THE OPEN INNOVATION NETWORKS: THE FUTURE OF R&D?

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Redes de Innovación Abierta. ¿El futuro de la I+D?

Las redes de Innovación Abierta pueden consitituir una variante de futuro factible para la gestión de I+D, siempre que en su diseño y gestión se tengan en cuenta premisas básicas de flexibilidad, intensidad, capacidad de absorbción y estructura.

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Already in 2009 many R&D professional have been thinking on how the R&D (as a process and as a strategy) will be going on in the near future. The innovation system evolved at a time when innovations were usually produced in individual companies as a result of their own R&D activity and recently been challenged by many trendsetters. Some real life examples, as the IBM and Bell Labs ventures, have **changed the "ivory tower" paradigm** (the innovation is often considered an "ivory tower" function, residing mostly in the ideation and product design phases of the product lifecycle, targeted innovations are usually discrete, narrowly defined solutions to technical problems) and put on the table the **necessity of new R&D approach** based on collaboration across companies, regions and of course, persons.

During last 4 years the dominating paradigm all over industry and research centres was Open Innovation and Crowdsourcing. So, at the fundamentals, Open Innovation requires collaboration, and we've already understood that the future of R&D must be "sketched" with some basic arguments on our mind:

- *"(…) not all ideas should necessarily be further developed by their own company, open innovation will be the solution that many choose to make innovation faster, cheaper and more successful."* as states i360institute.

- Even if currently, most companies focus their efforts exclusively on product innovation and usually only at the early product design stage (Henry Chesbrough "Open Innovation: The New Imperative for Creating and Profiting from Technology"), the Open Innovation paradigm **slowly becomes dominant** and as it works on the notion that organizations can innovate more quickly, cost-effectively and profitably by **combining external capabilities with internal innovation resources, the interest on the how to articulate this trend grows exponentially**.

- The necessary cultural change can only be accomplished through a wide understanding of open innovation principles throughout organizations: companies and R&D or innovation centers. **First goes the cultural evolution towards more open, collaborative and bottom-up environment of innovation, than strategies and benefits prospecting**.

- There is a significant compression of Technology and Innovation Life Cycles that **requires flexible and rapid-response structures**. Even if these structures are momentary or volatile. The Crowdsourcing initiatives are only partial solutions for the open R&D requirement.

- The role for public research centers is evolving too. The R&D institutions must foster innovation globally, even as their action range is local, and they **must explore knowledge inputs and outputs all over the world** like never before.

We are observing the growing tendency to move Open Innovation from concept to reality. But the Open Innovation is a quite holistic and sometimes ambiguous concept to make it work at average company (specially SME). So it's necessary to consider some other factors and to build the common functional frames.

We seem to be **heading towards a networked knowledge economy**, where innovation processes are distributed. Innovations are increasingly being created within various networks involving experts, users, communities and companies from all over the world. Perhaps the most exciting change of all- at least for many scientists in the field- is a **growing demand for definition and a toolkit of the open innovation networks**. However networks within the innovation process are not the novelty at all. The most important issue is **how to unify "freedom" of Open Innovation, " rules" of efficient corporative R&D implementation and Network "operativeness" model**.

Adrienne J. Burke in the article **"How open innovation networks can help solve scientific puzzles"** has debated the costs and benefits of challenge-based collaboration networks focused on innovation. Reviewing some

examples, as a Scientists Without Borders,InnoCentive, IdeaConnection, NineSigma, and OmniCompete, has concludes that even if "*not every scientific puzzle lends itself to the challenge format*", the Open Innovation Network provides benefits (in general) for all parts; seeker, solvers, observers and for the market.

As Tim Kastell says: "***Networks are a critically important source of great ideas***". Well, we have to understand how it creates itself and how to participate at the OI network "transactions". Some researchers consider the **Open Innovation Networks as a Community-Based Organizational Form, grounded on collaborative knowledge and interdependence among the diverse parties**. But this definition is quite wide term established and doesn't show all subtle shades of this phenomenon.

Adequate OI Network design would allow the development of a common, although flexible and modular, toolkit to facilitate the effective collaboration and provide the support to participants. Just because **OI Network is not all the result or the market-oriented strategy but also the multilateral knowledge sharing and collective learning**.

Clarifying goals is a must. What kind of OI Network do we need to build? The general Network for Challenges and Solutions is always enough? What factors are decisive for the OI Network establishment?

First of all, the creation of an unique, grass-root, accessible body of knowledge within a network is a fundamental requirement to transform open innovation from local, small, random and intermittent to distributed, large-scale, systemic and ongoing. And to turn OI networks into the **critical components of the innovation ecosystems**.

