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Performance and Potential of Open Innovation Intermediaries

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Abstract

Open innovation intermediaries are increasingly growing and changing the technology market profoundly. Especially in last 10 years, intermediaries have rapidly emerged in technology markets. Companies utilize intermediaries to search and solve innovation problems. The extant literature has very limited studies on intermediaries despite their crucial roles in the technology market. The objective of this study is to explore the open innovation intermediary market and how intermediaries differ in their strategies despite they are being in the same industry; the particular emphasis is given on the best practices, effectiveness, characteristics, challenges, and market implications, etc. Five prominent intermediary case companies are considered in the study. Intermediary market for innovation is mostly prevailing in a few advanced countries even though various technologies are distributed globally. There are no well-established theories and models how to organize the intermediary market in practice. Consequently, intermediary market demands further studies to build theories and models. This study is an effort towards building theories and models for intermediary market.

Keywords: Open Innovation, Intermediaries, Marketplace, External Ideas

1. Introduction

Companies generally keep research and development (R&D) activities within their closed boundaries so that other companies cannot get chance to know their innovations beforehand. This R&D model is considered as closed innovation (Chesbrough, 2003). Traditionally firms pursue closed innovation strategies (Porter, 2005; Chang et al., 2006; Alencar et al., 2007; Lee et al., 2008). However, they are compelled to open their innovation processes to get benefit from various external sources. Open innovation intermediaries are growing and playing crucial roles in online marketplace. It seems that online marketplaces provide significant transaction mechanism and worthwhile business communities (Satyadas and Harigopal, 2001; Kocharekar, 2001). According to Howells (2006), intermediary can be defined as “an organization or a body that acts as an agent or broker in any aspect of the innovation process between two or more parties”. Several innovation intermediaries have changed the innovation realm through shifting the boundaries from closed to open innovation and provided opportunities to connect technology markets. Online open innovation platforms such as online innovation contests (Bullinger et al., 2010; Haller et al., 2011) and open innovation intermediaries (Brown and Duguid, 1991; Wenger et al., 2002) have been increasingly growing worldwide. Moreover, firms are growingly relying on external sources for technology (Malanowski and Zweck, 2007; Vrande et al., 2009). Outsourcing different technologies needs highly efficient negotiations with other parties and these take
longer time to accomplish a successful outsourcing (Contractor, 1981). Companies also consider open innovation platform and collaborative networks for sustainable innovations (Adamczyk et al., 2011). Even though, critics of open innovation argue that it is not a new phenomenon (Mowery, 2009; Trott and Hartmann, 2009), in the recent years, it has received significant attention from academicians and practitioners in the recent years (Lichtenthaler, 2006; Chesbrough, 2011).

In recent time, the internet marketplaces for technology intermediary has achieved enormous important in technology industry (Dushnitsky and Klueter, 2010). There are various types of intermediaries prevalent for open innovation process (Roxas et al., 2011; Zhao and Zheng, 2011). Often time, intermediaries introduce or connect two parties for technology transactions. They play as mediators for technology transactions even though the real buying and selling firms manage transfer process because of the necessity of each firm is different and they usually have expert knowledge on a particular technology (Hislop, 2002; Autio et al., 2004). The fundamental initiatives of open online platforms have been started from around 10 years ago. Despite these intermediaries being successful in the technology transfer market with overcoming various challenges, limited attention has been given on how they manage all that challenges and become profitable ventures (Von Nell and Lichtenthaler, 2011). Lichtenthaler and Ernst (2008) believe that the internet marketplace for technology is still below the expectations. Hence, the objective of this study is two-fold: (1) to understand the open innovation intermediaries, and (2) to explore how intermediaries differ in their strategies despite they are being in the same industry; the particular emphasis is given on characteristics, challenges, and market, etc. This study is based on secondary data from websites, blogs, publications that are publicly available. Five prominent intermediaries (Innocentive, Ninesigma, YourEncore, IdeaConnection, and Yet2.com) have been considered for this study.

