

From e-JERICO pilot to a reliable and sustainable e-infrastructure

JERICO-CORE (or J-CORE) (COASTAL OCEAN RESOURCE ENVIRONMENT)

JERICO-DS WP3 - Now and looking forward
November 18, 2021

Miguel Charcos and Sebastien Legrand on behalf of the JERICO-DS and JERICO-S3 partners contributing to the ongoing e-infrastructure development and evaluation efforts

IEEE, SOCIB, RBINS, SMHI, AZTI, SYKE, FMI, MARIS, IFREMER, ETT, BLIT, IODE, CNRS-LOV, CNR, TALTECH

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JERICO-CORE (e-JERICO)

- **What?**

An e-Infrastructure that addresses the needs of coastal ocean researchers and other users for digital services in terms of networking, computing and data management.

- **Why?**

To increase the scientific and societal impact in a long-term sustained RI.

- **How?**

Providing a unified central hub of JERICO to virtually find, discover, access, manage and interact with JERICO resources including services, datasets, software, best practices, manuals, publications, organizations, projects, observatories, equipment, data servers, e-libraries, support, training, and similar assets.

- **When?**

JERICO-S3: Proof of concept to mature potential use and limitations

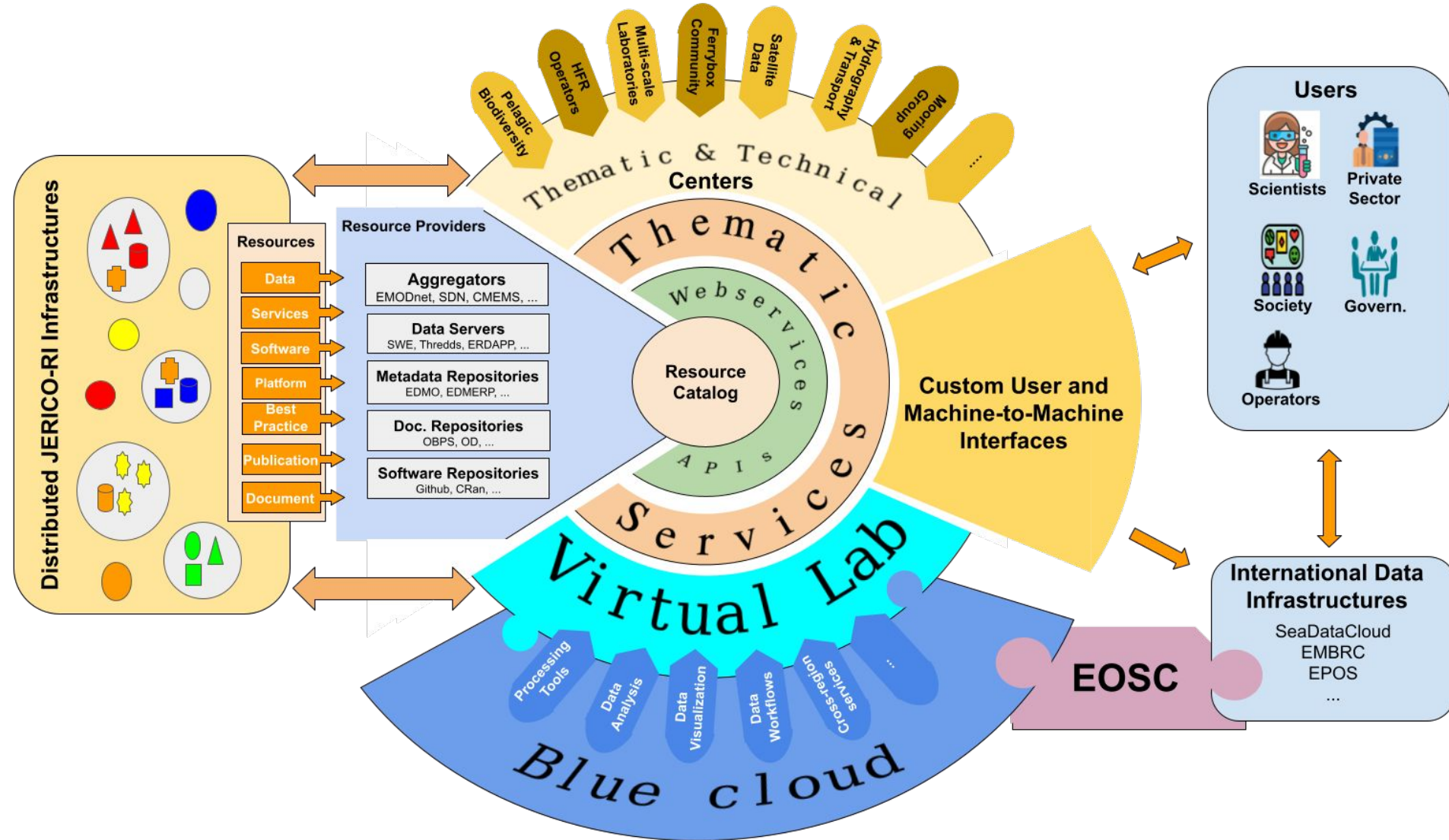
JERICO-DS: Clarify vision, define societal user and technical needs, and design for a long-term sustained e-infrastructure

Outline

- JERICO-CORE Concept
(JERICO-RI and International initiatives)
- JERICO-CORE Prototype (T7.5 JS3)
- Towards a sustainable e-infrastructure
(WP3 JDS)
- Discussion

JERICO-CORE Concept

JERICO-CORE Concept



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What JERICO-CORE Offers to Users?

- Discoverability of resources
 - Not a data repository but data across Data integrators (initially EMODnet, SDN, CMEMS)
 - Resource Access through a common metadata framework and robust machine to machine interfaces
 - Access to relevant best practices and documentation
 - Tools and software for producing information and analyses
- Framework to create services to support a wide range of expert and non-expert users for regional and local issues
- Computing and collaborative services: VRE for users (initially Blue Cloud)
- Interoperability with other RIs (initially EPOS)
- Monitoring and metrics capabilities
 - Operations status for observing systems
 - Cross-cutting use metrics to guide producers and users
- Built for evolution and future sustainability

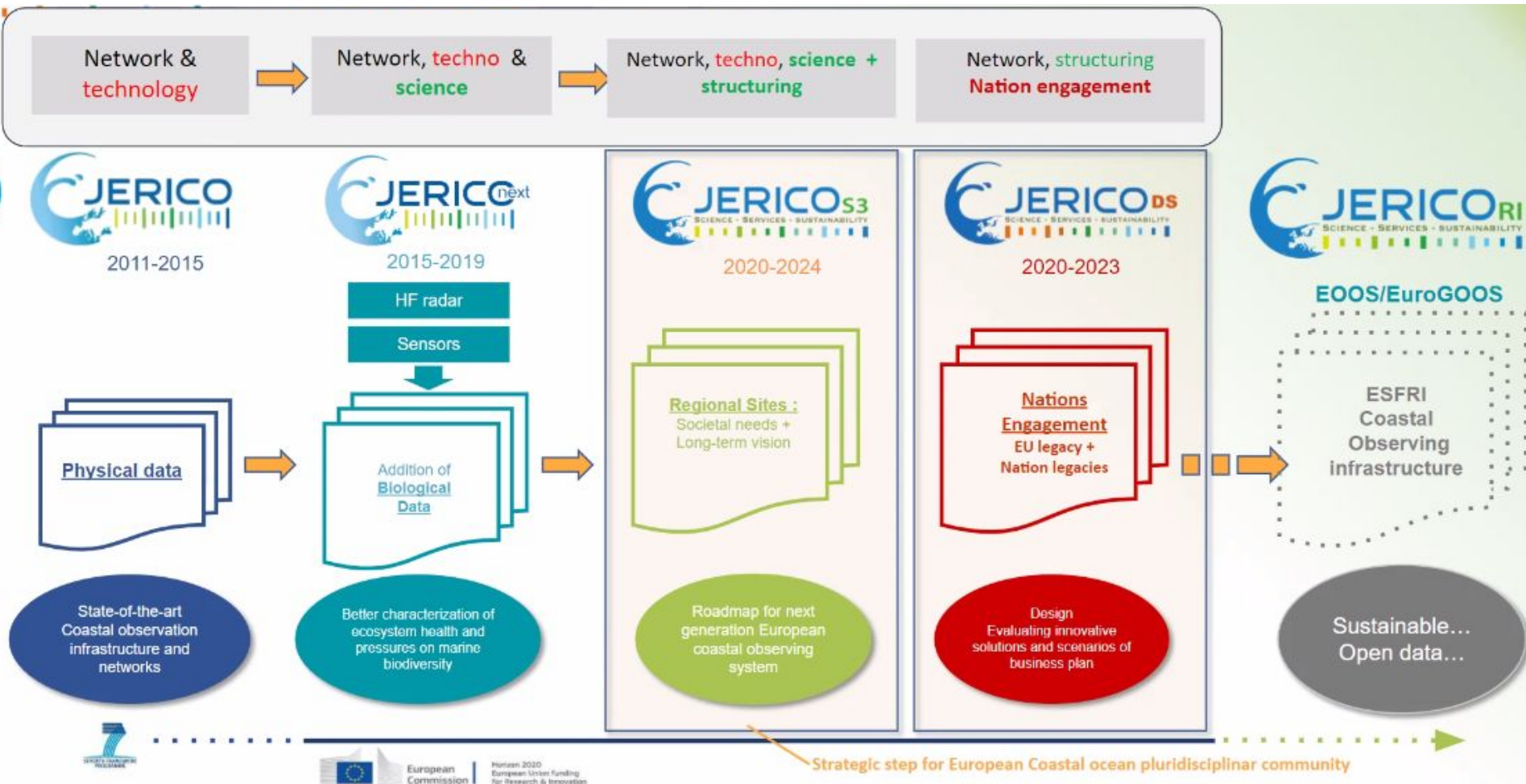
A “one stop shop” for users providing connectivity between functional capabilities and services.

JERICO-CORE Services

The heart of the infrastructure

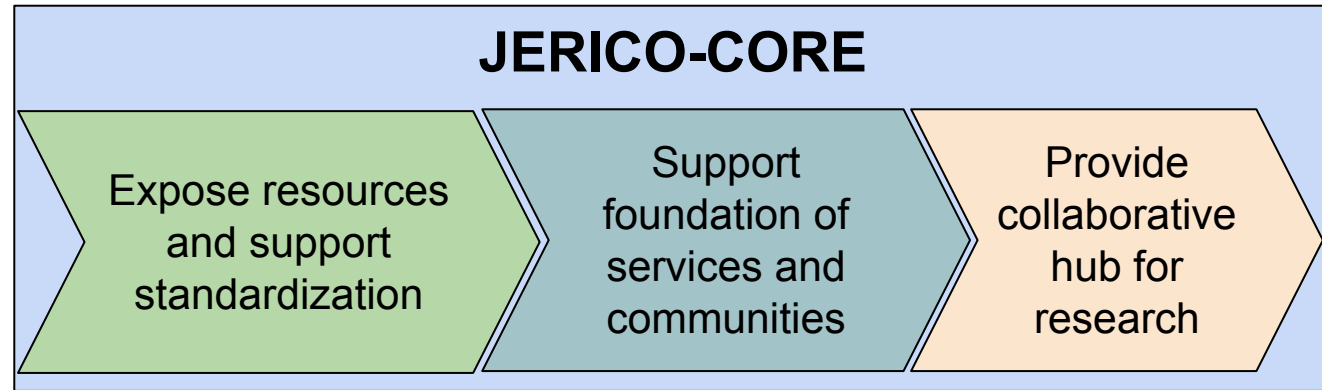
- J-CORE will provide an infrastructure for fundamental services for research, policy makers, society and private sector
- Services can take advantage of the resource catalog to find, search and access JERICO assets
- Services will provide support to main JERICO activities:
 - Data management
 - Transnational access
 - Data processing, QC and analysis
 - Modelling
- Services can be integrated to be accessed from a central access point
- Access and use of services can be measured in order to provide inputs for improving them or outreach activities
- Service definition and implementation depend on all of us

JERICO-CORE within JERICO Roadmap



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JERICO-CORE within JERICO Roadmap



Concept. Phase

Design Phase

Preparatory Phase

Implem. Phase

JERICO-FP7

JERICO-NEXT

JERICO-S3

JERICO-DS

JERICO-PP

JERICO-IMP

Build capabilities

Foundation of infrastructure

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JERICO-CORE Development Strategy

JERICO - S3 (T7.5 of WP7)

JERICO - DS (WP3)

REQUIREMENTS

JS3 partners and DoW description
International infrastructures interviews

T3.1 (Work in progress)
Nations & JERICO users/stakeholders
International infrastructures and initiatives

RESOURCE CATALOG

Jena catalog & harvesters
SPARQL and REST

T3.3 (Starts M18)

SERVICES

Thematic Services (D2PTS)
VRE - Blue Cloud (MoU)

USER INTERFACE

EPOS user interface (MoU)

DATA MANAGEMENT

T3.5 (Work in Progress)

MONITORING

VA Metrics System (VAMS) (WP11)
Resources monitoring

T3.6 (Starts M15) - KPIs

POLICIES

T3.2 (Work in progress)

OPERATIONS

Core deployment at DATARMOR
Core operated by SOCIB and Ifremer
Distributed resources by all

T3.4 (Work in progress)

