Access to Research Infrastructures services

- Training Module 1

IR0000032 – ITINERIS, Italian Integrated Environmental Research Infrastructures System
(D.D. n. 130/2022 - CUP B53C22002150006) Funded by EU - Next Generation EU PNRR-Mission 4 “Education and Research” - Component 2: “From research to business” - Investment 3.1: “Fund for the realisation of an integrated system of research and innovation infrastructures”

Finanziato dall'Unione europea NextGenerationEU
Ministero dell'Università e della Ricerca
Italiadomani

Overview of Training Module 1 (Oct 23)

- **I. Introduction to Research Infrastructure services**
- **II. Access legal framework**
- **III. User needs and experience**

Warming up…

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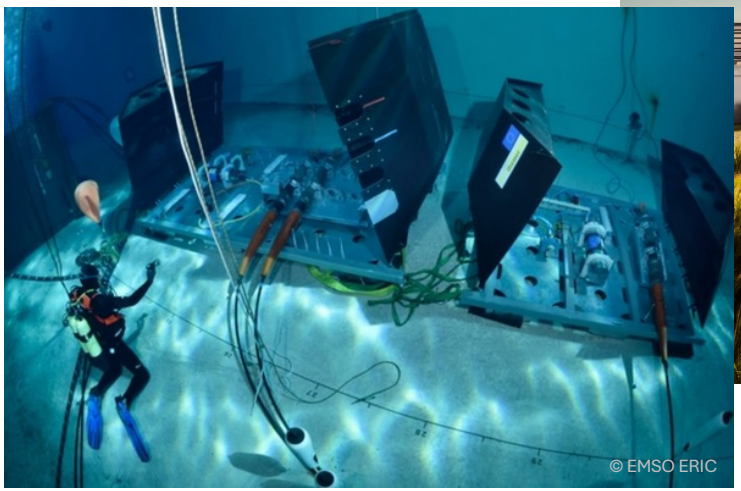
I. Introduction to Research Infrastructure Services

- **Relevance and objectives of Research Infrastructures**
- **European RI ecosystem**
- **RI Services & Access – Concepts**



What is a Research Infrastructure (RI)?

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What is a Research Infrastructure (RI)?

Research Infrastructures are **facilities, resources and services** that are used by the research communities to conduct research and foster innovation in their fields

- Major scientific equipment or sets of instruments
- Knowledge-based resources – collections, archives, scientific data
- Data, computing systems and communication networks
- Any other research and innovation infrastructure of a unique nature open to users to achieve excellence

Why do we need Research Infrastructures (RI)?

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Why do we need Research Infrastructure (RI)?

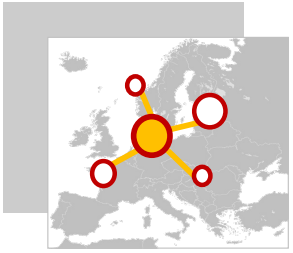
Research Infrastructures are **facilities, resources and services** that are used by the research communities to conduct research and foster innovation in their fields

- Excellence in European research and innovation
- Pan-European interest and sustainability
- Reduce fragmentation and avoid duplication of skills and efforts
- Sharing knowledge and resources
- Joining forces – international collaboration and networking
- Tackling key societal challenges

Types of Research Infrastructures

Single-sited research infrastructure

Geographically localized in a single site or in a few complementary sites, designed for user access, with European or international governance



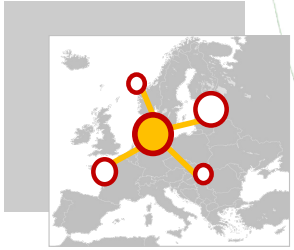
Distributed research infrastructure

The facilities, resources and services are geographically scattered, consisting of a central hub, with a single point of access for all users.

Virtual research infrastructure

E-infrastructure for digital online services to users: electronic services, networks, archives, databases and databanks, computing.

Single-sited vs distributed RIs



→ High level of integration

→ Common policies

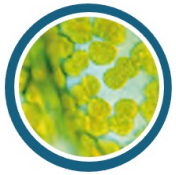
- User support structure to optimise access to the relevant site
- Accommodation arrangements and logistics
- Long-term planning for the site throughout the life-cycle

- Effective operation of Central Hub
- Single point of access for all users with support structure to optimise access for research
- Joint investment strategy through the National Nodes and common/shared facilities

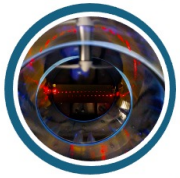
RI Organisational Elements

Human resources policy

Legal status and governance structure



Unique access policy and single access point and user strategy and user support structure



Data management system

Measurable KPIs for scientific excellent services and sustainability

Central hub

*and interlinked national notes, legally binding coordination structures and joint investment strategy

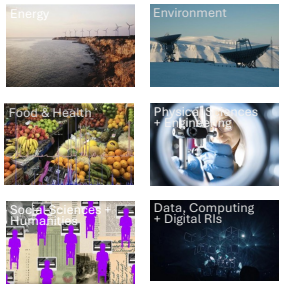
*) Distributed RIs

European RI Ecosystem – The ESFRI Roadmap

ESFRI

The European Strategy Forum on RI (ESFRI) is a strategic body, set up in 2002 and mandated by the EU council, to support a coherent and strategy-led approach to policy making on Research Infrastructures in Europe.

