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Barriers In Partnerships In Open Innovation Process

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Abstract

Today, innovation is a receipt for most of the problems the firms are facing. Today, firms can't develop innovations merely contenting themselves with their own effortful struggles. In addition to such initiative, they should cooperate with other actors. Cooperating with other actors outside the firm opens the innovation process. Open innovation has lots of advantages which can be categorised in two main groups : increasing revenues, and decreasing costs. The main idea in open innovation strenghtens the relations with external environment by increasing knowledge and technology inflows and outflows. However, dealing with the boundaries of the firm, there are barriers related with knowledge and technology flows. This research aims to explain evolution of open innovation, partnerships as main actors in knowledge and technology outflows, and intellectual property as the concept that protects knolwedge flows. external environment of the firm.

Keywords: *Open innovation, Partnerships, Intellectual Property, University,*

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INTRODUCTION

There have recently been inevitable social, economical and technological changes in global marketplace. Innovation is the key solution in the process of adaptation to these changes. Innovation has considerable effects on the national, regional, industrial and firm level. First theoretical approaches to innovation state that in innovation process only one actor (an individual or a company) is considered responsible for the innovation process. This paradigm causes firms to be strongly self-reliant, because they can't be sure of the quality, availability and capability of others' ideas. (Chesbrough, 2004, Research Technology). Furthermore, as Huizingh (2011) argues trends such as outsourcing, agility, and flexibility has already forced companies to reconsider their strategies and processes in other areas and to become network organizations. Hence, "do-it-yourself" mentality in innovation management is not valid anymore. Besides, innovation processes consist of complex social and disorderly interactive interactions which these earlier models cannot embrace and now become central in an array of innovation theories (Chesbrough, 2003; Sorensen et al., 2010). Since open innovation is concerned with the ability of many external factors to influence the rate and direction of innovation activity, it is rather associated with a different set of organizing assumptions than traditional firm-based innovation. (Lakhani and Tushman, 2012). Scanning, gathering and absorbing knowledge from the external environment is necessary in realizing open innovation projects. Hence, effective partnerships is unavoidable in open innovation projects. Traitler (et al, 2011) complement "innovate or die" with the new mantra "partner or perish". Partnerships are created to solve problems, fill gaps, or find answers more effectively and rapidly (for example, time to market). Effectiveness and speed are the operative and overriding principles of any innovation partnership.

In this paper, first open innovation concept will be introduced with the distinguishing factors of open innovation with respect to closed innovation second, partnerships and intellectual property as way of managing external knowledge and protecting knowledge will be introduced. The research aims to contribute to the relevant literature by examining how knowledge inflows and outflows as well as how to protect knowledge.

1. OPEN INNOVATION

The strengthening of the knowledge-based component in products and adoption of information and communication technologies has encouraged firms to seek new sources of opportunities from networked collaboration such as open innovation. Lichtenthaler (2011) defines open innovation as systematically performing knowledge exploration, retention and exploitation inside and outside an organization's boundaries throughout the innovation process. Open innovation has offered more possibilities for firms to operate over country borders in a much more open environment than before. (Edelmann and Volchek, 2010). Chesbrough(2003) is the first to define "open innovation", however; Vujovic and Ulhøi (2008) argue that the first applications of open innovation can be traced back to the UK iron industry and US steel industry in the third quarter of the nineteenth century. Toward the end of the 20th century, a number of factors were influential to rethink about closed innovaton. The main factor was the rise in the mobility and number of knowledge workers, making it difficult for companies to control their ideas and expertise. Another important factor was the growing ability of private venture capital which has helped to finance new firms and their efforts to commercialize ideas that have spilled outside of the corporate research labs (Chesbrough, 2003b). Chesbrough (2008) identifies 8 points that differentiates open innovation from the earlier innovation theories. These can be summarized as: increased importance of external knowledge, the importance of business model, the ability to turn unsuccessful R&D projects int successful ones, purposive outflow of knowledge and technology, abundant knowledge landscape, proactive role of IP management, the rise of innovation intermediaries and new metrics for innovation capability and performance.

