THE DESTINATION EARTH PLATFORM

May 2024

1. DestinE Platform Goals and Vision

2. Design to Fulfill DestinE Objectives

3. Technical Implementation by Industry

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The DestinE Platform fosters the **growth** of European Industry
at the service of the **digital and green transitions.**

The Platform represents a **European sovereign** solution
to **secure** critical services and information,
leveraging the conformity to **European regulations**
to stimulate **innovation** and new **operational** usages
for a **limitless community** of **climate** responsible actors.

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TWO CRUCIAL ASSETS IN ONE FRAMEWORK

A sovereign European infrastructure in a powerful framework that is mindful of climate concerns

A flexible ecosystem of services available to all DestinE users

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Attractive services to all users

DestinE

General Public

- DestinE Service offering open & free access and information

European Projects

- Allocation of dedicated resources upon DestinE governance decision

DestinE Platform Services are meant to favor local exploitation

An open ecosystem – Ready for collaboration

DestinE

General Public

- DestinE Service offering open & free access and information

- Services onboarded in the Platform offering open & free access

European Projects

- Allocation of dedicated resources upon DestinE governance decision

Third Parties

Autonomous Projects

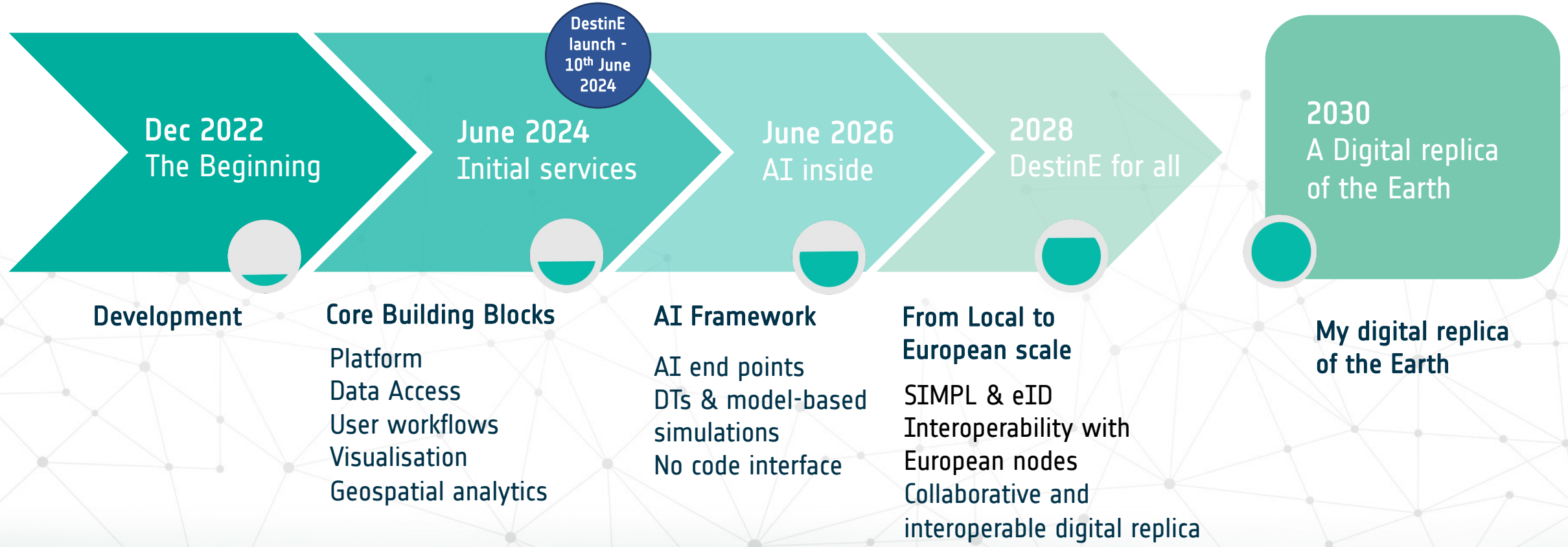- Third Party allocation autonomy (e.g., ESA DTE)

Third Party services may benefit from the whole ecosystem

ESA fully embraces the **climate change challenges** for the platform operations

- DestinE Platform activities shall become a **sustainable factor of economic growth** in a digital responsible framework

