D6.5 Specification and requirements for integration with ELViS

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Grant Agreement Number | 823827
Acronym | SYNTHESYS PLUS
Call | H2020-INFRAIA-2018-2020
Start date | 01/02/2019
Duration | 48 months
Work Package | 6
Work Package Lead | [W Addink]
Delivery date | [30 Jan 2023]

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SYNTHESYS+ was funded by the Horizon 2020 Framework of the European Union under the H2020 Open Innovation and Open Science Research Infrastructure call.

1. Summary

Work package 6 JRA1 in the SYNTHESYS+ project has been focused on the research, development and first implementation of the ELViS loans and visits system. The system is designed for integration with external systems providing e.g. information on available collections and specimens and institutional information on loans. In this report we summarize the collected requirements for integration with ELViS from user stories, from the MS52 milestone workshop and through ELViS user feedback. This led to 17 requirements for integration and specifications for the integration with ELViS as described in this report, and suggestions for further development in the future.

2. Introduction

The ELViS loans and visits system is designed to streamline the processes to get access to natural history specimens, making it more efficient and user-friendly. Instead of having to go to each individual institution to find out what collections are available and what is the procedure to get access, ELViS will provide a one-stop shop for discovery and access to all collections and facilities hosted by DiSSCo partners in Europe. The system will allow researchers and institutions to request loans of specimens online, track the status of their requests, and manage the loan process from start to finish. Additionally, the ELViS system will also allow researchers to access digital images and data associated with the specimens, even if the physical specimens are not available for loan. In SYNTHESYS+, the first version of ELViS has been developed and has been used to provide transnational and virtual (by digitisation on demand) access to collections from a limited number (22) of institutions.

One of the main goals of the ELViS system is to increase access to natural history collections for researchers worldwide, especially for those from under-represented groups and countries. The system is also designed to promote collaboration and knowledge sharing among researchers, institutions, and collections.

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3. Collected requirements

3.1 Requirements from user stories

User stories are an important tool for agile software development. They help identify specific values a product can offer and therefore provide a focus for the development team. Based on a 2019 survey and subsequent work in JRA1 WP6, ELViS development efforts made use of user stories to guide the ELViS 1.0 work (focused on the TA and VA call). These user stories facilitated conversation during workshops and new user stories were also generated as we received feedback from the user community.

DiSSCo Prepare Task 1.1 later looked at all the collected DiSSCo user stories for functional demand analysis (Fitzgerald et al. 2021). The deliverable identified 35 functional demands linked with different categories and subcategories. The following functional demand categories are pertinent to ELViS integration (each category corresponds to a GitHub label and is available via the link). Below we describe these functional demands and highlight what it means for ELViS integration. We attempted to make these requirements atomic, unambiguous, and testable. This led to nine requirements for integrated functionality with ELViS:

1. Advanced Search Functionality: Advanced search functionalities include front facing features like faceted search and filtering and on the backend these require software such as Elasticsearch and Apache Solr.

   This feature will be applied to the whole DiSSCo core architecture and Digital Specimen Repository. ELViS needs to integrate this search functionality to discover specimen and collections information.

   Req1: ELViS should be able to search the DiSSCo Digital Specimen Repository

   Req2: ELViS should be able to filter search results

   Req3: ELViS should be able to search collection holding records

   Req4: ELViS should be able to search facilities (such as lab, instruments) information

2. Data Integration: Data integration here means linking data from different sources, including from other domains and databases. For instance, linking type specimens with the protologue and publications with the specimens used in analyses. This is also a general requirement for all DiSSCo services.

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For ELViS specific data integration the idea could be for instance integration with local policy and procedure database (see user story 308).

Req5: ELViS should be able to interact with local systems.

3. Interoperability: This feature is about standards and functionality ensuring interoperability with external services e.g. GBIF, Catalogue of Life, thesauri.

Req6: ELViS should be able to interact with external systems and services like GBIF, Catalogue of Life.

4. Legal and Policy Frameworks: 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 of assets within the infrastructure.

Req7: ELViS should be able to access information about local rules and procedures.

5. Metadata: Metadata on collection and record level are important information describing or providing additional facts for a set of specimens or for a single record.

Req8: ELViS should be able to access and use metadata on collection and record level.

6. Physical Access: This refers to physical access to collections, sub-collections or certain specimens.

Req9: ELViS should be able to access data (such as usage, loan) regarding physical access to the specimen.

DiSSCo Prepare D1.1 and D1.2 also states that for Life Sciences the most important functional demand was 'Tools for data discovery' (scored for 100 of the 317 total use cases, Fitzgerald et al. 2022) and for Earth Sciences, the most important functional demand was 'Metadata on collection level' (scored for 42 of the 128 use cases, von Mering et al. 2022).

3.2 Requirements collected through a workshop

The MS52 Milestone workshop on ELViS Workflow Integration was held over two days: October 27th and 29th 2020. The European Loans and Visits System (ELViS)

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is a deliverable of SYNTHESYS+ WP6. After SYNTHESYS+ it is planned to continue ELViS as one of the core e-services in the DiSSCo research infrastructure to support industrial-scale digitisation, community curation and FAIR data.

In order to realise this vision, we need to have a common understanding of how ELViS as a service will work with current systems and workflows. We need to have a clear overview of the current practices, requirements and future needs to sketch out the ideas to deliver a specification for the software and service development work. The data landscape of ELViS is heterogeneous and the requirements for integration described in 3.1 involves datasets on institutions, people, loans, collections and specimens. The service needs to handle different stages of the research data life cycle. For example, collaborating on Transnational Access (TA)/ and Virtual Access/ digitization on demand (VA) ideas and proposal submission and review, facilitating digitisation initiatives, enabling comprehensive loans and visits management, tracking usage metrics, and providing various reporting, dashboard features. This requires collaborations across different institutions and sustainable technical planning.