The remainder of the paper is structured as follows. Section two includes a brief review of existing literature on intermediary open innovation market. In section three, five intermediary case companies have been discussed to explain how each intermediary evolves and runs its activities. A synthesis of the cases and comparative analysis of the intermediaries have been made in the section four. Section five concludes with future research propositions.

2. Literature Review

Online or electronic marketplaces are defined as interactive online business communities where various buyers (seekers) and sellers (solvers) can engage for business transactions (Bruun et al., 2002; Raisch, 2001). Kafentzis et al. (2004) believe that two key elements have been evolved from online marketplaces. Firstly, marketplaces enable to provide not only transaction capabilities but also these provide dynamic, relevant content to trading partners. Secondly, marketplaces have embraced dynamic commerce that consists of buying and selling of goods and services online through flexible transaction models. In the growing complexity of innovation, a set of bodies has emerged, who conduct various role in innovation process and they are considered as intermediaries (Howells, 2006). The knowledge and technology markets are growing exponentially, surpassing $300 billion during the period 1990-1997 as a market (Arora, Fosfuri and Gambardella, 2002). Technology and knowledge process is opening up beyond the boundaries of organizations. Hence, it is crucial to adopt strategies to explore and capitalize from external new innovations (Powell, Koput and Smith-Doerr, 1996). Chesbrough (2003) coined the concept called “open innovation” to distinguish the open innovation model from the traditional closed innovation model. According to him, “open innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology”. The concept of open innovation stems from the idea that all smart people do not work for a particular company as there are always smarter people out of a company boundary (DuPont, 2009). Firms are opening their innovation activities through inbound and outbound open innovation process (Chesbrough, 2006; Veugelers et al., 2010).

The fundamental change of knowledge transfer is its shift towards the belief that how knowledge can be shared and integrated in communities (Brown and Duguid, 1988; Wenger, 1998). Technology related transactions and transfers are moving rapidly towards online to match buyers and sellers. Online knowledge marketplaces facilitate a broad communication platform, and more people can reach in less time through intermediaries (Lichtenthaler and Ernst, 2008; Sieg et al., 2010). The shift towards online marketplaces provides numerous opportunities in trading. Transaction is taking place between more strange parties whereas previously it occurred largely around one’s social vicinity (Shane and Cable, 2002). Online marketplace reduces the difficulties to find appropriate parties for technology
and knowledge transactions (Nambisan and Sawhney, 2007; Yusuf, 2008). A great challenge for companies is to identify and capitalize value from external widely distributed knowledge. Intermediaries such as Innocentive, NineSigma, and Yet2.com, etc. have been helping companies by searching for external ideas through forging them with external locally distant, distinct and relevant partners. Search costs play crucial impacts in knowledge and technology market. Extant studies find that social ties help to reduce search costs dramatically (Coleman, 1990; Burt, 2004) and increase other financial benefits in technology transactions (Shane and Stuart, 2002). Protection of an invention ownership is increasingly challenging and even intellectual property rights (IPRs) do not give full protection of inventions (Cohen, Nelson and Walsh, 2001). Online marketplace provides several advantages: (1) access to a wide range of audience worldwide, (2) easier connections and transactions which are impossible in offline market, (3) intermediaries incur searching costs to find appropriate solutions, (4) lower cost to exchange information, (5) quick match between buyers and sellers. In contrary, online marketplaces have some disadvantages: (1) the enormous amount of information create a problem of attention, (2) time constraints to inspect and assess the great quantity of prospective entrepreneurs and inventors, (3) inappropriate ideas may eat up a valuable time period.

Depending on the roles in innovation process, intermediaries have been labeled with various names such as third parties, intermediary firms, brigders, information intermediaries, knowledge brokers, and agencies, among others (Stankiewicz, 1995; Hargadon and Sutton, 1997; Hargadon, 1998; McEvily and Zaheer, 1999; Popp, 2000; Howells, 2006). Stankiewicz (1995) and Carlsson and Stankiewicz (1991) believe that intermediary firms help to adapt specialized solutions on the market to meet the needs of individual firms. The innovation process is progressively becoming more open and widely distributed and that lead to the growing levels of collaborations among various firms (Coombs et al., 2003; Howells, 1999). The role of intermediaries is not just linking different parties, as commonly held belief, but also to search and transform ideas, provide solutions with new combination that fit to individual clients (Hargadon and Sutton, 1997). The role of intermediaries is also highly prevalent in service innovation (O’Farrell and Wood, 1999; Miles, 2000; Bettencourt et al., 2002). Previous studies imply that intermediaries have more complete knowledge than firms regarding the various technologies in which they operate (Howells, 2006).