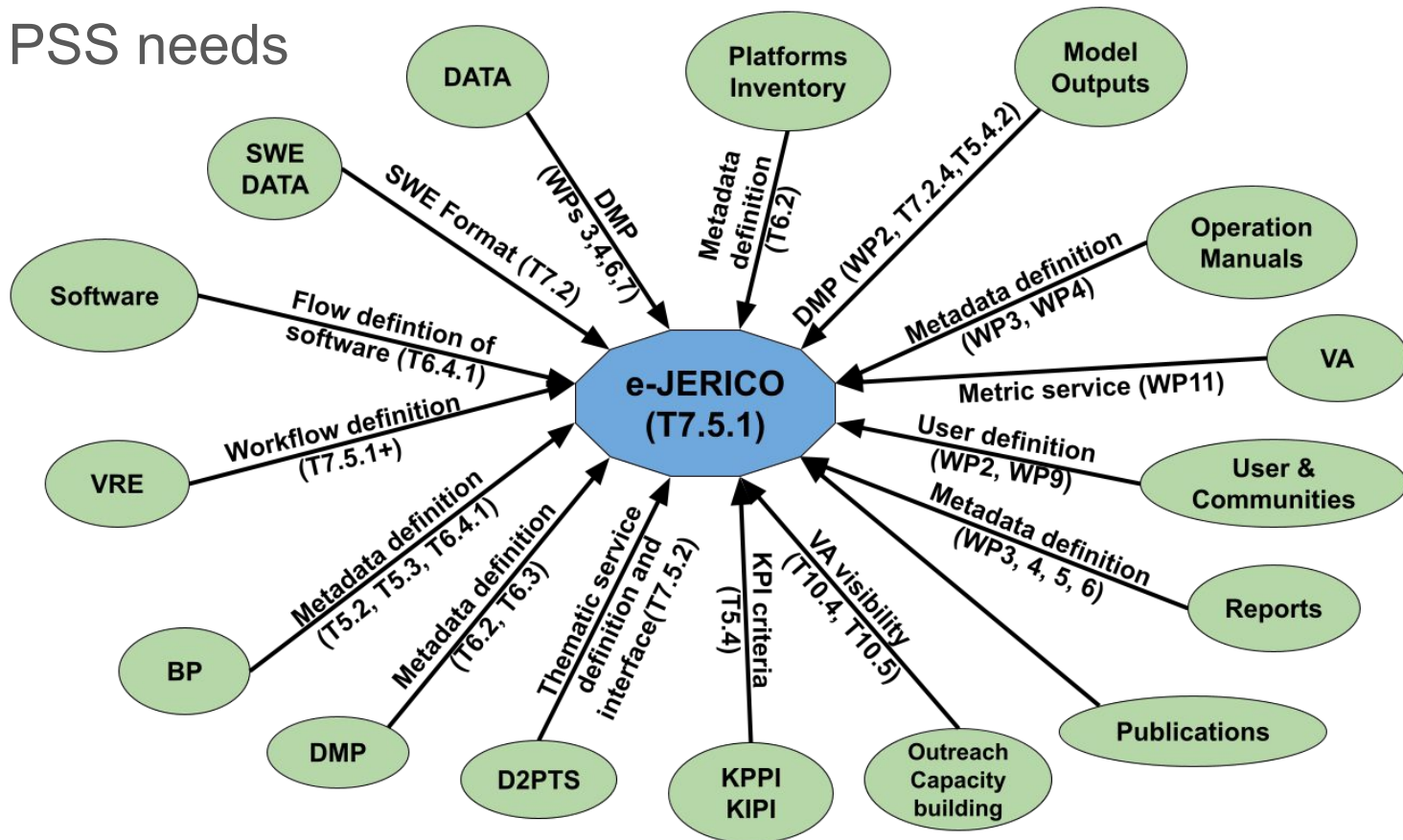
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JERICO-CORE Development Strategy - JS3

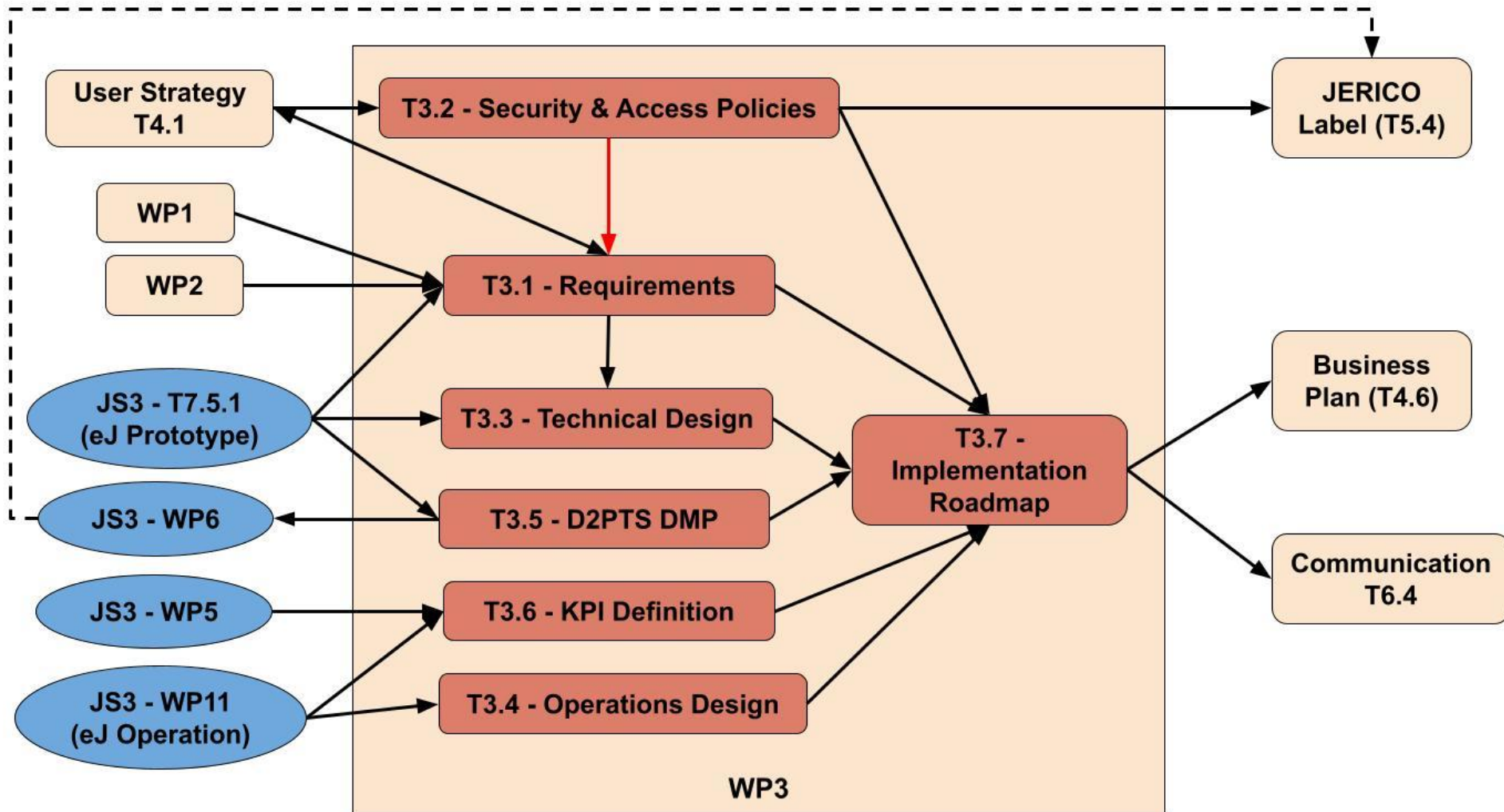
User driven and co-design

- Across JERICO-S3 WPs
- D2PTS use cases
- IRS and PSS needs



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JERICO-CORE Development Strategy - JDS



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JERICO-CORE Development Strategy

International Context

- Collaboration with European infrastructure including data aggregators and VREs



- In CoastPredict as the **Coastal Ocean Resource Environment (CORE)**
- International and cross-domain collaboration potential (for example)



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JERICO-CORE Prototype (JS3 T7.5)

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The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

Description and objectives of T7.5

- **Task 7.5:** JERICO e-Infrastructure (M1-M34): define and develop a Virtual Access (**VA**) scalable framework that allows the visibility and access of the JERICO-S3 resources with the aim of increasing the scientific and societal impact in a long-term sustained Research Infrastructure.

Description and objectives of T7.5

- **Subtask 7.5.1 VA Portal development (M1-M30):** Operational **requirements** will be derived with JERICO-RI partners, modelers, product developers and other experts in collaboration with WP11. Requirements will be used for detailed design of the VA portal. This development will include a **User Interface (UI)**, an **IT infrastructure**, **connectivity to the JERICO data and services catalogues**, **access** to the best practices systems and an e-library for tools and similar resources. In addition, the VA may provide access to aggregators like ROOSes/CMEMS (NRT), SeaDataNet (validated archives), EMODNet Physics and Biology portals. Access to **priority/mature tools from partners** will be incorporated into the VA and will help to test the e-infrastructure performance. This activity will set up the first elements of the JERICO e-infrastructure, e-JERICO, that will be **operated in WP11 VA** to support users.

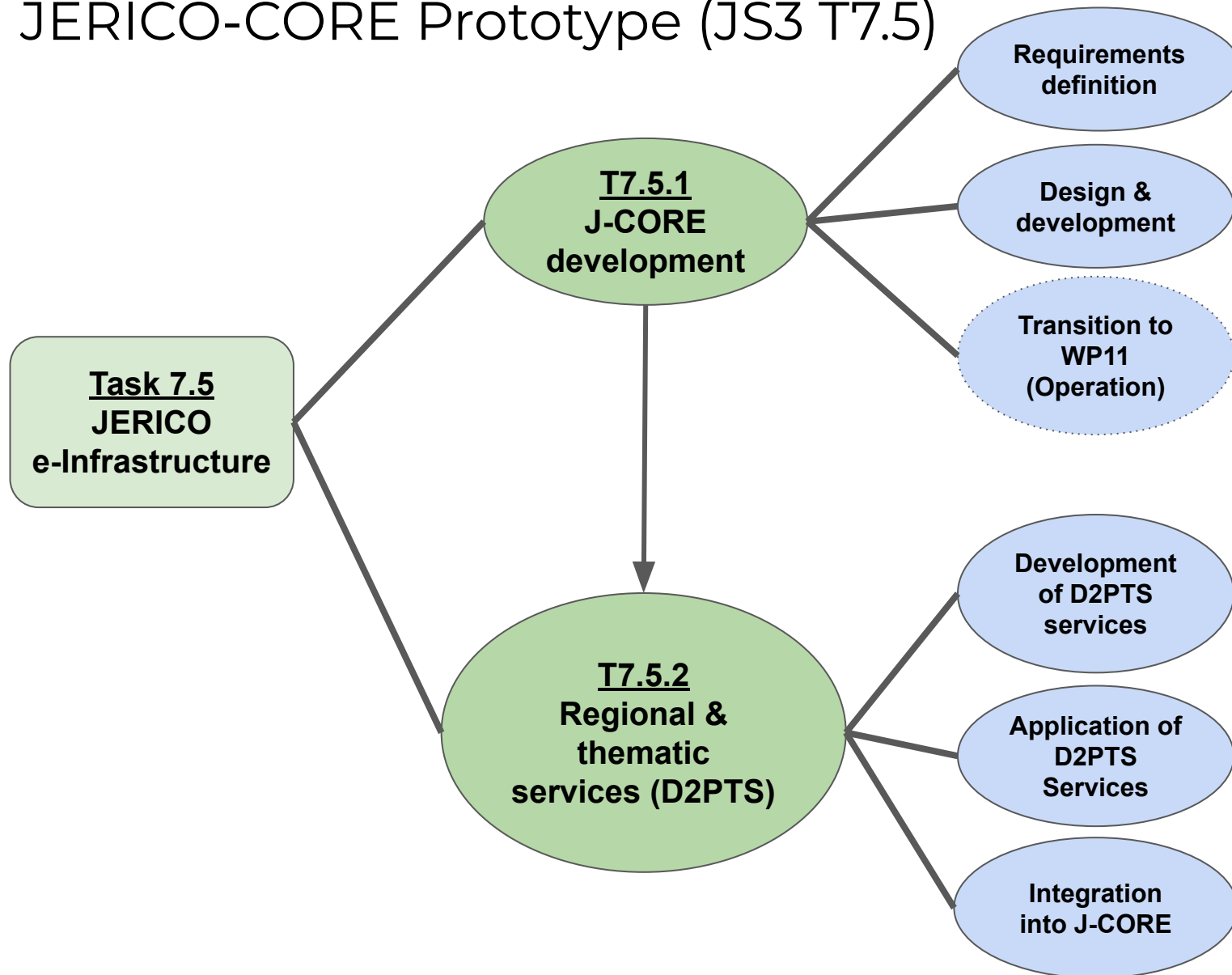
Description and objectives of T7.5

- **Subask 7.5.2: Data-to-Products Thematic Services (D2PTS) (M1-M25) :**

This subtask will create four pilot-focused regional/thematic services from JERICO-S3 data to demonstrate the benefits of the JERICO RI information life cycle. The work will be done in the areas of physical, biogeochemical and biological oceanography to be exemplars on “how to” for larger scale creation of products and services. Specific D2PTS targets include:

