Science 2 Society

Policy Brief

How policy makers can facilitate the open approach to innovation

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Editorial

Science2Society is an EU-funded project that aims to boost innovation efficiency across Europe. To improve the output of innovative processes, Science2Society analyses business creation, the use of knowledge in creating solutions, products and applications generating value from academic and scientific research. Science2Society brings together practitioners and system experts, including universities, industries and research & technology organisations. Through this interaction, the project makes available a wealth of experiences and practices which can help improve the performance of innovation processes, introducing the principles of open innovation.

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Our Purpose

Open Innovation (OI) is an effective way to 'innovate innovation', guiding enterprises, universities and research organisations to improved approaches and increased performance. The Science2Society project has experimented and practically applied OI concepts to seven interaction mechanisms, demonstrating their empirical implementation and their sustainability. The result are seven S2S service blueprints. The S2S pilots have also demonstrated that policy makers have a role and responsibility to put in place framework conditions, which facilitate the open approach to innovation and improve the process output. The guidelines in this document will support policy makers in their decision-making process and provide suggestions for action.

What are the Principles of Innovation Processes?

- Innovation is an engine of competitiveness, entrepreneurialism, economic growth and job creation as well a solution to socio-economic challenges.
- Innovation is the outcome of a journey whereby new ideas are turned into products, services or processes ready for adoption and diffusion.
- It is useful to underline that innovation of the S2S pilots focuses on every possible aspect of the process, not only the creation of technical knowledge and the reengineering of technical processes, but also all surrounding areas, such as finance, marketing, sales, human resources, etc.
- The innovation process is a multi-stage, non-linear process consisting of multiple knowledge transfer steps and involving a wide variety of actors.

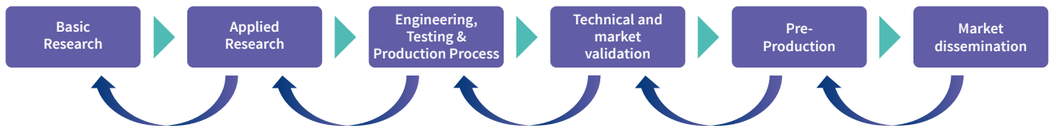

Figure 1: Innovation process

The **innovation process** is conceived as consisting of several stages from basic research to market dissemination. Each is an attempt to coordinate different knowledge components. If it succeeds, the innovation process proceeds to the subsequent stage. Otherwise, it may stop or go backwards to test new combinations of knowledge.

- Knowledge flows between actors depend on their learning and absorptive capabilities and are directly influenced by the overall framework in which they occur (including rules and regulations in force).
- Since the innovation process is inherently a systemic phenomenon, its outcomes depend on the well-functioning of specific functions within a given framework, which is itself subject to the presence of the appropriate actors, infrastructures, networks, institutions and capabilities.

Innovation systems include market and non-market players (including research organisations, universities, industry, public administrations, users, citizens etc.), which influence the direction and speed of knowledge flows between them. To varying degrees, these actors contribute to the achievement of the following functions: entrepreneurial activities; knowledge development and exchange; direction of research and innovation efforts; formation of markets; mobilisation of resources; and counteracting resistance to change.

Policy makers, as keepers of the common good and supporters of societal values, have a strong interest in stimulating innovation to make it pervasive and more effective. Innovation has the capability of generating positive impacts on knowledge directly; on economic and social issues such as entrepreneurialism, economic growth and job creation; as well as on wider societal issues such as environmental sustainability, welfare and personal wellbeing.

Open Innovation: What is it and what are its main trends?

Open Innovation is a very specific approach to the configuration of the innovaiton process, based on the purposive use of outside-in and inside-out knowledge flows with the external innovation ecosystem of the innovating organisation, to stimulate internal innovation processes on the one hand, and on the other hand to accelerate the external exploitation of internally-generated knowledge.

