

## **DiSSCo Strategy & operational planning**

DiSSCo Prepare WP7 MS7.3

Authors: Dimitris Koureas, Niels Raes, Eva Alonso, Ana Casino, Wouter Addink

v1.0\_20210123

---

---

## Table of Content

Introduction	3
DiSSCo vision	5
DiSSCo mission	5
DiSSCo values	5
Openness	5
Inclusivity & Equitable Development	5
Transparency & Trust	5
Innovate to empower	6
Accountability & Ownership	6
Personal growth	6
Respect & Enjoy	6
<b>Our approach to fulfilling our mission</b>	7
Our Programmes	7
Digitisation Programme	7
Integrated Access Programme	8
Data & Applications Programme	8
Capacity Building Programme	9
Value in uniqueness and complementarity	9
Our implementation approach	12
Steps towards delivering the strategy	13

---

## Introduction

This document aims at presenting the main results of the work done within DiSSCo preparatory phase to define the Strategy of DiSSCo-ERIC RI, and the methodology followed to facilitate the discussions around it.

The work described here is based on the previous work developed by different writing groups:

1. International landscape analysis: In 2020, the interim General Assembly (iGA) mandated the organisation of a task force (contact zones) to characterise the various dimensions of the biodiversity informatics landscape (DiSSCo, GBIF, LifeWatch, iBOL, COL, iNaturalist, BHL, GeoCase, eLTER and ELIXIR) relative to both their current activity and long-term strategic ambitions. The survey combined several criteria (type of data & phases of activity) under five categories (data, standards, software, hardware and policy). The exercise mapped gaps, overlaps and possible rate-limiting steps concerning DiSSCo and helped identify a set of high-level questions. The report was presented at the iGA meeting 3 (iGA3 - 10/11 June 2021).
2. Mission and Vision: The iGA, with the recommendations of DiSSCo Scientific Advisory Board, mandated the constitution of a task force (DiSSCo aspirations group) to come up with a joint definition of DiSSCo's vision and mission statements. The ultimate goal of this effort was to create a set of robust messages to encompass the key goals which DiSSCo strives to accomplish and develop them into tangible strategic steps. Definitions were approved at the iGA meeting 3 (iGA3 - 10/11 June 2021).

The development of the DiSSCo Strategy as part of the DiSSCo Prepare Project (DPP) is a community effort shaped through two workshops organised on November 10 and December 9, 2021. Among the participants of the workshops were the team involved with DPP WP7 on 'Governance, Policy & Legal frameworks', the DiSSCo Technical Team, and guests. Guiding in defining the DiSSCo strategic framework and its four pillars or programmes were the DiSSCo vision and mission and the draft of the DiSSCo technical infrastructure ([DiSSCo Prepare D6.2](#)). During the workshops for each of the four identified strategic programmes (Digitisation, Integrated Access, Data & Applications and Capacity Building), a 'strategy explorer' exercise was carried out to define its goal and a number of relevant strategic objectives. The results of the workshops were summarised in a report entitled: "Approach to developing DiSSCo Strategy - Co-creating DiSSCo key programmatic activities" (May 2022), which was shared with

---

the DiSSCo Funders Forum members and the DiSSCo consortium members. The results from the report were presented at the DiSSCo iGA meeting four (iGA4 - 24/25 May 2022) and the Funders Forum Advisory Body meeting four (FF4 - 16/17 June 2022).

## **Next steps**

The present document is a first draft resulting from the work of the community. It summarises the key findings but has not gone through the more comprehensive community consultation or approval of the relevant DiSSCo governance bodies. In 2023, the DiSSCo Coordination and Support Office will run a broad consultation across the relevant internal stakeholders, including the DiSSCo Scientific and Technical Advisory Bodies, the Funders Forum, the National Nodes and the interim General Assembly. We expect to have a new version of this early draft late in 2023 and adopt the latest version as the Strategy of DiSSCo ERIC.

---

## **DiSSCo vision**

Knowledge and evidence about nature's diversity - available to all

## **DiSSCo mission**

Unleash the full potential of natural history collections by bringing them together in a distributed, interoperable European research infrastructure, making them physically and digitally open, accessible, and usable for all forms of research and innovation.

