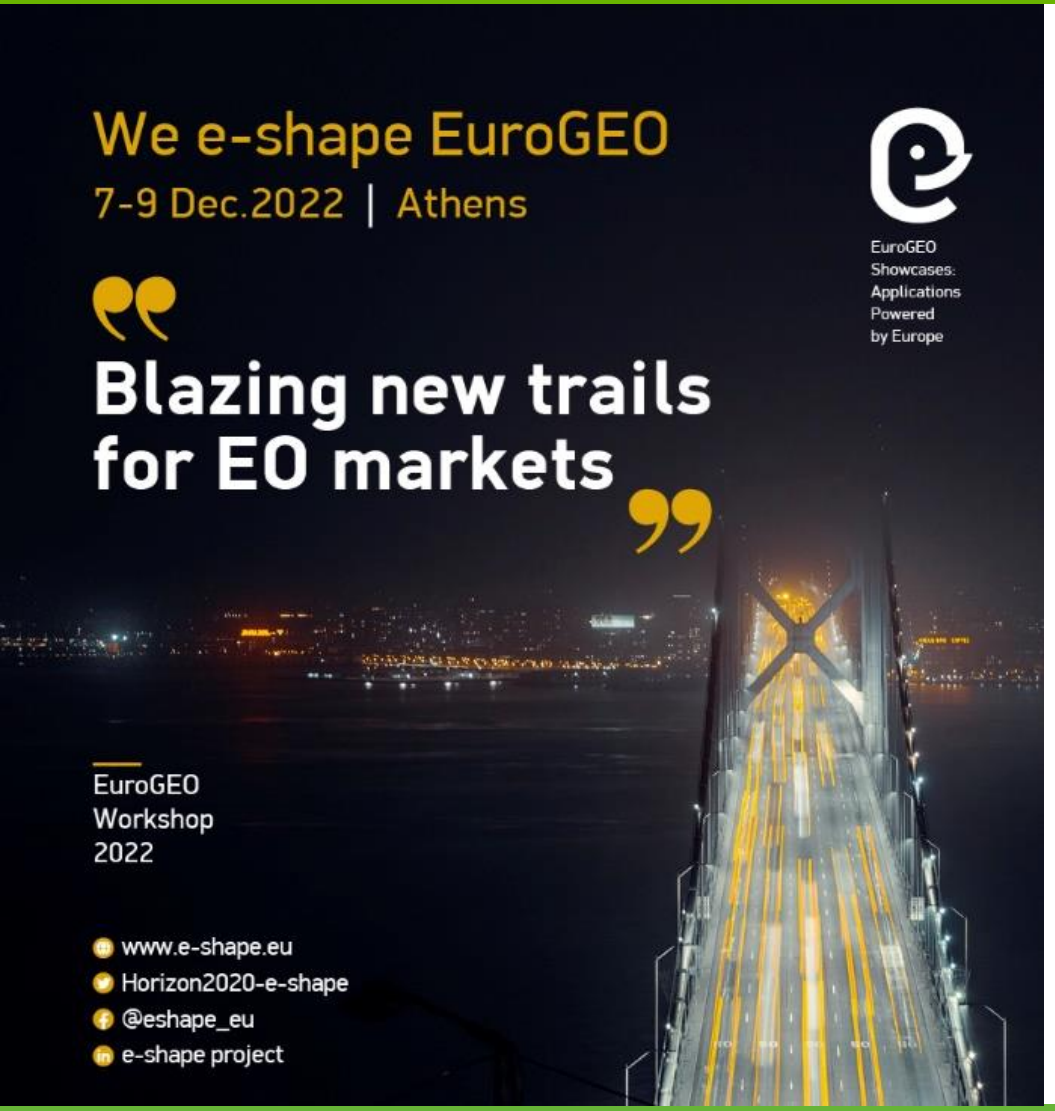

Status on the Usability of the available European Platforms based on e-shape return on experience

Marie-Françoise Voidrot-Martinez

OGC – e-shape Project

Open Geospatial Consortium

e-shape

Learn more here:

The e-shape project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 820852

HELLENIC REPUBLIC MINISTRY OF DEVELOPMENT AND INVESTMENTS | GSRI GENERAL SECRETARIAT FOR RESEARCH AND INNOVATION

European Commission

What is e-shape?

e-shape allows Europe to position itself as global force in Earth observation through:

- leveraging Copernicus,
- making **use of existing European capacities** and
- improving **user uptake of data** from European assets in the GEO context.

