



# Destination Earth – Core Service Platform

EODC Forum  
15<sup>th</sup> June 2022

Inés Sanz Morère – ESA



- 1. Overview of Destination Earth Initiative**
- 2. Destination Earth (DestinE) System**
- 3. ESA Role in DestinE**
- 4. ESA Procurement Process**
- 5. Current & Future Activities**





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# Agenda



## 1. Overview of Destination Earth Initiative

## 2. Destination Earth (DestinE) System

## 3. ESA Role in DestinE

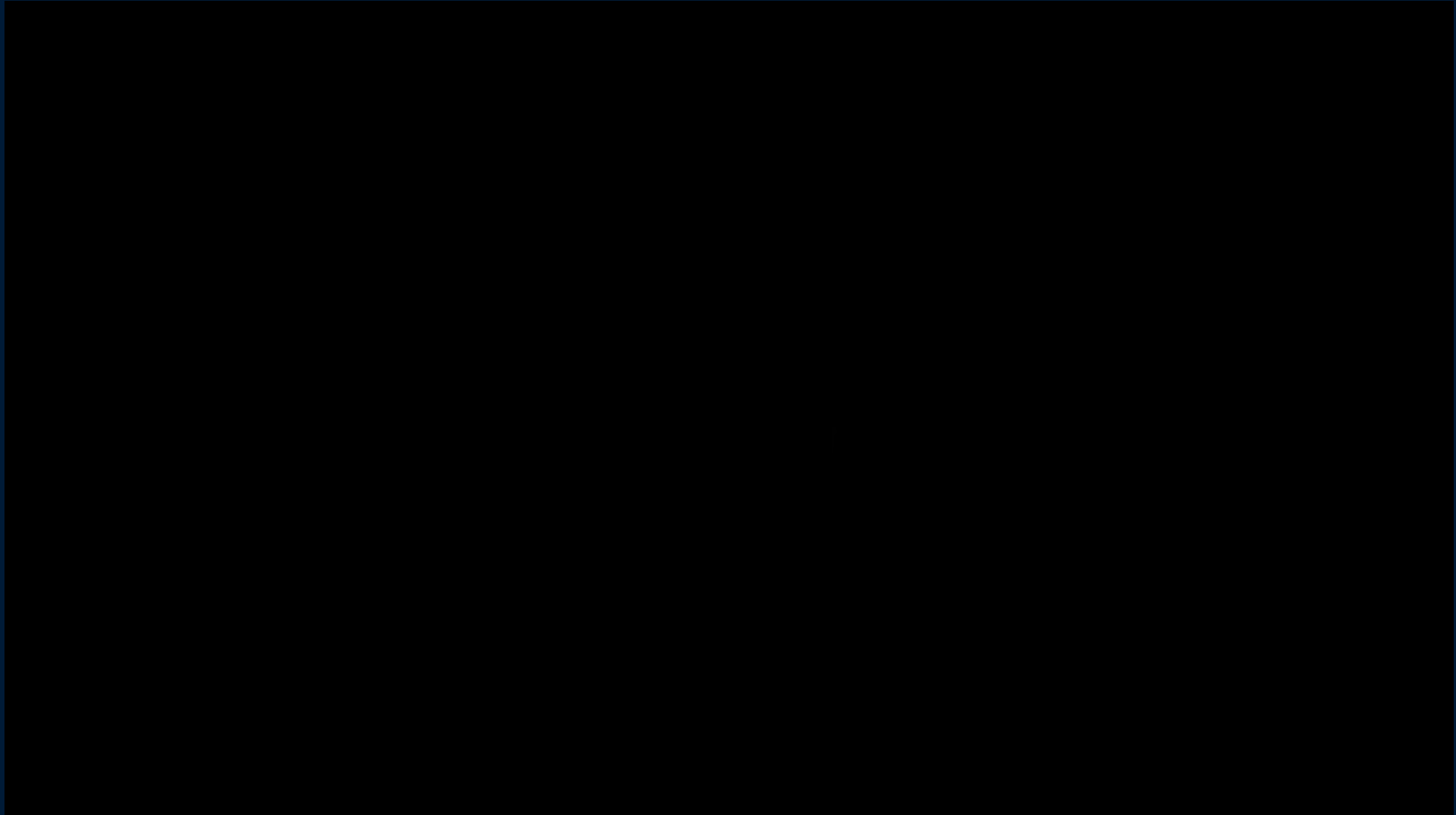
## 4. ESA Procurement Process

## 5. Next Steps



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# Destination Earth Objectives





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# Destination Earth Objectives



## DESTINATION EARTH



### SHAPING EUROPE'S GREEN AND DIGITAL FUTURE

Destination Earth (**DestinE**) will support the European Union's Green Deal and Digital Strategy and will enable policymakers and users to reach the next step in informed decision-making.

