

November 2017

Preliminary position on FP9

With over 50 years of experience in research and innovation, and as one of the renowned top institutes in the world in computer science and applied mathematics, Inria considers itself a key stakeholder in the research and innovation ecosystem. In this respect, Inria finds it important to clarify its expectations of a future framework programme.

Over the last 15 years, the European framework programmes for research and innovation have had a considerable positive impact on an organization like Inria, thanks to their capacity to stimulate collaboration with European partners within a stable, long-term and commonly accepted framework under reasonable funding conditions. These programmes help to strengthen the relations between the European research and innovation communities and the relevant industrial and societal stakeholders. They are important for economic growth and the resolution of societal challenges, notwithstanding a difference in the way they operate. Considering the high demand for talent and technology in all facets of our digital society, it is vital that this relationship is nurtured and further developed.

Horizon 2020's strong ambition is to confront difficulties of transfer and impact by tightly linking both research and innovation, this within a common programme under uniform rules to facilitate its implementation and maximize participation. Although these objectives are laudable, in practice a large part of Horizon 2020 tends to favour relatively short-term incremental innovation. It lacks flexibility to shape optimal conditions that are appropriate to the various levels of technological maturity and the particularities of the application context for which it is being developed.

In the remainder of this paper we address this concern in six key points and recommendations.

Clarify the role and position of ICT research in the next framework programme

The scope of the framework programmes evolved from developing enabling core technologies and competences, towards application and product oriented challenges, covering a wider spectrum of the innovation chain. There are valid arguments for this shift, yet it is important to note that the digital transformation we are currently experiencing is partly due to the transversal nature of digital technologies, and as such, they are deeply embedded in modern technology ecosystems. It is therefore critical that the support for the development of core technologies and competences (such as software engineering, software security, etc.) is maintained in FP9.

We argue that the ambition of a publicly funded European research and innovation programme should be primarily based on research and its interplay with innovation. Although synergies with other directorates is essential and necessary for coherency, attention should be paid that the scope of the R&I programme does not disperse into challenges better served by other EC directorates. Stakeholders in the R&I programme should understand the purpose of the European support and assume their role and responsibility towards supporting the European research and innovation ecosystem. Some of the

Public-Private Partnerships (PPP) that are meant to play an important role in the setting of the European research and innovation agendas are illustrative of this lack of scope. The idea of a PPP being that industries themselves are well positioned to identify the challenges they face, and to formulate a coherent strategy in collaboration with the European Commission, which commits to implementing them in part through earmarked funding of research and innovation projects. In cases where there is a concrete challenge and an objective at hand, this instrument works relatively well. However, for other domains where the challenges are less tangible, it is less effective. In these cases, attempting to define a coherent European R&I strategy for the short and mid-term interferes with the individual industrial strategies of the stakeholders involved. Due to the consensus-oriented approach of a PPP, the result is often a research and innovation agenda that is relatively shallow and neutral, lacking both ambition and a clearly identified strategy. Moreover, one may question the representativeness of the actors within a PPP (participation to a PPP requires a significant investment that is difficult to justify for notably smaller stakeholders). The role of academia, whose strength is to develop such a vision, is unclear as well. Furthermore, PPPs are contractually requested to identify socio-economic, policy and legislative issues. This makes perfect sense, as they are often barriers to adopting technological innovation. However, as the identified issues do not always concern research and innovation, they cannot be directly funded through the framework programmes. This is difficult for PPP stakeholders to understand (and occasionally leads to addressing such an issue indirectly, undermining the framework programmes' primary objective which is to tackle research and innovation challenges).

Nurture the European R&I system and reinforce European attractiveness for the most talented researchers and innovators

Continuously attracting talent and developing skills is the cornerstone of long-term economic growth, and to understanding and addressing critical global challenges. A sound scientific base, driven by a committed scientific community is a prerequisite to maintain (or position) Europe among the top players in the world.

Therefore, FP9 should dedicate the necessary resources to reinforce Europe's attractiveness, by fostering a favourable environment for the open circulation of ideas, by supporting training and mobility programmes for researchers, by further developing accessible infrastructures necessary for scientific and technological progress, and by attracting and maintaining the best talent with ambitious and attractive programmes.

In particular, the reintroduction of specific networking schemes should be considered. These networks correspond to a strong need of several research communities to develop and structure emerging domains in Europe and to strengthen their position as well as their visibility at the international level (the current Coordination and Support Activities - CSA - scheme under Horizon 2020 is undersized for this purpose).

Support the uniqueness of the ERC

In only 10 years, the ERC has grown into an internationally renowned programme supporting and attracting the world's best researchers. By selecting the best scientists and research projects on the basis of a sound competition, it has become a cornerstone of the whole European R&I ecosystem. Although an ERC grant is "individual" (apart from the newly reintroduced synergy scheme), it is important to note that, the impact on the R&I ecosystem is significantly larger. The privileged working conditions for students and research staff that are implicated in ERC grants, allows the next generation of scientific talents to emerge. This continuity is essential to keep European researchers at the frontiers of science. To maintain this success, the ERC has to be equipped with the necessary resources matching its high ambitions and ensuring an acceptable success rate (around 15 %). Priority in terms of budget

allocation should be given to individual grants (StG, CoG, AdG) to ensure an acceptable success rate. A careful evaluation of the impact of Synergy Grants should be performed on a regular basis.