The technical vision of ELViS is to provide services (APIs, portals, software libraries) that can help collection holding institutions to continue their day-to-day workflows for access to the collections efficiently but at the same time take advantage of value-added and new services that are not currently available to the community. This vision will support the wider goal of DiSSCo to transform a landscape of disconnected individual natural science collection providers into a coherent research infrastructure.

The goal of the workshop was to arrive at a common view of what needs to be integrated with ELViS, through discussion and collecting of additional user stories, and to sketch out the requirements further described in this document and ideas for integration of pilot systems (D6.6). The workshop was preceded by a digital **survey** on the existing routines regarding loans, visits and collection management at institutions with natural history collections, and the needs ELViS should meet. The workshop resulted in a prioritised list of user stories and list of broader integration needs.

Outcome 1: A prioritised list of user stories.

Results from discussion and voting on user stories (40 voted on of about 134 stories in total):

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User story	Votes	Requires integration ?
As an institution I want to be able to make our collections discoverable to users so that they are included in more research.	4	yes
As a collection manager, I want to know the loaned specimens of my institution collections that have been cited in scientific papers.	3	yes
As a VA/TA coordinator I want to assess the request with applicable local policy so that I can reach a decision.	2	yes
As a system administrator I want to see the loan change history (and revert changes when users make mistakes).	2	
As a researcher I want to gather all the digitised collections of a specific taxon for taxonomic purposes.	2	
As a researcher I want to discover the loan status of collection objects so that I know how long they will be on loan.	2	
As a requester I want to communicate with the collection manager.	2	yes
As a curator I want to be able to record annotations from people who have borrowed our specimens (physically or virtually).	2	yes
As an IT architect I want to fetch data for individual loan requests from an API from ELViS/DiSSCo into our CMS so that I can help my users to easily register loans in the CMS.	2	yes
As decision maker for land planning, I would like digital loans with information on species threatened by farming in a specific geographic region.	1	no
As a collections manager I would need to know "all synonyms" for a taxon when searching in the collections for the physical specimens stored under different names.	1	yes
As a researcher I want to find the appropriate institution in order to deposit my type material.	1	yes
As a software developer I want documentation and guidelines about API integration.	1	yes
As a software developer I want to use the ELViS standard API so that I can integrate it with the national geoscience data platform.	1	yes
As a person responsible for our national CMS I want to be able to integrate the system with ELViS so that we can make use of features we don't yet have and avoid having to develop those features ourselves.	1	yes
As a curator I need to know the loaning history so that I can track the condition and damage, the item state before and after the loan.	1	yes
As a curator I want to keep trace of the parts of my specimens that are kept by other institutions (e.g. genetic vouchers).	1	yes

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As a collection manager I want to fill in actual dates of the visit so that I can have a report and visit dashboard.	1	yes
As a visitor administrator I would like to know if a researcher needs a letter of invitation for visa purposes.	1	
As a loan requester I would like to know if duplicate specimens are held in other institutions.	1	yes
As a curator I want to transform all requests into digitisation requests so that we can reduce the number of physical loans being sent out.	1	
As a collection manager I want to see the loans made by a requester so that I could have a level of confidence before agreeing to lend specimens.	1	
As a collection manager I want to delegate the request to another collection manager so that the chosen collection manager can handle the request.	1	yes
As a collection manager I want to send a message to the requester so that I can inform the requester.	1	yes
As a collection manager I want statistics for loans and visits in a way that allows for attribution and advocacy of my collection.	1	yes
As a collection manager I want to print loan forms so that they can be used for shipping and can be signed by the recipient.	1	yes
As a user I want to easily find biological data regarding a taxon, preferably in an integrated system.	1	yes
As a loan administrator I want to know if a requester has a good track record in returning specimens.	1	
As a requester I want to have access to information about my data so that I can exercise my right to access and modify my data.	1	
As a requester I would like to track my request all the time.	1	
As a software project I want APIs that I can utilize for integration.	1	yes
As a collection manager I want to know how many people have viewed my collection through visits as well as community outreach events.	1	yes
As an IT architect I want to push loan data from our CMS via an API to ELViS/DiSSCo so that I can use ELViS DiSSCo as a unified BI tool.	1	yes
As a product owner of a national CMS I want to offer our CMS users a smooth user experience with seamless integration to ELViS (did not really know how to formulate what I mean by this but let's discuss).	1	yes
As a user I want to be able to record partial returns so that I can keep record of what is still to be returned and what is not.	1	
As a loan administrator I would like to know how many specimens have been returned in the case of a partially returned loan.	1	yes
As a loan administrator I would like to know which specimens have been sampled from when they are returned.	1	yes

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As a collection manager I want to know what loans I have from other collections and track them.	1	
As a loan or collection manager I want to use a single system.	1	yes
As a curator I want to record all digitisation requests so that we can see what has been digitised and why.	1	yes
As a rapporteur I want to measure the amount of loans and visits over a certain period of time.	1	yes

Summary: For these 40 user stories, there are five main categories of users: Loan/collection admin (21), External user (10), IT specialist (5), Institutional admin (4), VA/TA coordinator (1).

This prioritisation leads to additional requirements:

Req10: ELViS should provide an API to integrate ELViS data with external systems

Req11: ELViS should provide information on local handling of loans, visits and digitisation requests

Req12: ELViS should integrate with systems that provide information on usage of loaned specimens or visited collections such as citations

Req13: ELViS should integrate with systems that track loans.

Outcome 2: A list of broader integration needs. The below list of requirements was co-written by workshop participants.

