D2.4: Report on Governance Model

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Abstract:

A report on Governance Models for the future EUDAT CDI covering the identified risks and benefits from a range of organisational option which recommends a final governance model, legal structure and underlying governance structure to ensure sustainability beyond the current EUDAT 2020 project.

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EXECUTIVE SUMMARY

EUDAT needs a legal framework and underlying governance structure to ensure sustainability beyond the current EUDAT 2020 project based agreements. After consideration of various options (including a review of other e-infrastructure organisations) and discussions with existing EUDAT partners, it was agreed to establish a lightweight partnership agreement for the EUDAT CDI with a Council, Board and Secretariat within the remainder of the EUDAT2020 Project. This provides a framework for future sustainability as well as a stable platform to enable the consideration of other longer term options for the legal status and sustainability for EUDAT, without requiring substantial organisational overhead at what is still an embryonic development stage.

Membership of the EUDAT CDI is open to both generic and thematic service providers, with two different levels of commitment to ensure flexibility and openness in terms of membership. Whilst the partnership members will be service providers, engagement with user communities will be via operational committees. The Governance consists of a Council and Board with supporting advisory and operational boards and committees, supporting the Secretariat by providing interfaces with technical architects/software developers, service providers and user communities, as show below (Figure 1).
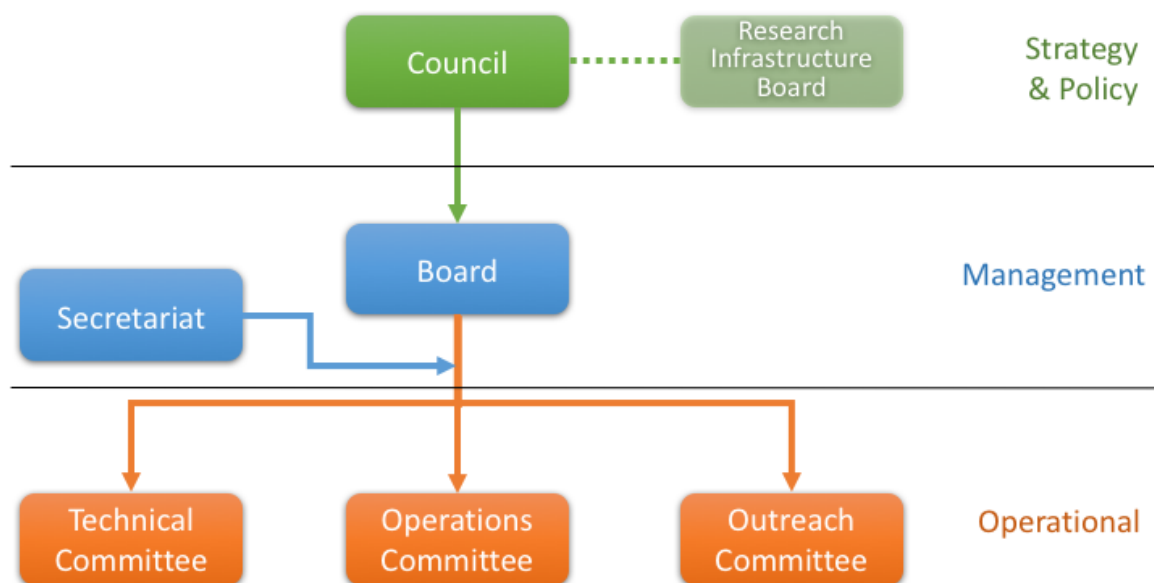
Figure 1: Lightweight governance structure

The Governance Structure will be established over the remainder of the EUDAT2020 project, with a controlled transfer of responsibilities (strategy, organisation, sustainability and services) from the project to the new organisation such that the EUDAT CDI will be fully operational by January 2018, in good time before the end of EUDAT2020 in March 2018.

Consideration is also made of the potential risks in moving to this structure, and a future roadmap for considering longer term options for EUDAT beyond the CDI Agreement: the CDI Agreement is intended to be a transitory vehicle and EUDAT2020 will investigate further the legal options.

1. INTRODUCTION

This deliverable outlines the proposed legal status and governance structure for the EUDAT CDI. EUDAT requires a legal framework and underlying governance structure to ensure sustainability beyond the current EUDAT 2020 project. After consideration of various options and discussions with existing EUDAT partners, then it was agreed to establish a lightweight partnership agreement for the EUDAT CDI with a Council, Board and Secretariat within the remainder of the EUDAT2020 Project. This provides a framework for future sustainability as well as a stable platform for considering other longer term options for the legal status and sustainability for EUDAT, without requiring substantial organisational overhead at what is still an embryonic development stage.

The document is organised into the following sections:

- An overview of existing e-infrastructure organisations and the governance structures for those organisations;
- An overview of the EUDAT Collaborative Data Infrastructure, outlining its purpose, services and type of participation;
- An overview of the legal status proposed for the initial EUDAT CDI, the reasoning for this structure, and potential future development of the legal status;
- An overview of the governance structure within the EUDAT CDI;
- Recommendations on establishing the EUDAT CDI Agreement and Governance structure and determining a roadmap for beyond the structure proposed here;
- Potential risks and mitigation;
- As an annex, an initial Terms of Reference for the CDI Council.

2.   OVERVIEW OF OTHER E-INFRASTRUCTURE ORGANISATIONS AND STRATEGIC INSTRUMENTS

2.1. EGI.eu

http://www.egi.eu/

The EGI Foundation, also known as EGI.eu, is a not-for-profit foundation established under Dutch law to coordinate and manage the EGI federation—currently a federation of over 350 resource centres—on behalf of its participants: the organisations that represent national e-infrastructures and European Intergovernmental Research Organisations (EIROs).

It is governed by the EGI Council, which is responsible for defining the strategic direction of the EGI federation. The Council acts as the senior decision-making and supervisory authority of EGI.eu. The Council participants are the organisations that represent national e-infrastructures and two European Intergovernmental Research Organisations.

The Council delegates oversight of the day-to-day running of EGI.eu to the Executive Board which currently has seven members. The Executive Board devolves financial and organisational responsibility to the Director, who is supported by a staff of 22 people based at the EGI.eu headquarters in Amsterdam. EGI.eu's work is supported by the equivalent of another 22 full-time workers spread across many organisations around Europe.

Operationally, EGI has a number of boards reporting to the EGI council which are based on the FitSM framework (http://fitsm.itemo.org) for federated service management.

Figure 2: EGI governance structure

2.2. GÉANT

http://www.geant.org/

GÉANT is a membership organisation acting with and for its members to further research and education networking in Europe and globally. It serves the research and education networking community in Europe, helping them to deliver innovative networks, technologies and services for research and education.

GÉANT's highest governing body is the General Assembly (GA), consisting of representatives of member organisations which meets at least twice per year. The GA has three classes of member; National members (one per country), Representative members and non-voting Associate members.

The GA elects members to the Board of Directors (BoD), which manages and administers the organisation. Day-to-day operations are carried out by the association's staff, based in Amsterdam and Cambridge, under the direction of the CEO and managers.

GÉANT has been divided into two separate legal entities with their own staff and financial arrangements, both offices trade under the unified brand of GÉANT. GÉANT is the collective trading name of the GÉANT Association in Amsterdam, NL, and of GEANT Limited in Cambridge, UK. GEANT Limited, trading as GÉANT is a private limited Company registered in England & Wales. The GÉANT Association is registered with the Chamber of Commerce in Amsterdam.
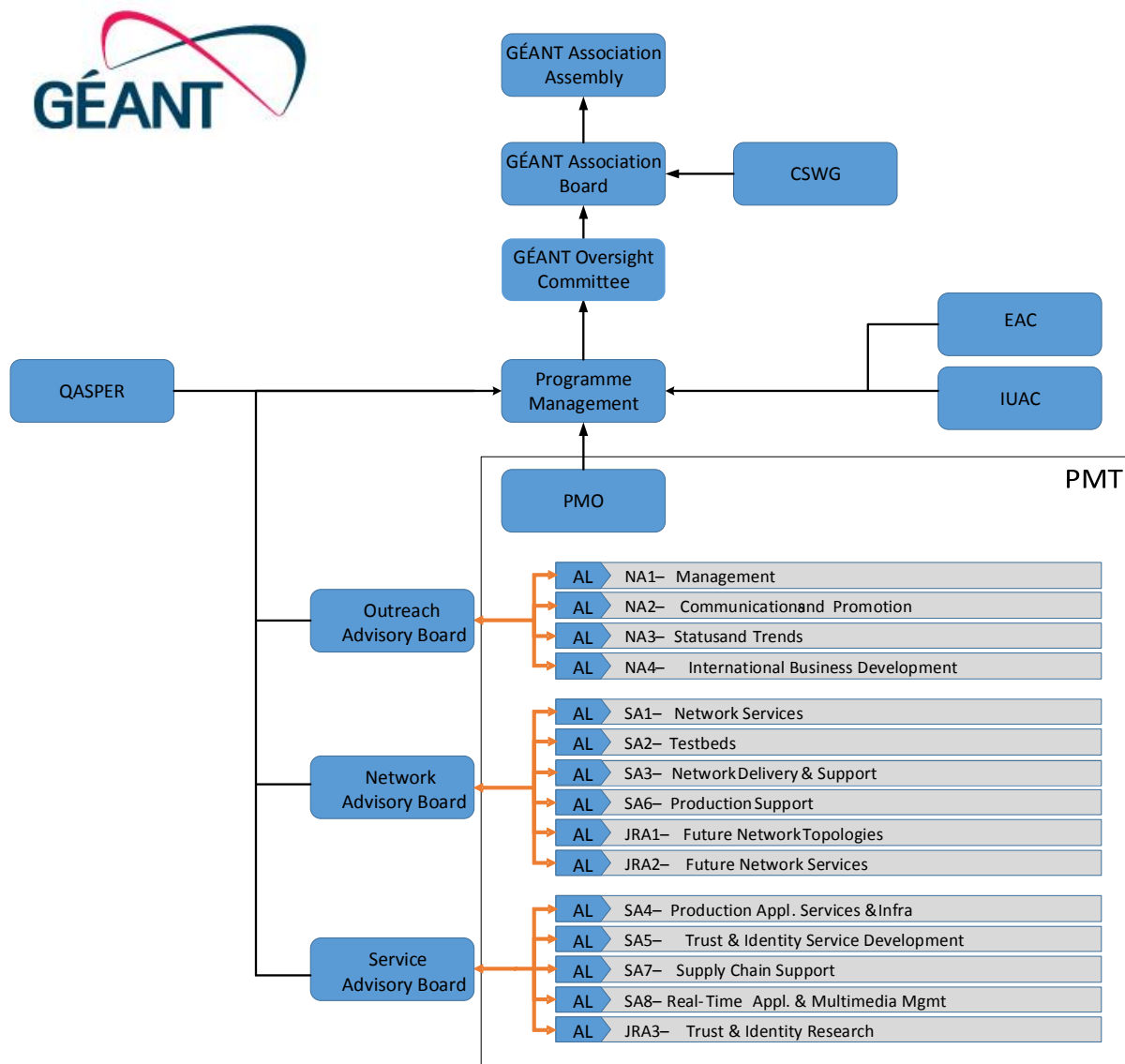