- Competitive and open access to high quality RI
- Attracting best researchers world-wide
- Better use and development of RI on EU and international level
- **Establish a European Roadmap for RI**

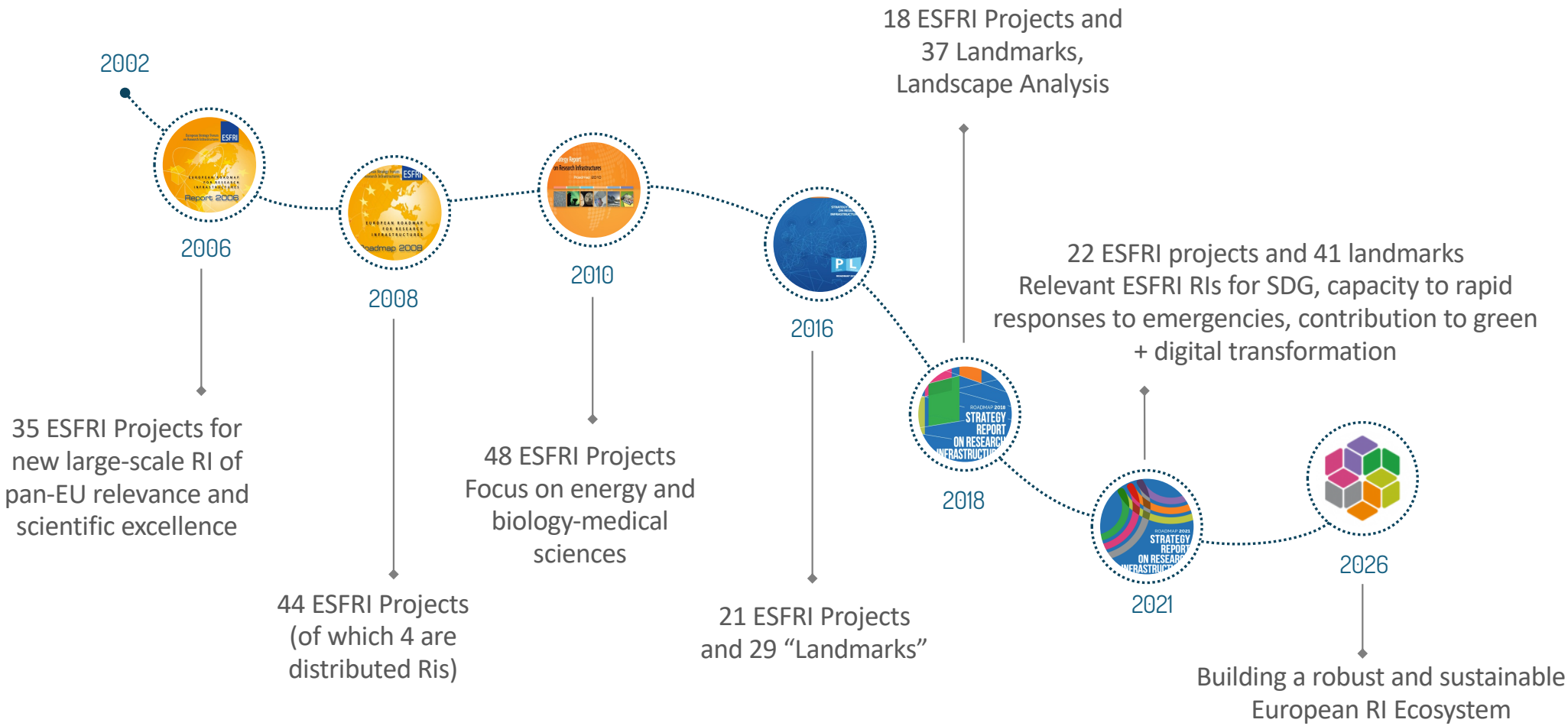


✓ Leading role in the development of pan-EU RIs / Global RI, incubator role

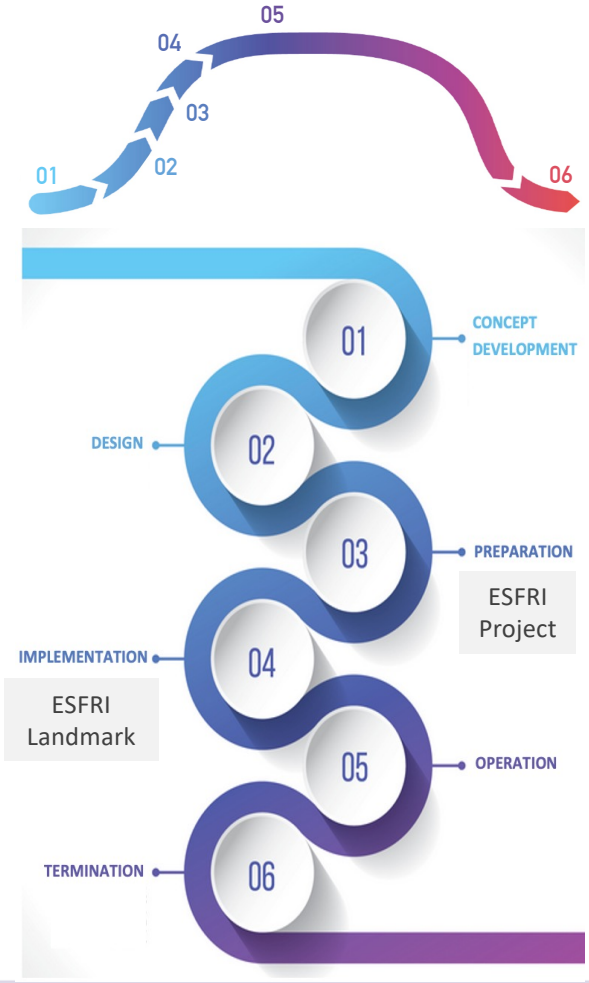
✓ Appointed ESFRI delegates from 28 EU MS, other associated countries and the EC

