



Open Innovation: An Evolving Entrepreneurial Technique

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Abstract. As internet penetration continues to grow across the globe, the potential pool of skilled and talented individuals and organizations that can be contacted or engaged in a commercial or professional arrangement expands. This flexible pool of resources can be utilised via a variety of methods and has been made more accessible by the growth of rich interactive media and social networking tools, which are frequently deployed both professionally and socially. This paper reviews the literature and recent uses of Open Innovation techniques which can facilitate corporate entrepreneurship. There is clear evidence to show that these techniques enable and accelerate entrepreneurial processes in addition to enabling greater agility in product and service development. The ability to access diversity and create new knowledge will be a key driver of success for many organizations and will support the development of entrepreneurial economies.

Keywords: corporate entrepreneurship, crowd sourcing, innovation, innovation brokers, open innovation.

1. Introduction and Objectives

As organisations adjust to an accelerating pace of change, greater competition and turbulent economic times, innovation and the ability to remain ahead of the market over time has become more challenging. A number of recent surveys (IBM, 2008, Andrew et al, 2007, McKinsey, 2007) highlight the need for companies to innovate more effectively whilst managing and reducing risk. Open Innovation is a very tangible way in which an organization can seek skills and expertise, which may supplement its own resources in solving business problems or seeking new business opportunities. Open Innovation, when applied appropriately, can reduce costs, accelerate development and identify new business areas and partners (see Tables 2 and 3 for specific examples). Early adopters of such techniques, for example Eli Lilly and Procter and Gamble, have helped to establish successful business models, which are being adapted and more widely adopted across a number of sectors.

This paper will review some of the current drivers for the adoption of Open Innovation and explore examples of how the techniques have been successfully deployed and are being embedded in the business processes of a number of organisations. The development of these techniques is reviewed along with the growth of the internet and social networking applications.

2. Innovation in Context

Audretsch and Thurik (2001) in their study of Organisation for Economic Co-operation and Development (OECD) economies described a fundamental shift towards an entrepreneurial economy with an increasing importance of new and small enterprises. They noted that decentralized decision-making in an industrial structure comprised of small firms led to a greater diversity of approaches (see the review of Open Innovation below). This diversity in turn generates greater creativity and greater opportunities for growth. Large bureaucratic organizations struggle to recognize the value of new knowledge and can suppress the exploration of innovative ideas. These observations are useful in explaining the recent growth in Open Innovation and its application by larger companies to help supplement their internal research and development efforts.

In 2008 IBM interviewed 1130 Chief Executive Officers (CEOs) and public sector leaders from across the globe to get an opinion of the characteristics of the enterprise of the future (IBM, 2008). The survey indicated that organizations are experiencing an accelerating pace of change and that many are struggling to keep up. Eight out of ten CEOs see significant change ahead, and yet the gap between expected change and the ability to manage it has tripled since the last survey was conducted by IBM in 2006.

Nearly all the CEOs were adapting their business models and two thirds said they were implementing extensive innovations. More than 40 percent of those interviewed were changing their enterprise model to be more collaborative. The organizations represented were moving towards global business designs, deeply changing capabilities and partnering more extensively.

The top three drivers for this assessment were seen as:

Market Factors	48%
People Skills	48%
Technological Factors	35%

The data from the survey led IBM to suggest that the Enterprise of the Future will establish processes and structures that promote innovation and transformation. It will operate in a venture capitalist style, actively managing a portfolio of investments, protecting and supporting fledgling ideas, whilst systematically weeding out the weaker projects. The diversity required to feed such an approach requires far greater levels of external collaboration and input to business challenges.

Boston Consulting Group conducted a senior management survey on innovation in 2007 involving 468 senior executives, representing 58 countries and all major industries (Andrew et al, 2007). Three of its key findings were as follows:

- Innovation remains a top strategic focus for the majority of companies, with 66 percent of the respondents to the survey ranking it within the top three strategic priorities.
- 67 percent of respondents said their companies would increase spending on innovation in 2007.
- Over half of those surveyed remain dissatisfied with the financial returns on their company's investments in innovation.