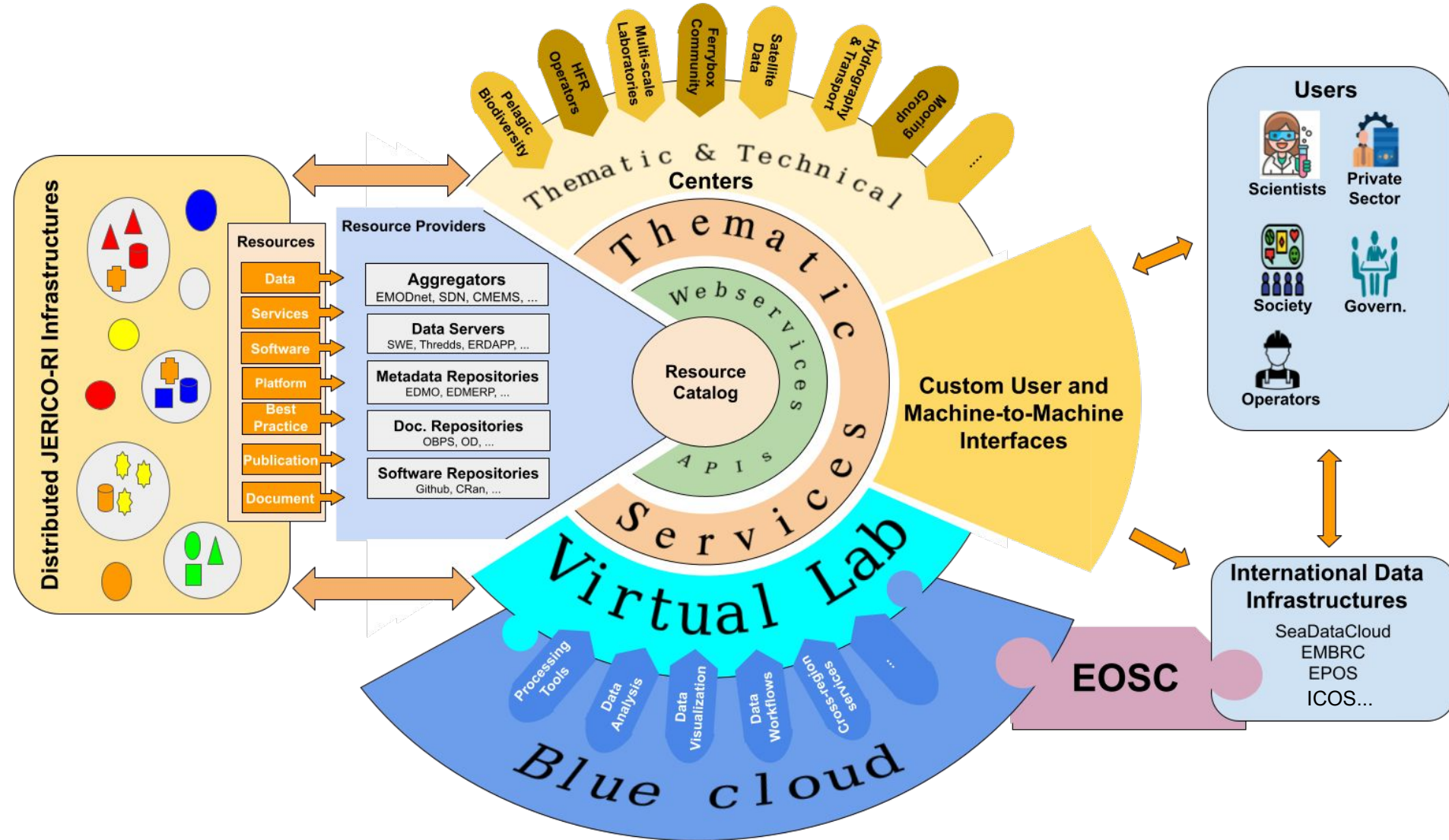
- **HF-Radar tailored products D2PTS:** will develop physical oceanography products from HF Radar data to provide gap filled surface current data products, potentially transferable to CMEMS in the future. Pilot application will be undertaken in Bay of Biscay IRS and NW-MED PSS.
- **Estimation of sea water masses types and transport monitoring D2PTS:** will develop physical oceanography products from glider data that may be combined with biogeochemistry observations. Pilot application will be undertaken in GoF and NW-MED PSSs.
- **Biogeochemical state of coastal areas D2PTS:** will provide regional, combined multiplatform observations products. Pilot application will be undertaken in GoF PSS.
- **JERICO-EcoTaxa D2PTS:** will provide coastal plankton monitoring products from ecological imaging sensors. Pilot application will be undertaken in NW-MED, GoF, Channel and NorthSea PSSs.

JERICO-CORE Prototype (JS3 T7.5)



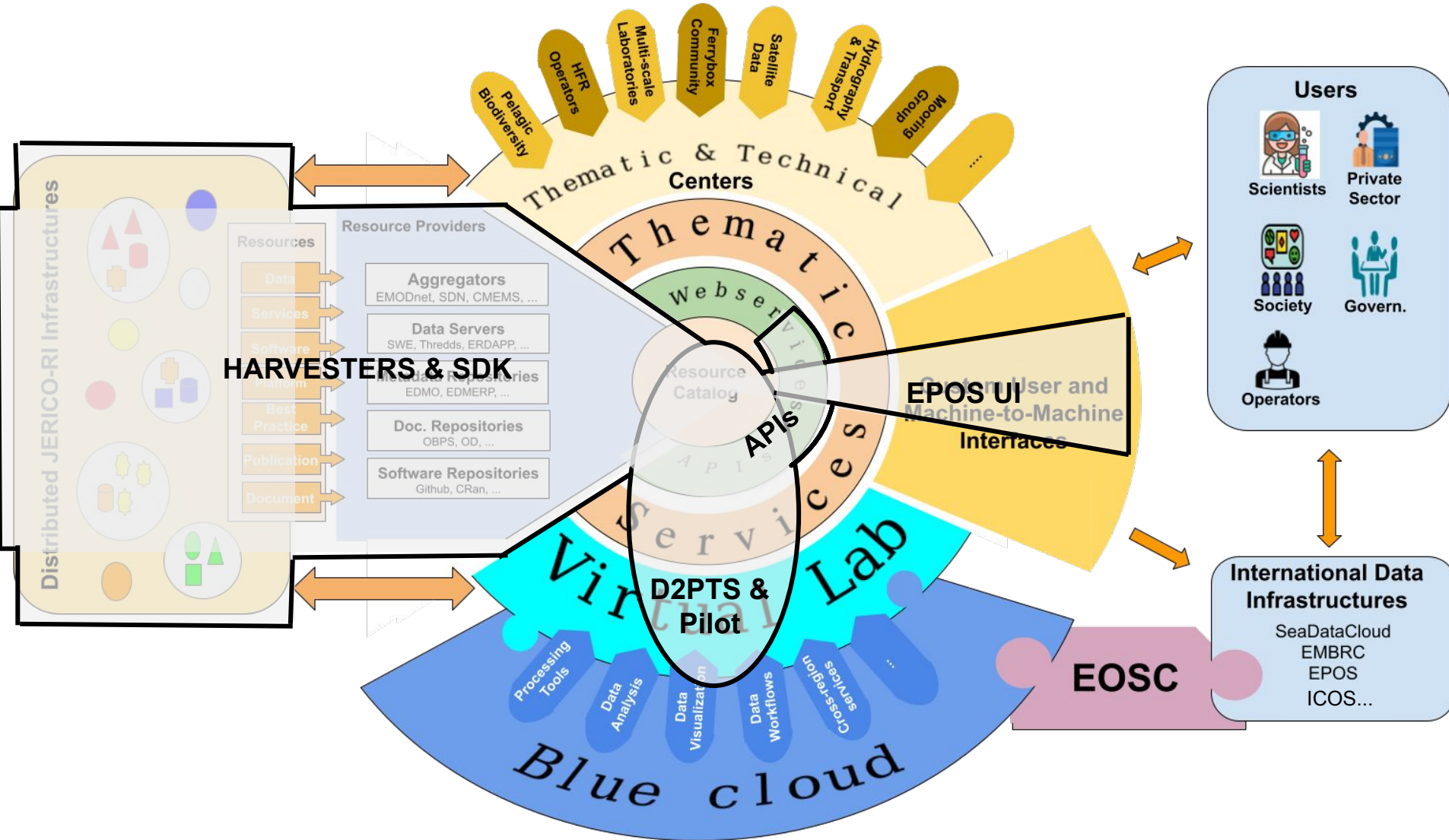
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JERICO-CORE Prototype



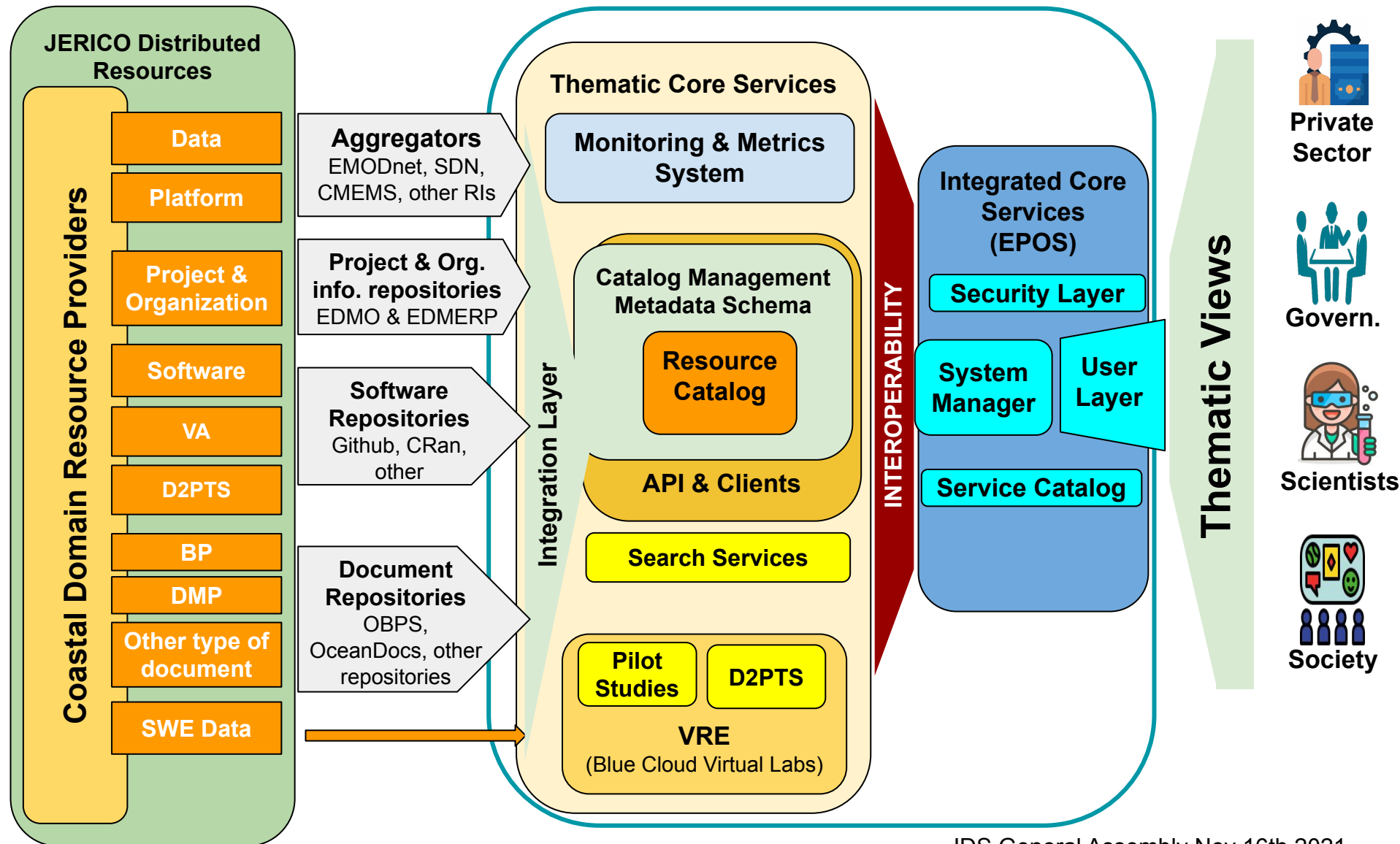
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JERICO-CORE Prototype



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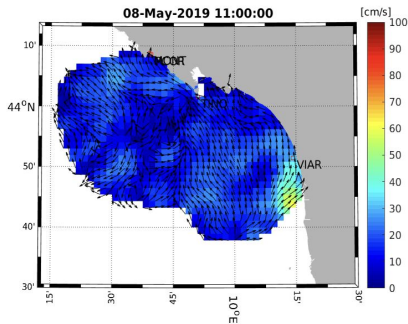
JERICO-CORE Prototype



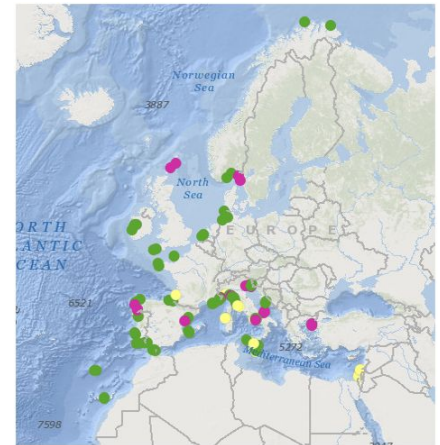
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Services (D2PTS [1/2])

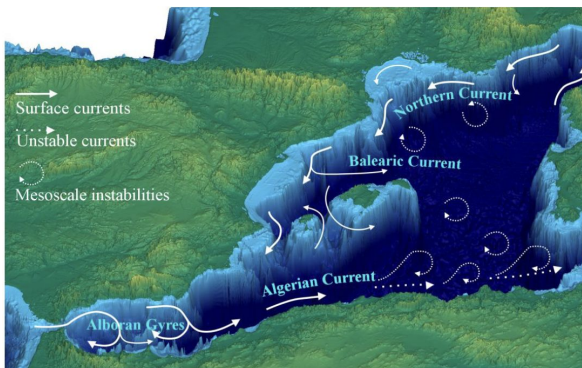
HF Radar D2PTS



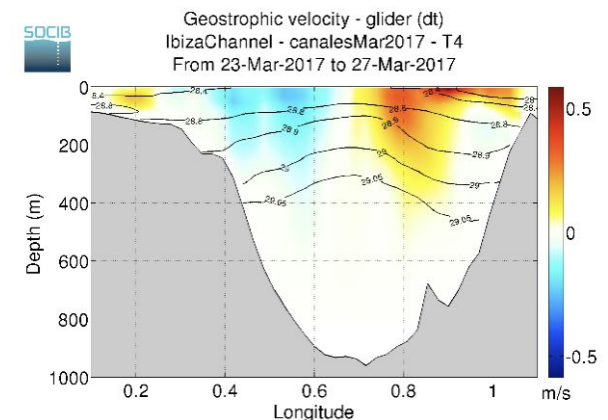
- Interactive map showing the inventory of the European HFR network (see left)
- Best Practices, Tools, Reports, Outage database
- Gap filled surface current fields implemented initially in Bay of Biscay IRS and NW-MED PSS (see right)



Glider D2PTS



- Geostrophic transports, variability of the circulation
- Impact on North/South water mass exchanges
- Impact on marine ecosystem, bluefin tuna, jellyfish, ...

