

The technical candidates for federation



Speakers and panellists

Karen Ambrose, Francis Crick Institute (TRELLIS)

Christine Stansberg, University of Bergen (EOSC ENTRUST)

Jonaa Eva, University of Nottingham (TREvolution / FED-A)

Chair: Chris Cole

Questions to panellists: [slido.com](https://slido.com/join/2784135) #2784135



Questions for the panel

<https://slido.com>

Code:

2784 135





THE
FRANCIS
CRICK
INSTITUTE



Imperial College
London



Trellis, The Francis Crick Institute Trusted Research Environment



By Karen Ambrose

Chief Data Officer &
Head of Data Management and Analytics
Platform Team.

The Francis Crick Institute

22nd September 2025



The Francis Crick Institute



A biomedical discovery institute researching the fundamental biology of health and disease.

Located in the heart of Kings Cross in central London, UK.

Over 1500 scientists, students and operational staff working collaboratively in science, technology, (EM) disciplines.

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d in 2016.

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Edith Heard

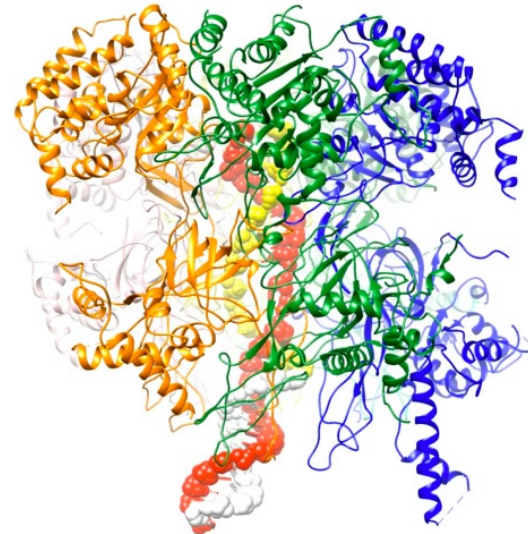
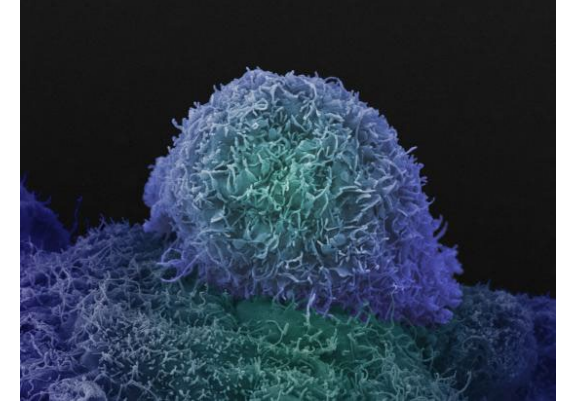
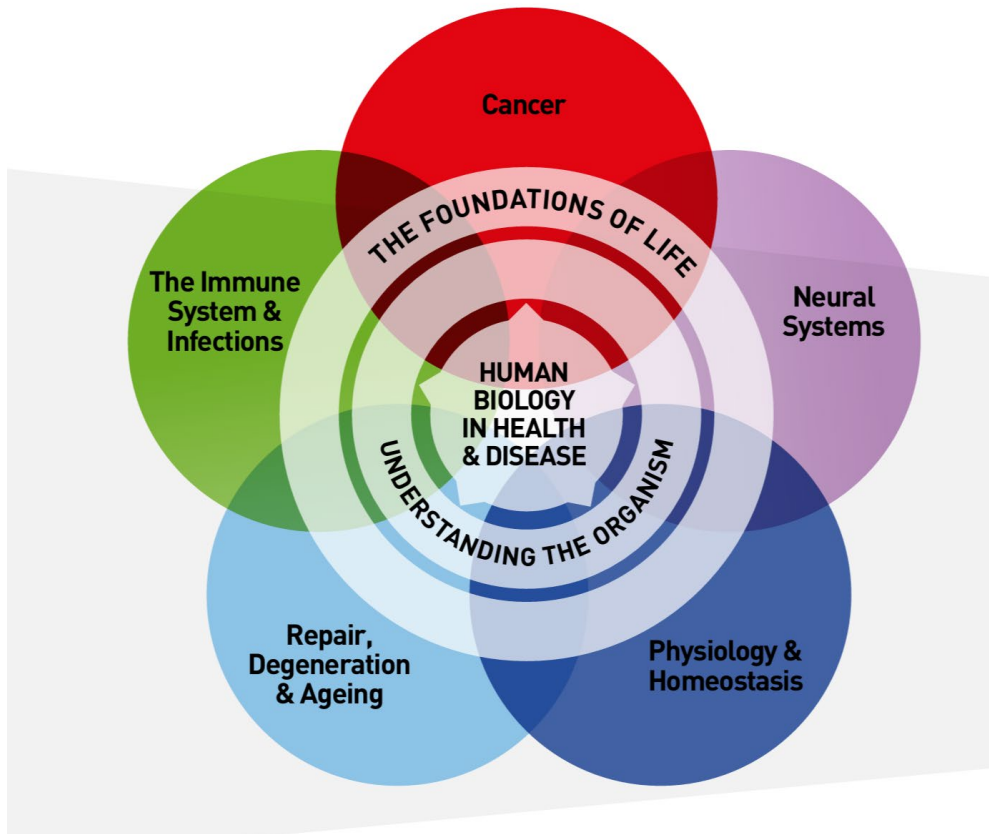
Director General, EMBL

**Joined in September
2025**



“Discovery without boundaries”

CRICK SCIENCE PROGRAMME



- Translate discoveries into new ways to prevent, diagnose and treat disease



Karen Ambrose

A little bit about me



Chief Data Officer at the Francis Crick Institute.

Responsible for research data management, scientific data and databases, operational data warehousing, analytics and reporting.

Over 11 years of experience at the Crick.

Worked on the Human Genome Project at the Wellcome Sanger Institute, Cambridge, UK

Chair of the Crick Research Data Management Consortium
Member of the EMBL-EBI TSC - SAB

Requirements to drive the strategic approach

1. **Global reach** - for Global Collaboration bringing data to the projects
2. **Cloud scalable resources** - any problem large or small.
3. **Cloud agnostic** (AWS / Azure / GCP)
4. **A programmable open platform** - integration for orchestration and workflow approval-based delivery provisioning
5. **Powerful standard activity metadata** - standardisation of audit and compliance tracking
6. **Billing and Cost control:** Budgetary control and democratisation of participation
7. **Bound with a legal agreement** - the terms of the project include the method of collaboration.
8. **Data control and sharing** - “No copy views” - sovereignty and data chain of custody

Result

- An eco system of cloud technologies delivering a Project TRE platform around Snowflake™ data fabric.



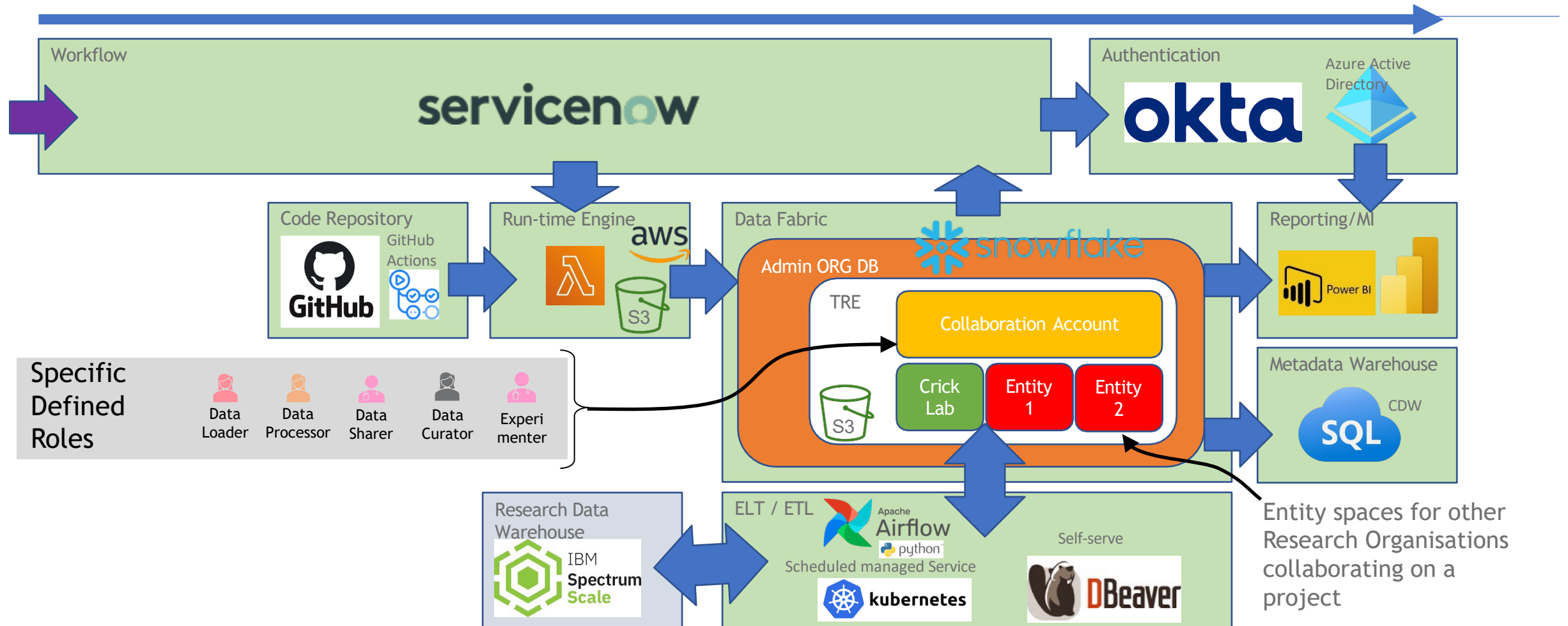
What is Trellis?



- A service built by ITO within the Crick using some pre-built tools
- A Cloud platform to share data easily and securely across institutes; including across regions
- Monitor and easily adjust budgets for each project
- Replicate quickly for various projects that need to share data
- Suitable for Clinical and patient identifiable data

