Making Fusion Data FAIR as a prerequisite to using Open Cloud Resources

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This project has received funding from the Euratom research and training programme 2014-2018 under grant agreement No 847612

Fair for Fusion – Open Access for fusion data in Europe

- Project duration: 24 months

(2019-2021)

- Total budget: € 1 987 960

Consortium: 7 partners

In Fair4Fusion we work on:

- Comprehensive assessments of **FAIR data requirements and open data issues** in fusion programme
- **Recommendations on the best technical approaches** for providing access to data
- Development of **support platforms and tools required to implement an open data policy** adapted to the needs of the fusion research programme.
- **Pooling the talent and knowledge** from big science programmes and organisations

With the objectives of:

- Further developing tools and platforms needed for an open data approach.
- Raising the profile and awareness of FAIR and open data within the fusion programme.
- Laying the foundations for implementing an **open data policy adapted to the needs of the present and especially the future fusion energy research programme**, particularly in the run up to the operation of ITER from the middle of the next decade.

Project website: https://fair4fusion.eu/

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Background

EUROfusion

EU funded project – not currently a LE

Co-ordination of fusion research in Europe (50% funded)

Funded JET operations and part funded some national facilities

Facilities all have at least 50% national funding and operate under local rules

Interest in FAIR is mixed, even FAIR within the community

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china eu india japan korea russia usa

Self governing, but with links to EUROfusion and IAEA

Provides some funding for specific tasks through direct contract (through F4E)

Has provided work on common ontology and access methods, but currently not open

Strong technical interest in FAIR

IAEA

International Atomic Energy Agency

Provides international collaboration opportunities for fusion and fission research.

Provides high level policies which are implemented at national levels.

Interest in FAIR but not in position to mandate

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Context and activities

- Several initiatives to bridge Fusion community and EOSC ecosystem
  - EOSC-hub Fusion Competence Center to evaluate selected data management technologies and AAI
    - Pilot of B2* and OneData services
    - Use of containerized **IMAS** (ITER Modeling and Analysis Suite) environments
    - Testing fusion workflows on the cloud – using **uDocker** and Singularity
  - EOSC-Pilot use case related to cloud compute technologies uptake
    - **Prominence** service which is now available through EGI via the EOSC marketplace
  - EUROfusion AAI pilot – to pilot selected Federated AAI technologies
  - FAIR – **Fair4Fusion project** – to work on **FAIR related issues -> focus of this presentation**

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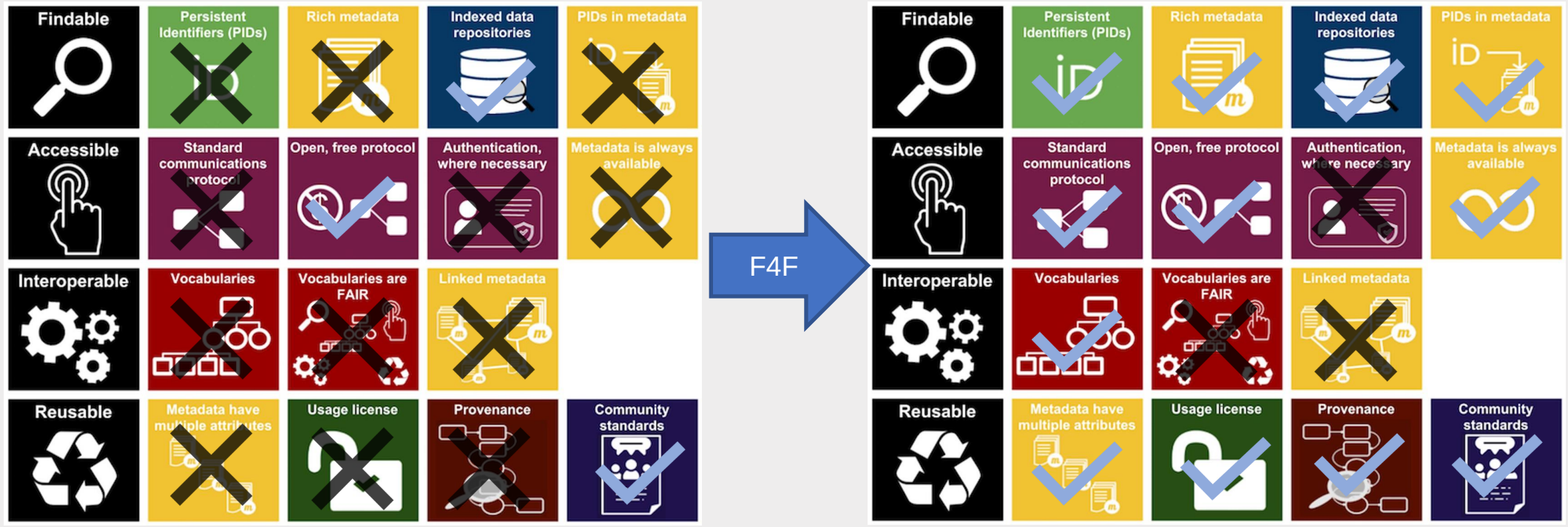
Fair4Fusion Challenges



