



InnoComp 2025

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DACISLab: Virtual laboratory based on open science and open data in the Romania - Moldova collaboration in the field of Computing Continuum

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DACISLab Innovation & Computing Continuum

- Drivers of digital European economy: **Datacenters, Cloud Computing, Big Data**
- **Computing Continuum systems** → must be **efficient, autonomous, robust, scalable**
- Explosion of data volumes impacts distributed systems & **Machine Learning**
- New applications follow distributed calculus paradigm:
 - Context-based dynamic interaction
 - Heterogeneous data
 - On-demand data access
- **Examples:**
 - Healthcare (DNA decoding, computer-based medical decisions)
 - Devices & embedded systems (self-driving cars)
 - Smart cities (traffic, pollution, water quality)
 - Science (CERN LHC – 30PB on HPC)
 - Business (predictive models)

DACISLab Innovation & Computing Continuum

■ Cloud–Continuum DacisLAB VLab

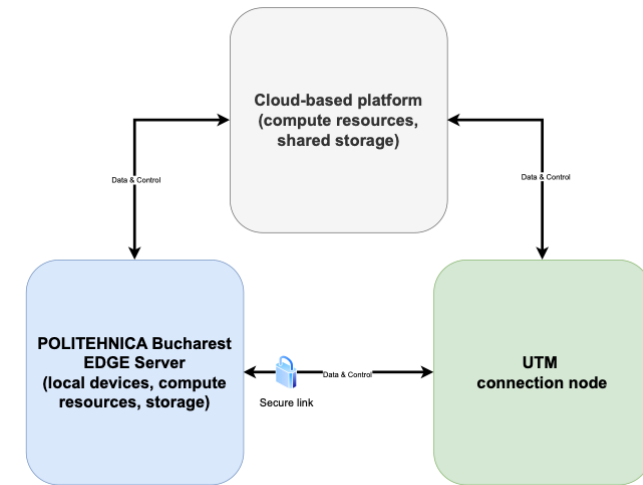
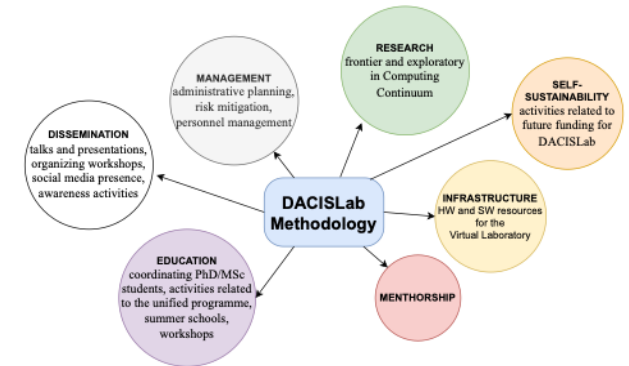
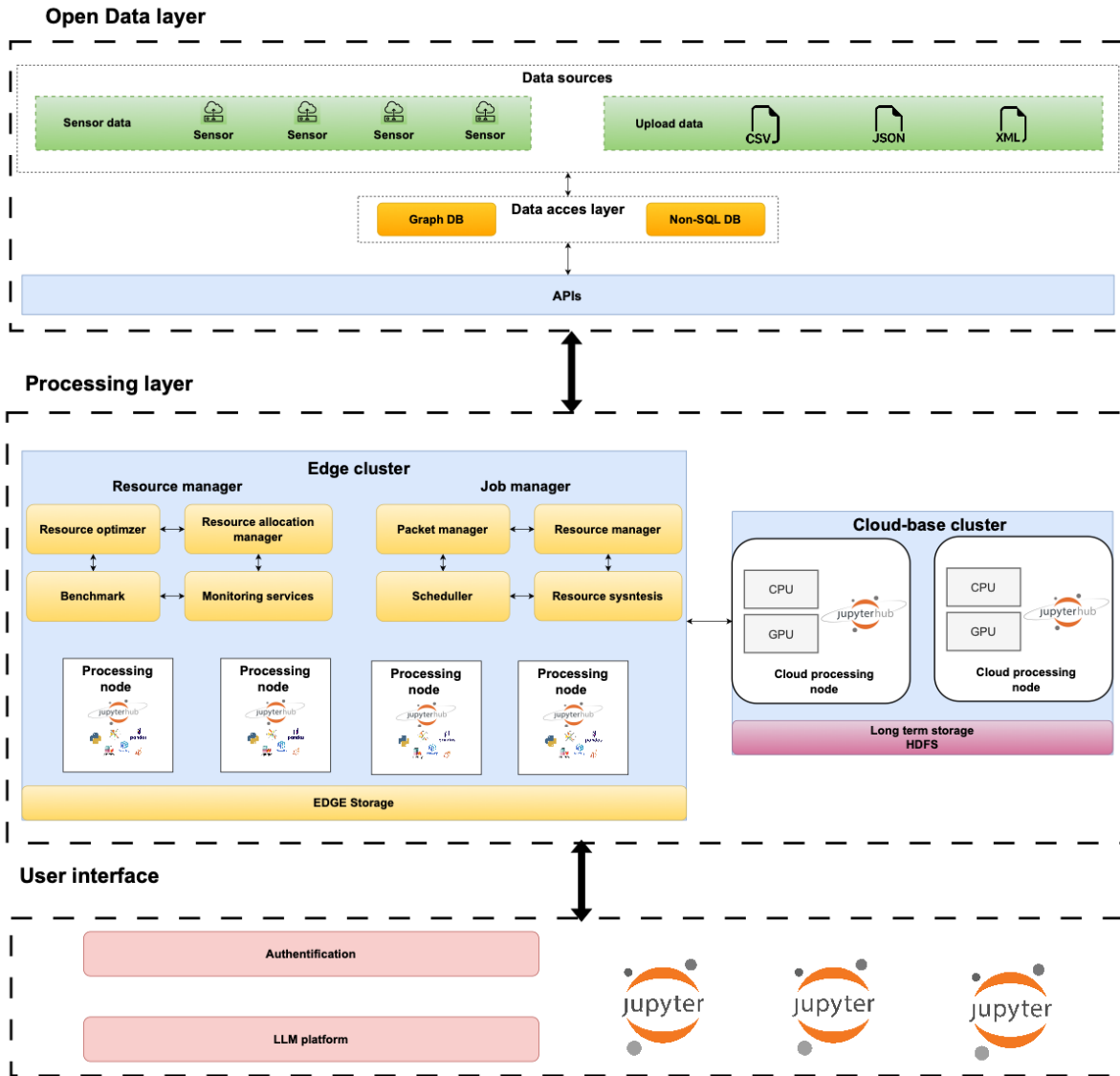
- Pre-IoT: Cloud platforms were main infrastructures
- requirements: **low-latency, secure data processing**
- Emergence of **Edge analytics & hybrid Cloud–HPC–IoT ecosystems** = *Computing Continuum*

■ Virtual Laboratory (VLab):

- Resource sharing & reproducible use-cases
- Knowledge sharing based on **Open Science**