Trellis: The Platform & Design

Integrated components in a cloud architecture





Trellis

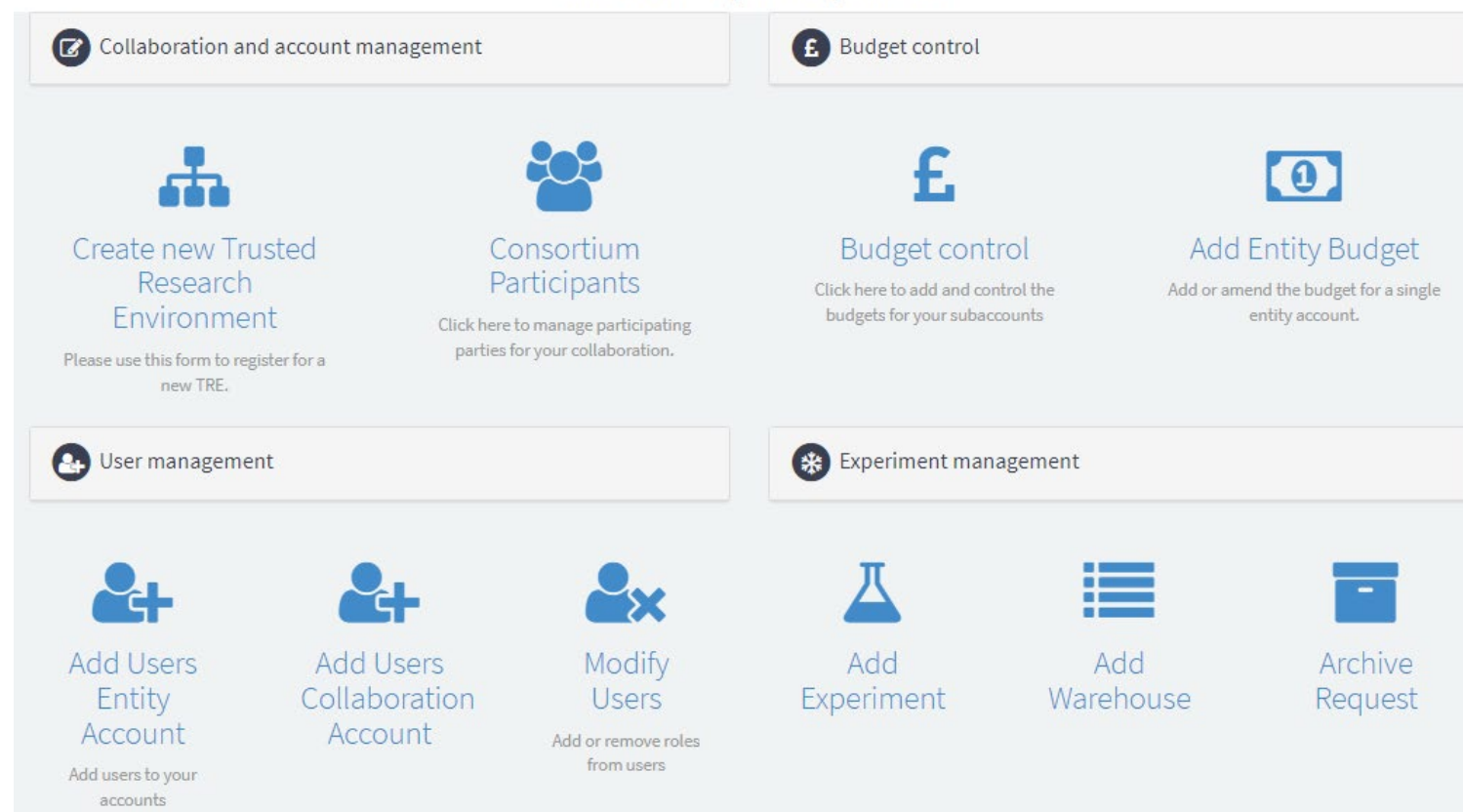
Secure Data Sharing
and Collaboration



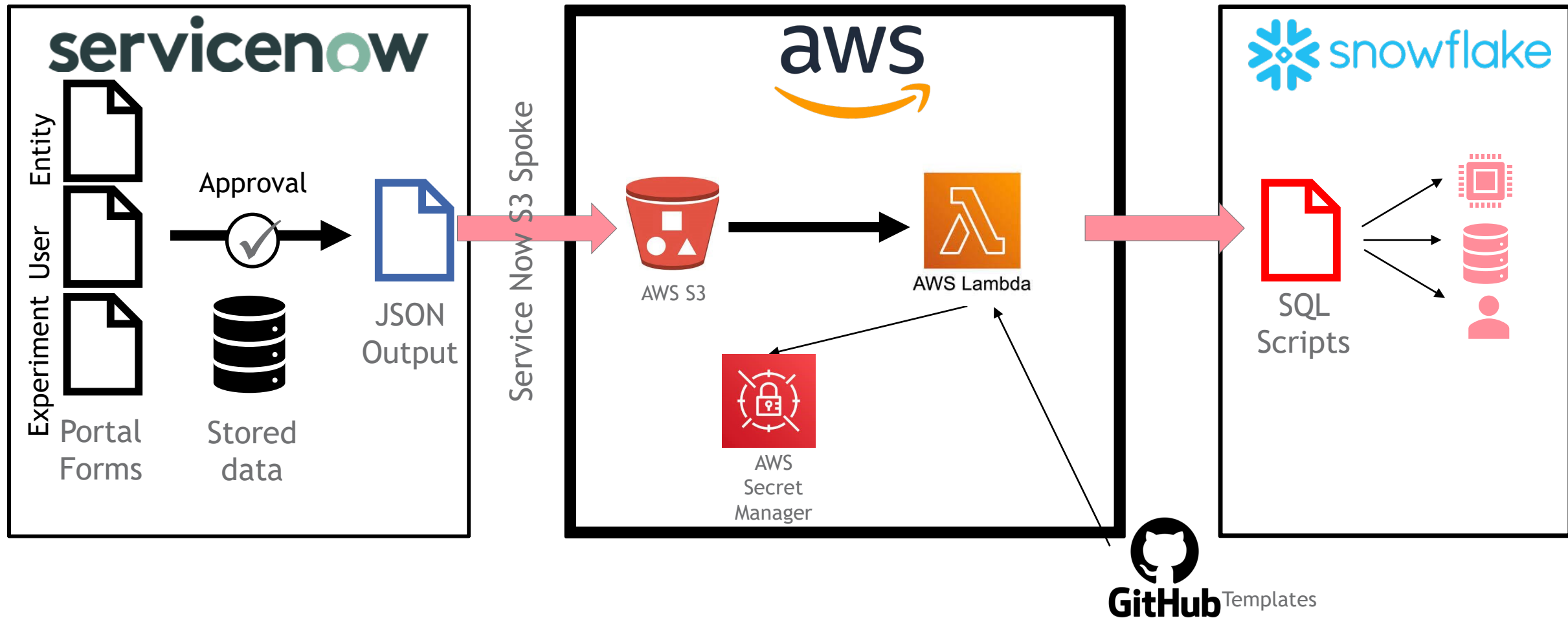
Trellis User Request Portal supported by Servicenow



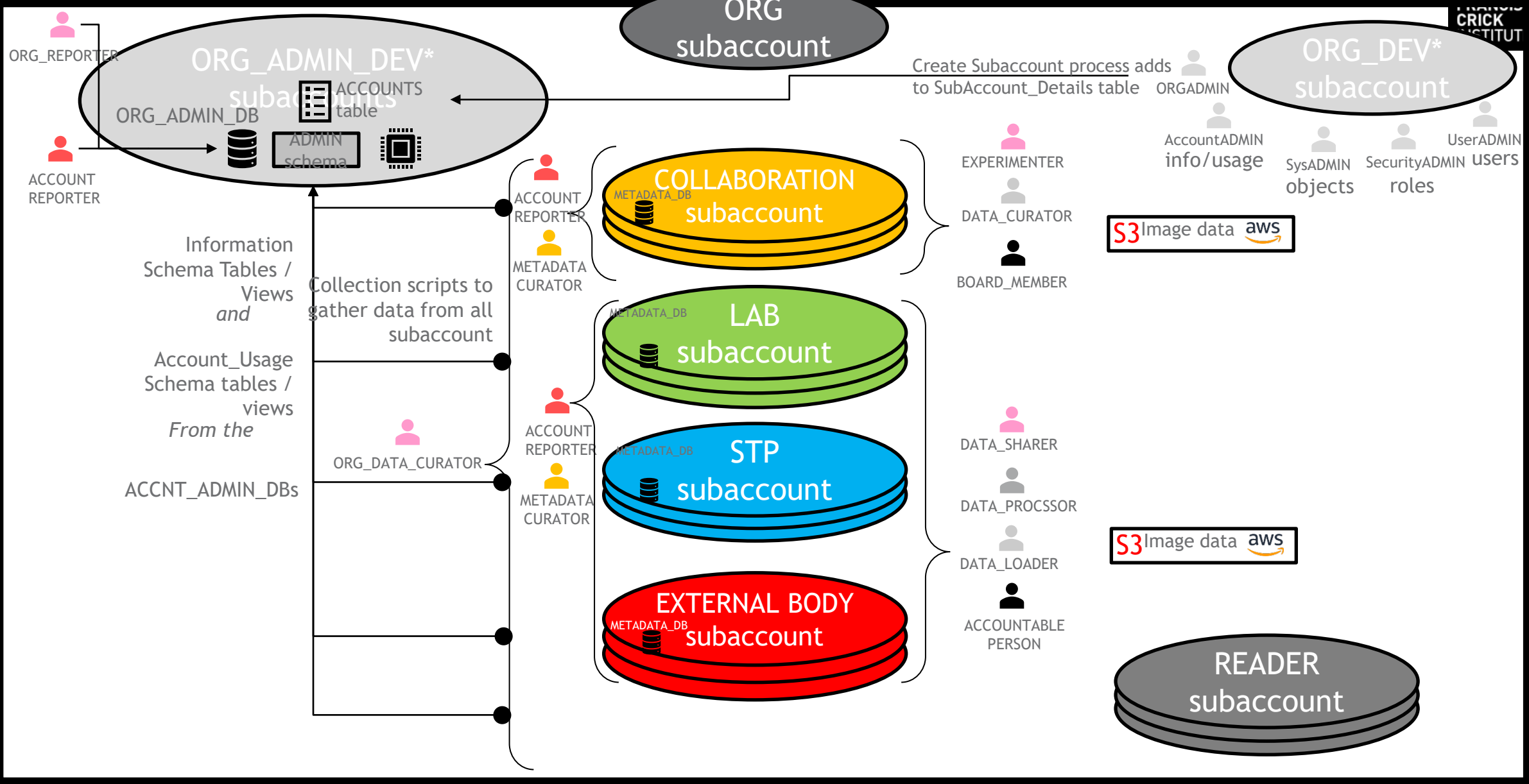
Trellis request portal



Workflow - end to end snowflake interfaces and processes

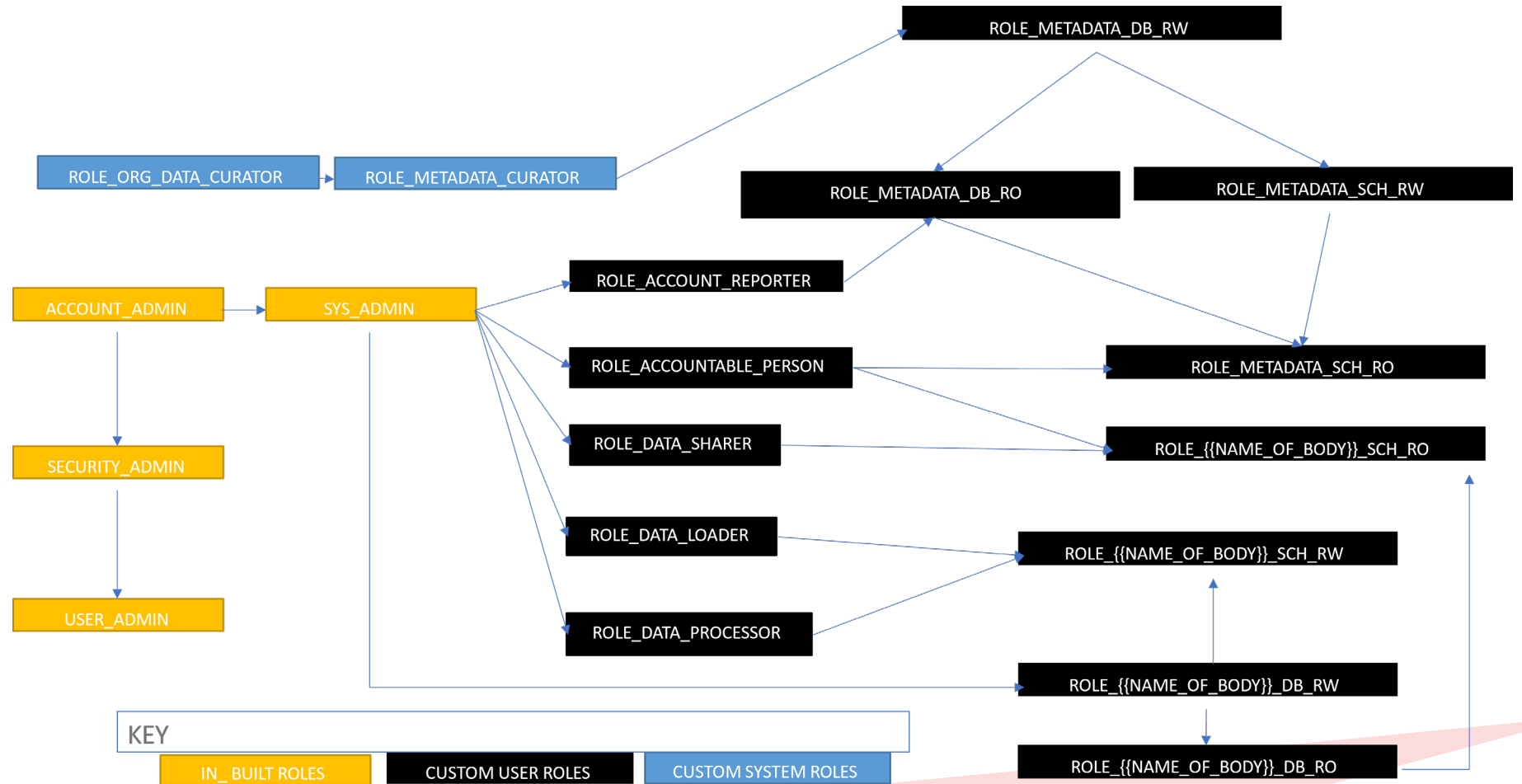


Crick Snowflake Organisation

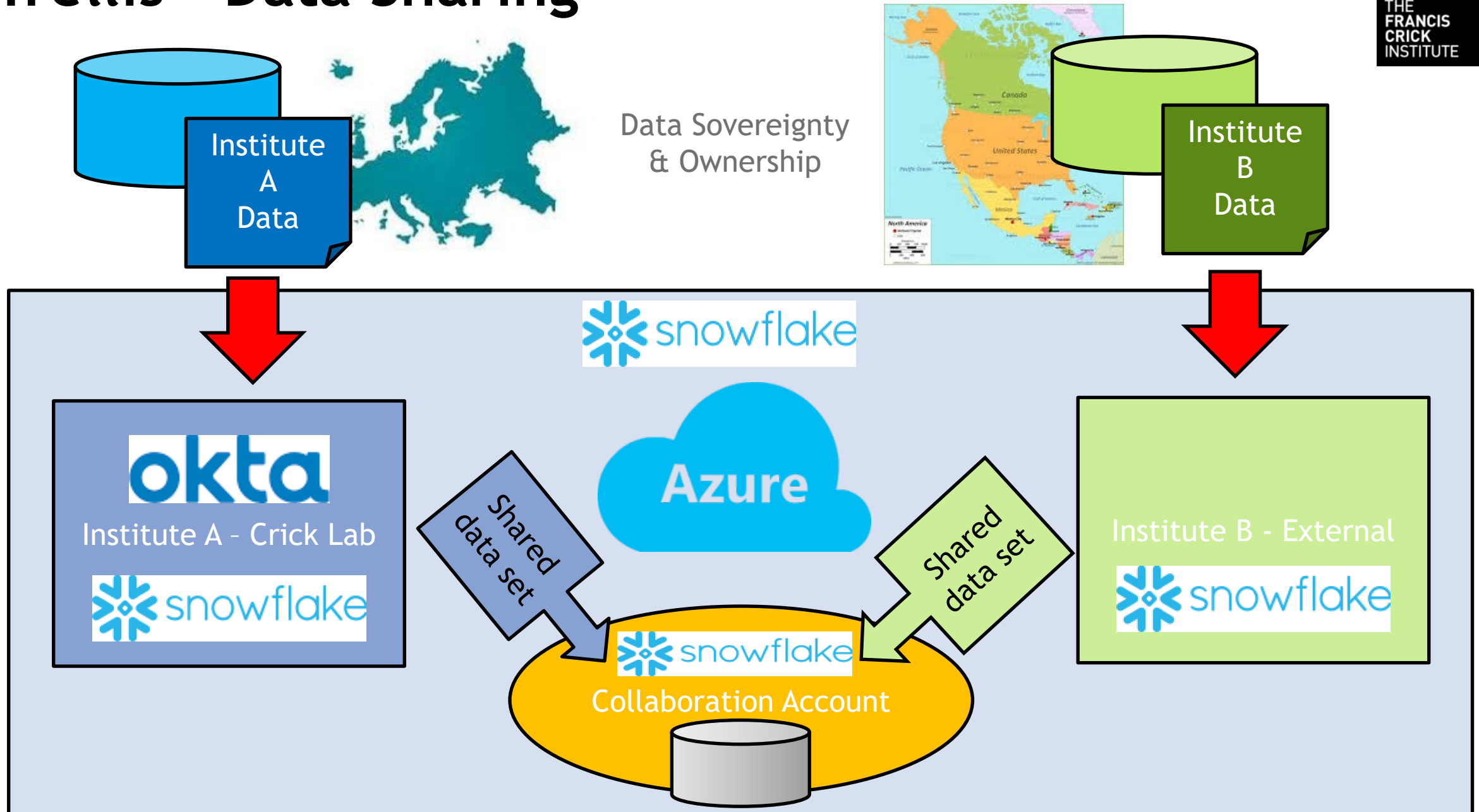


Benefits of Role Hierarchy

- Allows monitoring of users by roles.
- Limits access
- Keeps data safe within the TRE
- Controls the budgets per role
- Removing access is very simple