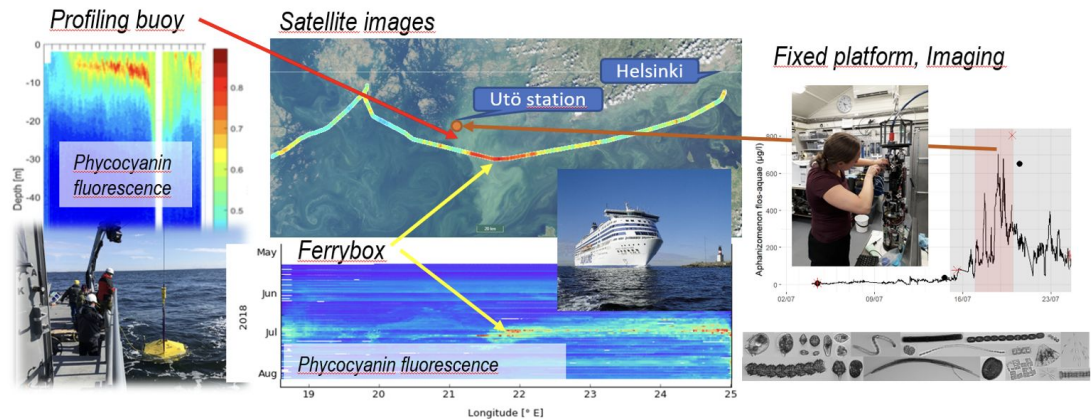


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Services (D2PTS [2/2])

BGC D2PTS

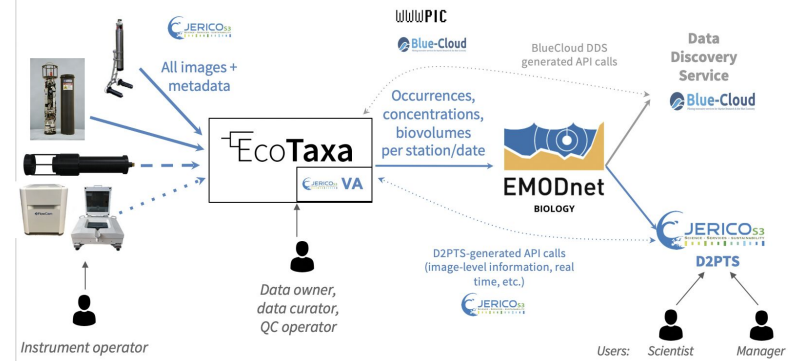
- Near real-time observations: data from two fixed island stations and three FerryBox lines.
- Data products: weekly HAB reviews
- Tools for data processing, QC, metadata and product creation.



EcoTaxa D2PTS

- Tool for a network analysis of plankton and marine particle images.
- Virtual Access to ECOTAXA services (upload, download, recognition algorithms, expert validation)
- Long term archiving of plankton counts through EMODnet.

Implementation in the frame of Jerico3, WWWPIC, Blue-Cloud



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Services (Pilot Study)

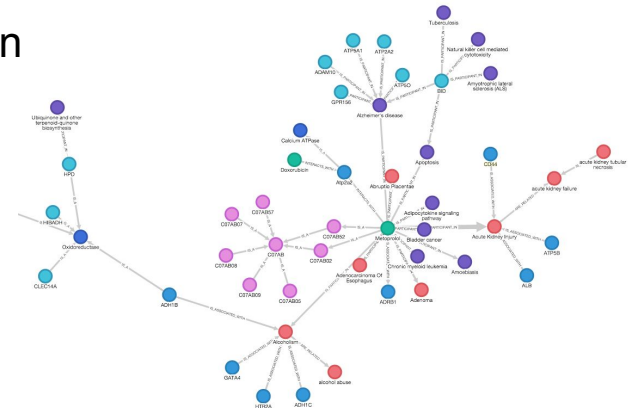
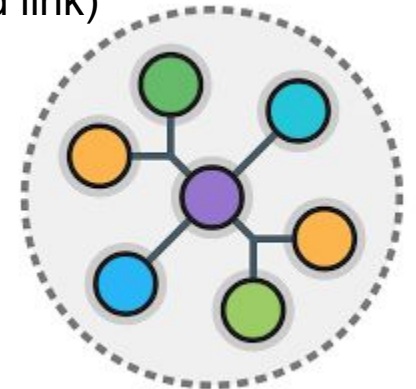
IRS Pilot Study in Iberian Atlantic Margin

- **Transboundary processes:** Forcing slope currents and interactions shelf-slope circulation
- **Extreme events:** Impact of extreme events such as storms and hurricanes
- **Long term variability and climate change:** Ocean warming and heat waves

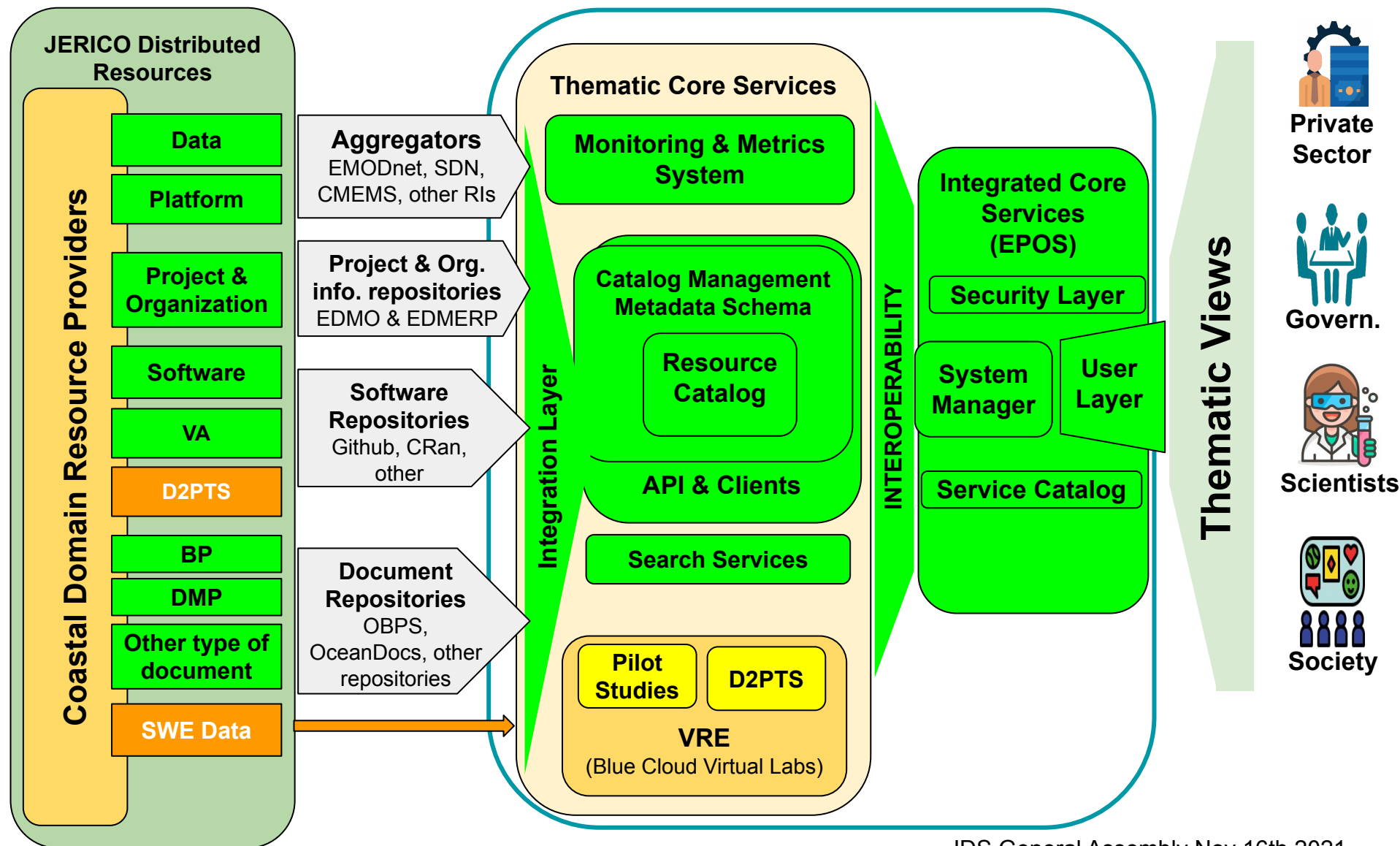


Services (Basic Search)

- **Resource information:** Search information for a specific resource
 - Metadata and source of resource (e.g. data metadata and download link)
 - Related resources (e.g. platform or documents related to a dataset)
- **Resource search:** Filtered search type of resources
 - Attribute values (e.g. textual search on name, description,...)
 - Spatial or temporal filters (e.g. datasets in the GoF)
- **Advance searching capabilities:** Answering specific questions
 - What are the CO2 measurements taken by ferryboxes in the Baltic at a specific date?
 - What is the impact of a given Best Practice used for glider operations in the scientific publications?
 - What existing advanced data products are relevant for the policies written to date?
 - What are the existing datasets and models that exist in a region that can support a rescue operation?



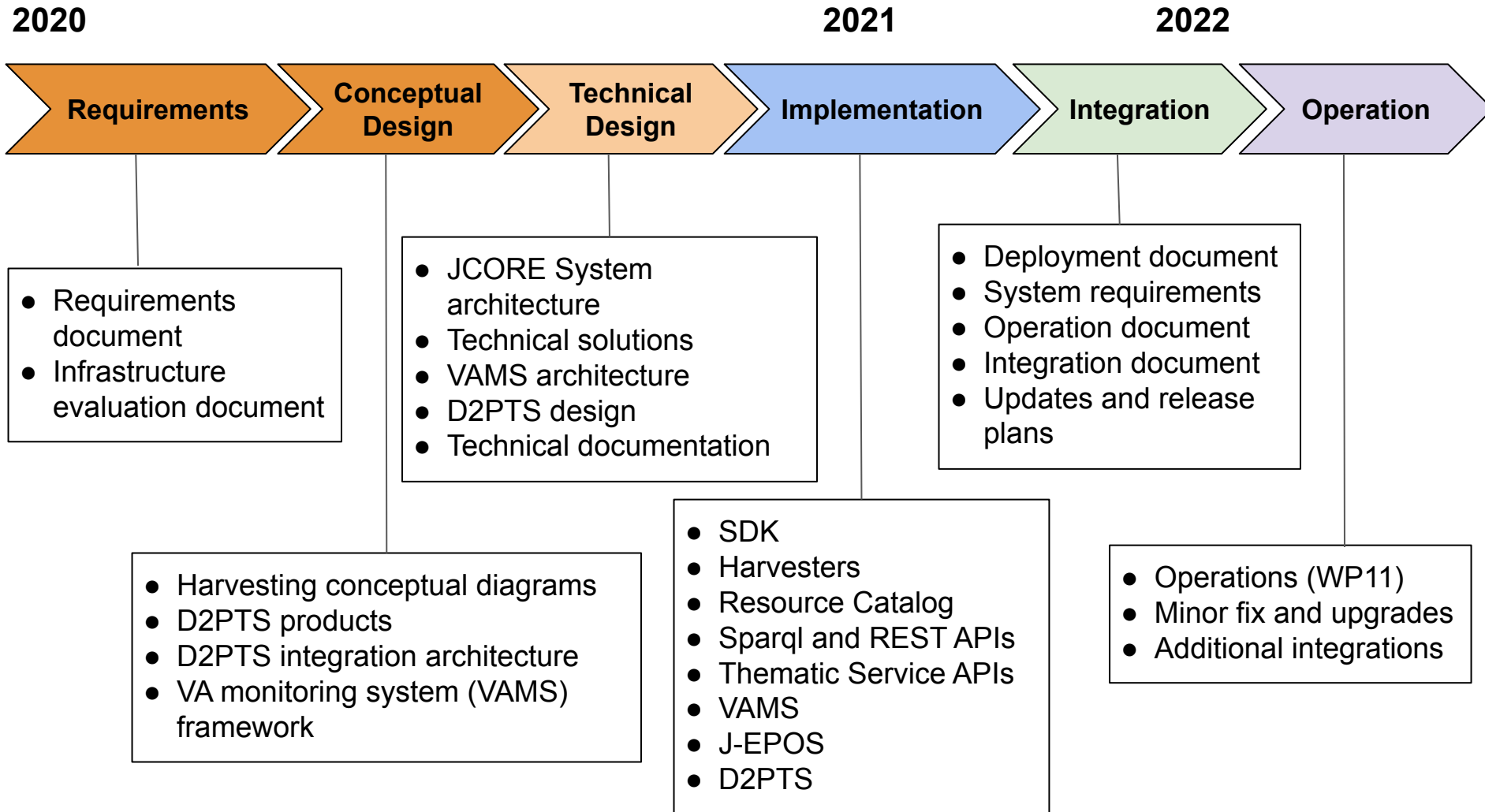
JERICO-CORE prototype development status