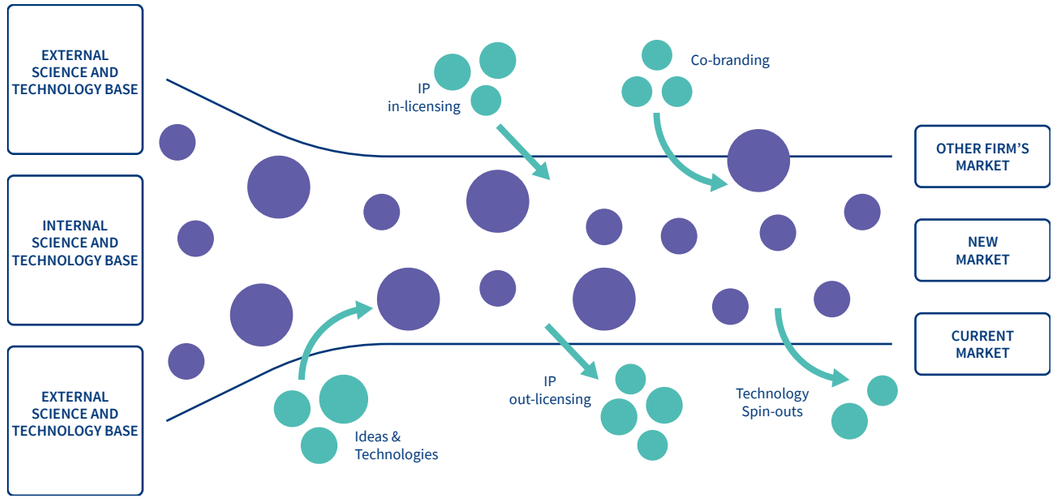

Figure 2: Concept of Open Innovation; based on Chesbrough (2006), format Rangus (2010)

Open innovation contrasts with the theoretical 'closed' innovation model, in which (vertically) integrated companies have full control over their innovation processes and are able to prevent any unwanted knowledge spill-overs. It is justified by the increasing technological complexity and embeddedness of technologies in manufacturing goods (blurring the line between products and services). Because **knowledge is becoming more specialised**, the cost of its production rises, which encourages companies to externalise it.

Open innovation is a concept coined in 2003 by Henry Chesbrough, yet it describes practices that have been ongoing for long and that relate to the increasing involvement of new and external actors in the internal innovation processes of companies.

The involvement of external actors in companies' innovation processes aims at ensuring the connection with of complementary sources of knowledge and therefore the functionality of innovations, i.e. their ability to be adopted, diffused and used.

- Due to the intrinsic characteristics and risks of basic research, it is generally expected that **public organisations** take care and **finance or perform it** directly. In principle, companies have no incentive to engage in it, because of the low appropriability of its outcomes.
- Users are increasingly involved in innovation processes to feed it with their needs and practices and thereby help the development of innovations with a high uptake potential.
- **Early supplier involvement** in product development explains the **higher competitiveness** of Japanese automotive industry in the 1980s and 1990s. It reduces development time and associated costs while improving and simplifying the production process.
- The **role of citizens** in innovation processes **has gained** a renewed interest following the emergence of grand challenges. particularly in Open Innovation 2.0.

Adopting open innovation approaches should consider that companies are in fact increasingly open towards external sources of knowledge but demonstrate lower commitment to outside-in knowledge transfer actions and strategies.

The core missions of higher education institutes and public research organisations include sharing (e.g. via education and training, publication in academic journals and participation in conferences) the knowledge they produce.

Higher education institutes and public research organisations are expected to start embracing a 'third' mission – beyond their education and research activities, i.e. to increase the benefits of science to society. In line with this strategy, intermediaries, such as Technology Transfer Offices (TTOs), and other actions undertaken for the purpose of 'academic entrepreneurship' aim to stimulate further commercialisation of public research findings sometimes via the establishment of new companies. However, **individual researchers** remain the **main actors** deciding on engagement in open innovation activities. They receive little incentive from their organisations' **top management**, which still **focuses** almost exclusively on their **education and research missions**. Furthermore, TTOs have often limited resources and capabilities and their activities are restricted to the provision of advice on intellectual property management.

The success of open innovation strategies in every type of organisation - be it an enterprise, university or research institution - depends on the presence of appropriate cultures and mindsets; enabling procedures; effective incentives; skills and resources; and, the well-functioning of innovation processes and collaboration for innovation.

The Science2Society project: what did we pursue and what did we find?

Science2Society develops, investigates and assesses the design and functioning of interaction mechanisms through which higher education institutes, public research organisations, society and industry collaborate. They create value through an open innovation approach.

As part of Science2Society, seven pilots experiment with different university-industry-society interfacing strategies and methods: co-creation; co-location; collaborative projects; intersectoral staff mobility; data sharing; university knowledge transfer via coaching and training actions; and online dedicated platforms. Via surveys, the pilot participants were able to assess their experience-based views and insights on the design and performance of the pilots.