In the past, internal R&D was a valuable strategic asset, and also a barrier to entry by competitors in many markets. Open innovation paradigm opens up the classical funnel to encompass flows of technology and ideas within and outside the organization: the duration of creation, recognition and articulation of opportunities can be drastically shortened if ideas come not just from the R&D department (Carbone et al., 2012). Hence, having effective partnerships have gained importance in open innovation. Mostly preferred partnerships are suppliers, customers, research organizations and universi-

ties (Luoma et al.,2010; Sorensen et al.2010; Evens; 2009). Furthermore; Sorenson (et al., 2010) and Evens(2009) complements generally accepted partners with competitors, spin-offs from large firms, knowledge intensive service firms, partners, government, private laboratory and other nations. However, the internal interfaces such as the business units, processes and structures are also as important as the external partners. (Edelmanand Volchek, 2010).

Herstad (et al., 2008) argue that the broader the range of actors and actor groups firms interface with, the higher the probability that ideas and knowledge complementary to own activity and capabilities is identified, and the higher the likelihood of something novel emerging. Besides, external actors can leverage a firm's investment in internal R&D through expanding opportunities of combinations of previously disconnected silos of knowledge and capabilities (Dahlander, Gann, 2010). The open model assumes that the value of a creative work can be increased by allowing more potential innovators to contribute to its development, and economic value is gained as a result. (Maxwell, 2006).

Hence, open innovation has become the umbrella that encompasses, connects and integrates a range of already existing activities. Firms that manage to create a synergy between their own processes and externally available ideas may be able to benefit from the creative ideas of outsiders to generate profitable new products and services. Available resources become larger than a single firm can manage; they enable innovative ways to market or to create standards in emerging markets. Such synergies can be created by relying on the external environment and by taking an active part in external developments (Dahlender et al., 2008). Lee (et al, 2012) identify the necessity of collaboration with that of other world-class firms to develop the internal competencies of firms. External networking is another important dimension which is consistently associated with open innovation. It comprises both formal collaborative projects and more general and informal networking activities. External participations enable the recovery of innovations that were initially abandoned or that did not seem promising (Van de Vrande et al.,2009). Open innovation has gained popularity for at least three reasons as (Barge-Gil, 2010):

1) It reflects the changes to work patterns where professionals are seeking portfolio careers rather than a job-or-life, and work contexts that involve increasing divisions of labour,

2) Improved market institutions (property rights, venture capitalists, standards) are enabling increased trade knowledge,

3) New technologies are easing coordination across geographical distance.

Though there is a trend toward open innovation, most of the firms hesitate to open up their innovation processes. However, it seems that there is a clear trend toward open innovation which will continue or even intensify in the future (Lichtenthaler, 2008). Besides, some industries need to continue to operate in a Closed Innovation regime. Nuclear reactors and aircraft engines are two industries in which reliance on one's own ideas, and internal commercializaton paths to market appear to be valid. (Chesbrough, 2003a). Meanwhile; Enkel (et al, 2009) suggest using an appropriate balance between open and closed innovation since too much openness may lead to faster loss of control and core competences. Open innovation is mostly realized by pioneering firms whereas other companies still follow a relatively closed strategy. Luoma (et al., 2010) show that most of the companies have cooperation with other parties and many of them are unconsciusly utilising open innovation to some extent. Evens (2009) compares closed innovation and open innovation. According to the precise conclusion of this comparison, in closed innovation, the main idea is that they have to do everything on their own, while, in open innovation the focus is on opening up to the external ideas.

Table 1: Comparing and Contrasting Principles of Open and Closed Innovation

	Closed Innovation	Open Innovation
Field of Expertise	The smart people in our field work for us.	Not all the smart people work for us so we must find and tap into the knowledge and expertise of bright individuals outside our company.
Function of the own R&D	To profit from R&D, we must discover, develop and ship it to ourselves.	External R&D can create significant value, internal R&D is needed to claim some portion of that value.
Attitude regarding research	If we discover it ourselves, we will get it to the market.	We don't have to originate the research in order to profit from it.
Market ambition	If we are first to commercialize an innovation, we will win.	Building a better business model is better than getting to market first.
Sources for idea	If we create and the best ideas in the industry, we will win.	If we make best use of external and internal ideas, we will win.
Intellectual property	We should control our intellectual property so that our competitors don't profit from our ideas.	We should profit from others' intellectual property, we should buy others' IP whenever it advances our own business model.