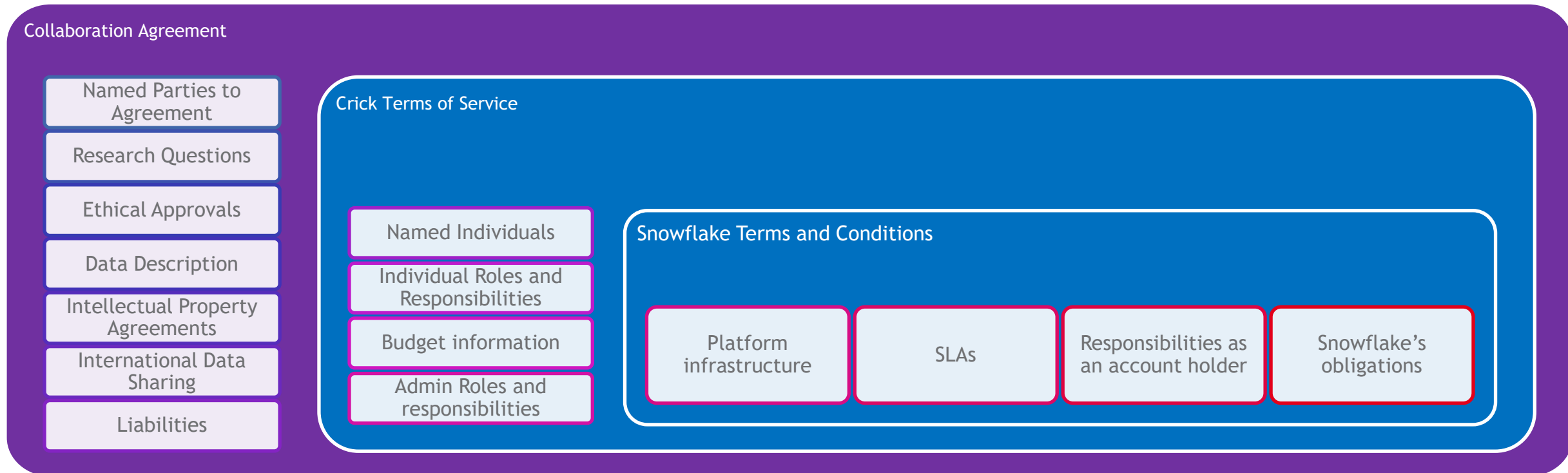


Trellis - Data Sharing



The TRELLIS platform - Legal Agreement Structure

- The structure of the **legal agreement is three nested documents**.
 - At the top level is the **Collaboration agreement**, encapsulating the data sharing arrangements.
 - The next level are the **Crick Terms of Service and Order Form**, which captures the input data for the collaboration, and sets out the obligations and roles of every party.
 - Finally, there are the **Snowflake platform terms and conditions**, derived from the Snowflake Master Services Agreement



The elements in blue are designed to be standard for every agreement, leaving only the elements which have to be unique to every collaboration in purple.

How are the Five Safes supported:

Safe	Design points
Projects	1. Approvals : A proposal needs ethics approval and legal approval before a collaboration can be started and a TRE created solely for, and explicitly restricted to, that project.
People	1. RPO signed legal s: All people joining have to be part of a established, and approved, Research Performing Organisation . The organisation has signed a legal document confirming its involvement in the collaboration TRE. 2. Work Email : All people can only get access through their work email and not by any “home” non affiliated address. 3. ROLES : All people can only do what is provided for them by one of the 5 different roles related to research process (Load, Process, Share, Curate or Experiment)
Settings	1. Secure cloud technology (ISO27001, HIPPA) held in any region available around the world. 2. Data share means full control rests with owner / processor. 3. Individual approvals , by accountable people, for person setup, only using affiliated research entities. 4. Validation : Account email validation, Multi-factor authentication passworded access 5. Specific roles - separating out the end-end research process. Ensuring conscious action. 6. Audit & Compliance: Full metadata on login, access, activity, usage, roles, etc. allows strong standardised audit and compliance reporting
Data	1. Pseudonomised & Anonymised as needed : Data is pseudonomised & anonymised as per need and agreement. 2. Documented sharing : Data is held in secure “bedroom” and released to the “living room” under the terms of the agreement and by approval of someone with the <i>Data Sharer</i> role. 3. Use monitoring : Monitoring audit for copy / duplication commands and remedial action (incl. automatic removal of new table of data / suspend user)
Outputs	1. Handled by each research collaboration - publication outputs review 2. Use of SACRO proposed.

Future Plans and Work and Conclusions

Future plans and Work

- Review of the architecture and potential to take advantage of new technologies that are now available.
- Infrastructure upgrades and security enhancements, where required.
- Streamline the workflows and integrations.
- Extending the application support for the platform to support the ever evolving research environment.

Current Activity

- Operation platform: 2 years
- Research projects : 4 active/ 4 pending

Conclusions

- **Main requirements of the platform have been fulfilled in the first instance but we are ever evolving the platform to ensure it continues to support our research requirements going forward.**

Contact Details

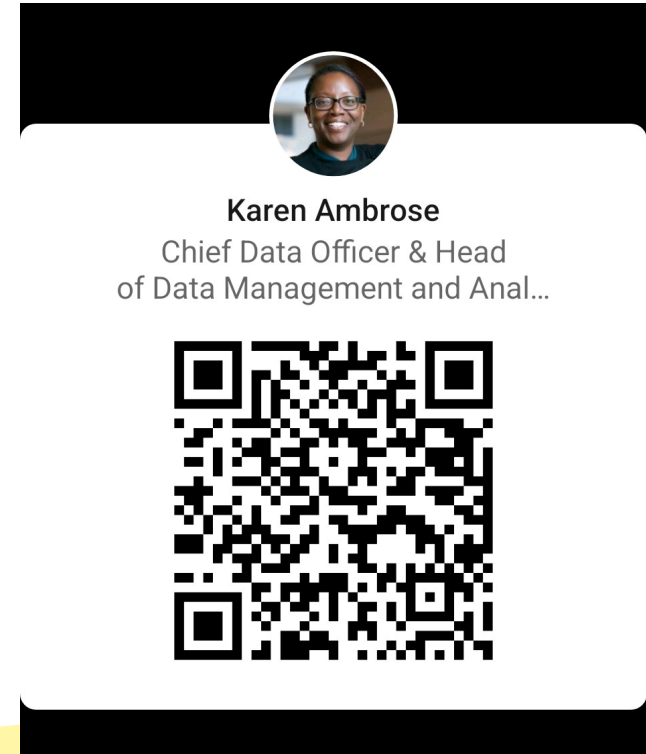
- Email

- Karen.Ambrose@crick.ac.uk

- The Francis Crick Institute

- www.crick.ac.uk

- LinkedIn





crick.ac.uk



EOSC-ENTRUST: European Network of Trusted Research Environments

The view from Norway

UK TRE Community meeting

Christine Stansberg
University of Bergen / NORTRE / EOSC-ENTRUST Architecture WP

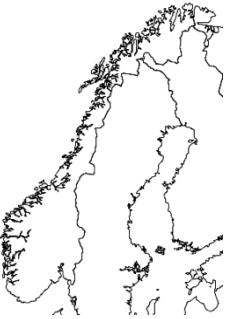
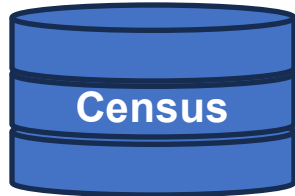


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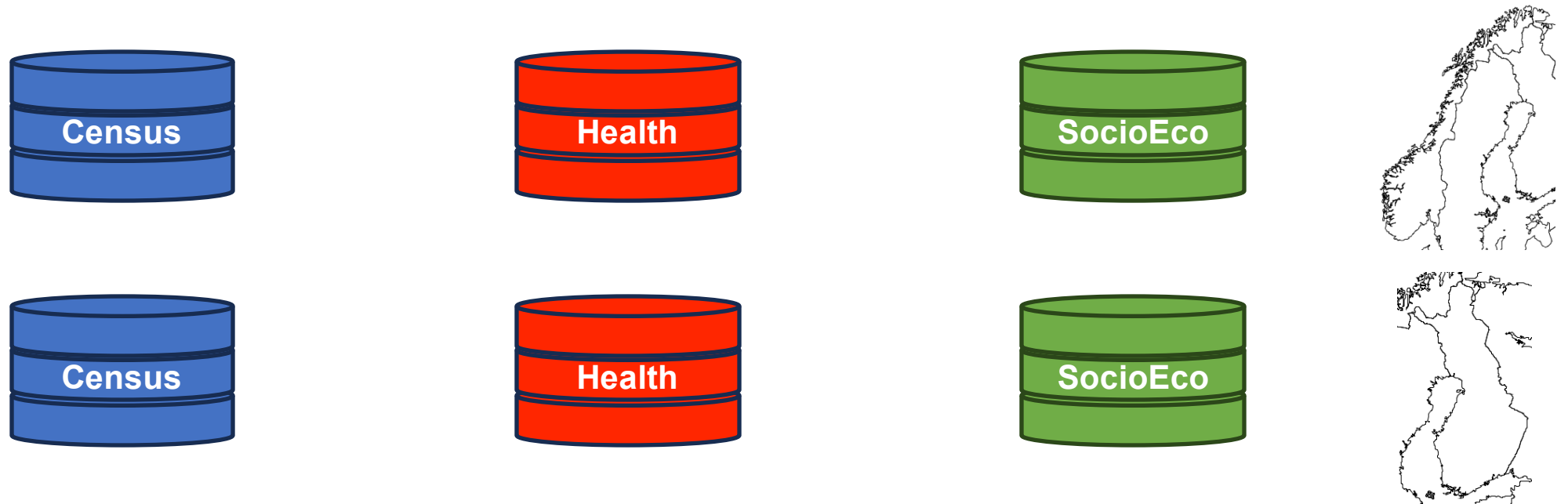
Fundamental challenge: research and policy-driven analyses on sensitive datasets

Q: *“Health issues in relation to income, education, age, and area of residence?”*



Fundamental challenge: research and policy-driven analyses on sensitive datasets

Q: *“Health issues in relation to income, education, age, and area of residence?”*



Improving the situation:

European Network of Trusted Research Environments

- build a **trusted, federated network** of European Trusted Research Environments (TREs)
- that enables **secure, cross-border access** to sensitive research data
- while **complying** with European legal and ethical requirements.
- → Blueprint and practical building blocks

How?

- Federation and interoperability
 - Connect national and domain-specific TREs so researchers can discover and use data and computing resources across Europe as if they were part of one system.
- Common standards and policies
 - Define and implement shared rules for identity assurance, security, governance, and data access that meet GDPR, EHDS, and other EU frameworks.
- Trust and compliance
 - Provide verifiable safeguards for privacy, confidentiality, and data protection to earn trust from data controllers, researchers, and citizens.
- Support for research
 - Make it easier to run multi-country studies, clinical research, and large-scale data analyses that require sensitive personal data.