Figure 3: GÉANT governance structure

2.3. ESFRI

http://www.esfri.eu/

ESFRI, the European Strategy Forum on Research Infrastructures, is a strategic instrument to develop the scientific integration of Europe and to strengthen its international outreach. The competitive and open access to high quality Research Infrastructures supports and benchmarks the quality of the activities of European scientists, and attracts the best researchers from around the world.

The Forum acts as an informal body on issues raised by one or more country delegations. The Strategy Forum gives national authorities the opportunity to be informed of and to explore international and national initiatives of European significance. Forum meetings are held on a regular basis, typically four times a year. The Forum is a self-regulated body, operating in an open method of coordination between the different countries mainly on the basis of consensus. The Forum itself decides when, where and what it will discuss, according to an agreed agenda; issues put forward by at least one delegation in the Forum are discussed.

The ESFRI Chair conducts meetings of the Forum and of the Executive Board, and acts as a moderator for discussions. The Chair is supported in his/her tasks by the Secretariat in the preparation of meetings, drawing up of minutes and other duties in the general interest of the Forum, as required. An Executive Board assists the Chair in the planning, preparation, implementation and continuous follow-up of ESFRI activities.

The Forum may decide to set-up, for a pre-defined period of time normally not exceeding two years, ad-hoc working groups (which may partly consist of non-Forum members) to analyse topical issues and to report to the Forum. The Secretariat is provided for by Commission services. It assists the Forum in its operation. In particular, it assists the Chair and the Executive Board in preparing and circulating draft agendas, meeting summaries and related documents.

The ESFRI delegations are composed of a maximum of two Delegates per country: they shall be senior science policy officials or equivalent representing the Minister(s) responsible for Research in each of those States wishing to take part; they shall have access to and be capable of influencing policy-making in their own country. Each ESFRI delegation may be accompanied by up to two Experts to ESFRI meetings and events.
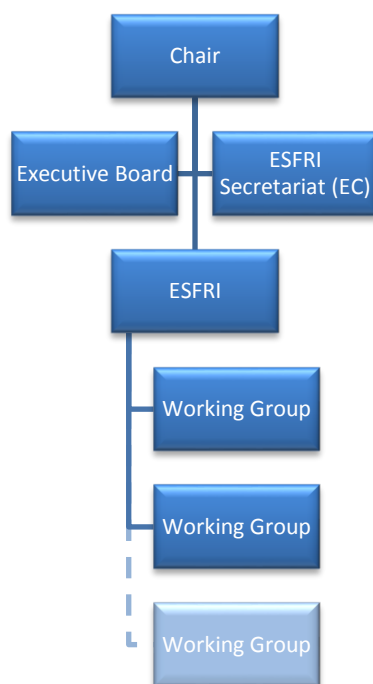
Figure 4: ESFRI governance structure

2.4. ERIC

http://ec.europa.eu/research/infrastructures/index_en.cfm?pg=eric

The European Research Infrastructure Consortium (ERIC) is a legal entity, based on EU law, which has been specially designed for the purpose of establishing and operating research infrastructures of European interest, involving several European countries.

In recent years research infrastructures (RIs) have become more expensive and increasingly complex, in particular when they span several Member States with a multitude of potential national legal frameworks. The EC and ESFRI identified the need to develop a totally new legal framework under EU law, custom-made for these complex joint RI requirements. As a result the ERIC framework entered into force on 28 August 2009.

An ERIC has a legal personality and full legal capacity recognized in all EU Member States. It is designed with the purpose to be a flexible legal tool which should be easy to use, fast to set up and give certain privileges to RIs.

An ERIC is recognized by the country hosting it as an international body for the purposes of the directives on VAT and on public procurement. This means that (under certain conditions) an ERIC may benefit from exemptions from VAT on its purchases in all EU Member States and may adopt its own procurement rules, not being subject to the directive on public procurement as implemented in national law.

A key feature of the ERIC concept is the flexibility referred to above. The internal structure can be adapted to suit each RI. It is up to the members to define the statutes and decide on membership rights and obligations, the bodies of the ERIC and their competences. However, there is a minimum requirement for governance. The minimum governing bodies required by the ERIC regulation are an assembly of members and a director or a board of directors. The membership of an ERIC must include a Member State and two other countries that are either Member States or associated countries.

The assembly of members is the body having full decision-making powers. It adopts in particular the annual budget, the annual work plan and the implementing rules which complement the statutes.

The director or the board of directors is appointed by the assembly of members. The director or board of directors is the executive body and legal representative of the ERIC.
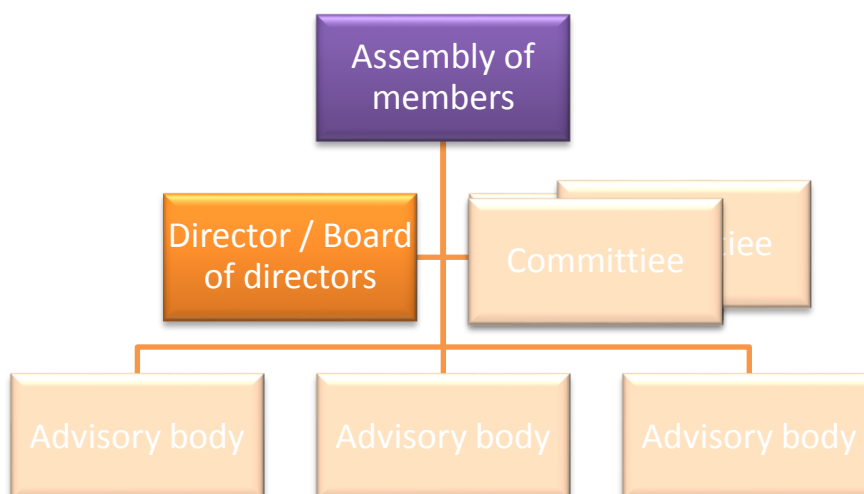

Figure 5: Typical ERIC governance structure

2.5. EIROForum

http://www.eiroforum.org/

EIROforum is a partnership of Europe's eight largest intergovernmental research organizations. In EIROforum, these organizations pursue joint initiatives, combine resources, and share best practices. The eight EIROforum members are:

- CERN - European Organization for Nuclear Research
- EUROfusion - European Consortium for the Development of Fusion Energy
- EMBL - European Molecular Biology Laboratory
- ESA - European Space Agency
- ESO - European Organisation for Astronomical Research in the Southern Hemisphere
- ESRF - European Synchrotron Radiation Facility
- European XFEL - European XFEL Free-Electron Laser Facility
- ILL - Institut Laue Langevin

A primary goal of EIROforum is to play an active and constructive role in promoting the quality and impact of European Research. In particular, the group constitutes a basis for effective, high-level interaction and coordination between the member organisations. It mobilises its substantial combined expertise in basic research and in the management of large international infrastructures, facilities and programmes, for the benefit of European research and development. This is pursued by exploiting the existing intimate links between the partner organisations and their respective European research communities.

As a small (in terms of number of member organisations) organisation EIROforum employs a relatively lightweight governance structure consisting of a council and coordination group. The EIROforum Council is comprised of the Directors General (or equivalents) of the partner organisations and as such, the EIROforum is an authoritative and representative actor in the current process of creating the European Research Area.

The EIROforum Coordination Group is comprised of senior officials of the partner organisations. Under the responsibility of the Chair, the Coordination Group oversees the day-to-day activities, the work of the thematic working groups and prepares the bi-annual meetings of the EIROforum Council.

EIROforum maintains a series of Thematic Working Groups as well as certain ad-hoc groups. Within their mandate, the Thematic Working Groups propose and implement activities of interest to the EIROforum partners, often in cooperation with external partners. The Information Technology working group has for example formulated a strategy[1] to put in place an e-infrastructure commons that will enable digital science by introducing IT as a service to the public research sector in Europe. The rationale calls for a hybrid model that brings together public and commercial service suppliers to build a network of Research Accelerator Hubs offering a range of services to a wide user base.

