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Why EOSC is pivotal to European competitiveness

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The European Open Science Cloud (EOSC) stands at the intersection of Europe's strategic priorities, offering solutions to critical challenges in research, innovation, and societal development. As a transformative tool, EOSC fosters digital sovereignty, inclusivity, trust, and transparency in the research and innovation domain. It is designed not only to support the Open Science movement but also to underpin Europe's broader competitiveness agenda—an agenda reinforced by recent policy recommendations coming from the Letta report[1], the Draghi report[2], and the Heitor report[3] on the next Framework Programme (FP10).

European digital and data sovereignty

Europe faces a significant challenge in the underutilization of its vast pool of research data. Without full exploitation, this wealth of resources risks benefiting global entities better positioned to capitalize on it, potentially hampering European strategic autonomy and economic security. To address this, Europe must create a European Knowledge Commons—a digital platform and related policies providing access to publicly funded research, digital research outputs, data, publications, and educational resources that empower researchers, citizens, and businesses alike.

EOSC embodies this ambition by establishing a system for researchers across the continent to store, share, process, analyse, and reuse FAIR (Findable, Accessible, Interoperable, and Reusable) research outputs. EOSC is fully aligned with the Letta report's call to harness Europe's untapped digital potential through a unified, accessible infrastructure ('the fifth freedom'). EOSC as a European Knowledge Commons approach helps to secure Europe's future by building a strong foundation for innovation.

Security in research and data management

Data sharing in research often faces two primary challenges: ensuring data owner control and providing a secure environment for collaboration. EOSC addresses these issues through its federation model, which complies with European regulations such as GDPR, cybersecurity directives, and the Data and AI Acts. The model is designed as a virtual environment where only authenticated users can upload high-quality data that need to be rigorously vetted for

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[1] https://www.consilium.europa.eu/media/ny3j24sm/much-more-than-a-market-report-by-enrico-letta.pdf

[2] https://commission.europa.eu/topics/eu-competitiveness/draghi-report_en

[3] https://data.europa.eu/doi/10.2777/9106236

compliance. Also, the users will be offered cross discipline and cross border services on the data they have access to.

This security framework builds trust among stakeholders—a critical requirement emphasized in the Draghi report, which highlights the need to remove regulatory and operational barriers that hinder innovation. EOSC's commitment to robust security protocols and provenance information for its resources ensures that sensitive data remains protected while being available to drive scientific breakthroughs.

Boosting European productivity and innovation

EOSC significantly enhances Europe's capacity for innovation and productivity by addressing inefficiencies that cost the continent billions each year[4]. By enabling the widespread adoption of FAIR practices, EOSC reduces duplication of efforts and streamlines access to diverse, high-quality data. This cross-border, interdisciplinary approach to research is vital for overcoming fragmentation in Europe's research landscape.

The European Commission's recently released "Competitiveness Compass for the EU"[5] communication underscores the necessity of an innovation-led growth model—a sentiment echoed in the Heitor report, which stresses the critical role of next-generation research infrastructures in driving economic productivity. EOSC not only facilitates rapid discovery and reuse of data, but also serves as a catalyst for economic growth by supporting start-ups, scale-ups, and mature industries alike.

Advancing social equity and inclusivity

EOSC plays a crucial role in democratizing access to research resources across Europe. By providing open access to FAIR datasets, EOSC empowers researchers, educators, and innovators from all regions—irrespective of economic or geographic constraints—to engage in cutting-edge scientific work. This inclusive approach is directly aligned with the Letta report's emphasis on reducing disparities and unlocking the full potential of Europe's talent pool.

In supporting capacity-building initiatives and creating pathways for early-career researchers, EOSC helps ensure that Europe's research ecosystem benefits from diverse perspectives and broad participation. This inclusive strategy is vital for sustaining a vibrant, competitive, and socially cohesive research community.

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[4] https://publications.europa.eu/resource/cellar/d375368c-1a0a-11e9-8d04-01aa75ed71a1.0001.01/DOC_1
[5] https://commission.europa.eu/document/download/10017eb1-4722-4333-add2-e0ed18105a34_en

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Fostering European leadership in artificial intelligence

Access to high-quality research data is essential for training trustworthy and efficient AI models. The FAIR principles provide the blueprint for ensuring that data meets the stringent standards required for both human and machine use. EOSC contributes to Europe's leadership in AI by offering a vast pool of quality data that can be leveraged by scientific communities and businesses to drive innovation in areas ranging from healthcare to climate change.

This support for AI innovation is in line with strategic recommendations from the Draghi report, which calls for the removal of barriers to technological advancement. By integrating EOSC into its broader digital strategy, Europe can nurture a thriving AI ecosystem that adheres to its ethical and security standards.

Strengthening European research infrastructure

EOSC is pivotal in strengthening Europe's research infrastructure by providing a cohesive framework that links diverse data repositories and Research Infrastructures. By standardizing data sharing protocols and ensuring interoperability across disciplines and borders, EOSC enhances the efficiency and effectiveness of both the Common European Data Spaces and Europe's research ecosystem as a whole.

This harmonization of research practices not only improves resource allocation and utilization, but also reflects the strategic imperatives outlined in the Draghi report. A robust, integrated research infrastructure is essential for maintaining Europe's competitive edge in a global context.

Addressing Grand Societal Challenges and enhancing Europe's global scientific competitiveness

EOSC is uniquely positioned to support efforts in tackling major societal issues such as climate change, public health crises, and sustainable development. In climate research, for example, EOSC will facilitate the exchange of the underlying environmental data critical for driving renewable energy innovations and sustainable resource management. Similarly, in the health sector, EOSC underpins advancements in AI-driven diagnostic and personalized medicine by providing the high-quality data required for these breakthroughs. The major contributions that emerged from the EOSC-Life approach[6], a comprehensive approach to address the COVID-19 pandemic, focusing on data sharing, research support, and infrastructure development, are an outstanding example of EOSC's potential.

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[6] https://www.eosc-life.eu/resources/ls-ri-response-to-covid-19/

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By creating a platform for interdisciplinary research, EOSC enables Europe to confront complex global challenges collaboratively—a strategy strongly advocated by both the Letta and Draghi reports. For Europe to achieve data-dependent goals such as environmental sustainability and healthcare innovation, EOSC provides the infrastructure necessary for coordinated, impactful research that can position Europe as a global leader in the scientific sector.

Conclusion

EOSC is central to Europe's research and innovation strategy, addressing key priorities in digital and data sovereignty, security, productivity, and technological leadership. By fostering a collaborative, secure, efficient, and trusted research environment, EOSC drives economic growth and innovation while advancing the Open Science movement. EOSC's design and operational principles are directly in line with the strategic imperatives outlined in the Competitiveness Compass communication, as well as the recommendations of the Letta, Draghi, and Heitor reports.

As Europe continues to navigate complex global challenges and a competitive international landscape, EOSC stands as a transformative asset—a critical tool for harnessing shared knowledge, driving breakthrough innovations, and ensuring that the continent remains at the forefront of global research and development. Continued investment in and development of EOSC is not merely beneficial; it is essential for securing Europe's future prosperity and global leadership.

Disclaimer

The purpose of this document is to provide an accessible narrative on EOSC in the context of current political and policy developments. It outlines how EOSC can contribute to addressing the strategic challenges highlighted in recent reports by Letta, Draghi, and Heitor, as well as the broader priorities of the Competitiveness Compass. This document is intended to support policymakers and stakeholders in understanding and contextualizing the role of EOSC within the European and national agendas.