✓ 6 Strategic working groups, implementation group, task forces, ad hoc working groups

ESFRI Strategic Roadmap



RI Lifecycle Approach



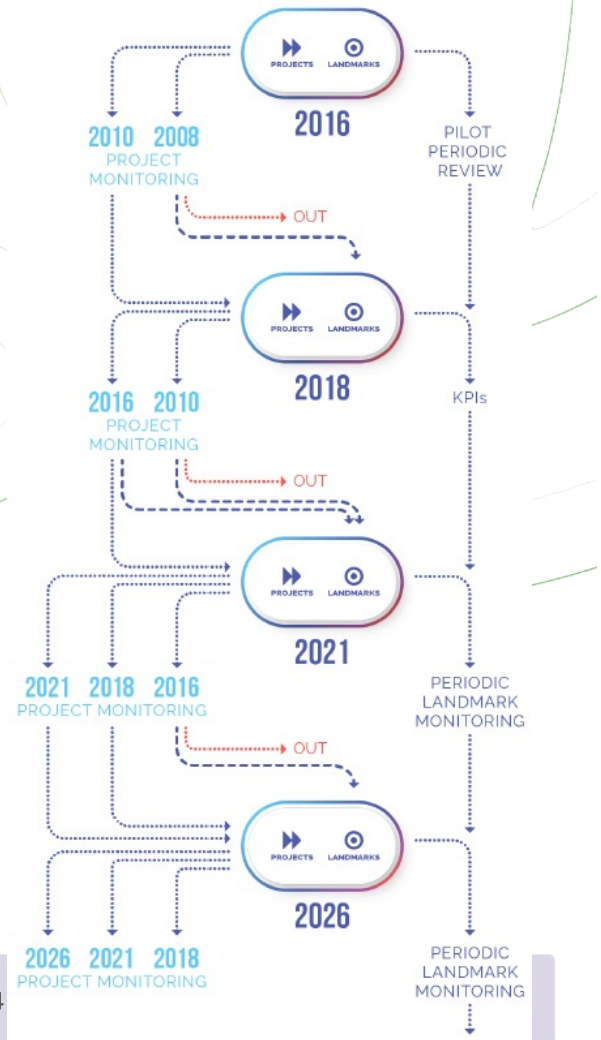
- Bottom-up clustering of scientific communities
- Proof of scientific concept of technical feasibility
- Centrally coordinated RI, developing the organisational, financial, operational and strategic framework
- Governance and management structure, political and financial support, legal entity and service launching
- Delivering excellent science services and generating frontier research
- Termination

Periodic Monitoring of ESFRI Landmarks

Thorough evaluation process: questionnaire, hearing, site visits

Monitoring of ESFRI Roadmap projects (10-year term)

- **Scientific case - minimal key requirements (operation phase)**
  - Scientific excellence
  - Pan-European relevance
  - Socio-economic impact
  - User strategy and access policy
  - e-Needs
- **Implementation case:** stakeholder commitment, preparatory work and planning, governance, management and human resources, finances, risks



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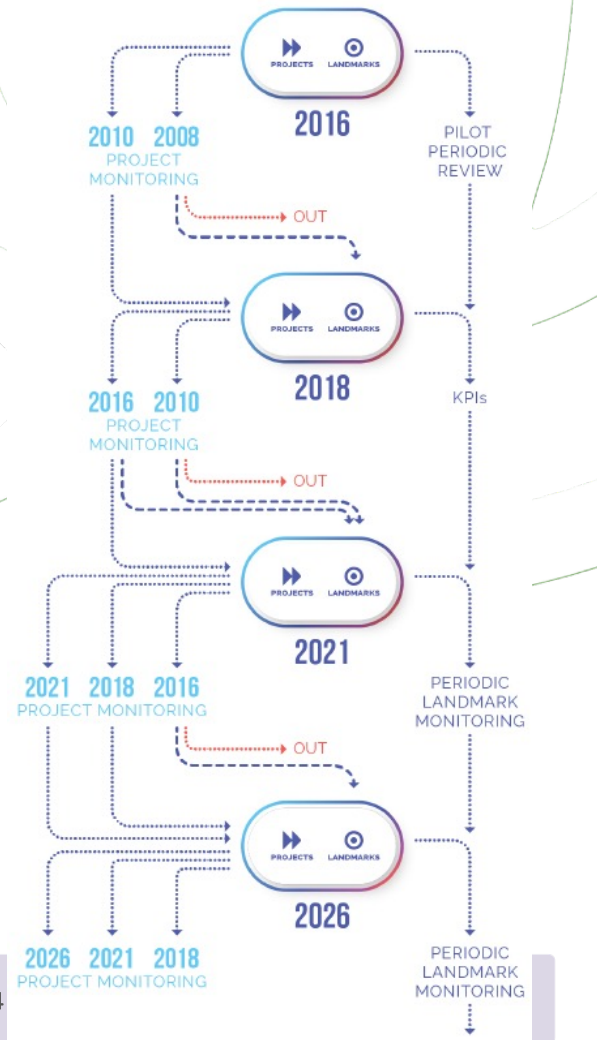

What may be the criteria for evaluating the maturity of a RI with respect to users & access?

