

# DiSSCo related output

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## Title

D2.2. Recommendations on the Helpdesk and user support services

## Author(s)

Judite Alves(1), Luca Bellucci (2), Frederik Berger (3), Ana Casino (4), Rui Figueira (5), Gianna Innocenti (2), Laura Tilley (4).

## Identifier of the author(s)

0000-0002-0550-4190, Judite Alves  
0000-0002-8464-6153, Luca Bellucci  
0000-0001-8400-3337, Frederik Berger  
0000-0002-9869-6573, Ana casino  
0000-0002-8351-4028, Rui Figueira  
0000-0002-4504-0765, Gianna Innocenti  
0000-0002-2455-7992, Laura Tilley

## Affiliation

1. Universidade de Lisboa
2. Universita degli Studi di Firenze
3. Museum für Naturkunde, Berlin
4. CETAF - Consortium of European Taxonomic Facilities
5. Instituto Superior de Agronomia, Universidade de Lisboa

## Contributors

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## Abstract

This document outlines the future DiSSCo Helpdesk, which will convey a personalised support service on

the use of the infrastructure, its services and facilities, both to data providers and users. Three different modalities of interaction with the user are envisaged: FAQs - Frequently Asked Questions; Human Intermediated Question and Answer Service, which will use a support ticket system and will include three lines of support; and how-to guides and other support documentation, that will offer comprehensive information and assistance, empowering the DiSSCo community to use services independently. Multilingualism of Helpdesk is expected by the DiSSCo users, and, ideally, the Helpdesk should offer the possibility to interact with the system using native language statements/commands. This possibility will promote equal opportunities among users, and attract non-English speaking users and stakeholders, ultimately increasing satisfaction with DiSSCo and the sense of community. The Helpdesk should follow the recommendations of the Web Accessibility Initiative (WAI), minding everyone who is permanently or temporarily disabled. Finally, the Helpdesk should be flexible and customizable, allowing the change of its structure in time so that it best fits users' needs, and accommodates new services.

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**Contact email**

mjalves@museus.ulisboa.pt



# D2.2. Recommendations on the Helpdesk and user support services

**WP2 Leader:** Judite Alves

**T2.2 Leader:** Judite Alves (ULisboa); **Team Members:** Luca Bellucci (UNIFI), Frederik Berger (MfN), Ana Casino (CETAF), Rui Figueira (ULisboa-ISA), Gianna Innocenti (UNIFI), Laura Tilley (CETAF).

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## Abstract

This document outlines the future DiSSCo Helpdesk, which will convey a personalised support service on the use of the infrastructure, its services and facilities, both to data providers and users. Three different modalities of interaction with the user are envisaged: **FAQs** - Frequently Asked Questions; **Human Intermediated Question and Answer Service**, which will use a support ticket system and will include three lines of support; and how-to guides and other **support documentation**, that will offer comprehensive information and assistance, empowering the DiSSCo community to use services independently.

Multilingualism of Helpdesk is expected by the DiSSCo users, and, ideally, the Helpdesk should offer the possibility to interact with the system using native language statements/commands. This possibility will promote equal opportunities among users, and attract non-English speaking users and stakeholders, ultimately increasing satisfaction with DiSSCo and sense of community.

The Helpdesk should follow the recommendations of the Web Accessibility Initiative (WAI), minding everyone who is permanently or temporarily disabled.

Finally, the Helpdesk should be flexible and customizable, allowing the change of its structure in time so that it best fits users' needs, and accommodates new services.

## Contribution to DiSSCo RI

DiSSCo needs to be in full and constant alignment with the needs of its identified users. This task defines the DiSSCo helpdesk, that will provide the necessary information on the use of the infrastructure, the services and facilities offered. The DiSSCo helpdesk will be a vital tool for increasing satisfaction of external users and stakeholders with the infrastructure, ultimately strengthening DiSSCo sustainability.

## Keywords

Support services, FAQs, Human Intermediated Q&A service, Ticket system, supporting documentation, multilingualism.



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## 01 INTRODUCTION

A Helpdesk is a key component of any research infrastructure, in particular of those providing e-services, and has the function to establish a communication channel between user and service provider in order to resolve user requests and to provide full support for its services.

DiSSCo Helpdesk aims to provide support to the infrastructure's user community, strengthening communications within the network in general. It will contribute to the scientific readiness (SR) of DiSSCo RI, defined in the DoA as follows: "DiSSCo needs to be in full and constant alignment with the needs of its identified user base. This requires the existence of a practical scientific evaluation framework, which allows the RI to inform decisions around its future scientific programme based on the ever-changing needs of its user base."

DiSSCo helpdesk will constitute a single point of contact for all DiSSCo users for requesting help, support and other requests related to DiSSCo services, resources, projects and general questions. It will provide the necessary information on the use of the infrastructure, the services and facilities offered, with the goal of creating a personalised support service for those who have technical, ethical, and legal questions. It will be a vital component for external users and stakeholders with the ultimate goal of improving user experience and satisfaction with DiSSCo while strengthening the sustainability of the infrastructure.

## 02 METHODOLOGY

As a first approach for the identification of support services to be provided by DiSSCo Helpdesk, we looked into the helpdesk's services provided by other research infrastructures, namely CORBEL Shared Services for Life-Science (<https://www.corbel-project.eu>), DARIAH-EU (<https://www.dariah.eu/helpdesk/>), CLARIN (<https://www.clarin.eu/content/support>), and Lifewatch (<https://www.lifewatch.eu/help-desk/>). We also considered the possibilities of integration with EOSC Helpdesk (<https://eosc-helpdesk.eosc-portal.eu>).

Delineation of the Human intermediated Question and Answer Service built on the top of work developed under the SYNTHESIS+ project, which has focused on supporting the use of ELViS – The European Loans and Visits System that will manage Transnational Access (TA) and Virtual Access (VA).

In order to gather information on the needs of supporting documentation, we developed two independent questionnaires, one directed to those responsible for the DiSSCo services and the other directed to users. These questionnaires were conducted via an online, customized google form.

The first survey was launched in March 2022 and aimed to compile the documentation needs that each WPs/Tasks leaders and e-service providers foresee. WP/Task leaders were questioned whether they anticipate the need to make documentation available on the Helpdesk to support the service or facility they are responsible for, or whether all questions will be easily answered by FAQs. Interviewees were requested to fragment the need by users' categories, as defined in DPP D1.1 *Report on Life sciences use cases and user stories* (Fitzgerald et al. 2021) and D1.2 *Report on Earth sciences use cases and user stories* (von Mering et al. 2021). Status of development and most adequate type of support documentation were also asked. The master document of survey 1 is available in Annex 1.

A second survey was administered to putative users of DiSSCo services and facilities during the Second All Hands Meeting (4-8 April 2022), in order to collect feedback on the relevance of providing supporting documentation in the Helpdesk. Respondents were required to classify themselves in one of the seven users categories, defined in DPP D1.1 (Fitzgerald et al. 2021) and D1.2 (von Mering et al. 2021). Most questions were "Interval scale" questions, where interviewees were asked to score the relevance of having supporting documentation, in addition to FAQs, for each DiSSCo services available in the Helpdesk, from 1 (Low relevance) to 5 (High relevance). Services considered in the survey included all services listed in [https://www.dissco.eu/wp-content/uploads/DiSSCo\\_community\\_e-services.pdf](https://www.dissco.eu/wp-content/uploads/DiSSCo_community_e-services.pdf), but also putative additional future services and support needs pinpointed in "ICEDIG D8.1 Conceptual design blueprint for the DiSSCo digitization infrastructure" (Hardisty et al. 2019), and others

identified in the responses to survey 1 by WP/task leaders. The master document of survey 2 is available in Annex 2.

