WP3 INTERLINK TECHNOLOGICAL ENABLERS

D3.3- FINAL REPOSITORY OF INTERLINKERS AND PARTNERSHIP TOOLS

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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, standardised functionality for the co-production of public services.
KNOWLEDGE INTERLINKERS	Resources that take the form of knowledge offered digitally that provide information and guidance for the public service co-production management. They include learning material and templates for co-production, governance models, co-business models, and methods for actually performing the various steps of a co-production process. They also include Partnership Enablers that help establish and manage a network of stakeholders involved in a co-production process.
SOFTWARE INTERLINKERS	Digital services or software components that can support co-production activities (like digital tools for ideas crowdsourcing and collaborative decision making, tools for surveys, tools for team management and document sharing and management) or that can aid service development by offering ready to use functionalities.
Public Service	The term refers to 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.

ACRONYMS

ABBREVIATED	EXTENDED
AAC	Authentication and Authorization Controller
AGID	the Italian Agency for Digitalization
API	Application Programming Interface
BAM	Booking Activity Module
C2G	Citizen to Government
C+G	Citizens and Government
CEF	Connecting Europe Facility
CPSV-AP	Core Public Service Vocabulary Application Profile
DPbDD	Data Protection by Design and by Default
EDPB	European Data Protection Board
EIF	European Interoperability Framework
EU	Europe / European

|	
eID	electronic IDentification
eIDAS	electronic IDentification, Authentication and trust Services
G2C	Government to Citizen
ICT	Information and Communications Technology
ISA2	Interoperability solutions for public administrations, businesses and citizens https://ec.europa.eu/isa2/
IT	Information technology
KPI	Key performance Indicator
MEF	Ministry of Economy and Finance – Italy
OAS	OpenAPI Specification
PA	Public Administration
RDF	Resource Description Framework
RO-CRATE	Research Object Crates
SAML	Security Assertion Markup Language
SME	Small and Medium-sized Enterprises
SOC	Service Offering Canvas
VARAM	Ministry of Environmental Protection and Regional Development – Latvia
WCAG	Web Content Accessibility Guidelines
ZGZ	Zaragoza, capital city of the Zaragoza province – Spain

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Executive summary

Deliverable D3.3 is a deliverable of type OTHER and is constituted by a digital catalogue of knowledge and software resources that implement the INTERLINKERs made available in the second version of the INTERLINK platform released at M28 and further refined during the second iteration of use case pilots until M32.

This report describes the INTERLINKERs digital catalogue by illustrating how the INTERLINKERs have been formally described and uploaded in the platform and which enablers are listed in the final repository available online at https://demo.interlink-project.eu/catal.

This document provides an update and an extension to deliverable report D3.2 which was released at M16 and included the description of 60 INTERLINKERs. The new D3.3 includes a revised version of the internal data representation schema, as was refined in the latest months of project development. It also provides a more detailed description of the knowledge resources or the functionalities supported by the INTERLINKERs in the catalogue and introduces the new knowledge and software resources that were implemented to prepare the INTERLINK platform for the second round of evaluation, reaching a total of 71 INTERLINKERs (with 11 new INTERLINKERS).

1 Introduction

INTERLINKERs 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**. These building blocks are designed to support the co-production of effective, participatory, and sustainable public services (see Deliverable D3.1 for a formal specification of INTERLINKERs). They can be used for the following purposes:

- **To guide co-production**: These are co-production enablers that guide and support teams in the collaborative execution of the co-production initiatives.
- **To build capacity**: These are 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**: These are technical enablers for co-delivered services, aligned with other existing EU-wide initiatives to foster interoperable and sustainable public services.

The INTERLINKERs catalogue is intended to provide a one-stop-shop for know-how and tools enabling co-production. The first version of the catalogue released at M16 was populated with knowledge and software INTERLINKERs leveraging, whenever possible, open-source tools or resources generated in previous EU projects, social innovation

initiatives, and service design best practices like: WeLive[1], Silearning.eu[2], servicedesigntools.org[3], DesignersItalia[4], IDEO[5] or Engage2020[6]. Some existing resources have required an adaptation to the specific needs of co-production. Other INTERLINKERs have been created from scratch based on the requirements and specifications emerged from tasks T4.1, T3.1, T5.1. The second version of the catalogue released at M32 features (i) a refined data model for INTERLINKERs' declarative internal representation and indexing and (ii) additional knowledge and software enablers identified as important for co-production, as identified during the reflection phase after pilot iteration 1 and the during the preparation of pilot iteration 2.

This report is structured as follows. Section 2 illustrates the type of metadata fields that were identified to internally describe INTERLINKERs included in the catalogue to support retrieval, search, filtering, recommendation, and use. Section 3 reports how the INTERLINKERs catalogue is integrated inside the Collaborative Environment from the technical point of view and the user interaction that is supported by the front-end interface. The following sections provide updated lists of the software INTERLINKERs (Section 4) and of the knowledge INTERLINKERs (Section 5) included in the final version of the catalogue. Section 6 illustrates how the reusability of INTERLINKERs is supported in the system, before the final remarks are collected in the concluding Section 7.

2 Schema for INTERLINKER metadata

This section describes the properties that have been defined for collecting information and metadata about each INTERLINKER. **The data prepared by using this specification was used to (i) populate the database of the INTERLINKERs Catalogue, (ii) provide contents to be shown in the INTERLINK portal interface at each node of the co-production tree, (iii) provide the information on which search filters and recommendation algorithms will operate.** It is based on the Template for INTERLINKER specification described in Deliverable D3.1. Some additional fields have been added (e.g. "Difficulty", "Overview") to improve the kind of information that is shown to the user in the portal interface. Other fields collect technical information, as for example the actual url addresses of the files implementing the knowledge resources or the link to the software services. Table 1 summarises the metadata fields that are used to describe INTERLINKERs. An asterisk close to a field name means that the field is required.

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[1] https://cordis.europa.eu/project/id/645845.

[2] https://cordis.europa.eu/project/id/693883/it.

[3] https://servicedesigntools.org/resources.

[4] https://designers.italia.it/.

[5] https://www.ideo.com/eu.

[6] http://www.engage2020.eu/.

Table 1. Metadata schema for INTERLINKERs. An asterisk close to a field name means that the field is required.

Property	Description
NAME TRANSLATIONS*	A name for the INTERLINKER. Translations in different languages may be provided. This input will be: ● Shown on the platform interface in the page showing the details of the INTERLINKER ● Used for searching/browsing the catalogue of INTERLINKERs by name VALUE = \<short text>, possibly in different languages (Translations are provided in the key-value form, with key being ISO 639-1 two-letter language code, and value representing the translated name)
DESCRIPTION TRANSLATIONS*	Textual description of the INTERLINKER, its functionality, usage, etc. Translations in different languages may be provided. This input will be: ● Shown on the platform interface in the page showing the details of the INTERLINKER VALUE = \<text>, possibly in different languages. It is important to note that the description may be potentially provided in a rich text format (e.g. HTML, markdown). The translations are provided in the key-value form, with key being ISO 639-1 two-letter language code, and value representing the translated description.
TYPE	This field describes the nature of the INTERLINKER, either Software or Knowledge. This input will be: ● Used by the internal algorithms for intelligent filtering and recommendation Possible values: ☐ Software INTERLINKER ☐ Knowledge INTERLINKER VALUE = \<keyword>
TAGS TRANSLATIONS*	Tags that can be used to semantically annotate the INTERLINKER. Translations in different languages may be provided. VALUE = \<array of tags>, possibly in different languages The translations are provided in the key-value form, with key being ISO 639-1 two-letter language code, and value representing the translated tags.
PROBLEM PROFILES*	List of names of Problem Profiles associated to the INTERLINKER. This input will be: ● Used by the internal algorithms for mapping the INTERLINKER to the corresponding nodes of the co-production tree VALUE = \<array of names of problem profiles>
IS SUSTAINABILITY RELATED*	Value that expresses whether the INTERLINKER may be useful in achieving the sustainability of the co-produced public service. VALUE = boolean
DIFFICULTY*	Expected level of difficulty in using the INTERLINKER. The value of this field will be: ● Shown on the platform interface in the page showing the details of the INTERLINKER ● Used by the internal algorithms for intelligent filtering and recommendation

|	

	Possible values:
	    1 very easy to use
	    2 easy to use, few energies required
	    3 Medium difficulty, some energies required
	    4 Difficult, expert facilitation may be useful
	    5 Very difficult, expert facilitation suggested
	VALUE = <value>

TARGETS	List of stakeholders, if applicable, that will be engaged in using this INTERLINKER. Multiple values are possible:
	    ☐ All
	    ☐ PAs
	        ☐ Public servants
	        ☐ Politicians
	    ☐ Businesses
	        ☐ SMEs
	        ☐ Freelancers
	        ☐ Large companies
	        ☐ Private non-profit
	    ☐ Citizens
	        ☐ Potential end-users
	        ☐ Expert citizens
	    ☐ Research organisations
	        ☐ Universities
	        ☐ Other research entities
	VALUE = <array of keywords>

LICENCE*	Type of licence under which the INTERLINKER is usable.
	Possible values:
	    ☐ Public Domain
	    ☐ Permissive licence
	    ☐ Copyleft
	    ☐ Non-commercial licence
	    ☐ Proprietary licence
	VALUE = <keyword>

(CEF-SOC) TYPES	This field describes whether the INTERLINKER is an Enabling or Enhancing Service, with the corresponding sub-classification. This input will be:
	    ● Used internally by the INTERLINK platform to describe how the INTERLINKER relates to the standard classifications introduced by the CEF Service Offering Canvas (SOC)[7]
	Possible values:
	    ☐ Enabling Services
	        ☐ Implementing Software and Artefacts
	        ☐ Operation services
	    ☐ Enhancing Services
	        ☐ Onboarding services
	        ☐ Follow-up services

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[7] https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/Service+Offering+Canvas+Playbook

	☐ External experts VALUE = <array of keywords>
ADMINISTRATIVE SCOPES	This field describes the administrative context for which this INTERLINKER is particularly suitable. The value of this field will be: • Used by the internal algorithms for intelligent filtering and recommendation • (potentially) Shown on the platform interface in the page showing the details of the INTERLINKER Multiple values are possible: ☐ EU level ☐ National level ☐ Local level VALUE = <array of keywords>
FORM	Field expressing the form of the INTERLINKER: e.g., visual template, document template, canvas, best practices, guidelines, checklist, survey template, legal agreement template. This input will be: • Shown on the platform interface in the page showing the details of the INTERLINKER Possible values are: ☐ software, ☐ visual template, ☐ document template, ☐ canvas, ☐ best practices, ☐ guidelines, ☐ checklist, ☐ survey template, ☐ legal agreement template, ☐ other VALUE = <option>
FORMATS	Type of the format used to encode the knowledge of the INTERLINKER. This input will be: • Shown on the platform interface in the page showing the details of the INTERLINKER Possible values are: ☐ PDF, ☐ Editable source documents (word, excel,) ☐ open documents, ☐ structured formats (e.g., JSON, XML, RDF, CSV) ☐ software VALUE = <option>
LANGUAGES	List of languages supported by the INTERLINKER. VALUE= <array of options>, with options being ISO 639-1 two-letter language codes
ENVIRONMENTS	List of pilot instances of the INTERLINK Collaborative Environment where the INTERLINKER is available in the Catalogue. Multiple values are possible:

	☐ Varam ☐ Mef ☐ Zgz VALUE = <array of keywords>
INSTRUCTIONS TRANSLATIONS*	Text or file path for a text document containing instructions on how to use the INTERLINKER. Translations in different languages may be provided. This input will be: ● Shown on the platform interface in the page showing the details of the INTERLINKER VALUE = <path> or <text>, possibly in different languages The translations are provided in the key-value form, with key being ISO 639-1 two-letter language code, and value representing the translated text or the path to the translated file.
SNAPSHOTS	One or more images that provide a preview of the knowledge / service that will be made available to users. VALUE = <a list of urls to images> (currently this field is not explicitly mentioned in the metadata, but snapshots are stored in a proper subfolder in github where the INTERLINKER data are saved).
CONSTRAINTS AND LIMITATIONS TRANSLATIONS*	Specific requirements and properties constraining the usage and exploitation of the INTERLINKER. Translations in different languages may be provided. This input will be: ● Shown to technical users of the platform to explain how the INTERLINKER can be used as a Building Block for Public Services VALUE = <text>, possibly in different languages The translations are provided in the key-value form, with key being ISO 639-1 two-letter language code, and value representing the translated text.
REGULATIONS AND STANDARDS TRANSLATIONS	Legal and technical context where the INTERLINKER operates, as a set of relevant, normative acts, policies, standards, and specifications the INTERLINKER adheres to. Translations in different languages may be provided. This input will be: ● Shown to technical users of the platform to explain how the INTERLINKER adheres to national and EU standards Possible values: VALUE = <text>, possibly in different languages The translations are provided in the key-value form, with key being ISO 639-1 two-letter language code, and value representing the translated text.
DOMAIN	This field describes the Public Service application domain for which this INTERLINKER is particularly suitable. It is advised that possible values are taken from standard classifications of public services. (For example, the Core Public Service Vocabulary Application Profile (CPSV-AP) developed within the ISA2 European initiative[8]). Currently the value of this field accepts free strings. VALUE = <string>

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[8] https://ec.europa.eu/isa2/solutions/core-public-service-vocabulary-application-profile-cpsv-ap_en

PROCESS	This field describes the governance model for which the INTERLINKER is particularly suitable. Multiple values are possible: ☐ G2C ☐ C+G ☐ C2G Currently the value of this field accepts free strings. VALUE = <string>
OVERVIEW	This field contains a brief description for the INTERLINKER (briefer than in the Description field). VALUE = <string>
SPECIFIC PROPERTIES FOR KNOWLEDGE INTERLINKERS	
SOFTWARE INTERLINKER*	Reference to the software INTERLINKER that can be used, within the Collaborative Environment, to open the Knowledge INTERLINKER. Possible values are: ☐ google drive ☐ survey editor ☐ ceditor ☐ external resource manager
FILE TRANSLATIONS*	This field collects the paths of the file implementing the knowledge resource in the supported language variants. VALUE= <array of strings> The translations are provided in the key-value form, with key being ISO 639-1 two-letter language code, and value representing the path to the translated file.
SPECIFIC PROPERTIES FOR SOFTWARE INTERLINKERS	
SUPPORTED BY*	Further classification of the software INTERLINKERs, according to different technical dimensions. This input will be: ● Shown to technical users of the platform to explain what is required to run the service provided by the INTERLINKER Possible values: ☐ Software-As-A-Service ☐ On-premise software ☐ Installed app VALUE = <array of options>
DEPLOYMENT MANUAL	Url for the deployment manual of the software INTERLINKER. This input will be: ● Shown to technical users of the platform to describe APIs and other technical details for using the INTERLINKER or integrating it as a building block in a Public Service VALUE = <url or string with file path>
USER MANUAL	Url for the user manual of the software INTERLINKER. This input will be: ● Shown on the platform interface in the page showing the details of the INTERLINKER VALUE = <url or string with file path>
DEVELOPER	Url for the developer manual of the software INTERLINKER. This input will be:

MANUAL	● Shown to technical users of the platform VALUE = \<url or string with file path\>
SUPPORTS INTERNATIONALIS ATION*	Boolean field expressing whether the INTERLINKER supports internationalisation. VALUE = \<boolean \>
IS RESPONSIVE*	Boolean field expressing whether the INTERLINKER is responsive. VALUE = \<boolean \>
AUTHENTICATION METHOD	Field collecting technical information about how the INTERLINKER manages the recognition of returning users. ☐ Header ☐ Cookie VALUE = \<option\>
CAPABILITIES	This property aggregates a list of boolean fields expressing certain abilities of the INTERLINKER with respect to the management of INTERLINKER-specific assets (e.g., documents, discussions, surveys, etc) and with respect to the ways the UI of the INTERLINKER is integrated in the collaboration environment: - INSTANTIATE: Boolean field expressing whether assets can be instantiated. - VIEW: Boolean field expressing whether assets are viewable. - CLONE: Boolean field expressing whether assets are cloneable. - EDIT: Boolean field expressing whether assets are editable. - DELETE: Boolean field expressing whether assets are erasable. - PREVIEW: Boolean field expressing whether assets can be opened in a preview. - OPEN IN MODAL: Boolean field expressing whether the INTERLINKER can be open in a modal window. - SHORTCUT: Boolean field expressing whether a shortcut can be created to assets
PATH	String field used together with IS_SUBDOMAIN to calculate the complete URL of the service. VALUE = \<string\>
IS SUBDOMAIN	Boolean field expressing whether the INTERLINKER runs as a subdomain VALUE = \<boolean \>
API PATH	String field used together with PATH to calculate the complete URL of the service APIs. VALUE = \<string\>
LOGOTYPE	Url for an image which represents the logo of the software INTERLINKER. VALUE = \<url\>
INTEGRATION*	For INTERLINKERs that have been integrated within the Collaborative Environment this field collects a list of subfields which describe technical specifications for the integration: - Service name - Domain - Path - Is subdomain

	- Api path - Capabilities - Capabilities translations - Auth method

3 Integration of the INTERLINKERs Catalogue with the Collaborative Environment

Following a design pattern similar to the one defined in Research Object Crates (RO-CRATE)[9], INTERLINK has defined an extensible declarative model, based on JSON Schemas formally describing the properties listed above, to guide the uniform preparation of the metadata for the Software and Knowledge INTERLINKERs to be uploaded in the Catalogue. JSON schemas and metadata for the content of the Catalogue of INTERLINKERs are saved as persistified data in the GitHub repository.

The way to add implementation of a new INTERLINKER is to create a new directory per INTERLINKER in the project GitHub repository that contains:

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

Knowledge INTERLINKERs usually contain several representations of the resource, 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 (see the example in Figure 1 of what is uploaded in github for the "Stakeholders Mapping Canvas" knowledge INTERLINKER).
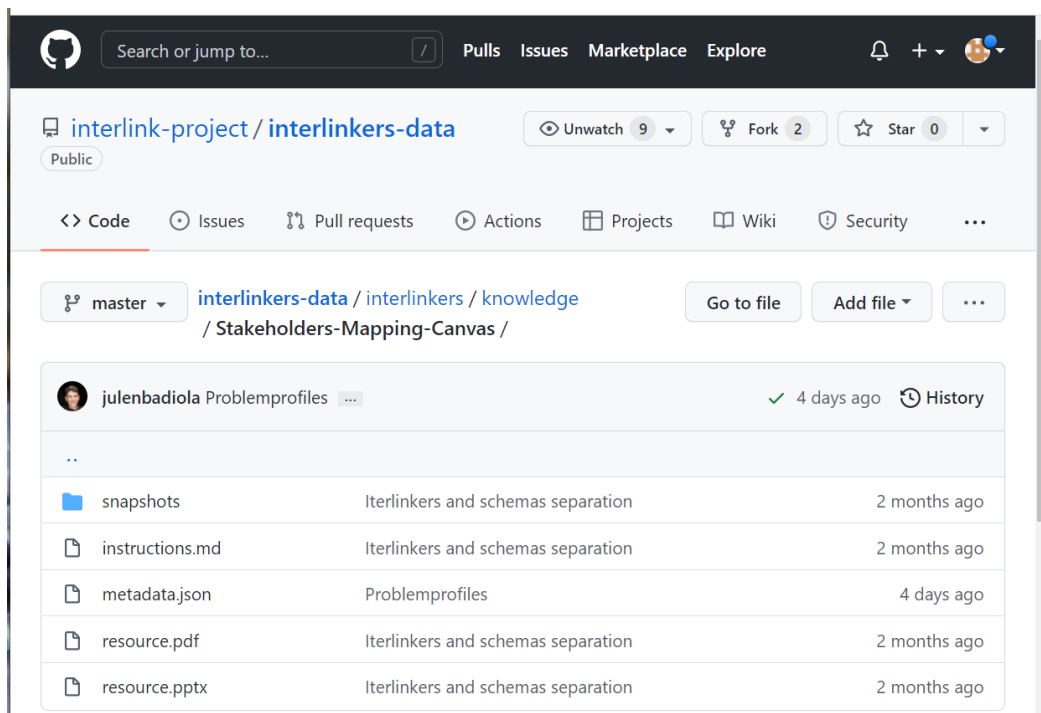
Figure 1. Metadata, instructions, snapshots and resource files uploaded in GitHub for the "Stakeholders Mapping Canvas" knowledge INTERLINKER

Software INTERLINKERs usually contain a *logo.png* file to be able to depict them in the Collaborative Environment (see the example in Figure 2 of what is uploaded in GitHub for the "Collaborative Editor" software INTERLINKER).
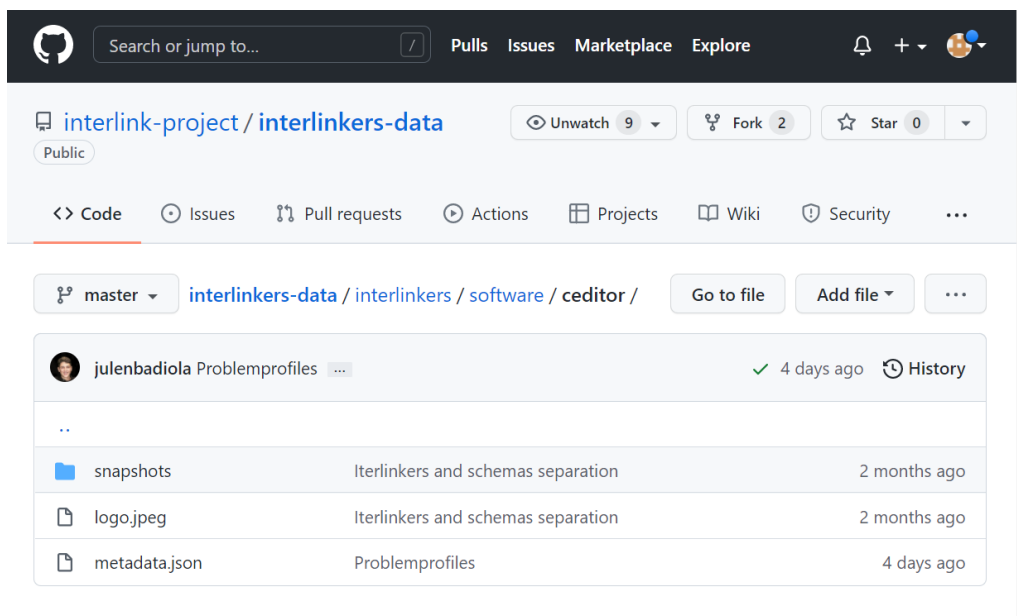
Figure 2. Metadata, logo, and snapshots uploaded in GitHub for the "Collaborative Editor" software INTERLINKER

Apart from common metadata to all enablers (e.g. problem profiles targeted, difficulty, licence, name, description, etc.) software INTERLINKERs also include aspects to enable their integration into the Collaborative Environment (metadata field "Integration"), whenever they are of platform-type (like Google Drive, Loomio, Augmenter, Survey Editor, Collaborative Editor). First, the integration defines how the user interface of the INTERLINKER software instance is integrated with the Collaborative Environment and how the INTERLINKER can be reached (e.g., where it is deployed). Second, the INTERLINKER is described with respect to the management of INTERLINKER-specific entities, called **assets**, that are operated during the co-production process. These entities include, for example, the shared documents, the discussion threads, the surveys created, etc. The specification of the INTERLINKER therefore includes the "capabilities" dictionary with elements like "instantiate", "clone", "view", "edit", "delete", "download" or "open_in_modal" Boolean fields among others. Table 2 illustrates the corresponding API methods for the asset management to be provided by every platform-type software INTERLINKER to be neatly integrated into the Collaborative Environment web portal.

Table 2. API methods for asset management supported by platform-type software INTERLINKERs.

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
/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

Apart from methods required to integrate a co-production INTERLINKER into the Collaborative Environment, as seen in Table 2, custom endpoints may be defined by each INTERLINKER, e.g. for GoogleDrive the endpoint shown in Figure 3 as */api/v1/assets/empty*[10].

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[10] The complete API for the Google Drive INTERLINKER is available at https://demo.interlink-project.eu/googledrive/docs. Another important API is the one for the management of entire co-production processes, which is available at https://demo.interlink-project.eu/coproduction/docs.
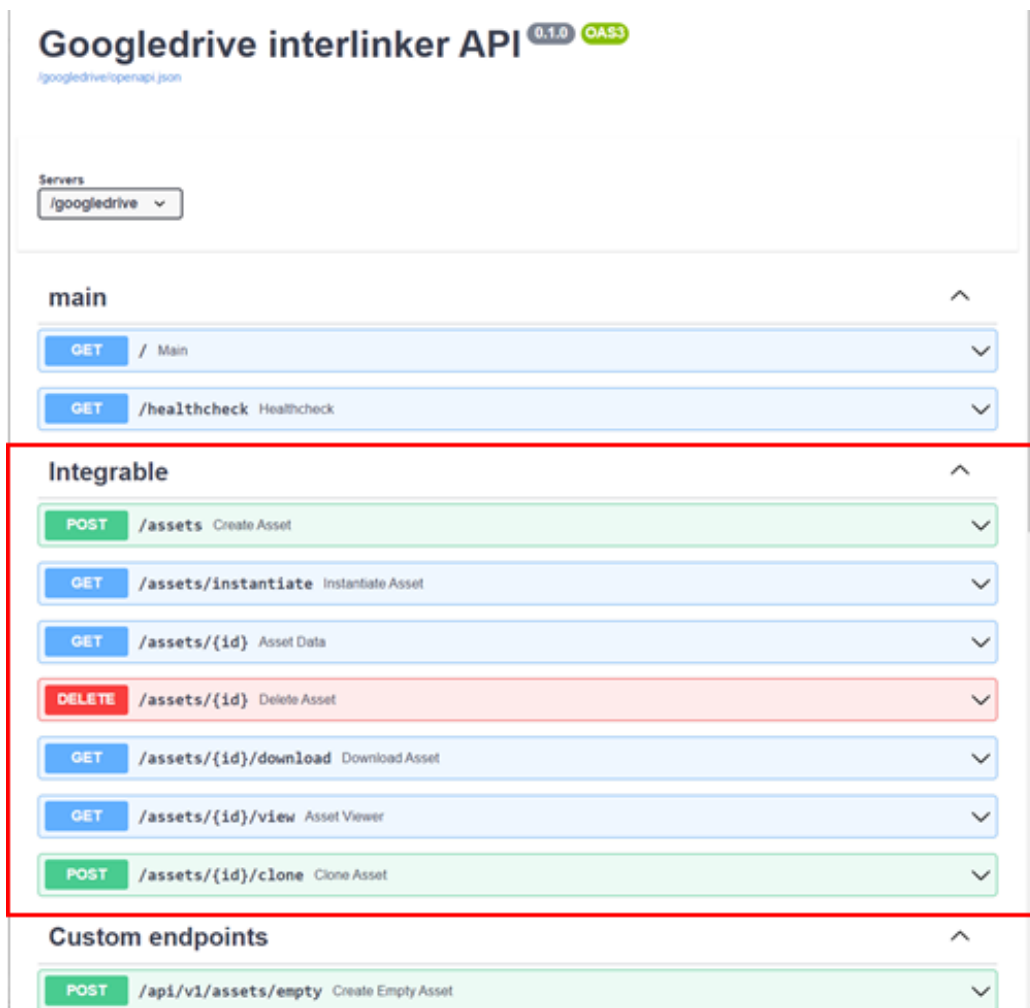
Figure 3. Sample API exposed by the GoogleDrive software INTERLINKER to be integratable in the Collaborative Environment.

3.1 Interaction functionalities for users

Considering the end-user perspective, INTERLINKERs can be accessed and exploited in two different ways: browsing them though the Public INTERLINKERs catalogue (Section 3.1.1.) or they can be accessed contextually to a given co-production process (Sections 3.1.2 and 3.1.3).

We describe in the following sections how users can access and instantiate both software and knowledge INTERLINKERs.

3.1.1 Public INTERLINKERs catalogue with search and filtering

The Public INTERLINKER catalogue provides a one-stop-shop for knowledge and software INTERLINKERs, leveraging resources generated in previous EU projects. A first version of the Catalogue of INTERLINKERs was made available in the first pilot iteration and was improved for the second pilot, according to the user's feedback described in

D4.4. Section 2 (Refinement of socio-technical requirements). Within the public section of the INTERLINK Collaborative Environment, a specific page provides an overview of the reusable knowledge and software resources available in the platform to aid the co-production of public services[11]. The list of available INTERLINKERs can be visualised in a List view (Figure 4) or in a Grid view (Figure 5).