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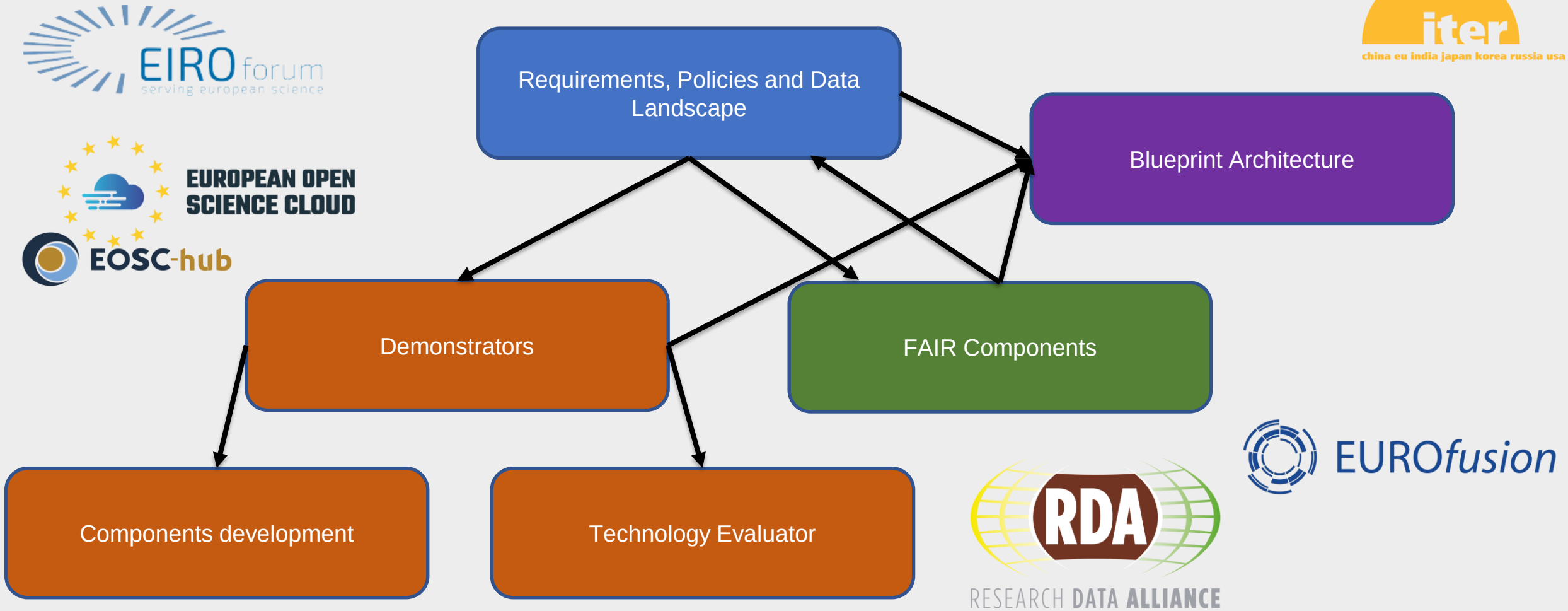
Project approach