The issue of multilingualism was also addressed in survey 2, as interviewees were asked about how important it is to have Helpdesk services in their national language (if different from English).



## 03 DESCRIPTION OF THE HELPDESK

### 3.1 SCOPE

The Helpdesk will:

- Provide information about DiSSCo services;
- Provide guidance for users on the application to DiSSCo services;
- Provide general guidance on standards used in DiSSCo;
- Resolve general difficulties/complaints with using the different DiSSCo services;
- Provide feedback on the need of new additions and improvements to DiSSCo services;
- Help fix technical issues with the system.

### 3.2 USERS

The Helpdesk will have two kind of users: on one side, the ones seeking for information on the use of DiSSCo's services and facilities, both data providers and data users; and, on the other side, the the Helpdesk staff and DiSSCo services' providers, who will answer and monitor enquiries.

For services' users, the DiSSCo Helpdesk provides a uniform communication channel to address any issues in the scope of DiSSCo. Task 2.2 makes use of the user groups or use categories of DiSSCo's services and facilities identified in DPP Task 1.1 and 1.2, and listed in *D1.1 Report on Life sciences use cases and user stories* (Fitzgerald et al. 2021) and *D1.2 Report on Earth sciences use cases and user stories* (von Mering et al. 2021), respectively. Seven user groups or use categories were identified:

- Research (academic, non-academic, including Citizen Science)
- Collection management
- Technical support (IT & IM)
- Policy (institutional, national & international)
- Education (academic & non-academic)
- Industry
- External (media & empowerment initiatives)

For services' providers, the DiSSCo Helpdesk delivers a support solution as a service for integration in their operational processes.

### 3.3 HELPDESK SERVICES

The analysis of support services provided by helpdesks of other research infrastructures, namely CORBEL Shared Services for Life-Science (<https://www.corbel-project.eu>), DARIAH-EU (<https://www.dariah.eu/helpdesk/>), CLARIN (<https://www.clarin.eu/content/support>), and Lifewatch (<https://www.lifewatch.eu/help-desk/>), suggest that users in need to use the DiSSCo infrastructure will benefit if DiSSCo offers three complementary services: FAQs - Frequently Asked Questions; Human Intermediated Question and Answer Service; and Supporting Documentation.

#### 3.3.1 FAQs - Frequently Asked Questions

The Helpdesk should include a section where a list of Frequently Asked Questions (FAQs) and their answers is maintained. Questions should be organised hierarchically, but a knowledge-based tool to search through them will help users find the information they seek faster.

The FAQ's hierarchy scheme should be based on users' functional demands. DPP Tasks 1.1 and 1.2, *D1.1 Report on Life sciences use cases and user stories* (Fitzgerald et al. 2021) and *D1.2 Report on Earth sciences use cases and user stories* (von Mering et al. 2021) have identified 35 functional demands, which were placed into 11 categories and 24 subcategories (Table 1).

FAQs should be constantly revised in a collaborative manner, and according to the users' frequent requests. Questions/Answers issued through the Human Intermediated Q&A Service (see below) will be used to feed into the FAQs.

**Table 1.** Hierarchy scheme for Helpdesk's FAQ based on the functional demand categories/subcategories as identified by use cases and user stories (*DPP D1.1 Report on Life sciences use cases and user stories* (Fitzgerald et al. 2021) and *D1.2 Report on Earth sciences use cases and user stories* (von Mering et al. 2021)).

FUNCTIONAL DEMANDS CATEGORIES AND SUBCATEGORIES	DEFINITIONS
Advanced search	Advanced search functionalities include technologies like faceted search (filtering), elastic search and Apache Solr

<b>Data</b>	Units of information relating to a specimen or observation
Biochemical or geochemical data	Data describing the biochemical or geochemical composition of a specimen, including secondary compounds in plants
Distribution data	Data describing the specimen collecting locality or observation data
Ecological data	Data describing the original environment and interactions of a specimen or observation, including habitat, associated species or traits
Isotopic data	Data describing the isotopic signature of specimens resulting from isotope analysis
Molecular data	Data describing the molecular composition of a specimen, including DNA/RNA sequence data
Morphological data	Data describing qualitative or quantitative morphological characteristics of a specimen or observation, including measurements
<b>Data integration</b>	Linking of data from different sources, incl. cross-domain (interoperability is a prerequisite); e.g. linking type specimens with the protologue and publications with the specimens used in analyses
<b>Data security</b>	System properties which protect from illegal and malicious data use or from intentional corruption of data systems
<b>Images</b>	Digital representation of specimen images
2D images	Storing and retrieving two-dimensional digital representation of specimens
3D images	Storing and retrieving three-dimensional digital representation of specimens (3D models)
Images related to collections	Storing and retrieving digital images of field notebooks, catalogues, correspondence, photos of sampling areas, etc.
Label images	Storing and retrieving digital images of specimen labels
<b>Interoperability</b>	Standards and functionality securing interoperability with external services e.g. GBIF, CoL, thesauri

<b>Legal and policy framework</b>	Rules and procedures related to legal and policy issues, such as access policies or information on legal obligations linked to specimens, but also standardized information on the use assets within the infrastructure
<b>Metadata</b>	Information describing or providing additional facts for any part of the data
Metadata on collection level	Information describing or providing additional facts for a set of specimens
Metadata on record level	Information describing or providing additional facts for a single record
<b>Physical access</b>	Physical access to collections e.g. sub-collections, certain specimens
<b>Reference system &amp; Standard lists</b>	Description of underlying data standards, data architectures and vocabularies which are needed for collection information system management and integration with other systems (e.g. GeoNames, Global Names Architecture, GBIF Backbone Taxonomy)
<b>Tools</b>	Digital applications to perform various tasks with specimen data or to interact with databases
Annotation tools	Tools to add additional information to specimen data
Tools for clustering requests	Tools to cluster related requests based on information including requester, purpose and material requested in communication/feedback system
Tools for data analysis	Tools to create data quality assessments, species distribution models
Tools for data discovery	Tools to perform complex specimen data searches simultaneously from different collections
Tools for data visualisation	Tools to visualise data
Tools for documentation	Tools to enable documentation of collections and collection history
Tools for downloading data/metadata	Tools to download data or metadata resulting from a data discovery event
Tools for geo-referencing	Tools to perform georeferencing of localities relating to collections

Tools for identification	Tools to view or capture trait data for identification or tools for automated identification of specimens
Tools for limiting access to data	Tools to restrict access to any part of the data relating to a specimen, due to cultural or environmental sensitivity
Tools for reporting & statistics	Tools to produce structured data in the form of reports or statistical summaries
Tools for uploading	Tools to upload or import data

### 3.3.2 Human Intermediated Question and Answer Service

Users who do not find the information they seek in FAQs should have the opportunity to interact with human experts through the Human Intermediated Question and Answer (Q&A) Service. This service should also handle incident and bug reports, and suggestions for improvement.