- Quality standards to **support all usages** shall be maintained

- DestinE platform activities shall become more **sustainable – 4 pillars:**

  - 🌍 Measure and Transparency

  - 🌍 Optimisation

  - 🌍 Usage adaptation and sobriety

  - 🌍 Training and increase of related competencies

All platform partners shall be involved and committed to define and implement a reference trajectory

An operational environment ready to be used and to grow

DestinE launch - 10th June 2024

Dec 2022
The Beginning

June 2024
Initial services

June 2026
AI inside

2028
DestinE for all

2030
A Digital replica of the Earth

Development

Core Building Blocks

Platform
Data Access
User workflows
Visualisation
Geospatial analytics

AI Framework

AI end points
DTs & model-based simulations
No code interface

From Local to European scale

SIMPL & eID
Interoperability with European nodes
Collaborative and interoperable digital replica

My digital replica of the Earth

An operational environment ready to enable your operations

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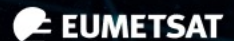
3. Technical Implementation by Industry

New resolutions for data

OPEN DATA HRES
~40KM
0.4 DEGREES

ERA5
~25KM
0.25 DEGREES

DESTINE CLIMATE DT
~7KM
0.0625 DEGREES

DESTINE EXTREMES DT
~4KM
0.035 DEGREES

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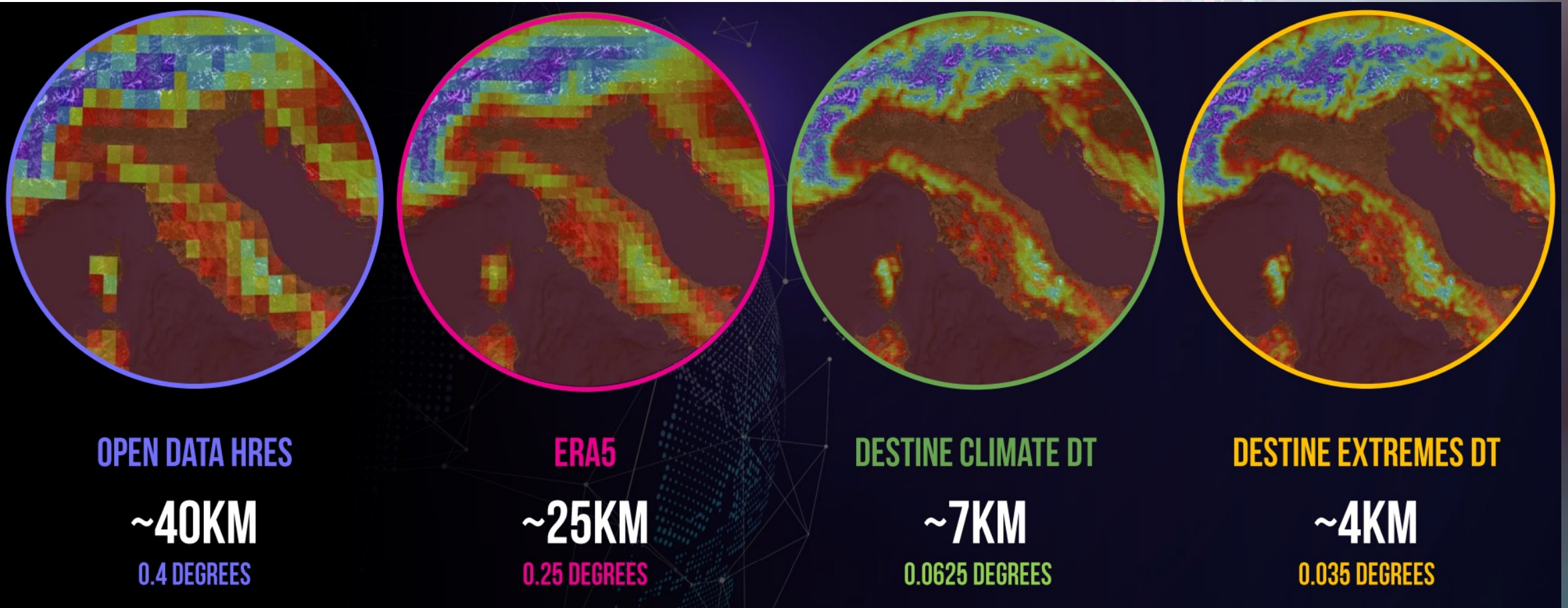
New grids for data

GAUSSIAN GRID   OCTAHEDRAL GRID   HEALPIX GRID

To enable DestinE data exploitation, the platform shall not abandon the users in front of such a huge volume of data.