Intermediaries such as Yet2.com (1999), Ninesigma (2000), Innocentive (2001) and IdeaConnection (2007) have changed the innovation spectrum dramatically and consequently new industry has emerged. Although the offerings of these firms differ, there are astounding similarities among them to establish internet-based platform for transferring technological knowledge (Chesbrough, 2006). Intermediaries are becoming increasingly relevant to companies for many important reasons such as (1) to help to facilitate internal and external technology commercialization, (2) to connect innovation seekers to innovation providers, (3) to help companies to screen external markets, (3) to understand the technology market better, (4) to make searching tasks easier for companies, (5) to reduce search cost of the companies, and (5) to in-license, co-develop and acquire external intellectual properties or technologies. There are considerable challenges to implement strategy and manage innovation process too (Lichtenthaler et al., 2009). However, to overcome these challenges, firms rely on collaboration with intermediaries for inter-firms contracts (Morgan and Crawford, 1996; Shohet and Prevezer, 1996; Hargadon, 1998; Zhang and Li, 2010).

3. Intermediary Cases

To study the intermediary marketplace, five intermediary cases have been considered. These intermediaries are prominent in their own niches and are based in North America. The intermediaries considered for this study are InnoCentive, NineSigma, YourEncore, Yet2.com and IdeaConnection.

3.1. InnoCentive

InnoCentive, a spin-off from Eli Lilly was launched in 2001 and spun-off from Eli Lilly in 2005. It is located in Waltham, MA, USA. InnoCentive emerged to become a global web community for open innovation, enabling engineers, scientists, students, and professionals to collaborate and to find solutions mainly for R&D-driven companies (InnoCentive, 2012). InnoCentive distinguishes ‘Seekers’ and ‘Solvers’. As InnoCentive operates using an online open innovation platform, anyone can become a solver or a seeker. However, the solvers and the seekers are anonymous to each other. Seekers are corporations of different types, such as Procter & Gamble, Eli Lilly, government and non-profit organizations. Seekers define R&D problems and post their challenges on the InnoCentive website.
Anyone can submit a solution to the InnoCentive (Lakhani, 2008). Once posted on the marketplace, challenges may be seen by more than 250,000 solvers from nearly 200 countries (Jiménez, 2011; InnoCentive, 2012). These solvers include private sector participants, academics, students, consultants, and retirees (InnoCentive, 2012). The selected solutions receive financial awards ranging between US$ 5000 and US$ 1,000,000, depending on the complexity of the challenges (InnoCentive, 2012). Challenges are classified into different industry types, and information about the challenges, such as description, deadline, and cash prize, are directly sent via e-mail to solvers who have declared a particular classification as their field of expertise (InnoCentive, 2012).

Before posting a challenge, seekers have to agree to IP audits; it may only be used if the company has awarded the solver (InnoCentive, 2012). Moreover, InnoCentive offers two additional services called ONRAMP and InnoCentive@Work. ONRAMP refers to “Open Innovation Rapid Adoption Methods and Practices” - a combination of professional services and technical resources to help organizations to successfully and rapidly adopt open innovation approaches in their innovation processes. On the other hand, InnoCentive@Work helps clients to create a web-based collaborative community for problem solvers. Thus, it supports companies with a variety of expertise in their first steps towards open innovation. After having gained more experience, InnoCentive@Work helps firms to shift internal problems challenges have been posted on the InnoCentive platform whereas over 19000 solutions have been received and 685 awards of around US$ 5 million have been given out (Marjanovic et al., 2012). Around one third of the posted problems are solved and solutions, in many cases, come from much unexpected sources.