Questions/Answers issued through the Human Intermediated Q&A Service will be used to feed into the FAQs, inform about the need of developing Supporting Documentation, and provide information on users' needs concerning training.

The Human intermediated Q&A Service for the support of ELViS – The European Loans and Visits System has been deeply analyzed under SYNTHESYS+. Prioritization of requirements for the Human Intermediated Q&A Service to support ELViS has been defined by SYNTHESYS+ project using the MoSCoW analysis (van Dongen et al. 2020) (Table 2), where MUST HAVE category includes those requirements that were considered mandatory (the Helpdesk will not work without them), SHOULD HAVE includes important requirements that will add significant value, and COULD HAVE includes requirements that will facilitate the use of the Helpdesk if developed. No requirements were considered to fall in the WILL NOT HAVE category. Prioritization of requirements has been revisited and updated under DPP Task 2.2 (Table 2).

**Table 2.** MoSCoW analysis of the Human intermediated Q&A Service. (Uptated of MoSCoW analysis developed under SYNTHESYS+, van Dongen et al. 2020; new requirements in **bold\***.)

MUST have	SHOULD have	COULD have
<ul style="list-style-type: none"> <li>● <b>manage a large number of questions from end-users*</b></li> <li>● <b>customizable / extendable by administrators*</b></li> <li>● Ticket system</li> <li>● Multilingual</li> <li>● Trustworthy</li> <li>● API integration</li> <li>● Connect with Github</li> <li>● Security functionalities</li> <li>● Good user experience</li> <li>● File sharing</li> <li>● Storage space</li> <li>● Alerts and notifications</li> <li>● Automated workflows</li> <li>● Email import</li> <li>● <b>3 lines of support*</b></li> <li>● <b>Knowledge-Base management*</b></li> <li>● <b>Compliance with GDPR*</b></li> <li>● <b>Inclusive functionalities for disabled people*</b></li> <li>● <b>Key operational metrics (reporting features, dashboard, analysis tools)*</b></li> <li>● <b>Scalability*</b></li> <li>● <b>Cost and time efficient*</b></li> </ul>	<ul style="list-style-type: none"> <li>● Data migration</li> <li>● AAI Support</li> <li>● Form design</li> <li>● Canned replies</li> <li>● Resource management tools, tick response times, overview of ticket types.</li> <li>● Collaboration tools</li> <li>● <b>IOS &amp; Android Apps*</b></li> <li>● <b>Integration with the EOSC Helpdesk*</b></li> <li>● <b>Multichannels of access*</b></li> </ul>	<ul style="list-style-type: none"> <li>● Group email distribution</li> <li>● Split and merge tickets</li> </ul>

### *Ticket system*

The Human Intermediated Q&A Service should use a support ticket system to manage the issues submitted by users, as implemented in the ELViS Helpdesk (Tilley et al. 2021, 2022). A ticket is created when a question is submitted, and it has a life cycle in which staff members can do operations like answering, closing, reopening, and transfer it to other colleagues. A

ticket will be firstly handled by the first line of support, and, if necessary, redirected to the second and third levels of support, based on the nature of the request.

The support ticket system will benefit if the end-user can select the topic which best suits his question, but this should be optional. In case the user does not select a topic, the system should automatically guess the topic of the ticket, or it assigns it to an agent who can transfer it to the correct department. Many support tickets are repetitive questions, and automation features like auto-assignment, canned responses, business rules, or workflows will improve efficiency. The system should allow requesters to track the status of their enquiry, from submission until it gets answered.

The envisaged structure for the Human Intermediated Q&A Service will include three lines of support:

A first line of support will identify the exact nature of the incoming message (request for help, incident, feature request, bug report) and do an assessment whether the message can be handled immediately because it is either a simple question for which the answer can be given instantly (for example, by redirecting the requester to FAQ or responding with a pre-defined template), or has to be passed on to the second or third line of support. First line of support should have a dedicated team of generalist support agents. The first line of support of the ELVIS Helpdesk is provided by CETAF - Consortium of European – we suggest that this service should be extended to the DiSSCo Helpdesk.

A second line of support will handle requests which cannot be answered by the first line of support, due to in-depth knowledge needed on the topic. Second line of support should go to DiSSCo institutions that will provide the services, and have specialist support agents. A “Call for expression of interest to develop as a DiSSCo service provider” was launched under DPP WP8, and will inform about putative services’ providers. Identification of expertise at national and institution level is fundamental to structure the second line of support, and will help in providing customized guidance and support. Structuring by areas of specialization will allow team members to become actual experts over a particular domain, and ultimately resolve problems faster because knowledge is more deeply rooted. Table 3 provides a non-exhaustive overview of DiSSCo services and current main service provider/developer.

A third line of support will handle technical questions related to the Helpdesk itself, and should go to the technical team.

**Table 3.** Overview of DiSSCo Services and current main service developer (in [https://docs.google.com/document/d/1KygTYz\\_wyfGQRNJ3UXRFR1iBR7Soh0l\\_ELrpz77iEG0/edit#](https://docs.google.com/document/d/1KygTYz_wyfGQRNJ3UXRFR1iBR7Soh0l_ELrpz77iEG0/edit#)).

Service Acronym	Service Name	Type of Service	Current main service developer <sup>1</sup>
<a href="#">ELViS</a>	European Loans and Visits System	e-service	<i>Picturae</i>
<a href="#">SDR</a>	Specimen Data Refinery	e-service	<i>NHM London</i>
<a href="#">UCAS</a>	Unified Curation and Annotation System	e-service	<i>Naturalis</i>
<a href="#">CDD</a>	Collection Digitisation Dashboard	e-service	<i>NHM London</i>
<a href="#">KB</a>	Knowledgebase	e-service	<i>MfN</i>
<a href="#">HD</a>	Helpdesk	e-service	<i>CETAF</i>
<a href="#">Policytool</a>	Policy Self-Assessment Tool	e-service	<i>NHM London</i>
<a href="#">OpenRefine uploader</a>	OpenRefine data management tool	e-service	<i>Senckenberg</i>
<a href="#">Collections Registry</a>	Collections and facilities registry	e-service	<i>CETAF</i>
<a href="#">Sandbox</a>	Core FDO data infrastructure	Access	<i>Naturalis</i>
<a href="#">PID infra</a>	Digital Specimen PID infrastructure	Access	<i>Naturalis</i>
<a href="#">AAI</a>	AAI infrastructure	Access	<i>GRNet</i>
TA	Transnational Access	Access	<i>Synth+ partners</i>
VA	Virtual Access	Access	<i>Synth+ partners</i>
Digitisation Centre	Digitisation centres of excellence	Digitisation	-
Training	Competence centres for training	Capacity	<i>Multiple partners</i>
Support	User support services	Capacity	<i>CSO</i>

<sup>1</sup> The current service developer information does not imply an already expressed interest for continuing the development of the service.



First line technicians will be responsible for prioritising the tickets. Prioritisation criteria and levels established for ELViS helpdesk (van Dongen et al. 2020; Tilley et al. 2022) are suitable to be adapted by the enlarged DiSSCo helpdesk. They follow ITIL (Information Technology Infrastructure Library), a globally recognized set of best practices for Information Technology Service Management, and are based on the analysis of the Urgency and Impact of the request. Urgency is the time it takes for an incident to have a significant impact on the working of the system, while Impact measures the effect of an incident on working processes of the system.

