



Open innovation models and the role of knowledge brokers

The movement from internal R&D to external connect and develop opens the door for companies – large and small – to reach beyond their core competencies to remain competitive in an increasingly complex, uncertain and changing environment. This report explains the phenomenon, the process and provides examples and a case report.

By Milton Sousa

The rise of open innovation

The recognition that knowledge is the fundamental driver of sustainable competitive and collaborative advantage has been a major breakthrough in management thinking.

This alone has opened completely new perspectives about how to manage human, physical and financial resources. It has also influenced organisations to start recognising that to thrive, they need to find new ways of accessing the knowledge they need exactly when they need it, in order to adapt to an ever-changing and increasingly complex and uncertain environment.

Additionally, organisations realise they need to find new ways of recognising what they need to know by exploring, experimenting and networking with people and entities inside and outside the organisation in ways never thought of before.

Innovation can be defined as the outcome of a set of activities that use knowledge to create new value to those benefiting from its use (de Sousa, 2006).

It is clear that successful innovation under complexity, uncertainty and change can only be achieved through collaborative approaches that integrate knowledge inside and outside the organisation. This model of open innovation is being increasingly used by organisations throughout the world, and while this model is a must for small enterprises, which usually lack knowledge of some sort to fully complete the innovation process, larger organisations too are moving away from their traditional R&D approach to a collaborative connect and develop (C&D) process.

This trend is driven by two major factors. First, market democratisation is increasing micro-segmentation and demanding more customised solutions in unexpected and

unpredictable ways; this requires a higher level of involvement of customers, suppliers and other stakeholders. Second, the increasing competitive pressure and reduction of product life-cycles demand quicker innovation processes at a reduced cost. Examples of innovations developed through open models proliferate in our lives, from the new mobile phone application to new lines of potato chips.

This desegregation of the innovation process, requiring internal and external knowledge, has opened room for the emergence of new business models and types of companies. Some of these new companies act as 'knowledge brokers', providing the links, knowledge sources and even technical knowledge so that firms can accelerate and increase the effectiveness of their innovation processes.

Open innovation and core capabilities

Open innovation is intimately linked to the concept of core capability and how that affects an organisation's innovation process. Leonard (1995) referred to core capabilities as comprising at least four independent dimensions: (i) skills and knowledge; (ii) physical technical systems; (iii) managerial systems; and (iv) values and norms. The unique combination of knowledge reservoirs and channelling mechanisms define an organisation's DNA and what it can and cannot do. Around these core capabilities, Leonard further defined four key innovation activities: (i) problem solving; (ii) implementing and integrating; (iii) experimenting; and (iv) importing knowledge.

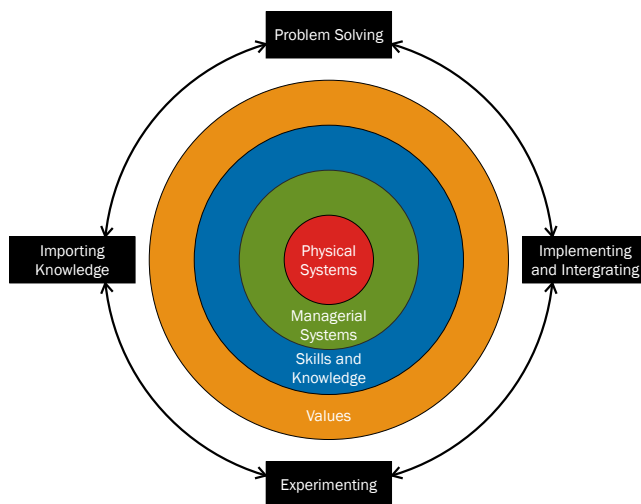


Figure 1: Dimensions of a core capability and the key innovation activities

Based on this model, one could surmise that open innovation is about knowing what your core capabilities are, understanding what other capabilities you need to have access to, and developing the networking and collaborative skills needed to incorporate those other capabilities into your innovation process. In this sense, sustainable

innovation can only be assured through both competitive and collaborative advantage. In order to incorporate external capabilities and knowledge into a company's innovation process, the organisation needs to be adaptive and open for change.

Adaptability can be greatly stimulated by amplifying differences and building transforming exchanges (the connections and interactions between system agents) (Olson and Eoyang, 2001). However, too much difference might generate a large number of possibilities, possibly reducing momentum for action, and too many exchanges might limit individual behaviour (for example, information overload). In this sense, knowledge brokers can act as intelligent change agents that stimulate difference and increase the number of external exchanges but in a focused way, stimulating innovation while creating momentum for action.

In regard to skills and knowledge, Leonard (1995) further identified three major types: (i) public-scientific, (ii) industry-specific and (iii) firm-specific. Knowledge brokers are those entities (organisations and individuals) that facilitate the sharing of these three types of knowledge between knowledge sources and knowledge needs.