European Researchers and Societal Impact



eosc

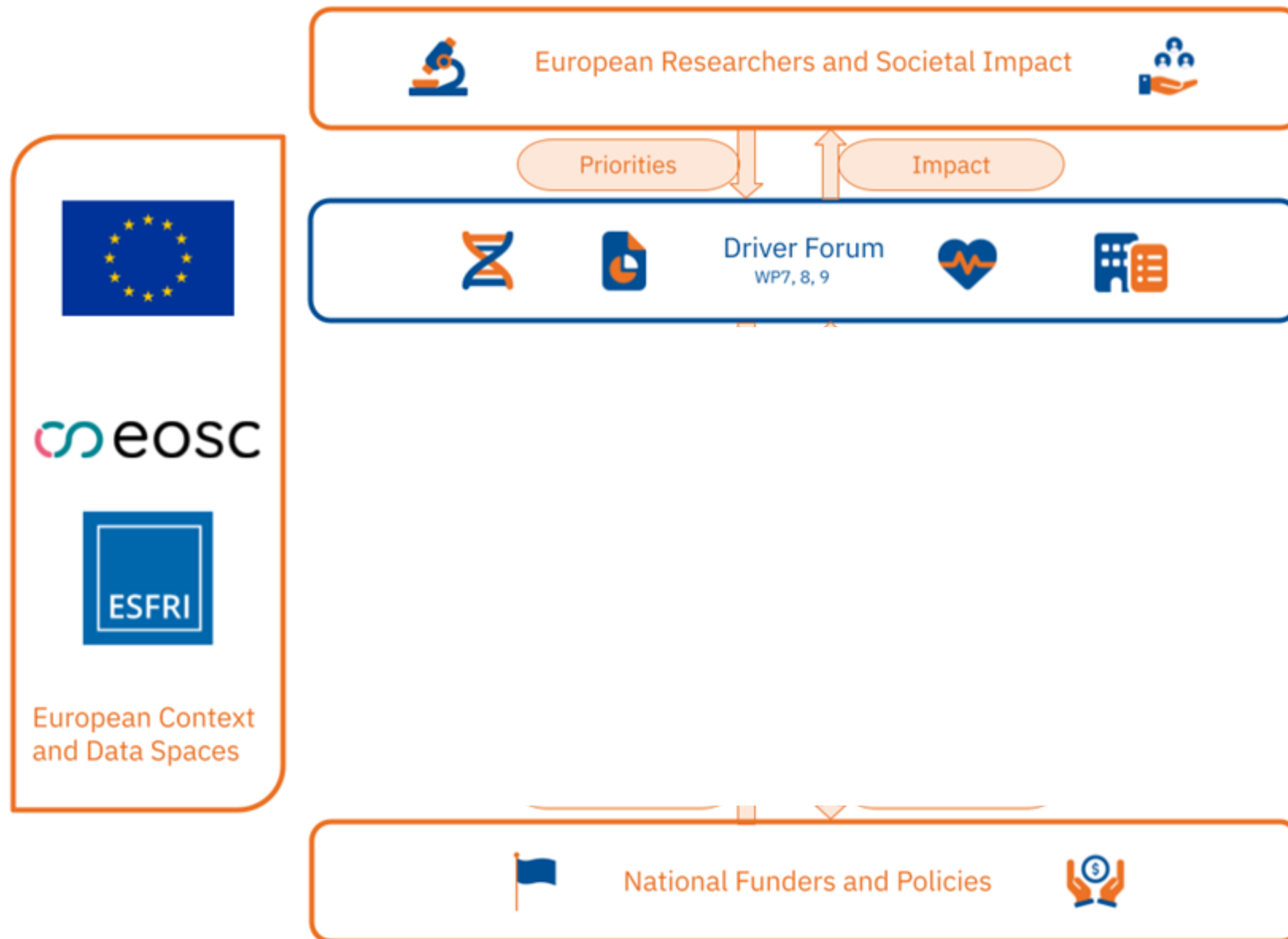


European Context
and Data Spaces



National Funders and Policies





Driver forum



- Driver 1: Federated Human Genomics
- Driver 2: Common standards to enable trans-national sharing of administrative/register and social science data

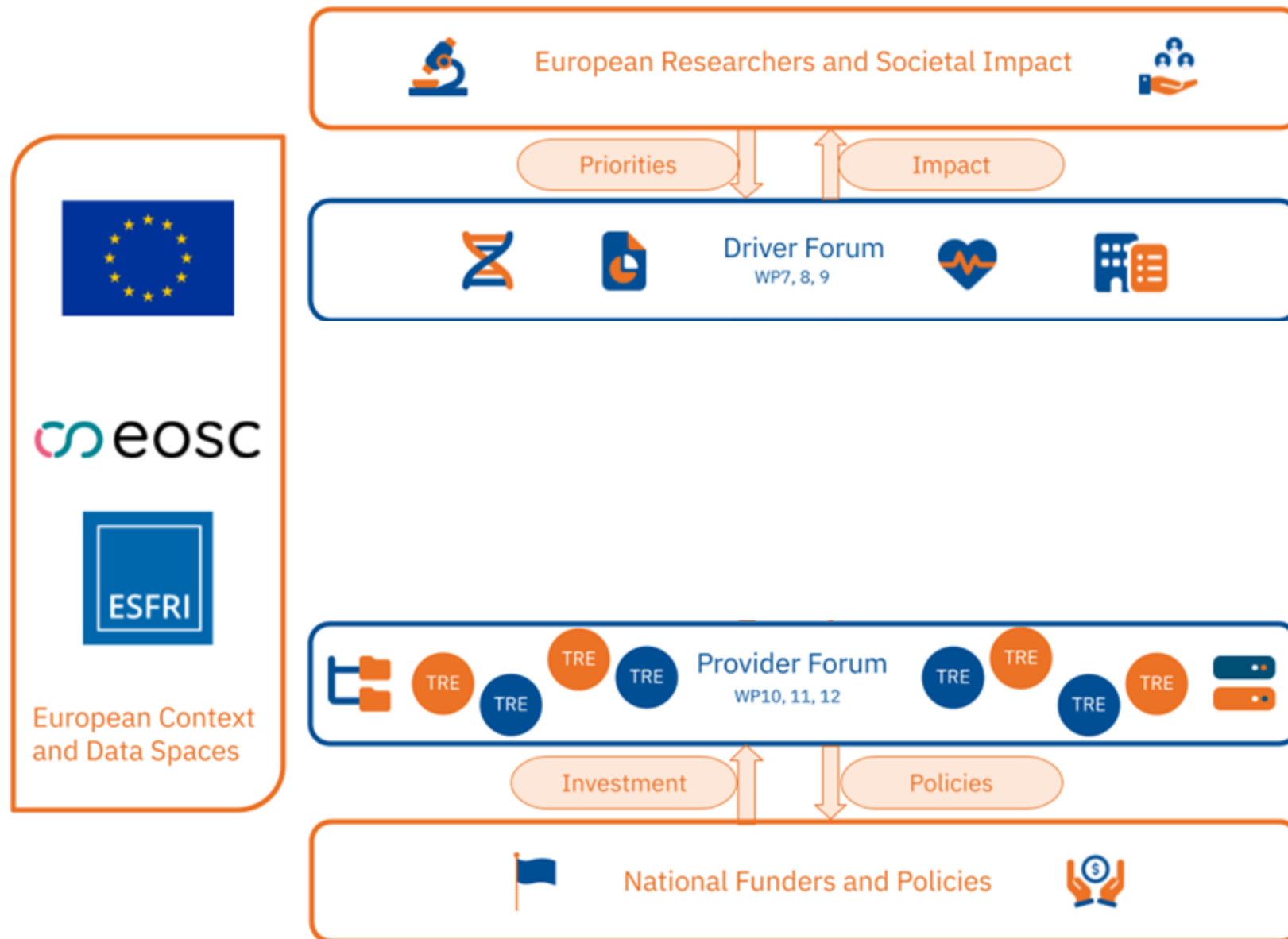


- Driver 3: Clinical Trials



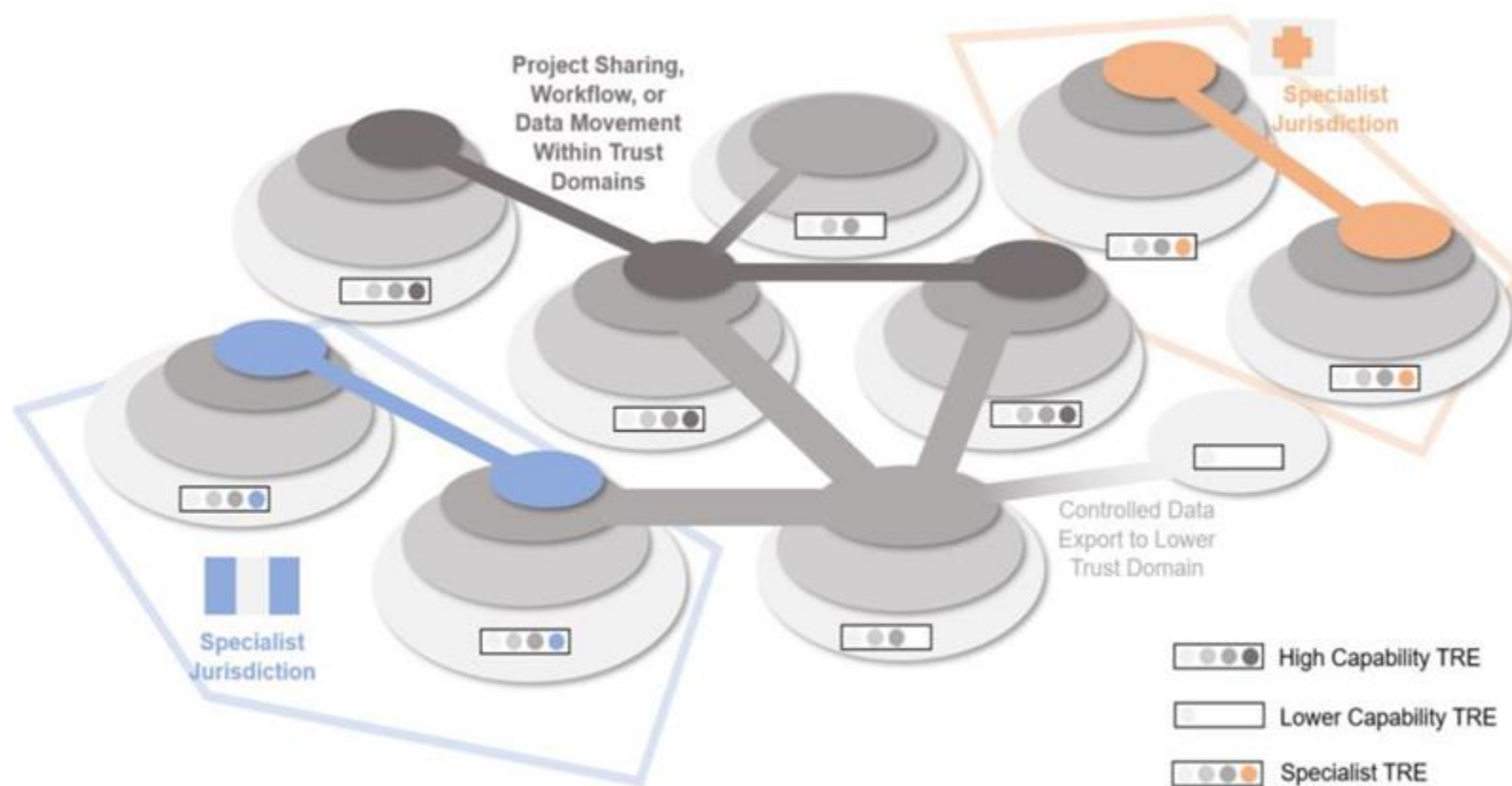
- Driver 4: Public-Private interactions between TREs in health and environmental data