EVIDENCE-BASED POLICY DEVELOPMENT

ACTIONABLE PREDICTIONS

APPLICATION DEVELOPMENT





## ***Contribution to policy-makers:***

- monitor and simulate the Earth's system and the impact of human interventions,
- anticipate environmental disasters and resulting socio-economic crises,
- enable the evaluation of scenarios for sustainable development.

## ***Contribution to researchers and scientists:***

- provide access to a wide set of intersectoral Earth-related data such as Earth observation data, output data from high-resolution Digital Twins, socio-economic data, etc.,
- create a science development ecosystem with most up-to-date tools and software, especially ML, for stakeholders to develop, share, and optimize Earth-related models.

## ***Contribution to the general public:***

- facilitate the access, exploitation, and visualization of Earth-related information to raise awareness and involve the global population in the topics of sustainability and environmental crisis.



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# Destination Earth Tools





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# Destination Earth Tools

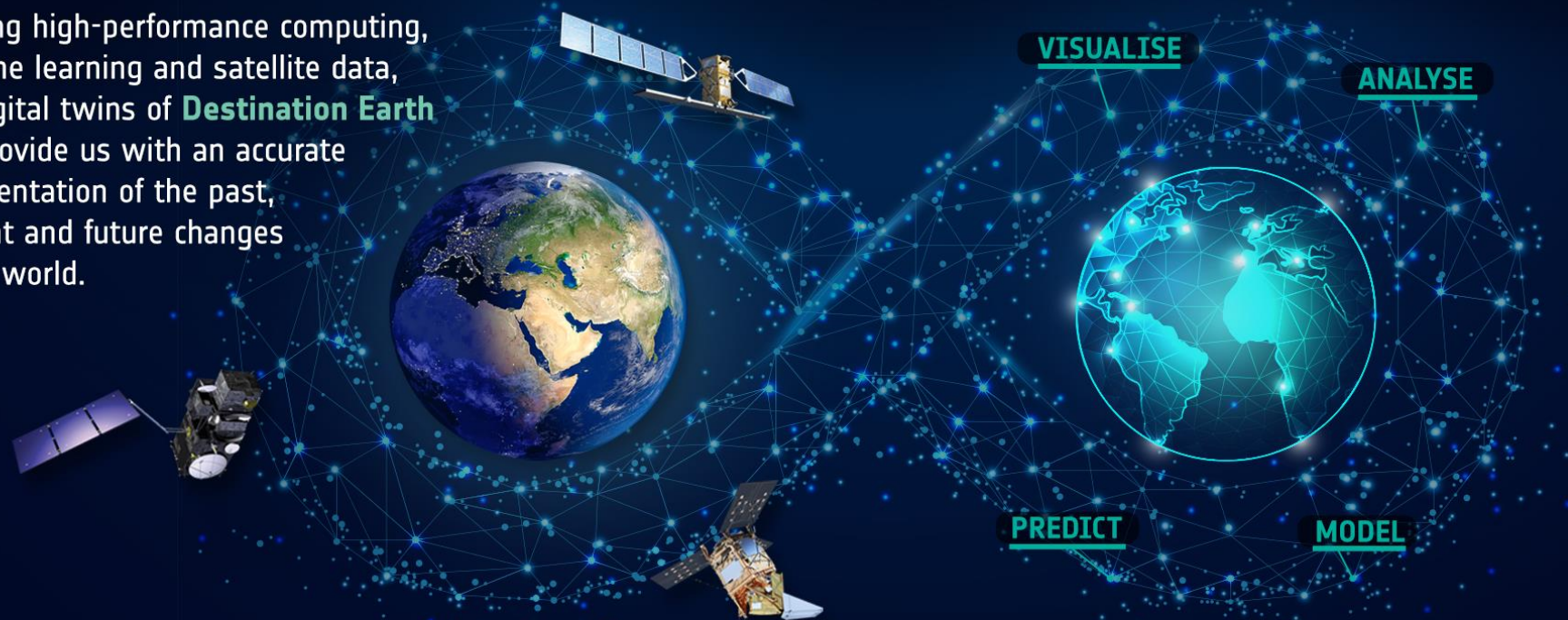


## DESTINATION EARTH



### UNLOCKING THE POTENTIAL OF DIGITAL MODELLING

Utilising high-performance computing, machine learning and satellite data, the digital twins of **Destination Earth** will provide us with an accurate representation of the past, present and future changes of our world.