**Urgency level definition:**

- **High:** critical, no workaround exists.
- **Mid:** significant, no immediate workaround exists.
- **Low:** minor, workaround is available, Long Term improvement.

**Impact level definition:**

- the number of affected users,
- the number of affected services
- breaches of regulations or laws,
- **High:** concerns the working of the whole system/organisation.
- **Mid:** concerns working in a department/service or more than 5 users.
- **Low:** concerns 1 to 5 users, or is general feedback for improvement of the DiSSCo service.

Crossing the levels of Urgency and Impact will categorize the priority of the ticket into 1. Critical, 2. High, 3. Medium, 4. Low, 5. Planning (Fig. 1), which will determine response time (Table 4).

		IMPACT		
		High	Mid	Low
URGENCY	High	1	2	3
	Mid	2	3	4
	Low	3	4	5

Fig. 1. Prioritization chart (in Tilley et al. 2022).

**Table 4.** Indicative Response times for a ticket according to its Prioritization Level (adapted from <https://wiki.octopus-itsm.com/en/articles/priority-definition-and-basic-service-levels> and van Dongen et al. 2020).

Priority Level	Description	Resolution time
<b>1. Critical</b>	Interruption making a critical functionality inaccessible or a complete network interruption causing a severe impact on services availability. There is no possible alternative.	4 hours
<b>2. High</b>	Critical functionality or network access interrupted, degraded or unusable, having a severe impact on services availability. No acceptable alternative is possible.	24 hours
<b>3. Medium</b>	Non-critical function or procedure, unusable or hard to use having an operational impact, but with no direct impact on services availability. A workaround is available.	3 days
<b>4. Low</b>	Application or personal procedure unusable, where a workaround is available or a repair is possible.	5 days
<b>5. Planning</b>	A long term project or service request with no specific expectations on response time. Priority 5 issues will be resolved based on scope, timeline, and other competing Priority 5 requests.	

### *Authentication*

DiSSCo services that require authentication (identification or authorization of level of access for a user), as is the case of the Helpdesk's Human Intermediated Q&A Service, should use the Authorisation and Authentication Infrastructure (AAI) (<https://www.dissco.eu/services/#aai>). The AAI has been implemented as a pilot in SYNTHESYS+. Users will be able to authenticate themselves through their institutional accounts, if the institution is connected to eduGAIN. If their institution does not yet offer this possibility, users can authenticate themselves through login with their ORCID iD or social media credentials (single sign-on).

All personal data collected through Helpdesk should be processed in compliance with the General Data Protection Regulation (<https://gdpr.eu/>).

### 3.3.3 Supporting Documentation

Facilitating supporting documentation at the Helpdesk, providing comprehensive information on the use of the infrastructure, will empower users to use DiSSCo services independently. The relevance of this self-service is clearly recognized by the DiSSCo community, by both the services' providers and users.

The responses from putative users collected during the Second All Hands Meeting (4-8 April 2022), mainly representing Research and Collection Management -related users, but also users related with Technical Support, Policy and Education (see Section 3.2 and Fitzgerald et al. 2021 and von Mering et al. 2021 for user groups definition), indicate that most interviewees found it highly relevant (score 5) to provide supporting documentation for the majority of services (Table 5). Although this inquiry only reached the already existing DiSSCo community, and therefore one may argue that it is not representative of the needs of the eventual user base, the high scoring obtained clearly shows that creating supporting documentation is an imperative demand.

**Table 5.** Scoring on the relevance of providing supporting documentation for the main DiSSCo services, as well as on other contents, from 1 (Low relevance) to 5 (High relevance), based on 21-22 answers from putative users.

DiSSCo SERVICE	RELEVANCE SCORE	
	Mean	Mode
ELVIS - European Loans and Visits System	4,82	5
SDR - Specimen Data Refinery	4,64	5
MIDS - Minimum Information about a Digital Specimen	4,55	5
UCAS - Unified Curation and Annotation System	4,36	5

ODS - Open Digital Specimen	4,32	5
Digital Specimen Repository	4,23	5
CDD - Collection Digitisation Dashboard	4,18	5
Digitization Best Practices	4,14	5
Compliance and Moderation Service (about movement of sensitive data across international borders)	4,14	4
Cost Calculation Tool	4,00	4
Prioritization of Digitization Tool –	3,90	5
Digital Maturity Self-Assessment Tool	3,77	5
Policies Compliance Self-Assessment Tool	3,73	5
E-Learning Platform	3,73	5
Specialization Tool	3,59	5
KB - Knowledgebase	3,54	5
AAI - Authorisation and Authentication Infrastructure	3,50	3 and 5
Pre-Commercial procurements and other financial aspects	3,19	3

Responses to survey 1 by DPP WPs and Tasks' leaders allowed to collect information on the documentation needs for 12 services. The answers are summarized in Table 6.

Most WP and Task leaders identified the need to provide documentation in the Helpdesk, in order to support users. Only for the "Digital maturity self-assessment tool" developed under Task 3.1, it was stated that no supporting documentation was required, while for the "Cost calculation tool" developed under Task 4.1, and the "Policy self-assessment tool" developed under Task 7.3, the need for supporting documentation was considered dependent on user tests.

In most cases, supporting documentation was yet to be developed or under development, with the exception of the supporting manual for ELVIs - ELViS – The European Loans and Visits System that will manage Transnational Access (TA) and Virtual Access (VA).

Different typologies of supporting documentation were indicated by WPs and Tasks' leaders, including manuals, online how-to-guides, and video tutorials. Online how-to guides will guide the user in an interactive way, step-by-step, on how to apply and use the services and explore features provided. Video tutorials, and relevant images and infographics may be embedded on the online guides, in order to make them more appealing and easy-to-follow to the audience.

Creating supporting documentation seems, therefore, imperative, as it will lead to fewer support hours by the Human Intermediated Q&A Service, leaving the Helpdesk support team free to assist users with more severe issues. Plus, it will shorten the wait times for users, with an increase of level of satisfaction.

We should look at the supporting documentation as a work in progress, in order to respond to the upgrade of services and also to the demands of users. Most DiSSCo services are still under development and, therefore, supporting documentation will have to change with the product. Prioritization to make documentation available should take into consideration several factors like the size of the user group, the amount of usage, and the user-friendliness of the service. The questions issued through the Human Intermediated Q&A Service will be an important tool to inform about the demand concerning supporting documentation.

**Table 6.** Responses obtained from DiSSCo Prepare WPs and Tasks' leaders regarding supporting documentation to be provided in the DiSSCo Helpdesk (Survey 1).