The survey found that there was a direct relationship between success with innovation and long term stock market performance. The total shareholder returns of the most innovative companies (as identified by survey respondents) were compared with those of industry peers over a five year span. Globally, innovators outperformed their peers by nearly 4 percent per year. McGregor (2006) found that companies which had been considered as innovators had seen median profit margin growth of 3.4% a year since 1995, whilst the S&P Global 1200 companies had only managed 0.4%. The data clearly demonstrates the impact of innovation in larger publicly listed companies.

The challenge within any large corporate is how to release the skills, creativity and expertise of its workforce and external network of contacts in a structured un-bureaucratic way. There is a clear advantage to be gained by the adoption of processes and techniques, which facilitate innovation by networking and supporting those driving entrepreneurship within an organization.

3. Closed versus Open Innovation

Chesbrough (2003, i & ii) described the Closed Innovation Model which can be found operating in the traditional organization. Ideas were generated internally and scaled up through the internal processes of development, manufacture, marketing, distribution and service. The organization was self-reliant and controlled its own processes. This model accurately describes the research and development operations of many of the leading industrial corporations for most of the 20th century. Their early successes funded subsequent investment leading to additional breakthrough discoveries, creating a virtuous cycle of innovation, which until recently has been relatively unchallenged. This incremental innovation was often brought about by a concentration of capital and labour frequently seen in the managed economy, where large, structured organisations were encouraged, offering stability, homogeneity and continuity.

In the Open Innovation model an organization commercialises both its own ideas as well as innovations from other sources and seeks opportunities to bring its internal ideas to market by developing pathways outside its current business.

This mode of operation enables an organization to be more effective in creating and capturing value (Chesbrough, 2007). Value is created by the potential leveraging of many more ideas because of the inclusion of a variety of external concepts. Additionally, value is captured by the utilization of a firms' key assets and resources or intellectual property by other organizations who may be better placed to use those assets. The development costs of innovation are reduced by the greater use of external technology and skills in an organisation's own research and development process. The organization can save time, money and potentially becomes able to participate in other segments through licensing, joint ventures and spin offs.

For an average company employees represent 36% of revenue (CFO / Mercer, 2003), which means that the ability to reduce or supplement existing staff levels in research and development or product development areas by Open Innovation could represent a significant ongoing cost reduction. These potential savings are particularly important in times of intense competitive or economic pressure.

The McKinsey survey of top managers (2007) indicated strongly that they felt isolated from innovators within their companies. Top managers revealed they sourced their new ideas from informal external discussions with peers, partners and suppliers (75% of respondents). The second most important source of new ideas to this group of managers was found to be interaction with consumers (67% of respondents). These figures show a high level of acceptance of the advantages to be gained from an Open Innovation business model. Internally driven innovation (closed innovation) on its own is unlikely to be enough for an organization to exist in an intensely competitive economy (Tapscott and Williams, 2006).

Audretsch and Thurik (2001) recognized an increasing movement away from a managed economy to an entrepreneurial one, where diversity has the potential to generate innovation and growth. They noted that a world of homogenous economic agents promoted diffusion but not innovation. Turbulence, diversity and heterogeneity are seen as being key drivers to the entrepreneurial economy and are factors which can be facilitated by Open Innovation.

The characteristics of the two different models of innovation are summarised in Table 1 and have been explored in subsequent analysis across a number of industries (Chesbrough and Appleyard, 2007, Chesbrough and Crowther, 2006, Christensen et al., 2005, Henkel, 2006, van der Meer, 2007). The growth of the internet and development of Web 2 applications have enabled Open Innovation techniques to flourish (See Figure 1). The facilitation of timely and rich information exchange across the globe and beyond traditional organizational boundaries has enabled a number of novel processes as described in section 5.