Data flows

Integration with institutional request workflows:

- Ingest a request made through ELViS
- Process a request through the institutional workflows:
    - Transform loan requests to digitization requests
    - If a request is accepted, the following actions are required to fulfil the request:
        - respond that a visit is agreed
            - discuss and prepare specimens prior to visit, e.g., pulling, digitisation
            - create a DOI for the set of specimens

    - digitise specimens
    - prepare loan
        - serve the loan

ELViS workflows:

- Login (single sign-on through ORCID or federated institutional user accounts using eduGAIN)
- Get collection / specimen object information
- Discovery
- Create requests
- Get status of objects and requests

Requirements

User requirements:

- Get person (requester) metadata into the local system
- Check availability and feasibility (state of physical object, embargos)
- Communicate about specimens not digitally catalogued yet
- Communicate about the status of requests in/with ELViS
- Create a Digital Specimen on successful request (e.g. you would need the ID for citation, enter availability and other data resulting from the visit/loan)

Technical requirements:

- ELViS compliant with existing API guidelines
    - Probably DINA as a broker for other systems
- Compliance with Digital Object Architecture & DOIP
    - Reachable with DINA compliance?
- Fetch information from the local systems (availability, etc.)
    - Either cached in ELViS or live from the local systems
    - Collection Descriptions (CETAF collections registry) should contain availability information etc. if objects are not digitized yet
    - Maybe provide collection metadata for CETAF registry with the help of local CMSs
- Idea: use the Elastic Search APIs from CETAF registry and ELViS for increasing the discovery mechanisms
- Create identifiers for the specimens as a minimum in order to reference them (e.g. in Specify "stub records") after successful request
    - Recommendation: use DOI

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- Idea: messaging system in order to facilitate the communication between the people and linking the objects in the systems
- ELViS should not store the detailed specimen information and (in the future) collection information, but it would fetch

Specification

User Interface

Machine / API

- Creation / exchange of identifiers for digital specimens (DOIs)
- Live PULL on the availability of objects

The results of this workshop were utilised in the ensuing work of the JRA1 D6.5 ELViS Integration working group. Please see the workshop results and report for further details.

The described broader integration needs lead to the following additional requirements:

Req14: ELViS should integrate with identity providers for login to the system
Req15: ELViS needs to be compliant with Digital Object Architecture & DOIP to be able to fetch Digital Specimen data and create new Digital Specimens
Req16: ELViS needs to provide FAIR data for other systems, e.g. for creating new Digital Specimens as FAIR digital objects
Req17: ELViS needs to be able to integrate with the CETAF registry for information about collecting holding institutions and their collections

3.3 Requirements from ELViS user feedback

An exit questionnaire was provided to all selected Transnational Access (TA) users following the completion of their SYNTHESYS visit. Whilst there is arguably an inherent positive bias in the results as all answers are provided by successful applicants, the results help to inform the SYNTHESYS management team of the

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user experience in several different areas such as the administrative support, and the quality of the collections and/or facilities accessed.

As of December 2022, 105 TA users provided feedback on their experience of the application process including ELViS in TA Calls 3 and 4 (see Figure 1, for answers to one such question). The feedback also included comments about specific aspects of the user experience such as ease of understanding, intuitiveness. We also received negative feedback such as confusion about the status of the application (4 responses), difficulties withdrawing and/or updating an application (3), difficulty navigating the system / finding information (3), no project identifier to reference or cite the grant (2), no PDF/Word functionality (2), not possible to add a supporting statement separately / after submission (2), no possibility to add outputs (1).

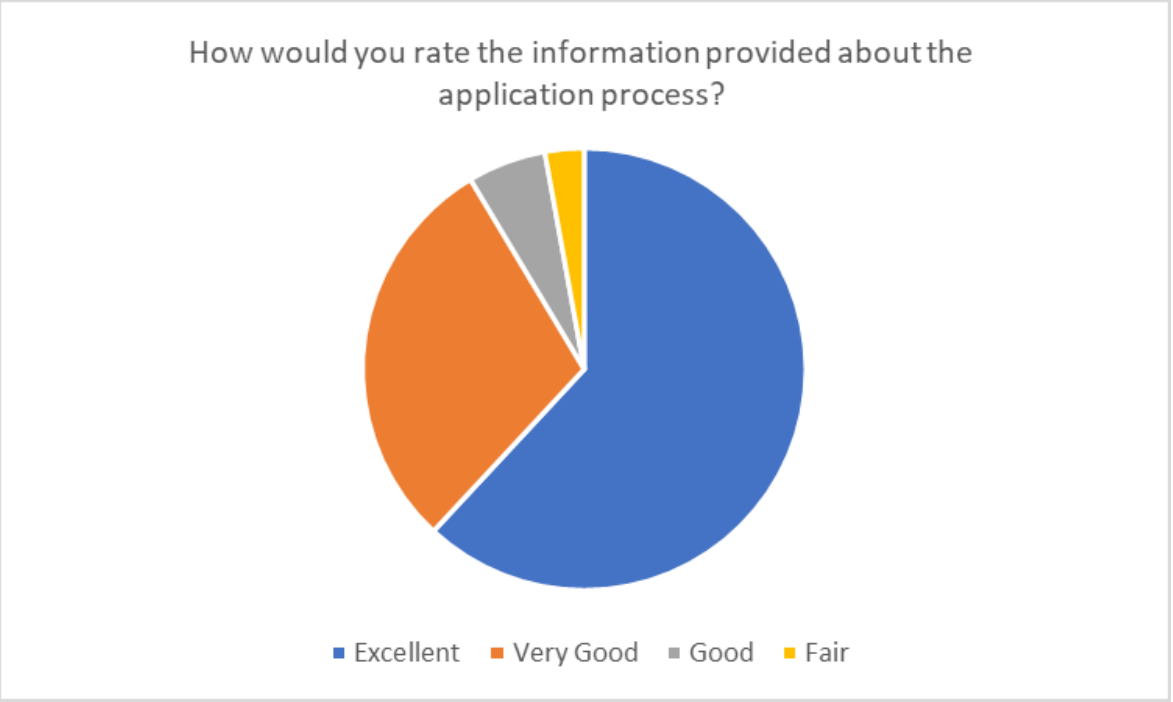

Figure 1: Answer to the question "How would you rate the information provided about the application process?" 65 users responded "Excellent", 31 responded "Very Good", 6 responded "Good" and 3 responded "Fair".