	SERVICE	DOCUMENTATION NEED
<b>Task 1.3</b>	<b>PRIORITIZATION OF DIGITIZATION TOOL</b>	
	STATUS	under development
	TYPE OF RESOURCE	Manual
	TITLE	Guidelines for prioritization of digitization
	USERS	Research (academic, non-academic, including Citizen Science), Collection management, Policy (institutional, national & international)
<b>Task 2.1</b>	<b>E-LEARNING PLATFORM</b>	
	STATUS	planned
	TYPE OF RESOURCE	Online how-to guide. Video Tutorial
	TITLE	How to use the e learning platform (both for users and trainers)
	USERS	Research (academic, non-academic, including Citizen Science), Collection management, Education (academic & non-academic)
<b>SYNTHEsys+</b>	<b>ELViS</b>	
	STATUS	to be concluded soon
	TYPE OF RESOURCE	Manual
	TITLE	ELViS user manual
	USERS	Technical support (IT & IM)
<b>Task 2.2</b>	<b>HELPDESK (includes ELViS HD)</b>	
	STATUS	upgrade from existing manual to ELViS HD needed
	TYPE OF RESOURCE	Manual
	TITLE	Helpdesk user manual
	USERS	Technical support (IT & IM)

	SERVICE	DOCUMENTATION NEED
<b>Task 3.2</b>	<b>DIGITIZATION BPs</b>	
	RESOURCE PLANNED (YES/NO/NOT KNOW)	under development
	TYPE OF RESOURCE	website: <a href="https://dissco.github.io/">https://dissco.github.io/</a>
	TITLE	Digitisation guides
	USERS	Collection management, Technical support (IT & IM)
<b>Task 3.1</b>	<b>DIGITAL MATURITY SELF-ASSESSMENT TOOL</b>	
	STATUS	not needed
	TYPE OF RESOURCE	
	TITLE	
	USERS	
<b>Task 4.1</b>	<b>COST CALCULATION TOOL</b>	
	STATUS	under evaluation whether it is necessary
	TYPE OF RESOURCE	Manual
	TITLE	Cost calculation methodology
	USERS	Policy (institutional, national & international), Industry
<b>Task 4.4</b>	<b>PRE-COMMERCIAL PROCUREMENTS AND OTHER FINANCIAL ASPECTS</b>	
	STATUS	not yet developed
	TYPE OF RESOURCE	Multiple
	TITLE	Support for Procurements
	USERS	Policy (institutional, national & international), Industry

	SERVICE	DOCUMENTATION NEED
<b>Task 5.1</b>	<b>KNOWLEDGE-BASE</b>	
	STATUS	under development
	TYPE OF RESOURCE	Video Tutorials
	TITLE	Knowledge-base
	USERS	Research (academic, non-academic, including Citizen Science), Collection management, Technical support (IT & IM), Policy (institutional, national & international)
<b>Task 7.3</b>	<b>POLICY SELF-ASSESSMENT TOOL DIGITAL MATURITY SELF-ASSESSMENT TOOL</b>	
	STATUS	not sure if it will necessary. Will be evaluated during users' testing
	TYPE OF RESOURCE	Manual
	TITLE	DiSSCo Policy Tool Manual
	USERS	Research (academic, non-academic, including Citizen Science), Collection management, Policy (institutional, national & international)
<b>SYNTHESYS+</b>	<b>SPECIMEN DATA REFINERY</b>	
	STATUS	not yet developed
	TYPE OF RESOURCE	documentation for developers (and training for users)
	TITLE	
	USERS	Research (academic, non-academic, including Citizen Science), Collection management, Technical support (IT & IM)



### 3.4 HELPDESK SYSTEM

Selection of a suitable helpdesk system for DiSSCo Helpdesk built on the top of work developed under the SYNTHESYS+ project, which has focused on supporting the use of ELViS – The European Loans and Visits System that will manage Transnational Access (TA) and Virtual Access (VA).

The SYNTHESYS+ WP2 and WP6 partners have identified a list of 13 possible candidates (van Dongen et al. 2020). The JitBit Helpdesk Ticketing System was chosen for implementation of the ELViS helpdesk due to its price and the completeness of its functionality, which matched almost all of the demands and requirements defined for the ELViS helpdesk (Van Dongen et al 2020; Tilley et al. 2021). The JitBit Helpdesk Ticketing System has a user friendly and intuitive interface with possibilities for interoperability with other systems. In terms of integration with the EOSC Helpdesk, JitBit has a fully developed REST API service, which allows full integration.

Considering that the DiSSCo community is already familiar with the JitBit Helpdesk Ticketing System (<https://www.jitbit.com/>), we highly recommend that the DiSSCo helpdesk should embrace this same system. The JitBit system accommodates the three services envisaged for the DiSSCo Helpdesk. In addition to the Human Intermediated Q&A Service, it includes a self-service customer portal for publishing FAQs and how-to articles and other supporting documentation. Most importantly, the JitBit system supports scalability, meaning that the system enables a layer to identify for which tool or service the request is meant, and therefore is adequate for the implementation of the DiSSCo helpdesk, that will give support to multiple DiSSCo services.

Here we list the most important features of JitBit Helpdesk Ticketing System (more details in <https://www.jitbit.com/helpdesk/helpdesk-features/>).

- Web-based;
- Hosted or self-hosted;
- Categorizing and Tagging tickets - assign tickets to different categories and assign default agents to categories;
- File attachments - attach documents, screenshots and PDFs to tickets and Knowledge base articles;
- Screen capture - allows a record of the screen (a video or a single screenshot) right from the web app and upload it to the ticket, no additional software needed;
- Live chat;

- Asset management - allows to track assets, assign assets to users and tickets, track incident history and quickly find the asset owner;
- Email-integration - the help desk app monitors support mailbox and converts emails to tickets, sends out email replies and notifications;
- Time tracking - automatic billable hours tracking;
- Knowledge base - self-service customer portal for publishing FAQs and how-to articles. Comes with a search engine, granular permissions and access logs and reports to discover your most popular content;
- Reports with an option to export to Excel and CSV: resolution time, time of day distribution, response speed and many others. Track various customer support metrics, agents performance etc.;
- Dashboard real-time overview of the most important metrics;
- Linking, merging tickets, "close as duplicate" and other advanced ticket management;
- Subtickets - divide a ticket into smaller subtickets;
- Userhistory - quickly see previous requests from a user;
- Anti-spam for incoming emails;
- User permissions - different user roles and security permissions (technicians can be assigned to different areas, no customer sees anyone else's data, etc). Set up custom password complexity policies;
- "Companies" - Assign users to "companies" and "departments", set up company "managers" and track ticket history from particular companies;
- Single sign on - integrate with other apps via SAML (with any SAML provider - like Google Apps, Azure AD, ADFS etc), or use our simple Authentication API, or use the built-in "login with Google" feature out of the box;
- Automation/macros engine - Set up complicated workflows using "if this - do that" engine. eg. "if the ticket becomes overdue send an HTTP-request to an external URL";
- Custom fields for tickets and assets;
- Custom statuses for tickets, like "on hold" etc.;
- Customizable design;
- Customizable working hours and timezones - global or per-user;
- Custom domain;

- Customizable email templates - global or ticket-category specific template, with granular notification settings;
- Canned responses to frequent issues;
- Multiassign - assign tickets to multiple agents;
- Agent collision detection - handy messages like "user X is also looking at this ticket and typing a reply";
- Multilingual;
- iOS app + Android app + Mobile Web UI - free mobile apps plus the mobile-optimized web-UI that works on any screen through a mobile browser;
- Import/export - import/export from CSV, users, tickets, assets, knowledge-base articles etc.;
- Audit logs;
- Search engine - quickly find tickets by keywords, advanced search by ticket date, users, companies, tags, custom fields etc.;
- Integration with 3rd-party apps, including Github, OneDrive, Google Drive, Dropbox, Slack, etc.;
- REST API;
- "Contact us" widget for website/app;
- Live-chat with website visitors and archive conversations as tickets;
- Source codes - C# source code license available for developers;
- AI powered autosuggest - suggest relevant KB articles to users when they create a ticket, utilizing modern Machine Learning and Natural Language Processing techniques;
- Calendar view for tickets, for easily managing helpdesk's "due-dates";
- Ideas forum where users can suggest new features for your product, "vote" for feature-requests and leave their comments;
- Scheduled tickets set up a daily/weekly/monthly/other schedule for your recurring maintenance tasks;
- Machine Learning (hosted version only) - automatically suggest relevant Knowledge base articles and canned responses to helpdesk agents (not just end users) when tickets come in.