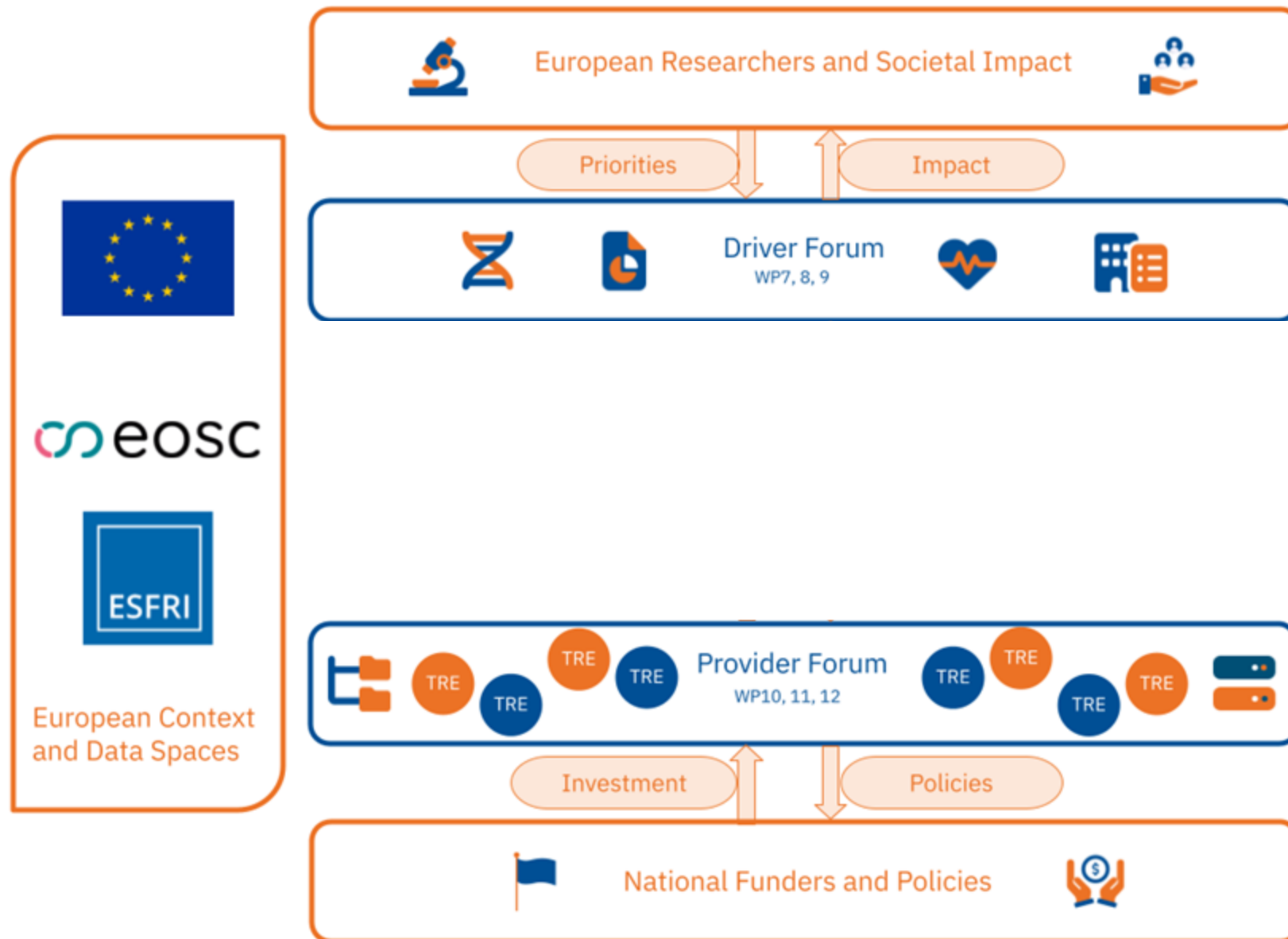


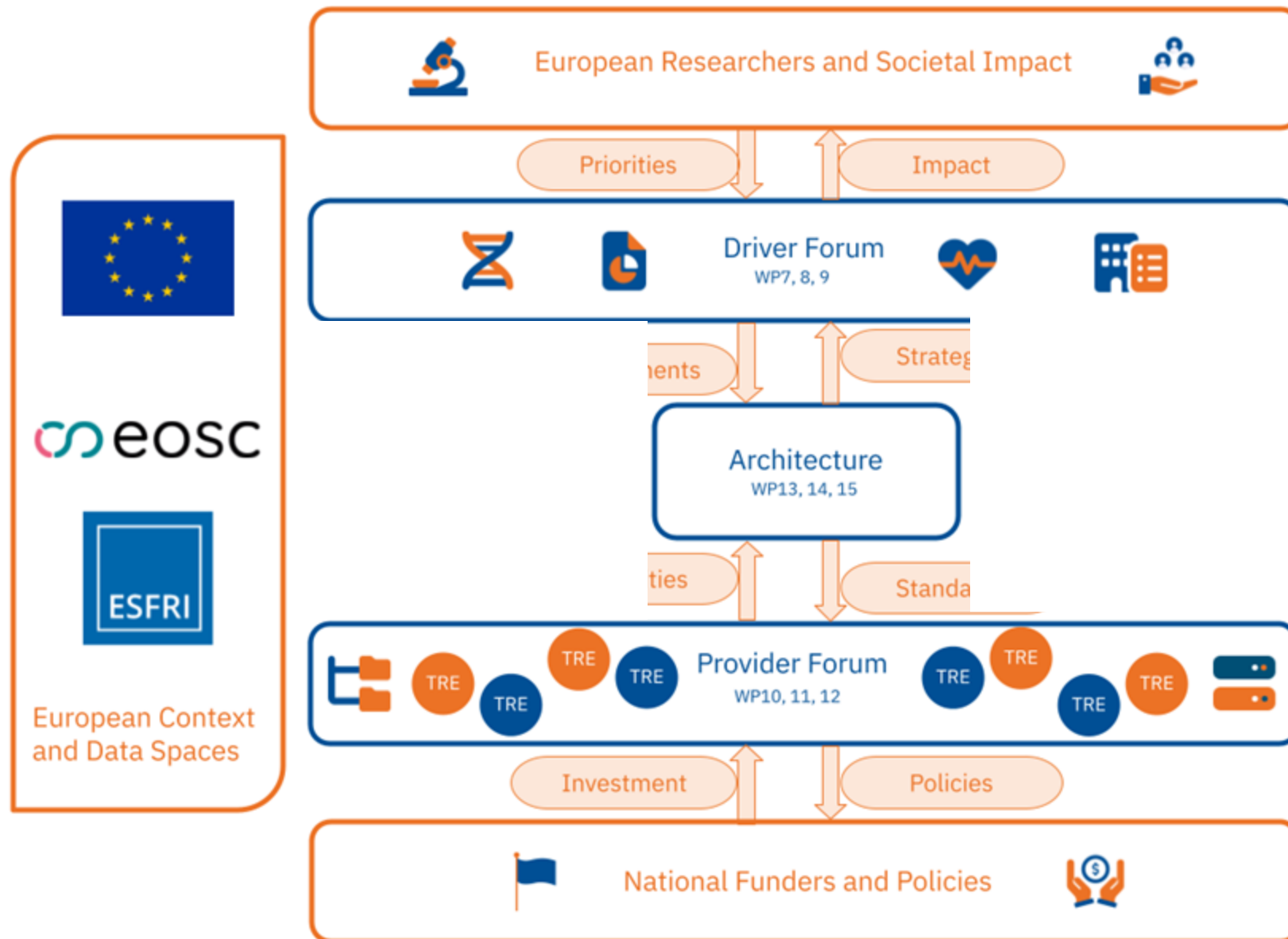


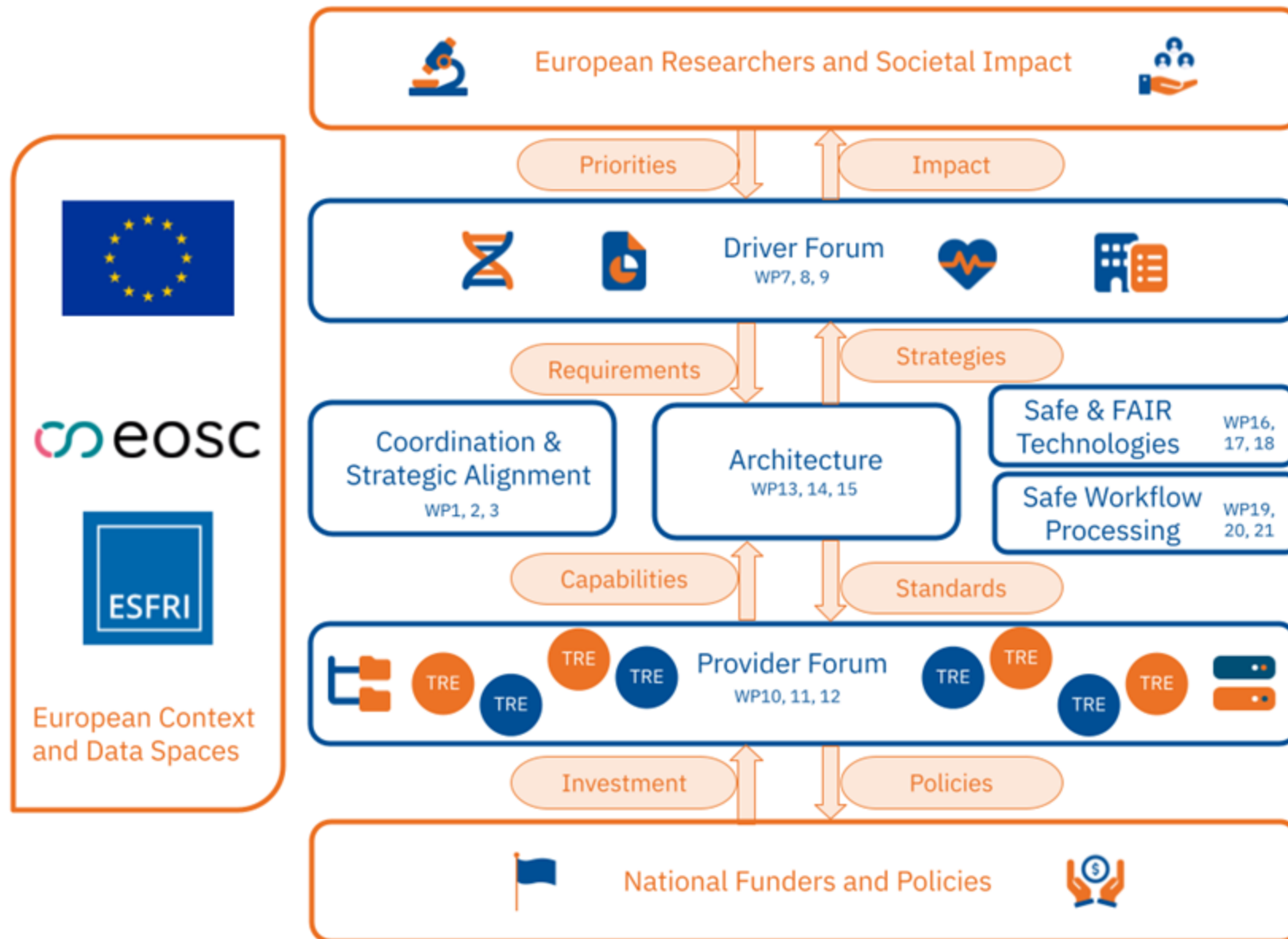
Provider Forum

TRE Providers Forum consolidate existing expertise and good practices for the common interoperability blueprint.



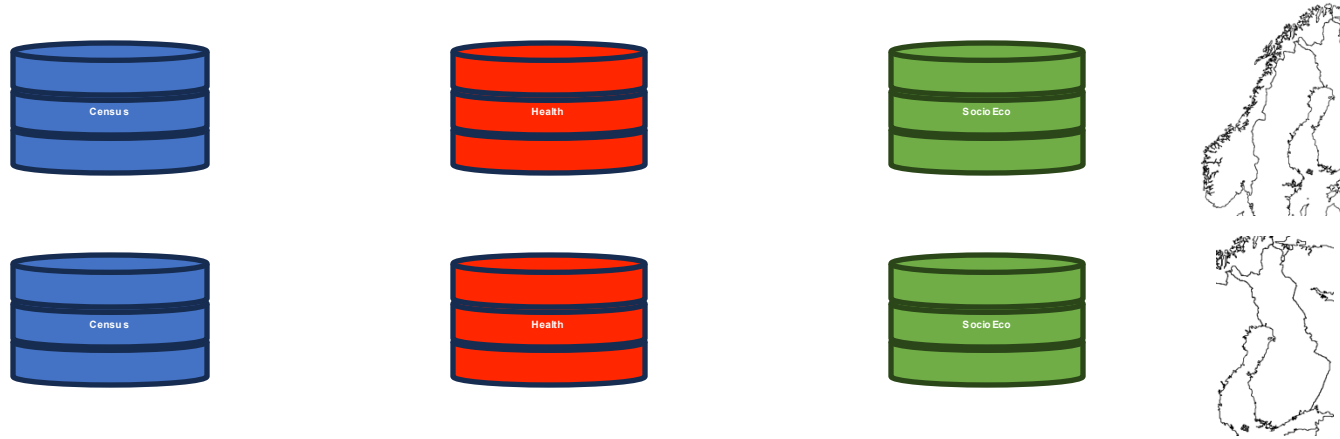






Fundamental challenge: research and policy-driven analyses on sensitive datasets

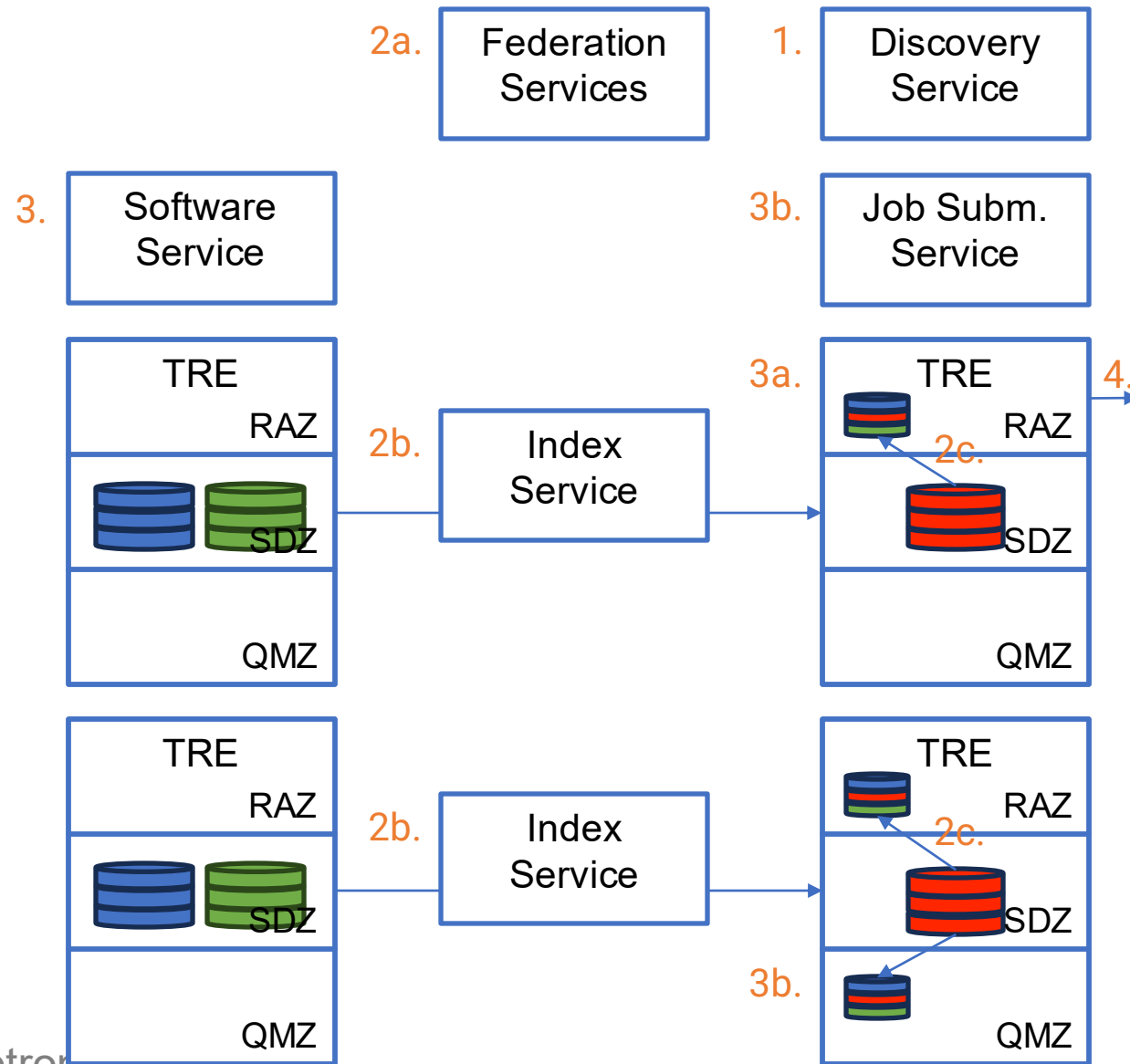
Q: *“Health issues in relation to income, education, age, and area of residence?”*