Support to the EuroGEO Regional GEO

e-shape vision: To **develop operational services with and for the users** and to **create a conducive environment** whereby the strengths of Europe are exploited towards **addressing societal challenges, fostering entrepreneurships** and supporting **sustainable development**

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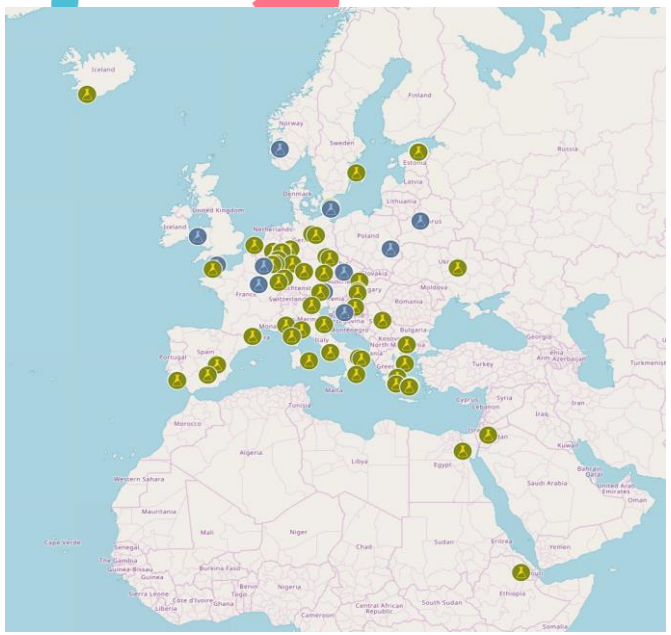
68 Partners from 28 countries