Source: Ili, Albers and Miller (2010) adapted from Chesbrough (2003)

The open innovation paradigm balances the role of internal and external sources of knowledge. Open innovation also requires a number of changes within firms in order to effectively best manage the use of purposive in and outflows of knowledge. Stahlbrost and Bergvall-Kareborn (2011) point out three elements in open innovation as *culture*, *structure* and *business model*. Having an open innovation approach forces organizations to embrace an entirely different culture in their way of thinking. The change in structure means that it's more important to develop mechanisms in support of importing and exploring knowledge and ideas. Lee (et al., 2012) and

Van der Meer (2007) explain the stages to open innovation beginning from closed innovation. Journey from closed to open innovation involves four main dimensions of the firm's organization, *inter-organizational networks*, *organizational structure*, *evaluation processe*s and *knowledge management systems*, along which can be managed and stimulated. (Gassman, et al.,2010; Huizingh, 2011). Open innovation reflects much less a dichotomy (open versus closed) than a continuum with varying degrees of openness. Open innovation also encompasses various activities, e.g. inbound, outbound and coupled activities. Each of these activities can be more or less open. Open innovation measurement scales should therefore reflect this multi-dimensional nature. Three core processes can be differentiated in open innovation such as (Enkel et al.,2009):

1) Outside-in process enriching the company's own knowledge base through the integration of suppliers, customers and external knowledge sourcing.

2) The inside-out process referring earning profits by bringing ideas to market, selling IP, and multiplying technology by transferring ideas to the outside environment.

3) The coupled process referring co-creation with (mainly) complementary partners through alliances, cooperation and joint ventures during which give and take are crucial for success.

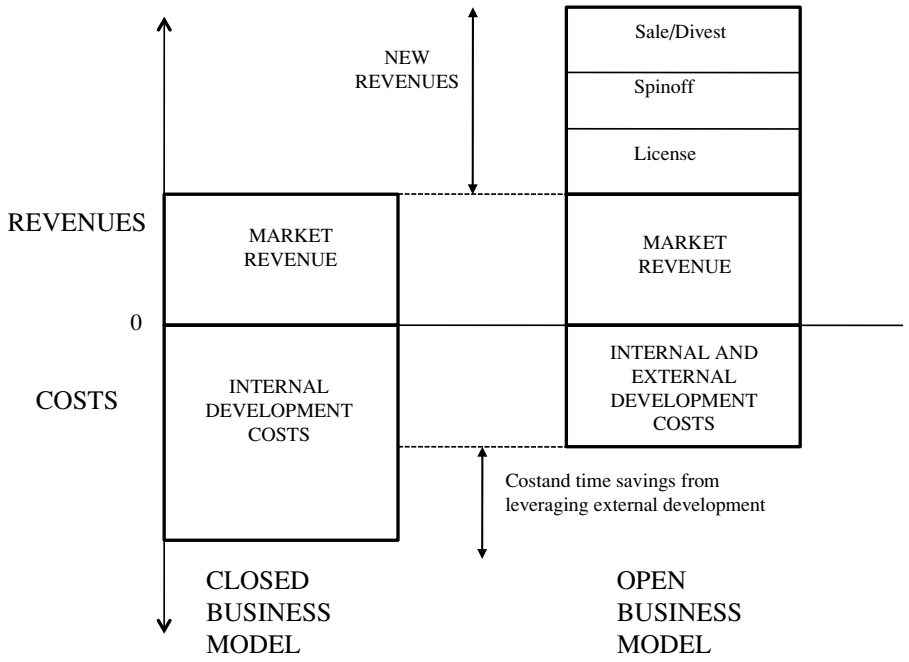

Figure 1: Open and Closed Business Models Compared Regarding Revenues and Costs

Source: Chesbrough(2007)

Chesbrough (2007) tells that to ofset the trends of rising development costs and shorter product life cycles (left bar), companies must experiment with creative ways to open their business models by using outside ideas and technologies in internal product development and by allowing inside intellectual property to be commercialized externally (right bar). Reed and Barnes(2012) propose that open innovation reduces the barriers related with economies of scale and capital requirements.