2.6. PRACE

http://www.prace-ri.eu/

PRACE (Partnership for Advanced Computing in Europe) has been established to enable high impact scientific discovery and engineering research and development across all disciplines to enhance European competitiveness for the benefit of society. They seek to realize this mission by offering world class computing and data management resources and services through a peer review process.

PRACE also seeks to strengthen the European users of HPC in industry through various initiatives. It has a strong interest in improving energy efficiency of computing systems and reducing their environmental impact.

PRACE is established as an international not-for-profit association (aisbl) with seat in Brussels. It has 25 member countries whose representative organisations create a pan-European supercomputing infrastructure, providing access to computing and data management resources and services for large-scale scientific and engineering applications at the highest performance level.

The top level decision making body is the Council which decides on all matters of the Association. It is composed of one representative from each Member. Depending on the nature of the decisions to be taken, —funding, scientific, provisioning, and so on—different voting rules apply.

Other committees / management bodies include the board of the Council (elected by the Council from among the delegates representing the Members), the Scientific Steering Committee (SSC), the Access Committee (AC) and the Industrial Advisory Committee (IAC) (see the diagram above)

The Board of Directors (BoD) is the executive body of the Association and is generally responsible for managing and representing the Association.

The PRACE RI has two forms of members: Members—a government organization or legal entity representing a government—and Hosting Members.

There is also a user forum associated with PRACE, but it is not a formal body of the Association.
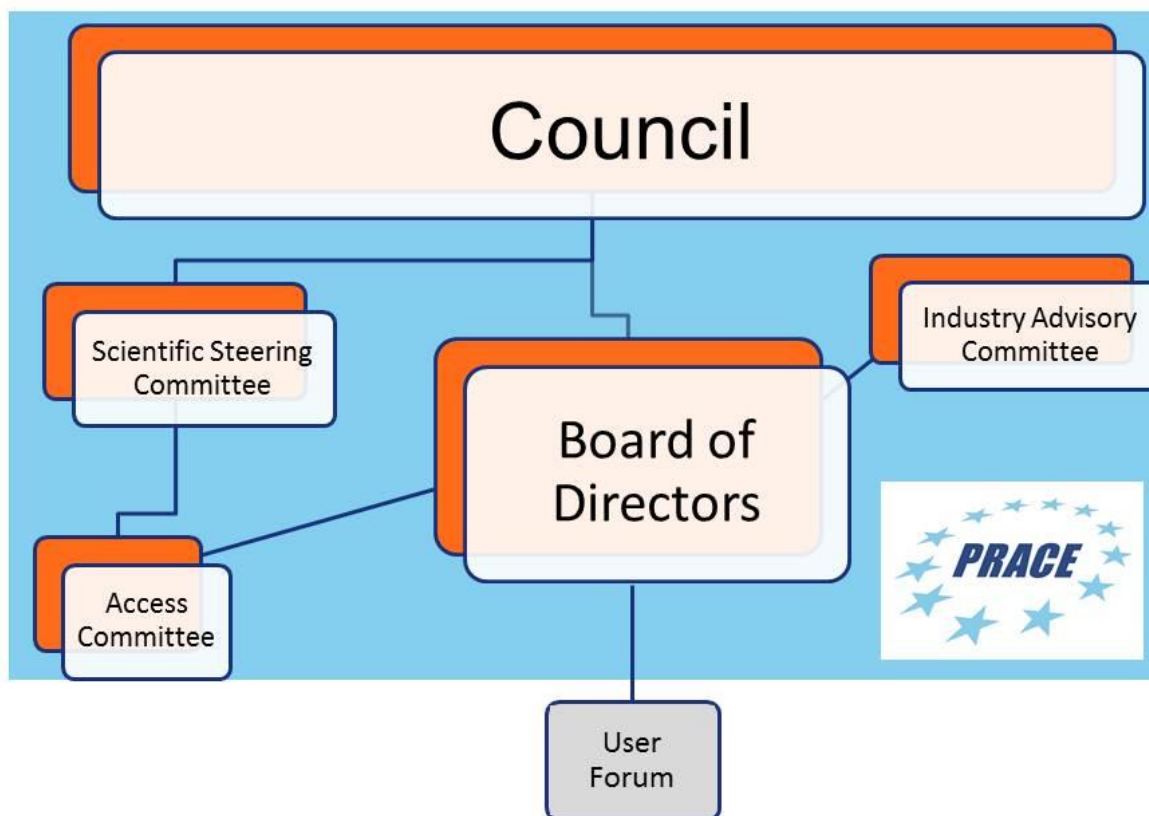
Figure 6: PRACE governance structure

2.7. HELIX Nebula

http://www.helix-nebula.eu/

The Helix Nebula Initiative (HNI) is a partnership between industry, space and science to establish an ecosystem, benefiting from open cloud services for the seamless integration of science into a business environment. Today there are over 40 public and private partners involved in Helix Nebula. The public and private entities involved for the moment in HNI are users (the User Members, initially publicly funded research organisations) and cloud service providers (the Service Provider Members, both commercial and publicly funded) but it may extend to the involvement of a broad range of customers, including government and SMEs. Members can join one or more of the following categories below:

a) **Users**: An entity that applies to become a User Member shall have an intent to procure cloud computing services and actively participate in the Initiative e.g., through participation in task forces, and provide use cases for cloud computing that support the work of the Initiative. Users will name a representative to participate in regular meetings of the Helix Nebula Users Board.

b) **Service Providers:** An entity that applies to become a Service Provider Member shall commit to support a set of cloud computing services and actively participate in the Initiative e.g., through participation in task forces. Service Providers will name a representative to participate in regular meetings of the Helix Nebula Service Providers Board.

c) **Interested Parties:** An entity may apply to become an Interested Party, if it initially does not want to be actively involved in the Initiative but wishes to make use of a product provided by a Helix Nebula Member or be kept informed of the work of or use information provided by the Initiative.

Each Member of the HNI shall cover his own costs of participation. The User Members will collectively ensure the resources required to run the HNI Secretariat.

The General Assembly (GA) is the highest decision making authority in the Helix Nebula Initiative. It provides a platform for the Members to influence the strategic direction of the Initiative. The HNI Secretariat is a function organised and supported by resources from User Members. Its objective is to run the HNI as a lively and well-organised forum and be the main contact point for Members and external contacts. Its tasks are to provide basic secretarial services for the HNI, maintain the Membership registry and documents, maintain a continuous and up-to-date online presence (website etc.) and organise the General Assembly meeting, including preparation of the agenda, writing and distribution of the minutes.
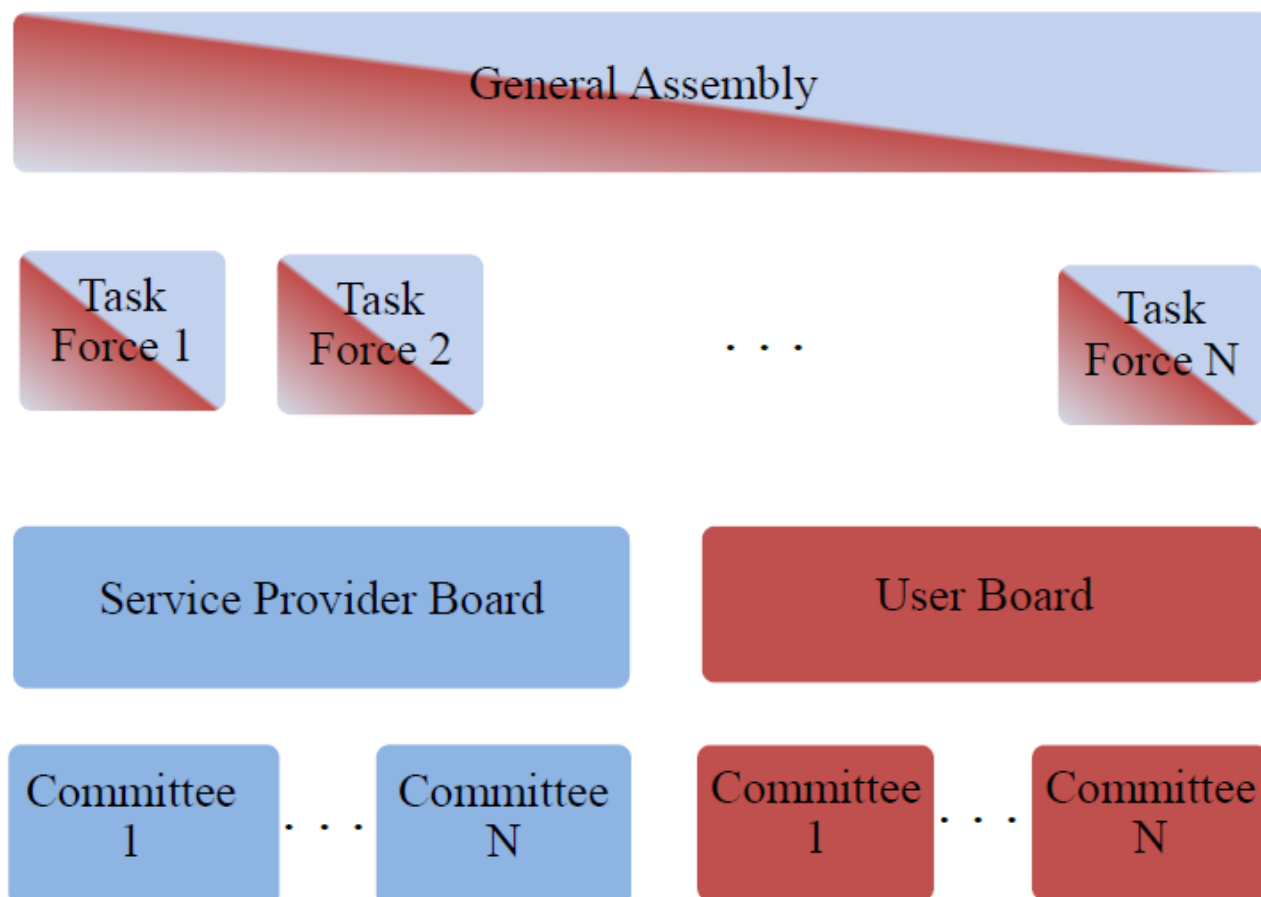
Figure 7: HELIX Nebula governance structure

The General Assembly may decide to establish Task Forces to assist it in its work. A Task Force is a temporary grouping of HNI Members to study a specific subject of common interest. Task Forces must be proposed to the General Assembly with a clear objective that contributes to the goals of HNI and shall be supported by the active participation of at least one User Member and one Service Provider Member.