## ***Contribution to policy-makers:***

- straightforward “what-if” scenarios simulation,
- accessible visualization of Earth-related variables and policy indicators.

## ***Contribution to researchers and scientists:***

- harmonized data access, including high-resolution weather- and climate- related Digital Twins,
- Earth System modelling tools, including ML implementation and training space,
- collaborative services for information sharing.

## ***Contribution to the general public:***

- comprehensible information and usage of DESP,
- effort on community building and accessibility,
- co-design features for stakeholders’ involvement.



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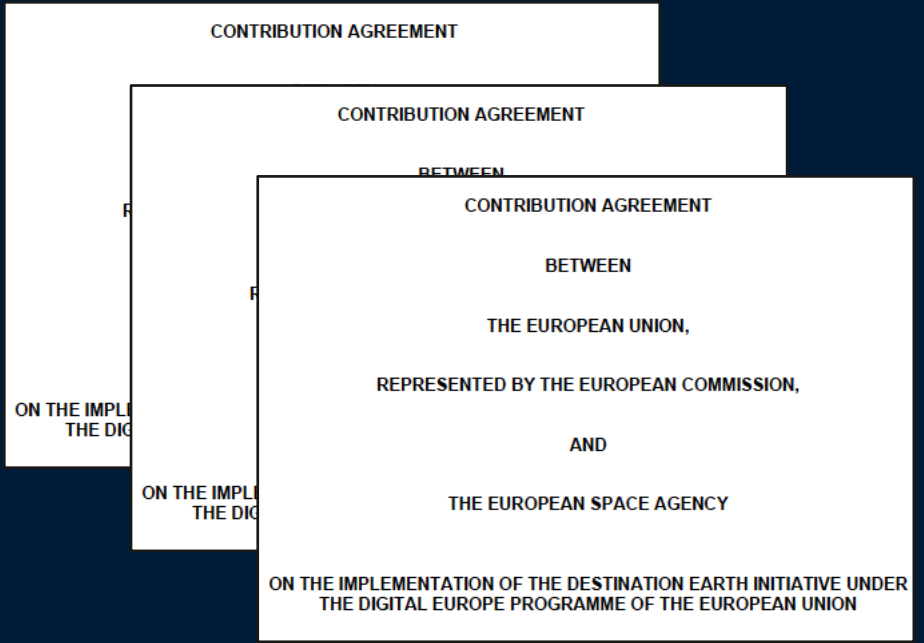


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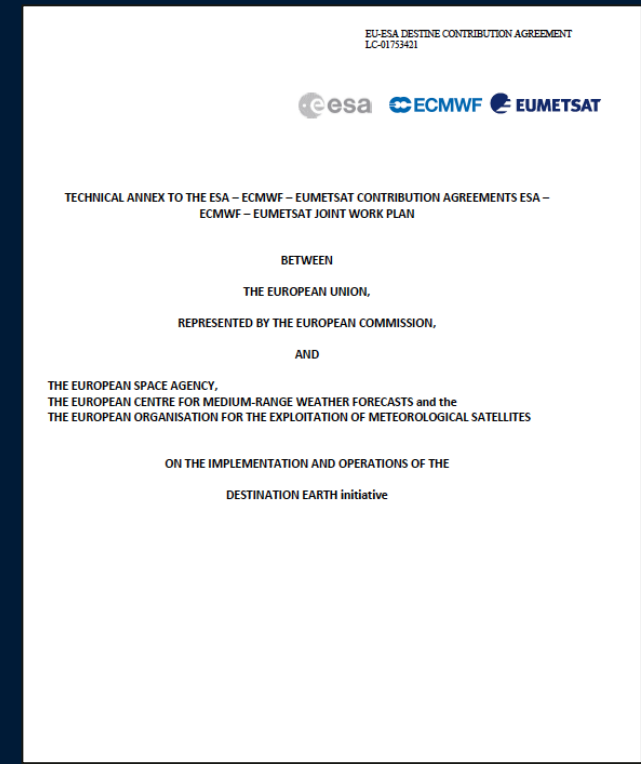
# DestinE Organization