Search and filter functionalities are available. Users can search by keyword, for example "stakeholder" as shown in Figure 4. The search will look into the catalogue for all the INTERLINKERs whose title or description contain the specified keyword(s). Users can also filter data by selecting options in the "Nature", "Problem Profiles", or "Minimum rating" filters. For example, by selecting "Internal Knowledge" under the "Nature" filter, only those INTERLINKERs of type "knowledge" prepared within the project (internal) will be displayed. Users who prefer to filter by "Problem Profiles" need to select one or more problem domains or functionality addressed by an INTERLINKER, e.g. "ORG_PROBLEM_5 – Stakeholders engagement plan".
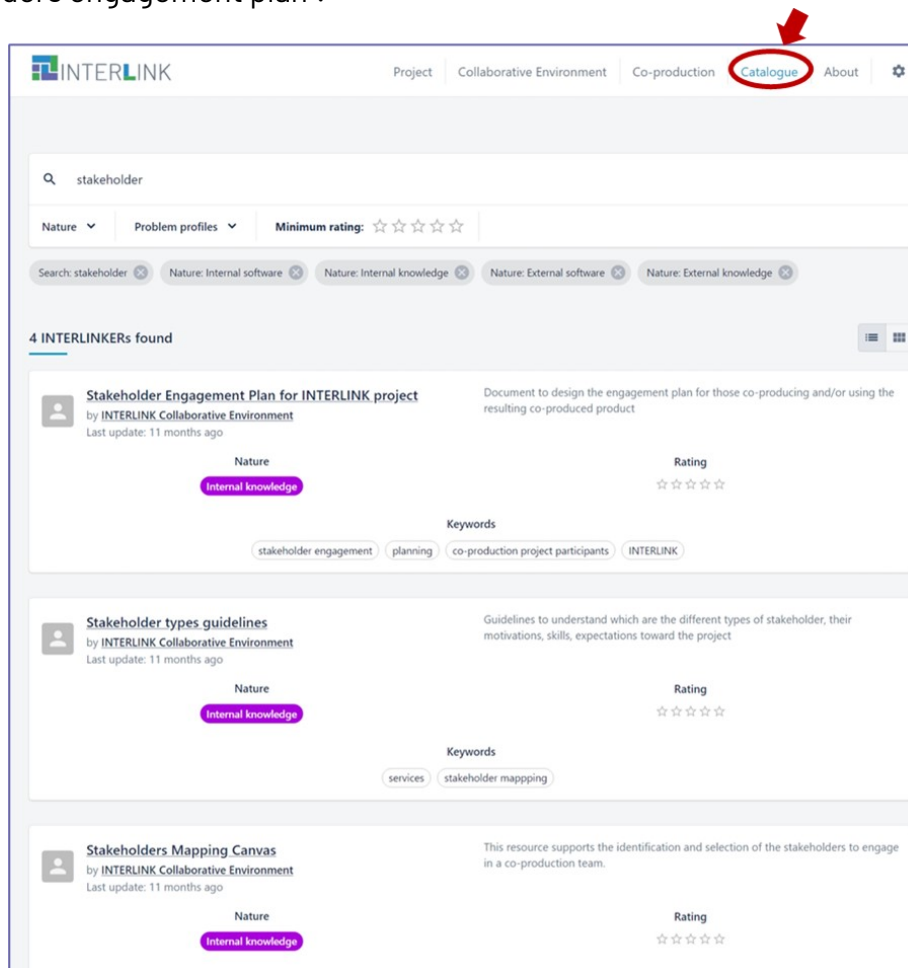

Figure 4. Catalogue of INTERLINKERs as displayed in the public section of the INTERLINK Collaborative Environment. List view.

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[11] https://demo.interlink-project.eu/catal.
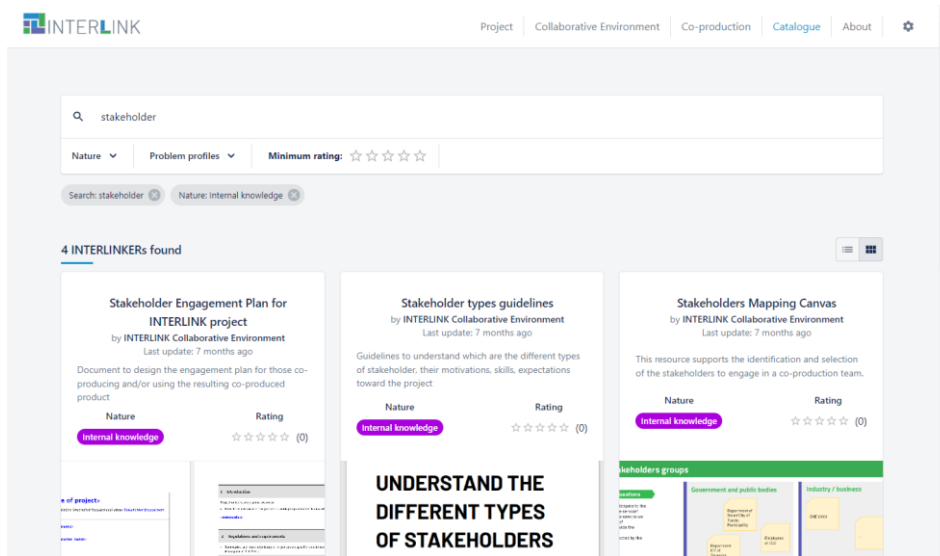
Figure 5. Catalogue of INTERLINKERs as displayed in the public section of the INTERLINK Collaborative Environment. Grid view.

By clicking on the title of one INTERLINKER, a pop-up window allows the user to inspect its information details (Figure 6).
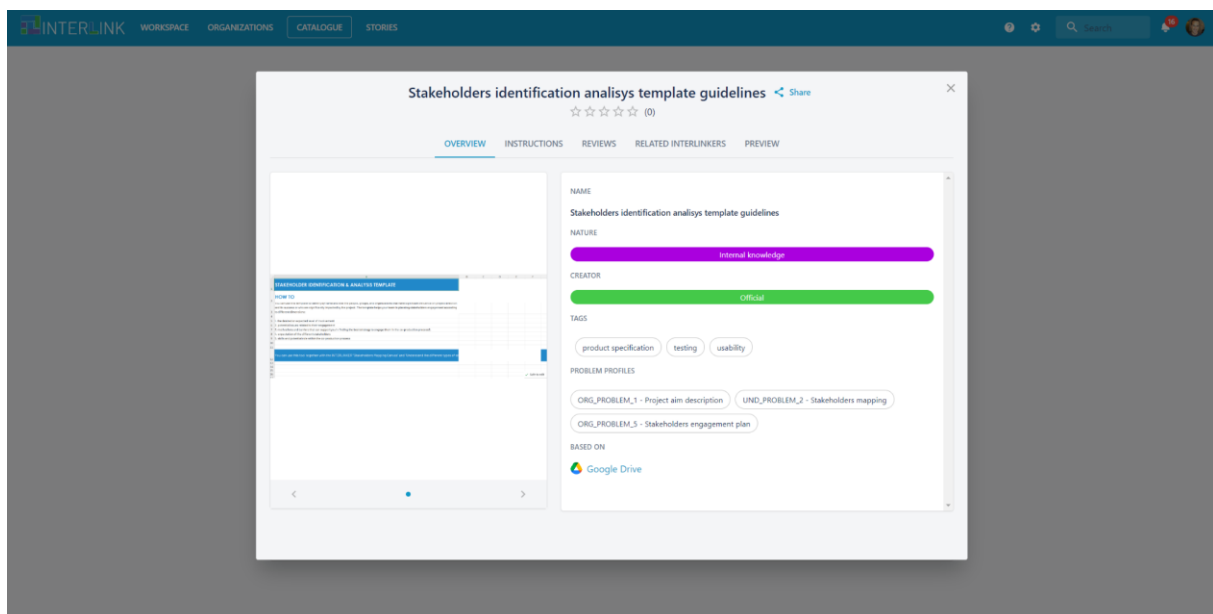
Figure 6. Preview of information details of an INTERLINKER from the public catalogue.

The catalogue of INTERLINKERS is extendable and supports continuous addition of new INTERLINKERs to match emerging needs and new INTERLINKERs produced during the different public service co-production processes.

3.1.2 In-context use of internal software INTERLINKERs to create resources

When users log in into their co-production workspace, further uses of INTERLINKERs are enabled.

In case users need to create an empty document, they can navigate to the task where they want to create it and open the tab showing its resources (Figure 7). Users can then click on the second blue button associated with internal software INTERLINKERs of general use. In the pop-up that appears, users can select the type of document they want to create. For example, by selecting to create a Google Drive document, the Google Drive INTERLINKER is activated and users can choose the type of document to create and save inside the shared co-production space (Figure 8).
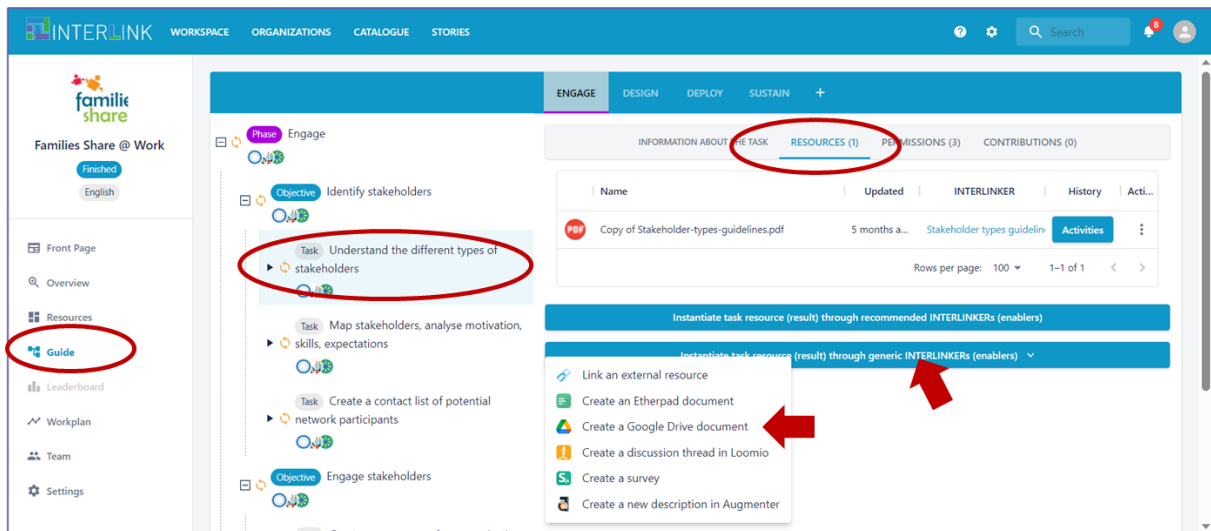
Figure 7. In-context selection of generic INTERLINKERs.
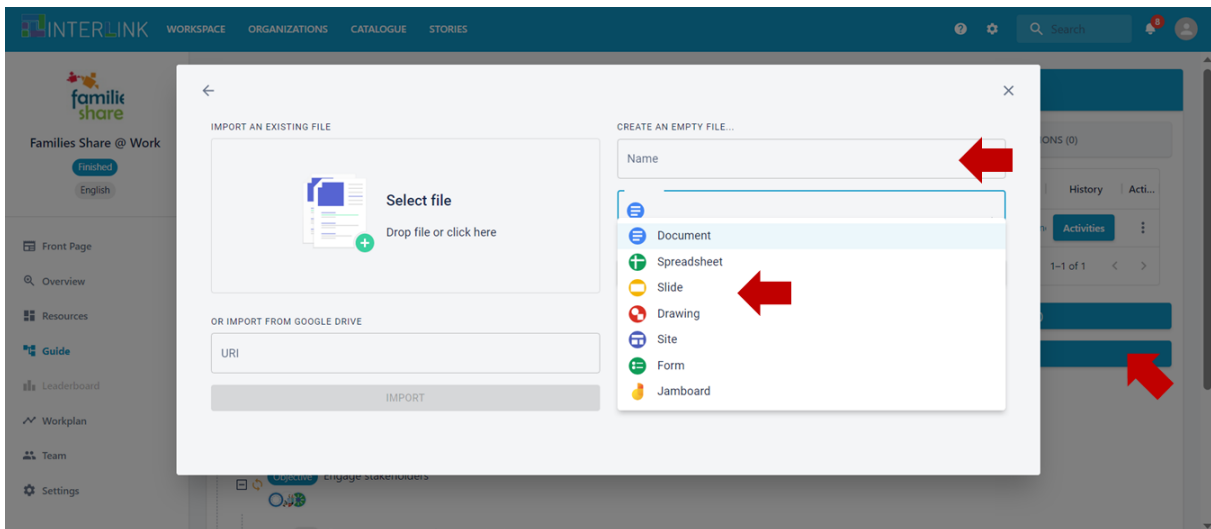
Figure 8. Instantiation of a document with the Google Drive generic INTERLINKER.

The Google Drive INTERLINKER also allows importing into the shared co-production space an existing compatible file by uploading it from the user's file system or by copying its Url (Figure 9).
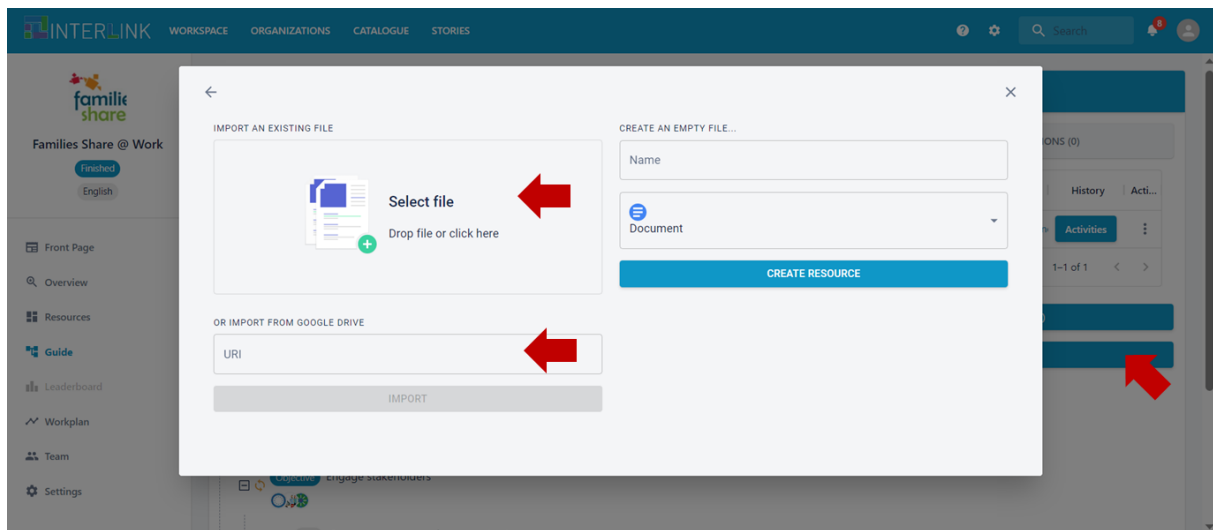
Figure 9. Import of a compatible document with the Google Drive generic INTERLINKER.