37 pilots
7 showcases

4 years grant
05/2019-05/ 2023

15 Millions Euros

A unique panel for a user-centric project

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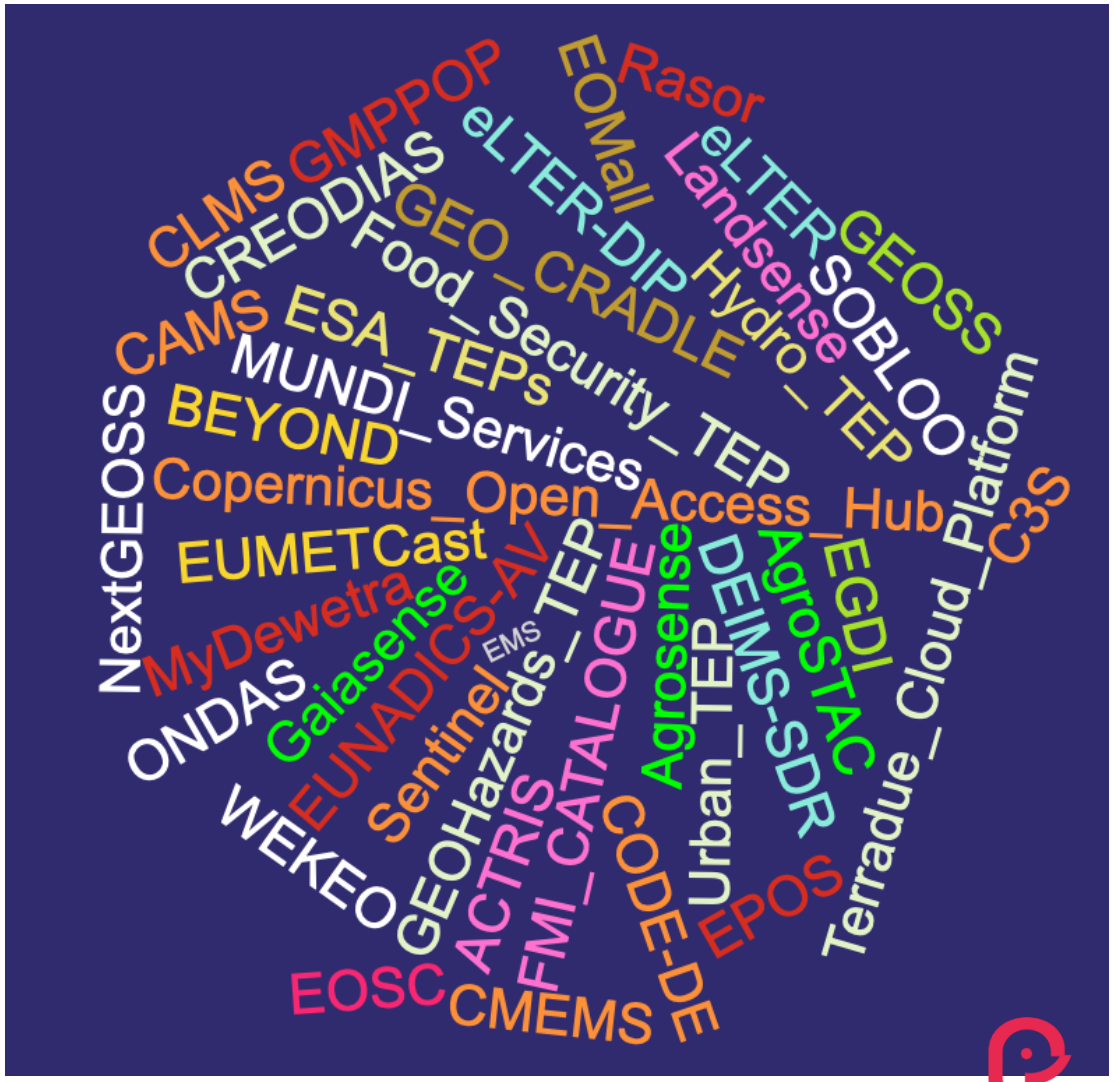
More than 70 platforms used



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Status on the Usability of the available European Platforms based on e-shape return on experience

Focus on Platforms as a Service

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Cloud Technologies for EO

web
Theory

e-shape
Practice

SWOT Analysis

	Helpful to achieving the objective	Harmful to achieving the objective
Internal origin (attributes of the organization)	Strengths	Weaknesses
External origin (attributes of the environment)	Opportunities	Threats

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Theory

Strengths

1. **Scalable IT resources**
2. Develop a business model as **Everything as a service**
3. **Cost-effective**
4. Flexible and resilient **disaster recovery**
5. **Pricing Transparency**
6. **Fast provisioning** of systems, applications, EO data*
7. **Secured infrastructure**

* Blue= specific to EO Cloud Platforms

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Practice

Strengths

- **Good guess of resources needed as a baseline and on pics** to compare prices of the different platforms. Free sandbox help
- **Minimize the initial configuration** to benefit from scalability rather than paying for unused resources
- **Packaging per Components** as needed
- **Shifting paradigm** from Data Download to Application near the Data
- Startups will be able to **afford infrastructures** they cannot buy on their own …. but
- Major research organizations will keep on using **in house HPCs until a real cost assessment is done,** a strategy for the optimal use of internal/external resources is defined and eventually a **budgeting reorganization** implemented
- Some pilots had irregular access to the data and had to implement their own data access to secure the service because the support was not reactive enough for the **level of reliability** they needed
- Transparent **Pricing** is but pricing lists not always clear and with scalability, real costs can become opaque
- **Network of Resources price assessment tool** can help

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Theory

Weaknesses

1. **Specific training** required
2. **Challenge in migrating** from one Cloud service to another
3. **Lack of interoperability** between the different cloud service providers
4. Application & Service access is dependent on **Network Bandwidth**
5. **Data transfer bottleneck**
6. **Open Standard** Implementation