ERA5 vs. new Climate DT data

Large flow of high-quality data with accumulated Digital Twin data in the order of PetaBytes

(~ 3 years of Copernicus Satellites user data)

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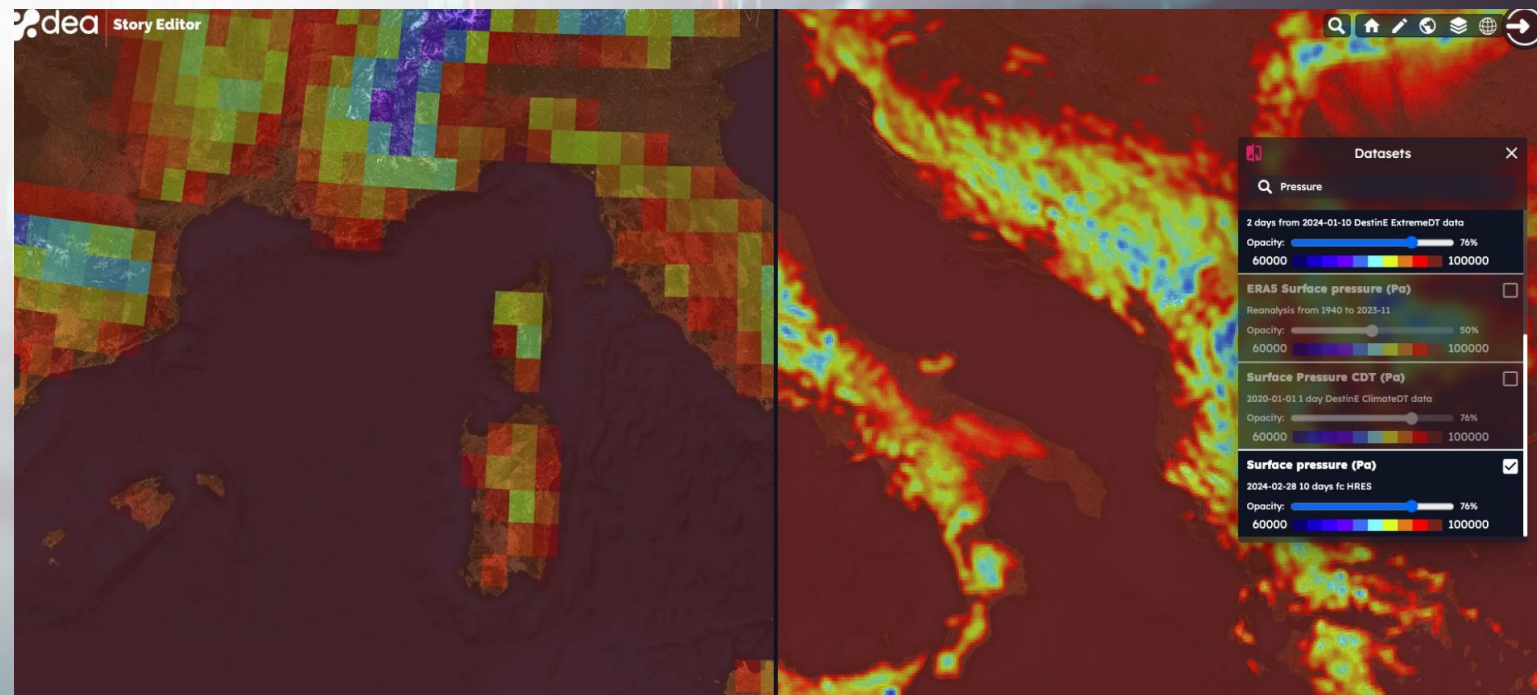
Platform design principles