Common user journey:

1. Discover data / plan research
2. Get access to data
3. Analyze data
4. Report / publish results

Architecture for interoperable sensitive data research



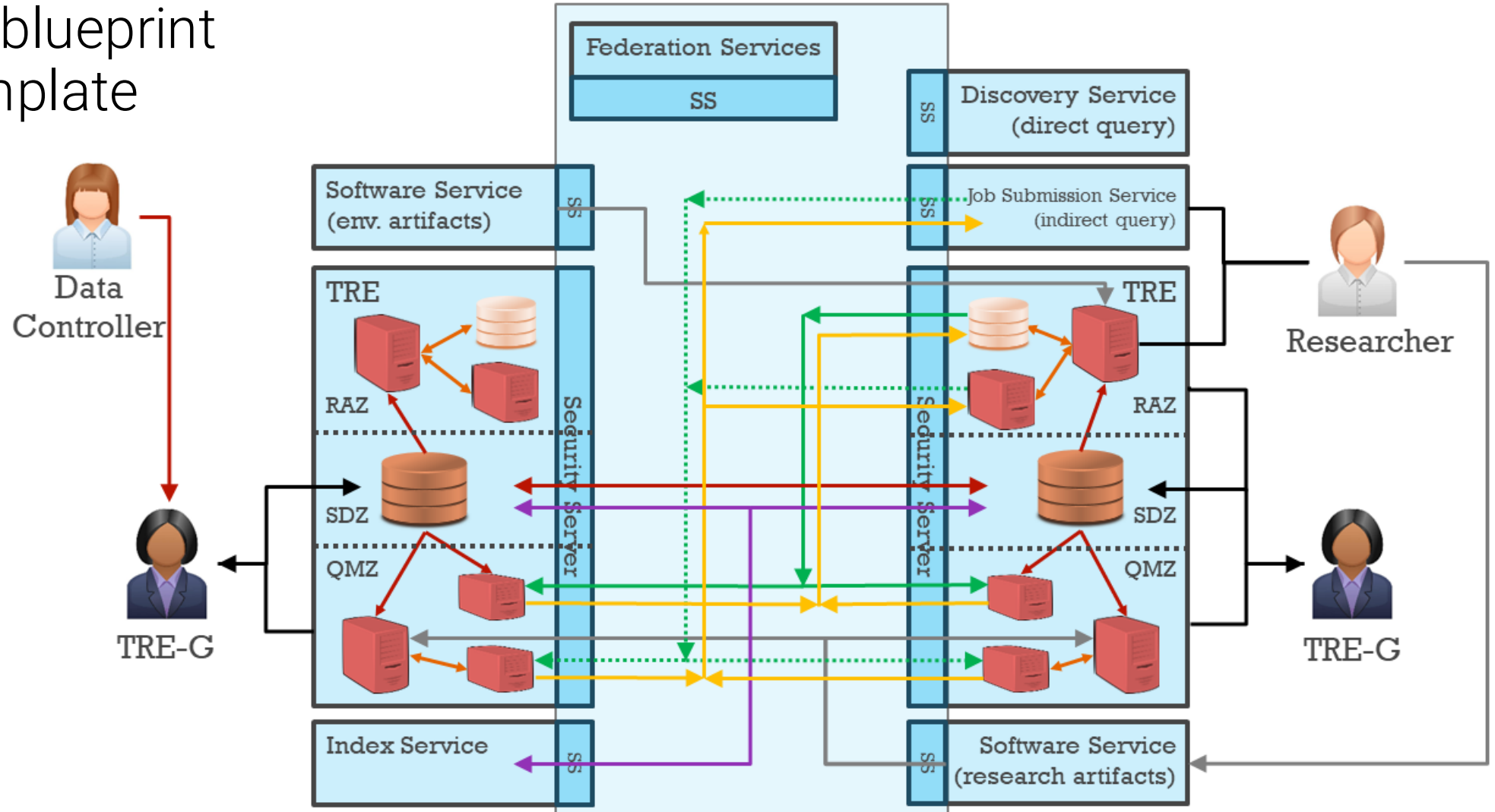
1. Discover data / plan research (R)
2. Get access to data
 - a. Register / apply (R)
 - b. Join data (IG)
 - c. Make available (IG)
3. Analyze data
 - a. Local (R)
 - b. Remote (R)
4. Report / publish results (R / IG)

R: Researcher

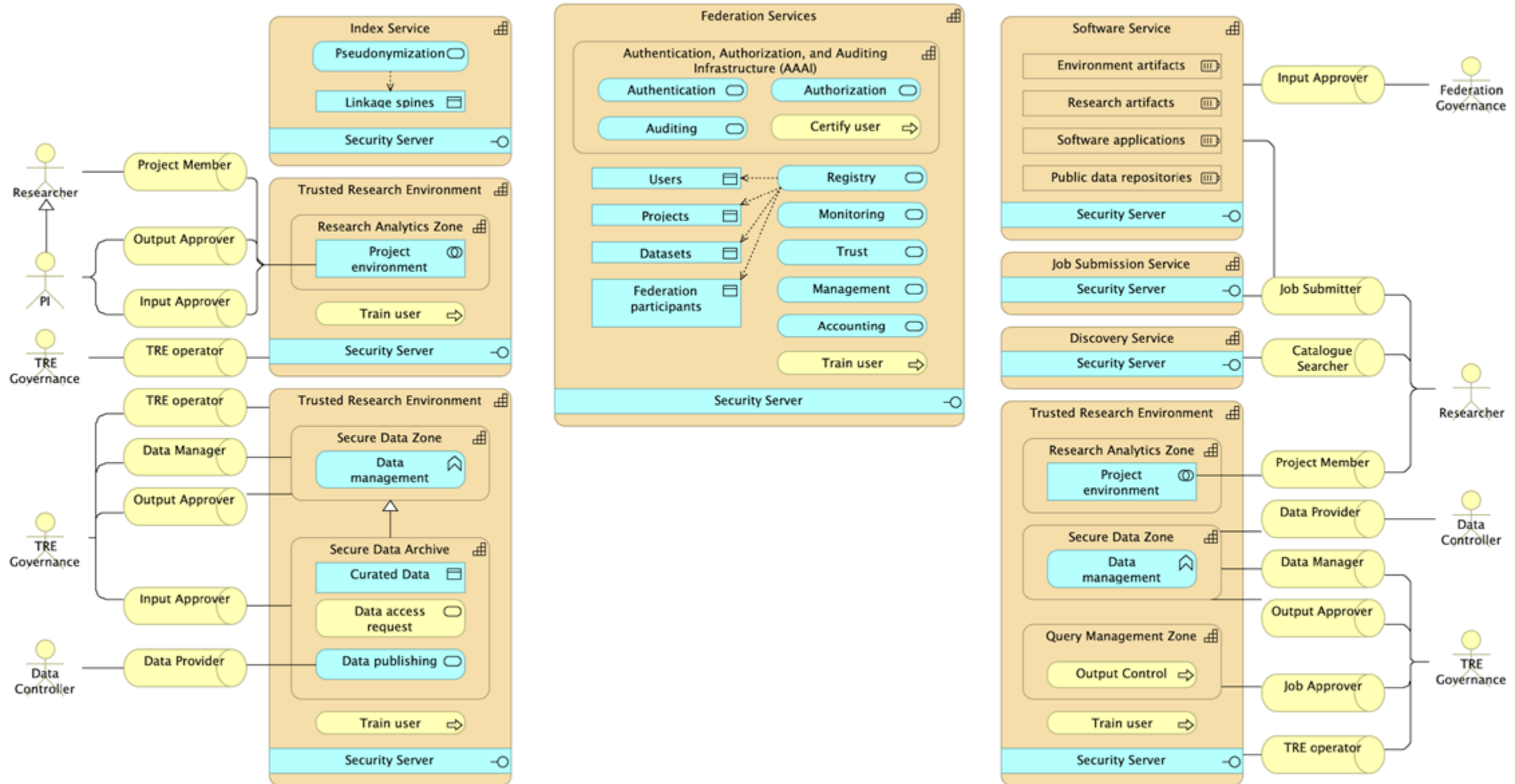
IG: Information Governance

EOSC-ENTRUST Blueprint Architecture

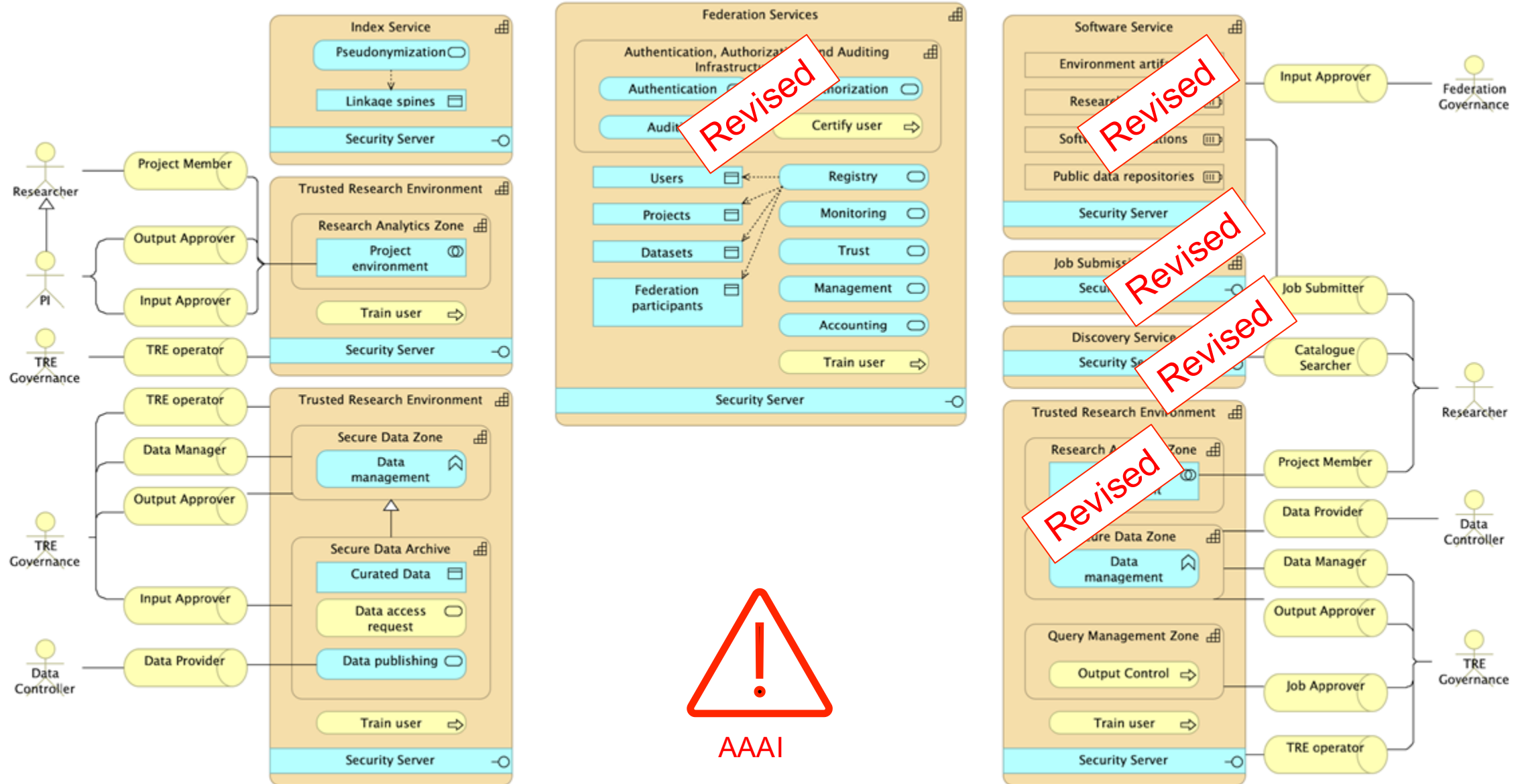
- DARE blueprint as template



EOSC-ENTRUST Blueprint Architecture v1



EOSC-ENTRUST Blueprint Architecture v1.5



Current outputs

1. Driver requirements year 1 & 2
2. Provider capabilities year 1 & 2
3. Catalogue of European TREs and their capabilities year 1 and 2
4. Federation Blueprint Architecture year 1.5
5. AAI Blueprint architecture year 1
6. Analysis demonstrator year 1