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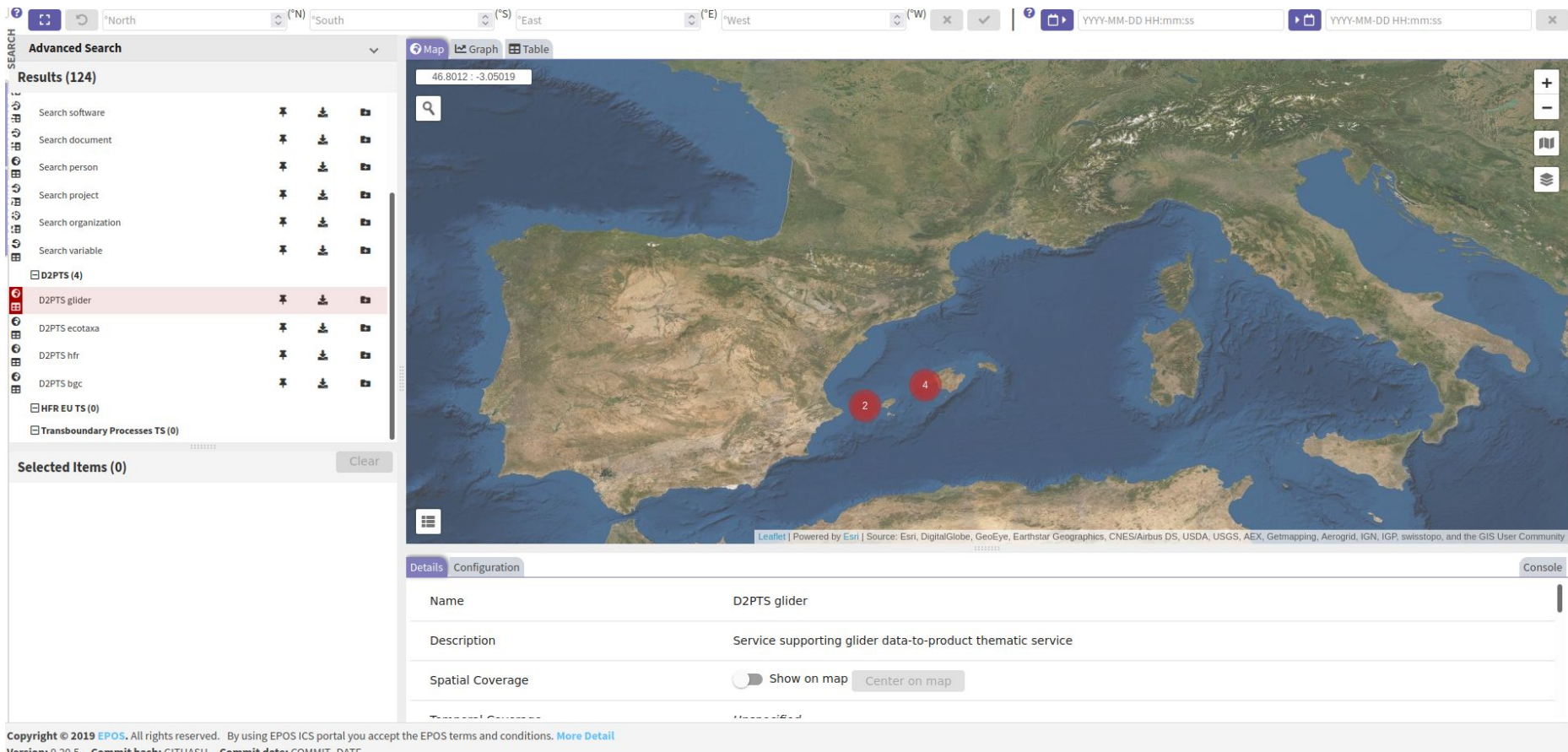
JERICO-CORE prototype outcomes



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JERICO-CORE in action



The screenshot displays the JERICO-CORE web application interface. At the top, there is a navigation bar with search filters for North, South, East, and West, along with coordinate input fields. Below this, the 'Advanced Search' section shows 'Results (124)' with a list of search categories: Search software, Search document, Search person, Search project, Search organization, and Search variable. Under 'D2PTS (4)', the 'D2PTS glider' is highlighted. Below this, 'Selected Items (0)' is shown with a 'Clear' button. The main map area displays a satellite view of the Mediterranean Sea and surrounding landmasses, with two red circular markers labeled '2' and '4' indicating specific locations. The map is powered by Esri and includes a legend. Below the map, the 'Details' section for the 'D2PTS glider' is visible, showing its description as 'Service supporting glider data-to-product thematic service' and its spatial coverage as 'Show on map' and 'Center on map'. The footer contains copyright information for EPOS, version 0.20.5, and a link to the EPOS portal.

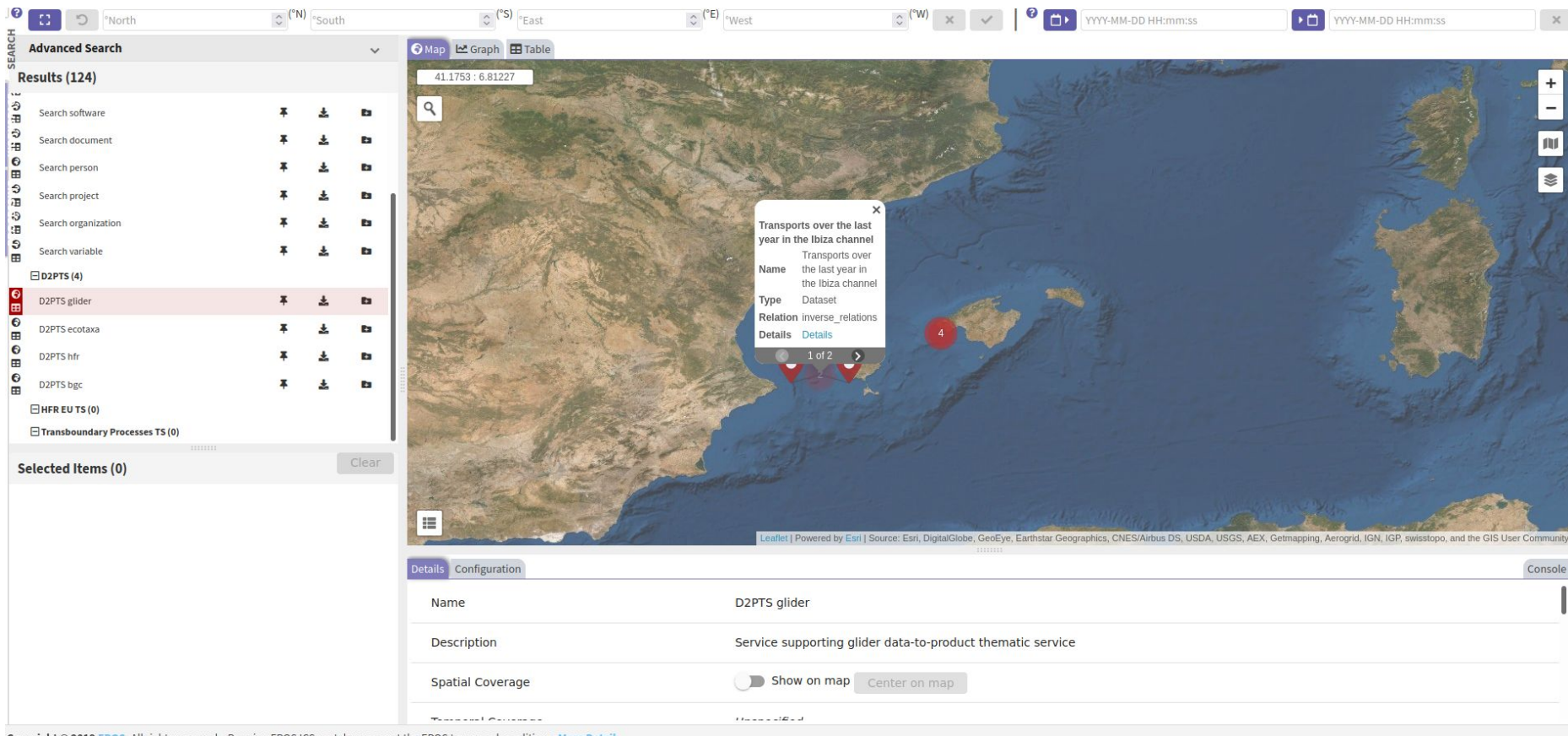
Copyright © 2019 EPOS. All rights reserved. By using EPOS ICS portal you accept the EPOS terms and conditions. [More Detail](#)
Version: 0.20.5 Commit hash: GITHASH Commit date: COMMIT DATE

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JERICO-CORE in action



The screenshot displays the JERICO-CORE web application interface. On the left, an 'Advanced Search' panel shows 'Results (124)' with various search filters like 'Search software', 'Search document', etc. Below this is a 'Selected Items (0)' section. The main area is a map of the Iberian Peninsula with a search bar at the top left showing coordinates '41.1753 : 6.81227'. A pop-up window over the map displays details for 'Transports over the last year in the Ibiza channel', including 'Name', 'Type' (Dataset), and 'Relation' (inverse_relations). At the bottom, a 'Details' panel for 'D2PTS glider' shows its description: 'Service supporting glider data-to-product thematic service' and spatial coverage options.

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JERICO-CORE in action

Advanced Search

Results (124)

- Search software
- Search document
- Search person
- Search project
- Search organization
- Search variable
- D2PTS (4)
 - D2PTS glider**
 - D2PTS ecotaxa
 - D2PTS hfr
 - D2PTS bgc
- HFR EU TS (0)
- Transboundary Processes TS (0)

Selected items (0) Clear

Map Graph Table

D2PTS glider

Filter

Items per page: 10 1 - 10 of 10 Expand all

Name	Type	Relation	Details	longitude , latitude
SOCIB water mass transport toolbox	Software	software	Details	2.6319,39.6358
['Sistema de Observación y Predicción Cos...]	Organization	provider	Details	
JERICO-S3 : Joint European Research Infr...	Project	project	Details	
['Sistema de Observación y Predicción Cos...]	Organization	owner	Details	2.6319,39.6358
['Mélanie Juzai', 'Mélanie Juzai']	Person	contact	Details	
Transports over the last decade in the Mall...	Dataset	inverse_relations	Details	0.7999999999999999,38.91
Transports over the last year in the Ibiza c...	Dataset	inverse_relations	Details	0.7999999999999999,38.91
Transports over the last decade in the Ibiz...	Dataset	inverse_relations	Details	2.17,39.28
Transports over the last year in the Mallorc...	Dataset	inverse_relations	Details	2.17,39.28
Water mass transport calculation service	Service	D2PTS service	Details	

Items per page: 10 1 - 10 of 10

Details Configuration Console

Name D2PTS glider

Description Service supporting glider data-to-product thematic service

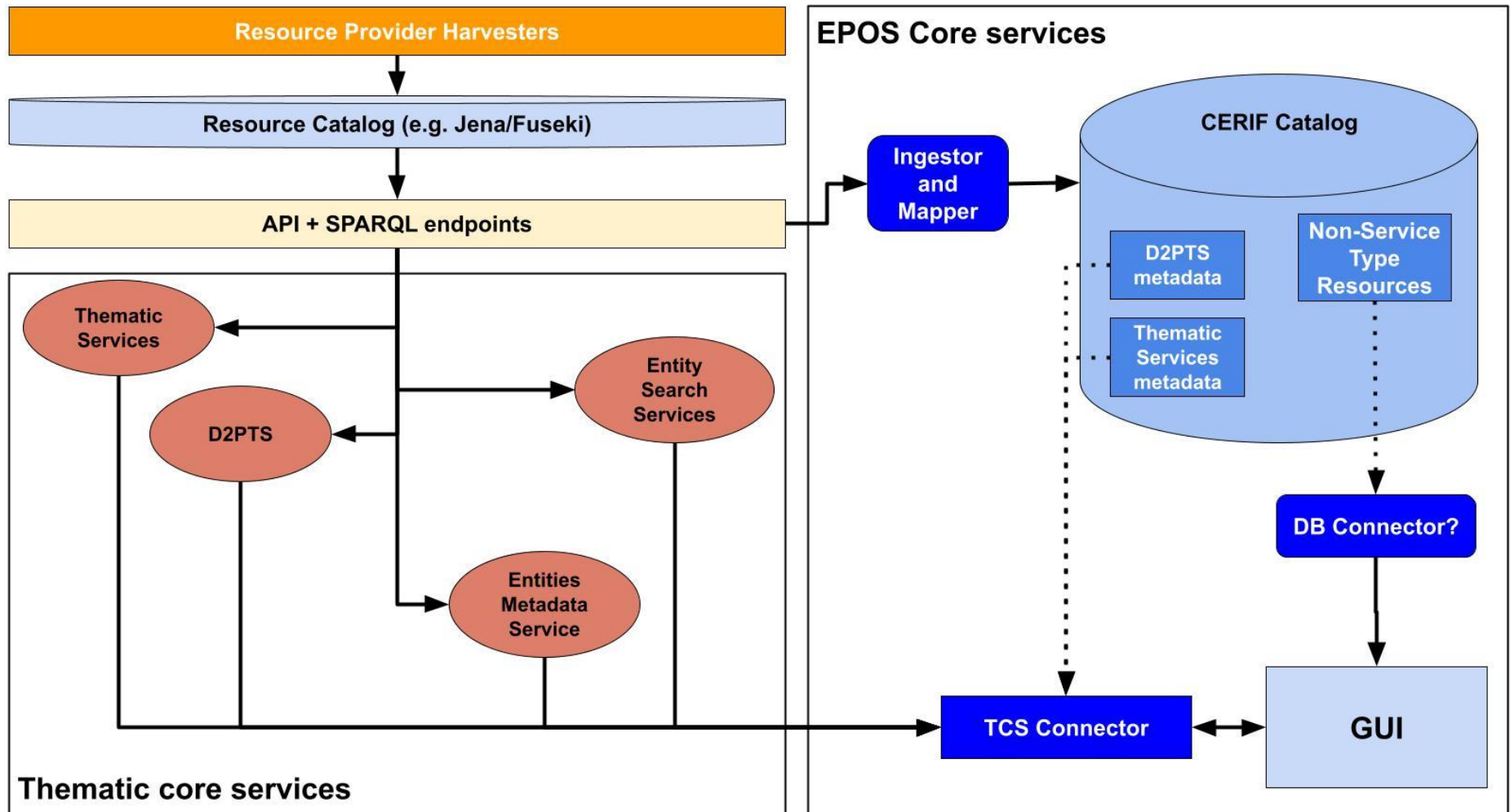
Spatial Coverage ☐ Show on map

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JERICO-CORE in action



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JERICO-CORE in action

ContactPoint ▾		
GET	/api/contactpoint/	Provides a list of contactpoints matching the requirements given by the query parameters.
GET	/api/contactpoint/{id}	Retrieves a specific contactpoint given by its id.
Dataset ▾		
GET	/api/dataset/	Provides a list of datasets matching the requirements given by the query parameters.
GET	/api/dataset/{id}	Retrieves a specific dataset given by its id.
Distribution ▾		
GET	/api/distribution/	Provides a list of distributions matching the requirements given by the query parameters.
GET	/api/distribution/{id}	Retrieves a specific distribution given by its id.
Document ▾		
GET	/api/document/	Provides a list of documents matching the requirements given by the query parameters.
GET	/api/document/{id}	Retrieves a specific document given by its id.
Equipment ▾		
GET	/api/equipment/	Provides a list of equipments matching the requirements given by the query parameters.
GET	/api/equipment/{id}	Retrieves a specific equipment given by its id.
Facility ▾		
GET	/api/facility/	Provides a list of facilities matching the requirements given by the query parameters.
GET	/api/facility/{id}	Retrieves a specific facility given by its id.

