Splinter 4: The role of a constellation within the European EO Ecosystem – Discussion Summary

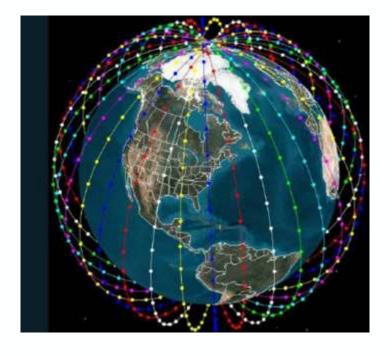Dirk Bernaerts, Vanessa Keuck and Bernardo Carnicero

The European Earth Observation Ecosystem (satellite) constellation **combines different EO systems** in different ways to strategically **leverage the strengths** of each through synergy in a **Systems of Systems** architecture. It provides **verified products and services with certified performance to meet user/stakeholder needs**."

The role of a constellation within the European EO ecosystem

1. Why constellations "NOW AND IN THE FUTURE"?

- **Need for constellations:**
  - Role of backbone missions and reference missions is recognized, with constellations complementing and/or enhancing in terms of:
    - Revisit time, increased coverage of diurnal cycle, temporal coverage
    - Near real time data
    - Higher resolution, e.g spatial, in combination with complementary observations.
    - Reconfigurability, tasking, flexibility

Big/Reference/backbone satellites/infrastructure provides stable profile of measurements, while constellations provide flexibility/adaptability/enhancement.

- However, backbone mission have limit on market opportunity, while generator and enabler of current and future opportunities.

The role of a constellation within the European EO ecosystem

1. Why constellations "NOW AND IN THE FUTURE"?

- **Who are the users / What are the use cases ?**
  - Services and information in addition to data.
  - Institutional, commercial, security. Currently main demand from Security and Resilience (extreme events, natural disasters…). However, scientific usage remains important.
    - *Note: Concern raised sustainability of funding needs by institutional actors.*
  - Service, data, information depending on type customers and is rapidly evolving.
  - Trend towards service based on more and more aggregation of data from combination of systems/constellations/satellites into information.

⇒ Facilitate **data aggregation and access to multi-source information** with **data quality adequate for the specific user needs.**

⇒ **Dual use systems** to be smartly managed/prepared to enable institutional, commercial and scientific use (as already done by some National/Commercial services).

- Use cases vary strongly across users, nations, institutions. **Facilitate centralised/grouped identification of use cases**. Benefit of **facilitating interface between service/information providers and users with single contact point** (currently scattered as opposed to US). **However: Governance of all this ?**

1. Why constellations "NOW AND IN THE FUTURE"?

- **Who are the users / What are the use cases ?**

    - **What should be the next activities towards future applications/services ?**

    - Longer term potential use cases, in addition to current demands:

        - Pollution, Ecosystems, conservation, Climate Change in relation with extreme weather events, and effects on human activity. Agriculture, Liveability, Meteorology, Related regulations

- **How can we facilitate use of the already existing national and commercial capacity to avoid fragmentation?**

2. How do we make it happen "NOW AND IN THE FUTURE"?

- Access to venture capital:

  - **confirmed demand, standardisation but or no ?**

    - if there is already a market and limited risks, investment available with lower or no institutional support. Encourage evolution of industry without unnecessary layers of bureaucracy and/or slow-down.

    - for unconfirmed/potential new markets/user needs or high risk: high institutional support needed related to technology, transfer of knowledge, risk reduction, demand creation, interface between science and commercial aspects.

- Help derisking

- Supply chain standardisation but allowing vertical integration afterwards to address cost efficiency and implementation speed where needed.

- Data/service interchangeability/aggregation

- Data quality/service qualification (as opposed to "certification"), dependent on the user needs (commercial/science)

- Governance and coordination of commercial and institutional initiatives

- Careful: healthy competition versus fragmentation

- Ensure knowledge transfer, synergies and interfaces between science advancement and commercial/societal services

The role of a constellation within the European EO ecosystem

4. How can ESA support and help you – "NOW AND IN THE FUTURE"?

- Technology development / risk reduction

- Service / application development support

- Regulations

- Technical Support and expertise

- Backbone missions

- Certification services (performance)

- Data quality / cal / val

- Financial support

- Fostering competitiveness

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