## **DiSSCo values**

Organisational values are guiding principles that transcend everything we do. These values are our fundamental beliefs about what matters and dictate how we tackle challenges and explore future opportunities.

As a DiSSCo Research Infrastructure, we adopt and adhere to the following seven values:

### **Openness**

We value openness and publicly share our knowledge and ideas;

We strive to develop open-source software and adhere to the FAIR and open data principles for all our services.

### **Inclusivity & Equitable Development**

We celebrate diversity and do not discriminate against any colleague or applicant for employment because of race, colour, sex, age, national origin, religion, sexual orientation or gender identity and expression;

We actively seek to build, and favour our participation in, inclusive partnerships for promoting scientific excellence and equitable sharing of benefits;

We value and promote knowledge and technology transfer across countries, organisations and individuals;

### **Transparency & Trust**

We strive to develop clear, actionable and simple policies;

---

We are transparent in what and how we do our work, share our experiences and embrace feedback;

We build long-lasting relationships of trust with our users, members, suppliers and other stakeholders and partners.

### **Innovate to empower**

We strive to understand our user communities and focus service and solutions development according to their needs;

We design and provide fit-for-purpose, sustainable and robust solutions together with and for our user communities.

### **Accountability & Ownership**

We feel accountable for everything we do and say;

We feel responsible for our user experience and the effectiveness of all our services.

### **Personal growth**

We value and promote personal growth;

We educate and train ourselves regularly;

We strive for people to be in roles where they feel most comfortable, valuable and appreciated.

### **Respect & Enjoy**

We encourage everyone to speak their mind respectfully and positively and be appreciated for that;

When working hard, we also take the time to enjoy ourselves;

We accept everyone for who they are and celebrate what they bring to our collaborations.

---

## Our approach to fulfilling our mission

As a pan-European Collections-based Research Infrastructure, we focus on maximising the impact of our collective assets (in both data and expertise) and share the benefits of our knowledge with the broadest possible audience. To do so, we embark on four distinct yet interconnected work programmes.

### Our Programmes

The DiSSCo RI programmes constitute its strategic business pillars, based on which it develops implementation plans. DiSSCo's four strategic programmes mandate the development and operation of highly relevant to its mission services, with emphasis on end-user requirements, as well as the improvement of efficiency and effectiveness of DiSSCo facilities' (natural science collections) relevant internal operations.

### Digitisation Programme

**Overarching goal:** Accelerate and lower barriers to digitisation across European Natural Science Collections

*Why is this important ?*

Digitisation of our European collections is essential for unlocking the full potential of the knowledge linked to our vast natural science collections. Building on earlier investments in digitisation, we focus on science-driven and mass-scale pan-European digitisation programme. Through this programme, we mobilise new digital information that addresses global science needs for trusted, fit-for-purpose biodiversity and geodiversity data and promotes the discovery and modelling of our natural world.

#### **Programme Strategic objectives:**

1. Developing strategies for prioritising digitisation at various levels based on community consensus;
2. Develop open digitisation workflows, training and best practices.
3. Establish & operate regional digitisation centres & centres of excellence.

---

## **Integrated Access Programme**

Digital and physical access to our collections and the information linked to them continues to be a priority for our community.

**Programme Goal:** Create and implement multimodal standardised and innovative routes for accessing and curating collections information, including transnational, remote and digital.

### *Why is this important*

Access to specimens and specimen-derived information is at the core of the mission of Natural Science Collections. It is part of their institutional mandate, their mission, and a mechanism to measure impact. Integrated access programmes that balance access modes (transnational, remote and digital) improve the availability of specimens and specimen-derived information, provide harmonised ways to measure access and impact and help democratise museums' scientific assets.

### **Strategic objectives:**

1. Develop and facilitate a pan-European transnational and remote access programme;
2. Deliver robust and comprehensive online capabilities for the access and scientific curation of specimens' information by championing the concept and process of collections' twinning (the generation and maintenance of specimens' digital twins);
3. Widen the reach of collections-derived information to more users and communities (e.g. industry, cultural heritage).