## 3.5 OTHER FEATURES

### 3.5.1 Scalability/flexibility

The Helpdesk is expected to evolve, changing its structure in time so that it best fits users' needs, and accommodates new services. It should, therefore, be flexible and customizable with ease by administrators. As mentioned above, Jitbit system supports scalability, being able to accommodate additional DiSSCo services.

### 3.5.2 Multilingualism

When asked about the importance of having the Helpdesk services, namely the FAQs service, the Human Intermediated Q&A Service and the supporting documentation, in their own national language (if different from English), most respondents of Survey 2 considered it highly relevant or relevant (Fig. 2). Such need was rated with a mean score of 3,72 for FAQs, 3,86 for Human Intermediated Q&A service, and 3,81 for supporting documentation.

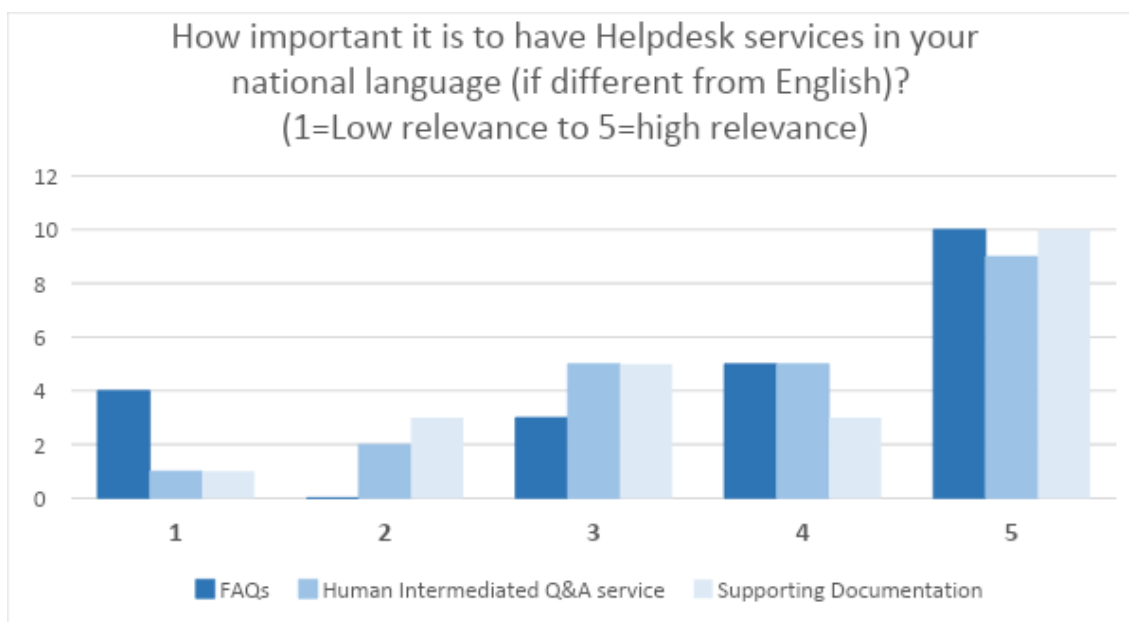
It is, therefore, clear that most users have the expectation that the Helpdesk will be multilingual, ideally offering the researcher the possibility to interact with the system using native language statements/commands. This possibility will promote equal opportunities among users, attract non-English speaking users and stakeholders, ultimately increasing satisfaction with DiSSCo and sense of community.

The DiSSCo community includes 23 countries that speak 18 different languages. We recommend that the Helpdesk should be multilingual, in line with the EU Charter of Fundamental Rights, that states that "EU nationals have the right to use any of the 24 official languages to communicate with the EU institutions, and the institutions must reply in the same language."

([https://ec.europa.eu/info/aid-development-cooperation-fundamental-rights/your-rights-eu/eu-charter-fundamental-rights\\_en](https://ec.europa.eu/info/aid-development-cooperation-fundamental-rights/your-rights-eu/eu-charter-fundamental-rights_en)).

Multilingualism poses a major challenge that may increase Helpdesk costs. Multilinguality should be fully implemented in FAQs and in support documentation, including videos with an option for subtitles in other languages. With regard to the Human Intermediated Q&A Service, English will be the main working language, but the possibility of receiving questions

and providing answers in different languages should be evaluated. The solution may be to opt for automatic language detection and translation.



**Fig. 2.** Distribution of relevance scores of providing Helpdesk services in the several national languages, if different from English.

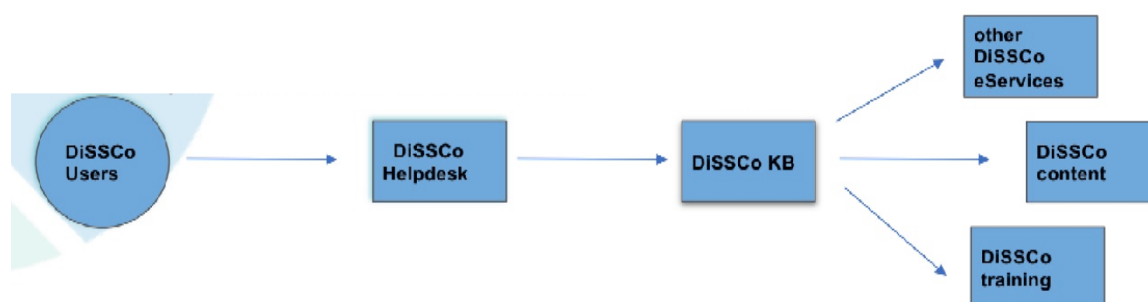
### 3.5.3 Knowledgebase

The Helpdesk should make use of the Knowledgebase (KB) service developed under Task 5.1 (D5.1 "DiSSCo Knowledgebase for technical development", von Mering et al. 2022).

In response to users contacting the Helpdesk, the KB can provide (Fig. 3):

- links to new and/or relevant content in the KB;
- automatically generated search results from the KB based on incoming questions, supporting personalized responses;
- linking to other DiSSCo eServices, etc.

Integration of KB in the helpdesk will allow detecting common problems and finding common solutions in the end-users' interactions with DiSSCo infrastructure, lowering the answering time. The JitBit systems allows publishing a resolved ticket to the knowledge base, optionally editing the resulting article, add more images and more rich content, remove sensitive info, tag the article or assign it to a "category". When a user wants to submit a ticket and enters some text into the "subject" field, suggestions with similar articles from the knowledge base are automatically pulled out.



