



Advancing Europe's competitiveness and security requires more funding and clear priorities for FP10

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Summary

The next framework programme for research and innovation, FP10, can help EU build its strategic competences for advancing competitiveness, sustainability and security, through excellent research, innovation and digital leadership.

Through accelerating the digital transformation, EU can become **a champion in developing and applying digital technologies** and FP10 must **fully embrace the data-driven research and innovation paradigm**. This cannot be done without **publicly owned world-class digital research infrastructures**, capable of serving the whole European R&I ecosystem and of building Europe's own technological capacity and digital skills. FP10 will be a decisive factor in determining whether Europe can achieve its strategic ambitions regarding competitiveness, sustainability and security. It's time for a **significant increase in Europe's RDI budget**, and focus on four key priorities:

1. Accelerating data-intensive and AI-driven, open research and innovation for competitiveness and prosperity
2. Strengthening Europe's technological capacity and skills through world-class digital research infrastructures and European data ownership, to reduce dependencies and contribute to security
3. Dismantling silos, forging new models for collaboration across the EU to reap the benefits from data-intensive RDI
4. Driving sustainability, supporting the clean transition

Europe, along with the rest of the world, is navigating turbulent times. Major crises, including war and climate change, are unfolding alongside disruptive global trends such as the data-driven digital transformation and intensifying competition for technological leadership. In this context, the urgency for Europe to enhance its research and innovation (R&I) capacity has intensified, highlighting the need for securing global competitiveness, addressing pressing societal challenges, reducing dependencies, and achieving sustainable economic growth and wellbeing. CSC - IT Center for Science Ltd. commends the new commissions commitment to placing R&I, science, and technology at the heart of Europe's economy. We are convinced that this is the only way for Europe to systematically build robust and long-term competitiveness

and skills across diverse disciplines and industry sectors, which is the foundation for sustainable growth and prosperity.

The next framework programme for research and innovation (FP10) will be a decisive factor in determining whether Europe can achieve these ambitions. Every aspect of FP10 - budget, structure, processes, and priorities - will play a crucial role. The first step must be a **significant increase in Europe's RDI budget**. The EU is lagging behind its own 2030 target of 3% of GDP for RDI investment, falling behind countries such as the US, Japan, and China. To succeed, FP10 requires **ambitious and earmarked funding** and must **maintain excellence as the primary criterion for funding across all framework programme actions**.

The next step for delivering more excellent research, impactful innovation and technology is for **FP10 to accelerate Europe's digital transformation**. Europe has to become a **champion in developing and applying digital technologies** and FP10 must **fully embrace the data-driven research and innovation paradigm**. This cannot be done without **publicly owned world-class digital research infrastructures**, capable of serving the whole European R&I ecosystem and of building Europe's own technological capacity and digital skills. This is important from the point of view of both competitiveness and security. The digital transformation represents a systemic shift that both enables and demands an entirely different level of collaboration across disciplines, sectors and borders. **FP10 must support this trend by taking an active role in dismantling traditional silos between the public and private sectors and foster integration across research disciplines**. Moreover, FP10 has to support a seamless **R&I continuum, where basic research, applied research, and innovation are seen as an interconnected process**, rather than competing efforts. One of the key challenges of advancing the digital transformation is its growing negative impact on the climate. **FP10 has a key responsibility for reducing the carbon footprint of R&I, particularly for digital research infrastructures, while amplifying its positive environmental impact**.

For FP10 to succeed in accelerating Europe's digital transformation in a sustainable way, the programme must focus on:

1. Accelerating data-intensive and AI-driven, open research and innovation for competitiveness and prosperity
2. Strengthening Europe's technological capacity and skills through world-class digital research infrastructures and European data ownership, to reduce dependencies and contribute to security
3. Dismantling silos, forging new models for collaboration across the EU to reap the benefits from data-intensive RDI
4. Driving sustainability, supporting the clean transition