## 3 Agreements



## One Technical Annex



ESA – ECMWF – EUMETSAT  
Different Contribution Agreements

One system




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# System Organization



**Users**

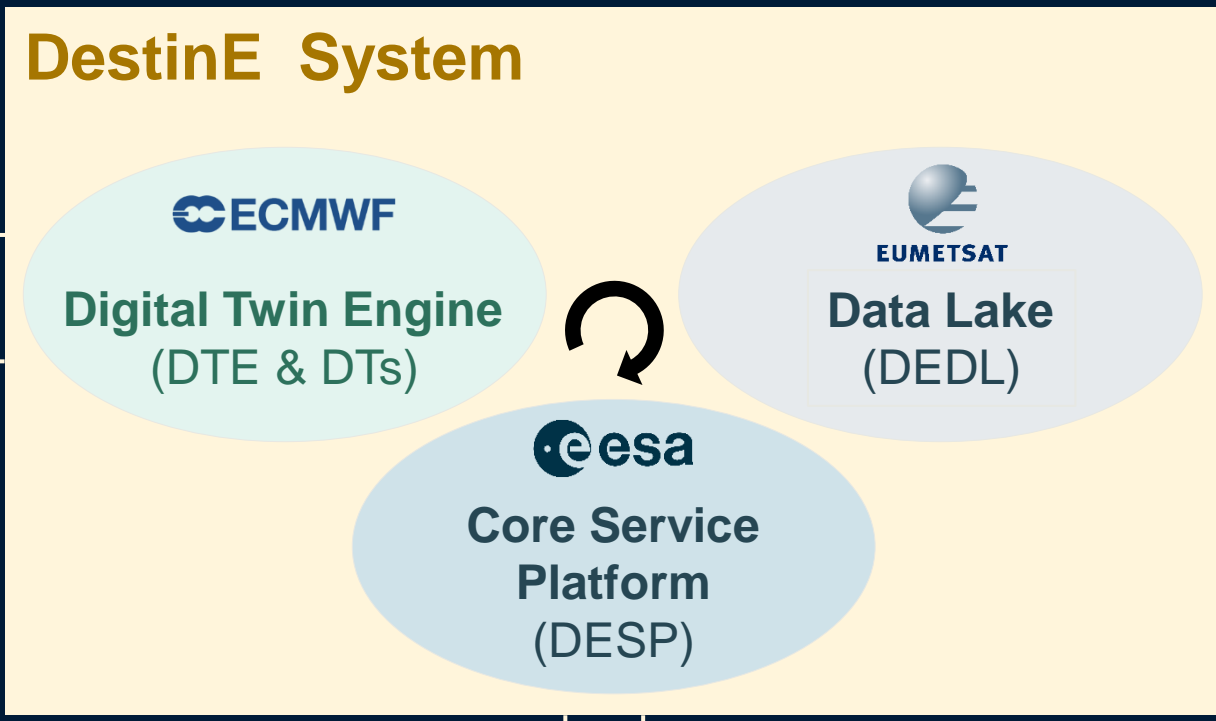


**Data Services**

**European Commission**



**Funding Implementation Coordination**



**External HPC Providers**

**Infrastructure**


**External Cloud Providers**

**Infrastructure**

**Complementary Data Provider**

**Auxiliary Data**

**Copernicus Data Access**



**Copernicus Data**

**3E (ESA – ECMWF – EUMETSAT) Data Lakes**

**Data**





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# ESA Role in DestinE: DESP



- DESP is DestinE's entry point for users.
- DESP is designed as a digital platform enabling the development and exploitation of applications and services targeting DestinE data.
- DESP provides a comprehensive framework for the analysis and management of Earth system processes with state-of-the-art applications associated to the simplicity of use.
- DESP provides an environment for evidence-based policy and decision-making supporting tools.





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- DESP provides an environment for evidence-based policy and decision-making supporting tools.