3.2. NineSigma

NineSigma was founded in 2000 as a privately owned company in Cleveland, OH (NineSigma, 2012). It was ranked number 79 in the “Top 100 Business Services Companies of the Fastest-Growing Private Companies in America”. It claims to be the market leader in its highly segmented market of innovation intermediaries. It helps clients in sourcing innovative ideas, technologies, products, and services from outside by connecting them with the best innovators around the world. NineSigma has ‘Request’ process to connect clients, called innovation seekers, with solution providers worldwide to solve challenges. In 2008, it started NineSigma Planet Earth, an open innovation sustainability initiative and nearly 70% of NineSigma’s current innovation intelligence projects are related with sustainability issues (NineSigma, 2012). So far, it has developed over 1,500 open innovation projects (NineSigma, 2012). The main focus of NineSigma is to leverage the global innovation community to find solutions. Its services include project selection, engaging the global innovation community, ecosystem development supplier/university elite networks, and inter-company collaboration, etc. (NineSigma, 2012). It’s primarily target is to work with implying greater external R&D.

In the past few years, NineSigma reached out to more than 1.5 million solution providers, mainly from other corporations, and connected them with its clients. Thus, NineSigma claims to be the largest global innovation community, enabling companies to engage in open innovation and to source external knowledge across various industries and countries (NineSigma, 2012). NineSigma’s OI PlusSM service helps its clients to work with solution-provider facilitation from evaluation of responses through negotiation, while addressing confidentiality requirements that may be specific to a new opportunity (NineSigma, 2012). The initial important thing for the solution seekers is to formulate a clear and precise definition of their problem that they want to solve. NineSigma usually uses a professional search team to identify people around the globe, who are expected to have solution for a particular challenge. It gives four weeks to the potential solution providers to submit solutions. NineSigma reviews the received proposals and summarizes them to present to the clients who then give their opinions regarding which proposal they want further continuation (NineSigma, 2012). Prior to exchanging confidential information, both parties sign a confidential disclosure agreement before exchanging any confidential information and the agreement document explains the extent, duration, and reward of the co-operation between the innovation seeker and the solution provider.

It charges a discovery fee and a success fee in the case of a signed contract (NineSigma, 2012). Moreover, it offers services to support companies in establishing competitive knowledge and in strengthening their innovation strategy. It has a program called “NineSigma Intelligence Program” to access and integrate private and public domain information into management and planning tools, supporting decision making, reducing risk, and providing early warnings for new opportunities and threats. Furthermore, NineSigma helps organizations to solve sustainability challenges by jointly
developing an open innovation strategy that includes R&D, procurement, logistics, engineering, manufacturing and marketing. The “Rapid Open Innovation Program” supports the launch of open innovation programs by leading the client’s team through the development and implementation phases. Its “Open Innovation Program” helps client teams in assessing and acquiring external technologies. Thereby, NineSigma’s team interacts with the client’s open innovation team to integrate best practices in bringing external solutions in-house (NineSigma, 2012).

3.3. YourEncore

YourEncore is an Indianapolis-based company, which was founded in 2003. Procter and Gamble Company and Eli Lilly and Company are the initial founding member companies. Moreover, the Boeing Company joined as a founding member during the first year in business (YourEncore, 2012). This was founded based on the financial support from Eli Lilly, Procter & Gamble, and several other firms (YourEncore, 2012). Initially, it was an online recruiting platform connecting member and non-member firms with retirees for short-term assignments. YourEncore’s work process typically starts with the company developing and defining project scope, expert assigned success criteria, budget and timelines together with YourEncore’s experts who then use the database to identify appropriate retirees owning adequate skills and expertise. The projects are frequently 2-6 weeks of length. However, projects can be as short as one day or as long as one year (YourEncore, 2012). YourEncore has over 40 client companies and over 5000 retirees who have registered and posted their personal profiles on the site (YourEncore, 2012). It hires the retirees at reasonable salaries and contracts with the client company to provide the retiree’s payment (YourEncore, 2012). It has a portfolio of high-quality talent by managing and supporting the entire recruitment and enrollment process for its experts. It facilitates experts to be available to its member companies on need basis. It also provides clients an Account Team that includes an account manager, administrative support, and appropriate technical or scientific advisors. This integrated team assists client companies in the identification and definition of needs and project scope, and matches the project requirements with the skills and expertise of the experts available in its database (YourEncore, 2012).