3.1.3 In-context preview, download or instantiation of knowledge INTERLINKERs

In the context of each co-production task, under the Resources tab, the system offers to users recommendations about useful knowledge resources that may be of help in the execution of the task. By clicking on the blue button "Instantiate task resource (result) through recommended INTERLINKERs (enablers)" (Figure 10), users are presented with a list of recommended enablers that can be reused (Figure 11). When selecting one recommended INTERLINKER (by clicking on its name) a pop-up opens with further details and previews for the resource (Figure 12). The two buttons at the bottom of the pop-up allow the user to download or to make a copy of the resource to add it to the shared co-production workspace (Figure 12).
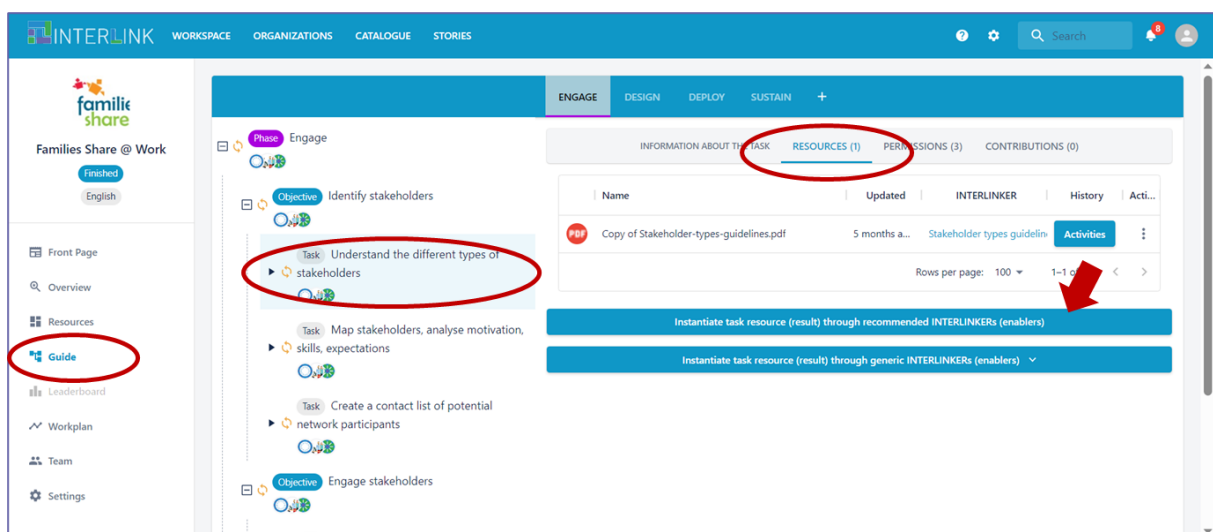
Figure 10. Availability of recommended INTERLINKERs within each co-production task.
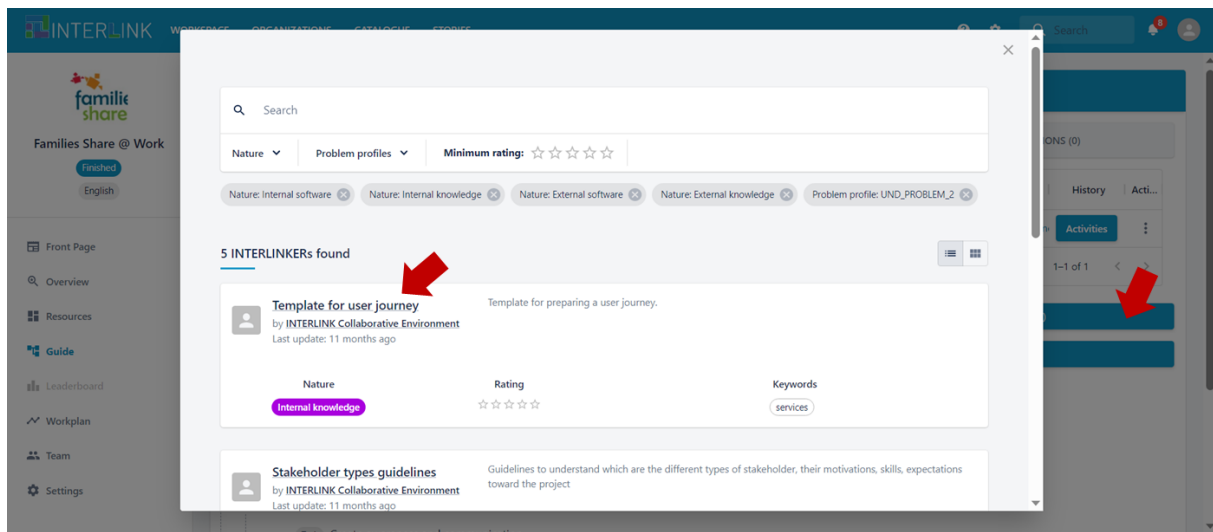
Figure 11. Sample list of in-context recommended INTERLINKERs.
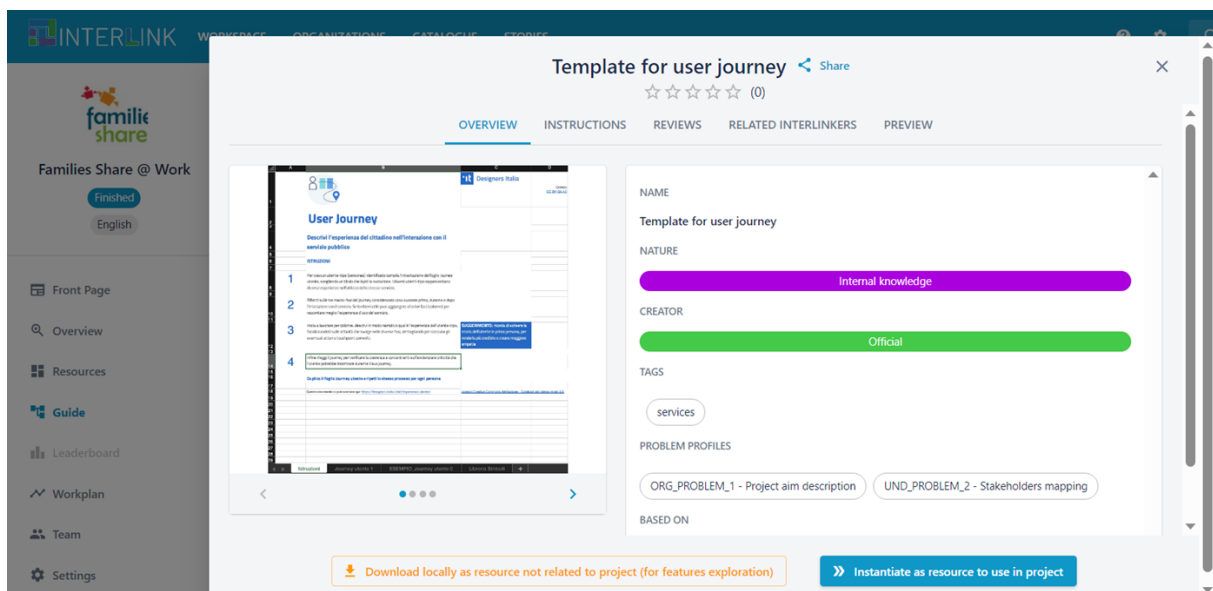
Figure 12. Details of a sample knowledge INTERLINKER with actions for download and instantiation.

3.1.4 Preview and use instructions for software INTERLINKERs

The list of recommended INTERLINKERs for the execution of a task may also include reusable software INTERLINKERs. In this case, the information displayed in the details pop-up includes a synthetic description of the problem profiles for which the software component is useful (Figure 13) and instructions and links for the actual usage of the enabler (Figure 14).
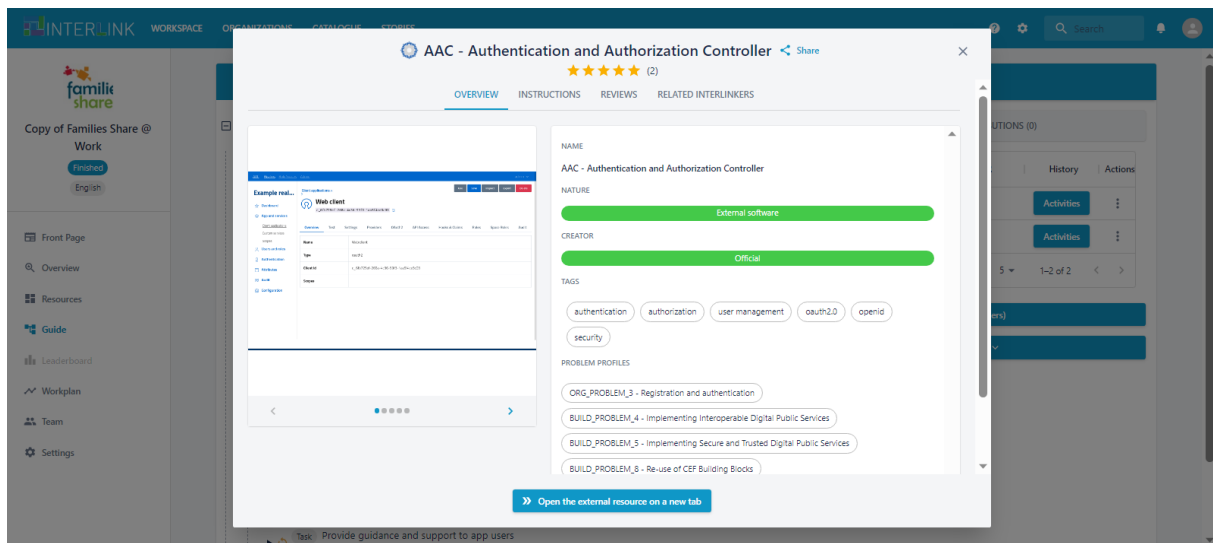
Figure 13. Details of a sample software INTERLINKER with problem profiles and a link to external resources.
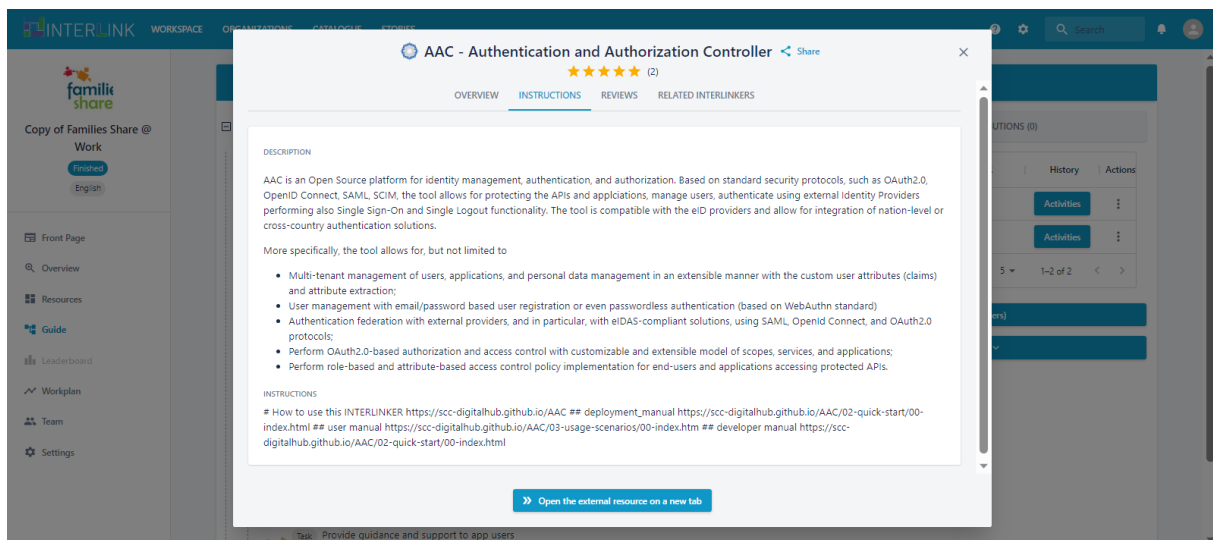
Figure 14. Instructions on how to use a sample software INTERLINKER.

4 Software INTERLINKERs

The following subsections present the list of the software INTERLINKERs that have been developed within tasks T3.3 to populate the INTERLINK platform. For each INTERLINKER a brief description is provided as well as the link to the directory in the GitHub repository created for the project in which the complete resource and its metadata are available for consultation.

Each software INTERLINKER is also available for inspection within the INTERLINKER catalogue in the demo environment[12].

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[12] https://demo.interlink-project.eu/catal.

INTERLINKERs have been divided here into (i) software enablers that are particularly useful to support co-production (although, in some cases, they can be considered also building blocks for Public Services) and (ii) software enablers that can be used to assemble Public Services.

4.1 IT enablers for Co-production

This subsection collects the software INTERLINKERs that may be helpful during the co-production process and have been made available in the second version of the Collaborative Environment used for the second pilot season. (The **NEW** tag in the list below, highlights the fact that the relative INTERLINKER is new with respect to the first version of the INTERLINKERs catalogue.)

Software enablers developed within INTERLINK:

- Augmenter
- Survey Editor

Tightly integrated third-party software:

- Google Drive Manager
- Loomio
- Collaborative Editor (Etherpad)

Pointers to selected useful third-party software:

- W3C accessibility Tools
- W3C Markup Validation Service
- Trello
- Google Charts
- Grafana
- Mailchimp
- **(NEW)** Brevo
- Doodle

4.1.1 Software enablers developed within INTERLINK

Augmenter	
Description	Augmenter is a Web-based, Open-Source application that offers the possibility of creating and improving texts (like Public Service descriptions). In the workspace users can share opinions, questions, and feedback. An assigned moderator will decide to approve or not a suggestion. With Augmenter it is possible to: ● create and improve texts (like public service descriptions), organise discussions and keep record of participation and involvement; ● manage moderator's decisions over the improvements; ● generate a final improvement report. **The Augmenter can run as a standalone application but It has also been integrated internally to the INTERLINK platform.**

Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/software/augmenter
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/8c041a1b-fae9-4da3-9592-07c50996989b

Survey editor	
Description	Survey Editor is a survey designer and publishing software component which allows creating on demand new forms to gather information or help in decision making in co-production processes. It is based on the open-source tool SurveyJs (https://github.com/surveyjs). **This software component is tightly integrated in the Collaborative Environment.**
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/software/survey-editor
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/bcfc37f2-b3fd-4cd4-a44d-121ca205a3f9

4.1.2 Tightly integrated third-party software

Google Drive Manager	
Description	Google Drive is a file storage and synchronisation service developed by Google. It allows users to store files in the cloud, synchronise files across devices, and share files. The Google Drive manager integrated in the INTERLINK Collaborative Environment provides access to Google Docs, Google Sheets, Google Slides, Google Drawings, Google Sites, Google Forms, Google Jamboard which are a part of the Google Docs Editors office suite that permits collaborative editing of documents, spreadsheets, presentations, drawings, forms, and more. Files created and edited through the Google Docs suite are saved in Google Drive. This software INTERLINKER allows users of the Collaborative Environment to create new files which can be co-edited and shared by co-production team participants. **Google Drive has been tightly integrated inside the Collaborative Environment.**
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/software/google-drive
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/b4ca7276-54bc-45c4-9762-50843bf13033