Evens (2009) points out that there are a lot of things to be learned about open innovation since it's only at the beginning of its existence. It is stated that the focus of open innovation is usually on the benefits, however, the evidence of possible barriers research is scarce (Luoma et al, 2010). Further-

more, Vega (et al., 2012) define identification of barriers as relevant entry points to get immersed in the system of innovaton in order to identify system failures.

Luoma (et al, 2010) group open innovation barriers in two main categories such as: *company-specific factors* and *environment-specific factors*. Many researchers detailed company-specific and environment-specific factors with different viewpoints. West and Gallagher(2006) define open innovation barriers related with processes in open innovation. Roper and Dundas(2013) point out the role of various channels in managing the relations between external environment. Munos(2011), Stone and Keating (2010) define open innovation barriers as the difference between actors involved. Birkinshaw (et al., 2007) define barriers related with network formation. Savistkaya (2011) comments that external influences are stronger in creating barriers to open innovation than internal practices which companies may develop and improve over time. Successful partnerships are effective to manage the barriers in external environment. In this research, barriers related with two important partnerships and intellectual property as a bridge between these partnerships will be discussed.

2. PARTNERSHIPS

Luoma (et al., 2010) point out the barriers related with partners and collaboration in network management. The diffciulties can be summarized as: 1) To recognise possible partners from the network 2) To find new reliable partners 3) To understand partners and negaotiate with them and 4) To build trust.

2.1. PUBLIC-PRIVATE PARTNERSHIP

The main aim of the PPP idea is to bring together the public and private sector organizations in mutual benefit (Awe et al., 2011). There are four sets of arguments in support of PPP – synergy, transformation, budget enlargement and capacity enlargement (Oyebanji et al., 2011). In case PPP provide a better service by aligning the social and private benefits, they will end up producing a better outcome for society (Rangel et al., 2011). Successful

partnerships should be collaborative, operational, operational, contributory and consultative (Wettenhall, 2003). Munksgaard (et al., 2012) state that there are barriers between private and public actors in innovation process. Besides, the barriers within between PPIP(Public Private Innovation Partnerships) are harder to solve. As long as the public sector widely pursues dissemination of partnership, the conditions for organizing processes seem difficult. In case of successful partnerships, win-win becomes the name of the game.

The differences between public and private actors and how these differences affect innovation partnerships are explained as follows:

1) The first difference is the diverse objectives for engaging in innovation projects held by public and private partnership respectively.

2) The second difference is balancing the divergent planning and implementation horizons which is a delicate matter also related to the timing of goal achievement of the partners.

3) The third difference is that public and private actors tend to perceive risk differently leading to differences in their risk behaviour. Risk is shared commonly in the public sector whereas risk is assumed individually based in the private sector.

4) The fourth difference relates to incentives for participation and expected rewards. Private actors prefer incentives and expectations of economic rewards whereas public actors aim to prefer creating public value through innovations.

5) The fifth difference is related with the viewpoint of innovation. Public actors view innovations as creating new knowledge whereas private actors define innovation in terms of added value through new applications.

Relations between organizations should be conducted on the basis of specilization and cooperation rather than hiearchical diktat. (Pollitt, 2005 in Skelcher). In *Learning Collaborative* model; partners, which are selected based on their experience, share freely and stay focused on the shared goal of translating discoveries from laboratory to marketplace and also improve the processes. (Weir et al., 2012).

As the conditions on joint innovation differ in every project, a need exists for more flexible governance modes how to cooperate between public and private actors. Furthermore, there is a need to change the traditions and cultures for innovation in the public setting.

2.2. UNIVERSITIES AS PARTNERS

Howells (et al., 2012) claim that firms see universities as being poor sources for innovation information. More importantly, in terms of the open innovation and networking agenda, we may infer from this that universities are seen as low priority, low-order partners for forming collaborations and in the development of network architectures. Hagen (2002) also emphasizes that partnership process is an extremely high risk strategy at the level of implementation. However once established, this study reveals that collaborations by firms with universities and other Higher Education Institutions were found to have a very positive and significant effect on innovation. Melese (et al, 2009) identify two major areas that affect industry-academia collaborations in terms of strategy and operations: organizational and cultural issues and funding challenges.