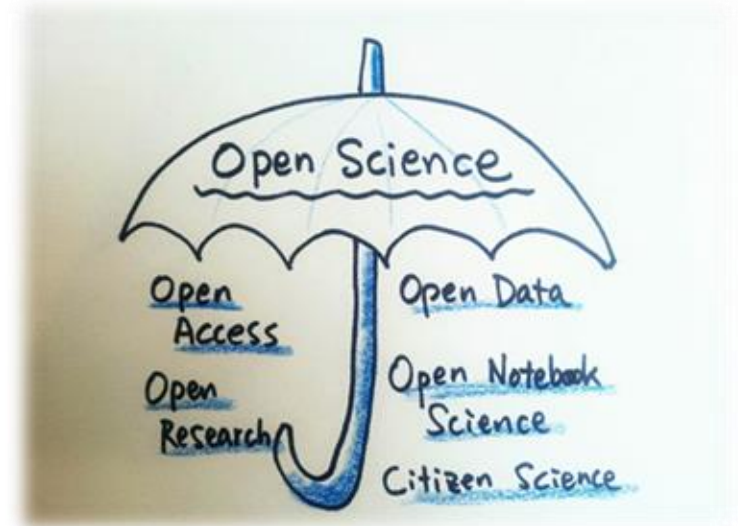
ROMANIA-MOLDOVA Virtual Laboratory

Computing systems built for Big Data Processing



Open Science

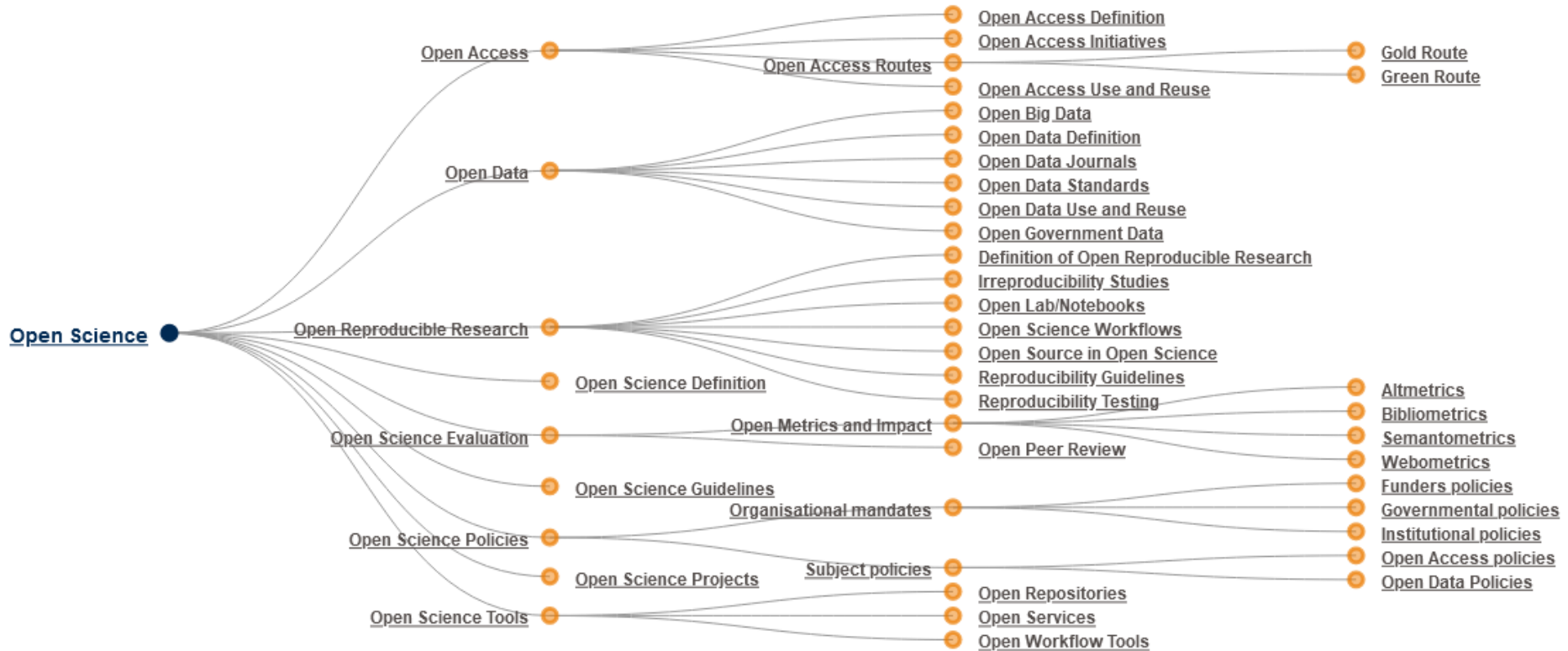
- ‘Open Science is an inclusive construct that combines various movements and practices aiming to make multilingual scientific knowledge openly available, accessible, and reusable for everyone, to increase scientific collaborations and sharing of information for the benefits of science and society, and to open the processes of scientific knowledge creation, evaluation, and communication to societal actors beyond the traditional scientific community’ (UNESCO, 2021, p. 7)