Loomio	
Description	Loomio (https://www.loomio.com/) is a web-based Open-Source solution developed by a third party that offers a workspace for conversation, sharing information and opinions, making proposals, deciding actions and achieving outcomes. With Loomio it is possible to: ● start and organise discussions and keep record of participation and involvement; ● manage collaborative decisions through different forms of polls and surveys; ● enable collaborating and voting around ideas and proposals under discussion. **Loomio has been partly integrated inside the Collaborative Environment.** A dedicated instance of Loomio has been created for the INTERLINK platform: users can launch a new discussion thread from inside the Collaborative Environment and work on it from a separate browser tab. Loomio can also be accessed independently, to facilitate the participation of large numbers of participants, also in case they are not registered to the INTERLINK platform. This is to facilitate citizen engagement.
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/software/loomio
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/a2cdc1bd-8769-4bf1-b0b1-dd04183629ad

Collaborative Editor	
Description	This INTERLINKER supports collaboration on text documents in real time. It uses Etherpad (https://etherpad.org/), an open-source, web-based collaborative real-time editor, that allows authors to simultaneously edit a text document, and see all of the participants' edits in real-time, with the ability to display each author's text in their own colour. There is also a chat box in the sidebar to allow meta-communication. **This software component is tightly integrated in the Collaborative Environment.**
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/software/ceditor
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/06a31f4d-3931-4d57-ad9f-30192878c823

4.1.3 Pointers to selected useful third-party software

W3C accessibility tools

Description	Web accessibility evaluation tools are software programs or online services that help determine if web content meets accessibility guidelines. This INTERLINKER is a link to an external page providing a list of evaluation tools that can be searched and filtered to find ones that match particular needs. **This INTERLINKER is a pointer to an external recommended resource.**
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalsoftware/w3c-accessibility-tools
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/1d830d3f-825f-4eac-95a7-ad77edc2b76e

W3C Markup Validation Service

Description	This validator checks the markup validity of Web documents in HTML, XHTML, SMIL, MathML, etc. Most pages on the World Wide Web are written in computer languages (such as HTML) that allow Web authors to structure text, add multimedia content, and specify what appearance, or style, the result should have. As for every language, these have their own grammar, vocabulary and syntax, and every document written with these computer languages is supposed to follow these rules. The process of verifying whether a document follows the rules for the language(s) it uses is called validation. The W3C Markup Validation Service can check online documents provided with a URI, uploaded files or directly pieces of marked up text. **This INTERLINKER is a pointer to an external recommended resource.**
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalsoftware/w3c-markup-language-validator
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/b426aa0f-e03a-46f2-8c33-45b8dadf4066

Trello

Description	Trello (https://trello.com/) is a commercial collaboration tool that organises projects into boards. It provides summary views that communicate to the team components what's being worked on, who's working on what, and where something is in a process. Through its Dashboard, Trello maps an activity as a task card. The activity card has start/end dates, can be assigned to any of the team members, and supports file upload. To manage and monitor its status, the activity supports a checklist which can optionally be used. The Dashboard supports different activity card views among which timeline and table.

	This INTERLINKER is a pointer to an external recommended resource.
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalsoftware/trello
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/f09dfa90-d47c-43c5-aa2b-1db3ca4da112

Google Charts	
Description	Google Charts is an interactive Web service that creates graphical charts from user-supplied information (from simple line charts to complex hierarchical tree maps). The user supplies data and a formatting specification expressed in JavaScript embedded in a Web page; in response the service sends an image of the chart. **This INTERLINKER is a pointer to an external recommended resource.**
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalsoftware/google-chart
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/c656e906-3668-42a4-a780-2edebeb61743

Grafana	
Description	Grafana (www.grafana.com) is a multi-platform open-source analytics and interactive visualisation web application. It provides charts, graphs, and alerts for the web when connected to supported data sources. With Grafana it is possible to query, visualise, alert on, and understand metrics independently from where data are stored. It's also possible to create, explore, and share dashboards with team members. **This INTERLINKER is a pointer to an external recommended resource.** **Grafana has also been integrated inside the INTERLINK platform** in support of the logging and monitoring services of the infrastructure, as described in deliverable D4.4, Section 3.2.3.
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalsoftware/grafana
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/b466bcb8-1924-488e-ade8-49fb189128d2

Mailchimp

Description	Mailchimp (www.mailchimp.com) is a freemium marketing automation platform and email marketing service for managing mailing lists and creating email marketing campaigns to send to customers. With Mailchimp it is possible to organise the project contact list and manage the communication and the involvement of the project community. It supports the creation of newsletters as well as surveys, postcards, and social posts. Users of this service should be aware that MailChimp is a US-based provider. Using its services to send newsletters implies transferring personal data to the US (e.g., e-mail addresses of recipients will be transmitted to MailChimp, in the US). Following recent developments, the EU legal framework imposes strict requirements on organizations transferring personal data outside the EU. These steps imply: (i) identifying a valid transfer mechanism (e.g., signing specific terms with Mailchimp), and (ii) performing and documenting a "data transfer impact assessment" prior to transferring data. This exercise requires assessing (and documenting) the level of protection provided by Mailchimp and whether additional measures need to be put in place to protect EU data. Individuals (newsletter' subscribers) will also have to be informed about the transfer. This would be done through the Privacy Notice. **This INTERLINKER is a pointer to an external recommended resource.** Mailchimp has been experimented within the MEF use case to manage communication with the network of stakeholders.
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalsoftware/mailchimp
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/63b12401-7d89-4465-b4c5-76c3f766b573

(NEW) Brevo

Description	Brevo (www.brevo.com), formerly Sendinblue, is a SaaS solution for relationship marketing. It offers a cloud-based marketing communication software suite with email marketing, transactional email, marketing automation, customer-relationship management, landing pages, Facebook ads, retargeting ads, SMS marketing. It is a EU-based service that ensures GDPR compliance of data management. **This INTERLINKER is a pointer to an external recommended resource.** Brevo has been experimented by the INTERLINK project to send out project newsletters.
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalsoftware/brevo
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers

Doodle	
Description	Doodle (www.doodle.com) is an online calendar tool for time management and coordinating meetings. Doodle can be used to schedule meetings with team members, project collaborators, and external suppliers. It gives the possibility to create a matrix with a set of time slots and a list of persons. Each person ticks the time slots where he/she is available. When everybody completes the votes, doodle returns the time slots where all the persons are available for a meeting. **This INTERLINKER is a pointer to an external recommended resource.**
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalsoftware/doodle
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/4316b4b9-a6ca-4250-9571-3f9430252745

4.2 IT enablers for building Public Services

This subsection collects software INTERLINKERs that may be helpful during the building of Public Services and have been made available in the second version of the Collaborative Environment used for the second pilot season. (The **NEW** tag in the list below, highlights the fact that the relative INTERLINKER is new with respect to the first version of the INTERLINKERs catalogue.)

Software enablers developed within INTERLINK:

- **(NEW)** Co-Calendar
- **(NEW)** Booking Activity Module (BAM)
- **(NEW)** Loyalty Engine
- **(NEW)** Co-Business Accelerator

Tightly integrated software:

- **(NEW)** Gamification Engine
- AAC - Authentication and Authorization Controller

Pointers to selected useful third-party software:

- KeyCloak
- WSO2 API Manager

4.2.1 Software enablers developed within INTERLINK

(NEW) Co-Calendar

Description	Co-Calendar offers different types of functionalities that support community engagement, communication, collaboration in designing and organising new public events, and co-business aspects. It is a multi-tenant web application i.e. there can be multiple deployments that each have their own private data and users. Co-Calendar uses the same database schema as the Booking Activity Model (BAM) and they can be used together. While the BAM provides administrative tools to actually organise co-designed events and manage required resources, Co-Calendar offers a community point-of-view to the same data which allows more people to participate in co-production. When used together, Co-Calendar can be the source of new event proposals and BAM is the tool to put them into practice. Alternatively, in case the new event proposal is made with BAM as a result of an internal design process, Co-Calendar can be used to co-evaluate proposals and find the people with right skills to perform required tasks. However, Co-Calendar can also be used without BAM as a lightweight event co-designing tool and a shared calendar. A previous version of this component, was available for preliminary testing during pilot iteration 1 and was documented in deliverable D3.2 with the name Event co-designer (ECO).
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalsoftware/co-calendar
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers

(NEW) Booking Activity Module (BAM)

Description	Booking Activity Module (BAM) is a web application that allows co-designing and organising new public events. It features tools for managing programs and proposals, like an easy-to-use and feature-rich calendar view to schedule new events and make requests for resources, facilities, and services needed to organise the event. BAM also includes collaborative tools for documenting, discussing, and co-evaluating the event proposal. It additionally comprises an administrator view including features to manage available resources and services and allocate them to requests made in event proposals. BAM is implemented as a multi-tenant application which allows creating new instances of the BAM for different end-user organisations without server or software updates. A previous version of this component was available for preliminary testing during pilot iteration 1 and was documented in deliverable D3.2 with the name Event Organizer (EVO).
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalsoftware/booking-activity-module
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers

(NEW) Loyalty Engine	
Description	Loyalty Engine allows the extension of a web site managing a community of users with incentives and rewards to improve users' engagement and participation. The Loyalty Engine comprises the following components: • An Admin User Interface to define challenges, actions, skills and other gamification dimensions that define how participants (community members) can gain points and recognition for their engagement and participation. • A Loyalty API to fetch user specific data or to allow external services to submit data when users perform actions. • A Loyalty Dashboard to visualise user's achievements and show available challenges. • Mechanisms to integrate or simulate the Loyalty data sources (like for example the INTERLINK Collaborative Environment, Woocommerce). In particular, the Loyalty Dashboard is a Wordpress plugin which shows user's achievements as charts that summarise points and skills earned by the user. It fetches user data from the API based on user email (login required). A specific instance of Loyalty Dashboard was developed to be integrated with the Etopia web site for the ZGZ use case. Loyalty Engine has been designed to support easy co-exploitation. The dashboard plugin can be installed to existing Wordpress sites and configured to access a specific Loyalty API. The Loyalty API and Admin UI are implemented as a multi-tenant application which can be instantiated for new use cases without software or server updates.
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalsoftware/loyalty-engine
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers

(NEW) Co-Business Accelerator	
Description	Co-Business Accelerator implements and demonstrates the key concepts of the co-business model specified in deliverable D2.4. It can be used as a stand-alone web application or integrated to other applications as software libraries. Every user of the Co-Business Accelerator has a personal *INTERLINK Token Wallet* to store and manage *INTERLINK Tokens* owned by the user. INTERLINK Token is a virtual currency which is valid only within the Co-Business Accelerator and can be earned by doing actions in the Co-Business Accelerator such as performing tasks specified by other users. Any user can start a *co-business* to co-produce something and invite others to join it by giving them *co-business shares* that define the ownership of the co-business and all assets owned by it. Co-businesses have token wallets as well and can use tokens to boost their co-production objectives by promising a reward to complete a co-production task. Active co-businesses and open tasks are publicly visible in the Co-Business

	Accelerator so that all members of the co-business ecosystem can see what's going on and participate in interesting co-productions. Users may donate tokens to co-businesses to support their objectives or even invest in them to become a shareholder. Every investment increases the valuation of a co-business so purchasing shares of a promising co-business in early phases may bring significant profits to investors which they can later invest in other new-born co-businesses. This keeps the co-business ecosystem alive and growing while making it an exciting investment game.
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalsoftware/co-business-accelerator
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers

4.2.2 Tightly integrated software

(NEW) Gamification Engine	
Description	Gamification Engine is a software platform that permits to define and integrate score-based games in mobile and web applications. The usage of the Gamification Engine starts from the definition of a game model. A game model defines the set of rules, the points, and the actions that trigger the execution of the game. Each game model consists of a set of elements, such as: ● game actions, ● game concepts, ● rules, ● levels (optional), ● leaderboards (optional). The game actions represent game-specific events that trigger changes in the game state. The game concepts represent elements like scores, points, and badges. Each game may define its own set of scores (green points, community points, etc.). The rules define the mechanics of a game. It is based on Drools language and follows the event-condition-action paradigm where "event" corresponds to a game action triggering the rule, "condition" represents the situation around the current user state and defines how the state should evolve (e.g., scores that are added, badge that is earned, and the notification that is sent). This INTERLINKER can be used as a building block for new public services that integrate serious games concepts to support citizens' participation. **Besides being proposed as a standalone INTERLINKER, the Gamification Engine was tightly integrated in the INTERLINK Collaborative Environment** to implement incentives and rewards functionalities to support recognition and transparency of participants' contribution and to incentivize active participation during co-production activities. The interaction functionalities made available to users of the Collaborative Environment are described in the knowledge INTERLINKER named "How to take advantage of Gamification in the Collaborative Environment".

Link to Github resources	Instance of the Gamification Engine integrated inside the Collaborative Environment: https://github.com/interlink-project/interlink-gamification
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers

AAC – Authentication and Authorization Controller

| Description	AAC is an Open-Source platform for identity management, authentication, and authorization. Based on standard security protocols, such as OAuth2.0, OpenID Connect, SAML, SCIM, the tool allows for protecting the APIs and applications, managing users, supporting authentication using external Identity Providers and performing also Single Sign-On and Single Logout functionality. The tool is compatible with the eID providers and allows for integration of nation-level or cross-country authentication solutions. More specifically, the tool allows for, but not limited to ● Multi-tenant management of users, applications, and personal data management in an extensible manner with the custom user attributes (claims) and attribute extraction; ● User management with email/password-based user registration or even passwordless authentication (based on WebAuthn standard) ● Authentication federation with external providers, and in particular, with eIDAS-compliant solutions, using SAML, OpenId Connect, and OAuth2.0 protocols; ● Perform OAuth2.0-based authorization and access control with customizable and extensible model of scopes, services, and applications; ● Perform role-based and attribute-based access control policy implementation for end-users and applications accessing protected APIs. **Besides being proposed as a standalone INTERLINKER, the tool is used for user management and authentication within the Collaborative Environment.** Its pilot-specific installation may be also engaged by the public services in the SaaS mode.
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalsoftware/aac
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/e6cd852b-38f1-4ce7-98a4-a83be49e11ed

4.2.3 Pointers to selected useful third-party software

Keycloak	
Description	Keycloak (www.keycloak.org) is an open-source solution providing user federation, strong authentication, user management, and fine-grained authorization. Keycloak can authenticate users with existing OpenID Connect or SAML 2.0 Identity Providers. Keycloak has built-in support to connect to existing LDAP or Active Directory servers. Through the admin console, administrators can centrally manage the aspects of the Keycloak server: enable and disable various features, configure identity brokering and user federation, create and manage applications and services, and define fine-grained authorization policies. Administrators can also manage users, including permissions and sessions. Through the account management console, users can manage their own accounts. They can update the profile, change passwords, and set up two-factor authentication. Users can also manage sessions as well as view history for the account._ While Keycloak and AAC have significant functional overlap, there are some substantial differences in the way the two platforms manage the authorization flow. More specifically, AAC allows for more flexible and configurable implementation of the authorization parameters and policies, such as defining custom claim evaluation and extraction, service definitions, attribute set management. Furthermore, AAC targets native support for the public identity providers, including Italian SPID and CIE protocols both in line with eIDAS specification and with more specific mobile-friendly protocols (e.g., OpenID-Federation). On the other hand, Keycloak allows for more modular and extensible architecture, where some specific functionality is delivered as community modules. **This INTERLINKER is a pointer to an external recommended resource.**
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalsoftware/keycloak
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/e328ee8e-83cf-4adf-8f78-60e29008f595

WSO2 API Manager	
Description	WSO2 API Manager is an open-source complete platform for building, integrating, and exposing digital services as managed APIs in the cloud, on-premise, and hybrid architectures to drive a digital transformation strategy. It allows API developers to design, publish, and manage the lifecycle of APIs and API product managers to create API products from one or more APIs. WSO2 API Manager is one of the INTERLINK software building blocks. With WSO2 API Manager it is possible to: - Publish an API; - Control and monitor the access to the published API; - Document the published API. **This INTERLINKER is a pointer to an external recommended resource.**
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalsoftware/wso2-api-Manager
Public link in	https://demo.interlink-project.eu/dashboard/interlinkers/b12c180a-7f3c-46a8-

the Catalogue	b51d-7b8af0f1d64d

5 Knowledge INTERLINKERs and partnership enablers

Knowledge INTERLINKERs take the form of knowledge offered digitally, that provide interoperable, re-usable, EU-compliant, standardised information, and guidance for the public service co-production management.