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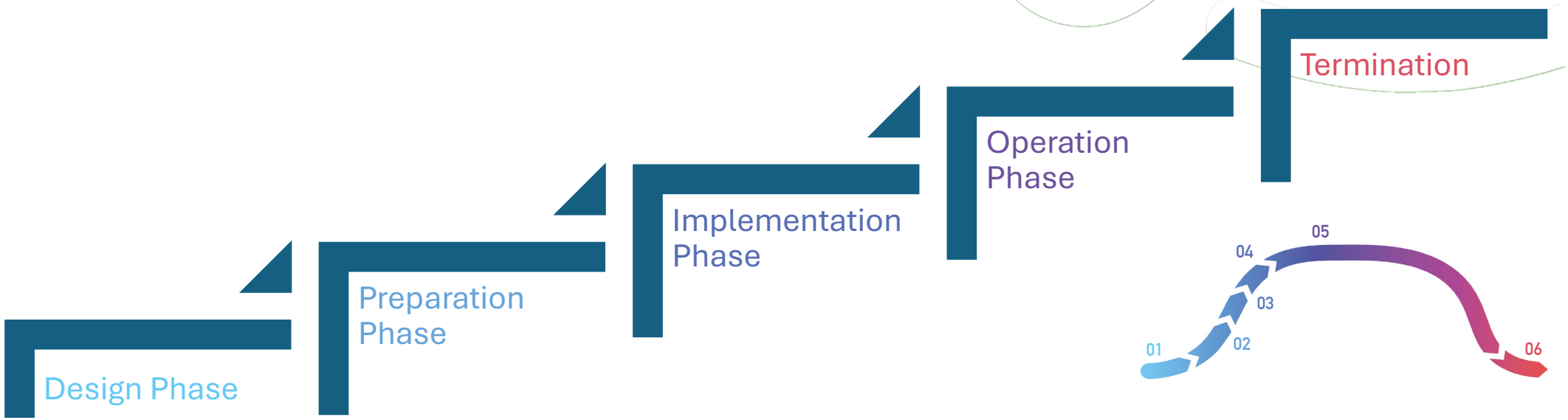
Minimal Key Requirements – Users & Access



Minimal Key Requirements – Users & Access

- Vision about user community
- Access model described
- Common approaches for national /thematic nodes

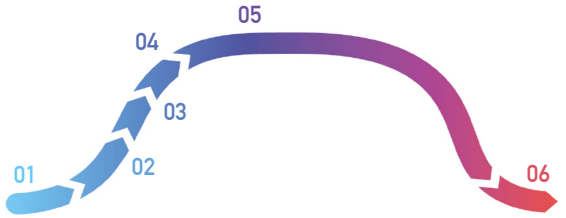
Design Phase

Preparation Phase

Implementation Phase

Operation Phase

Termination



*) Distributed RIs

Minimal Key Requirements – Users & Access

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- User categories identified
- User community quantitatively investigated
- Identified services (user needs)
- Single entry point
- Access policy outlined

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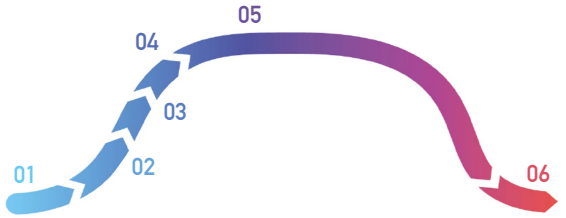

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- User community consolidated
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- User strategy
- Common access policy
- Access process approved

Operation Phase

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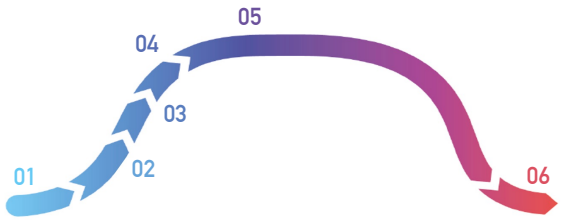

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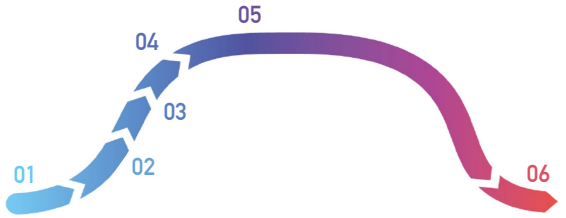
Operation Phase

- Solid user strategy and access policy
- Catalogue of services
- Solid and sustainable access
- IPR policies
- Dissemination strategy
- Training for RI +. users

Termination



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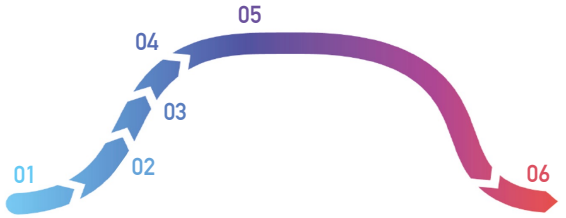
Termination