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- **Transparency:** Sharing research methods, data, and results openly
- **Accessibility:** Ensuring free and open access to scientific outputs (publications, data, and tools)
- **Reproducibility:** Promoting practices that allow others to replicate and validate findings
- **Collaboration:** Encouraging partnerships across disciplines, borders, and sectors.
- **Inclusivity:** Involving diverse stakeholders, including citizens, in the scientific process.

Open Science Taxonomy



Open Science „As Open as Possible and as Closed as Necessary”

- We must now *close* certain scientific results, so as not to be used by those who have a different way of thinking and, therefore, undermine the principle of open use of knowledge, by stating that science should be as „open as possible and as closed as necessary”.
- For these reasons, at the European and world level, the countries with democratic regimes that had opted for a total openness of science, are moving towards a new Open Science approach regarding balancing Open Science with other needs:
 - protect commercial interests,
 - protect intellectual property rights,
 - protect personal data (GDPR),
 - ensure integrity in the research process,
 - address concerns of knowledge security,
 - comply with export control and sanctions.

FAIR principles

- A core set of principles was proposed to optimize the reusability of research data or any digital object:
 - **Findable** - It should be easy to find the data and the metadata for both humans and computers. Automatic and reliable discovery of datasets and services depends on machine-readable persistent identifiers (PIDs) and metadata.
 - **Accessible** - The (meta)data should be retrievable by their identifier using a standardized and open communications protocol, possibly including authentication and authorisation. Also, metadata should be available even when the data are no longer available.
 - **Interoperable** - The data should be able to be combined with and used with other data or tools. The format of the data should therefore be open and interpretable for various tools, including other data records.
 - **Re-usable** - To achieve this, metadata and data should be well-described so that they can be replicated and/or combined in different settings. Also, the reuse of the (meta)data should be stated with (a) clear and accessible license(s).

Open Science Current Developments

- The eight pillars of Open Science identified by the European Commission* and used by LERU** in their advice paper on Open Science (OS) and the role of universities „A Roadmap of cultural change”
- The Eight Pillars of Open Science
 - 1/ The future of scholarly publishing
 - 2/ FAIR data
 - 3/ The European Open Science Cloud (EOSC)
 - 4/ Education and skills
 - 5/ Rewards and incentives
 - 6/ Next-generation metrics
 - 7/ Research integrity
 - 8/ Citizen science

Eight principles of open government data

- 1. Complete
- 2. Primary
- 3. Timely
- 4. Accessible
- 5. Machine processable
- 6. Non-discriminatory
- 7. Non-proprietary
- 8. License-free

7 Additional Principles

- Online & Free
- Permanent
- Trusted
- A Presumption of Openness
- Documented
- Safe to Open
- Designed with Public Input

Main objectives of DACISLab... started in September 2025

- **O1:** *Stimulate and increase the scientific excellence and innovation capacity in the area of Computing Continuum*
- **O2:** *Boost the visibility and availability of research results for the participating institution, especially in the widening organization*
- **O3:** *Raise staff's research profile of UTM and of the institutions involved and align and contribute to the overall Research Strategy of both countries, which is focused on the ICT field.*
- **O4:** *Increasing the participation capacity of the research teams to the new research projects, by elaborating scientific project proposals for the announced competitions of the EU Horizon program, as well as to other international projects.*

Thank you!



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