Table 1: Comparison of Closed and Open Innovation (Chesbrough, 2003, i)

Closed Innovation Principles	Open Innovation Principles
The smart people in the field work for us.	Not all the smart people in the field work for us. We need to work with smart people inside and outside our company.
To profit from R&D, we must discover it, develop it and ship it ourselves.	External R&D can create significant value; internal R&D is needed to claim some portion of the value.
If we discover it ourselves, we will get it to the market first.	We don't have to originate the research to profit from it.
The company that gets an innovation to the market first will win.	Building a better business model is better than getting to the market first.
If we create the most and the best ideas in the industry, we will win.	If we make the best use of internal and external ideas, we will win.
We should control our intellectual property so that our competitors don't profit from our ideas.	We should profit from others' use of our intellectual property, and we should buy others' intellectual property whenever it advances our business model.

4. Innovation and Corporate Entrepreneurship

Many definitions of innovation have been suggested, from the work of early economists such as Joseph Schumpeter, to the work of recent academics and industry bodies. Whilst the exact definitions may vary depending on their source and the context in which they are being used, the importance of innovation to almost every aspect of an organization is clearly recognized. A recent survey (n=1 458) performed by The McKinsey Quarterly 2007 (McKinsey, 2007, Barsh et al., 2008) found that 70 percent of senior executives considered that innovation would be one of the top three drivers of growth for their companies in the next three to five years.

Peter Drucker (1985) in defining the practice of innovation described it as follows:

Innovation is the specific tool of entrepreneurs, the means by which they exploit change as an opportunity for a different business or a different service. It is capable of being presented as a discipline, capable of being learned, capable of being practiced. Entrepreneurs need to search purposefully for the sources of innovation, the changes and their symptoms that indicate opportunities for successful innovation. And they need to know and to apply the principles of successful innovation.

The OECD Oslo Manual (2005) defines innovation as:

An **innovation** is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations.

Drucker's definition of innovation underlines the link between innovation and entrepreneurship, with innovation being seen as an essential part of the entrepreneur's characteristics. It identifies the need to collect and evaluate innovative ideas and approaches, which may not originate from the entrepreneur.

Sharma and Chrisman (1999) reviewed a number of definitions of Corporate Entrepreneurship and described the ambiguity which existed amongst them. The term had previously been used mainly to describe internal corporate venturing, the activities that result in the creation of organisational entities within an existing organization. The researchers took a broader view and suggested that corporate entrepreneurship should encompass three elements; corporate venturing, innovation and strategic renewal.

McFadzean *et al.*, (2005) conducted a further evaluation of the literature, specifically as it related to innovation, developing the following description:

...corporate entrepreneurship can be defined as the effort of promoting innovation from an internal organisational perspective, through the assessment of potential new opportunities, alignment of resources, exploitation and commercialisation of said opportunities.

In a corporate environment, innovation without corporate entrepreneurship has little impact. An entrepreneurial philosophy, which stimulates change, and the provision of a supportive environment is most likely to foster innovation (Shaw, *et al.*, 2005). The ability of an organisation to encourage an appropriate culture and the supporting processes to assist with the identification of innovative ideas and subsequently assess and bring them into production may be a measure of entrepreneurship.

5. Open Innovation in Action

Within a given organization the strength of the innovation capability is determined by a large number of variants which include culture, processes and behaviours. Companies that try to emulate innovation role models frequently fail to generate the results and outcomes they expect.

However, there are a number of techniques which have been deployed across organizations of varying sizes, which include access to experts, talented individuals, and other companies outside of the usual organizational connections. This is a trend which has been recognized in some of the surveys conducted (IBM, 2008).

The phenomenon of crowd sourcing, or in some cases expert sourcing can be facilitated by a wide range of tools and activities some of which are described below. These can provide some of the sources of innovation needed by the entrepreneur as suggested by Drucker.

5.1. Innovation Brokers

Innovation Brokers have established themselves as intermediaries between organizations and individuals or other institutions that may hold some expertise or skill that the organization needs. They frequently specialize in certain industry segments and undertake activities to attract potential solution providers or solvers and those that may be seeking help to solve a business challenge or technical problem. For some organizations the ability to work through a third party gives a level of anonymity and process experience that can smooth the transition of an idea into an organization (or out) within the correct frameworks that protect intellectual property rights. Innovation Brokers remove the burden of finding a large panel of potential experts who can either solve problems or propose novel solutions for challenges which have not yet been fully commercialized.

