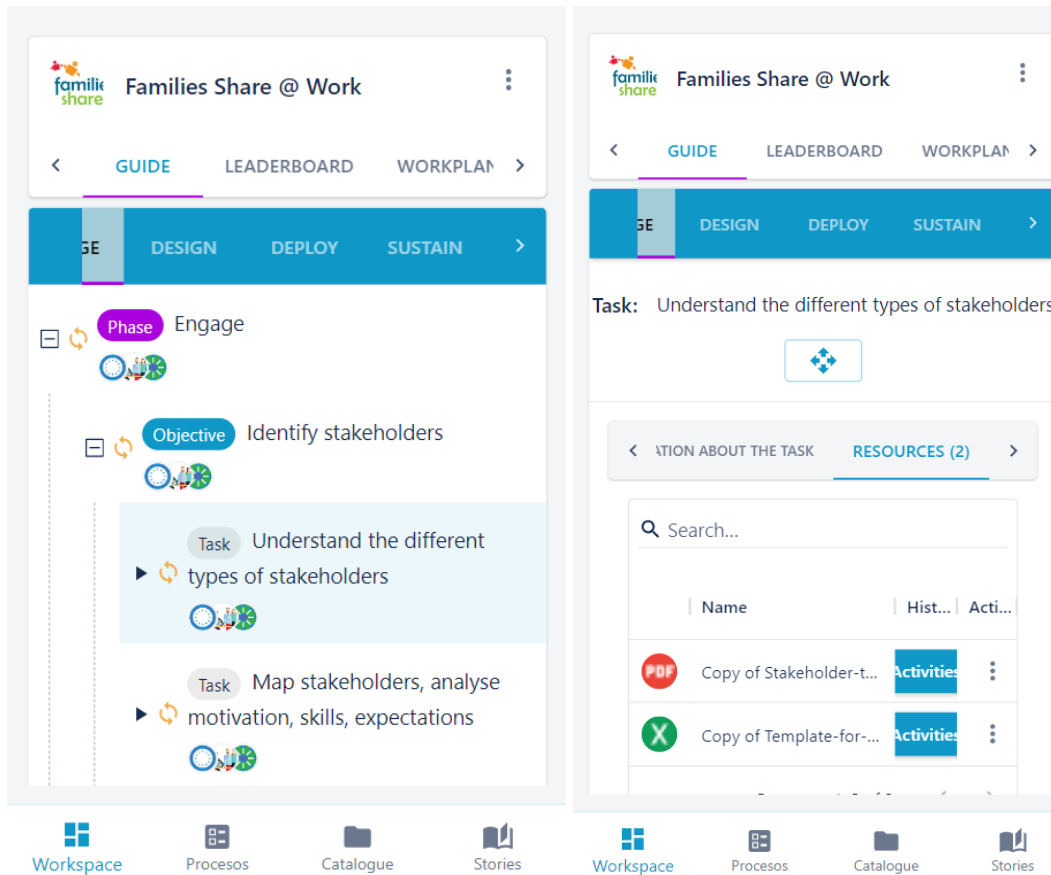


Figure 33. Expanded Tree version for mobile.

Additional Enhancements with Intuitive Access Icons

A notable enhancement in the mobile interface is the integration of strategically placed access icons within the bottom menu bar. This update introduces two new icons, enhancing the user experience by providing direct and effortless navigation to crucial sections. The icons, and therefore the buttons work as follows (from left to right):

- **Workspace:** Access to the initial dashboard
- **Processes:** Access to the list of available processes
- **Catalogue:** Access to the catalogue of Interlinkers and public processes
- **Stories:** Access to the success stories' view



These icons are not only visually appealing but also functionally significant, simplifying the user's journey through the application and ensuring a more engaging and user-friendly interface.



The graphic consists of several colored rectangular blocks. At the top left is a blue rectangle containing the INTERLINK logo and the word 'INTERLINK' in white. To its right is a tall green vertical bar. Below the blue rectangle are a purple square and a blue rectangle. Below the purple square is a green square containing the text 'FIND OUT MORE'. Below the blue rectangle is a purple rectangle containing the text 'Interlinking Governments & Citizens in the digital single market'.