**Phase 1 (2022-2024):** Progressive entering into operations of routine services.

**Phase 2+ (2024-):** Routine operations associated to enhanced applications, collaborative environments uptake, and user access to DTs interfaces.



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# ESA Role in DestinE: DESP



- DESP is based on an open, flexible, federated, scalable and secure cloud-based architecture, and will connect to existing and future HPC infrastructure.
- DESP is free for its users.
- DESP is conceived to enable integration of complementary resources and to create a seamless scalability framework.
- DESP will gradually allow users to customise the platform, integrate their own data, and develop their own applications.
- DESP is planned for a large user community, with gradual opening designed to be inclusive and to benefit from on-going activity on the design and implementation of the Smart Middleware Platform (DG-CNECT).





- DestinE delivers a continuous and very large flow of high quality data.
- DESP provides tailored services to support users in the information management and extraction.

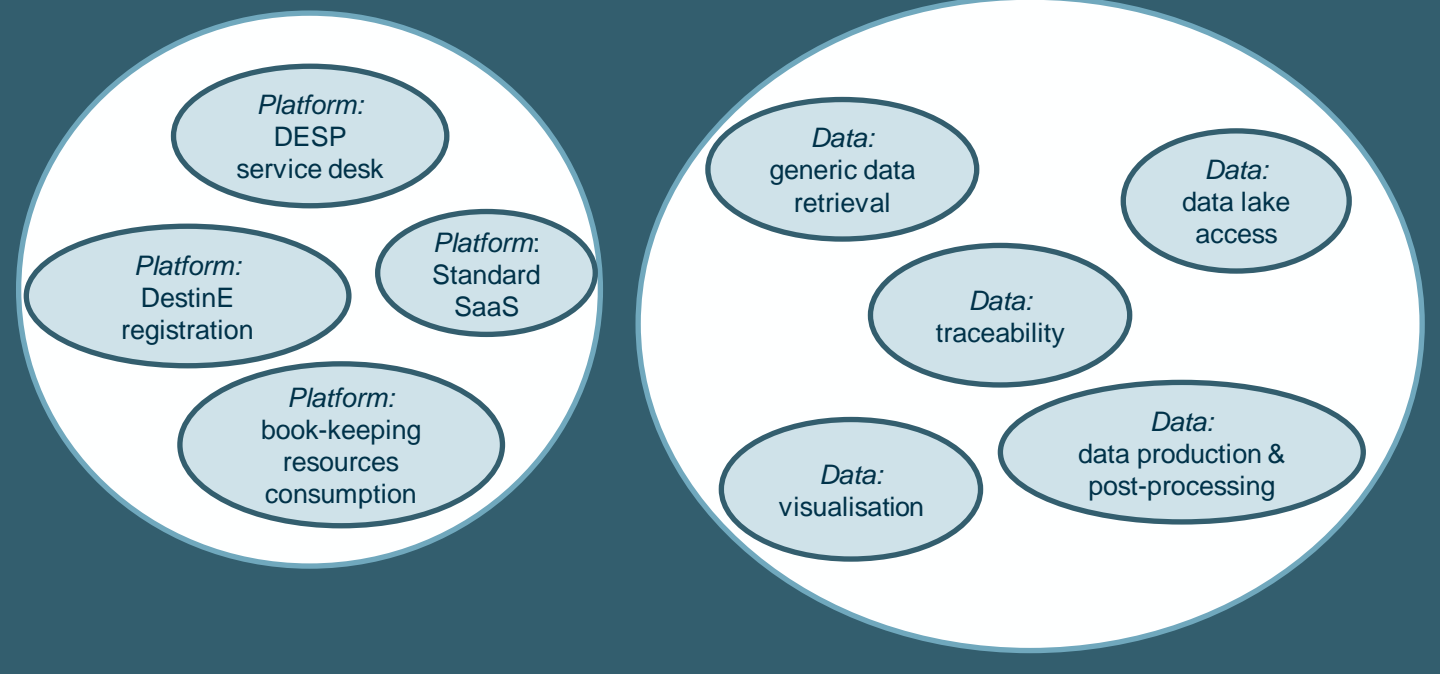
## DestinE System



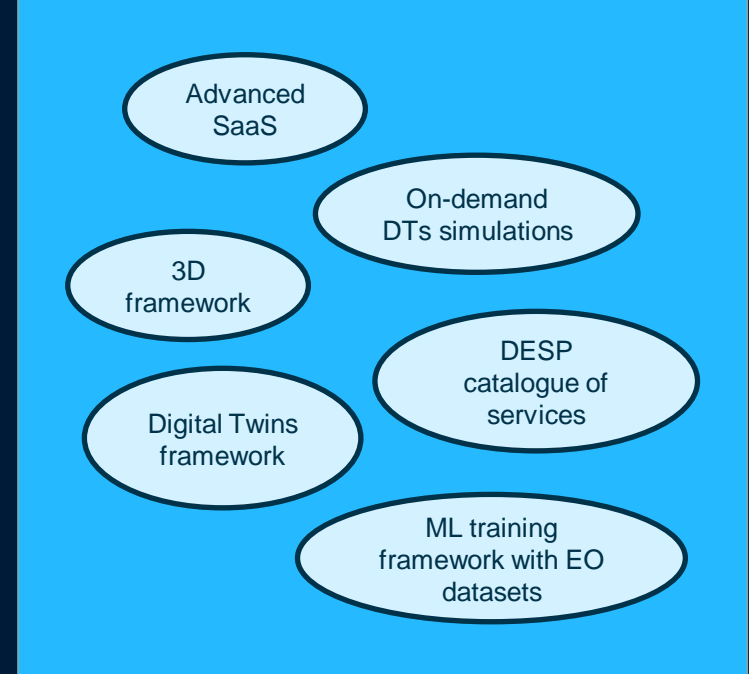
- DESP provided services are divided in the following categories:
  - **Essential Services:** platform & data management services,
  - **Advanced Services:** Earth Twins, applications, and collaborative services.



## Essential Services



## Advanced Services



- DESP platform ecosystem is built and operated by industry.
- DESP operational approach will be based on the definition of services with associated Service Level Agreement(s) procured through industrial competitions.



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## DESP Procurement Logic:

Secure Core Access ↔ Develop Advanced Services ↔ Verify With Users

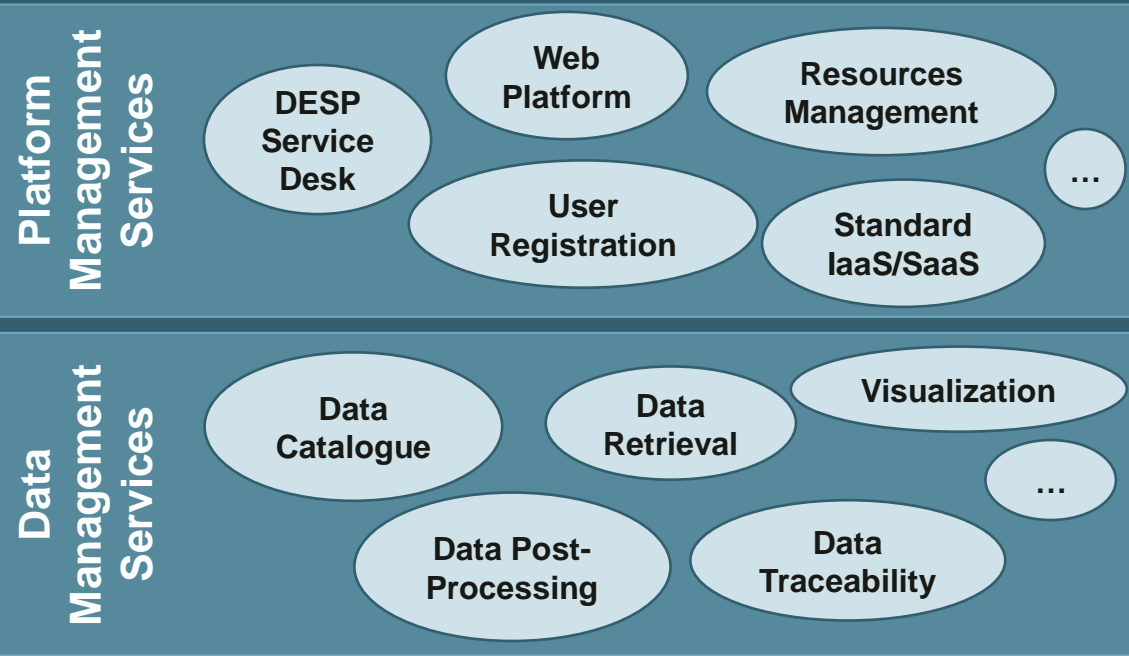
- DESP *use cases* selected in time-limited batches through an open competition from *end of 2022*.
- Platform *essential interfaces and services* with target progressive opening *in 2023* via open competition.
- *Advanced services* procured through a separated open competition with target progressive availability *end of 2023*.



