

## Policy Letter

# The Horizon 2020 framework and Open Innovation Ecosystems

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**Abstract.** Horizon 2020 will be the financial instrument implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness. Planned to run from 2014 to 2020 with an €80 billion budget, the EU's new Programme for research and innovation is part of the drive to create the conditions for new growth and jobs in Europe. It has been approved on 3rd December 2013, with many interesting new initiatives supporting the whole innovation process. Interlinking the new Horizon 2020 actions with the findings of the Dublin Open Innovation 2.0 conference findings and the Dublin Declaration for new European narrative for innovation we end up with very interesting new opportunities for all stakeholders in the innovation, including the societal dimension. In this short article I will elaborate some of the findings from Dublin Declaration and interlink those to the responses we see in the Horizon 2020 Programme.

**Keywords.** EU policy, competitiveness, innovation

## 1 Horizon 2020: background

Horizon 2020 is a totally new type of research programme for the EU that has been designed to deliver results that make a difference to people's lives. Built on three pillars it will fund all types of activities, from frontier science to close-to-market innovation.

Horizon 2020 is built around three pillars:

1. Support for "Excellent Science" – including grants for individual researchers from the European Research Council and Marie Skłodowska-Curie fellowships (formerly known as Marie Curie fellowships);
2. Support for "Industrial Leadership" – including grants for small and medium-sized enterprises and indirect finance for companies through the European Investment Bank and other financial intermediaries;
3. Support for research to tackle "societal challenges". During negotiations between the European Parliament and Council it was decided to support research towards meeting seven broad challenges:
  - Health, demographic change and wellbeing
  - Food security, sustainable agriculture and forestry, marine, maritime and inland water research, and the bioeconomy
  - Secure, clean and efficient energy
  - Smart, green and integrated transport

- Climate action, environment, resource efficiency and raw materials
- Inclusive, innovative and reflective societies
- Secure & innovative societies

In addition, part of the Horizon 2020 budget goes towards funding the European Institute of Innovation and Technology (EIT), research activities carried out under the Euratom Treaty and non-nuclear research carried out by the Joint Research Centre, the European Commission's in-house science service.

In the following I will elaborate the Horizon 2020 programme from DG Connection Networks, Contents and technology (DG CONNECT) perspective, focusing on the industrial part of the programme as well on the societal challenges part where ICT is one of the critical technological enablers.

## 2 Open Innovation 2.0

Open Innovation 2.0 is a new innovation approach formulated by Martin Curley et al in their paper "Open Innovation 2.0: A New Paradigm", published in conjunction with the Irish Presidency conference Open Innovation 2.0 held in Dublin in May 2013. The paper identifies critical elements in the new approach clearly differing from the past understanding of open innovation.



**Fig 1:** Components characterising Open Innovation 2.0

The key components are based on twenty interlinked elements from which I in this context want to highlight the following:

OI2 is a mash-up parallel process where the public policy maker needs to create the framework for this interaction (mash-up) to happen. OI2 is genuinely intersectional as innovation often happens in crossroads of technologies and applications and is not linear extrapolation of past.

To speed up the scalability all stakeholders need to co-create the solutions/find the innovations together, in real world settings. Only then we have a strong driver to create new markets and services, and are able to scale up successes fast. There is inherent buy-in in this kind of innovation environments. On the other hand by involving end users as co-creators upfront and seamlessly we see very fast the less successful experiments and prototypes failing; "failing fast, scaling fast" is actually one of the strongest advantages of Open innovation 2.0.

All this is leading to quadruple helix innovation model where the triple helix one

(research, industry, public sector) is complemented with the people component. Actually in this model the citizens are not seen as passive objects of new products or services but as active agents contributing in the whole innovation process seamlessly.

Importantly, taking both the quadruple helix approach as well as the interdisciplinarity into account we enter the innovation ecosystem model. The cluster model for innovation is outdated because it is still reflecting the sectorial approach. We see in many regions of Europe how the cluster approach has been successful in industrial sectors, e.g. in Germany and Northern Italy. However the cross-fertilisation beyond traditional value chains to value networks and further value constellations is increasingly important.