- IPR deployed beyond decommissioning



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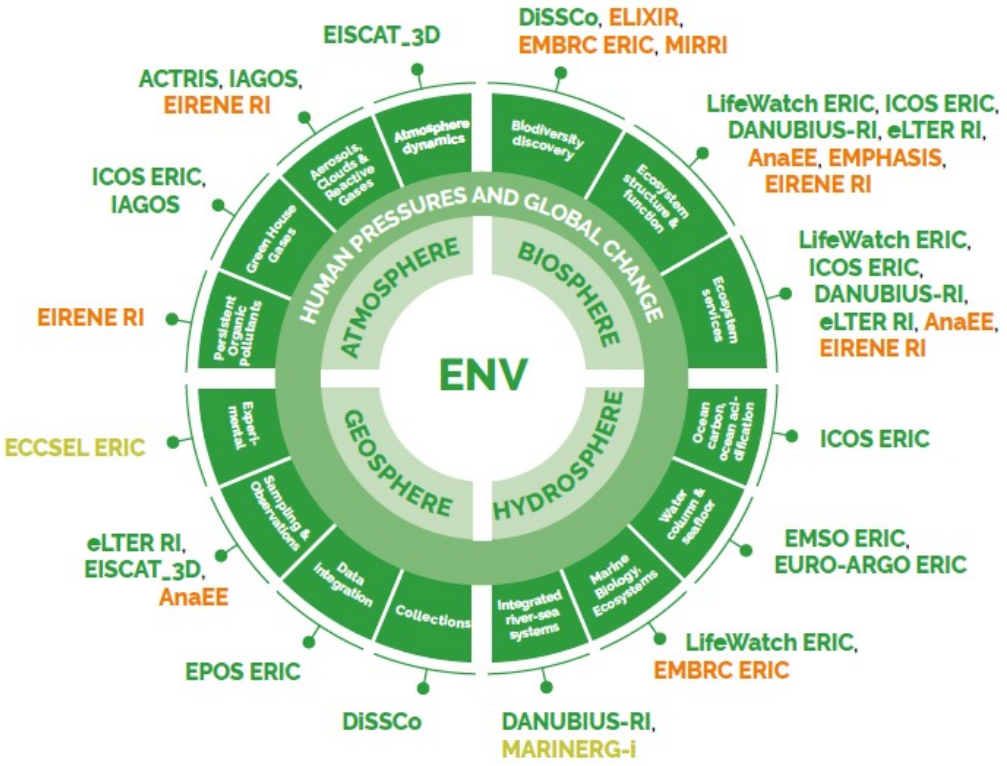
European RI Landscape – 2021 ESFRI Roadmap

DIGITAL | ENERGY | ENVIRONMENT | HEALTH & FOOD | PHYSICAL SC & ENGINEERING | SOCIAL & CULTURAL



- Overview of European RI ecosystem
- Identifying gaps and promoting inter- and cross-disciplinary aspects
- 6 reference scientific domains
- Best European science facilities, including national, regional, international facilities and consortia
- Synergies and complementarities of interfaces between RIs and across areas

Challenges and Strategy

- Addressing specific challenges (climate change, environmental sustainability, food, health, …) cutting across scientific disciplines
- Global dimension, requiring multiple platforms and types (including mobile and virtual capacities)
- Pushing the frontiers of scientific knowledge but producing socio-economic impact
- Long-term sustainability and sustainable development goals
- Interconnecting RIs – Forming a new RI ecosystem
  - Serving science – integrated RI services
  - Link to the innovation ecosystem – state-of-the-art services and technologies and interaction with the industry

National RIs, Roadmaps and Process

- National Research Infrastructure roadmaps developed, updated or under preparation in >25 European countries
- Often aligned with European ESFRI Roadmap process for coordinating at national and EU level
- Key pillar of national research and innovation ecosystem
- Strategic piloting tools for national governments, for setting national priorities and funding programmes

National vs

European vs

Global Research Infrastructures

Global RIs

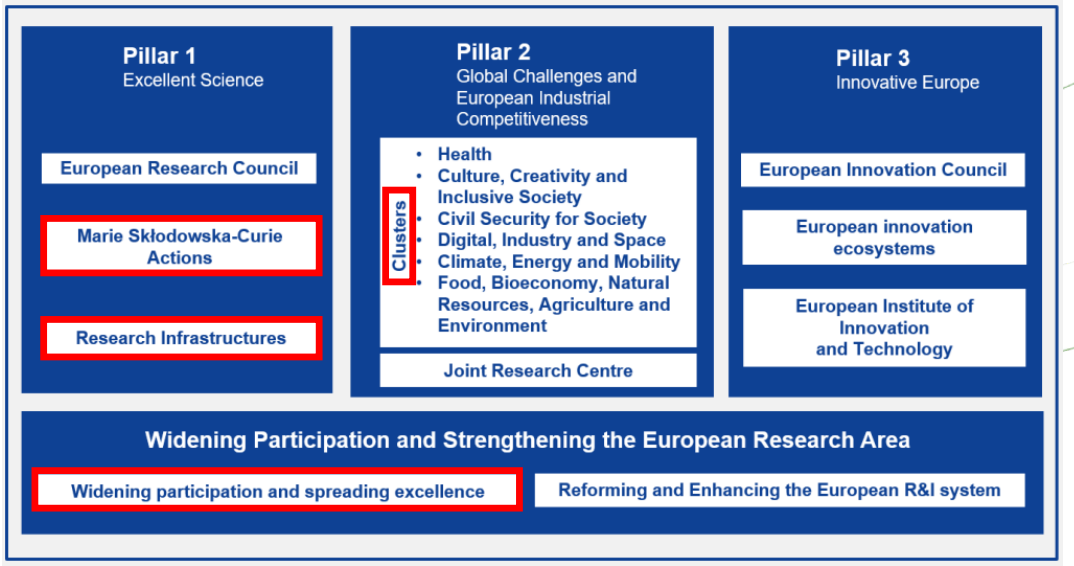
- International collaboration facilitated by RI
- Need for global data and observations
- Fostering scientific collaboration worldwide
- Addressing complex scientific and societal challenges with globa scope
- Sharing common needs and efforts

- OECD Global Science Forum (GSF)
- Group of Senior Officials (GSO)

EU Funding & RIs

FP1 (1984-1987) | FP2 (1987-1991) | FP3 (1990-1994) | FP4 (1994-1998) | FP5 (1998-2002) | FP6 (2002-2006) | FP7 (2007-2010) | H2020 (2014-2020) | Horizon Europe (2021-2027) | FP10 (2028-2024)