Kaiv-oja (et al., 2010) explain the evolution of universities beginning from knowledge store, knowledge factory, knowledge hub to innovation factory and added that universities are not ivory towers, but innovation engines and learning environments in contemporary sciences. Melendez and Moreno(2012) emphasize the new role of universities that changed from that of ivory tower to knowledge broker. On the contrary, Hagen(2002) states that due to fragmented nature of knowledge generation and dissemination, universities are no longer the only knowledge and innovation centers. Furthermore, universities are seen as the vehicle to develop processes for dissemination of new knowledge mostly at a regional level. However; the opportunity to build on these relationships and extend them to others within the organization is not well understood. Besides; these collaborative activities are often based on personal relationships between individuals in each organization. As a result, it is rarely realized that the company and the university are losing important opportunities to leverage existing researh relationships and broaden the scientific focus.

Knowledge Transfer Exchange (KTE) is an important factor to sustain satisfactory results. KTE process generally follows such phases as: *carrying out scientific discovery*, *securing intellectual property*, *marketing intellectual property* and *realizing profit.* Interestingly, the only agent that could be involved in all activities is the researcher. Thus, the understanding of which factors influence researcher engagement in KTE is of key importance.

Johnston (et al., 2010) identify eight inhibitors affecting exchanges between researchers tasked with KTE activities:

1) Adapting the research cycle to fit real-world timelines;
2) Establishing relationships with decision makers;
3) Justifying activities that fit poorly with traditional academic performance expectations;
4) A perceived lack of knowledge of the research process;
5) The traditional academic format of communication;
6) Research that is not relevant to practice-based issues;
7) A lack of timely results; and
8) The lack of time and resources to participate in KTE.

Johnston (et al., 2010) identify seven emerging themes influencing Higher Education Institution-industry KTE interactions.

1) The importance of network intermediaries;
2) Flexibility, openness and connectivity of network structures.
3) Encouraging network participation.
4) Building trust in relationships through mutual understanding.
5) Active network learning
6) Strengthening cooperation through capacity building, and
7) Culture change

Fabrizio (2006) advises that to successfuly embrace the open innovation paradigm, firms must develop the ability to identify, assimilate, and make use of external knowledge and ideas. Unversity-based research con-

tribute to firms' knowledge base. However, firms should also develop their internal research expertise. Roper and Dundas(2013) suggest that knowledge co-production with other organizations, such as company-based and university-based public funded research centers, as part of their R&D or knowledge-generation activities are likely to be important. They also define spatial distribution, cognitive proximity and organizational proximity as important factors for creating knowledge spillovers. Significant differences emerge between university-based and company-based public research centers, with university-based research centers more likely than company-based public research centers to engage both in knowledge sharing and the co-creation of knowledge as well as knowledge-supply activities. Concerns about intellectual property protection seem to be particularly important in limiting the external connections developed by company-based public research centers.

2.3. INTELLECTUAL PROPERTY

Wikhamn and Knights(2011) state that much of the open innovation process is contingent on a contractual use of intellectual property in terms of trading (both buying and selling) on the market or with selected partners. West and Gallagher(2006) emphasize that open innovation is a powerful framework encompassing the generation, capture, and employment of intellectual property at the firm level, however, as (Maxwell, 2006) points out openness is challenging the conventional closed model of intellectual property resulting with a difficult combination between intellectual property and open innovation (Luoma, et al., 2010). The logic of the publish-versus-patent approach is an example of open innovation thinking. In Closed Innovation, firms that make new discoveries would think first about how to own and protect this knowledge. In Open Innovation, firms choose to patent core knowledge, but carefully consider "publish" as well. The decision between patent-and-publish is related with the business model. The model helps the firm create value throughout the value chain and then positions the firm to capture some portion of that value (Chesbrough, 2003a).