## **Data & Applications Programme**

A suite of e-Services, will be developed to extend the functionality and impact to the RI.

**Goal:** Develop and maintain the required data infrastructure and offer a portfolio of e-Services that add value to the core data infrastructure of DiSSCo and offer easy to access solutions to the identified end users

### **Strategic objectives:**

1. Develop and maintain the digital extended specimens infrastructure as machine- and human-readable and actionable knowledge units;



- 
2. Implement novel community curation services that muster expertise from a wide pool of scientists and data from the broadest possible external scientific sources.
  3. Deploy hybrid intelligence approaches to knowledge production by coupling machine learning technologies and human contributions to increase the volume and quality of specimen-linked and specimen-derived data.

## **Capacity Building Programme**

As DiSSCo is a novel RI the Capacity Building programme is critically important to enable users to use the DiSSCo RI and all its e-Services.

**Goal:** Partners and users are confidently supplying/using data through DiSSCo and using DiSSCo's e-Services.

### **Strategic objectives:**

1. Provide tools to DiSSCo facilities to self-assess the level of digital maturity and provide roadmaps to improve facilities' compliance with DiSSCo technical and policy framework.
2. Organise and facilitate training within the DiSSCo consortium to build in-house capacity and enhance European collections' community digital skills and competencies.
3. Lead within the international community in refining and implementing standards to ensure that DiSSCo's data and e-Services are FAIR and impact research, policy and scientific/private sector/societal innovations.

## **Value in uniqueness and complementarity**

### **Unique Scientific Proposition**

DiSSCo RI operates within a constantly evolving ecosystem of linked and related infrastructures in a complex landscape of natural science data. DiSSCo RI recognises the importance of developing a unique European research infrastructure based on an existing network of national, European and international stakeholders.

DiSSCo builds its value on the data, expertise and capacity of its distributed facilities of natural science collections and human capital. DiSSCo invests in data innovation to deliver

---

value services predominantly to communities of science linked to biological and geological diversity and human impact.

At its core, DiSSCo aims at scaling up (through the acceleration of knowledge production) and scaling out (through broadening the spectrum of users) to deliver impact. It does so by adopting novel technologies and approaches to knowledge management, improving the capacity of DiSSCo facilities to partake.

### **Working together and in sync to deliver impact**

Data served by natural sciences-related infrastructures are critical to addressing many of science and society's greatest challenges, including the interconnected crises of biodiversity loss and climate change. For example, much of the science underpins policies designed to tackle biodiversity loss from data mediated by these infrastructures.

Consequently, there is an ever more pressing need to tackle the barriers that hinder the acquisition of more data. As new needs emerge, especially in responding to the growing data needs, more coordination is required to develop new infrastructures. One such gap relates to the provision of data from natural science collections.

DiSSCo is taking stock of the developing landscape of biodiversity and geodiversity-related infrastructures and developing its service portfolio, taking into consideration data and application zones of contact. Furthermore, DiSSCo works with those infrastructures in the context of international projects to develop a shared understanding of the division of effort among all interconnected domain actors.

DiSSCo adopts a framework for a step-change in collections curation and impact delivery by massively improving the capacity of scientists to discover, access and analyse complex and previously disjointed information deriving from the study of the vast European natural science collections. The main drivers for developing a European integrated system of natural science collections include a) the need for more effective and scaled-up access to the data deriving from vouchered specimens and b) the need for improved provenance, reproducibility and eventually better quality of biodiversity information.

As a research infrastructure, DiSSCo aims at the development of end-user services that contribute to issues related to a series of issues linked to scientific quality, capacity and efficiency (Table 1).

---

**Table 1.** Issues related to current limitations that impact scientific quality, capacity and efficiency and the expected contribution of DiSSCo services.