- Multi-annual Framework Programmes (FP)
- Strategic tool to finance, streamline and support research and innovation activities across scientific domains
- **EU funding to support opening and developing RIs at European level**
  - →Supporting ESFRI
  - →Catalysing and leveraging role the development and financing of EU RIs
  - →Pooling of resources across Europe
  - →Structuring effect for integrating and consolidating RI development and landscape
  - →Tackling complexity and diversity of RIs and investments



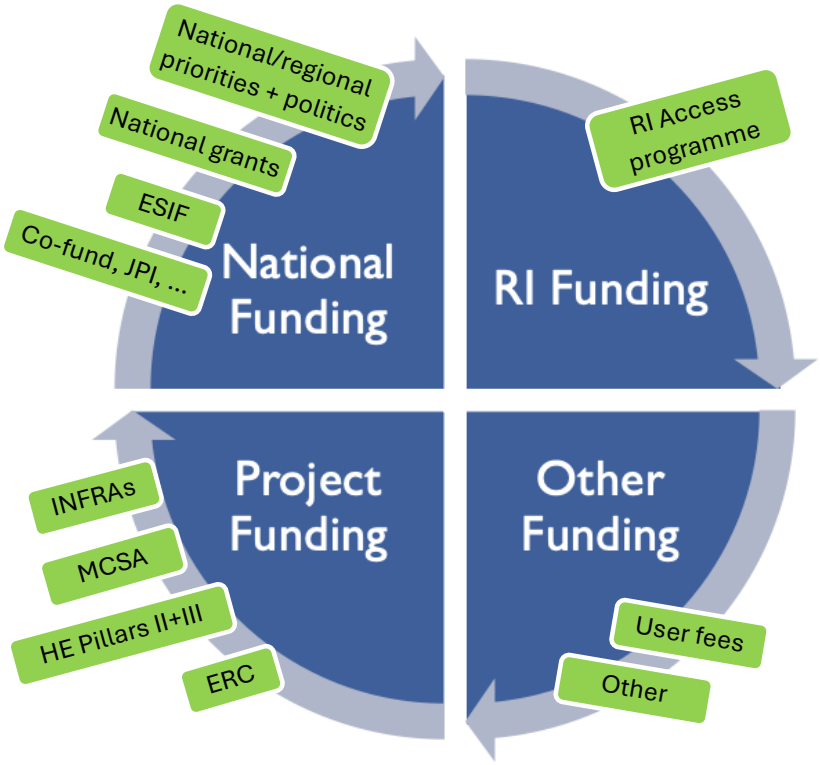
EU RI Funding Instruments

INFRA **DEV**	Consolidation and evolution of the EU RI landscape, to develop an integrated European ecosystem of research infrastructures, including single-sited, distributed and networks of facilities providing joint services
INFRA **EOSC**	Enabling an operational, open and FAIR EOSC ecosystem, to contribute to a web of FAIR research data and provide a trusted and secure federated system of research data and services
INFRA **SERV**	RI services to support health research, accelerate the green transition and the digital transformation, and advance frontier knowledge
INFRA **TECH**	Next generation of scientific instrumentation, tools, methods, and advanced digital solutions of research infrastructures and foster innovation and co-creation with industry
INFRA **NET**	Network connectivity in Research and Education – Enabling collaboration without boundaries

EU Funding to finance access to RIs

- Initiatives for support of RIs ("use of major installations") date back to FP2
- The concept of trans-national access (TNA) has been in the core of all initiatives for RIs supported since FP2 to ensure wider and more efficient access to and use of the existing infrastructures
- FP2-FP5: Individual "TNA" contracts
- FP6-H2020: Integrated Infrastructure Initiatives (I3) / Integrated Activities (IA)
  - TransNational + Virtual access to support "free" access for users to identified key research infrastructures
- **Horizon Europe: Research infrastructure services to provide challenge-driven and curiosity driven access opportunities**
  - Efficient and customised cross-RI services to address societal challenges on dedicated topics
  - Access to RI services to advance frontier knowledge

Sustainable access funding



- Synergy of available funding sources and mechanisms
- Flexibility and attractiveness
- Recognize funding as strategic investment to address complex societal challenges
- Joint effort and common sharing of responsibilities and resources among all stakeholders
- Due to diversity of RIs, no one-size-fits-all solution → adapting funding mechanisms to long-term operation needs of each individual RI
- Aim: Ensuring a medium to long-term funding commitment

EU Charter for Access

- Published by the EU in 2016 as non-binding document
- Non-regulatory principles and guidelines for defining access policies and related services

Principles

- Access policies
- Acknowledgments
- Legal conformity
- Costs and fees
- Ethical integrity
- Non-discrimination
- Implementation
- Data management
- User instructions

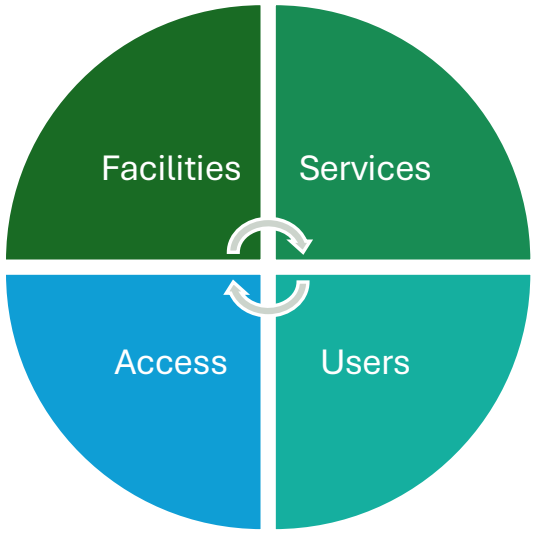
Guidelines

- Access policies
- Access modes
- Access restrictions
- Access processes
- Support measures
- Education and training
- Regulatory framework
- Transparency
- Data management plan
- Safety and environment
- Quality assurance
- Limitations