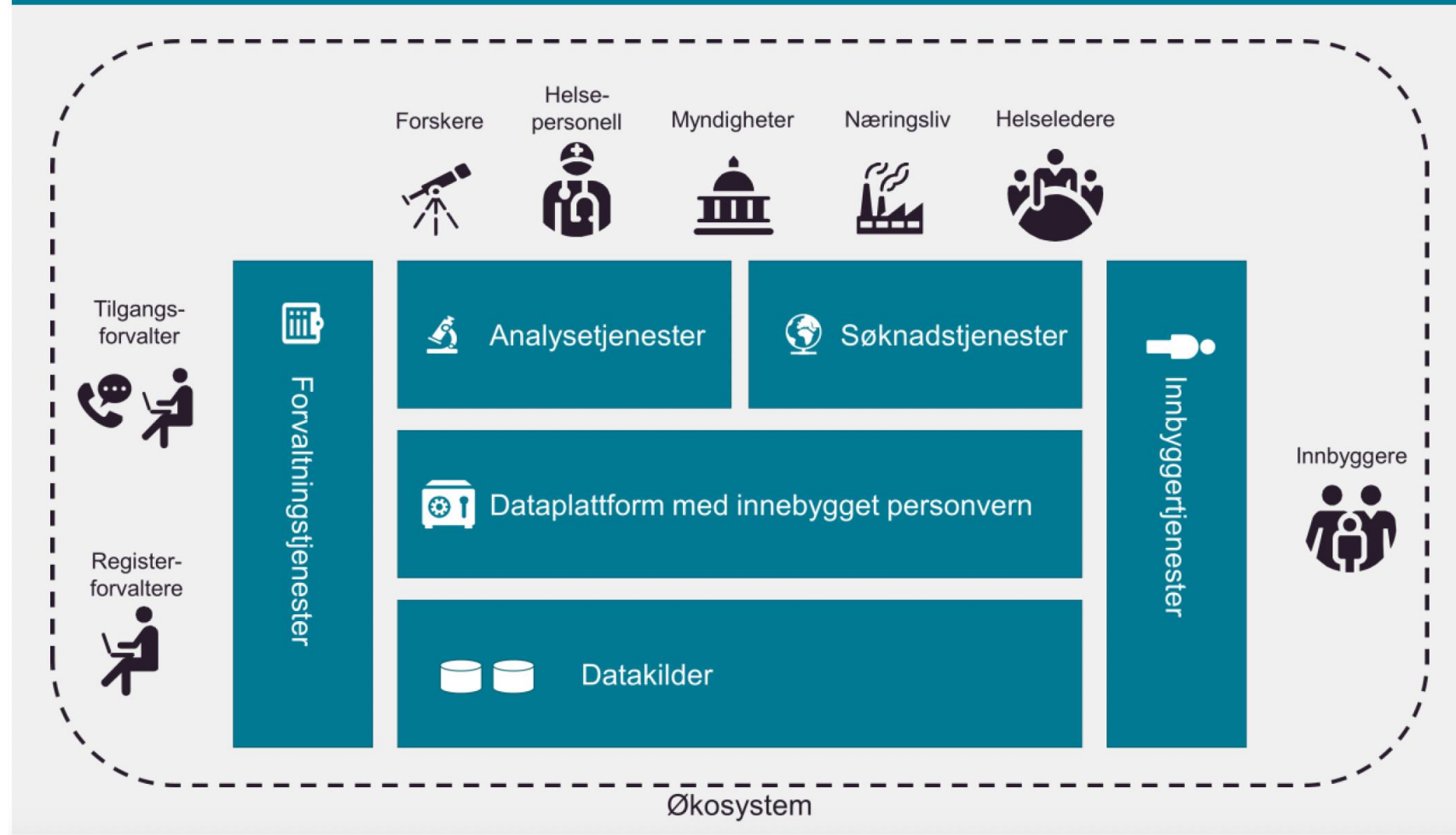
Year 2:

1. Refining Blueprint
2. Trying to define federation interfaces

The view from Norway

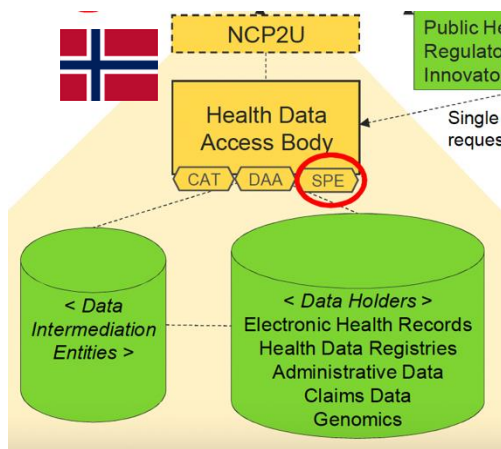
- Health data as the new gold (or oil)

Figur 19 - Illustrasjon av funksjonalitet i anbefalt konsept for Helseanalyseplattformen



The view from Norway

- NORTRE as national SPEs for health data



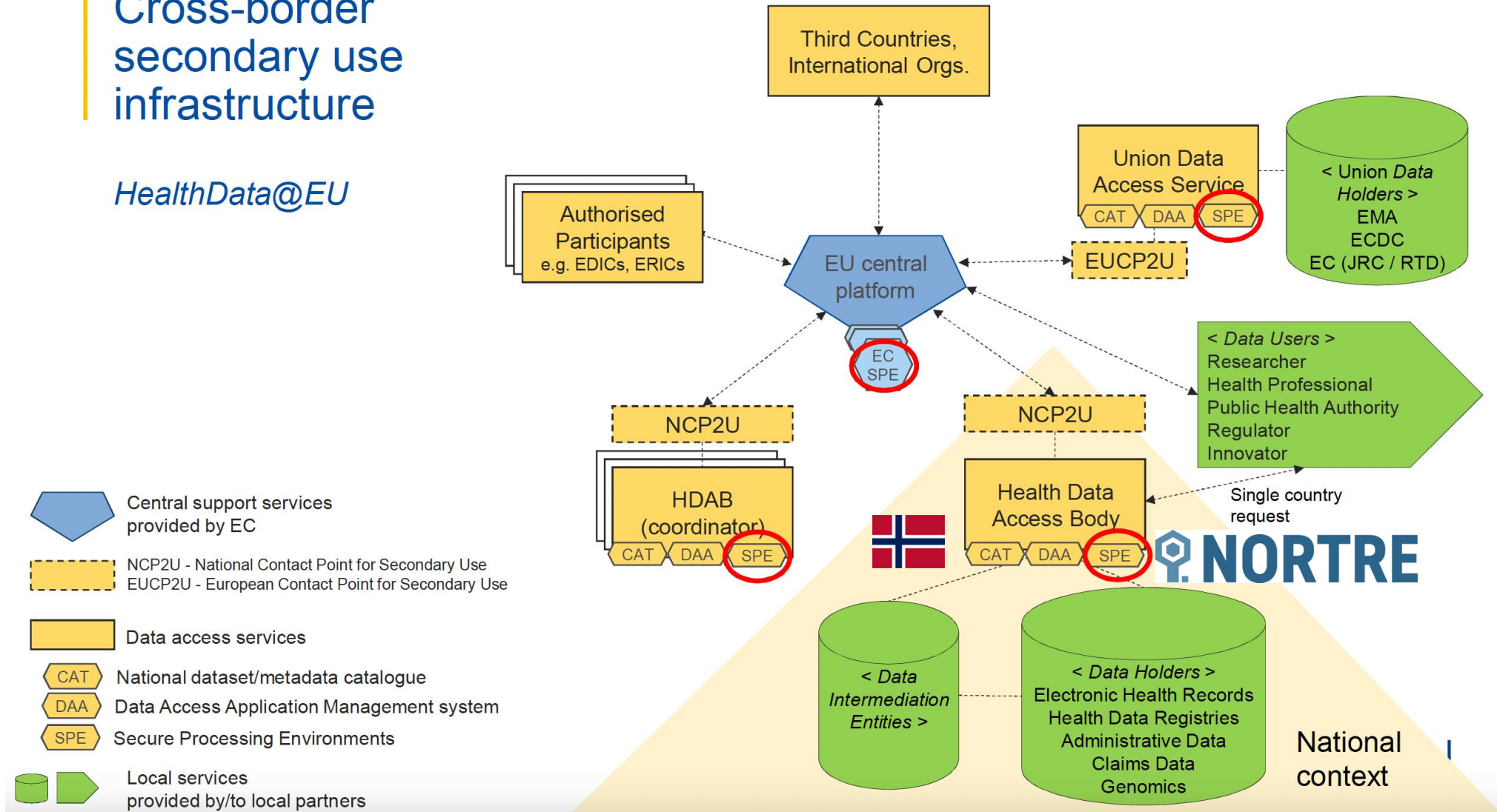
Figur 19 - Illustrasjon av funksjonalitet i anbefalt konsept for Helseanalyseplattformen



The view from Norway

Cross-border secondary use infrastructure

HealthData@EU



NORTRE

- >10 years
- Supporting most regions, domains and sectors
- Hosting registries, collections and archives
- Towards EHDS requirements and ISO27001
- Towards TRE federation
- Consortium as national infrastructure from 1.1.2026



NORTRE

“Federation”

- Data transfer between SAFE and TSD
- eDelivery to connect to Norwegian and European central HDAB
- Slurm API from TRE to HPC being developed
- Eessi / CVMFS being set up

Missing:

- Identity trust
- 3 different IAM solutions





ENTRUST

European Network of Trusted
Research Environments

 www.eosc-entrust.eu

 [@eosc_entrust](https://twitter.com/eosc_entrust)

 [/company/eosc-entrust](https://www.linkedin.com/company/eosc-entrust)



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University of
Nottingham
UK | CHINA | MALAYSIA

Technical candidates for federation

What is good federation for research?

Jonaa Eva, University of Nottingham



What is federation?

Independent organisations working together through agreed-upon standards and protocols, while keeping control over their own data, services, or platforms.

- Federation is **many** platforms working together, not one.
- Federation is an **ecosystem**, not a single system.
- Federation is **collaboration**, not control.



What is federation in research?

Federation in research aims to mitigate barriers inherent in conducting research on sensitive, siloed, and disparate data.

- What is *possible*?
- What is *useful*?
- What is *acceptable*?

Discovery

Analysis

Learning

Federated research spectrum



Programme vision and objectives

Federated Analytics



Transform how **researchers securely access** and analyse data across multiple locations.

- Secure exchange
- FAIR and transparency
- Safe tools and services

TREvolution

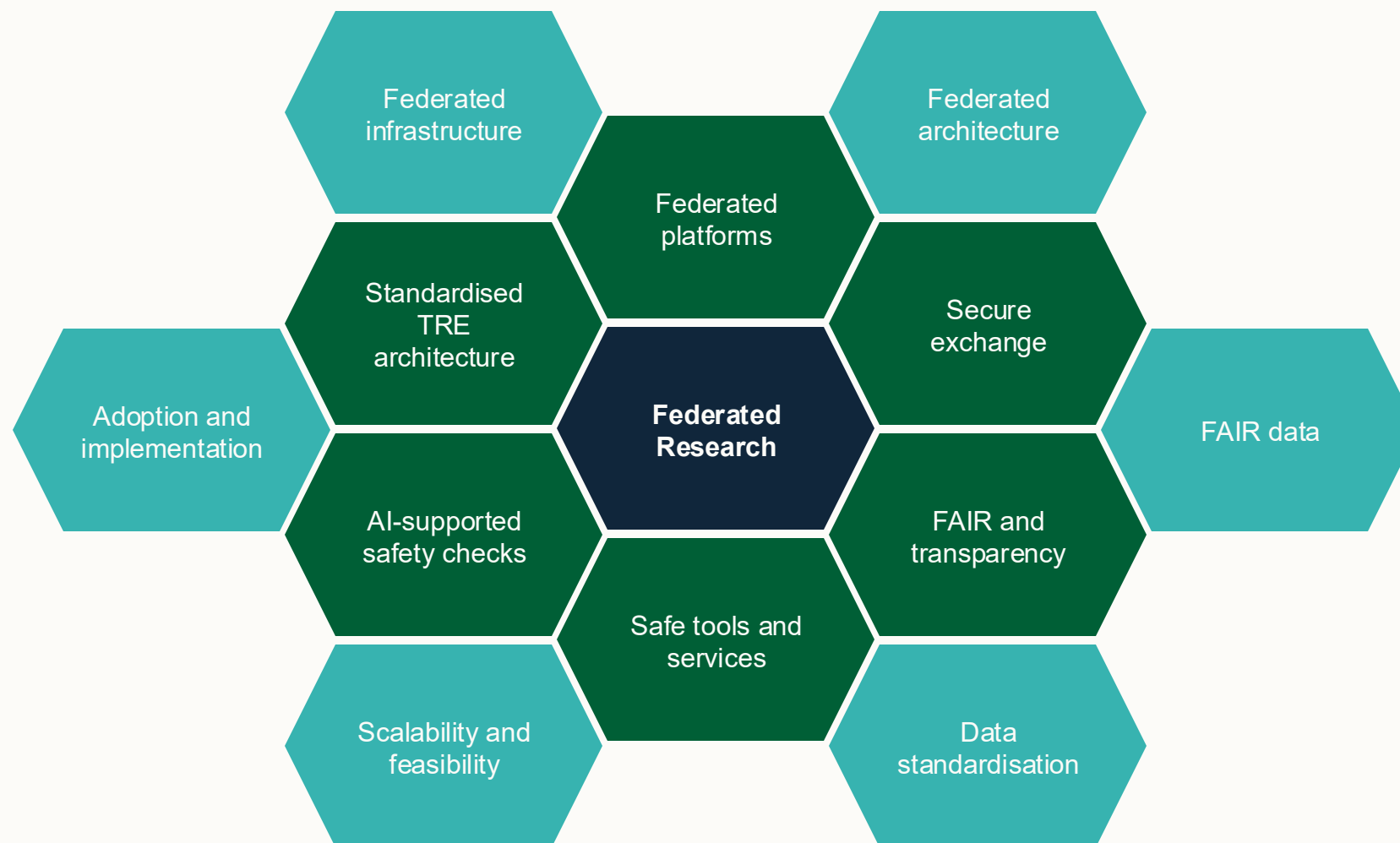


Improve the way **researchers securely access** and use sensitive data.