Encourage symbiotic relations between academia and EU industry through curiosity-driven R&I

Especially in our domain (computer science and applied mathematics), it is essential to justify and validate scientific theory and progress by means of realistic and tangible use-cases, platforms and data. To this end, collaborative/partner-based research with industrial partners is to remain a key feature of the European framework programmes.

While it is natural that publicly funded research is grounded in socio-economic challenges, it is equally important to valorise visionary and groundbreaking science when innovation opportunities arise. This raises the question of the role of science in the society and its ability to shape the future by taking risks. Based on our experience, it often remains difficult to raise interest of European industrial partners for collaboration on the frontiers of science, as opposed to several industrial partnerships Inria has with international technology giants. We argue that a future program should embrace curiosity-driven research at lower Technology Readiness Levels (TRL) that are necessary for future creative and visionary products.

Similarly, the pragmatic focus of the industrial leadership pillar, based on industrial research and innovation agendas, imposes a clearly defined short-term impact. Moreover, the unreasonable acceptance rate of the FET Open programme makes the cooperation between academic and industrial stakeholders on more visionary topics difficult. FP9 should correct this imbalance to avoid the risk of seeing the best teams and talents shifting away from the European collaborative programmes.

Revisit the notion of impact for research and innovation as an evaluation criterion

We acknowledge the importance for a research and innovation proposal to think beyond the duration of the potential project, and to present a strategy to maximize the impact of R&I results. Nevertheless, we argue that the focus on impact as evaluation and discrimination criteria does not always have the intended effect. The risk with formalizing impact as part of the Horizon 2020 evaluation process for proposals and projects is that short-term impact is favoured simply because it is easier to assess (although even that is debatable). This is short-sighted and perilous for the long term. There are numerous examples of research areas that have been funded by prior programmes and have achieved deep impact long after the end of the project itself.

Estimating and measuring impact is a necessity, and a vision of potential impact should be required for any proposal. However, a vision skewed only towards short-term economic benefit is unsatisfactory. Potential long-term impact has to be evaluated (taking into account that this evaluation is risky and cannot provide any form of guarantee). It is also essential that a consistent follow-up strategy be put in place, going beyond the duration of the project. In addition, dedicated instruments are needed to ensure a project's follow-up in order to deliver innovation. Such instruments should be provided by the European Innovation Council (EIC).

Optimize the conditions for fostering innovation in Europe

For academic excellence to thrive, an open, inclusive and competitive ecosystem is arguably the best for advancing science ("standing on the shoulders of giants"). However, this may be less true for successful innovation that does not solely depend on excellence, but on a plethora of other factors (market, legislation, competition, etc.). The conditions to stimulate innovation are variable, and therefore require flexibility to take down barriers as they emerge.

FP9 should optimize conditions for innovation and stimulate where and when needed. As research and innovation challenges are different in nature, they require an adaptable approach that is not served by a rigid one-size-fits-all programme. Suitable instruments that assure a certain degree of continuity and follow-up can be under the umbrella of a European Innovation Council, possibly including the existing EIT KICs, when successful and for the sectors or challenges they cover. The EIC's added value should include the ability to detect and help emerge results and technologies with high innovation and/or business potential from European projects and to assure they are visible and accessible to wider communities and potential application domains.

Specific attention should be paid to disruptive innovation, which is unpredictable, but requires support when it emerges. This concerns in particular technology domains with a high transformative potential of science, economy and our society in general, such as artificial intelligence, cybersecurity, quantum computing. Lack of disruptive innovation in these domains will have a negative impact to create and maintain jobs in Europe (although not being the only job markets).

Recommendations

- Reinforce a programme grounded in scientific excellence as the basis for a research and innovation ecosystem that is necessary for nurturing and attracting talents and, as such, will ultimately benefit economy and society.
- Clearly define the scope and objectives of the next framework programme for research and innovation, maintain a clear support for the development of ICT core technologies, restore a prominent role for lower TRL actions with active industrial involvement.
- No one-size-fits-all programme, but distinct rules and conditions for research projects (meant to stimulate curiosity-driven research) and innovation projects (meant to optimize conditions for transfer and innovation).
- Establish a joint European disruptive initiative able to financially support high-risk technologies.

And more specifically:

- Maintain the excellence of the ERC and give budget priority to individual grants.
- Reintroduce specific networking schemes to develop and structure emerging research domains in Europe.
- Foster and further stimulate a balanced cross-fertilization of communities (academia and industry) through collaborative research programmes that are the basis for future innovation.

About Inria:

Established in 1967, Inria is the French National Institute for computer science and applied mathematics (public research establishment). Inria produces outstanding research in the computing and mathematical fields of digital sciences and promotes "scientific excellence for technology transfer and society". Inria has been very active in the previous European framework programmes and is strongly involved in Horizon 2020. Inria is also playing a lead role in the construction of the KIC EIT Digital and is a core partner of the KIC EIT Health.