Besides their technical knowledge, knowledge brokers possess what could be called relational knowledge or knowledge about knowledge, allowing them to know what others know, while providing the managerial and physical tools to access that knowledge.

What distinguishes knowledge brokers from most other knowledge service providers, like consulting companies, state agencies or business intelligence firms, is the active role they play in providing the links and the development of relationships that address the innovation needs of their customers. They are the active change agents that can help customers continuously adapt to their environment.

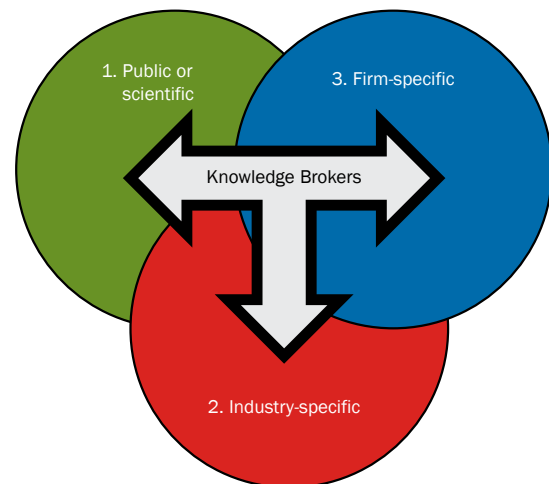


Figure 2: Knowledge brokers and knowledge sharing of different types of knowledge

Examples of organisations that support open innovation models

Open innovation models demand a higher involvement of external entities in an organisation's innovation process. It is important that organisations develop permeable boundaries and allow knowledge to flow selectively inside and outside the organisation (Bennet and Bennet, 2004). External entities can include suppliers, experts, customers, universities, R&D institutes, partner companies or even competitors.

Large companies that pioneered building successful open innovation models include organisations like Procter & Gamble, Nokia and Philips. Procter & Gamble showed a particularly active role in stimulating this model by creating spin-off companies that helped sustain its own open innovation model through networking and exchange of IP and knowledge (Huston and Sakkab, 2006).

These companies that originally formed the basis of the C&D approach of Procter & Gamble and later became

- YourEncore is a network of retired and veteran scientists, and engineers providing clients with proven experience to help accelerate their pace of innovation. YourEncore is positioned to help clients recover lost knowledge and to enable them to make connections to solve challenging problems using expertise from a variety of industries.

SPI as a knowledge broker

Sociedade Portuguesa de Inovação (SPI) is a Portuguese based multi-discipline international firm founded in 1997 as a centre of national and international networks connected to the business innovation sector.

Despite being located in a small country relatively distant from most global decision centres, the company is a catalyst for connections among business, scientific and technological institutions, public and private national organisations and international institutions. In addition to Portugal, SPI has

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completely independent provide access to networks of knowledge that can support the open innovation model of their customers. Some of these companies include:

- NineSigma was founded in 2000 by Dr. Mehran Mehregany, Goodrich Professor of Engineering Innovation, Case Western Reserve University, Cleveland, Ohio, US. The company's core mission is to work on behalf of its clients to source innovative ideas, technologies, products and services from outside their organisation quickly and effectively by connecting them with the best innovators from around the world;
- InnoCentive is a company that created a vast network of solvers around the world, specialised in different industries and disciplines including business and entrepreneurship, math, computer science, physical sciences, chemistry and life sciences. InnoCentive created an Open Innovation Marketplace, where seekers can provide challenges. Each InnoCentive challenge has a solution submission deadline and is assigned a cash award. Registered InnoCentive solvers can open a Project Room and begin working on any challenge they wish. The seeker organisation reviews all submissions, and issues the award to the solver who submits the best answer;

offices in the US (Columbia, Maryland and Irvine, California) and the People's Republic of China, and has provided projects for public and private sector clients in Europe and around the world.

SPI's mission is the management of projects that foster innovation and promote international opportunities. In fulfilling this mission, SPI has created competences in several different areas which include establishment of alliances and partnerships, marketing initiatives, capacity building for organisations, qualification of human resources, programme technology transfer, promotion of internationalisation, sector studies and project evaluation. In addition, SPI has developed a particular competency in developing cross-border partnerships and networks.

Within the context of open innovation, the core capabilities of SPI, like with other knowledge brokers, could be defined as:

- Ability to understand innovation problems;
- Ability to translate innovation problems into a structured project;
- Ability to understand the necessary capabilities, skills and knowledge to solve the problem;
- Ability to identify who can better provide those same capabilities, skills and knowledge;

- Ability to establish the necessary relationships and collaborative teams at a global scale to solve the innovation problem.

According to the dimensions of core-capabilities presented before, one could say these need to be based on the following characteristics:

- Values – collaborative team work, openness and diversity;
- Skills and knowledge – networking, synthesis and technical expertise;
- Managerial systems – promote international collaboration and networking, stimulate diverse and flexible teams and focus on knowledge sharing;
- Physical systems – promote open communication technologies and shared information technology systems.