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JERICO-CORE in action

e-JERICO API REST Endpoint

Api Root / Entity List

Entity List

GET

« 1 2 3 »

GET /api/dataset/?max_count=10

HTTP 200 OK

Allow: GET

Content-Type: application/json

Vary: Accept

```
{
  "count": 114,
  "max_page_size": 500,
  "next": "http://ejerico.endpoint.test.socib.es/api/dataset/?max_count=10&page=2",
  "previous": null,
  "results": [
    {
      "created": "2021-08-03 00:00:00",
      "creator": "http://ejerico.endpoint.test.socib.es/api/organization/94412c9ab42fcd83624f917184678f3c92b8ee",
      "distribution": "[ 'http://ejerico.endpoint.test.socib.es/api/distribution/c8fd6261bf5baa75652fe64fdae5aa671d41ec34', 'http://ejerico.endpoint.test.socib.es/api/distribution/c8fd6261bf5baa75652fe64fdae5aa671d41ec34' ]",
      "identifier": "http://ejerico.endpoint.test.socib.es/api/dataset/e052b82b375dde88d71cf49321c3ee906a51dc95",
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      "spatial": "http://ejerico.endpoint.test.socib.es/api/spatial/a9fb387a7ded60294cc3acb7ad4287a03dde81c4",
      "temporal": "http://ejerico.endpoint.test.socib.es/api/temporal/8aebfe75cecb4917348f532b88ce2bdf613d6b47",
      "title": "HFR Near Real Time In Situ Surface Ocean Radial Velocity - COSYNA BUES",
      "variable": "[ 'http://ejerico.endpoint.test.socib.es/api/variable/da5ae3e72b5733f49ac670c5d389a89d50295f31', 'http://ejerico.endpoint.test.socib.es/api/variable/da5ae3e72b5733f49ac670c5d389a89d50295f31' ]",
      "alias": "[ 'http://ejerico.endpoint.test.socib.es/api/dataset/e052b82b375dde88d71cf49321c3ee906a51dc95', 'http://erddap.emodnet-physics.eu/erddap/...' ]"
    },
    {
      "created": "2021-04-01 00:00:00",
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      "identifier": "http://ejerico.endpoint.test.socib.es/api/dataset/f472252f4db978e6e91e82e7a48fdef8b74241e3",
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    }
  ]
}
```

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JERICO-CORE in action

```

type: "FeatureCollection"
▶ @epos_style: {}
▼ features:
  ▼ 0:
    type: "Feature"
    geometry: null
    properties:
      @epos_type: "dataset"
      ▼ @epos_links:
        ▼ 0:
          href: "http://127.0.0.1:8000/api/dataset/e052b82b375dde88d71cf49321c3ee906a51dc95"
          label: "Details"
          type: "application/json"
        ▼ 1:
          href: "http://erddap.emodnet-physics.eu/erddap/tabledap/HFR_COSYNA_BUES.nc"
          label: "x-netcdf"
          type: "application/x-netcdf"
          authenticatedDownload: false
        Name: "HFR Near Real Time In Situ Surface Ocean Radial Velocity - COSYNA BUES"
        Type: "Dataset"
      ▼ @epos_map_keys:
        0: "Name"
        1: "Type"
        2: "Description"
        3: "@epos_links"
      ▼ @epos_data_keys:
        0: "Name"
        1: "Type"
        2: "Description"
        3: "@epos_links"
      Description: ""
  ▼ 1:
    type: "Feature"
    geometry: null
    properties:
      @epos_type: "dataset"
      ▼ @epos_links:
        ▼ 0:
          href: "http://127.0.0.1:8000/api/dataset/f472252f4db978e6e91e82e7a48fdef8b74241e3"
          label: "Details"
          type: "application/json"
        ▼ 1:
          href: "http://erddap.emodnet-physics.eu/erddap/tabledap/HFR_Lisboa_590_IH0C_PL016.nc"
          label: "x-netcdf"
          type: "application/x-netcdf"

```

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JERICO-CORE in action



JOINT EUROPEAN RESEARCH
INFRASTRUCTURE OF COASTAL
OBSERVATORIES

JERICO CATALOG SPARQL ENDPOINT

```
select ?s ?p ?o where { ?s ?p ?o } limit 25
```

Output JSON ▾

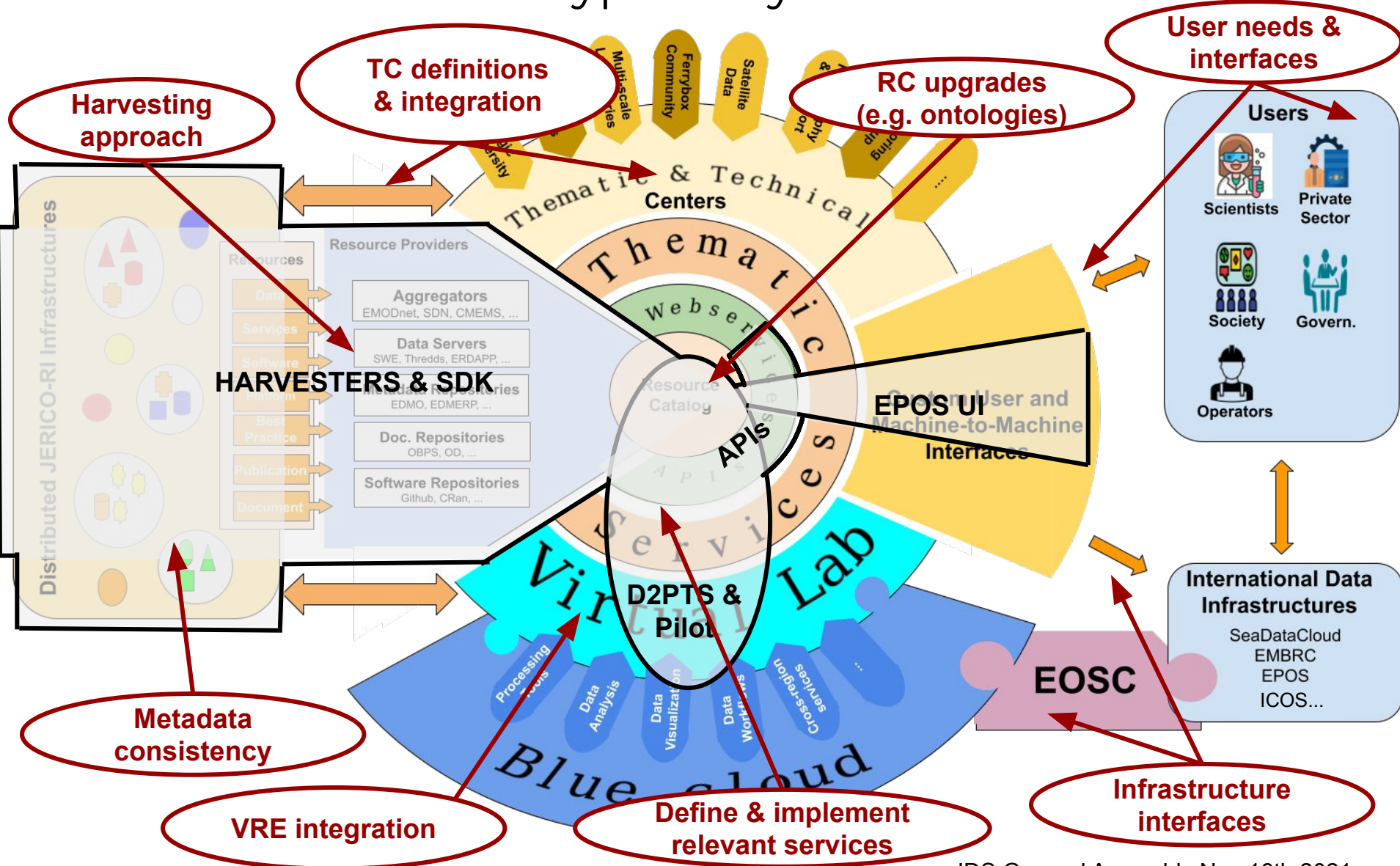
SEARCH

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The JERICO-S3/DS projects are funded by the European Commission's H2020 Framework Programme under grant agreements No. 871153/951799. Project coordinators: Ifremer, France.

JERICO-CORE Prototype - beyond JS3



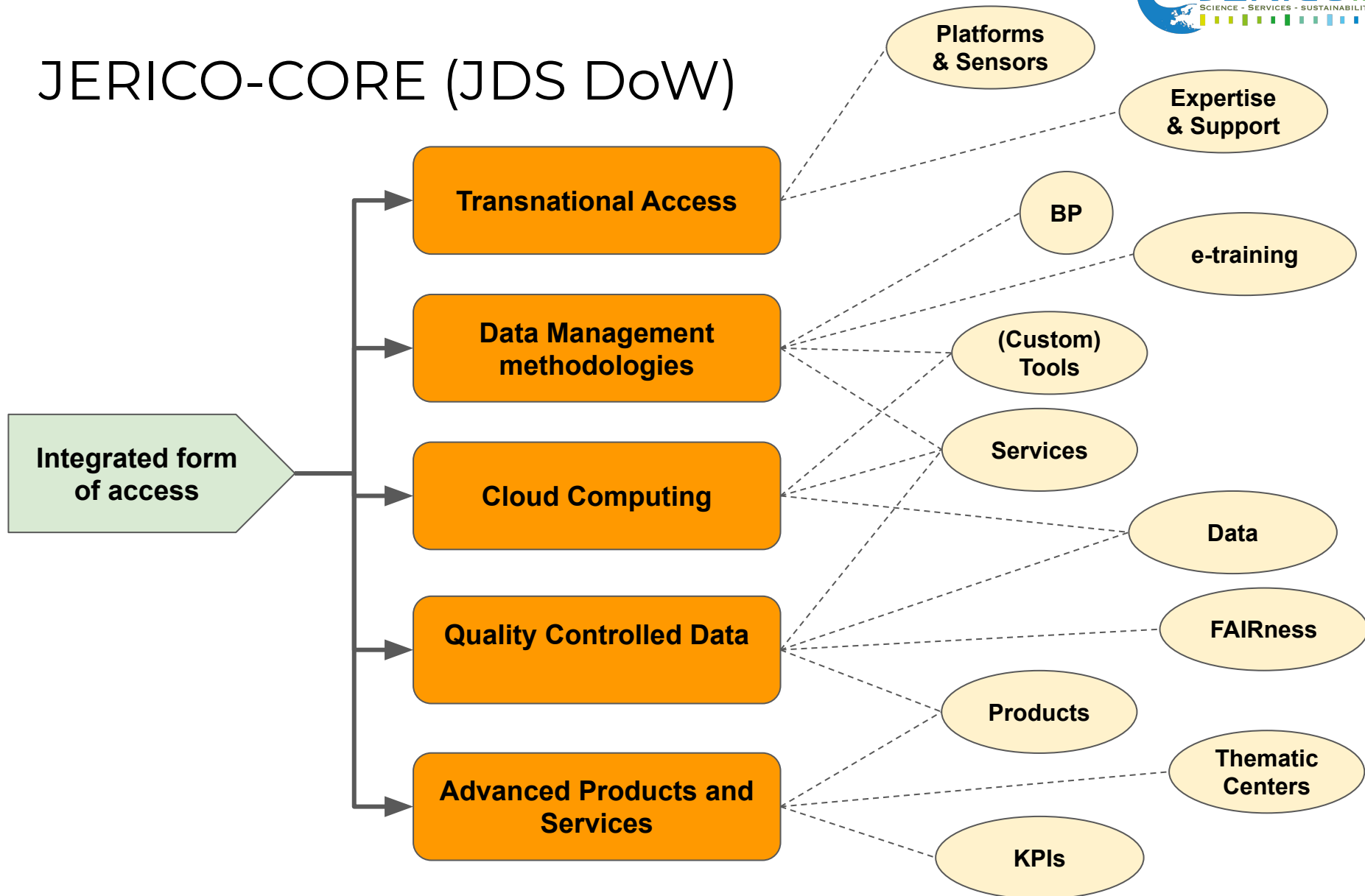
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Towards a sustainable e-infrastructure (WP3 JDS)

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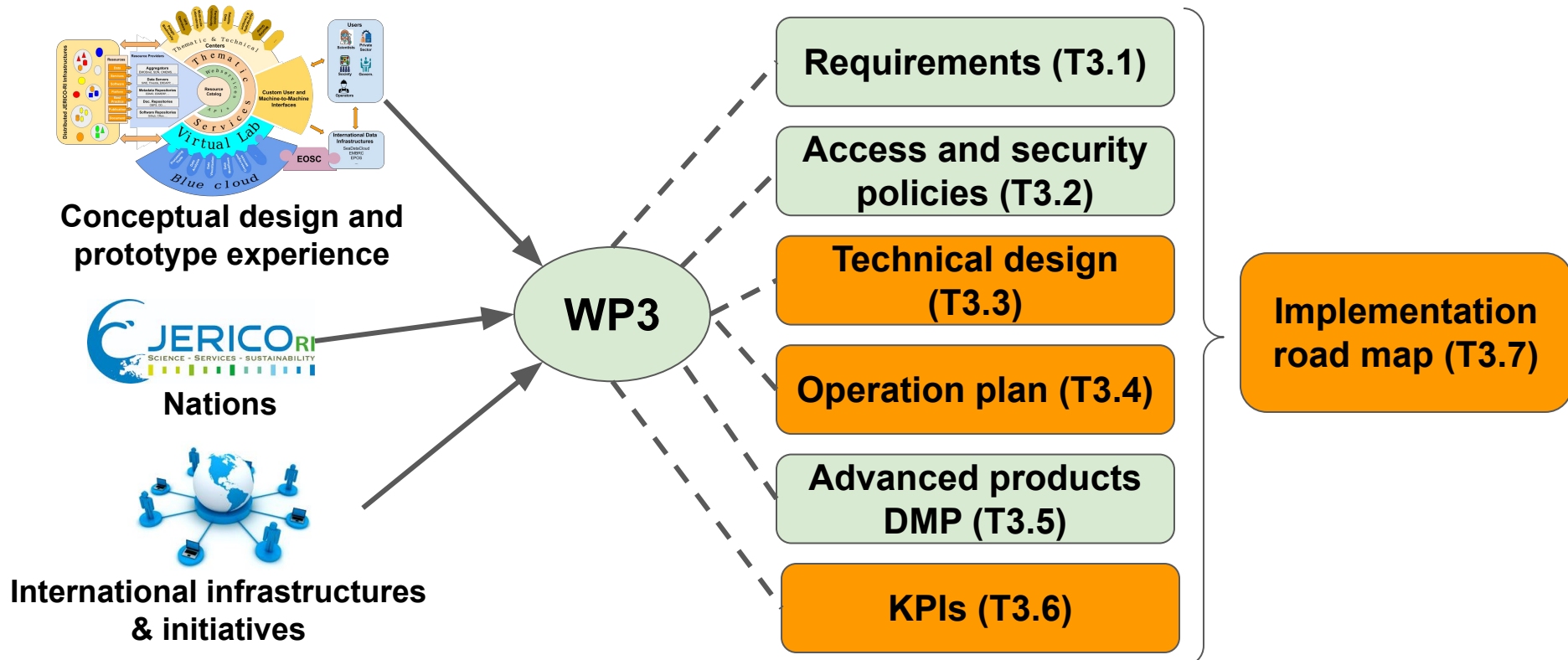
JERICO-CORE (JDS DoW)