There is a community called YourEncore innovation community that enables collaboration and open innovation in a secure online environment through connecting experts and clients in professional communities. Community participation facilitates experts to share their ideas with other like-minded peers, answer questions posed by clients and participate in problem solving forums. On the other hand, clients have chance to ask questions, conduct ideation sessions and manage project works more effectively (YourEncore, 2012). Traditionally, YourEncore’s search methods use keywords to search resumes to find the right match for a project need (YourEncore, 2012). For some projects, online collaboration space is used in the innovation community and experts are asked to join in project specific community to share information through wiki (YourEncore, 2012). Clients can post question in the community of experts but no formal collaboration occurs among the experts or between the clients. It is considered to be necessary to secure the confidentiality and IP protection (YourEncore, 2012). There is an online forum in the innovation community to use as bulletin board. The community team makes information highly secured.

3.4. Yet2.com

Yet2.com, founded in 1999 in Cambridge, Massachusetts, focuses on bringing buyers and sellers of technologies together so that all parties maximize the return on their investments (Yet2.com, 2012). The fundamental purpose of Yet2.com is to create a marketplace for technologies, where information could be distributed easily across companies of different sizes in different industries and in different geographic regions (Yet2.com, 2012). It is considered as one of the important intermediaries especially for IP. Yet2.com offers companies and individuals the tools and expertise to acquire, sell, license, and leverage world’s most valuable intellectual assets (Yet2.com, 2012). Its main services to the clients are to get a return on IP through locating unrealized IP value potential, especially in situations where IP and technology offer substantial market opportunities for products, services or cooperative relationships with third parties (Yet2.com, 2012) and to find IP and technology around the globe, enabling clients quickly and efficiently to enhance their own resources and to address gaps in their IP portfolios (Yet2.com, 2012). It has offices in the USA, Europe, and Japan and had access to about 50% of the world’s R&D through its large online-based community and through its personal contacts with major business leaders of multinational firms (Yet2.com, 2012).

Yet2.com has created a wide network of strategic technology transfer partners, technical experts, technical magazines, online technical communities, and technology brokers. The marketing experts among around 100
employees were responsible for extending the user community by acquiring new accounts and members posting new technologies in the marketplace. Some employees are fully dedicated to design the software for the website (Yet2.com, 2012). Although, it was successful in convincing many renowned companies to invest in the platform; Yet2.com faced challenges in delivering solutions (Von Neill and Lichtenthaler, 2011). After noticing that connecting potential licensors and licensees needed stronger support, Yet2.com refocused its business towards offering more supporting services in the technology transfer process. The company has subsidiaries in the UK and different countries in Asia (Yet2.com, 2012). It considers its employees as a strong advantage as most of them are working with the companies for several years so they have dedicated experiences in technology marketplace (Yet2.com, 2012). Moreover, Yet2.com provides a “Technology Prioritisation Report”, which analyzes website’s activities quantitatively to make comparisons with the client’s IP portfolio (Yet2.com, 2012).

3.5. IdeaConnection

IdeaConnection is a Canada based company founded in 2007. IdeaConnection takes challenges from large and small companies and give companies to access to the world's most creative and innovative people who work collaboratively to solve problems and develop innovations. It strives to discover the best emerging technologies for its clients. The fields it works on include solving problems ranging from nanotechnology, virtual reality, biochemistry, to marketing and sociology (IdeaConnection, 2012). Companies have problems solved by solvers who worked collaboratively in IdeaConnection's virtual ThinkSpace™ (IdeaConnection, 2012). IdeaConnection has a database of technologies for sale and wanted. However, listed parties' names are confidential but interested parties can contact them directly. It claims to solve very complex challenges which cannot be solved by clients’ internal resource. IdeaConnection helps its clients to define and fine-tune challenges in order to ensure that expert solvers’ works are focused and productive.