This feedback can be summarised as the following requirements for ELViS:

- ELVIS application preparing and submitting functionalities should be faster
- ELViS should provide easy application status checking
- ELViS should provide a mechanism to update and withdraw applications
- ELViS should add project identifiers to cite or reference the grant

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- ELViS should enable PDF download of application

Most of these issues have been addressed in the subsequent ELViS update.

The feedback led to one additional requirement for integration with ELViS:

> Req18: ELViS needs to be able to integrate with systems providing project grant information

4. Specification for integration with ELViS

4.1 Authentication and authorization

DiSSCo is planning to implement an Authentication and Authorization (AAI) service to provide single-sign on capability and also allow users to use organisation's credentials or other third party systems (such as ORCID, and Google). An AAI solution has been researched and piloted in WP6, see deliverable D6.2 (Leeflang et al. 2022). Several other major European and international Research Infrastructures use AAI service for seamless authentication and authorization (for example Life Science Login) and this will also be needed for connection with the European Open Science Cloud (EOSC) in the future.

During the initial ELViS design work, a milestone document was created (see Addink et al. 2020) that outlined requirements and design principles based on open community standards. Part of the design was implemented in ELViS 1.0 that included a Keycloak installation for role management and local password based authentication. The ELViS 1.0 registration process also collected ORCID (a persistent identifier for researchers) for SYNTHEYS+ TA and VA participants to persistently link the research activities and outputs to the users. The use of this identifier and collections of other personal data (such as gender and age) was addressed in the ELViS privacy statement.

ELViS should integrate with the DiSSCo AAI infrastructure to provide login functionalities (also see Leeflang et al. 2022 for more details about the DiSSCo core infrastructure design), which will meet requirement Req14 (ELViS should integrate with identity providers for login to the system).

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4.2 API and event based service integration

To achieve the integration between complex systems and the FAIR principle - **F**indability, **A**ccessibility, **I**nteroperability, and **R**eusability (detailed on the section below), DiSSCo has developed a prototype of an event based application programming interface (API) that is required to provide bi-directional interfaces to link between the data in the Collection Management Systems (CMS) through the DiSSCo research infrastructure (RI).

Because the Digital specimen (DS) should record the provenance of a specimen, it should also contain the metadata of all events that happened to that digital specimen (e.g. “specimen loan request”). As these events are very broad and depend on each use case, a task group within the DiSSCo Prepare work package “Technical Architecture & Services Provision” (WP6) organised a workshop with different stakeholders in order to allow for identification, appropriate prioritisation and documentation of most common events, relevant connection points and the potential dependencies between CMSs and the DiSSCo RI. The workshop was conducted with the help of the Event Storming method (Brandolini 2013).

The event based pilot API has the goal to connect the Collection Management Systems (that are used in the DiSSCo consortium) to the DiSSCo RI, to make it available for ELViS and other services. An example of an interaction between a CMS and ELViS via the event based API can be seen in Figure 2.

As the API has the functionality to store events emitted by a CMS (e.g. "new specimen was requested for loan"), the CMS would trigger ELViS and it would provide new data to the data storage container. The DiSSCo Prepare deliverable D6.1 (Glöckler et al. 2022) includes a list of terms to be used as subjects for the formal description of events in CMSs. For example the term "object availability" gives the object’s availability status to indicate if it is physically available for loan, digitization, analyses or any other kind of physical handling.

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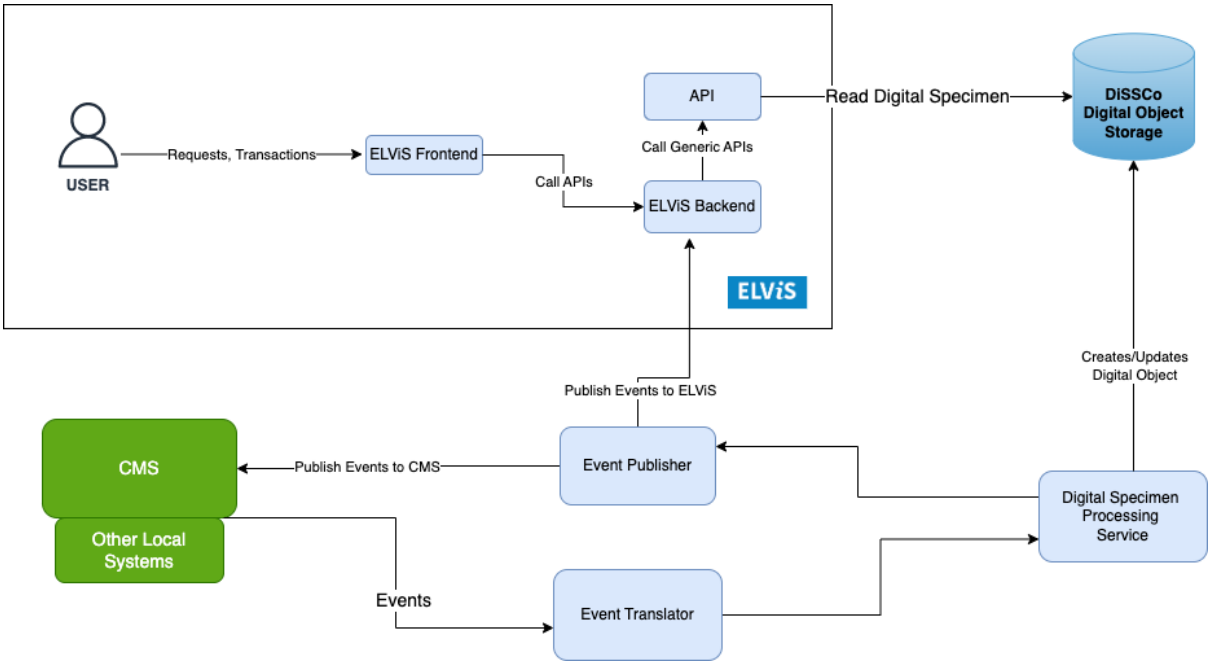

Figure 2: A high level overview of how events from CMS and ELViS can interact with the core DiSSCo architecture via APIs and event publisher.