1. Accelerating data-intensive and AI-driven, open research and innovation for competitiveness and prosperity

The combination of data, AI and powerful computing resources is transforming research and innovation. AI is expanding researchers' productivity and creativity through processing large amounts of research data, discovering underlying patterns, and generating predictions and models at a speed that was previously unimaginable. This acceleration of research is extremely powerful, and has positioned AI as a catalyst for groundbreaking scientific advances. China currently leads in AI-driven research, with the EU and the US trailing behind. However,

the EU's annual growth in this field lags behind that of both China and the US¹. The impact of data and AI varies considerably across different research domains, and FP10 must ensure that data-intensive and AI-driven research is fully embedded in all disciplines. Equally important is for FP10 to advance the research of AI itself, in order to push the boundaries of what AI can achieve and to develop versatile AI tools that can be applied across a range of different fields.

- FP10 has to ensure that necessary structures and processes are in place to fully leverage the significant shared pool of AI resources in which the EU and the Member States are currently investing, to build a globally competitive and innovative European AI ecosystem. This includes the AI-dedicated supercomputing and service infrastructures developed by EuroHPC JU, as well as the upcoming European AI Research Council.
- FP10 must establish stronger incentives and mechanisms to advance data-intensive and AI-driven research across all scientific domains, including disciplines where the integration of these methods is less mature, such as social sciences, arts, and humanities (SSH). Interdisciplinary approaches that merge natural and technical sciences with SSH is essential for developing solutions that address the social, cultural, and behavioural dimensions and FP10 should encourage broad data-driven R&I efforts, rather than focusing on siloed funding for individual disciplines.
- The next generation of AI in R&I will be based on critical and high-value data. FP10 has to boost value creation from data by increasing support to data management, availability and access in line with FAIR data principles and all layers of interoperability².
- Open Science must remain at the heart of FP10, and the remaining challenges of mainstreaming Open Science has to be proactively addressed. The widespread access to research publications, data and other outputs is also a key component in boosting the uptake of AI in R&I.
- AI-driven and data-intensive R&I is essentially about generating value from data, and FP10 should strive to retain critical data ownership in Europe. One example is health and human data: European data ownership ensures the protection of these data resources while maximising their potential to enhance RDI activities and economic growth. FP10 must also strive to ensure more synergies between EU-funded research projects and European data infrastructures. Data and results generated through EU research projects have to enrich data resources in European infrastructures through a mix of incentives, best practice and mandatory requirement.

2. Strengthening Europe's technological capacity and skills through world-class digital research infrastructures and European data ownership

Digital research infrastructures (RIs) are not mere infrastructures - they are the backbone of modern research and innovation, with a great potential to provide high societal impact, ranging from improving the wellbeing of people to making our societies more secure and resilient. Ultimately this is about supporting European values through European ownership of research data and securing our critical infrastructures. Digital RIs are designed to support a wide range of disciplines and sectors, serving as a common foundation where researchers and innovators can share data, methods, and expertise. Moreover, they are indispensable for developing and applying new technologies, building Europe's own technological capacity. World-class RIs attract talent, providing researchers with the resources they need to excel. Additionally they develop talent by offering training opportunities that enhance users' skills in advanced

¹ [Trends in the use of AI in science - Publications Office of the EU](#)

² https://ec.europa.eu/isa2/sites/default/files/eif_brochure_final.pdf

technologies and methodologies. Horizon Europe has not yet managed to integrate and encourage the full use of digital RIs across the whole programme. In FP10, the strategic and critical role digital RIs must be clearly defined and prioritised.