The platform is not built as a monolithic or rigid application

The platform is conceived as an open and dynamic framework of operational services

The platform is not built as a data distribution system

The platform enables and simplifies the interaction with DestinE data (E.g. dedicated APIs with high potential for efficiency e.g. data streaming, compression, … vs one API for all)

The platform shall favour innovation with new operational services

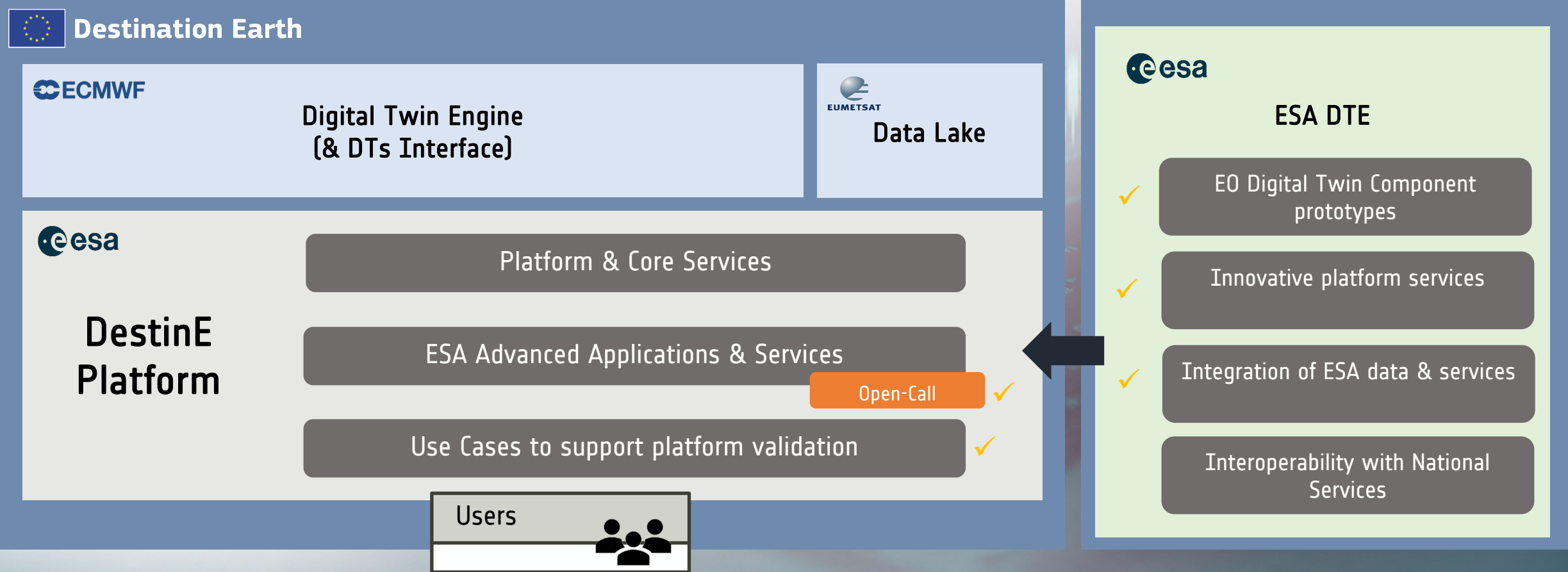**New data, new problems, new difficulties: Solutions shall be adapted to the challenges**

The platform shall favour scalability

Solutions shall be scalable to support large growth by design

Resource management is delegated to the services

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How to contribute to building the Platform?

✓ Activities open soon

Destination Earth

ECMWF
**Digital Twin Engine
(& DTs Interface)**

EUMETSAT
Data Lake

esa
ESA DTE

esa

**DestinE
Platform**

Platform & Core Services

ESA Advanced Applications & Services

Open-Call ✓

Use Cases to support platform validation ✓

Users

EO Digital Twin Component prototypes ✓

Innovative platform services ✓

Integration of ESA data & services ✓

Interoperability with National Services

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How to participate?