The User Board is composed of representatives for each of the User Members of HNI. The User Board reports to the General Assembly. It is responsible for collecting information about the needs for and requirements and use of cloud services. It shall work closely with the Service Provider Board to document service requirements and coordinate and harmonise information necessary to enable the advancement of the use of cloud services.

The Service Provider Board includes representatives for each of the Service Provider Members of HNI. The Service Provider Board reports to the General Assembly. It is responsible for exchanging information, coordinating actions, monitoring and documenting the range of services proposed by service providers to the User Members in the context of HNI. It shall work closely with the User Board to understand the requirements and use of cloud services and suggest solutions capable of addressing their needs.

2.8. EU-T0

http://www.eu-t0.eu/

EU-T0 is a Data Research and Innovation Hub: a European Tier 0 data-management and computing centre, implementing a point of connection and coordination among major national e-infrastructures.

EU-T0 is a consortium bound together by a simple agreement of pursuing a common agenda and establish a framework for collaboration among Particle, Nuclear and Astro-Particle Physics, Cosmology and Astrophysics institutes and funding agencies. The purpose is to federate their major computing and data processing centres into a coherent and cost-effective pan-European Integrated Distributed Data Management Infrastructure for Science and Technology.

The EU-T0 consortium was initiated on 11th February 2014 by CERN, CIEMAT, DESY, IFAE, IN2P3-CNRS, INFN, KIT and STFC, funding agencies and organisations which between them fund and provide very large scale computing and data processing resources for a set of scientific communities which already have Exabyte scale requirements. INAF, CEA-IRFU and SURFsara joined in 2015.

EU-T0 member institutes aim for: development of modern data management services and solutions, deployment and operation of the federated computing infrastructure and interoperable services to support research workflows, improving networking capability and software development, at the service of science, technology and society.

3.   CDI OVERVIEW

The EUDAT CDI (Collaborative Data Infrastructure) is an infrastructure defined by a common data model and a set of technical standards and policies adopted by European research data centres and community data repositories. The scope of the CDI covers data management services for upload and retrieval, identification and description, movement, replication and data integrity.

The EUDAT CDI is realised through ongoing collaboration between service providers and research communities working as part of a common framework for developing and operating an interoperable layer of common data services. The EUDAT Service Suite comprises a set of concrete implementations of services conforming to the CDI model and standards, including a baseline of CDI-compliant application programming interfaces (APIs) and web-based GUIs – "CDI Gateways" – plus a number of server applications and command-line client tools. These services are split into seven classes: data access, data discovery and metadata, persistent identification, authentication & authorisation, data management, service management infrastructure and storage (see Figure 8).

Service Providers join the EUDAT CDI either as *interoperable* nodes (level 2) or *integrated* nodes (level 1).

1. *Interoperable nodes* must have a data repository in which they preserve or curate data from a single research community or host data from several research communities or experiments (*storage* and *access* services). Interoperable nodes must identify the data hosted in the repository via some form of persistent identifier (*persistent identification*), and it must be possible to harvest and discover the associated metadata through EUDAT's B2FIND service (*metadata*).
2. *Integrated nodes* are interoperable (as above) and also integrate their local data infrastructure with the CDI's *data management* services, provide a common *data access* layer, integrate with a common *authentication & authorization* infrastructure (AAI) and connect their services to the common CDI *service management infrastructure* and operate it according to an agreed service management framework.

The table below summarises the requirements for Service Providers joining the CDI as either interoperable or integrated nodes. "O" denotes an optional requirement; "M" is mandatory. EUDAT's "B2" service suite provides turnkey solutions for most of the requirements for an integrated node.

Table 1: Service Classes and the two levels of collaboration

Service Class		Interoperable	Integrated
Data access	Web UI	O (e.g. B2SHARE, B2DROP)	O (e.g. B2SHARE, B2DROP)
	API	M (any)	M (CDI Gateway/HTTP) O (B2STAGE/gridFTP)
Data Discovery and Metadata	MD Store	M (any)	M (any, e.g. B2SHARE)
	Publish	M (OAI-PMH)	M (OAI-PMH)
Persistent Identification		M (any)	M (B2HANDLE)
AAI		O	M (B2ACCESS)
Data Management		O	M (B2SAFE, Data Policy Manager)
Service Management Infrastructure		O	M (operational services and service desk)
Storage		O	M (shared with B2SAFE)
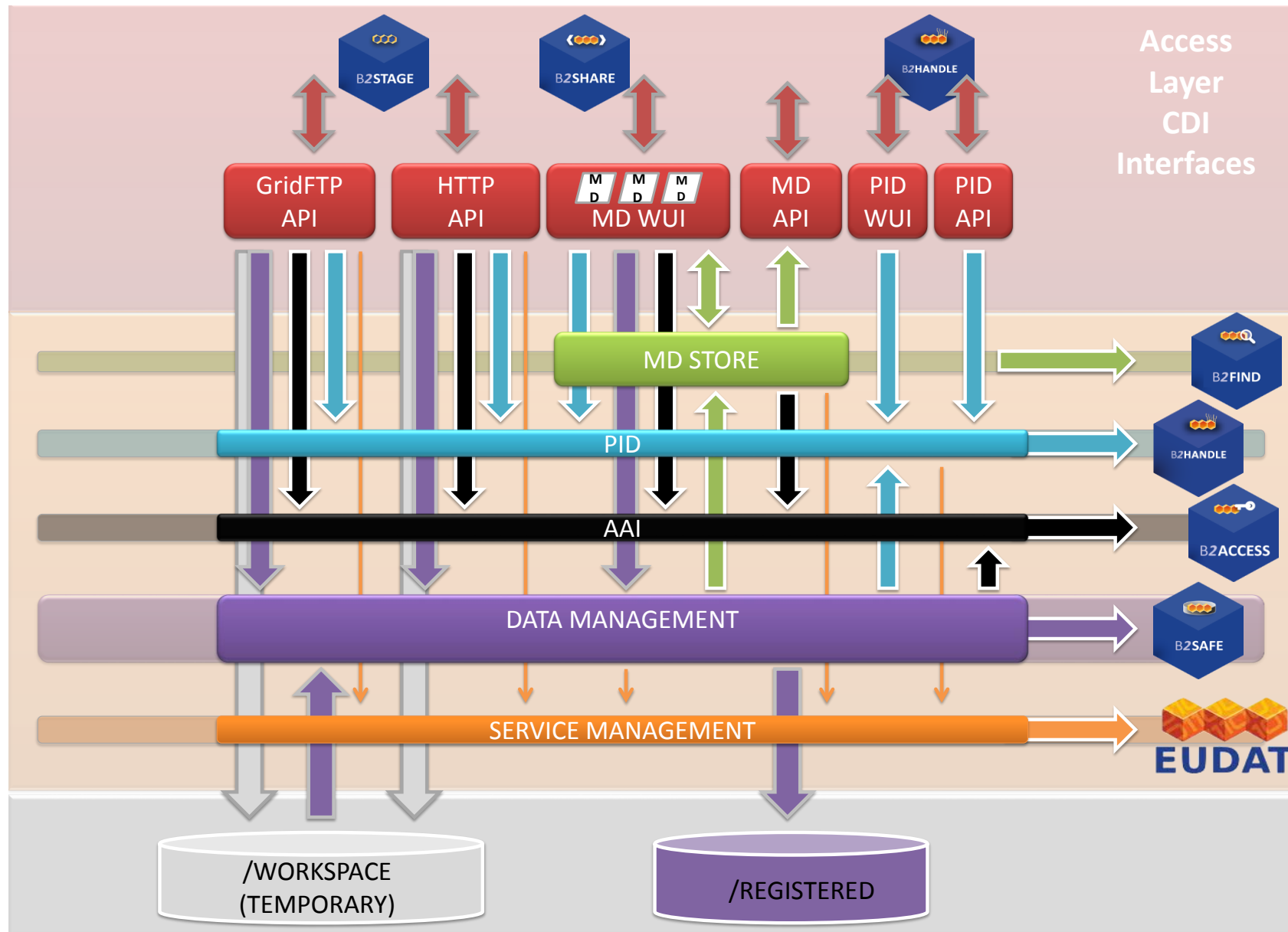
Figure 8: CDI service suite

3.1. Scope: CDI Central Service Instances

A small number of integrated Service Providers operate central B2-services on behalf of the rest of the CDI. These services may be deployed as single instances at one Service Provider, or multiple instances at more than one; they are distinguished from the common services noted above in that not every Service Provider need run them; however, in all cases there must be at least one instance within the CDI.

Table 2: CDI Central Service Instances and current Service Providers

Service	Required number	Purpose
B2FIND (central)	1	Central metadata catalogue for the CDI.
B2ACCESS (central)	1	Identity and access control management for the CDI.
B2SHARE (basic)	1	"Catch all" public data repository.
B2SAFE-DPM	1	Central data policy manager.
B2DROP (basic)	1	General-purpose data sync and sharing.
B2HANDLE	1+	Handle Prefix registration service and (EPIC) PID services.