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Weaknesses

- Several **pilots had to migrate platforms** and did not identify this as a major source of problems even if it required specific integration activities. At most some delays that they could mitigate
- No major problems were expressed related to **interoperability**
- **Open standards and open-source are used** by all the stakeholders. Their benefits are obvious
- Some pilots have **reached the limits for data download** while others have directly **implemented the new paradigm** of Applications near the Data
- **Lack of In-Situ global or thematic collections** push users to develop their own in-situ data hubs

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Theory

Opportunities

1. Integration, deployment and entry to the market is cheaper, allowing **higher ROI**
2. **Good opportunity for SMEs** to optimize upfront investments
3. **Pay-for-Use licenses**
4. **Adaptive to future needs**
5. Excellent backbone for Mobile & Web-based applications
6. **High-tech work environment** offering modern information solutions according the last technology,
7. Easy, Quick & Low-effective mitigation of identity, privacy, security, and reliability risks in cloud-based environments.
8. EO Platforms provide access to **big catalogs of Open Data and Open source**
9. EO platforms often offer **software packages enabling expert EO data processing**

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Practice

Opportunities

1. Cloud is a **Source of complexity** requiring new skills development introducing delays
2. The higher ROI is not clear when the Cloud platforms do not have the **same level of "operationality"** as the usual resources: debugging or running analysis in a distributed environment can be complex and costly.
3. **Privacy** stays an issue
4. **Reliability** has been criticized by several pilots
5. Speeds the deployment for a newcomer but for those who already have infrastructures that they master, it is not the case
6. **All catalogues are not online** and the process to synchronize the download of several datasets can be tricky.
7. **Analysis Ready Data** should be made available. **Essential Variables** as an opportunity
8. **Web Data analytics** are an opportunity to optimize the catalogs

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Theory

Threats

1. **Data Security** concerns,
2. **Physical location of hardware** is unidentified, therefore Governments consider the storage of their data out of their land and beyond their regulation boundaries.
3. **Scalability impacts costs** that can become opaque in the long run. Users need to know when and how long the resources used have been "exceptional"
4. Business is highly **dependent** on the 3rd party Cloud service provider,
5. **Lack of commitment** to high quality service and availability

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Threats

- *No problem with security has been reported*
- Several pilots had to change platforms and could mitigate the impacts
- It can be necessary to identify where the **personal data** are physically stored and this information can be difficult to get from the providers
- **Web Data analytics are** a revealer of the open data value. Currently the free tools are US and the generated data is not public.

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Conclusion

- **Cloud technologies fit the needs of Earth Observation domain**.

- Companies working with EO **should develop a strategy** for the best use of Cloud technologies for their needs. This strategy will be highly dependent on the size of the company and existing in-house infrastructures. The real cost of the use of existing infrastructures (in particular HPCs) should be considered.
- Cloud technologies for Earth Observation require **specific training,** hiring **new staff** with these skills, **subcontracting** experts or getting. very good support from providers mastering Cloud and EO.

- Developers reaching data **download bottlenecks** should consider pushing the **Application near the Data**
- The application **architecture should be modular** and the component should be containerized in consistent packages in relation to the Cloud resources scalability/elasticity that is needed.
- The **use of open standards** as an enabler to reduce dependency should be encouraged.

- The **operational SLA** should be explicit to identify the level of reliability and reactivity of the support. Users should test the reliability (data access and processing) and the reactivity of the support over a reasonable period of time.

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Conclusion for platform providers

- Platform providers should keep on offering a **free period and sandbox** to develop this training on the users' specific needs to identify the technical minimum and maximum requirements.
- **Alerts on extra resources activation or threshold** of costs and their deactivation should be implemented.
- **Dashboards** to monitor real resources consumption should be accessible.
- **Online catalogs should be optimized**, cover longer period of time, maybe on specific data and coverage to be identified.
- **Web Data analytics** can be used to optimize the catalogues
- **More Analysis Ready Data** should be made available
- **Essential Variable can be an opportunity**
- **In situ** still driven by the communities. Can ARD on in situ be an opportunity ?

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Based on the unique value of e-shape project and partners collected in e-shape Best Practices

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Thank you for your attention

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