As we may imagine Open Innovation networks vary significantly based upon such factors as **network size, vetting levels, solution provider qualifications, confidentiality needs, business relationships, intellectual property protection considerations, and upfront resource investment and potential return on investment**. But this are general conditions of any Network, not necessarily Open-Innovation-based.

Gary Pisano considering two forms of Innovation based on Open Participation (Innovation Mall and Community Innovation), affirms: "*open models are terrific for attracting a large number of potential solutions from unexpected sources, but can also involve significant costs of testing and selecting solutions*", so for really efficient OI Network design we should take into consideration some following issues:

- in which stage of Innovation process we are (ideation, develpement, prototyping, collaborative projects, commercialisation). Each stage may need different Open Innovation Network.
- understanding how ideas spread through networks is essential, and make them flow.
- how to make the network being its own feedback, introducing the loop of empowerment into the network life(or productivity) cycle
- in what way reward the "kings of collaboration", and how to promote key-contributors within P2P environments
- when the diversity is required at Open Innovation Network and when it can convert the network into flea market.

Innovation Intensity, Risk-taking Level, Learning and Absorption Capacities are others fundamental factors to consider when creating or moderating Open Innovation Network.

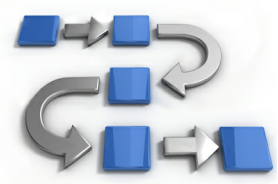
The **Innovation Intensity of OI Network** is of vital importance. If we pretend reach the maximum level of effectiveness, the range of Innovation Intensity must be considered before the Network's launching. It will be different for

specialised industry-branch Open Innovation Network (so called industry-scale open innovation network that links the innovations of small firms with the systems integration, scaling, and distribution strengths of larger firms), and will have some particular characteristics when OI Network is more general and non-exclusive.

The **Level of Risk-taking** by both companies looking for innovation input and R&D providers should be thought over at early stage of network forming. This factor will narrow the communication, transaction and participation model of the network. (Here some really interesting examples of Pharma companies).

The **Learning Capacity of the Network** emphasizes the exigency that leads to self-organization within the community and creates innovative emergent strategies, as a sign of self-improved (based on experience and shared knowledge) performance. Identifying and educating outside channels of innovation costs more time and effort than solving the problem directly within the already created community.

Finally, the **Absorption Capacity** may be explain with the "Connecting absorptive capacity and open innovation" article: "*(...)absorptive capacity is crucial in explaining why some companies are much better than others in creating and capturing value from in-sourcing externally developed technology and technological collaboration with innovation partners. Hence, absorptive capacity and the outside-in dimension of open innovation are necessarily linked to each other.*" Contrary to conventional thinking, the **Absorption Capacity is a very manageable driver of the Network success**. If only correctly established and empowered.



Kevin Blackwell and David Fazzina from Nerac, consider that, based on general characterizations, the Open Innovation Networks fall into one of three categories: **non-qualified**, **pre-qualified**, and **business partners**, which can include suppliers and customers.

- **Non-Qualified Open Innovation Networks**: easy to establish through third-party and based on extremely large number of innovators, communities of seekers and solvers. Like InnoCentive or NineSigma. But normally limited to the innovation ideas conception or product design phase and too general and transparent to competitors to be effective for disruptive technology sharing.

- **Pre-Qualified Open Innovation Networks**: usually established by known big organization; managed the way that confidential information and intellectual property are protected. May include current suppliers, experts in particular fields, independent research and engineering companies, or virtually any other entity that the company thinks could add value to its innovation efforts. For example: Proctor&Gamble OI Network.

- **Business Partners**: suppliers and customers are potentially the most plentiful source for R&D (open or not). Known partners may often lack resources to exploit technologies on their own, and do not have sufficient market presence or resources to capture the true value of their technology contributions during negotiations. Cooperation within OI Network may offer an increased chance of discovering disruptive technologies.

Today's Open Innovation Networks probably will evolve into more stable interconnected and flexible forms, but only if companies recognize the potential and opportunities implied.

Maybe it is quite presumptuous statement but **many traces seem to confirm that Open Innovation Networks will shape the future of R&D**. On strategic, functional and even technological level. **The pace of Open Innovation Networks will only continue to accelerate**, because exponential evolution is built into the very nature of innovations (not only technologies). And nowadays the social change of business (including R&D Management) aimed to Open Innovation and more collaborative culture is just catching the wind in the sails.