One of the first brokers to be established was Innocentive which was founded in 2001 as an online research and development forum for Eli Lilly which focused on chemistry related challenges. It quickly demonstrated an ability to bring together skilled individuals who were able to solve complex synthesis questions in days rather than months (Seewald & Scott, 2002). Other companies recognized the benefits, and the organization was spun out from Eli Lilly. It now has an impressive client list including many multinational companies (Haiken, 2006) and has broadened its offering beyond those earlier chemistry based challenges.

Table 2 summarises a number of innovation brokers. It is notable that more have been established in recent years, probably driven in part by the increasing connectivity being experienced globally as the Internet becomes more pervasive. The business models of these brokers are quite variable and other open collaboration platforms are also beginning to appear where less formal exchanges can take place. Some of the brokers may have experts in certain areas who may be matched with a specific need of a client or organisation, in a closed community where only the desired experts can be involved in the solutioning process. Some have argued that the solving of specific problems by specific individuals that have the right skill is not the basis for sustained creativity and that a more community based approach is needed (Leadbetter, 2008).

A number of organizations have also developed and deployed their own innovation portals to assist in the process of disseminating business challenges and collecting external solutions, see Table 3. Procter and Gamble have been particularly effective in utilizing Open Innovation principles to support their Connect and Develop initiatives which aim to find some 50% of their pipeline from external sources (Anonymous, 2007). The choice of platform will be driven by the commercial sensitivity of the challenge and the skills needed to address the issue for the organization. Deployment of these platforms has been a clear indication to employees that the company is encouraging innovation, building capability and ensuring that entrepreneurs have the ability to explore, build upon and assess the viability of suggestions, often with the support of others.

Table 2: Innovation brokers, sample with a summary of key attributes (Reid, 2009)

Company Name (URL)	Estimated Community Size	Expertise Areas	Key Features	Date Established
Crowd Spirit www.crowdsprite.com	-----	Technology	Individuals suggest ideas and improve them with input from others. Peer review and voting used. Contributors have chance of winning prizes.	2007
Fellow Force www.fellowforce.com	-----	Any, predominantly consumer related	Challenges are posted and solvers respond.	2007
Idea Connection www.ideaconnection.com	-----	Science and Technology	Selects the solvers to tackle a given challenge. Enables buying and selling of technology.	2007
Innocentive www.innocentive.com	160 000+	Science and technology, business and public policy	Connects seekers and solvers across many different sectors. Offers varying degrees of assistance as needed.	2001
Innovation Exchange www.innovationexchange.com	15 000+	Strategy, management and marketing	Focused on business innovation and enables the creation of ad-hoc team from its virtual global community.	2006
Nine Sigma www.ninesigma.com	1 000 000*	Science and technology	Work with client organizations to develop a request for proposal, which is sent to solution groups for review. Facilitators help with the review process and subsequent negotiations.	2000
Tek Scout www.tekscout.com	2 000 Universities Several thousand scientists	Science and technology	Enables outsourcing of research and development projects to individuals and organizations.	2008
Yet 2 www.yet2.com	100 000+	Science and technology	Online market place for intellectual property.	1999
Your Encore www.yourencore.com	4 000+	Science and technology	Provides access to retired professionals, including managers, engineers and scientists etc..	2003

*Attained through the US-EU Match consortium

Table 3: Corporate Open Innovation, a sample of recent corporate initiatives (Reid, 2009)