Recommendations for revised version

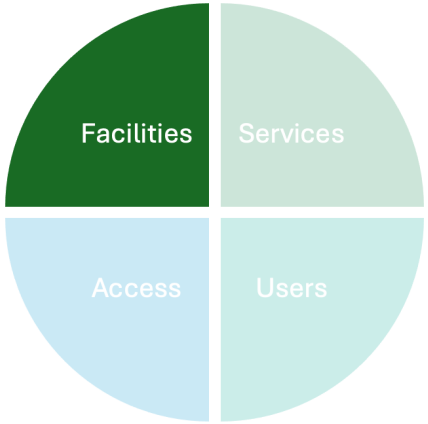
RI Services & Access – Concepts

“Research Infrastructures* are facilities, resources and services that are used by the research communities to conduct research and foster innovation in their fields”



*) Article 2 (6) of the Regulation (EU) No 1291/2013 of 11 December 2013: `Establishing Horizon 2020 - the Framework Programme for Research and Innovation (2014- 2020)`

RI Concepts – Facilities



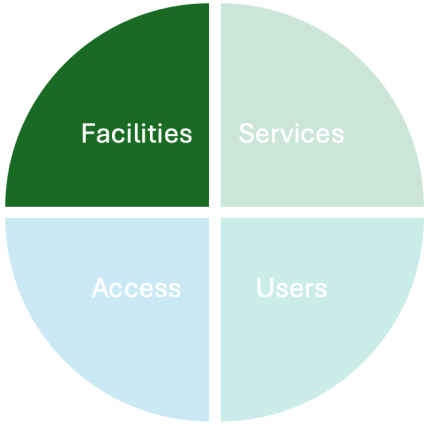
Definition

→ Physical infrastructure, buildings, and equipment within a research organization or institution that support the day-to-day activities of research, experimentation, and collaboration, including specialized scientific equipment.

→ Not necessarily organised at single locations

→ Operated by one or several research institutions

RI Concepts – Facilities



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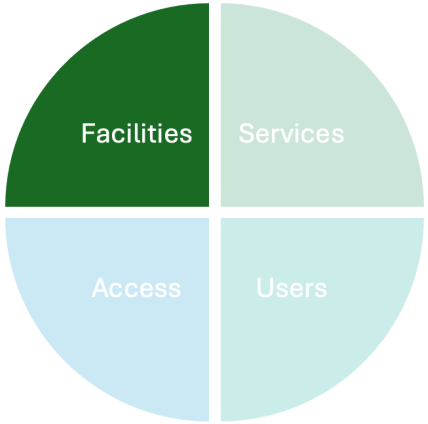

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What are the types of facilities within RIs or within your RIs?

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RI Concepts – Facility Types

Core Facilities

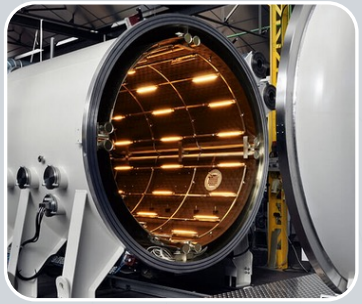
- European-level
- Support & expertise
- QA/QC + standards

Data & Computing facilities

- HPC, servers, cloud-systems
- storing, processing, managing data

Observational Facilities

- Ground-based, ambient
- Monitoring, collecting, recording data



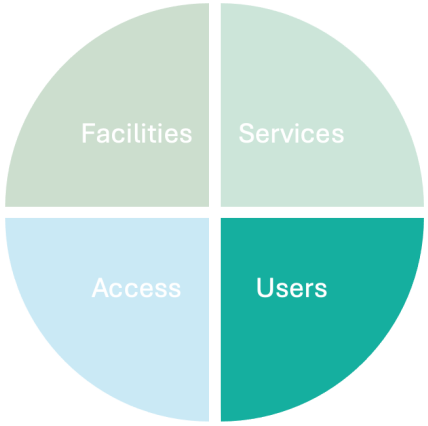
Exploratory Facilities

- Investigating processes + phenomena
- cutting edge technologies + discoveries

Mobile Facilities

- Transportable systems
- Specialised equipement
- ground-based, air, ship

RI Concepts – Users



Definition – What is a user?

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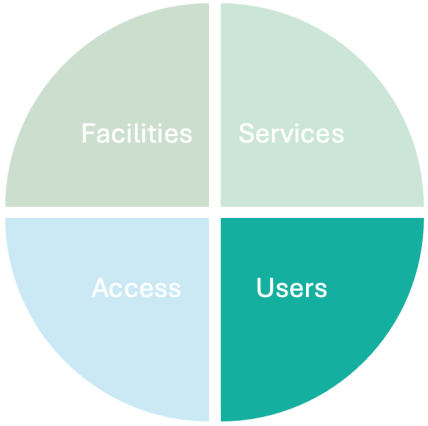
RI Concepts – Users



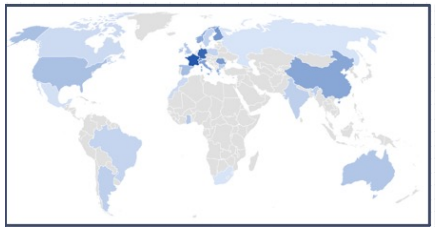
Definition

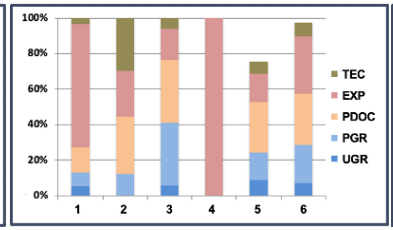
→ "Individuals, teams and institutions from academia, business, industry and public services. They are engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the management of projects"