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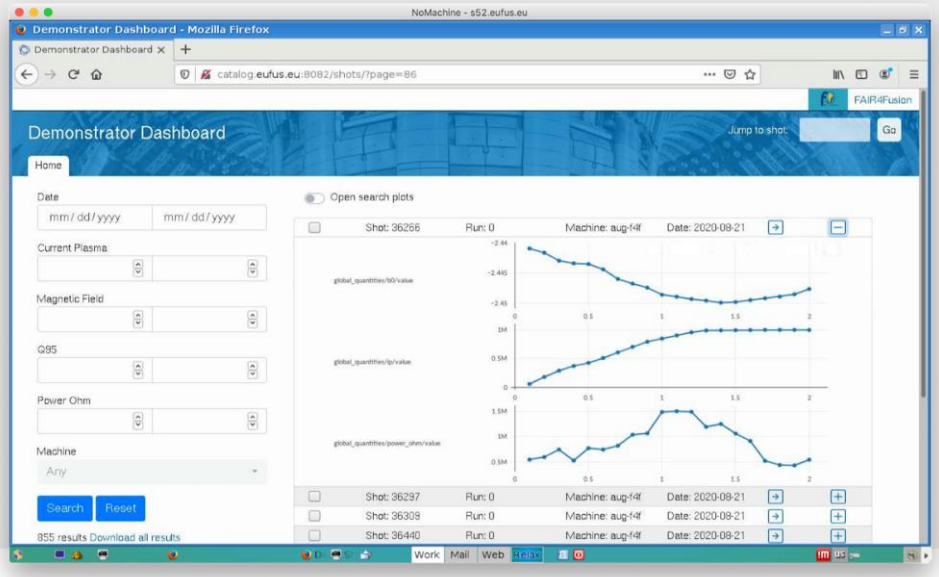
Fair4Fusion Demonstrators

Two different demonstrators to prioritise different technologies and approaches (presented during previous session ;))

- Demonstrator #1
  - Data and metadata ingestion from various sites
  - Based on re-use of existing components
  - Use of IMAS and EUROfusion Gateway
  - Using Federated AAI
- Demonstrator #2
  - Alternative metadata representations
  - Alternative visualisation frameworks
  - Search technologies



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Main Achievements and Recommendations

- Achievements
  - Introduced DC elements into Data Dictionary
  - Most sites now capable of supplying IDS formatted metadata
  - Two demonstrators received well
- Recommendations
  - Licensing (CC-BY-NC-SA)
  - Agreed to use Summary IDS, FAIR IDS and Machine Description IDS as metadata model
  - Standard Provenance Model and introduction of provenance into IDS structures
  - Blueprint Architecture for full implementation with phased cost model.

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Current State and Problems

- Funding
  - FAIR4Fusion was a project and was never funded to make anything operational
  - EUROfusion are considering funding “scenario A” which is a minimal implementation of the blueprint architecture, and prototype “scenario B” (common data access)
    - But EUROfusion is also a project
  - Much concern on ongoing costs
- Interest in making any service or data available through EOSC still subject to discussion
  - Not clear whether any current sevices are applicable
  - More looking at EUROhpc

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Summary

- Big step forward for the community towards FAIR and Open Data
- EOSC ecosystem technologies, services and best practices as an inspiration
- Looking forward to feedback from EOSC community on the Blueprint Architecture to validate correctness of approaches
- Still to do…
  - Data access from the portal – looking into EOSC technologies
  - Demonstrate data subscription service so downloaders get a notification
  - Actually get a PID service up and running for the community
  - Complete blueprint architecture

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Questions?