The paradigm change from closed innovation to open innovation and furthermore to Open Innovation 2.0 can be illustrated by the following table:

<b>Closed innovation</b>	<b>Open innovation</b>	<b>Open Innovation2.0</b>
Dependency	Independency	Interdependency
Subcontracting	Cross-licensing	Cross-fertilisation
Solo	Cluster	Ecosystem
Linear	Linear, leaking	Mash-up
Linear subcontracts	Triple Helix	Quadruple Helix
Planning	Validation, pilots	Experimentation
Control	Management	Orchestration
Win-lose game	Win-win game	Win more-Win more
Box thinking	Out of the Box	No Boxes!
Single entity	Single Discipline	Interdisciplinary
Value chain	Value network	Value constellation

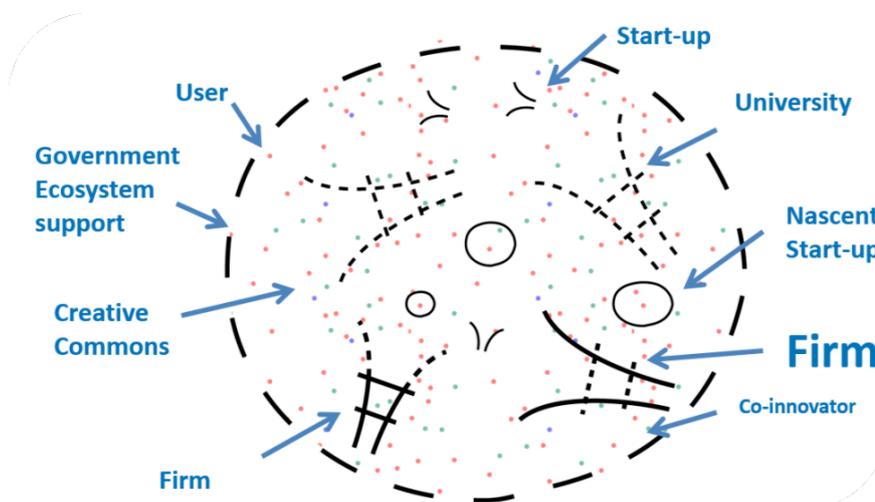
In summary,

- Open stands for openness, curiosity, interlinking of different stakeholders, technologies and challenges.
- Innovation is making things happen, beyond ideation; scalability, and creating entirely new approaches. Innovation speed and success attracts talent and inwards investment, both intellectual and financial.
- Ecosystems would mean involving all stakeholders in quadruple helix manner, in order to build interdependencies and dare to drive a common agenda. It goes beyond sectors, clusters or PPP, involving all the ingredients needed in a mash-up process.

### 3 Open Innovation 2.0 and the Horizon 2020

Open innovation is present in many sections of the new H2020 programme and can be used systematically to create new (open) innovation ecosystems and environments. A lot of how strong the impact of these new instruments will be in real world depends on how the research, development and innovation projects are designed to complement and match and thus reinforce each others.

What is important is that there is a culture built enabling seamless interaction between the projects and the actors in ecosystems, that regionally new co-creative culture is created and that also new kind of courage is fostered in experimenting and bringing the results into real world.



**Fig 2:** Open Innovation Ecosystem

In Fig 2 the heterogeneity of competencies are shown by different colours of the dots, combining together into competencies, more or less organised. A firm is an example of well organised form of collaboration, but increasingly we have expertise (or problem ownership; quadruple helix in mind!) regrouping project by project, based on their competencies.

Public support for the ecosystems is important not only in funding (and e.g. precommercial procurement of innovative solutions) but also as one important participant to create the rules in the ecosystems, to increase trust, and to increase the open mind sets of all participants in their various, simultaneous roles. As example, a citizen can be professional, distributing his skills towards several problem solvers, but at the same time he can be a problem owner longing for some solutions, etc. Each of us have multiple simultaneous roles in these ecosystems, which roles can be simultaneously public and private, problem owner or solver (contributor).

The H2020 programme is designed to cover the innovation aspects in the actions, bringing the research, development and innovation actions into the same basket. What is also interesting is that regional funding is now very strongly interlinked to the H2020 programme. The "smart specialization" is one of the elements in focusing the RD&I towards impact –provided that the smart specialization strategy goes beyond the buzzwords to share and solve the real issues.

This new thinking is reflected directly not only in the Horizon 2020 programme structure supporting demand-orientation but also in linking interdisciplinary thinking to problem solving. The science –driven innovation part of the programme supports the growth of new science and technology based results to be harvested in the other parts of the programme.

This holistic approach for research and innovation shapes the programme fundamentally.