DestinE:

Yearly selection of use cases to support validation of the platform functions, performances and fit for purpose

Open call for advanced applications including support for platform integration and early service operations

ESA DTE:

Earth Observation Digital Twin Components – first call just closed; second call planned for Q1 2025

Make ESA EO data & services available in the DestinE context - call ready for opening

Prototype new services ready for Destine operations

Industry can apply to the different open competitions, no conflict of interest identified at this stage between DestinE or ESA DTE competitions (! eligibility and rules are different)

Large focus on on-boarding : a one-year competitive cycle offering regular opportunities

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THE CONSORTIUM

DestinE Platform
OVERVIEW

- ## PLATFORM MANAGEMENT SERVICES
  Trusted entities within the ecosystem,
  competing in creating a community
  around services, establishing trust among participants.

- ## DATA MANAGEMENT SERVICES
  All services allowing consumers to access data and
  applications.

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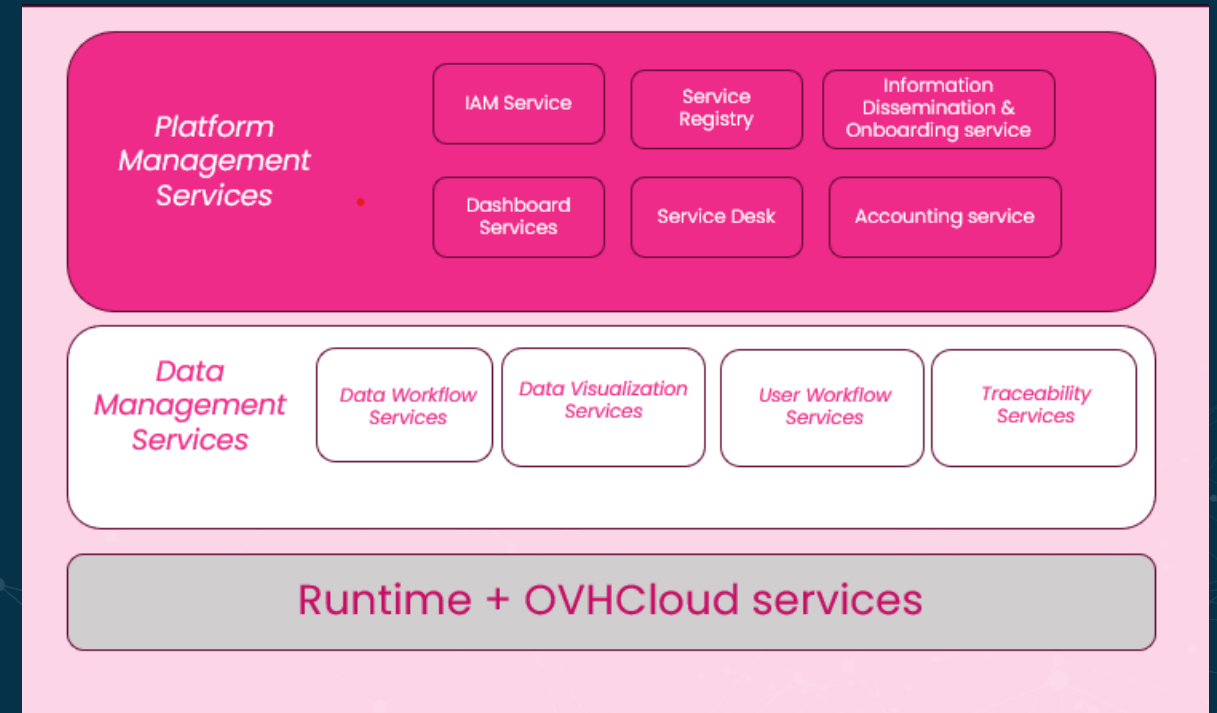
PLATFORM MANAGEMENT SERVICES
HIGH-LEVEL OVERVIEW

DASHBOARD SERVICES

Provides live information about the platform usage, performance and status of the Registered Services

ACCOUNTING

- Allows Users to monitor their consumption of services resources

INFORMATION DISSEMINATION

- Take cares of the Web information Presence layer. Supports Users and Services providing up-to-date and accurate information on the platform Services.

- Provides engineering support for new Services integrating in the platform and exploiting the platform functionalities.

ORCHESTRATION PLATFORM (RUNTIME)

- Common layer for the deployment and operation of all the services.