4.3 Integration with DiSSCo FDO data infrastructure

FAIR and FAIR Digital Objects are core components of DiSSCo's data infrastructure design. The main purpose of this architecture is to treat the digital representations of physical specimens as atomic items to allow machine readability and actionability thus giving foundations for building services based on operations and transactions. For instance, one of these operations will be loans. The loan request requires access to all specimen related information to determine if the requested items can be loaned or not. The Digital Specimen Repository will be the catalogue of all the specimens within the DiSSCo core infrastructure (see Leeflang et al. 2022 for more details) which will act as the integration piece between different services. ELViS needs integration with the Digital Specimen Repository and the DiSSCo core infrastructure to meet requirements Req1 and Req15.

Each Digital Specimen with a persistent identifier (PID) and attributes thus provides an anchor for the core information about the specimens. As DiSSCo adopted FAIR principles therefore ELViS also needs to adhere to that. This can vary on the specific aspect of the implementation for example, each transaction based on a specific digital specimen can be subject to the FAIR principle. One question that still needs to be explored further is how to treat a loan transaction as a FAIR

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Digital Object. However, it is clear that ELViS needs to be able to interact with the Digital Specimen Repository to access this information.

4.4 Facilities and Collection descriptions integration

The integration of information about facilities with their services and instruments, and descriptions about available collections have been discussed by the partners of WP6. This led to the development of structured information about institutions and their facilities including services and instruments offered by the facilities. This information has been included in ELViS for the 22 institutions involved in the SYNTHESYS+ TA and VA access programme (227 Research and Digitisation facilities together with their instruments and services, see Figure 3). Functionality has been implemented in ELViS to enter and maintain this information by the institutions.

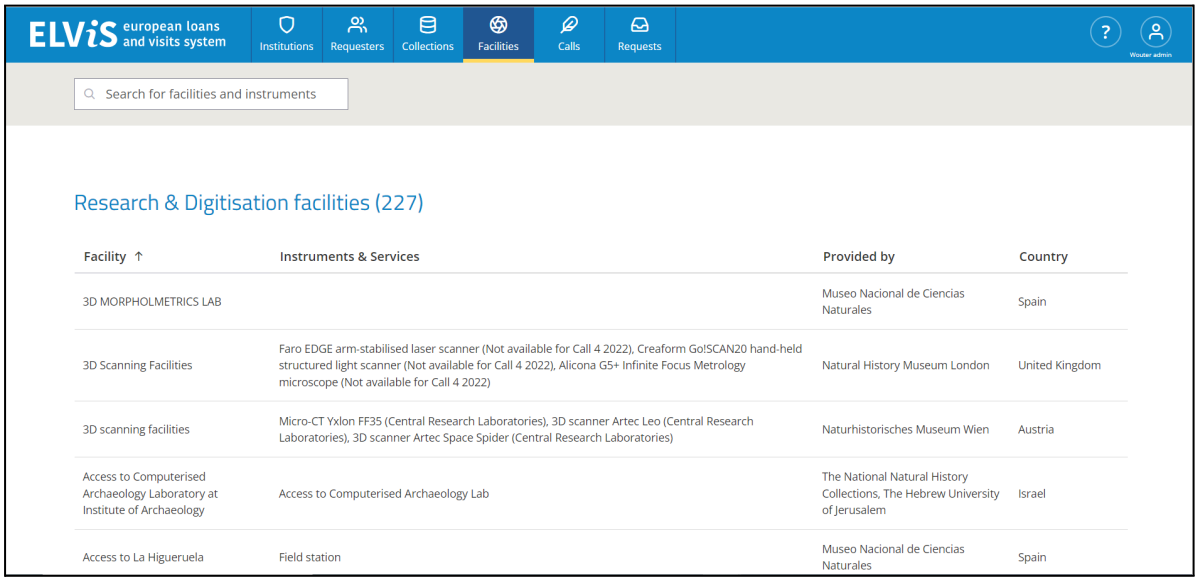

Figure 3: Screenshot of the list with facilities in ELViS.

To scale up with full operation of DiSSCo and include descriptions of all facilities available at the more than 170 DiSSCo partners, integration with the CETAF Registry is needed. The CETAF registry has been designed to hold this information for all natural history collection holding institutions in Europe in the future, where CETAF as a network organisation can provide executive editing capabilities to ensure quality and trustworthiness of the data. In collaboration with WP6 the CETAF Registry datamodel has already been adjusted to fit the agreed structure for this information as implemented in ELViS, but an integration between the systems

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has not been made yet, as this is dependent on the DiSSCo data infrastructure development and further development of the CETAF Registry. Currently, the CETAF Registry includes only a fraction of the facilities data that is present in ELViS, but CETAF has started collecting the data from all DiSSCo facilities. The DiSSCo data infrastructure will provide the FAIR digital object storage in the future for all DiSSCo related data, including data about the facilities and collections.