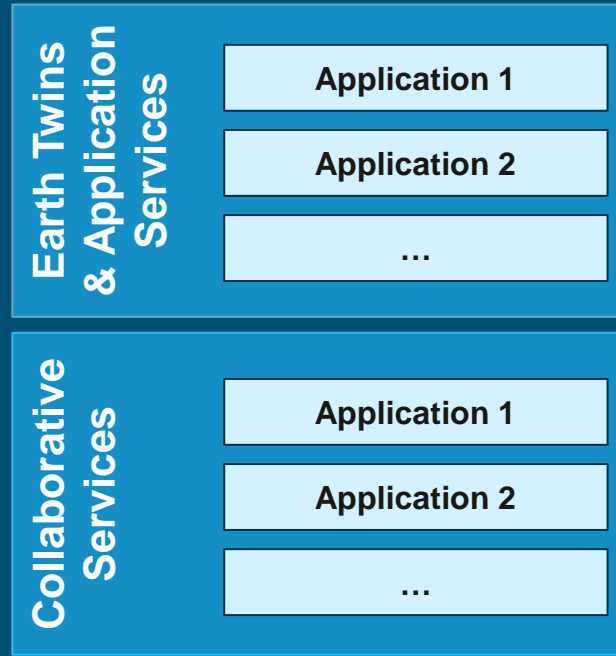


## DESP

### Essential Services



### Advanced Services





**DESP Framework**

- Includes *initial cloud infrastructure* purchase
- *Independent* services
- *Scalable* through DESP's purchasable extra space

## DESP

### Essential Services

**Platform Management Services**

- DESP Service Desk
- Web Platform
- Resources Management
- User Registration
- Standard IaaS/SaaS
- ...

**Data Management Services**

- Data Catalogue
- Data Retrieval
- Visualization
- Data Post-Processing
- Data Traceability
- ...

### Advanced Services

**Earth Twins & Application Services**

- Application 1
- Application 2
- ...