- The European RI landscape is still fragmented, and this fragmentation undermines the potential of RIs to act as a unified driver of European innovation and competitiveness. FP10 has to ensure long-term collaborative investments in publicly owned, critical European digital infrastructures. It must build on existing large-scale investments in Europe's world-class high-performance computing (HPC) and data infrastructures, in particular the EuroHPC Joint Undertaking and the common European data spaces, including the European Open Science Cloud (EOSC). The impact of these investments are profound - a recent Social Return on Investment (SROI) study³ reveals that every euro invested in CSC's HPC services between 2018 and 2023 brought 25-37 euros back to the society as direct economic benefit.
- The true potential for research and innovation lies in the combined strength of horizontal infrastructures for HPC, data and AI, which are increasingly working together. The flagship project Destination Earth is a prime example of this convergence of high-quality, large-scale data resources and European supercomputing capacities. FP10 must prioritize the coordinated development of these infrastructures, ensuring they work seamlessly together to maximize their impact and efficiency.
- Europe must reap the benefits of European data. This means, that EU must build keep on developing its critical capabilities for making use of data, in a situation where web indices, tools for harvesting data, are non-European. A European web index needs to be recognized as strategic for Europe, and sustainable funding for it must be secured beyond the project phase.
- Creating value from data is highly dependent on users' digital competencies combined with domain-specific understanding of how to develop and apply technology. The new commission is placing a strong emphasis on addressing Europe's digital skills shortages and FP10 must recognise that digital RIs play a key role in building these competencies. For some fields, data-intensive research requires adoption of new research methodologies and a different skillset. On the RI provider side, there must be understanding of domain-specific research challenges and methodologies. FP10 should support both formal digital skills development, research domain specific support in service provision and practical hands-on peer learning in the ecosystems and cooperation projects emerging around data and computing infrastructures – an approach that also supports research careers.

3. Dismantling silos, forging new models for collaboration across the EU

The digital transformation is a systemic shift that both enables and requires new structures, rules, and a new collaborative mind-set and culture across disciplines, sectors and borders. Technologies like AI rely on data and expertise from diverse fields, driving the need for interdisciplinary and multi-stakeholder R&I. For instance, AI for healthcare can revolutionize diagnosis and treatment, but it demands collaboration between actors like computer scientists, medical professionals, and policy experts to ensure effective and ethical solutions. FP10 should actively support this trend by dismantling silos and encourage new models for collaboration at all levels.

³ <https://csc.fi/en/media-release/sroi-of-cscs-high-performance-computing-services-studied-e25-37-return-per-euro-invested/>

- FP10 must increase public-private collaborations and flagship projects between academia and companies for driving innovation and bridging the gap between academic research, industrial application and commercial deployment of digital technologies. Funding mechanisms for joint projects between companies, research institutes and higher education institutions has to incentivise companies to invest in their own R&D capabilities and human resources.
- In the planning and implementation of FP10 closer collaboration is needed between the Commission's Directorates-General (DGs) in order to address and understand the various stakeholders' challenges and needs for digital infrastructures, technologies and skills. Funding programs targeting the digital transformation must be better aligned in the next MFF to create synergies and to ensure more scalable and deployable resources.
- Research and innovation are inherently global. World-class digital infrastructures will enhance Europe's ability to collaborate with like-minded countries on global challenges and the development of critical technologies. Close international cooperation with like-minded countries should remain at the core of the Framework Programme, exploring all forms of cooperation, including association.

4. Driving sustainability, supporting the clean transition

One of the key challenges of advancing the digital transformation is its growing negative impact on the climate, requiring measures across all sectors to prevent it from becoming an environmental burden. FP10 must take responsibility of reducing the negative environmental impact of R&I in the digital age.

- The climate footprint of research infrastructures and data centers is growing, driven by their massive energy demands. The development and deployment of AI, particularly large-scale language models is contributing to this development. FP10 has to set impactful sustainability and energy efficiency indicators for research infrastructures and other energy-intensive industries, addressing their entire life-cycle from construction and operation to decommissioning. Operating sustainable research infrastructures should be considered an integral part of research integrity.
- FP10 must also leverage the positive environmental impacts of digital RIs and data-intensive and AI-driven R&I. Digital RIs and AI are crucial for accelerating the green and digital transformation of key EU industrial sectors and agriculture, enabling advancements such as the development of cleaner technologies and the optimisation of energy solutions. Another example is the development of digital twins that are currently improving our understanding of ecosystems, biodiversity, and climate dynamics, enabling evidence-based policies. For supercomputers, a positive example is to efficiently re-use the waste heat from data centers. FP10 must be geared towards further incentivising projects that take both the green and digital aspects into account. This includes the full spectrum from development of new technologies to basic research which is laying the foundation for long-term technological progress.

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