Diversity plays a particularly important role in terms of cultural, professional and technical backgrounds. Despite having a relatively small number of permanent full time consultants (around 50 in total), SPI has people from nine different countries, with fluency in 11 different languages. Professional backgrounds cover different areas like engineering, psychology, economics, law or management. Professional experience, most of the times international, covers all the elements of the supply chain, bringing expertise in R&D, operations, marketing, sales, finance, human resources, logistics, etc. Scientific areas cover chemistry,

to establish a research centre within the firm's existing infrastructure. The centre would provide the desired activities and initiatives in R&D and innovation, and so contribute to improved provision, management and commercialisation of research activities.

The company's five industrial units coupled with its 12 commercial delegations and four logistical platforms provided technological and commercial leadership, and ensured the necessary production quality level.

A focus on R&D and innovation is becoming ever-more critical for producing companies in this sector to continue to distinguish their product lines from the competition and, as important, develop new markets and revenue channels. The R&D and technology transfer activities meet these business needs by:

- Distinguishing the company from its competitors;
- Creating knowledge capital;
- Developing new markets;
- Increasing market share within existing markets;
- Reducing production costs (for example, through an increase in efficiency and reductions in product losses).

SPI provided a service to develop a strategy for the establishment of a research centre for this company. This strategy covered all strategic and organisational aspects required to develop such a centre, the identification of research partners and the development of research

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electronics, energy, environment, life sciences, materials or information technology.

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Another important element is the network of partnerships and relations developed by SPI. Stimulated by its diverse work force, SPI has been able to develop partnerships and relationships in reference R&D centres and experts throughout the world, providing this way the necessary links to its clients when trying to address specific innovation needs.

SPI as a knowledge broker: a case study

In 2007, a major food sector company in Portugal producing dairy products and milk approached SPI requesting help

relationships. During an initial phase, SPI developed criteria to support the identification of possible research partners according to the company's priorities. After that, SPI identified organisations using these criteria and contacted them regarding their interest in collaboration. Particular regard was paid to achieving the desired range of types of possible partner, geographical location, and research theme.

The possible research partners that were interested in collaboration were interviewed and the information gathered regarding their research and collaborations was compiled in the form of detailed meeting reports that were further analysed. Recommendations were made regarding 10 possible research partners that best met the company's criteria.

In a second phase, six possible research partners were chosen in the UK, Portugal, The Netherlands and Denmark, representing the company's different R&D themes. A report was designed to support the company's

collaboration with the R&D community and particularly with the organisations selected.

Collaboration activities to develop strong links with the identified research partners were proposed for a 12-month period. Information was provided on relevant scientific events and networks that would allow the company to remain informed of R&D in its selected research fields. Furthermore, a detailed budget and survey of external funds that could provide co-financing for the company's research activities was included.

Finally, monitoring and evaluation activities were described to ensure that project goals were met on time and their value to the company's business assessed.

This project has made a major breakthrough in the innovation process of this company. It allowed them to complement traditional R&D with an open C&D process with several national and international partners. In this example, the Knowledge Broker SPI acted not only to solve particular innovation problems but also as a change agent, inducing a major re-organisation of the company's innovation process.

Conclusions

Open innovation is essential for companies to remain competitive in an increasingly complex, uncertain and changing environment. Open innovation increases adaptability, while providing several direct benefits to the company and, consequently, to its customers, namely products and services better adjusted to the market, flexible cost structures; increased creativity; adaptability, easier access to knowledge, and quicker and cheaper innovation cycles.

However, open innovation does not come without risks. It is important that companies clearly understand the capabilities, skills and knowledge that make them unique in the market, so they can clearly define what they need to outsource in their innovation process. It is also important to ensure IP rights and minimise knowledge leak risks through appropriate protection strategies.

Knowledge brokers can play an important role in open innovation processes. They act as catalysts, accelerating the combination of complementary knowledge and skills necessary to solve innovation problems, by making the right connections and links with solvers and seekers. In this way, knowledge brokers can help increase collaborative advantage. The emergence of a knowledge broker as SPI, in a small country, relatively distant from the main global decision centres, demonstrates how knowledge is pervasive. Two corollaries result from this:

- Successful innovation quickly becomes behind the times, requiring a continuous and sustainable flow of innovation to stay competitive;
- Knowledge can be accessed from anywhere, provided you have the right connections and links to knowledge sources,



and the right technological and organisational tools. Consequently, knowledge brokers can emerge anywhere.

With this in mind, one can safely affirm that knowledge brokers are here to stay and will have an increasingly important role in stimulating innovation through global and interconnected networks of people and knowledge. Brokering knowledge to stimulate innovation has become a key innovation activity on its own. ■

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