4.   LEGAL STATUS

4.1. EUDAT CDI Agreement

The EUDAT CDI is realised through ongoing collaboration between Service Providers and research communities working as part of a common framework for developing and operating an interoperable layer of common data services. A number of legal models for sustaining the CDI beyond project based agreements were reviewed in 2015, and it was agreed by general consensus amongst the existing EUDAT2020 project partners that at this stage a lightweight legal and governance structure was the most appropriate next step in the ongoing evolution of EUDAT.

It should be noted that the EUDAT CDI Agreement and governance mechanisms referred to in this section are distinct from the EUDAT *consortium* agreement—which deals with the governance of the project and the interrelationships between project partners over the lifetime of the project—not the CDI.

The legal status of EUDAT will be an agreement between service providers underpinned by a binding agreement covering the key topics of:

- Definition, roles and responsibilities of Service Providers within the context of the CDI, and the Service Management Framework within the CDI;
- Governance (as outlined in Section 5);
- Finances and funding;
- Confidentiality and liability;
- Publications, results, rights of use and ethics;
- Term and termination of the agreement;
- Governing law and dispute settlement.

The CDI Agreement can be signed by either generic or thematic service providers:

- Generic service providers have regional, organizational or national mandates to support scientific research, usually from different disciplines;
- Thematic service providers are (discipline-specific) organisations mandated to support a well-defined scientific community or group of customers and users.

Joining the agreement can be done in two ways. These involve different levels of integration between the joining organisation and the rest of the EUDAT CDI and different levels of responsibility: *integrated service providers* and *interoperable service providers* as defined in Section 3 above.

4.2. Justification

The consensus between the existing project partners was that a collaboration agreement would provide a relatively quick and easy next step in establishing a sustainability model within the EUDAT2020 project lifetime to ensure continuity beyond the project. It would also provide a platform for running the CDI and to develop a more formal and longer term legal structure for EUDAT without the pressures of a time-bound project.

One of the drivers behind the implementation of an interim collaboration agreement was the need to boost the confidence of potential users of the CDI service suite relating to the longevity of those services—in particular the pilot data users. It was recognised early on in the project that users would be reluctant to commit their data if they thought that the service would cease to exist as soon as the project funding came to an end. It was also recognised that to rush into the formation of a fully-fledged legal entity before completing a wide consultation regarding the service portfolio and the business case would be injudicious.

A collaboration agreement was seen to have the advantage over other legal structures (such as a legal organisation or ERIC) of having a lightweight structure, in particular in making use of existing central legal and administrative organisational facilities instead of creating new ones, and hence having minimal overhead and membership fees. The approach and details of the partnership agreement were discussed in detail with

the EUDAT2020 project Executive Board (RZG, CINECA, CSC, JUELICH, EPCC, DKRZ, KIT) and also with the EUDAT2020 project co-ordinator at site visits with: DANS, SURFsara, BSC, STFC, EKUT, SNIC-PDC, UCL, CLARIN-ERIC, IN2P3, Jisc, CINES, INGV.

The key considerations in moving towards such an agreement were that:

- It should be flexible, allowing different levels of integration, thus allowing newcomers to join at a level of engagement which they are able to support. It should be open to any organization meeting well defined criteria with clear entry and exit mechanisms;
- It should be a community-driven collaboration. It should include a balance between generic data centres and community focused centres by allowing both to participate within the CDI and governance with appropriate commitments and expectations. Communities would be represented in the Council through thematic service providers and in the Research Infrastructure Board;
- It should provide a sustainable mode, in that partners should have a clear commitment on sustaining services, and there would be membership fees to allow the setup of a Secretariat which ensures continuity of the infrastructure and coordination of its activities.

In its current form, the CDI membership consists of service providers. This reflects the fact that many of the benefits of the EUDAT CDI will be to offer "business to business" interoperability and integration between the service providers. The CDI model assumes that user communities will act as "consumers" either of EUDAT CDI services directly (where relevant) or directly from the service providers enhanced by the interoperability benefits of the CDI. The governance framework, however, will actively engage with user communities via the operational committees such as the User Committee as outlined in Section 5. This will ensure that user requirements are reflected in both the technical and policy development of the CDI.

The ERIC framework had been reviewed in the first EUDAT project. A number of benefits had been identified as regards the political and economic sustainability, including important factors such as improved funding possibilities, access to information, high political acceptance and visibility, quality recognition and possibility to influence in policy issues. However, the barriers included the potential long setup time, and the need to obtain ministerial support. It was concluded that an ERIC could be a long term objective, and better achieved from the stability of an existing and established legal framework such as the CDI partnership agreement rather than within the time constrains of a funded project.

4.3. Long Term Roadmap
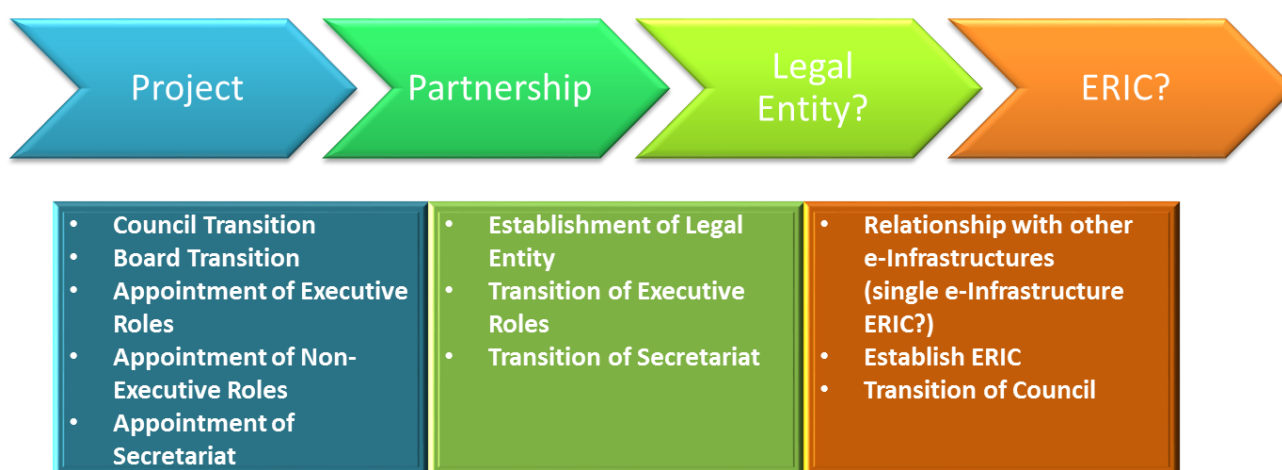
Figure 9: Roadmap for the evolution of EUDAT governance

The EUDAT CDI Agreement is seen as the next step beyond the EUDAT2020 project in the evolution of the EUDAT CDI. However, it will not necessarily be the final step. As EUDAT CDI service provision, uptake and membership evolve it may be necessary to consider moving towards a more formal legal entity (for example

establishing a legal foundation) or an ERIC (which might be an EUDAT specific ERIC or be a joint "umbrella" ERIC involving a number of research e-infrastructures). Which, if any of these become appropriate for EUDAT will depend both on how EUDAT evolves and also on external factors such as the evolution of other e-infrastructures and initiatives such as the European Open Science Cloud. Much of the Governance structure as outline in Section 5 could be easily migrated with little or no change into these new legal entities.

The governance structures for the EUDAT CDI Agreement is expected to be fully operational by 2018, with an expected lifespan of 10 years; this will provide a strong foundation for full consideration of future options for the development of EUDAT. However, some initial work to determine a roadmap for these activities will be conducted within the EUDAT2020 project (see Section 5)

5.   CDI BOARD STRUCTURES

5.1. Organisational Structure

The organisational structure shall comprise the following Bodies:

- **EUDAT CDI Council** as the ultimate decision-making body of the Collaboration, consisting of the Service Providers.
- **EUDAT CDI Board** as the supervisory body for the execution of the Collaboration which shall report to and be accountable to the EUDAT CDI Council.
- **EUDAT CDI Secretariat** assists the EUDAT CDI Board and Council.
- **EUDAT Research Infrastructure Board** as an advisory body consisting of senior representatives of research infrastructures appointed by the EUDAT CDI Council and which provides strategic guidance and advice on how to best meet the needs of the research communities.
- **EUDAT Operational Committees** which will support the Secretariat by providing interfaces with technical architects/software developers, service providers and user communities.
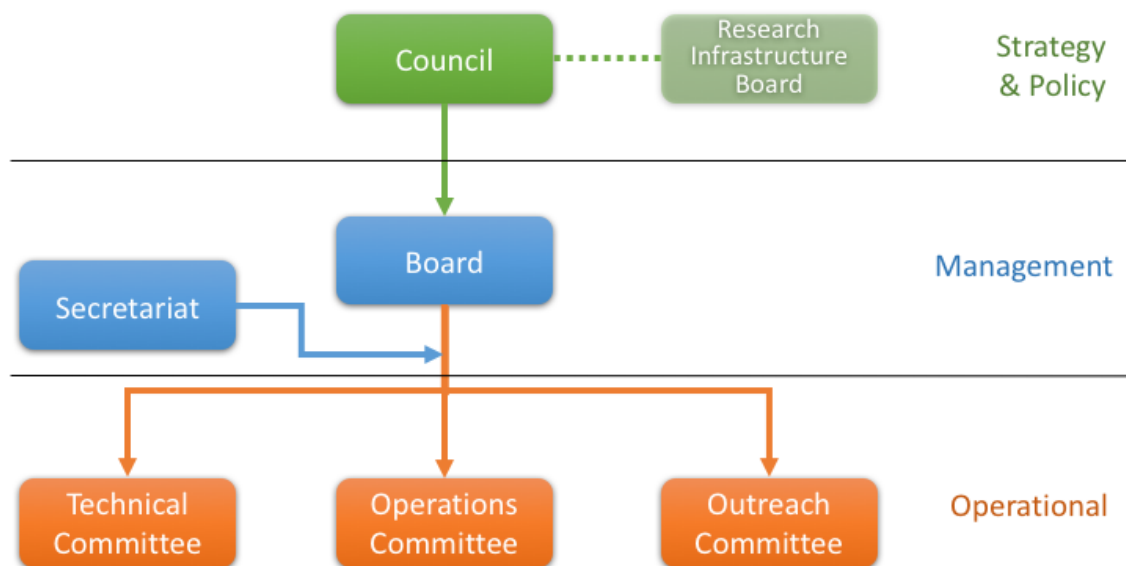
Figure 10: Interrelationship between the CDI governance and management bodies