Knowledge INTERLIKERs include **learning material and templates for co-production,** governance models, co-business models, and methods for performing the various steps of a co-production process, like for example: problem framing and analysis, service exploration via personas, scenarios and user journeys, service design, evaluation methods for the co-delivered services. Also, **Partnership Enablers** pertain to this type of INTERLINKERs. They are non-technological enablers that help establish and manage a network of stakeholders involved in a co-production process. They include, for example, partnership agreements, non-disclosure agreements, legal and social frameworks, promotion material templates, best practices from grassroots' initiatives on how to set up and organise groups of heterogeneous people, guidelines for stakeholder engagement, etc.

In short, knowledge INTERLINKERs are aimed at the **creation of a community of stakeholders who possess knowledge and competence on the co-production of public services and the ability to apply them**.

The following subsections present the list of the knowledge INTERLINKERs that have been developed within task T3.2 to populate the INTERLINK platform. For each INTERLINKER a brief description is provided as well as the link to the directory in the GitHub repository created for the project in which the complete resource and its metadata are available for consultation.

Each knowledge INTERLINKER is also available for inspection within the INTERLINKER catalogue in the demo environment[13].

5.1. INTERLINKERs for co-production process start

This category of knowledge INTERLINKERs includes the following enablers. (The **NEW** tag in the list below, highlights the fact that the relative INTERLINKER is new with respect to the first version of the INTERLINKERs catalogue.)

- **(NEW)** Setting out for your co-production journey
- **(NEW)** Tutorial Package on the usage of INTERLINK Collaborative Environment for co-production
- Project description template
- Project description example

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[13] https://demo.interlink-project.eu/catal.

Other knowledge resources and guidelines to help build capacity on governance models will be described in deliverable D2.2 "Advanced Governance Model" and will later be considered for integration in the catalogue of INTERLINKERs.

5.1.1 Knowledge enablers developed within INTERLINK

(NEW) Setting out for your co-production journey	
Description	This document provides some guidelines on how to take advantage of the digital functionalities made available by the INTERLINK Collaborative Environment to guide and facilitate co-production processes. It helps coordinators envisage how the platform can help the internal activities of their team as well as the collaboration with external stakeholders. The document is organised in terms of general questions users might have and suggestions and tips on what the Collaborative Environment can do for users. In several places of the document a clickable icon redirects to the page in the online User Manual where users can find more detailed information on how to use the Collaborative Environment functionalities. Suggestions on potentially useful INTERLINKERs are also included, with direct links to the INTERLINKERs online catalogue. At the end of the document, a specific section summarises all the major functionalities that are available in the system.
Formats	PDF document
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Setting-out-co-production
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers

(NEW) Tutorial Package on the usage of INTERLINK Collaborative Environment for co-production	
Description	This knowledge INTERLINKER is represented by a set of documents that provide training material on how to use the Collaborative Environment to facilitate a co-production initiative. It provides complementary material with respect to the detailed user manuals available inside the platform. Materials can be presented or sent in advance to stakeholders invited to participate in a co-production initiative to help them familiarise with the platform. The Tutorial Package includes: ● Tutorial for registering to the platform. Available in English and in Italian. ● Tutorial for co-producers on the basic functionalities of the Collaborative Environment ● Tutorial for co-production administrators on the advanced functionalities of the Collaborative Environment
Formats	PDF documents

Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Tutorial-Package-registration-EN https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Tutorial-Package-registration-IT https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Tutorial-Package-basic https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Tutorial-Package-admin
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers

Template for project description	
Description	This is a template for preparing a project description that synthetically summarises the goals and major aspects of a co-production initiative. Drafting a project description at the beginning of a collaborative initiative is very important to identify addressed problems and scenarios, orient the following stages of stakeholders' network building, and provide the starting point for communication and collaborative service design. This document provides a template on how to describe the main aim and expected benefit of establishing a collaborative network of stakeholders and engaging them in the co-production process. This template can be downloaded and filled in with the information of the project or it can be edited online, with the digital template directly offered inside the INTERLINK platform for the same purpose.
Formats	Editable source document (Word)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Project-Description-Template
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/23703a43-da3d-4dfd-a78f-c07bc6e5a748

Project description example	
Description	This knowledge resource provides an example of project description that synthetically summarises the goals and major aspects of a co-production initiative. Drafting a project description at the beginning of a collaborative initiative is very important to identify addressed problems and scenarios, orient the following stages of stakeholders' network building, and provide the starting point for communication and collaborative service design. This document provides an example of project description and describes the main aim and expected benefit of establishing a

	collaborative network of stakeholders and engaging them in the co-production process. This template can be downloaded and used for inspiration.
Formats	Editable source document (Word)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Project-Description-Example
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/724d5b95-be7b-443e-b023-f1a0e44b5fc8

5.2. INTERLINKERs for stakeholders' engagement

This category of knowledge INTERLINKERs includes the following enablers. (The **NEW** tag in the list below, highlights the fact that the relative INTERLINKER is new with respect to the first version of the INTERLINKERs catalogue.)

Knowledge enablers developed within INTERLINK:

- Stakeholder types guidelines
- Stakeholder mapping canvas
- Stakeholders' identification and analysis template
- Stakeholder engagement plan
- Communication for stakeholder engagement KIT
- Focus Group guidelines
- Template for Focus Group on co-production process
- Consent form for INTERLINK project
- Consent form template
- Information sheet for INTERLINK project
- Information sheet template
- **(NEW)** Introduction to Incentives and Rewards
- **(NEW)** Introduction to Gamification
- **(NEW)** How to take advantage of Gamification in the Collaborative Environment
- **(NEW)** Gamification canvas

5.2.1 Knowledge enablers developed within INTERLINK

Stakeholder types guidelines	
Description	This resource provides guidelines, helpful during the first stages of co-production, to understand which are the different types of stakeholders to be involved, their motivations, skills, and expectations toward the project.
Formats	PDF document

Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Stakeholder-Types-Guidelines
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/2749cd5b-b83c-41c6-b4cd-0c2e440a6a89

Stakeholder mapping canvas

Description	This resource provides practical material that may support a team to identify and select the stakeholders in the co-production team. This canvas can be used collaboratively, for instance, during a brainstorming or a focus group, to reflect on the different types of stakeholders that should be involved in the co-production process in order to represent the different target groups.
Formats	Editable source document (Power Point)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Stakeholders-Mapping-Canvas
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/eff30d96-2f37-41df-a9f8-76e15d7e6cc1

Stakeholders' identification and analysis template

Description	This template of an excel file can be used in conjunction with the Stakeholder Mapping Canvas to identify by name and title the people, groups, and organisations that have significant influence on project direction and its success or who are significantly impacted by the project. The template helps in planning stakeholders' engagement according to different dimensions: 1. the desired or expected level of involvement 2. potential issues related to their engagement 3. motivations and barriers that can support finding the best strategy to engage them in the co-production process. 4. expectations of the different stakeholders 5. skills and potential role within the co-production process.
Formats	Editable source document (Excel)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Stakeholders-identification-analisys-template
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/4c5e95ed-befb-45f1-ac00-06b3593e6249

Stakeholder engagement plan template

Description	This document can be used to design a Stakeholder Engagement Plan. A stakeholder engagement plan—also known as a stakeholder management plan—is a subsidiary document that is often created alongside the main project plan for a given body of work. It is a written document that is formulated before a project begins, and which is kept on file and updated over the course of the project as necessary. Its purpose is to identify a project's key stakeholders and to outline a methodology and approach for how the project team will interact and communicate with those stakeholders. Simply put, stakeholder engagement is about figuring out how to effectively communicate, collaborate, and interact with key people who have a positive or negative influence and may impact the success of your project. This document guides the completion of the following sections: 1) Stakeholder Identification 2) Planning to Interact with the Stakeholders 3) Stakeholder Engagement Activities
Formats	Editable source document (Word)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Stakeholder-Engagement-Plan-Template
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/fae810e6-a830-44cd-9070-b731b5ffe247

Communication for stakeholder engagement KIT

Description	This kit contains a checklist and links to requirements to be handed out to use case managers engaged in co-production activities. It briefly explains the procedures of involving stakeholders and collects communication materials like email templates, social cards, newsletter templates. All the templates and social cards can be tailored according to the specific event / activity / experiment the participants will be involved in, for example, to spread the correct information about the venue, purposes, and so on.
Formats	Editable source document (Word)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Engagement-Communication-KIT
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers

Focus Group Guidelines

Description	This INTERLINKER provides a list of operational steps to help setting-up a research investigation based on focus groups for a co-production project. It includes a template for writing down the research plan underlying a (set of) focus group(s).
Formats	Editable source document (Word)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Focus-Group-Guidelines
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/335e54db-5cee-4530-b03e-c1727e2dd656

Template for Focus Group on co-production process

Description	This resource provides a skeleton for a PowerPoint presentation structuring a focus group to investigate the co-production practices in a given organisation. It addresses a series of questions about previous or current collaboration practices, the dynamics of collaboration (timeline, people, tools, communication channels), current KPIs, critical aspects and desiderata.
Formats	Editable source document (Power Point)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Focus-Group-Template-Co-production
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/0e974f6a-8ba2-4624-a9ad-e1ef4da9360a

Consent form for INTERLINK project

Description	This resource offers a template to prepare a form to collect consent from participants engaged in INTERLINK research activities about the use of their personal data.
Formats	Editable source document (Word)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Consent-Form-INTERLINK
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/7d36dca5-0b11-4bdd-b32c-a195fa54060f

Consent form template

Description	This resource offers a template to prepare a form to collect consent from participants engaged in research activities of a co-production project about the use of their personal data.
Formats	Editable source document (Word)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Consent-Form-Template
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/74645802-9e88-4315-8bc4-c32ad7ae8ae7

Information sheet for INTERLINK project

Description	Information on the INTERLINK project to be distributed to participants. It provides background on research activities.
Formats	Editable source document (Word)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Information-Sheet-INTERLINK
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/5cd7563e-c290-417a-9012-5558d9a0ebae

Information sheet template

Description	Template to guide the preparation of an information sheet to be distributed to participants to project activities in a co-production initiative. It provides background on research objectives.
Formats	Editable source document (Word)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Information-Sheet-Template
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/4046e3e9-125d-46ac-9748-f7139d24be20

(NEW) Introduction to Incentives and Rewards

Description	This document provides tips and examples on how to exploit incentives, in particular within Public Administrations. Incentives and rewards are a powerful tool that can be used to increase engagement and participation. They can be effective for motivating individuals and achieving specific goals, such as to increase participation in collaborative projects or to enhance engagement in citizen science projects. They can provide a sense of purpose, recognition, and satisfaction, and can sustain long-term motivation and engagement of people in their work or personal life. As explained in this knowledge INTERLINKER, to effectively apply incentives and reward it is important to consider different aspects, including cultural norms, individual preferences, and desired outcomes.
Formats	PDF document
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Introduction-Incentives-Rewards
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers

(NEW) Introduction to Gamification

Description	Gamification is the use of game design principles and mechanics in non-game contexts to encourage participation, engagement, and motivation. It involves taking the fun and excitement of games mechanisms that valorize achievement, social, and immersion related aspects and applying them to everyday activities. This document provides tips and examples on how to apply gamification considering different contexts, targets and goals.
Formats	PDF document
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Introduction-Gamification
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers

(NEW) How to take advantage of Gamification in the Collaborative Environment

Description	This document provides information and guidance on functionalities integrated in the INTERLINK Collaborative Environment to support recognition and transparency of participants' contribution and to incentivize active participation. Activities performed during the co-production process by participants can be

	counted and assigned a virtual value (points) that can potentially be converted into rewards. Points can also be used to create a visual rendering of the joint efforts that have contributed to co-production. Both activities performed inside the INTERLINK digital platform and activities performed offline during physical meetings can be registered.
Formats	PDF document
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Gamification-Collaborative-Environment
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers

(NEW) Gamification canvas	
Description	This document can be a useful tool for designing and planning gamified experiences. It helps to visualise and structure the key elements and components of a gamification strategy.
Formats	Editable source document (Power Point)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Gamification-Canvas
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers

5.3. INTERLINKERs for service design

This category of knowledge INTERLINKERs includes the following enablers. (The NEW tag in the list below, highlights the fact that the relative INTERLINKER is new with respect to the first version of the INTERLINKERs catalogue.)