Company Name (URL)	Description of External Innovation Activity	Outcomes	URL of Innovation Portal	Submission Only
Cisco www.cisco.com	Open challenge to identify a major new business opportunity (Kamenetz, 2008 & King, 2008)	1100 submissions	www.cisco.com/iprize	Yes
Google www.google.com	Open challenge for ideas to help as many people as possible and change the world (Griggs, 2008)	150 000+ submissions to 8 categories	www.project10tothe100.com	Yes
GlaxoSmithKline www.gsk.com	Open challenge to solve specific problems for consumer health business unit	-----*	www.innovation.gsk.com	Yes
Kraft Foods www.kraftfoods.com	Open challenge for products, new technologies, packaging and processes (Covel, 2008 & Staggs, 2008)	Bagel-fuls 'All-Out-Squeeze' technology New flavours and ingredients Many more...	www.innovatewithkraft.com	Yes
Procter & Gamble www.pg.com	Open challenge for specific needs from Procter & Gamble businesses as well as more general innovative ideas (P&G Connect and Develop Brochure, Huston and Sakkab, 2006, Sheridan, 2008, Dodgson et al., 2006)	Bounce Swiffer Dusters Many more...	www.pgconnectdevelop.com	No Will facilitate access to P&G assets via out licensing
Unilever www.unilever.com	Open challenge for submissions relating to food, home and personal care	-----*	www.ideas4unilever.com	Yes

* Data not available

5.2. Contests

The use of contests has long attracted public attention and encouraged individuals to apply their skills to solve a particular problem. Some individuals and companies believe that public contests have the ability to capture diverse skills,

creativity and imagination to solve issues. Large prizes over the centuries have resulted in many innovations including; the marine chronometer, a canning process, margarine and the first non stop flight between New York and Paris. More recently the X Prize Foundation (Morse, 2008) is looking to reward the first private space flight with a ten million dollar prize and is considering the use of smaller sums of money in a MyXPrize to solve simpler challenges.

A number of major corporate contests were run in 2008 including the Cisco iPrize event and Google's 10 to the 100 Project (see Table 3). The iPrize event was fully internet enabled from the initial call for suggestions through to the development of the final solution utilizing many collaboration techniques by the winning teams. The ability to run such competitions with widespread participation would have been impossible in the 1990s without the expenditure of significant offline resources to promote and manage.

Table 4: A sample of commercial Open Innovation tools (Reid, 2009)

Company Name (URL)	Tools and Functions	Client List Includes:
Brain Bank www.brainbankinc.com	Idealink Sequential – workflow based program Idealink Open – community based program Idealink Custom – fully tailored process	Baxter, Fedex, GM, McNeil, Wachovia
Bright Idea www.brightidea.com	On Demand Innovation Management Suite Research, Idea Management, Project Tracking, Expert Location, Reward and Recognition, Analytics, Archive	Bosch, BT, Experian, Honeywell, ING, Thomson
Imaginatik www.imaginatik.com	Idea Central –web based software to facilitate capture, build, sharing of ideas, consolidation and review	Coca Cola Company, Kraft, Nokia, Pfizer
Jenni www.jpb.com	Web based idea management software	-----*
Ovo Innovation www.ovoinnovation.com	Spark, Incubator and Develop for the front end innovation tasks. Shuffle to capture ideas and trends. Launch and Scorecard for project management and metrics	-----*

* Data not available

5.3. Tools

To fully exploit the potential of open innovation techniques, a number of tools have become available commercially to help solicit ideas from employees or invited individuals. These tools enable the collection of feedback and review of these ideas, often facilitating the process of ranking and then encouraging further building on them by others. The tools help to simplify the idea management process and are frequently used to support idea campaigns. Larger companies