5.2. EUDAT CDI Council

The EUDAT CDI Council consists of the Lead Persons of all of the partners of the EUDAT CDI. It has responsibility for

- Approval of the annual work plan and budget;
- Changes to the non-normative parts of the CDI Agreement;
- Decisions concerning substantive changes to the service management framework;
- Policy decisions related to licensing and other intellectual property rights;
- Decisions concerning the entry of a new partners;
- Remedies to be performed by partners in breach of the CDI Agreement;
- Termination of a partner's participation in the CDI Agreement;
- Appointment of the partner hosting the EUDAT CDI Secretariat;
- Appointment of the members of the EUDAT CDI Board;
- Decisions concerning additional agreements that may be needed to ensure sustainability of core CDI Services or service components.

There are two level of membership according to the partners' commitment to the CDI. Voting and other rights are conferred according this level as shown in Table 3.

Table 3: Membership and voting rights

	Integrated Service Provider	Interoperable Service Provider
Votes	5	2
Attend Council	Yes	Yes
Participates in appointment of Chair	Yes	Yes
Participates in appointment of Board	Yes	Yes
Linked Third Party Funding Mechanism	Yes	No

5.3. EUDAT CDI Board

The EUDAT CDI Board shall consist of seven representatives of the Parties as appointed by the EUDAT CDI Council. The members of the EUDAT CDI Secretariat will have the right to attend EUDAT CDI Board meetings, without voting rights. It will have the following responsibilities

- Collaborate with the chair of the EUDAT CDI Council to prepare the meetings, propose decisions and prepare the agenda of the EUDAT CDI Council;
- Execute and implement the decisions of the EUDAT CDI Council;
- Monitor the effective and efficient implementation of the partnership;
- Prepare proposals to the EUDAT CDI Council concerning the work plan and budget;
- Prepare proposals of any substantial changes to the service management framework;
- Appoint the members of the EUDAT CDI Secretariat.

5.4. EUDAT CDI Secretariat

The EUDAT CDI Secretariat is responsible for managing, on a daily basis, the CDI Agreement and for coordinating the development and operation of the CDI infrastructure. The EUDAT CDI Secretariat consists of the following five functions: Management; Administration; Operational coordination; Technical coordination; and Outreach coordination.

These responsibilities are enacted through the following roles appointed by the EUDAT CDI Board.

Table 4: CDI Secretariat roles

Functions	Roles
Head of Secretariat	✓ Manage the partnership and the collaboration of partners within it. ✓ Act as primary interface for organising involvement of pan-European communities and new service providers. ✓ Scout for funding opportunities and support the participation of partners in projects.
Finance and Administrative Coordinator	✓ Provide admin and financial support to the PA and its partners. ✓ Support the participation of partners in new projects.
Operation Coordinator	✓ Supervise overall infrastructure operations. ✓ Asses operational capacity of existing and new Parties. ✓ Ensure quality of services delivered.

Functions	Roles
Technical Coordinator	✓ Supervise technical development of the CDI. ✓ Foster innovation through projects.
Outreach Coordinator	✓ Organise communications towards and involvement of users. ✓ Promote and market the CDI and its services.

The EUDAT CDI Secretariat will be hosted by one of the partners as selected by the EUDAT CDI Council. The Head of the Secretariat and the Financial and Administrative Coordinator shall reside at the Secretariat hosting site. Other members of the Secretariat can be distributed across the consortium (i.e. Partners) and be normally employed by their organisation. They may also come from organisations that are not signatories of the Agreement.

The Secretariat activities (including the manpower effort of its members) will be funded through the membership fees paid annually by the partners. The Council will decide on an annual basis about the level of fees and involvement of the Secretariat.

5.5. Research Infrastructure Board

The Research Infrastructure Board will consist of senior representatives of research infrastructures and will act as an advisory body for the EUDAT CDI Agreement. It will advise the Council and Board on strategic developments, research infrastructure policy development and technical requirements, and will assist the Council in the prioritisation in the CDI roadmap. Terms of reference and membership will be established by the EUDAT CDI Council.

5.6. Operational Committees

The work of the Secretariat will be supported by a number of representative committees which will interface with technical architects/software developers, service providers and user communities. Terms of reference and membership will be established by the EUDAT CDI Council.

Table 5: Operational committees

Technical Committee	Operations Committee	User Committee
Technical architecture, Technologies, Software	Core Services and Infrastructure	User Community Outreach and Requirements

6.   RECOMMENDATIONS

6.1. Implementation Roadmap

Figure 11 on the following page outlines the process for "bootstrapping" the CDI Agreement and governance boards from the existing EUDAT2020 project governance. It is anticipated that there would be an interim period from June 2016 until January 2018 whilst the EUDAT CDI fully establishes its governance structures. The EUDAT CDI would be fully functional by January 2018, and hence ready to take over from the end of the existing EUDAT2020 project which is due to complete March 2018.

The legitimacy of the CDI Agreement is established by approval of the EUDAT2020 Project Council[2]. In particular, approval includes:

- Endorsement of the list of service providers expressing interest in signing the CDI Agreement. Those service providers who have signed the CDI Agreement before 27th September form the initial EUDAT CDI Council. After that date prospective applications for joining the partnership are approved by the EUDAT CDI Council;
- Endorsement of the interim hosting partner for the EUDAT CDI Secretariat, and the Acting EUDAT CDI Secretariat membership. These would be the hosting partner and secretariat until 1st January 2018 whilst the CDI is fully established. The CDI Council and Board would agree and appoint the secretariat after the 1 Jan 2018 via an agreed open process.

Until January 2018, both the EUDAT2020 Project Council and the EUDAT CDI Council shall run in parallel with a controlled transfer of responsibilities (strategy, organisation, sustainability and services) from the EUDAT2020 project to the EUDAT CDI until the end of the EUDAT2020 Project in March 2018.

During the first three EUDAT CDI Council meetings the key activities would include:

- Ratification of the Council Terms of Reference (see Annex 1);
- Establishment of the Board Terms of Reference and Membership;
- Establishment of Research Infrastructure Board, Operational Committees and other operational structures;
- Approval of applications for new members;
- Membership fees, budget and work plan for 2018;
- Oversee the CDI Board in establishing the hosting partner and secretariat from Jan 2018.

In addition, any new funding opportunities for EUDAT (for example future H2020 programmes) shall be undertaken within the auspices of the EUDAT CDI.

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[2] The EUDAT2020 Project Council meeting in Dublin, Republic of Ireland, 3rd June 2016, duly approved the establishment of the CDI Partnership, the list of founding partners and the interim Secretariat.

PMO sends draft Partnership Agreement & Annexes to EUDAT2020 Council
20 Apr, 2016

Deadline for interested Partners to send signed Statement of Intents to PMO
27 May, 2016

Collection of CDI Membership Fees
1 Jan, 2018

Deadline for Founding Partners to sign Partnership Agreement
Sep\Oct, 2016

End of EUDAT2020 Project
31 Mar, 2018

2016 Apr   Aug   Dec   2017   Aug   Dec   2018   Aug   **2018**

3 Jun, 2016
EUDAT2020 Council
Upon recommendation from the PMO, appoint signatories of the Statement of Intents as "Founding Partners" of the EUDAT CDI Agreement and Acting Secretariat

27 Sep, 2016? (Krakow?)
First CDI Council (with initial signatories of the PA)
Agenda: Planning EUDAT CDI future (including strategy and participation in next H2020 Calls in 2017, in particular E-INFRA-12), endorsement of Acting Secretariat, review of Statement of Intent received after June 2016 (including from partners outside the EUDAT2020 consortium), decision regarding acceptance of new members.

Jan/Feb, 2017
Second CDI Council (with first & second waves of signatories)
Agenda: Planning EUDAT CDI future ((including strategy and participation in next H2020 Calls, in particular E-INFRA-12), opening of nominations for Chairs and Board members), review of declaration of interests received after October 2016, decision regarding acceptance of new members.

Sep/Oct, 2017
Third CDI Council
Agenda: Planning EUDAT CDI future, validation of budget and work plan for 2018, validation of membership fee structure and level, election of Chairs and Board members, review of the SMF, review of declaration of interests received after January 2017, decision regarding acceptance of new members.