Each challenge is handled by specially selected teams based on their level of expertise related to the problem, and their willingness to devote their energies to teamwork to produce the highest quality solution(s) and to "get the job done" on time (IdeaConnection, 2012). Clients decide how much the solution to their challenge is worth. Their risks are minimized as they pay only when receive an acceptable solution and ownership of the underlying IP has been transferred to them (IdeaConnection, 2012). Clients save costs as they receive solutions to their problems and are able to manage their open innovation aspects of their R&D on budget. In order to protect client identity and information, their identity, details of their challenges and the accepted solutions are kept confidential. Even its teams of experts and facilitators do not know the clients' identity. IdeaConnection helps companies, governments and other organizations to find emerging technologies to meet their needs. Each technology need is sent to over 80,000 IdeaConnection partners and experts worldwide who have extensive networks with emerging companies, university labs, home-based labs, patent lawyers (IdeaConnection, 2012). Clients’ costs are low as they pay only for the solution they received, in general. IdeaConnection offers organizations that provide prizes for competitions innovative ways to launch and promote their contests locally, nationally, or internationally (IdeaConnection, 2012).

4. Synthesis and Comparison

The selected five intermediary cases have been compared considering most related issues to understand their business models. Even though, the fundamental purpose of all the five intermediary cases are same – to make match among seekers and solvers, there are some differences in terms of their business models. Moreover, these cases are successful in the business though failures cases are also well evident. We see that there was fundamental change in technology marketplace in around 2000s as many successful companies started their journey at that point. Technology marketplace is initially highly prevalent in North America and subsequently it spreads in Europe and Asia to some extent. Many intermediaries were initially started by large companies and spun-off later. The intermediary marketplace is becoming mature market gradually. Service is the most dominant revenue source for the intermediaries.

It is very striking that a huge pool of experts is engaged as solution providers in online platform. Ninestigma claims to have around 2 million experts in its network whereas InnoCentive has around 250 000 registered solvers (see table 1). YouEncore has 120 000 registered experts who are mostly retirees with huge expertise. The range of awards to the solution seekers is also appreciable. The intermediary market serves the companies of all categories - large, small to non-government organizations. The financial growth rates of intermediaries are also
remarkable; for examples, the growth rates for InnoCentive and NineSigma are 80% and 20% respectively. This growth phenomenon is very rare in any other business sectors. Intermediaries play very pivotal roles through coordinating between potential seekers and solvers. They help solutions seekers to formulate problems so that potential solvers can get clear idea.

Table 1 Comparison of Salient Features of Five Prominent Open Innovation Intermediaries