**Fig. 3.** Potential for linkage and integration of Knowledgebase (KB) and the Helpdesk.

### 3.5.4 Inclusiveness

The DiSSCo Helpdesk should mind everyone who is permanently or temporarily disabled, following the recommendations of the Web Accessibility Initiative (WAI) "Web Content Accessibility Guidelines (WCAG) 2.1" (<https://www.w3.org/TR/WCAG21/>). Accessibility involves a wide range of disabilities, including visual, auditory, physical, speech, cognitive, language, learning, and neurological disabilities.

The Helpdesk should look for easy-to-use products that meet the needs of as many individuals as possible, embracing an inclusive design. The accessibility of users with disabilities can be supported by a variety of features at the platform and application levels, namely keyboard navigation, compatibility with screen readers, and support for alternative forms of communication, such as phone or video calls.

Incorporating web accessibility into the helpdesk service also involves providing clear and concise instructions for users on how to use accessibility features of the website, and training of the helpdesk officers on web accessibility best practices and guidelines, to ensure that they understand the needs of users with disabilities and can provide appropriate support.

### 3.5.5 Monitoring

The Helpdesk should allow real-time monitoring of the support process. Monitoring will allow to identify any areas for improvement, and make adjustments as needed. This will help ensure that the helpdesk remains effective and continues to meet the needs of its users.

The JitBit Helpdesk Ticketing System provides a dashboard (<https://www.jitbit.com/helpdesk/dashboard/>) that informs about the Human Intermediated Q&A Service status and performance, at each moment. Tickets in-progress, tickets opened/closed that day, response time, resolution time, ticket per-hour, are metrics provided by the JitBit dashboard that allow a quick real-time overview of helpdesk's efficiency and identification of putative bottlenecks.

The JitBit Helpdesk Ticketing System provides several built-in reports (<https://www.jitbit.com/helpdesk/reporting/>) that inform about key operational metrics, namely ticket resolution rates, and average ticket pick-up/response/solve time. Other important metrics such as how many tickets are created and closed in a given week, day or month, number of escalations to second and third lines of support, workload distribution, performance by agent etc, are also reported. A monitoring frame has been established for ELVIS helpdesk (Tilley et al. 2021, 2022) and may be adopted to DiSSCo Helpdesk (see Table 4). JitBit's reports also inform about Knowledgebase FAQs and supporting documentation, namely most viewed ones, 20 recent KB searches and whether these searches have returned any results.

A follow-up on closed/solved cases with a user survey or feedback form should also be considered.

Both Key operational metrics and follow-up surveys are opportunities to gather information on helpdesk performance and satisfaction levels, with the aim of improving processes.

A service level agreement (SLA), in which goals are set to meet users' expectations, should be defined. The SLA should be established between DiSSCo legal entity and the provider of the helpdesk.

### 3.7 HELPDESK WORKFLOW

Figure 4 provides a general overview of the Helpdesk workflow.

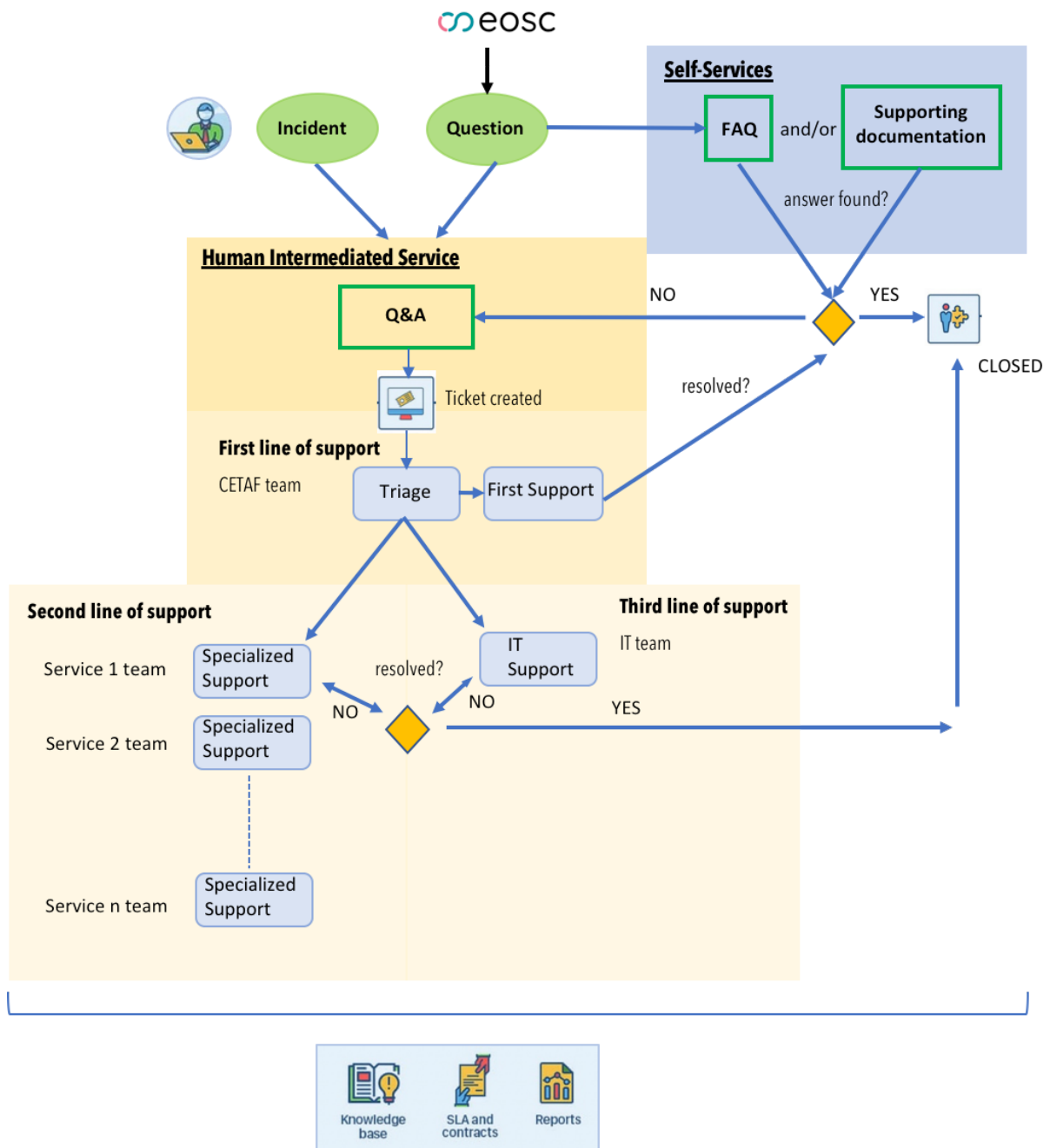


Fig. 4. General overview of the DiSSCo Helpdesk workflow



In summary:

1. Users who have a question may use Helpdesk self-services, such as the FAQs and supporting documentation, including manuals, online how-to-guides, and video tutorials.
2. Users who do not find the information they seek in FAQs or supporting documentation will have the opportunity to interact with human experts through the Question and Answer (Q&A) Service. This service should also handle incident and bug reports.
3. A ticket will be created.
4. The first line of support team will do triage, where requests will be assigned a priority level and moved to the appropriate queue and line of support for handling.
5. The first-line of support provides initial support.
6. If the request cannot be resolved by first-line support, then it is passed onto the relevant second- or third-line support team. DiSSCo service providers will provide specialist support agents, who will constitute the second lines of support for each specific service. If the question is about technical/software issues, it will be sent to the I.T team.
7. The Helpdesk's team of technical experts will investigate and resolve the issue. They should follow established procedures and guidelines to troubleshoot and resolve the issue in a timely manner. If the issue cannot be resolved immediately, they should provide the requester with a status update and an estimated resolution time.
8. Once the issue has been resolved, the helpdesk should close the request and document the resolution. If necessary, the requester should be contacted to confirm that the issue has been resolved to their satisfaction.
9. It is important for the helpdesk to track and record all requests and resolutions, in order to identify trends, areas for improvement, and measure the efficiency of the support process.
10. Integration of KB in the helpdesk will allow detecting common problems and finding common solutions in the end-users' interactions with DiSSCo infrastructure, lowering the answering time.