Jan/Feb, 2018   Sep/Oct, 2018
Fourth CDI Council   **Fifth CDI Council**
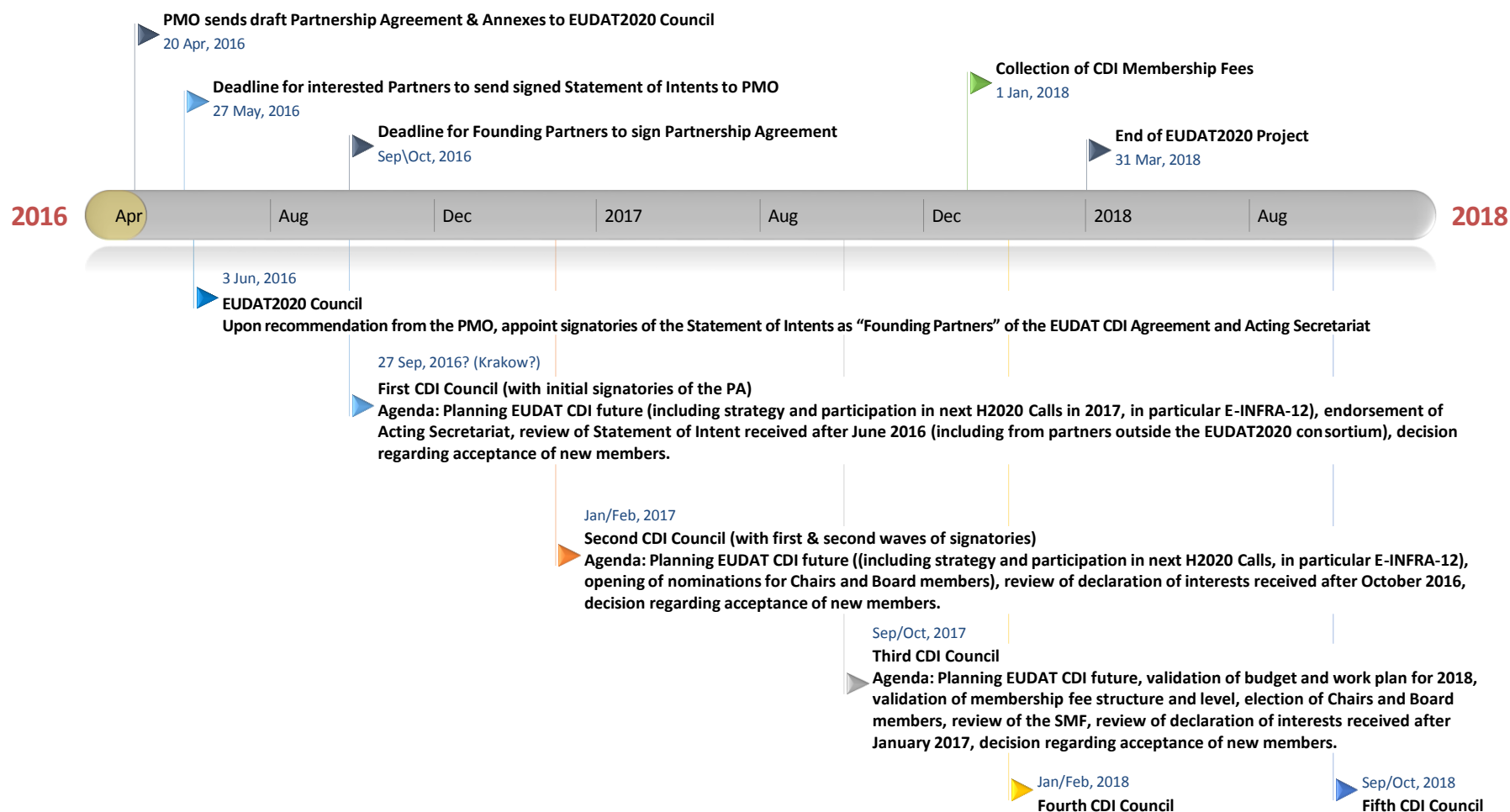
Figure 11: Implementation timeline

6.2. Consultation on Governance beyond the EUDAT CDI Agreement

This task, EUDAT2020 WP 2.4.1, and the underlying drivers for the task, have altered considerably since the start of the project. The initial plan was to deliver a governance report followed by another task delivering a business case. It was realised quite early on that the business case and governance were too closely interdependent to follow this time line. In addition, the shifting demands of the project overall led to the early implementation of a partnership agreement to provide potential users with a degree of confidence in the service.

The formal deliverable outlines possible governance options focusing on those in use in similar pan-European organisations. The second deliverable—a superset of the first—will be the more researched document based upon stakeholder interviews and a national data infrastructure landscape review, leading to recommendations as to future legal forms.

One of the drivers behind the implementation of an interim collaboration agreement was the need to boost the confidence of potential users of the CDI service suite relating to the longevity of those services—in particular the pilot data users. It was recognised early on in the project that users would be reluctant to commit their data if they though that the service would cease to exist as soon as the project funding came to an end. It was also recognised that to rush into the formation of a fully-fledged legal entity before completing a wide consultation regarding the service portfolio and the business case would be injudicious.

To solve these immediate problems, at the behest of the project council, the interim CDI Agreement was put in place and the implementation timeline (Figure 11 above) instigated. The truncated consultation process for this agreement focused on service providers and council members. The approach and details of the partnership agreement were discussed in detail with the EUDAT2020 project Executive Board (RZG, CINECA, CSC, JUELICH, EPCC, DKRZ, KIT) and also with the EUDAT2020 project co-ordinator at site visits with: DANS, SURFSara, BSC, STFC, EKUT, SNIC-PDC, UCL, CLARIN-ERIC, IN2P3, Jisc, CINES, INGV.

Although the CDI Agreement is fine for current phase of EUDAT (the EC funded period and for a short period afterwards) it is likely that longer term a more inclusive governance structure may be needed, possibly even a legal entity as postulated in the timeline diagram on page 27.

Further consultation is being undertaken both within the project membership and also with a wider community of stakeholders. In addition, the work and outputs of other work packages and tasks—many of which are not yet available—are being further integrated into a second iteration of this deliverable which in turn will inform the future decisions of the CDI governing bodies.

6.2.1. Method

The following methods have been or are being employed to gather information from the stakeholders.

Document one: (this document) Desk research and face to face consultation with key project stakeholders.

Document two: Desk research—consisting mainly of a landscape review of existing/potential e-infrastructures with similar scale, scope and remit;

Structured interviews—mostly virtual, supported by a PowerPoint deck and a response template—with stakeholders (internal to the project as well as external).

6.2.2. Scope

The structured interviews are (understandably) evolving as circumstances change and as other work packages and tasks feed in, but they will include questions around topics including:

- Identity/positioning—What is EUDAT and what is it trying to solve?
- Value Proposition—What's in it for me? What does it cost?
- Business Case—How is the CDI sustained?
- Collaboration model—What does the EUDAT Collaborative Data Infrastructure (CDI) look like? How does it function?

- Governance—How is the CDI to be governed longer term, future legal form and relationships with other e-infrastructures?

A landscape review of data infrastructures would sample the current landscape as opposed to being a fully comprehensive review of all national/international infrastructures, and consider how these can be articulated within EUDAT.

It will include approximately six countries with the appropriate variations in complexity / scale / maturity / region (for simplicity / ease of access partner countries have been favoured for this exercise).

Choices are likely to be from the following:

- Great Britain—North, large, relatively established;
- The Netherlands—North, small, established;
- Greece—South, small, emergent;
- Finland—North, small, established;
- Spain—South, large, emergent;
- Poland—East, large, emergent.

6.2.3. Interviewees

Interviewees have been selected from amongst the partners and nominated external bodies (nominated by the partners in the WP 2.4.1 task). Additional interviewees will be nominated by project partners after the current document has been delivered and the slide deck / answer template has been updated. Further interviewees may be sought after the landscape review is complete.

6.2.4. Timescale and resources

Interviews have been divided up between the partners[3] in the task (WP 2.4.1) based upon their geographic location, their common language and their available resource and a few other strategically located project partners. Interviews are likely to take place in the period October 2016 to January 2017.

The landscape review will be undertaken in parallel with the interview process in November 2016.

It is intended that the initial draft synthesis of the results will be available in early 2017.

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[3] Partners with resource assigned in WP 2.4.1: CSC, JUELICH, SURFsara, DANS, LIBER, JISC

7. RISKS

There are risks that the proposed CDI governance structure will not support the EUDAT objectives and sustainability within the expected lifespan of the governance structure. We record them here.

Risk	Mitigating Action
Lack of service maturity may impact "contribution in kind" aspect of the CDI Agreement.	Ongoing work within EUDAT2020 in terms of service frameworks and business models.
The CDI Agreement is not suitable for research infrastructures; communities who do not regard themselves as providers.	Part of the consultation is intended to look into the role of end user communities and software developers within governance. Particular questions to be addressed are: ▪ are research infrastructures part of the governance or suppliers and consumers? ▪ if they're not part of the governance how can we validate the quality of software, quality of service provided, and the relationship in general?
Low take-up of the CDI Agreement due to: ▪ concerns that the obligations are too onerous; ▪ concerns that the membership subscription is too high.	The project coordinator covered this issue in the initial CDI Agreement consultation process and has gained consensus. In addition, the slow "bootstrap" allows further consensus to be achieved at every stage. There is no evidence of this risk in response for letters of intent.
Business model is immature. Concerns regarding who pays, how, etc. especially if demand exceed expectations.	The Business model development is scheduled for EUDAT2020 Year 2. Revisions will be made to the governance roadmap based upon the outputs of that subtask.
Software development is not covered in governance.	Part of the consultation is intended to look into the role of end user communities and software developers within governance. Changes could be made to the structures and road map as a result of this consultation.
Lack of confidence in the sustainability of the project beyond the EC funding period.	The interim CDI Agreement is designed to address these concerns.
Insufficient take-up of the CDI Agreement leading to insufficient funds to run the Secretariat.	The slow bootstrap process will allow the CDI partners to assess the potential subscription income at several stages and adjust the scale of the secretariat accordingly.