	<b>What is the issue</b>	<b>How DiSSCo responds</b>
1	Taxonomic expertise across our local collections is declining	A community curation model that is able to pull expert resources across locations, transforming institutionally restricted curation to a shared community model.
2	Digitisation investments are scattered and not coordinated	A pan-European digitisation programme that ensures optimum scientifically-driven prioritisation of content mobilisation across all European assets
3	Trust in mobilised digital records is declining because of quality concerns	Re-unification of all data classes derived from the study of collection objects and provide unified access to the digital twins of physical specimens along with extended provenance information
4	Physical and virtual access is disconnected	An orchestrated multi-modal access programme for European collections
5	Collections development is fragmented, and investment decisions are taken based only on institutional or national gaps	Services that allow a birds-eye-view on the taxonomic and geographic gaps in biodiversity and geodiversity surveying and related European-wide policies that would enable for a pan-European orchestrated collections development programme

6	Data deriving from the study of vouchered specimens is disconnected	A new concept of the digital extended specimen is at the core of the data architecture of DiSSCo. The digital specimen is an informationally enhanced digital twin of a physical specimen. A digital specimen acts as a human-readable and machine-actionable knowledge unit that integrates all data from the study of the physical object.
7	Use of collections in scientific outputs is poorly monitored	Deployment of a unified persistent identification system for digital specimens would further facilitate the tracking of individual specimens across scientific outputs.

## Our implementation approach

### A hybrid intelligence approach to impact delivery

DiSSCo approach to digitisation is based on implementing a FAIR Digital Object Architecture. This architecture focuses on the reconstruction of each physical object in cyberspace. A reconstruction that enables the scientific exploration (curation, use, analysis) of each digital object. It delivers information augmented (extended) digital objects (i.e. digital extended specimens) that are both human and machine-readable and actionable. Through its application services, DiSSCo facilitates mass-scale processing of these digital extended specimens from human and machine agents, massively accelerating the generation of specimen-derived evidence and improving the quality and fitness for purpose.

### User needs are at the heart of our Service lifecycle

DiSSCo delivers impacts and measures success through its capacity to engage users. It is a user-facing infrastructure. As such, it is essential that we constantly (re-)calibrate the value propositions of the end-user services and make adjustments within their lifecycle to (a) improve the experience of the users, (b) offer additional functionality of value, and (c) keep up-to-date with the ever-changing technological and informatics global landscape.

---

## **Distributed by design**

As a distributed RI, DiSSCo must rely on the cooperation of multiple partners who act as service providers. Together these services form the DiSSCo service portfolio and help reach the goals of DiSSCo's four distinct programmes.

Emphasis is placed on formulating clear agreements between DiSSCo ERIC and its service providers. Furthermore, DiSSCo will further focus on developing and adopting clear community standards that will lower the interoperability threshold between its distributed technical components.

## **Relying on Strategic Partnerships**

We are driven by the notion that for any RI to reach its full potential, it must operate within a transparent ecosystem of relevant actors. From suppliers of data, expertise and technology to beneficiaries of its services. DiSSCo commits to working with relevant stakeholders within and outside Europe as a reliable and committed partner. We will do this in the context of international fora, organisations and projects. We will specifically focus on aspects related to (meta)data standards development, policy alignment, personnel exchange, and other actions requiring international collaboration for impact delivery.

## **Steps towards delivering the strategy**

### **Implementation / Construction Phase (2024 - 2026)**

Our ten priority actions during the implementation phase:

1. To the extent that these have not been delivered in the transition phase, draft and approve required policies for the DiSSCo ERIC operation, as clear, simple and actionable documents;
2. Proceed with necessary recruiting for the central hub (or core infrastructure?);
3. Instigate all agreed-upon governance bodies and draft their rules of procedure;
4. Set up required Service Level Agreements with all identified e-Service Providers (National Nodes and individual organisations);
5. Continue working on the core infrastructure of DiSSCo and champion the implementation of a global digital extended specimens system as the pillar for all DiSSCo user applications;
6. Detail and budget each of the four distinct strategy programmes for the first phase of operations;

- 
7. Participate in international organisations, fora and projects towards technical specifications required for the realisation of DiSSCo e-Services and in the context of a global collaboration framework with relevant RIs;
  8. Identify opportunities for funding linked to the strategic objectives of DISSCo through national, European and international funding frameworks;
  9. Establish a clear communication and engagement plan for its e-Services and describe its impact delivery mechanisms to as many diverse audiences as possible;
  10. Continue engaging with national governments to extend the membership of DiSSCo ERIC.