- Integrates the cloud infrastructure layer

- Security management capabilities

SPECIALISED SERVICE DESK

Supports Users and Services with thematic discussion forums, issue management, ticketing and technical material and information.

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PLATFORM MANAGEMENT SERVICES
IAM and SERVICE REGISTRY

IDENTITY AND ACCESS MANAGEMENT

Unified DestinE Platform user management service, granting access to all authorised Registered Services based on the same digital identity

Allows Users to:

- Register and manage user profiles
- Authenticate with credentials from external Identity Providers (IDP Federation)
- Authenticate through Single Sign On (Service Federation)

Allows Service Providers to:

- allocate Service resources to projects or users' activities

SERVICE REGISTRY

- Catalogue of all applications and services, integrated in the platform, including the Core Services
- Exposes Service end-points
- Entry point for the Onboarding process

SERVICE REGISTRY

The comprehensive catalogue of all services available on the DESP platform. You can easily discover and search all entries, conveniently organised by thematic areas.
In addition, the Service Registry allows the registration of new services in DESP, through our straightforward onboarding procedure.

This will empower you to enhance your engagement with our community and actively contribute to the DESP ecosystem.

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PLATFORM MANAGEMENT SERVICES
WEB INTERFACE

LANDING PAGE

SERVICE REGISTRY

Explore and visualise data

DestinE data on the edge

Services provided by the other DestinE components

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DATA MANAGEMENT SERVICES
Data Workflow: EDEN and DCMS

Eden is the entry point to access all the data available from

- the DestinE Data Lake including simulations generated by the DestinE Digital Twins

- federated data sources e.g. CDSE

The Data Cache Management Service (DCMS) is the rolling archive storing data retrieved from the DestinE Platform data sources.

Available interfaces are HTTP APIs
- STAC
- S3

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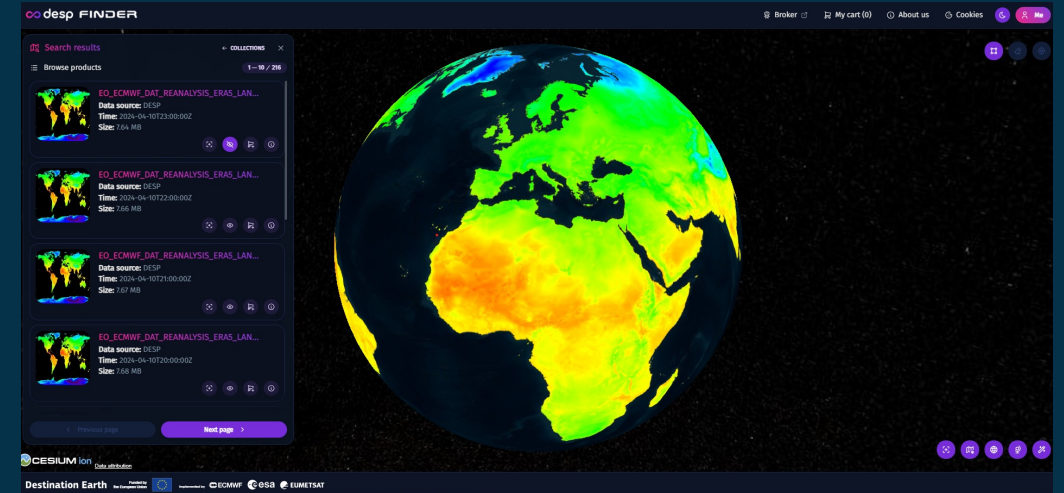
DATA MANAGEMENT SERVICES
User Workflow: INSULA

Python, R, Julia

Jupyter and Beaker

DEVELOPMENT ENVIRONMENT

Ready-to-use user environments with pre-installed libraries.

It is possible to add storage by attaching OVH containers and use CPUs/GPUs.