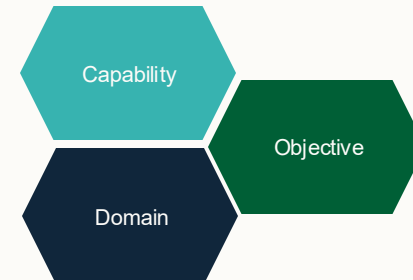
- Standardising TRE architecture
- AI-supported safety checks
- Federated platforms



Delivering federated research



Legend





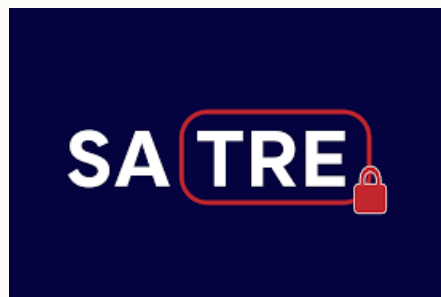
Towards federated research



Adopt standards

Demonstrating how existing international standards can be used to build trust and enable federation.

- Compliance with standards providing assurance
- **K8TRE**: open-source platform on Kubernetes
- DARE Early Adopters → what is suitable, relevant and appropriate?

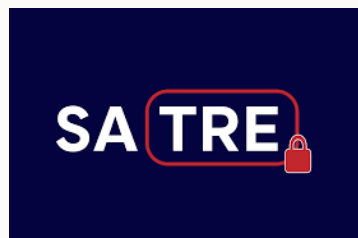




Build trust

Developing frameworks and tools to build trust between TREs, the public, and technology providers.

- **PPIE**: Public advisory boards, public co-leads, open events
- **SATRE** specification standardising capabilities of TREs
- **Five Safes RO-Crate** approach for packaging metadata

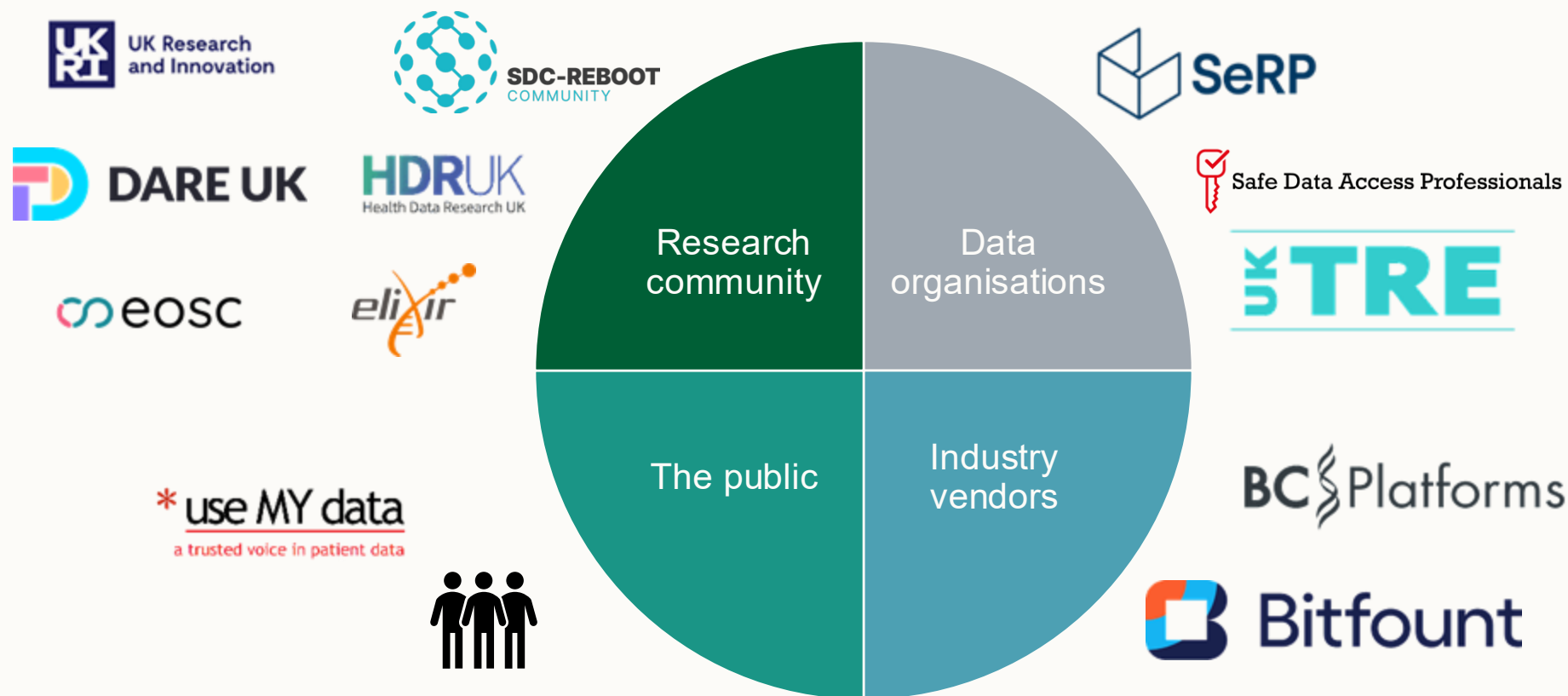


5S RO-Crate



Engaging the ecosystem

We must engage with groups across the ecosystem to build trust, understand requirements and surface expectations.





What's important to TREs?

- Understanding importance of elements that TREs consider when managing sensitive data.
- Trust between TREs
 - Control over analysis movements and the levels
- Data access
 - Different modes of data access between a federation of TREs





Enable federation

Establishing methods to address the complexity of undertaking research that involves many TREs.

- **Director:** supporting a federated standard operating model
- **Five Safes (5S) TES:** implementation of GA4GH TES standard for interoperability
 - Singapore-UK use-case: synthetic OMOP data



5S TES



Bunny



5S RO-Crate



Accelerate research

By promoting standards, building trust and enabling federation, we aim to speed up discoveries across multiple TREs.

Discovery

Analysis

Learning

- **HDR Gateway** enabling cohort discovery
- **SACRO** supporting output checkers to enhance oversight
- Aligning governance with **Five Safes framework**





Delivering federated research





What is good federation for research?

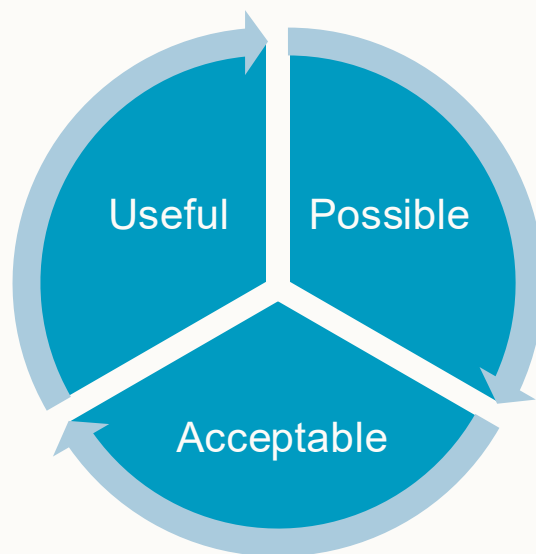


What is good federation for research?





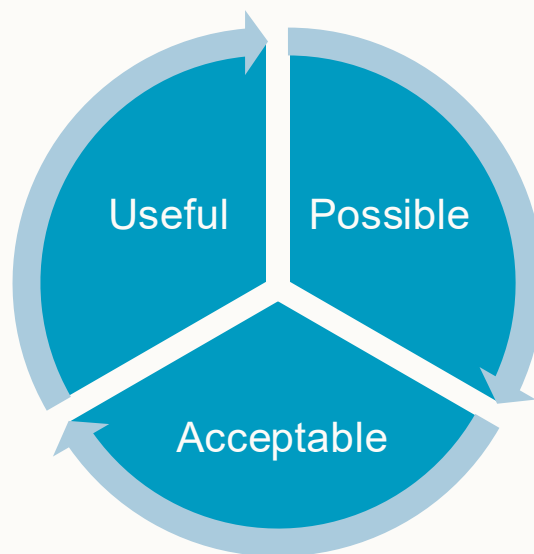
What is good federation for research?





What is good federation for research?

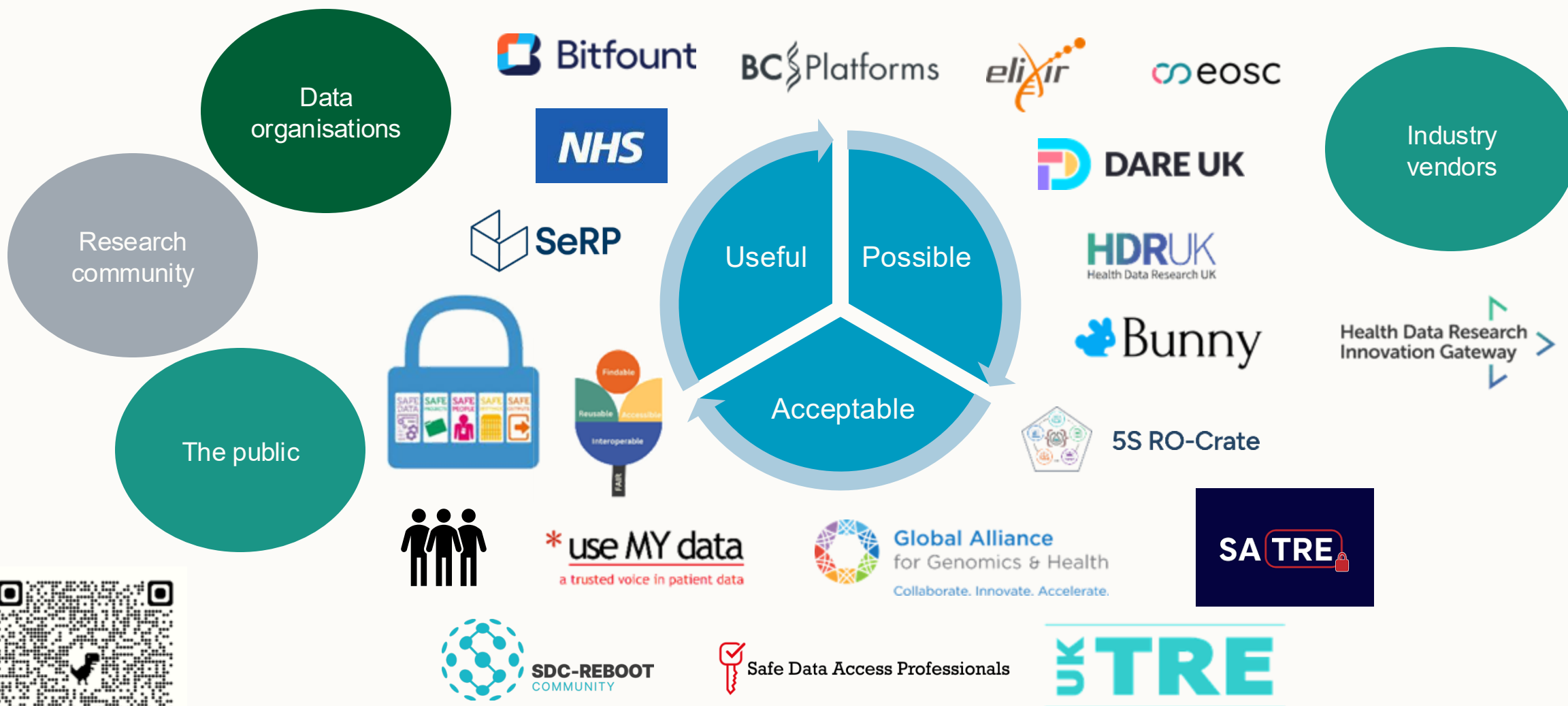
Adopt **Standards**. Build **Trust**. Enable **Federation**. Accelerate **Research**.





What is good federation for research?

Adopt **Standards**. Build **Trust**. Enable **Federation**. Accelerate **Research**.





Get involved!

- Durham University
- Lancaster University
- National Health Service Scotland
- Nottingham University Hospitals NHS Trust
- Research Data Scotland
- Swansea University
- University College London
- University of Basel, Switzerland
- University of Cape Town, South Africa
- University of Dundee
- University of Manchester
- University of Nottingham
- University of Queensland, Australia
- University of West England



TREvolution



Federated Analytics





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Thank you