**Collaborative Services**

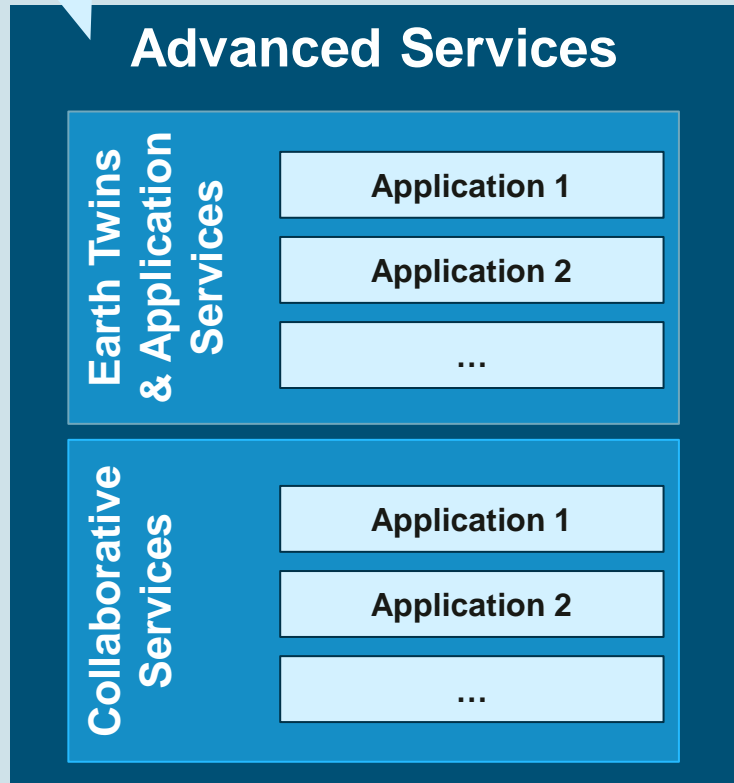
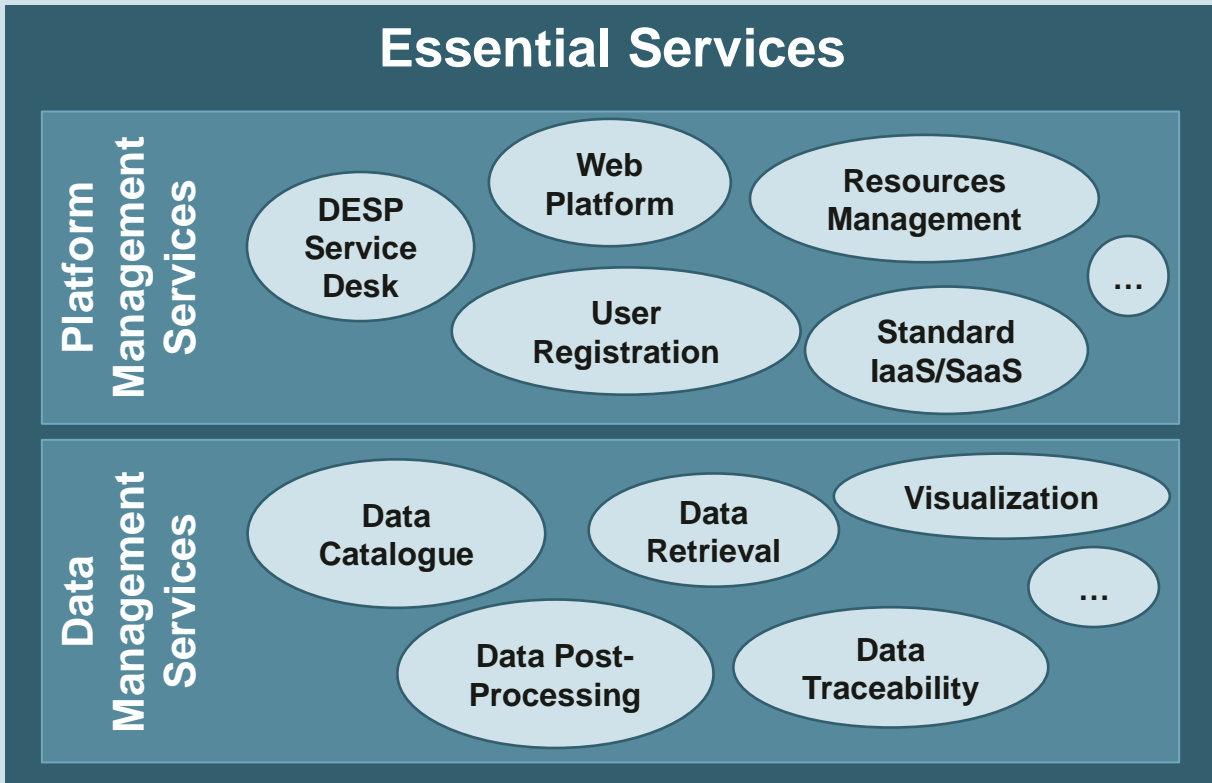
- Application 1
- Application 2
- ...



**Advanced Services**

- Selected & Third-Party applications
- Served by DESP's essential services
- Scalable through DESP's purchasable extra space

## DESP





- Served by platform services with *no financing*
  - *Candidate* to be part of the platform
  - If *approved*, available at DESP's catalogue

## DESP

### Essential Services

**Platform Management Services**

- DESP Service Desk
- Web Platform
- Resources Management
- User Registration
- Standard IaaS/SaaS
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**Data Management Services**

- Data Catalogue
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### Advanced Services

**Earth Twins & Application Services**

- Application 1
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**Collaborative Services**

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Third-Party Candidate Service





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## Current activities:

- end-to-end technical baseline review and consolidation (in coordination with the 3 entrusted entities),
- DestinE system governance aspects definition between the 3 entrusted entities and the European Commission,
- preparation of DESP framework procurement,
- start of use cases and partnership procurement process, including co-design specifications.

## Future activities (6-18 months):

- start of DESP procurement process for implementation in Q2 2023,
- integration and validation of interfaces for a consistent development of the full DestinE system,
- gradual start of operations of DestinE ecosystem.





# Thank you!

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