ANNEX A.   EUDAT CDI COUNCIL INITIAL TERMS OF REFERENCE

The EUDAT CDI Council is the ultimate decision-making body of the Collaboration between Parties of the EUDAT CDI Agreement ("Agreement").

The purpose of this Terms of Reference document is to define detailed requirements concerning the preparation and organization of EUDAT CDI Council meetings. In case of discrepancy between the Agreement and the Terms of Reference, the Agreement shall prevail. Terminology used in this document shall have the meaning given to them in the EUDAT CDI Agreement.

Article 1   Membership and representation

1. The EUDAT CDI Council shall consist of the Lead Persons of each Party.

2. Each Party shall nominate its Lead Person, who will represent it in the Council as a Council member and a permanent deputy. The Lead Person's other duties are defined in the Agreement.

3. Each member of the EUDAT CDI Council shall be deemed to be duly authorized to deliberate, negotiate and decide on all matters listed in Section 8.8 of the Agreement.

4. Any changes to Lead Persons and their deputies must be notified to the EUDAT CDI Secretariat without delay.

5. Nominated Lead Persons and their deputies are entitled to participate in Council meetings. If needed, substitutes and proxies can be appointed by informing the Council Chairperson no later than the day before the start of the respective meeting. The Council Chairperson needs to notify the meeting of the appointment of a proxy at the start of the meeting.

6. Each member of the EUDAT CDI Council can be accompanied by up to two (2) person(s), including members of the EUDAT CDI Board without voting rights, by informing the Council Chairperson one day before the start of the respective meeting at the latest.

7. The members of the EUDAT CDI Board and EUDAT CDI Secretariat shall be allowed to participate in the meetings of the EUDAT CDI Council without voting rights. For avoidance of doubt, a member of the EUDAT CDI Board or the EUDAT CDI Secretariat who is at the same time a member of the EUDAT CDI Council or a representative in the EUDAT CDI Council will act as a member of the EUDAT CDI Council and will have a voting right, unless the Party is otherwise present or represented in the meeting.

8. The Council shall elect a Chairperson and Deputy Chairperson from its members using the process described in Article 3.7 of these terms of reference. If no Chairperson or Deputy Chairperson is elected, then the CDI Secretariat will perform the duties of the Chairperson until a Chairperson can be appointed. The Chairperson of the EUDAT CDI Council may be re-elected once.

9. The Chairperson of the EUDAT CDI Council shall chair all meetings of the Council, unless decided otherwise in a meeting of the EUDAT CDI Council.

Article 2   Meeting procedures and information distribution

1. The standard agenda of the Council meetings should comprise at least the following items:

    a. Appointment of note taker

    b. Approval of minutes from previous meeting(s)

    c.   Report from CDI Secretariat

    d.   AOB (Any other business)

2.   The Chairperson is responsible for convening ordinary meetings at least once per year.

3.   An extra-ordinary meeting of the Council can be convened upon request of the CDI Board, or of one third of the members of the CDI Council.

4.   The Chairperson of the Council shall give notice of the time slot and the place of an ordinary meeting as soon as possible and no later than 30 calendar days prior to the meeting for an ordinary meeting and 15 calendar days prior to the meeting for an extraordinary meeting

5.   The Chairperson of the Council shall prepare and send each Council member and permanent deputy a written (original) agenda no later than the 14 calendar days preceding an ordinary meeting or 7 calendar days for an extraordinary meeting.

6.   Any decisions to be taken must be identified as such on the agenda. Wherever practicable, a decision proposal prepared by the Board and material related to the decision will be made available with the agenda, or at least 7 calendar days prior to the ordinary meeting date or at least 5 calendar days prior to an extraordinary meeting date.

7.   Any member of the Council may add an item to the original agenda by written notification to all of the other members of the Council up to 7 calendar days preceding the meeting for decision items, or 5 calendar days preceding the meeting for items for discussion or any agenda items for an extraordinary meeting.

8.   During a meeting if all the members of the Council are present or represented a unanimous decision can be made to add a new item to the original agenda.

9.   Meetings may also be held by teleconference or other telecommunication means or in mixed configurations where some members attend in person and others by electronic means, including electronic vote by email to the Chairperson of the Council.

10. The Chairperson of the Council shall produce written minutes of each meeting, with the assistance of a note taker nominated in that meeting, which shall be the formal record of all decisions taken. The Chairperson shall send the draft minutes to all its members within 15 calendar days of the meeting.

11. The Parties present or represented during the meeting may object within 15 calendar days of receiving the minutes with respect to the accuracy of the draft of the minutes. If no objection has been made within the time frame, the minutes shall be accepted.

12. The Chairperson shall send the accepted minutes to all the members of the Council and to the EUDAT CDI Secretariat for safeguarding. If requested the EUDAT CDI Secretariat shall provide authenticated duplicates to Parties.

13. The accepted minutes are formally approved and signed by the Chairperson during the subsequent Council meeting.

14. Unless otherwise required, materials in writing related to a meeting (e.g. agendas and minutes) will be communicated via email.

Article 3   Voting procedures

1.   Any agenda item requiring a decision by the members of Council must be clearly identified as such on the agenda.

2. The Council shall not deliberate and decide validly unless two-thirds (2/3) of its members are present or represented (quorum).

3. Each member of the EUDAT CDI Council where each member representing a Party that is level 1 Service Provider shall have five (5) votes and each member representing a Party that is level 2 Service Provider shall have two (2) votes. A Party may not split their votes across multiple options.

4. A Party in breach with its obligations under this Agreement may not vote in matters concerning their breach or remedies thereof.

5. Decisions shall be taken by a majority of two-thirds (2/3) of the votes.

6. A closed vote must be held if requested by any member of the Council.

7. The process for electing candidates to positions such as Chairperson, Deputy Chairperson, CDI Board members, etc. will be as follows:

    a. If there are more candidates than positions, a simple majority vote will be held to select the necessary number of candidate-elects. If there are the same or fewer candidates, they are automatically candidate-elects;

    b. The appointment of the candidate-elects to the positions is ratified by a two-thirds (2/3) majority vote.

8. Decisions may only be executed once the relevant part of the minutes has been accepted according to Article 2.11 of these terms of reference.

9. Any decision deemed not to require additional discussion may also be taken without a meeting by a written document which is then accepted in writing or when deemed necessary, signed by the defined majority of all members of Council. Such document shall include the deadline for responses. Any member of Council may request a conference call to allow for questions and concerns to be raised. The results of such a decision must be included in the minutes of next scheduled Council meeting as evidence that the decision was properly taken.

Article 4   Appointment of the Board members

1. The Council will elect the 7 members of the CDI Board from its membership, using the process described in Article 3.7 of these terms of reference.

2. The Council will appoint one of these members to be the Chairperson of the CDI Board.

3. The term of a CDI Board member and Chairperson will be two years, and may be renewed once.

Article 5   Conflicts of interest and confidentiality

1. Members of the Council must report to the Council any circumstances that affect the member's impartiality with regard to the member's functioning in any elected capacity.

2. The Council shall keep confidential from third parties all information pertaining to the transactions of the Council that has been marked confidential in writing, or whose confidential nature results of a decision of the Council, including the information exchanged in the transactions of its committees.

3. Unless otherwise agreed, confidential information obtained by members of the Council as the result of his/her functioning in the Council or any elected capacity, will not be used for the participation, in direct mode or in partnership with other organizations, to tender, commercial activities or business

development in competition against others parties. In particular, members who, in the course of their work for the Council or in any other elected capacity, are made aware of any other person's private circumstances, or of research, company or commercial secrets, must not use, transfer or in any other way make available such knowledge to parties not entitled to receive it, and not to make use of it in their own future activities.

4. Any declaration of confidentiality by the Council is applicable without limit of time, or until the Council has released material from this requirement.

5. In case of breach of confidentiality by a person in any elected capacity (including the CDI Board) or in case of a conflicting interest between a person in any elected capacity and the CDI Agreement, the Council may decide to dismiss this person, temporarily or permanently, from his/her position or engagement with the Council.

6. For avoidance of doubt, the obligation for confidentiality set out in this Article 5 does not prevent the members of the Council from sharing the confidential information within the Parties they represent, as long as confidentiality obligation set out in Section 6 of the Agreement is respected.

Article 6   Amendment of articles

1. The articles may only be amended by a resolution of the Council.

2. For this purpose the members of the Council will be called to attend a meeting by the Chairperson of the Council within a period of at least 30 calendar days, whilst the convening notice will state the proposed amendment of the articles.

ANNEX B.   GLOSSARY

Term	Explanation
API	Application Programming Interface.
B2ACCESS	B2ACCESS is the central user identification service regulating access to services through a fine-grained control mechanism. It represents the (AAI) front-end to other EUDAT services.
B2DROP	B2DROP is a secure and trusted data exchange service for researchers and scientists to keep their research data synchronized and up-to-date and to exchange with other researchers.
B2HANDLE	B2HANDLE is the distributed services managing the provisioning of PIDs and namespaces.
B2SAFE	B2SAFE is a robust, safe and highly available service which allows community and departmental repositories to implement data management policies on their research data across multiple administrative domains in a trustworthy manner.
B2SHARE	B2SHARE is a user-friendly, reliable and trustworthy way for researchers, scientific communities and citizen scientists to store and share small-scale research data from diverse contexts.
CDI	Collaborative Data Infrastructure An infrastructure defined by a common data model and a set of technical standards and policies
GUI	Graphical User Interface
EPIC	European Persistent Identifier Consortium
ERIC	European Research Infrastructure Consortium
OAI-PMH	Open Archives Initiative Process for Metadata Harvesting (a metadata exchange protocol)
PID	Persistent Identifier