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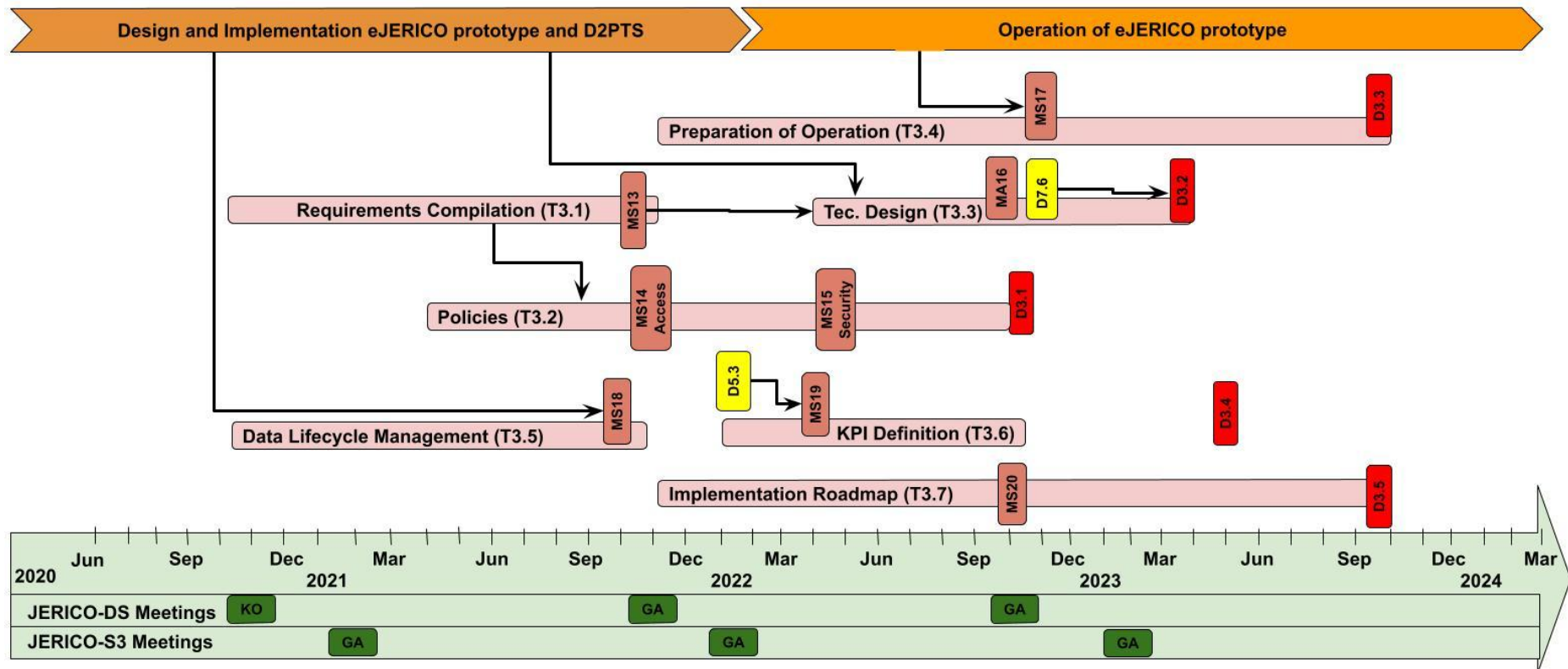
Towards a sustainable e-infrastructure

WP3 overall objective is to conduct the design study of the JERICO-CORE (e-JERICO) and to produce a strategic plan and roadmap for the implementation within the framework of the ESFRI roadmap.



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Towards a sustainable e-infrastructure



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Requirements Preview - Demanded Services

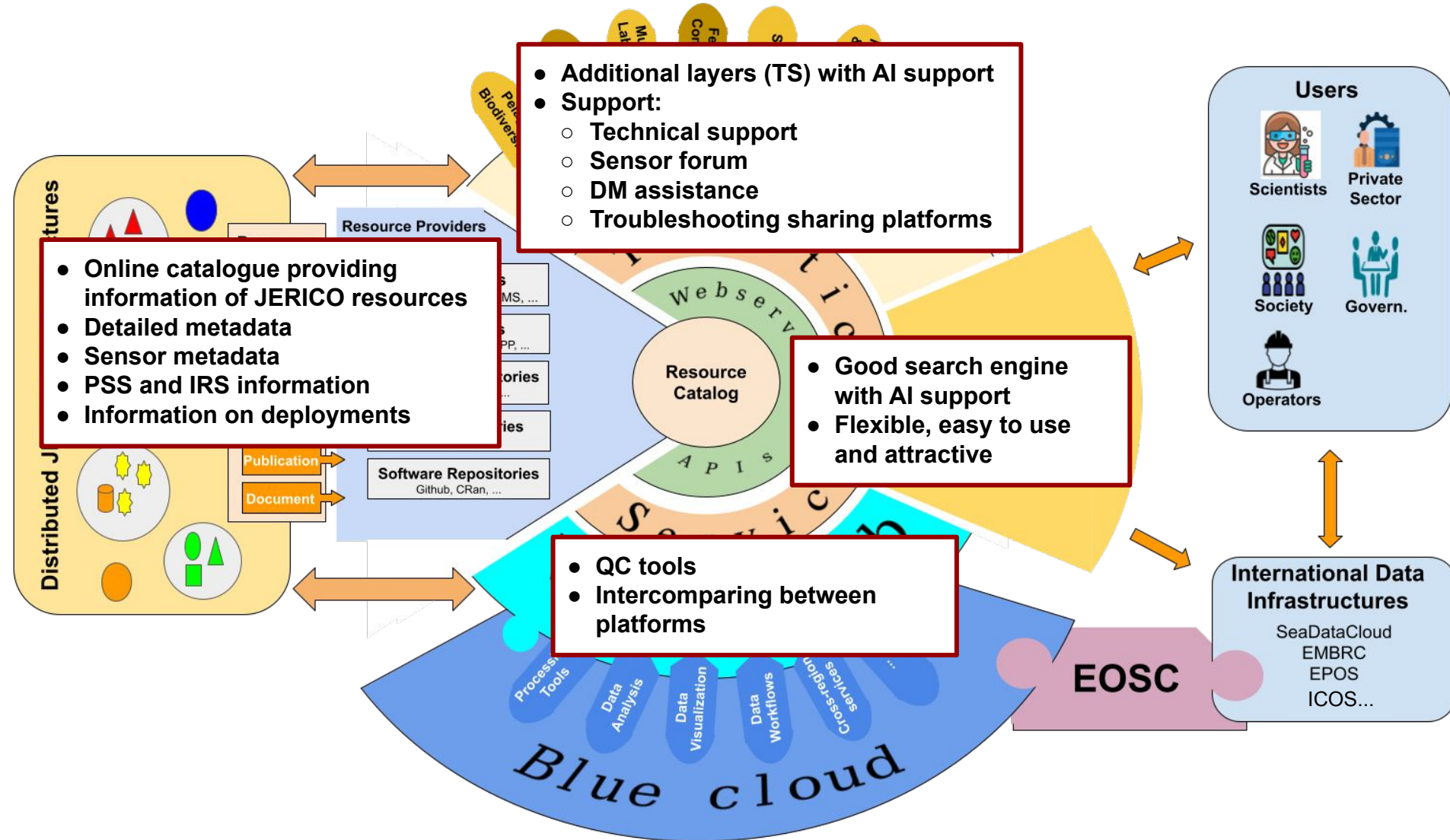
Collection of requirements under T3.1

- Not another data portal
 - An online catalogue providing information on JERICO resources:
 - Data, Tools, Scripts, Sensor information, Repository of relevant best practices and Thematic centres
 - From JERICO platforms, collect detailed metadata information including on sensor level and present in a catalogue i.e. elevate the current metadata information available
 - Providing info on the pilot sites and IRS
 - Descriptions of the platforms and sensors
 - A good search engine (AI expertise)
 - Additional layers (ex. Climatology) with AI expertise
 - Visualisation tools
- A system that allows inter-comparing between platforms
 - An efficient and reactive tech support (not help desk but various engineers specialized) and data management assistance
 - Provide a sensor forum / network for sharing information on sensor level
 - A troubleshooting sharing platform
 - Provide QC tools, common protocol...
 - Information on deployments (past, present, future... included, type of sensors, cruises etc.)
 - Provide assistance for near- real time presentations of data
 - Flexible, easy to use and attractive

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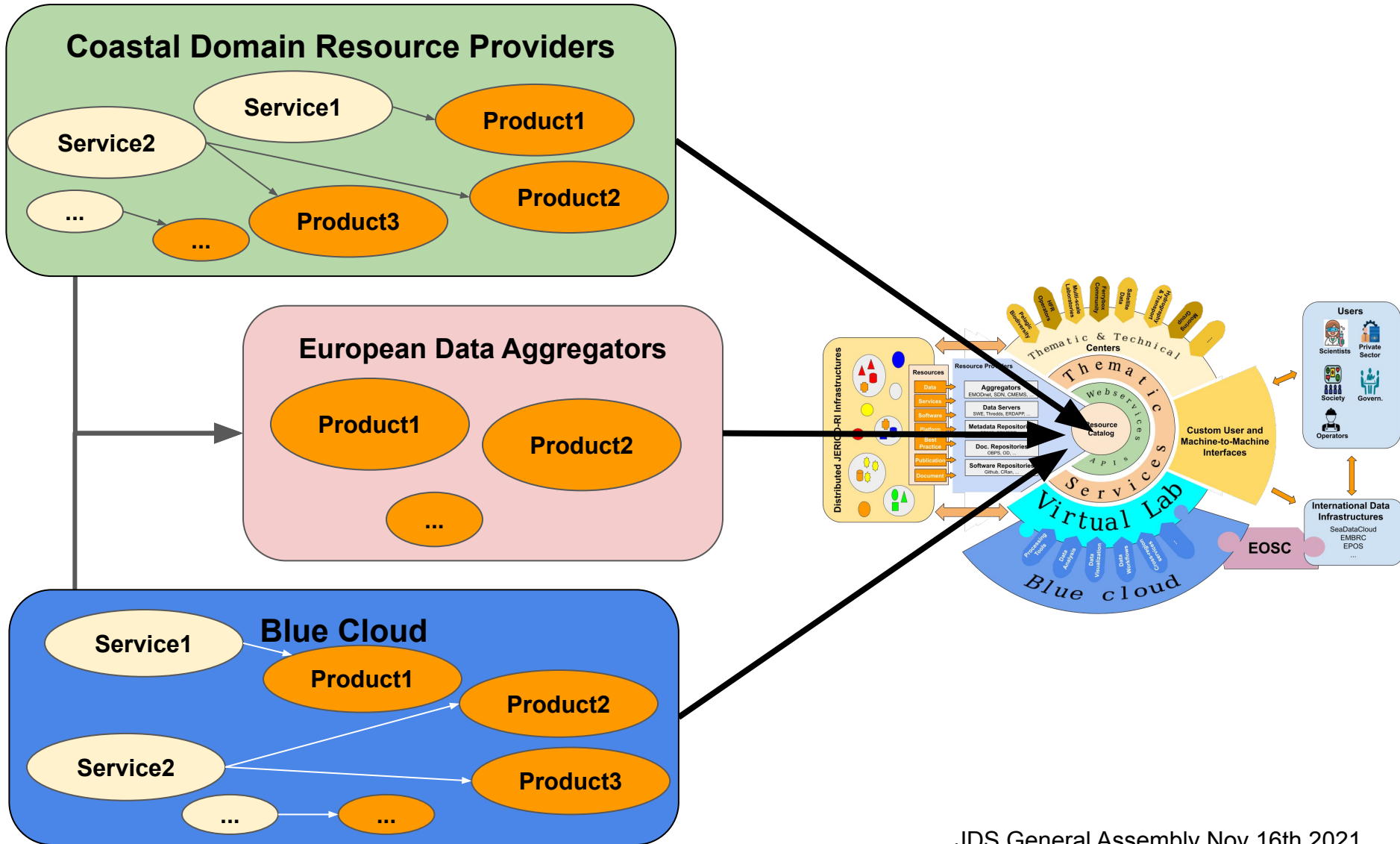


JERICO-CORE Requirements



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Advanced Products Approaches



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Conclusions

- From co-design and collaboration we achieved a **conceptual solution** that is flexible enough to fit all of our needs. However, there is still time to adapt the concept to the needs of the users, partners, stakeholders... in the context JERICO-DS
- We achieved well advanced stage of JERICO-CORE **prototype**. It is time for users to provide feedback about use experience and propose services that will respond to the needs of society and the community.
- JERICO-DS in the process to provide the **JERICO-CORE design** for the long term use with the provided inputs and discussions.