PROCESSING ENVIRONMENT

Advanced processing service available via UI or API:

- Create structure of the service implementing the algorithm via templating (e.g., AI/ML services, EO Processing)

- Add code and configuration to the structure (I/O, parallel computing)

- Build code and configuration via UI

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DATA MANAGEMENT SERVICES
Data Visualization: VIZLAB and DEA

Vizlab is a Data visualisation in 2D-3D-4D Service (timeseries)

- Supports geotiff, netcdf, grib, shapefile, WMS, WMTS, etc

- Data available on cache are pre-processed for visualization

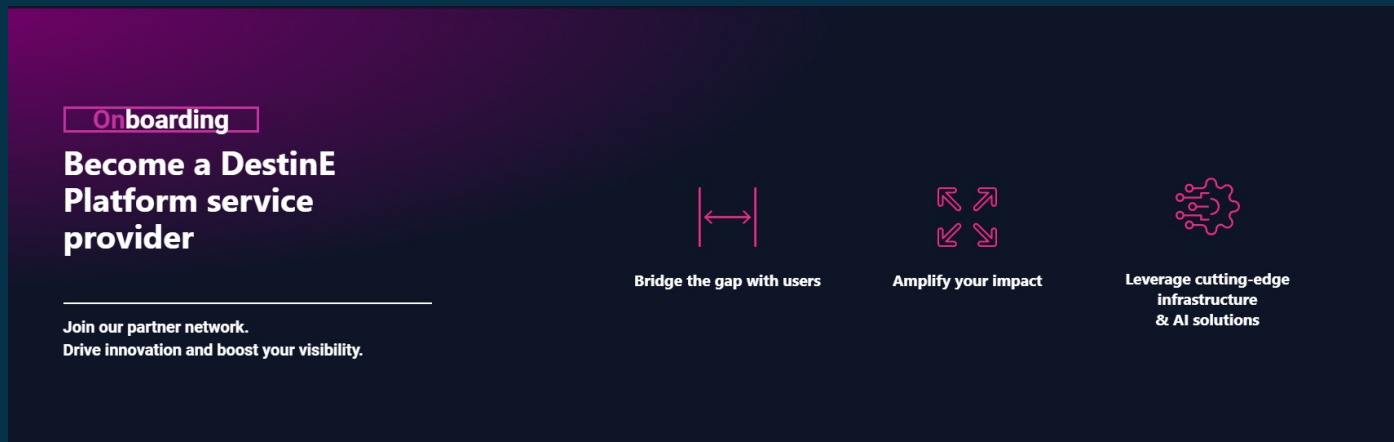- User-generated Data visualisation in 2D-3D-4D for supported standard formats
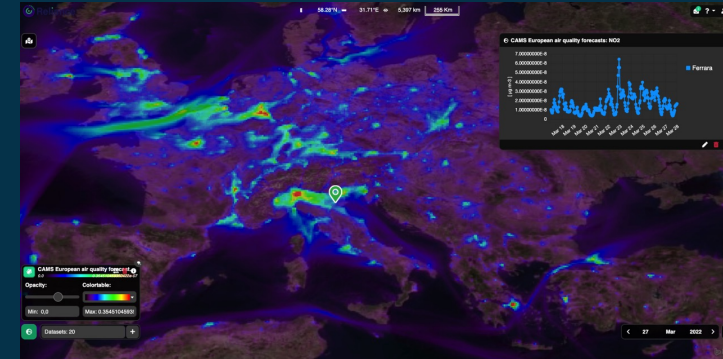
DEA Service is a content creation platform that allows users to create a story without needing to write a line of code.
This enables the non-expert users to share their own engaging visualizations with other people in a simple way.

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DestinE Platform
BECOME A DESTINE SERVICE PROVIDER

Onboarding

Become a DestinE Platform service provider

Join our partner network.
Drive innovation and boost your visibility.

Bridge the gap with users

Amplify your impact

Leverage cutting-edge infrastructure & AI solutions

- **Stage 1: Request**
  Acknowledge and provide service information.

- **Stage 2: Evaluation**
  Your request will be evaluated based on the match with DestinE Platform drivers.

- **Stage 3: Integration**
  We set up the collaboration platform for integration and testing. Your service is published on our platform.

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Register now at https://platform.destine.eu
(beta-testing phase until May 17th)

We want you!

Thank you!

Inés Sanz Morère
(ines.sanz.morere@esa.int)

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the European Union   Implemented by   ECMWF   eesa   EUMETSAT