For more please follow us on social media and check the web site for project updates

https://www.fair4fusion.eu

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https://www.facebook.com/Fair4fusion

https://www.linkedin.com/company/fair4fusion

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- BACKUP SLIDES

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Where does Fusion sit in FAIR?

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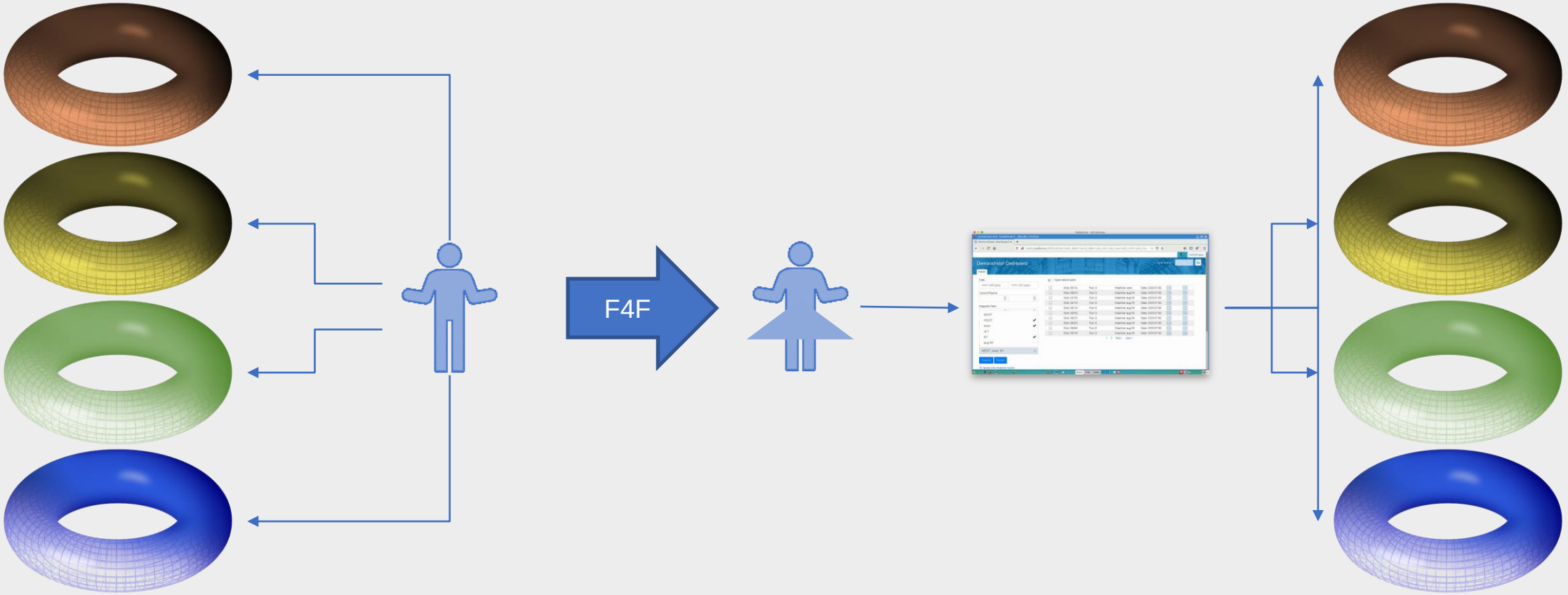
Goals



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Background

- The EOSC provides potential opportunities in terms of scalability and flexibility which have never previously been available to European researchers, including those involved in the fusion community.
- For Fusion community, the uptake of resources provided by the cross infrastructure projects, including those provided by EGI and EUDAT has been hampered by a number of policy, political and infrastructure related issues.
- Recent drives by EUROfusion and some national funding agencies are starting to bridge these issues.
- The potential use of external HPC and cloud resources offer the community access to larger scale and newer technologies.
- Increased uptake of cloud facilities making use of the planned FAIR data portal for Fusion is being investigated

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