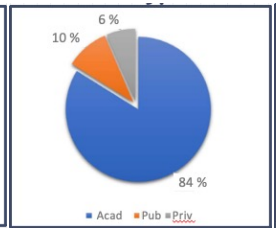
Article 3 (b) of the European Charter for Access to Research Infrastructures

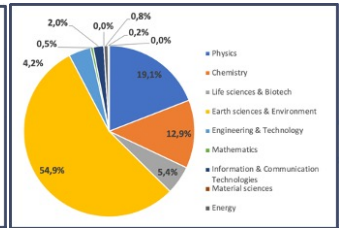
→ They make use of RI data, resources, equipment or other services provided by these to conduct their own activity or research or development work.

- User origin
- User type
- User profile + gender
- User scientific field

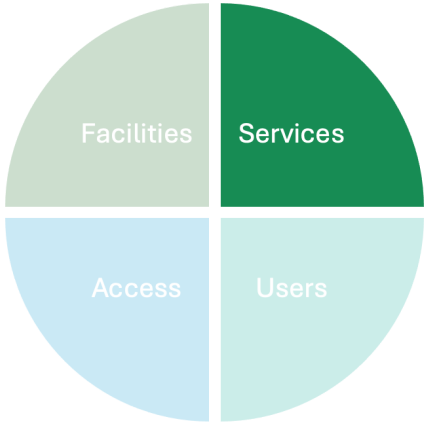








RI Concepts – Services



- **Definition**
  - → Various types of support, expertise, tools, and resources provided to users to facilitate their work and help them achieve their research goals.

- **What examples of service (general categories) exist within Ris?**

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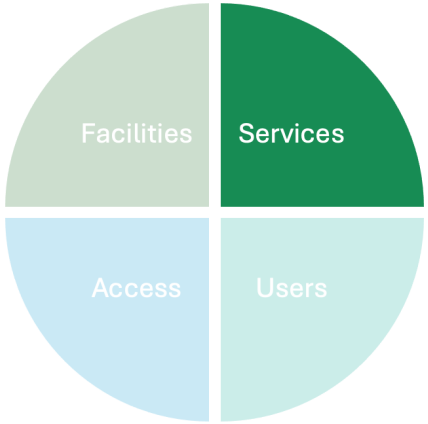
RI Concepts – Services



Definition

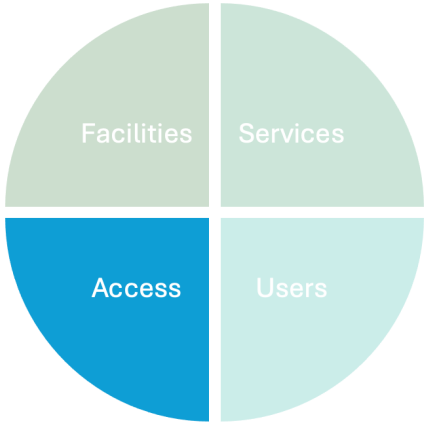
→ Various types of support, expertise, tools, and resources provided to users to facilitate their work and help them achieve their research goals.

What examples of service (general categories) exist within RIs?

Digital Services		Use of quality data and data products and other digital services including data documentation, compilation, archiving, preservation, traceability, citation and attribution
Scientific Services		Use of experimental research facilities equipped with state-of-the-art instrumentation and equipment for scientific exploration and realisation of experiments
Technical Services		Use of scientific expertise centres to ensure instrument quality, high performance measure-ments and methodologies, calibrations and intercomparisons, quality procedures and tools
Innovation Services		Use of scientific facilities for technological development, prototype testing, industrial or market-oriented applications including private sector use
Training Services		Training of scientists, new generations of researchers, and facility personnel to acquire knowledge and skills and provide good practices to exploit all essential tools for science

Training current RIs staff and user communities: "

RI Concepts – Access



Definition

→ ‘Access’ refers to the legitimate and authorised physical, remote and virtual admission to, interactions with and use of Research Infrastructures and to services offered by Research Infrastructures to Users.

Article 3 (c) of the European Charter for Access to Research Infrastructures

→ = Ability to utilize the resources, equipment, and services of a facility to conduct research or experiments. Access can vary in terms of the scope, type, and conditions under which users can engage with the infrastructure.

What types of access exist in RIs? How do users access the services?

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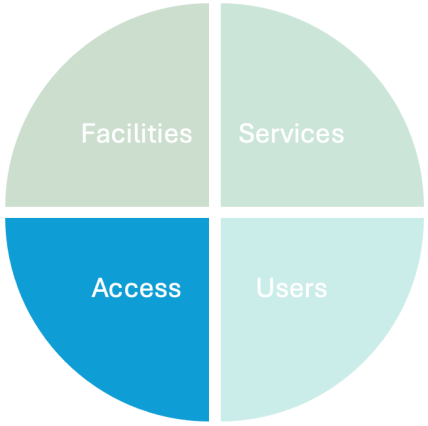
RI Concepts – Access Types



PHYSICAL ACCESS

« Hands-on » access of users who physically visit a facility

REMOTE ACCESS

Access to a facility without users physically visiting the facility

HYBRID ACCESS

Combination of physical and remote access

Access is made to resources that are not unlimited → competitive selection process

VIRTUAL ACCESS

Wide and free access through communication networks

Access can be simultaneously made by an unlimited number of users → no selection, free access

ITINERIS

THANKS!

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