## 04 COSTS AND SUSTAINABILITY

Helpdesk's running costs include costs related with the JitBit Helpdesk Ticketing System and staff related costs.

The license for the JitBit Helpdesk Ticketing System acquired for ELViS is the SaaS version – Enterprise, hosted in the cloud, which has a monthly fee of \$249 (ca. 234 euros) (annual fee \$2499, ca. 2350 euros). This license allows for up to 9 agents. Extending the helpdesk to additional DiSSCo services may imply a higher number of agents, which will cost \$29 month extra per agent (ca. 27 euros). It not is not easy to estimate the exact number of agents that will be necessary for operating the Helpdesk at the different phases of DiSSCo implementation and full operation, specially because DiSSCo services are at different of maturity and will be made available at different times, and are heterogenous in what concerns the level of support they will require. As mentioned above, the Helpdesk is expected to evolve, as it accommodates new services and services reach higher levels of maturity.

First line of support for ELViS Helpdesk is presently provided by CETAF, and according to [https://docs.google.com/document/d/1KygTYz\\_wyfGQRNJ3UXRFR1iBR7Soh0I\\_ELrpz77iEG0/edit#](https://docs.google.com/document/d/1KygTYz_wyfGQRNJ3UXRFR1iBR7Soh0I_ELrpz77iEG0/edit#) it is expected that CETAF will be the provider of the DiSSCo Helpdesk service. According to the same document, it is expected that parties who express interest in becoming future DiSSCo service providers will commit resources to support the Helpdesk, namely will provide specialist support agents, who will constitute the second line of support of the Helpdesk Human Intermediated Q&A Service, for the specific service. Also, it is expected that service providers will commit resources to develop supporting documentation and feed the FAQs.

There are several points that will ensure the sustainability of the helpdesk:

1. Clear definition of the goals and objectives of the helpdesk, as well as the level of service aimed to provide to users. This will help to ensure that the helpdesk is aligned with the needs and expectations of users. This point has been addressed in section 3.1.
2. Choose the right tools and technologies to support the helpdesk, such as a user relationship management system, a knowledge management system, and a ticketing system. These tools will help to manage users' inquiries more efficiently and effectively. This point has been addressed in sections 3.3.2, 3.4 and 3.5.3.
3. Investment in the training and development of a qualified helpdesk team to ensure that they have the skills and knowledge they need to provide a high-standard service. Support staff should get training on the policies and procedures, as well as on the

tools and technology they will be using. The team should be encouraged to take ownership of users' issues and empowered to make decisions that will help to resolve customer issues quickly and effectively.

4. Regularly monitoring and measurement of the performance of the helpdesk team to identify areas for improvement. This information will allow to make changes and adjustments as needed to ensure that the helpdesk is meeting the needs of users. This point has been addressed in section 3.5.5.
5. Foster a culture of continuous improvement within the helpdesk team by encouraging feedback and ideas for improvement. This will help to ensure that the helpdesk is always evolving and improving to meet the needs of your customers.

## 05 DISCUSSION AND CONCLUSIONS

Three different modalities of interaction with the user are envisaged for the DiSSCo Helpdesk: FAQs - Frequently Asked Questions; Human Intermediated Question and Answer Service, which will use a support ticket system and will include three lines of support; and how-to guides and other support documentation, that will offer comprehensive information and assistance, empowering the DiSSCo community to use services independently.

The DiSSCo Helpdesk will use the JitBit Helpdesk Ticketing System adopted for ELViS, so we anticipate no major issues for its implementation. We expect that the parties who express interest in becoming future DiSSCo service providers will provide specialist support agents, who will constitute the second line of support of the Helpdesk Human Intermediated Q&A Service, for each specific service. Most DiSSCo services are still under development and, therefore, the constitution of the support teams is dependent on the development of the respective services. The same is true for the production of FAQ and supporting documentation, which are also dependent on services's development.

Prioritization to make documentation available should take into consideration several factors like the size of the user group, the amount of usage, and the user-friendliness of the service. The questions issued through the Human Intermediated Q&A Service will be an important tool to inform about the demand concerning supporting documentation.

Multilingualism of Helpdesk is expected by the DiSSCo users, and, ideally, the Helpdesk should offer the possibility to interact with the system using native language statements/commands. This possibility will promote equal opportunities among users, and attract non-English speaking users and stakeholders, ultimately increasing satisfaction with DiSSCo and sense of community. Multilingualism poses a major challenge that may increase Helpdesk costs, and the solution may be to opt for automatic language detection and translation.

The Helpdesk should follow the recommendations of the Web Accessibility Initiative (WAI), minding everyone who is permanently or temporarily disabled.

Finally, the Helpdesk should be flexible and customizable, allowing the change of its structure in time so that it best fits users' needs, and accommodates new services.

Training of support staff, to ensure that high-quality support to users is provided, and fostering a culture of continuous improvement within the helpdesk team by encouraging feedback and ideas for improvement, is fundamental to ensure Helpdesk sustainability.

## 06 RECOMMENDATIONS

### **Recommendation 1:**

DiSSCo Helpdesk should offer three complementary services: FAQs - Frequently Asked Questions; Human Intermediated Question and Answer Service; and Supporting Documentation.

### **Recommendation 2:**

DiSSCo helpdesk should use the JitBit Helpdesk Ticketing System adopted for ELViS helpdesk, considering that the DiSSCo community is already familiar with this system.

### **Recommendation 3:**

The Helpdesk should be multilingual, offering the researcher the possibility to interact with the system using native language statements/commands. Multilingualism should be fully implemented in FAQs and in support documentation, and although English will be the main working language of the Human Intermediated Q&A Service, it should have the possibility to receive questions and provide answers in different languages. Automatic detection and translation of languages should be considered.

### **Recommendation 4:**

The Helpdesk should integrate the DiSSCo Knowledgebase (KB), which will provide links to new and/or relevant content; automatically generated search results based on incoming questions, supporting personalized responses; and linking to other DiSSCo eServices, etc.

### **Recommendation 5:**

The Helpdesk should follow the recommendations of the Web Accessibility Initiative (WAI), embracing an inclusive design that meets the needs of those who are permanently or temporarily disabled.

**Recommendation 6:**

The Helpdesk should allow real-time monitoring of the support process to identify any areas for improvement, and make adjustments as needed.

**Recommendation 7:**

Helpdesk team should get training on the policies and procedures, as well as on the tools and technology they will be using. This will help ensure that the helpdesk team is able to provide high-quality support to users.

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