The institution descriptions in ELViS were designed to be FAIR and include a GRID (Global Research Identifier Database) persistent identifier for the institutions (GRID). GRID was created by Digital Science, however to better guarantee persistence there should be a community rather than a single company providing the identifier infrastructure. Therefore, in 2021 the GRID passed the torch to ROR for being the community-driven research organisation identifier. ROR was not yet mature enough at the time of development of ELViS 1.0 but the GRID identifiers can be easily replaced by ROR now it has become mature enough, since all GRID identifier data was migrated to ROR. How necessary persistent identifiers are, became already visible soon in ELViS where all links to institution descriptions in CETAF were broken after CETAF had migrated to a new website.

Collection descriptions are not yet available in ELViS. However, the partners in SYNTHESYS+ agreed on a data structure and controlled vocabulary for this functionality and the user interface for such collection descriptions in ELViS has already been designed, see Appendix I. These descriptions need to be structured in order to present them in the future as one virtual European collection and also to integrate them with digital specimen information. This allows combining this data, for example to show the estimated total number of specimens in a collection together with the actual number of specimens that are available online as Digital Specimens. This would allow ELViS users for their access requests to navigate seamlessly between available collections and online specimen data.

5. Future development

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ELViS is an important milestone towards creating an integrated European platform for access to natural science collections data. As ELViS facilitated the TA and VA call procedures, it served as an important contribution to the SYNTHESYS+ project. However, we still have several components and modules to build until ELViS can provide the integrated functionality as the one-stop shop for accessing natural sciences collections infrastructure across Europe. The requirements described in this document will guide the future development process that includes:

1. Looking into the current code base of ELViS and suggesting a short term improvement plan, e.g. to fully integrate ELViS with the AAI piloted in WP6 and to replace GRID identifiers with ROR. Some of these works have already started. See DiSSCo technical team's Jira sprint planning.
2. Turning requirements and user stories into actionable development milestones.
3. Integration with the DiSSCo Core infrastructure when this becomes available. Some of the prioritisation will be addressed in the DiSSCo Construction Master Plan (DiSSCo Prepare Deliverable D9.6) and the subsequent DiSSCo transition phase towards full operation in 2026.

In December 2022, the DiSSCo Coordination and Service Office issued a call for expressions of interest to develop various DiSSCo services. ELViS is one of these services that can be led by a DiSSCo member in collaboration with the broader DiSSCo community. By taking ownership of a service's development, further resources and commitment can be allocated to build a robust service and move the ELViS service closer to its integrated and fully operational phase.

DiSSCo partners in several countries have also expressed interest in providing further VA and TA access services through national programmes. While the TA and VA functionality in ELViS has been designed for international calls, this could be easily adapted to also support national access calls in the future.

ELViS code developed in SYNTHESYS+ has been transferred to DiSSCo for future maintenance and further development, and was made available as open source under APACHE 2.0 license (see: https://github.com/DiSSCo/elvis-frontend and https://github.com/DiSSCo/elvis-backend), which enables collaboration on code development for integration of new systems in the future.

References

SYNTHESYS+ was funded by the Horizon 2020 Framework of the European Union under the H2020 Open Innovation and Open Science Research Infrastructure call.

Addink, W., Islam, S., Koumantaros, K., Laskaris, N. (2020). SYNTHESYS+ milestone report MS48 AAI Infrastructure design. https://osf.io/sc7vw

Brandolini, A. (2013). Introducing EventStorming. An act of deliberate collective learning. Available online at: https://www.eventstorming.com/book/

Fitzgerald, H., Juslén, A., von Mering, S., Petersen, M., Raes, N., Islam, S., Berger, F., von Bonsdorff, T. K., Figueira, R., Haston, E., Häffner, E., Livermore, L., Runnel, V., De Smedt, S., Vincent, S. & Weiland, C. (2021). DiSSCo Prepare Deliverable D1.1 Report on life sciences use cases and user stories. https://doi.org/10.34960/XHXW-CB79

Glöckler, F., Reis, J., von Mering, S., Petersen, M., Weiland, C., Dillen, M., Leeflang, S., Haston, E., Addink, W., & Fichtmueller, D. (2022). DiSSCo Prepare Deliverable D6.1 Harmonization and migration plan for the integration of CMSs into the coherent DiSSCo Research Infrastructure. https://doi.org/10.34960/366D-SF49

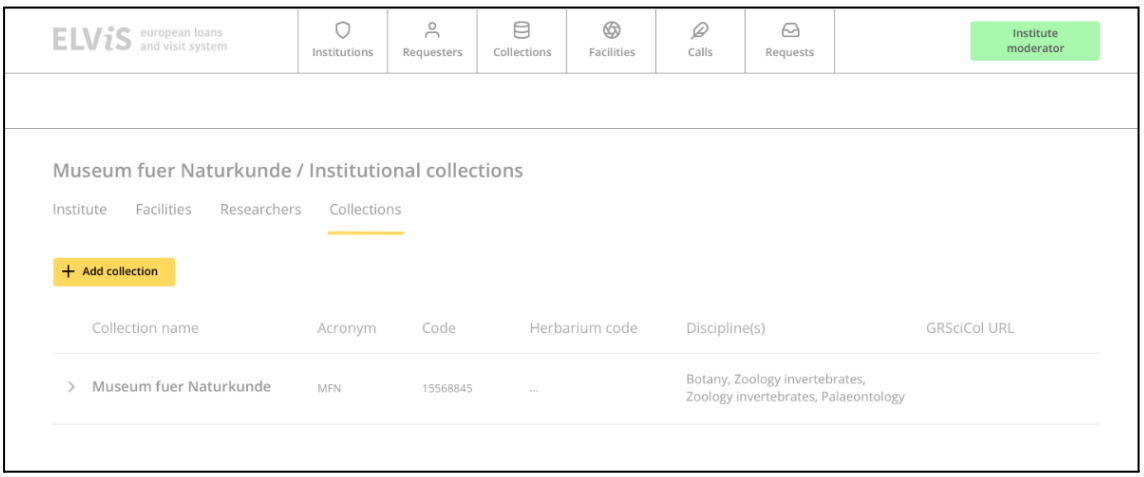
Leeflang, S., Weiland, C., Grieb, J., Dillen, M., Islam, S., Fichtmueller, D., Addink, W. & Haston, E. (2022). DiSSCo Prepare Deliverable D6. 2 Implementation and construction plan of the DiSSCo core architecture. https://doi.org/10.34960/50b9-kj05