<table>
<thead>
<tr>
<th></th>
<th>Innocentive</th>
<th>NineSigma</th>
<th>YourEncore</th>
<th>Yet2.com</th>
<th>IdeaConnection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office</td>
<td>USA</td>
<td>USA, Europe &amp; Japan</td>
<td>USA</td>
<td>USA, Europe &amp; Japan</td>
<td>Canada</td>
</tr>
<tr>
<td>Spin -Off</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Spin From or Supported by</td>
<td>Eli Lilly</td>
<td>N. A</td>
<td>P&amp;G, Eli Lilly, Boeing and General Mills</td>
<td>N. A</td>
<td>No</td>
</tr>
<tr>
<td>Revenue Source</td>
<td>Posting fees and Commission fees 250000</td>
<td>Service Fee</td>
<td>Service Fee</td>
<td>Service Fee</td>
<td>Service Fee</td>
</tr>
<tr>
<td>People Engaged</td>
<td>2 million plus</td>
<td>5,000</td>
<td>120,000</td>
<td>80,000</td>
<td></td>
</tr>
<tr>
<td>Award (US$)</td>
<td>5 000 to 1 000 000</td>
<td>Based on Agreement</td>
<td>Based on Agreement</td>
<td>Based on Agreement</td>
<td>Based on Agreement</td>
</tr>
<tr>
<td>Main Field of Activities</td>
<td>Chemistry, Applied Science and Life Sciences</td>
<td>Automotive, chemical, consumer packaged goods, and food &amp; beverage industries</td>
<td>Various Fields</td>
<td>Various Fields</td>
<td>Various Fields</td>
</tr>
<tr>
<td>Major Clients</td>
<td>Corporations, Goverment and NGOs</td>
<td>Large companies</td>
<td>Large Corporation</td>
<td>Large and Small Corporations</td>
<td>Highly Technology Companies</td>
</tr>
<tr>
<td>Growth</td>
<td>Very High (80 %)</td>
<td>High (20 %)</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Roles</td>
<td>Presents Challenge and Liaises with Seekers</td>
<td>Presents Challenge and Liaises with seekers and help our clients in the design and launch of successful OI programs</td>
<td>Liaison between seekers and potential expert solvers</td>
<td>Acquiring IP and accessing technology solutions; bringing buyers and sellers of technologies together</td>
<td>Searching technologies for the seekers, Making solver teams</td>
</tr>
<tr>
<td>Rewards to Solvers Risk</td>
<td>Solution fees and non-financial benefits</td>
<td>Solution fees and non-financial benefits</td>
<td>Solution fees and non-financial benefits</td>
<td>May not get appropriate solutions</td>
<td>Solution fees and non-financial benefits</td>
</tr>
<tr>
<td>Who Solves</td>
<td>Unknown Individuals</td>
<td>Unknown Individuals</td>
<td>Individuals mostly retired and senior scientists</td>
<td>May not get appropriate solutions</td>
<td>May not get appropriate solutions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Solve through IP</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Exchange between buyers and sellers</td>
<td></td>
</tr>
</tbody>
</table>
Intermediaries provide all necessary services to launch a successful open innovation program or to find technology from other companies. Acquiring IP is usually a complicated task. It demands a clear understanding of a technology and legal aspects. Intermediaries play a very pragmatic initiative to make IP transfer easy for seekers and solvers. Companies usually keep R&D unit to innovate. However, in some cases, many external experts provide better innovative ideas than internal R&D unit and with lower costs.

5. Conclusion and Future Research Directions

The more we have access to information, thanks to the Internet, the easier to accomplish the innovation-related tasks. However, the failure cases of open innovation intermediaries are prevalent. However, intermediaries run various risks such as not to find appropriate solutions, delay to make match, not to find right solution providers, etc. Open innovation intermediaries are increasingly growing around the world. The study provides an insight considering five intermediary cases. There are almost no studies on why they fail. In absence of necessary established evidence, it is impossible to understand the benefits, mechanisms, opportunities, and limitations, etc. of the intermediary market. It is well evident that there are various unique challenges for intermediaries. A wide range of risks such as IP protection, value assessment, time investment, commercial viability of an innovation, etc. are highly associated with this intermediary business. This intermediary market consists of well-established formal terms and conditions in one hand, and informal relations such as trusts and vicinity, on the other. Thus, research is needed to understand the factors and their influences in the intermediary business models. The extant literature comprises insignificant articles on the issues related with the failure of intermediary market. Moreover, policies and legal frameworks are still very vague and only a few companies have adequate resources to get insights of this market. How intermediaries profitably make match of problem seekers and providers and how to make balance between search outside and research inside of a company are scarcely known. Intermediaries are not a popular means in developing countries though accessibility to information is beyond geographical barriers. IP protection regulations need to improve globally and it requires studies to understand IP issues throughout the world. Extant literature does not contain failure cases, in general. It is really important to consider why some intermediaries fail. In traditional large organizations, there are internal resistances to embrace ideas from intermediary marketplace. Concerns about trade secrecy and IP protection are considered fearsome issues while going for intermediary sources. Intermediaries are competing with each other and it seems that the competition might be fierce as their contributions increase. A large number of solvers need to get guarantees on successful solutions. The trend of intermediaries would witness diversification of strategies as the solution seekers prefer to get a wide range of services from single intermediaries.

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