Thanks

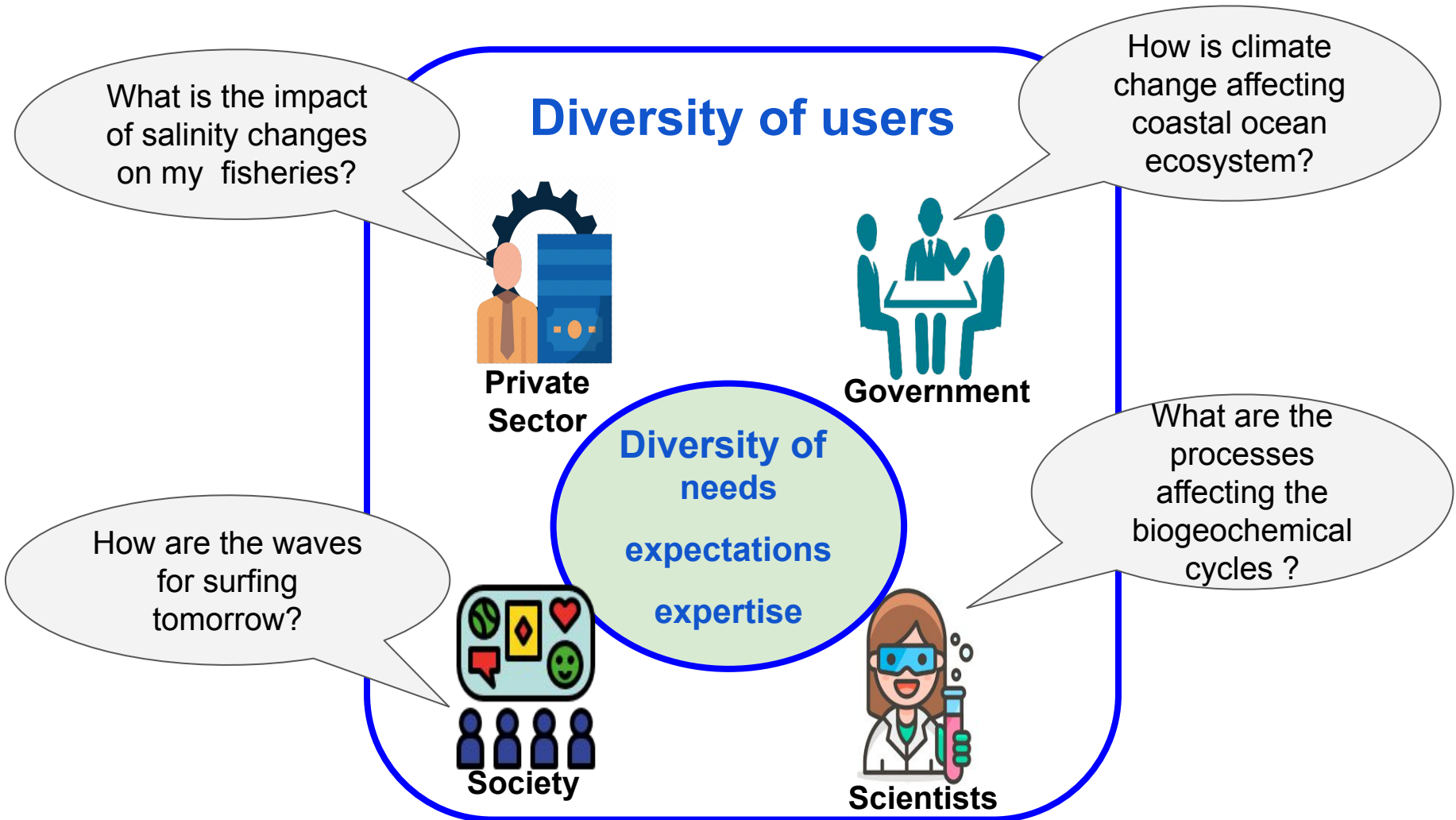
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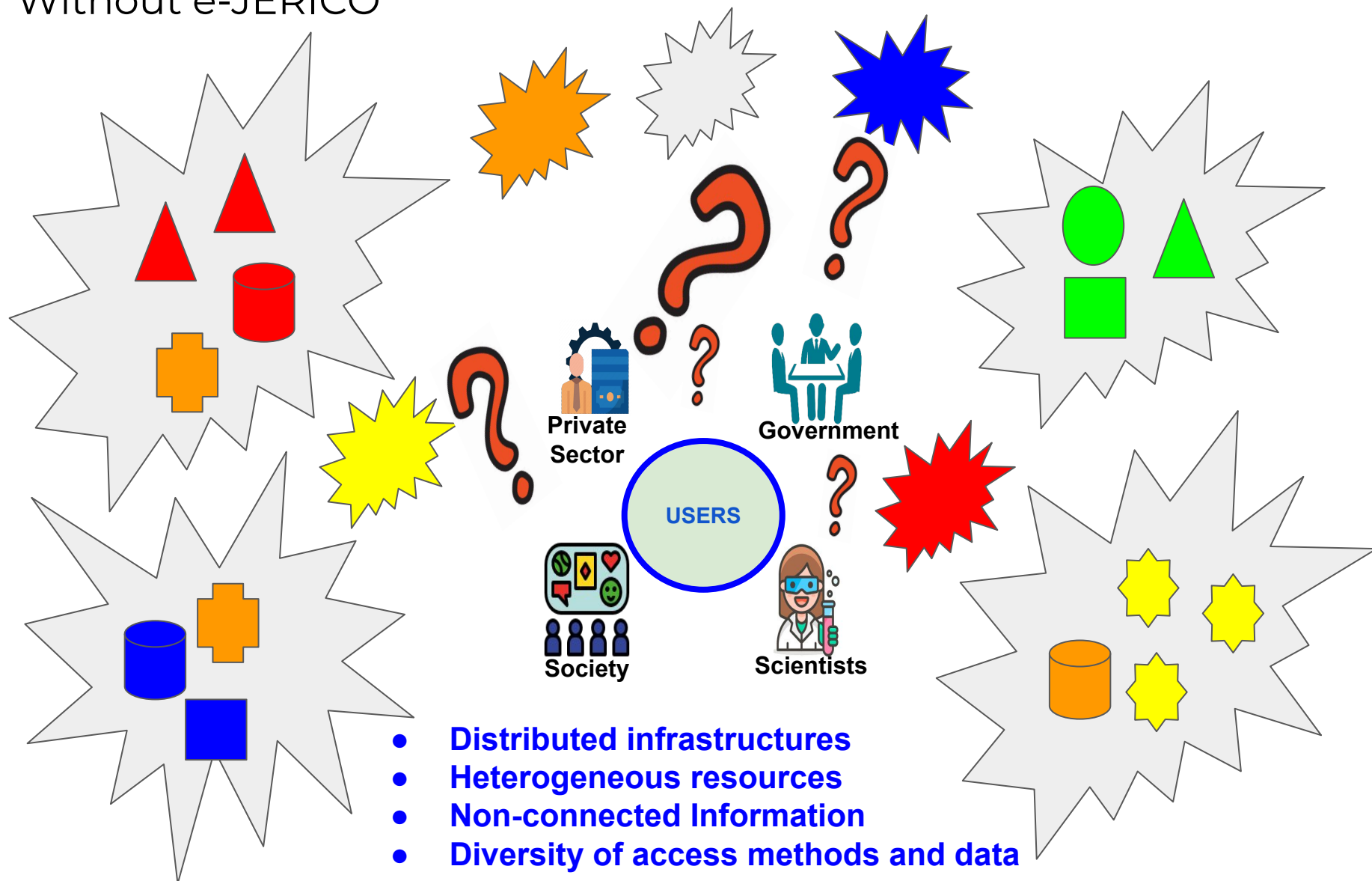
Discussion

Additional material



JERICO-RI Users and Partners

Without e-JERICO

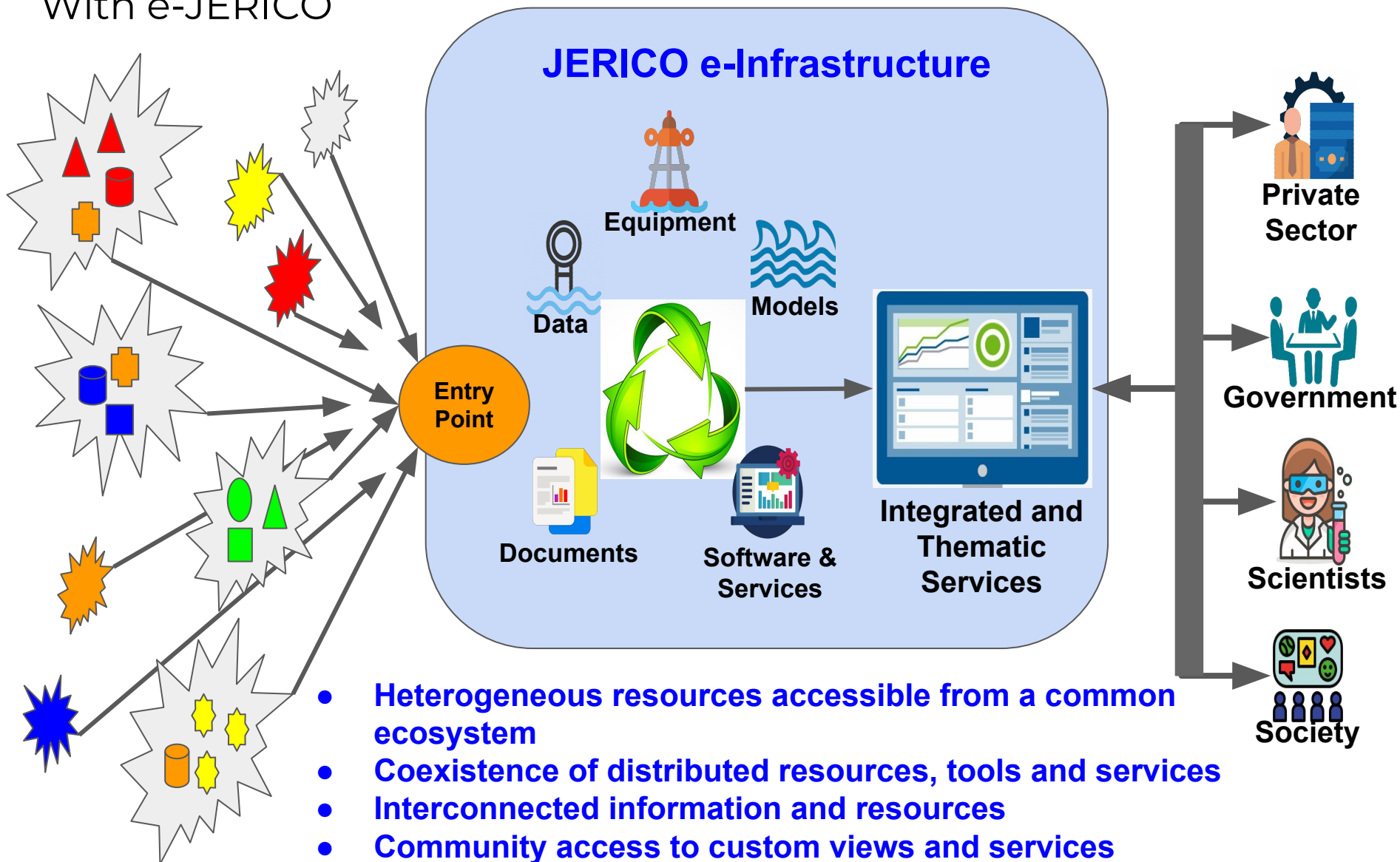


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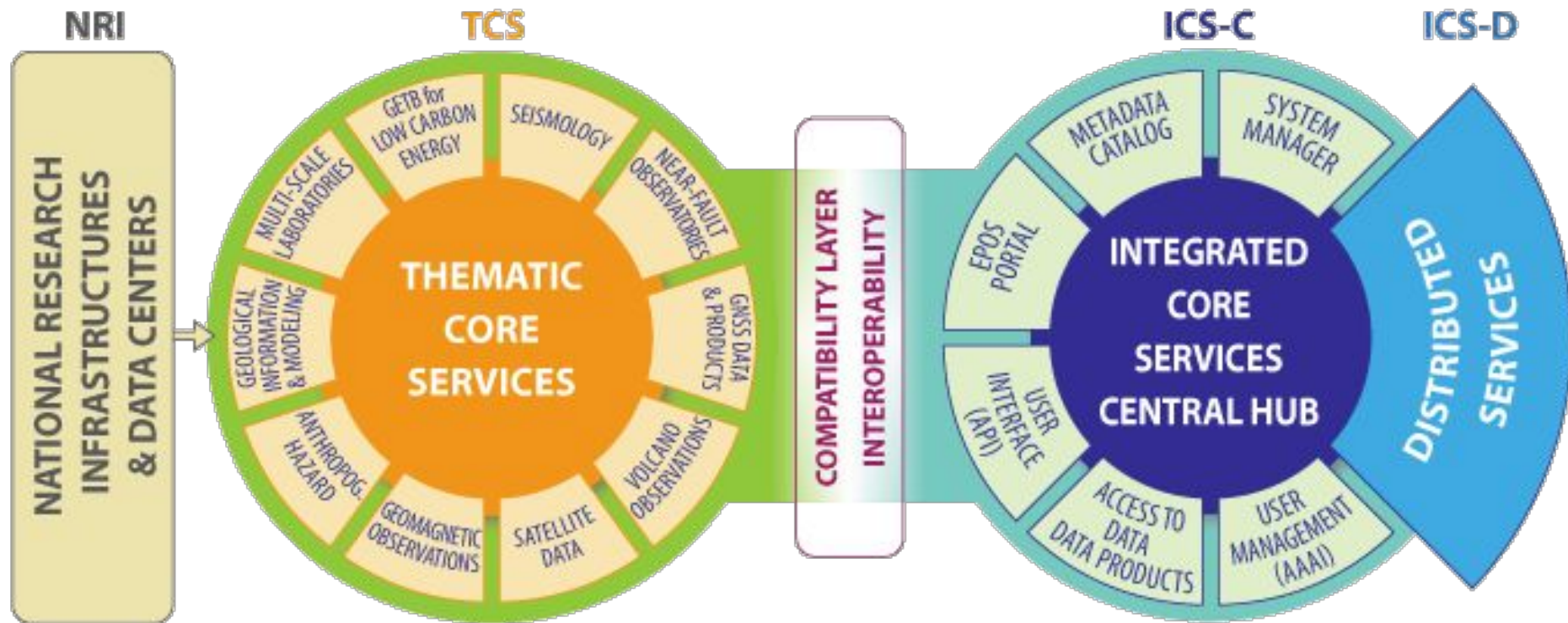
JERICO-RI Users and Partners

With e-JERICO



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EPOS Thematic Centers and Structure



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