Besides the "normal" projects there are quite a lot of new instruments bridging the gap between research and deployment. What is however very important, is that the RD&I actors themselves are doing the design of their own projects to match and complement each others, to create a sustainable (open) innovation system feeding continuously to the economical and societal development in these innovation hubs, attracting talent and leading to welfare, wealth and well-being.

Regarding traditional project approaches the H2020 is not defining the research and development method in general. However the partners are free to use the methodical approach; e.g. Experimental and Application Research method in real world settings. This would lead to upscaling of successful pathways and cutting the less successful ones. Of course then the design of the project needs to be done accordingly, which leads to new approaches in most cases. In the programme the applicants will see a drive towards prototyping, experimenting, and all happening in real world settings.

In some of the industrially driven research areas as well as in those addressing socio-economic challenges there is a clear requirement to develop and verify the outcome in real world, not in laboratories as usual. What is fostering the modern quadruple helix innovation model is to involve the users, e.g. citizens actively early and seamlessly the innovation process in co-creation of the results as then we are not only verifying the research at the final phase of the project, but also creating new markets, and even new solutions based on the real world interlinkages.

Open innovation environments call for a RD&I methodology based on courage to experiment, trial, scale-up and daring to fail small, but not big.

Regarding the new instruments for the H2020 there will be interesting new openings for prototyping and feasibility studies of ideas. The Open and Disruptive Innovation scheme (ODI) together with the SME-instrument allows ideas to be brought to the programme to be verified and prototyped in very light manner. If the prototype or feasibility phase show that the idea is worthwhile it can be brought forward with our more normal schemes. The risk level of this initiative is rather high, but by dividing the process to phases the risk is managed, at the same time maintaining the openness and incentive in the scheme.

One of the targets of the scheme is to create new markets by disruptive approach, which very often involves also strong presence of the problem owner (clientele, citizens) in the project execution, enabling at its best co-creativity for innovative solutions.

The public sector has an important role to play in creating innovation and bridging the research to successful applications. By procuring innovative solutions and investing on this bridging the public sector cannot only achieve better results but also directly encourage new entrepreneurship. If in these procurement processes quadruple helix innovation models are used also the co-creativity for the solutions means faster and more successful take-up, even creating new service models for enterprises and the public sector itself.

Importantly also inducement prizes will be proposed. They drive real solutions which are often application oriented. Prizes attract new constituency which not usually is involved in EU projects and highlights well also in public the issues to be solved. Prizes ideally bridge research results to commercialization without predetermining the structure or technology of the solution. There is clear evidence that prizes mobilise much wider constituency to solve the problem, and thus has a very strong impact on the innovation culture.

SME funding has been discussed thoroughly. One of the issues is to see clearly that one size does not fit all; that the focus needs to be on growth-hungry and even atypical SME's and even entrepreneurs. SME-enablers are critical also from the perspective of SME's often being very dynamic and knowledgeable players in business ecosystems, bringing agility and focused solutions to specific problems. It is important to realise that the (ICT oriented) SME's do not have "children's" tickets as they are immediately exposed to global competition. This is especially true for the new generation web entrepreneurs. Particularly interesting is that in specific SME schemes only one SME can be the sole participant, provided that the problem has a

European dimension. Also innovation vouchers are to be used to bring the SME:s digital. This part will be funded by ERDF.

One component of the holistic approach is also the use of loan instruments to cover parts of the innovation process close to the market.

#### **4 Conclusion**

The new innovation drivers (Open Innovation 2.0) call for new type of mind setting where key is the involvement of all stakeholders into a collaborative, co-creative culture. The quadruple helix model where the research community, industry, public sector and citizens are all active actors create a win-win situation as it is targeting to create new markets and fast upscaling of the successful solutions.

Having the Open Innovation Ecosystem as goal to attract talent, financial resources and ideas to be experimented and prototyped in real world leads to the need to engineer and design the portfolio of activities to create a winning game by sharing, not closing. Open Innovation Ecosystems create strong interdependency and a drive to make things happen. It has the possibility to drive the change by merging the technology enablers like ICT with the societal change.

Now it is up to the quadruple helix innovation community to tackle the challenge, and experiment the future; to scale up successes. Horizon 2020 together with the smart specialization creates a lot of new opportunities to build the portfolio upon. I urge you to have a close look at the new opportunities the research and innovation framework creates for you, and how you can together with relevant stakeholders jump into the new impactful innovation paradigm.

#### **Disclaimer:**

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