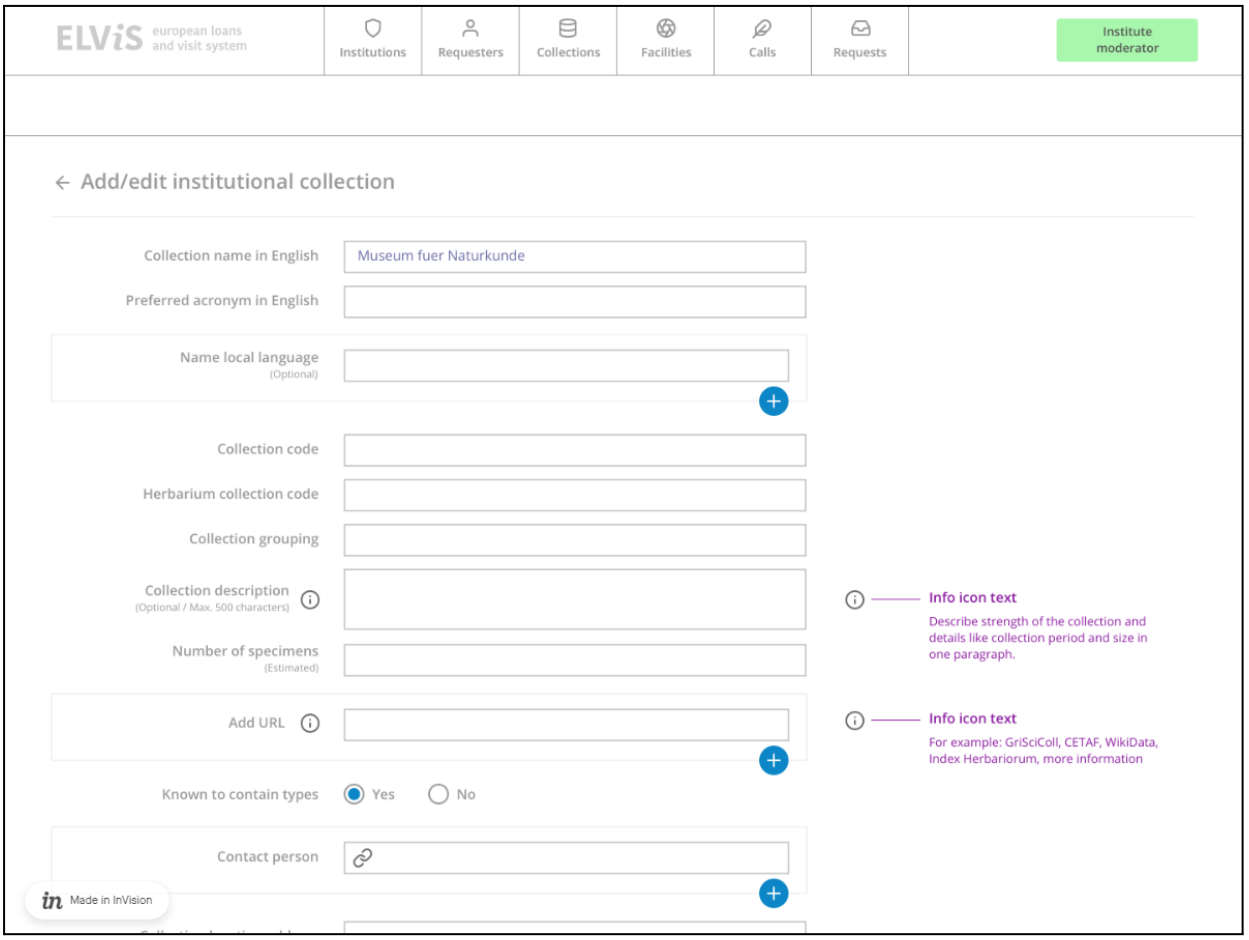
von Mering, S., Petersen, M., Fitzgerald, H., Juslén, A., Raes, N., Islam, S., Berger, F, von Bonsdorff, T., Figueira, R., Haston, E., Häffner, E., Livermore, L., Runnel, V., De Smedt, S., Vincent, S. & Weiland, C. (2021). DiSSCo Prepare Deliverable D1.1 Report on Life sciences use cases and user stories. https://doi.org/10.34960/n3dk-ds60

SYNTHESYS+ was funded by the Horizon 2020 Framework of the European Union under the H2020 Open Innovation and Open Science Research Infrastructure call.