Knowledge enablers developed within INTERLINK:

- Guidelines for online Surveys
- Guidelines for collaborative problem refinement
- Template for Focus Group on problem exploration for new digital functionality
- Guidelines for interviews
- (NEW) Template for Surveys on Media and Technology Usage
- Template for semi-structured interviews
- Template for structured interviews
- Template for Personas
- Template for Use Scenario

- Guidelines for co-design of service
- Templates for User Journeys
- Template for Hackathons Rules
- Template for Public Service proposal

5.3.1 Knowledge enablers developed within INTERLINK

Guidelines for online Surveys	
Description	This resource contains instructions on how to set up a research activity based on online surveys for a co-production project, including pre-arranged templates to support you with research planning, execution and analysis. The online surveys allow to collect information from users in a structured way, so that they can be processed quantitatively.
Formats	Editable source document (Word)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Guidelines-for-online-surveys
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/c3bc5bfd-dfab-45d6-b92c-2b065bab4eef

Guidelines for collaborative problem refinement	
Description	This resource provides guidelines that explain how to refine the problem to be addressed by the co-production team as an important step to creating an effective and efficient solution. It contains a canvas that can be completed individually or in groups. Completing the task in groups however is preferable as the objective of the exercise is to approach the problem from different viewpoints in order to understand and define the problem better.
Formats	Editable source document (Power Point)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Collaborative-Problem-Refinement
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/4213f7db-029d-4221-bd2d-eafab5f42d1d

Template for Focus Group on problem exploration for new digital functionality

Description	This resource provides a skeleton to organise a focus group to investigate the problem that needs to be solved by a digital service / functionality. A focus group is a qualitative research method that involves a moderated discussion with a small group of individuals who share common characteristics or experiences. The purpose of a focus group is to gather in-depth insights, opinions, and perceptions on a specific topic or research question. The template addresses a series of questions about potential users, current practices, critical aspects and desiderata.
Formats	Editable source document (Power Point)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Focus-Group-Template-problem-exploration-functionalities
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/49d6cf7a-d269-4ad2-8c0b-f4d35324c1c2

Guidelines for interviews

Description	This resource provides knowledge and guidelines about the use of interviews. It includes a template for writing down the research plan and managing the process of data collection and analysis. Interviews allow you to gather a range of information and perspectives from different actors and stakeholders.
Formats	Editable source document (Word)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Guidelines-for-interviews
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/19a018af-1ae3-4d85-984b-99211967f978

(NEW) Template for Surveys on Media and Technology Usage

Description	This resource provides a template to collect data through an online survey for assessing media and technology usage and attitudes. The template guides users through 5 different steps, in which they are supposed to: 1. Personalise the survey introduction message. 2. Translate key research topics into a series of questions aimed at gathering participant feedback. 3. Transfer the questions into a tool for administering online questionnaires, adding an introductory message explaining the intent and duration of the survey and below all the respective questions for each topic.

	4. Before sending the survey, test it with a small sample of trusted participants, to verify that the questions are clear and presented in the correct order. 5. Once the questionnaire is ready, proceed with sharing the link.
Formats	Editable source document (Word)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Template-for-online-survey
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/7e9903bf-55ad-42de-b4d1-3c9fc70b2889

Template for semi-structured interviews	
Description	This resource offers a list of operational steps on how to conduct semi-structured interviews for a co-production project. A semi-structured interview is a method of research used to explore a specific set of dimensions. It is organised as an open conversation to allow new ideas to be brought up as a result of the conversation dynamics.
Formats	Editable source document (Word)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Template-for-semi-structured-interview
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/5cf6490a-75f3-4b13-837f-463ff0e81fc8

Template for structured interviews	
Description	This resource offers a list of operational steps, examples and guidelines to set up a research investigation based on structured interviews, that are standardised interviews to collect information from heterogeneous people with different backgrounds and perspectives. Their objective is to guarantee uniformity in the interview process by asking all participants the same set of questions in a consistent sequence, to allow seamless data aggregation and to enable comparisons.
Formats	Editable source document (Word)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Template-for-structured-interview
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/e54cebf9-f704-415d-a581-df856f263355

Template for Personas

Description	This resource offers a template that guides the development and use of personas that represent users' archetypes of the service to be designed. A persona refers to a fictional representation of a target user or a group of users. Personas are created based on research and data about actual users to represent their characteristics, behaviours, needs, goals, and preferences. Personas are typically given names, descriptions, and sometimes even visual representations to make them more relatable and tangible. Personas are powerful tools to describe the profiles of typical users of the digital public service. **This knowledge enabler is a local copy of a resource created by Designers Italia for AGID (the Italian Agency for Digitalization).** The resource is available in Italian and in English.
Formats	Editable source document (Power Point)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/it-agid-personas
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/5579b159-f922-47ae-9161-4a10238575a0

Template for Use Scenario

Description	This resource provides guidance and examples on how to develop scenarios. Scenarios refer to a narrative description or a fictional story that depicts a specific user's interaction with a system or technology in a particular context. Scenarios are used to understand and explore how users might interact with a system, software, or interface in real-world situations. They provide a detailed account of the user's goals, tasks, actions, and the environment in which the interaction takes place. Scenarios help designers and researchers gain insights into user needs, expectations, and challenges, which can inform the design and evaluation of user interfaces and systems. **This knowledge enabler is a local copy of a resource created by Designers Italia for AGID (the Italian Agency for Digitalization).** The resource is available in Italian and in English.
Formats	Editable source document (Excel)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/it-use-scenarios
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/4209f0db-0d06-4eab-a94d-75495abcc8ef

Guidelines for co-design of service

Description	This resource includes the guidelines for the co-design of a service in the public administration. Instructions on how to set-up a co-design workshop, how to invite participants and how to present goals and activities during a co-design workshop are provided. The resource also includes a template that can be customised according to the goals of the activity. **This knowledge enabler is a local copy of a resource created by Designers Italia for AGID (the Italian Agency for Digitalization).** The resource is available in Italian. Translation in English is in progress.
Formats	Editable source document (Power Point)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/it-workshop-service-design
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/3d577f0b-f020-43d5-a387-0dc574f7aeb8

Templates for User Journeys

Description	This resource includes a template to prepare and exploit user journeys for the co-design of a digital service. The user journey (or experience journey) narrates the interaction between a citizen and a service, through a synthetic representation of all the stages of the experience and the description of all the actions (or activities) phase by phase. **This knowledge enabler is a local copy of a resource created by Designers Italia for AGID (the Italian Agency for Digitalization).** The resource is available in Italian. Translation in English is in progress.
Formats	Editable source document (Excel)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/it-user-journey
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/9b1504d2-d83e-45d9-9d6a-3f4e556bc8bf

Template for Hackathons Rules

Description	This resource contains a template for describing hackathons rules. A hackathon is an event, typically lasting for a day or multiple days, where groups of individuals, often including programmers, designers, and other creative professionals, come together to collaborate and work intensively on software development projects. The purpose of hackathons is to involve citizens and the different city agents in the

	search for solutions to the social, cultural, and economic challenges that are identified and raised by public and private bodies through the definition of new web/mobile public service apps.
Formats	Editable source document (Word)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Hackathon-Rules-Template
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/77db64b8-409c-40f1-b269-9302c4d2745d

Template for Public Service proposal	
Description	This resource contains a template for the co-design of Public Service Proposals to be used by teams during hackathons. It guides teams in defining the purpose of their digital solution, the impact that the solution might have on the society, the resources needed for its implementation (e.g. dataset, etc).
Formats	Editable source document (Word)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Public-Service-Proposal-Template
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/03b066e7-9340-4b27-b025-1602335af827

5.4. INTERLINKERs for service development

This category of knowledge INTERLINKERs includes pointers to useful third-party resources.

Pointers to selected useful third-party knowledge:

- W3C Web Content Accessibility Guidelines
- EDPB Data Protection Guidelines
- Open-Source guides
- AGID Cloud Enablement Kit
- AGID Cloud computing migration strategy evaluation template
- AGID Guidelines on the acquisition and reuse of software for public administrations
- AGID Guidelines for the development of secure software
- AGID Italian PA interoperability model
- AGID Minimum Security Measures for Public Administration.
- Open API specification
- EIDAS standards

5.4.1 Pointers to selected useful third-party knowledge

W3C Web Content Accessibility Guidelines	
Description	Web Content Accessibility Guidelines (WCAG) provide guidelines that explain how to make the Web content more accessible to all, also when disabilities (auditory, cognitive, neurological, physical, speech, visual) are present or there are temporary or situational limitations. Web "content" generally refers to the information in a web page or web application, including: ● natural information such as text, images, and sounds ● code or markup that defines structure, presentation, etc. WCAG applies to dynamic content and multimedia as well, also when rendered with mobile devices. **This INTERLINKER is a pointer to an external recommended resource.**
Formats	External link to structured content in online Html pages
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalknowledge/w3c_web_content_accessibility_guidelines
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/4d6ce604-7926-4a4a-a3ec-6da0a9d83039

EDPB Data Protection Guidelines	
Description	These Guidelines, produced by the European Data Protection Board, give general guidance on the obligation of Data Protection by Design and by Default (DPbDD) set forth in Article 25 in the GDPR. DPbDD is an obligation for all data controllers, irrespective of size and varying complexity of processing. To be able to implement the requirements of DPbDD, it is crucial that the controller understands the data protection principles and the data subject's rights and freedoms. The Guidelines also contain guidance on how to effectively implement the data protection principles in Article 5, listing key design and default elements as well as practical cases for illustration. The controller should consider the appropriateness of the suggested measures in the context of the particular processing in question. **This INTERLINKER is a pointer to an external recommended resource.**
Formats	External link to a PDF document
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalknowledge/it-guidelines-data-protection
Public link in	https://demo.interlink-project.eu/dashboard/interlinkers/9e440e9f-9507-44fe-

the Catalogue	ad23-61390b39b271

Open Source guides

Description	This INTERLINKER suggests a collection of resources for individuals, communities, and companies who want to learn how to run and contribute to an open-source project. Open-Source Guides (https://opensource.guide/) were created and are curated by GitHub, along with input from outside community reviewers, and they are not exclusive to GitHub products. They aggregate community best practices. **This INTERLINKER is a pointer to an external recommended resource.**
Formats	External link to structured content in online Html pages
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalknowledge/Opensource-Guide
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/7041e092-1261-44e6-bbf7-89c7988f63b2

AGID Cloud Enablement Kit

Description	This resource is part of the Cloud Enablement strategy outlined by AGID and Team Digitale to build capacity in Italian Public Administrations for the adoption of cloud solutions. This enabler focuses in particular on the methods, tools, and good practices that Public Administrations can use to migrate existing infrastructures and applications towards cloud computing solutions. The document is addressed to technical IT experts, to digital transformation decision makers, as well as to stakeholders in Public Administrations involved in the current management of existing services or in the planning of new digital services. It provides guidance for the whole journey starting with the identification of the application to migrate up to the final evaluation of the key performance indicators after the migration has concluded. **This INTERLINKER is a pointer to an external recommended resource.** The resource is available in Italian.
Formats	External link to a PDF document
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalknowledge/it-cloud-enablement-kit
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/92fc22f5-f578-4884-b175-850443838980

AGID Cloud computing competence evaluation template

Description	This resource is part of the Cloud Enablement strategy outlined by AGID and Team Digitale to build capacity in Italian Public Administrations for the adoption of cloud solutions. This enabler contains a questionnaire to assess the level of knowledge and competence in cloud computing of a given team assisting a Public Administration in the migration of services towards cloud computing. **This INTERLINKER is a pointer to an external recommended resource.** The resource is available in Italian.
Formats	External link to a Google Spreadsheet
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalknowledge/it-cloud-competences-assesment
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/ef2ec893-6671-46aa-aad7-4b600f58f521

AGID Cloud computing migration strategy evaluation template

Description	This resource is part of the Cloud Enablement strategy outlined by AGID and Team Digitale to build capacity in Italian Public Administrations for the adoption of cloud solutions. This enabler is a technical evaluation template to support public administrations assessing the features of their services in preparation of the migration to the cloud. It suggests a well-defined process to analyse the features of the service to migrate, its technological constraints, type of involved data, involved stakeholders, needs related to the usage of the service. **This INTERLINKER is a pointer to an external recommended resource.** The resource is available in Italian.
Formats	External link to Google Spreadsheet
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalknowledge/it-cloud-strategy-assesment
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/d1c3b2e3-77e7-4fca-9f70-333316b2de91

AGID Guidelines on the acquisition and reuse of software for public administrations

Description	This INTERLINKER provides guidelines to follow when a Public Administration decides to reuse software developed by other organisations, in compliance with the

	regulations in force, in particular with regards to digital public administration, public contracts and the protection of personal data.
	This document endorses a cultural process in which public administrations are the protagonists for the increasing use of open software, which requires public administrations that own solutions and computer programs created at the specific instructions of the public client to make the relevant source code available, complete with documentation and released in a public repository under open licence.
	This INTERLINKER is a pointer to an external recommended resource.
Formats	External link to structured content in online Html pages
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalknowledge/it-guidelines_acquiring_reuse_sw_pa
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/16802030-6304-4a94-b466-379ae6d28268

AGID Guidelines for the development of secure software

Description	This resource provides guidelines for the specification of software security policies aimed at guaranteeing the availability, integrity and privacy of data within the information systems of Italian Public Administrations. The knowledge enabler includes:
	● Guidelines for the adoption of a development cycle for secure software.
	● Principles for the writing of secure code.
	● Configuration options for secure baseline infrastructures.
	● Guidelines for the risk modeling and mitigation actions compliant with the general principle of Security/Privacy by Design.
	This INTERLINKER is a pointer to an external recommended resource.
	The resource is available in Italian.
Formats	External link to structured content in online Html pages
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalknowledge/it-pa-guidelines-for-secure-software
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/4b73c019-5fa7-4285-abef-f6886d6ee5b5

AGID Italian PA interoperability model

Description	It is important for a Public Administration to design and develop interoperable services. This interlinker describes the interoperability policies to be adopted in the Italian context.
	The interoperability model aims at enabling the collaboration between different

	Public Administrations and third parties to favour: the development of new applications for PAs, the access to PA data by third parties in compliance with privacy regulations, the implementation of the principles of the European Interoperability Framework (EIF). In particular, the model contains standard principles for the implementation of APIs that guarantee: ● the traceability of different versions of the APIs to allow for non-disrupting software evolution (versioning); ● the availability of documentation aligned with API version (documentation); ● the limitation to the number of API requests in a certain period related to the API characteristics and user type (throttling) ; ● the traceability of API requests and output (logging and accounting); ● an adequate service level, according to the type of delivered service (SLA); ● a scalable configuration of resources. **This INTERLINKER is a pointer to an external recommended resource.** The resource is available in Italian.
Formats	External link to structured content in online Html pages
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalknowledge/it-pa-interoperability-model
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/3907647d-d808-4b5e-b103-c3dcc799a165

AGID Minimum Security Measures for Public Administration.	
Description	This resource describes the minimum ICT security measures issued by AgID aimed at countering the most frequent cyber threats to the Italian Public Administration. The measures consist in technological, organisational and procedural controls, with three levels of implementation. ● Level 1: this is a "minimum" level which is mandatory for every public administration ● Level 2: this is a standard level which can be considered as a baseline for most Public Administrations ● Level 3: the subsequent "high" level requires more complete protection systems. It concerns organisations that are most exposed to risks due to the critical nature of the information processed or services provided. The minimum measures also foresee public administrations' access to early warning services to keep up with new security vulnerabilities. **This INTERLINKER is a pointer to an external recommended resource.** The resource is available in Italian.
Formats	External link to structured content in online Html pages
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalknowledge/it-pa-minimum-security-measures
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/9846944c-a77f-4ffc-9b0c-8ace05b2cd65

Open API specification

Description	For a Public Administration, it is important to develop the new services considering future integration possibilities. OpenAPI is a standard helping in doing that. The OpenAPI Specification (OAS) defines a standard, programming language-agnostic interface description for HTTP APIs, which allows both humans and computers to discover and understand the capabilities of a service without requiring access to source code, additional documentation, or inspection of network traffic. When properly defined via OpenAPI, a client application can understand and interact with the remote service with a minimal amount of implementation logic. **This INTERLINKER is a pointer to an external recommended resource.**
Formats	External link to structured content in online Html pages
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalknowledge/open-API-specification
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/aa84a4be-9d70-4a45-85a1-6514a4646d96

EIDAS standards

Description	The eIDAS solution allows citizens from Member States to prove and verify their identification when accessing on-line services in other Member States. It allows citizens to authenticate themselves by using their eIDs and connecting with their Identity Provider (IdP) from their country. The CEF eID building block is a set of services (including software, documentation, training, and support) provided by the European Commission and endorsed by the Member States, which helps public administrations and private Service Providers to extend the use of their online services to citizens from other European countries. **This INTERLINKER is a pointer to an external recommended resource.**
Formats	External link to structured content in online Html pages
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/externalknowledge/eidas-standard
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/63cf0e58-a6fd-4646-b649-e43cf03d54fb

5.5. INTERLINKERs for service sustainability

This category includes the following knowledge enablers developed within INTERLINK:

- Outcome marketing feature set

- Business model canvas
- Business plan template

Other knowledge resources and guidelines for co-business and co-exploitation will be described in deliverable D2.5 "Guidelines for co-exploitation processes" and will later be considered for integration in the catalogue of INTERLINKERs.