Overall, the participants express positive opinions on the pilots they were involved in. However, it appears that some collaboration-enabling factors (e.g. degree of commitment and mutual trust) have not improved as much as expected throughout the course of the project. In any case, the results of the seven pilots and their assessment, as well as the S2S project experience as a whole, are providing a wealth of information to support the ongoing innovation learning process.

What have we learnt?

- Rather than looking for a 'one-size-fits-all' policy intervention, **open innovation would benefit from targeted and customised innovation measures**. That said, a number of policy lessons may be drawn from the Science2Society pilots.
- The Science2Society university-industry-society **interaction mechanisms** investigated should not be considered as alternatives to one another, among which policy-makers would need to select and implement the best one. Whatever interaction mechanism is chosen, its design would **need to be tailored** to the specific characteristics of the open innovation projects and organisation.
- The pilot participants must commit themselves to **collaboration and cooperation for problem solving**. Actions, like teambuilding activities, will greatly facilitate their success.
- It is important to have a **common understanding** of what the goals are, (including the timeline for their achievement) sometimes across large groups of participants. This common understanding relies on using **familiar language** (avoiding academic jargon and commonplaces where possible) and requires **effective communication** (preferably face-to-face or assessing the effectiveness of online tools). Intermediaries, like Technology Transfer Offices, may also act as facilitators to create linkages between the different categories of actors and to stimulate their mutual understanding.
- University-industry-society collaboration depends on the effective **alignment of objectives** and practices of involved actors. It is also of key importance that their respective functioning has a **compatible timeframe with individual strategies** and agendas.
- **University-industry-science interactions could be facilitated** by the establishment of dedicated infrastructures, i.e. incubators, physical platforms, and methodological support. However, the operation of these facilities, tools and the content of the collaboration should be the sole responsibility of the innovating participants.
- Dedicated procedures should be implemented for university-industry-society interactions. Their design must guarantee **simplicity, time efficiency and clear decision making** in order to curb transaction costs.
- Open innovation through interactions between universities, industry and society requires **conducive framework conditions** and contractual arrangements. They should provide the necessary legal certainty on which these actors can build and develop their collaboration. The agreements on which the interaction mechanisms are based must **define the roles and responsibilities** of each participant. A special attention should be paid to **intellectual property**, as some related strategies focusing exclusively on the protection of rights may be detrimental to knowledge flows and collaboration.

- The **concrete rolling** out of university-industry-science collaboration initiatives is central to innovation success. It is of key importance that, for instance, the **motivation and commitment** of the participants **remain high** throughout the initiative. This issue is particularly important in universities and public research organisations, whose researchers have very little, if any, incentive to engage with open innovation activities (including the sharing of research data), as their career prospect (primarily) depends on their research and education performance.
- The implementation of university-industry-society interaction mechanisms for open innovation should be gradual, so the participants have **time to change their culture** and adapt their practices and procedures.

How can policy-makers 'make the difference'?

Policy-makers can help identify the segments of the innovation process that can be 'opened'. These segments are those that should receive dedicated support, such as capacity building and innovation services delivered by experts.

AWARENESS AND EDUCATION

- Prepare guidelines and organise dedicated events for raising participants' awareness of the potentials and challenges of open innovation and disseminating good practices. These include 'generic' good practices, such as the design of an open innovation strategy, as well as practical organisational measures to develop OI.
- Establish intermediaries with the mission to provide advisory services, to facilitate and reduce the costs of engagement in open innovation activities. Launch TTOs as Open Innovation 'facilitators'.
- Launch support actions that target the improvement of skills and capabilities of the individuals and organisations (absorptive capacity skill and 'learning organisation'), promoting the take-up of knowledge.
- Stimulate an 'application' and 'commercialisation'-oriented attitude of those who produce knowledge and disseminate it, mostly of non-enterprise innovators.

FINANCIAL INCENTIVES AND FUNDING

- Fund (parts of) the costs induced by the decision to conduct (open) innovation activities via 'open innovation grants' or financial support for specific activities deemed relevant for open innovation activities.
- Provide incentives for higher education institutes to move towards their 'third mission', which consists in increasing the benefits of science to society and therefore in accelerating knowledge transfers.

REGULATIONS AND FRAMEWORK CONDITIONS

- Reinforce framework factors and their implementation and enforcement and the actors' awareness thereof, such as intellectual property right protection, financial support, and the relevant regulatory frameworks.
- Facilitate and support start-ups in open innovation ecosystems, also creating infrastructures to host innovators, research facilities, test facilities, power computing, as well as financial instruments and services. They could consist of physical and online platforms helping the relevant actors connect with each other.

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