Appendix I

Frontend design for institutional collections in ELViS





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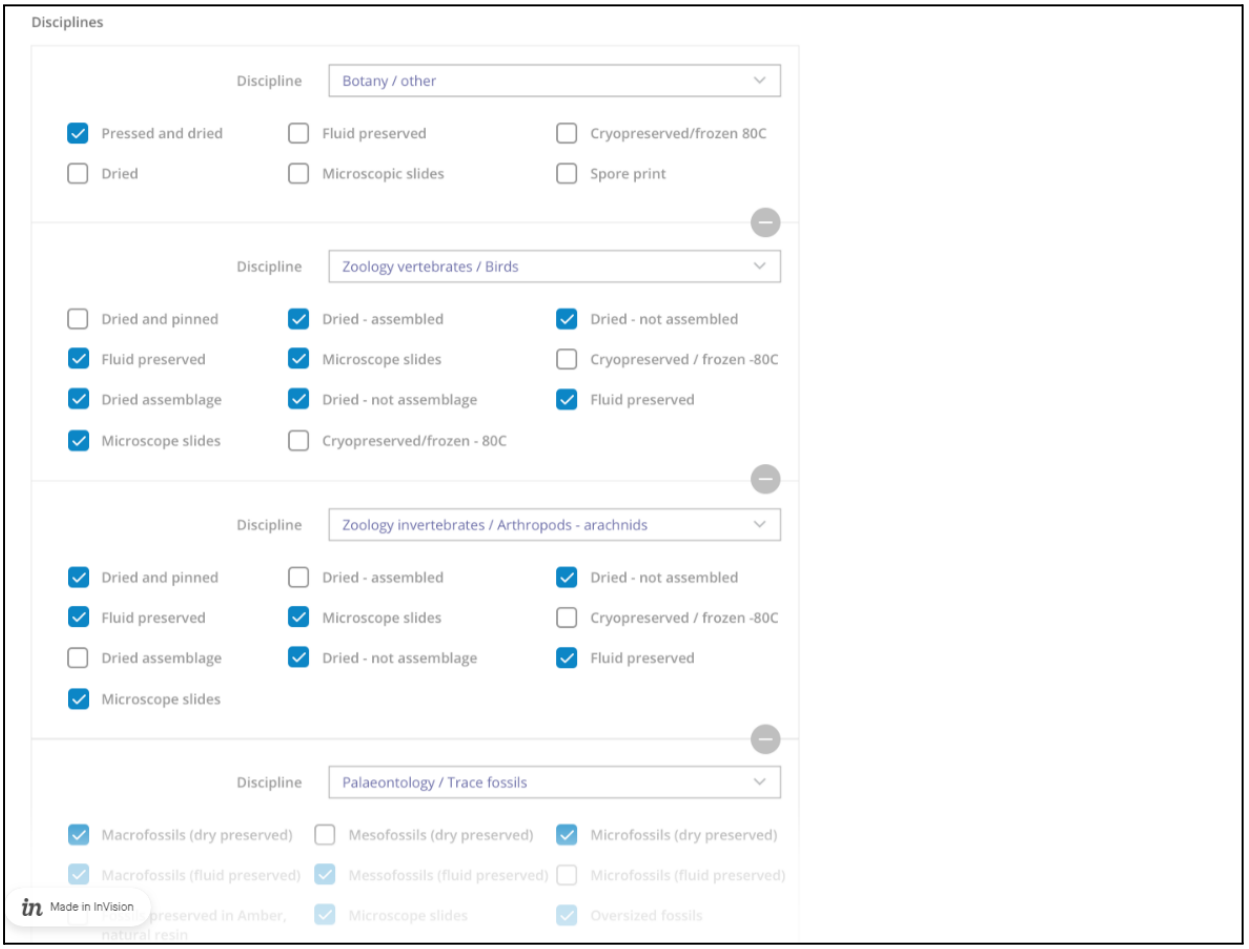

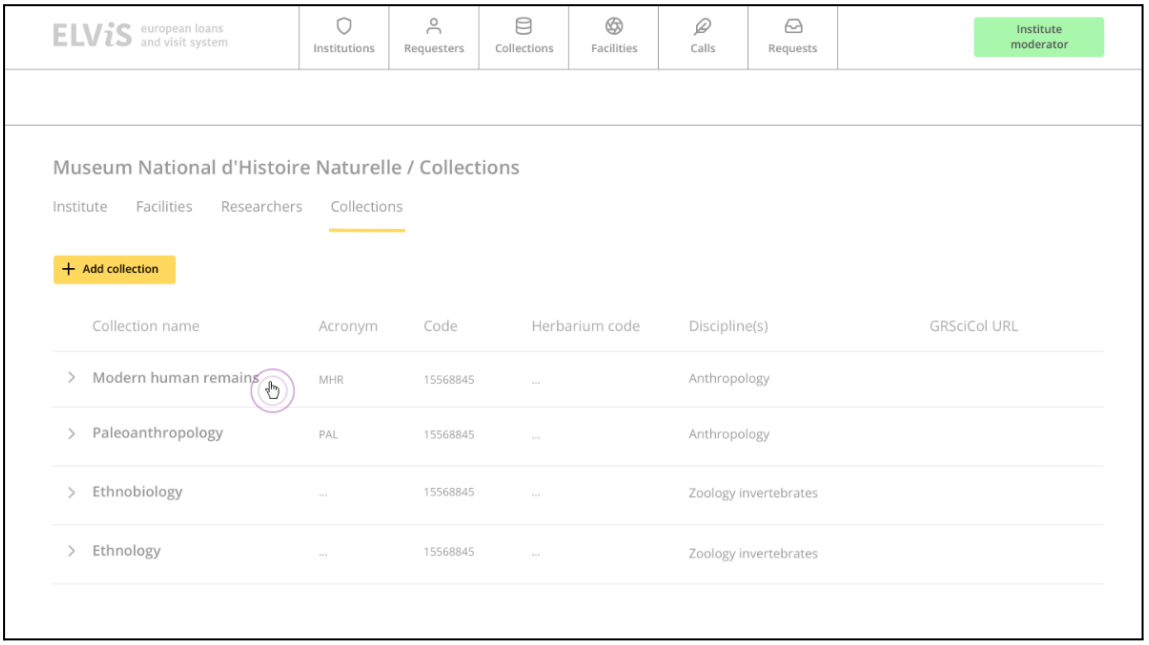

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