5.5.1 Knowledge enablers developed within INTERLINK

Outcome marketing feature set	
Description	This resource suggests a model to define the features of a co-produced service. It guides the description of the problem(s) that the product will solve in the long run, the vision for the user experience as well as the user interface, the vision for how the product will generate a return of investment.
Formats	Editable source document (Word)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/outcome-marketing-featureset
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/01ddf856-6f1e-410f-9148-f6cc21df181e

Business model canvas	
Description	The Business Model Canvas is a business tool used to visualise all the building blocks when you want to start a business, including customers, route to market, value proposition and finance, assisting businesses to align their activities by illustrating potential trade-offs. This canvas can be used collaboratively, for instance, during a brainstorming or a focus group, to reflect on the most suitable business model associated with a co-produced service.
Formats	Editable source document (Power Point)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Business-Model-Canvas
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/90197435-e374-4d8a-ab0f-c636eafca7f7

Business plan template	
Description	A business plan is a formal written document containing the goals of a business, the methods for attaining those goals, and the time frame for the achievement of the goals. This template provides a suggested list of sections that can be edited collaboratively by the co-producing team to elaborate the business plan for a co-produced service.
Formats	Editable source document (Word)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Business-Plan-Template
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/e9b11e22-23fa-4bf2-8a9d-8f8f88bdde55

5.6. INTERLINKERs for evaluation (of co-production and of service)

This category includes knowledge INTERLINKERs that are useful for the evaluation of the co-production of public services and for the evaluation of the execution of public services.

Knowledge enablers developed within INTERLINK:

- Final End-Users' Questionnaire for Quality of Service
- INTERLINK Co-Producers' Perceptions Questionnaire
- INTERLINK Users' Demographics and Activity Satisfaction Questionnaire
- Usability testing

5.6.1 Knowledge enablers developed within INTERLINK

Final End-Users' Questionnaire for Quality of Service	
Description	This is a model of End Users' Perceptions Questionnaire. It aims to measure end-users' perceptions on user-based quality, value-based quality, trust and acceptance. This questionnaire is thought to be answered by users of traditional e-services and also those who co-produced them through INTERLINK.
Formats	PDF document
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Final-End-Users-Questionnaire-QoS
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/5b43a066-d3cb-4685-a9b3-c09d49ef9bf6

INTERLINK Co-Producers' Perceptions Questionnaire

Description	This is a model of a questionnaire aimed to measure co-producer's perceptions on user-based quality, value-based quality, trust and acceptance. This questionnaire is thought to be answered by those who take part in the co-production of a public service or reuse artefacts (public services & INTERLINKERs) made available through INTERLINK co-production tools (Collaborative Environment and Catalogue).
Formats	PDF document
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/co-producers-perceptions-Questionnaire
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers

INTERLINK Users' Demographics and Activity Satisfaction Questionnaire

Description	This is a model of a questionnaire aimed to collect demographics and activity satisfaction scores from participants to project events and activities.
Formats	PDF document
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Demographic-activity-satisfaction-questionnaire
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/76b7fe78-167d-4235-8955-4b1e2403d770

Usability testing

Description	This INTERLINKER provides guidelines on how to perform usability testing to improve the usability of a digital service.
Formats	Editable source document (Word)
Link to Github resources	https://github.com/interlink-project/backend-catalogue/tree/master/catalogue/seed/interlinkers/knowledge/Usability-testing
Public link in the Catalogue	https://demo.interlink-project.eu/dashboard/interlinkers/c4145d7d-2143-405d-a18e-9899b840fd29

6 Reusability of INTERLINKERs

During the initial phases of the INTERLINK project, an analysis of multidisciplinary and multidimensional requirements was conducted to inform the design and development of the Collaborative Environment. At that stage, *exemplification* and *reuse* emerged as pivotal principles to provide effective support to co-production (as described in deliverable D3.1). **Reusability** (combined with customization) is, thus, an important property for both knowledge INTERLINKERs and software INTERLINKERs. For example, during stakeholders' engagement and co-design, practical examples, templates and reusable materials that can be downloaded or modified collaboratively can make a difference in enhancing PA's capacity for co-production. During service development, reusable applications and software components compliant with national and international regulations for public services can reduce development costs and effort, by allowing the integration of functionalities already available. At the same time, clear examples of co-business models for the long-term sustainability of services may be determinant to incentivize co-delivery by providing a starting point to the exploitation of co-produced artefacts.

Different forms of INTERLINKERs' reusability are supported and have been demonstrated in the INTERLINK R&D and piloting activities, both for knowledge INTERLINKERs as well as for software INTERLINKERs.

For knowledge INTERLINKERs the following reusability forms are supported:

- **Download of knowledge INTERLINKERs for inspection and edit in the user's local file system.** This has happened for example with the templates of Information Sheets and Consent Forms that pilot owners downloaded and customised to collect consent from the participants to their activities.

- **Creation of new instances of knowledge INTERLINKERs inside the shared workspace within the Collaborative Environment for collaborative editing.** This form of reuse of knowledge enablers was largely tested in the INTERLINK pilot activities and in collaborative processes of the project consortium.

- **Sharing/assigning of links to new instances of knowledge INTERLINKERs inside the Collaborative Environment with single users or groups of users**, together with a request of contribution. This functionality was specifically implemented following use case owners' request.

For software INTERLINKERs the following reusability forms are supported:

- **Opening of a software INTERLINKER directly from the Collaborative Environment.** This type of INTERLINKER use was intensely tested within the VARAM use case where the Augmenter INTERLINKER was used to support collaborative revision of public service descriptions during workshops with various stakeholders, including citizens.

- **Reuse of software INTERLINKERs by creation of new instances of multi-tenant online services.** This type of reuse has been tested for example in the ZGZ use case with the creation of new instances of the Co-Calendar INTERLINKER, of the BAM INTERLINKER, and of the Loyalty Engine INTERLINKER.

- **Reuse of software INTERLINKERs by download and installation of the corresponding code to be used as a standalone component.** This scenario is exemplified by the possibility to download, customise, and reuse the mobile application published within the resources of the Families Share co-production success story[14].

- **Reuse of software INTERLINKERs as building blocks of a larger platform for a public service.** Examples of INTERLINKERs used as building blocks of a larger service that have been experimented in the project are for instance:
  - the AAC INTERLINKER used in different instances of the Collaborative Environment to implement login routines, with customization with respect to the different pilots (e.g., the login for the ZGZ instance of the Collaborative Environment integrates with Etopia web site authentication system);
  - the AAC INTERLINKER used for login into the Co-Calendar INTERLINKER;
  - the AAC INTERLINKER used for login into the Loomio INTERLINKER;
  - the Loomio INTERLINKER integrated into the Collaborative Environment;
  - the Augmenter INTERLINKER integrated into the Collaborative Environment;
  - the Gamification Engine used to incorporate gamification capabilities in the Collaborative Environment;
  - the BAM and Loyalty Engine used to extend the community engagement services within the Etopia web site.

An additional form of reusability of INTERLINKERs is implemented as an effect of the possibility for platform users to "reuse co-production processes" by a) cloning the process embedded in a success story and b) cloning a user's own previously created process.

- **Creation of copies of instances of INTERLINKERs when cloning co-production processes.** The cloning of an entire co-production process has the effect of duplicating resources, i.e. instances of INTERLINKERs, that can thus be used in the newly created co-production process.

The many different forms of resource reusability illustrated above have been complemented with methods for encouraging co-production contributors to take active part in resource collaborative usage (via email notifications, in-app notifications, assignment of tasks). Besides, participation can be encouraged by publishing open processes declaring the skills or tasks demanded by those willing to participate.

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[14] https://demo.interlink-project.eu/stories.

In view of the future exploitation of the INTERLINK results, including the INTERLINKERs catalogue, a proper licence policy is currently under definition to further enforce reusability. The licence policy for INTERLINKERs will take into account the potential reuse of knowledge and software resources by different types of actors, e.g. project partners, users registered to the platform with administrator rights for certain co-production processes, users registered to the platform as participants to co-production processes, external readers/non-registered users, other developers interested in reusing software INTERLINKERs. Licence aspects will be described in detail in deliverable D7.6 "Sustainability and exploitation plan", due at the end of the project.

7 Conclusion

The research and development activities carried out within Work package 3 of the INTERLINK project unfolded into several steps:

(i) the initial analysis and specification of what is meant by common building blocks to support the co-production of effective, participatory and sustainable public services (Task 3.1), with the specification of a formal model for the classification, description, and definition of the INTERLINKERs and the introduction of the notion of Problem Profile which describes the problems that INTERLINKERs should address (as described in deliverable D3.1, M10);

(ii) the implementation of an initial set of knowledge and software INTERLINKERs that allowed experimentation in pilot iteration 1 with the concept of partnership tools and software enablers that support co-production processes and the building of public services (Task 3.2 and Task 3.3). This activity resulted in the realisation of a first version of the INTERLINKERs catalogue (as described in deliverable D3.2, M16);

(iii) the elaboration of the feedback and the reflections emerged from the use case activities in pilot 1 to carry out the revision of the data models and the extension of the set of enablers that are offered to support co-production (Task 3.2 and Task 3.3). This activity resulted in the realisation of a consolidated INTERLINKERs catalogue (as described in this deliverable D3.3, M32).

The final version of the catalogue illustrated in this report includes 21 software INTERLINKERs (summarised in Table 3) and 50 knowledge INTERLINKERs (summarised in Table 4). However, the approach used to ground the design and the development of the INTERLINKERs catalogue was purposefully aimed at ensuring **future flexibility and extensibility of the catalogue** with new enablers of different types. The use case activities within the project in pilot iteration 1 and 2 allowed demonstrating different types of reusability and usefulness of the INTERLINKERs as building blocks for the co-production of public services.

Table 3. Software INTERLINKERs in the final version of the INTERLINKERs catalogue.

SOFTWARE INTERLINKERS	
IT ENABLERS FOR CO-PRODUCTION	**IT ENABLERS FOR BUILDING PUBLIC SERVICES**
Software enablers developed within INTERLINK - Augmenter - Survey Editor **Tightly integrated third-party software** - Google Drive Manager - Loomio - Collaborative Editor (Etherpad) **Pointers to selected useful third-party software** - W3C accessibility Tools - W3C Markup Validation Service - Trello - Google Charts - Grafana - Mailchimp - Brevo - Doodle	**Software enablers developed within INTERLINK** - Co-Calendar - Booking Activity Module (BAM) - Loyalty Engine - Co-Business Accelerator **Tightly integrated software** - Gamification Engine - AAC - Authentication and Authorization Controller **Pointers to selected useful third party software** - KeyCloak - WSO2 API Manager

Table 4. Knowledge INTERLINKERs in the final version of the INTERLINKERs catalogue.

KNOWLEDGE INTERLINKERS	
ENABLERS FOR CO-PRODUCTION PROCESS START	**ENABLERS FOR STAKEHOLDERS' ENGAGEMENT**
Knowledge enablers developed within INTERLINK - Setting out for your co-production journey - Tutorial Package on the usage of INTERLINK Collaborative Environment for co-production - Project description template - Project description example	**Knowledge enablers developed within INTERLINK** - Stakeholders types guidelines - Stakeholders mapping canvas - Stakeholders identification and analysis template - Stakeholders engagement plan - Communication for stakeholders engagement KIT - Focus Group guidelines - Template for Focus Group on co-production process - Consent form for INTERLINK project - Consent form template - Information sheet for INTERLINK project - Information sheet template - Introduction to incentives and rewards - Introduction to gamification - How to take advantage of Gamification in the Collaborative Environment - Gamification canvas
ENABLERS FOR SERVICE DESIGN	**ENABLERS FOR SERVICE DEVELOPMENT**
Knowledge enablers developed within INTERLINK - Guidelines for online Surveys - Guidelines for collaborative problem refinement - Template for Focus Group on problem exploration for new digital functionality - Guidelines for interviews - Template for Surveys on Media and Technology Usage	**Pointers to selected useful third-party knowledge** - W3C Web Content Accessibility Guidelines - EDPB Data Protection Guidelines - Open-Source guides - AGID Cloud Enablement Kit - AGID Cloud computing migration strategy evaluation template

- Template for semi-structured interviews - Template for structured interviews - Template for Personas - Template for Use Scenario - Guidelines for co-design of service - Templates for User Journeys - Template for Hackathons Rules - Template for Public Service proposal	- AGID Guidelines on the acquisition and reuse of software for public administrations - AGID Guidelines for the development of secure software - AGID Italian PA interoperability model - AGID Minimum Security Measures for Public Administration. - Open API specification - EIDAS standards
ENABLERS FOR SERVICE SUSTAINABILITY **Knowledge enablers developed within INTERLINK** - Outcome marketing feature set - Business model canvas - Business plan template	**ENABLERS FOR EVALUATION (OF CO-PRODUCTION AND OF SERVICES)** **Knowledge enablers developed within INTERLINK** - Final End-Users' Questionnaire for Quality of Service - INTERLINK Co-Producers' Perceptions Questionnaire - INTERLINK Users' Demographics and Activity Satisfaction Questionnaire - Usability testing

https://interlink-project.eu/