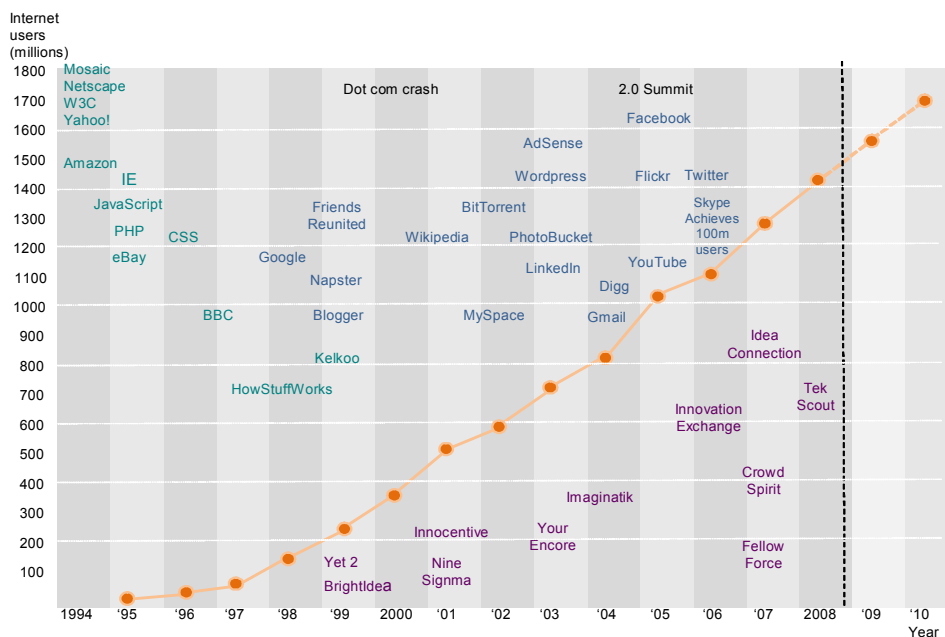
have used these tools to engage with employees at all levels to harvest ideas or to seek solutions for business challenges. Once the ideas are collected the employees can then help to vet the ideas by a process of peer review, rapidly identifying those ideas with the most potential impact (Weiss, 2006).

Table 4 summarises some of the tools in the market, a number of which have been utilized by major companies.

6. Evolution of Open Innovation

Figure 1 shows the growth of the internet and major milestones, particularly those involving Web 2 applications which have been instrumental in driving the behaviour of online users and in the development of communities. There is a clear correlation between internet growth, the launch of many social networking services and the launch of a number of innovation brokers and tools as detailed in Tables 2 and 4. The infrastructure and behaviours required for the successful deployment of Open Innovation techniques have been established and have led to the direct deployment of a number of corporate initiatives as detailed in Table 3. These would not have been possible without the access to such large numbers of potential participants enabled by web based communications which continue to expand and enable rich collaboration across diverse populations.

Figure 1: Growth in internet usage, launch of web applications and open innovation tools.



Source: Developed using Internet usage date from: <http://www.internetworldstats.com/emarketing.htm>, Accessed 19th December 2008

Table 3 illustrates the broad adoption of Open Innovation techniques across a diverse range of businesses with some examples of successful commercialisations. The successes seen by the likes of Procter and Gamble have encouraged continued investment and an integration of Open Innovation principles into their business.

Those involved in the strategy generation of an organization should evaluate the potential to integrate a co-creation or Open Innovation approach to areas of their organization, in addition to attempting a full understanding of the benefits and risks, and how risks might be mitigated. The ability for a company to encourage and develop corporate entrepreneurship with relatively low risk has been significantly enhanced by developments in this field.

Innovation brokers have played a key role in building confidence and credibility in the field of Open Innovation and offer organisations of any size a relatively low risk way to experiment with discrete and easily manageable challenges. The introduction of tools to facilitate Open Innovation, which may be deployed both internally and externally of an organization, have helped to remove some of the barriers in the execution of such activities. Many companies have established expertise in the creation and deployment of such techniques and are informing further development of these platforms.

Companies such as Procter and Gamble have shown the impact which may be achieved with these approaches and continue to optimise methodologies to create greater business value from the opportunities available. They were one of the first companies to recognize the value of a distributed innovation approach. This has meant that Procter and Gamble have been able to achieve 50% of new product ideas origination from outside the company and has been able to double its research and development productivity (Cash et al., 2008).

The majority of organisations have yet to fully exploit the opportunities being created by the emerging Open Innovation techniques and associated technologies which are contributing to their successful adoption. These techniques are accelerating the shift from the older managed economy model to the entrepreneurial economy, where sharing and collaboration become an integral part of business processes.

Disclaimer

The views contained within this article are those of the author, and may not represent the views or policies of any institution, company or organisation associated to the author.

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