The use of intellectual property rights such as patents, trade marks and copyright may help to bring the intangible intellectual assets more tangible and manageable which may be of value especially in collaboration situation(Varis and Olander, 2010). Intellectual property rights may also help

in capturing value from innovations as they enable protection over the innovation and thus the patent owner for example may exclusively use and outlicense the product. Increasing intellectual property concerns in an arena previously characterized by open knowledge sharing may create barriers and administrative burdens that can be a drag on innovation (Fabrizio, 2006).

Lli (et al., 2010) relate the intellectual property rights with the changing role of R&D in open innovation. Herstad (et al., 2008) state that outsourcing R&D may provide cost-efficient problem solving on a project basis but comes with the organizational cost of knowledge accumulation. West and Gallagher(2006) suggest that firms must make use of intellectual property as a supplement to, not a replacement for, internal R&D. Savitskaya(2011) conclude that the greater the complexity and cost of intellectual property protection, the less likely firms will engage in open innovation. West and Gallagher(2006) say that firms question to contribute to intellectual property since it's also going to be made available to their rivals.

Varis and Olander(2010) state about the usage of intellectual property that firms which engage in R&D in order to find new solutions to existing problems or creating totally new knowledge and innovations have several possible strategies related to innovations. They also argue that firms might either decide to apply for intellectual property rights (for example, a patent) to protect the innovation from imitation or in order to license the right to use the innovation to other firms, or they may want to keep the innovation a secret to prevent knowledge about the innovation from spreading around, which might give them lead time in developing the innovation further. Some firms are believed to choose patenting for reasons of ensuring future freedom of operation while others might fear a failure in patenting process or that a competitor would be granted one before they had the chance, and thus decide to publish their innovations for defence.

As the open innovation framework makes clear, the best way for a firm to gain value from innovations that do not fit the firm's own set of complementary assets is to look outside of the firm for a licensee or spin off to develop the innovation. Traitler (et al., 2010) suggest understanding clear definition of partners' needs in solving the contradictions related with intellectual property.

Savitskaya (et al, 2010) relate the problems in intellectual property rights system as weak appropriability regime, strong intellectual property rights protection and costs of intellectual property protection and procedure of claiming intellectual property. Under a weak appropriability regime, firms are encouraged to protect their innovations and thus less inclined to share their internally generated knowledge with others. Hence, firms have less incentive to conduct in-house R&D; therefore the amount of research surplus would decrease as well. Weak intellectual property rights protection may lead to the overall rate of private sector R&D decreasing below the levels needed to sustain long-term private returns from innovation and may therefore necessitate public support for in-house R&D. In strong protection of intellectual property, firms are supposed to increase the willingness of companies to develop own techologies in house. Hence, the involvement of companies into open innovation may depend on the strength of intellectual property rights protection and associated with its costs and formal arrangement. Giannopoluou (et al., 2010) mention that different strategies of open innovation require particular intellectual property management.

The other partnership that should be considered in intellectual property is the relation between universities. Melese (et al. 2009) state that intellectual property rights continue to pose a challenge for cultivating collaborative environments that support innovation. They also propose giving more thoughts to structure contractual agreements that promote innovation while continuing to respect the intellectual property rights of the collaborators. If the intellectual property protection terms are too broad, it will be difficult for academic researchers to collaborate. If intellectual property protection reaches too far into the future to include research that might be performed after the collaboration ends, the result will be to restrict research with other collaborators. This serves to unnecessarily limit or tie all inventions exclusively to one partner and will therefore be a major barrier to innovation.

CONCLUSION

Innovation is an effective solution for many of the problems resulting from inevitable changes. However, rapid and uncontrollable changes in the external environment force companies to colloborate with actors in external

environment. These mentioned developments have caused a new type of innovation to emerge which is defined as open innovation. In open innovation, the advantages can be briefly described as increasing revenues via decreasing costs. Besides, ideas from actors' knowledge about problems increase the probability of novelty of innovations. However, increasing number of partnerships cause barriers in developing innovations. In this research, barriers related with universities and public partnerships are discussed. Intellectual property acts a bridge between firms and the external actors during innovation process. In open innovation, building trust is important for the relationship. Partners should begin collaboration with appropriate agreements. Although the importance of intellectual property in open innovation is admitted in literature, there is a lack of intellectual property issues in the literature. One of the main problems between actors is the difference in their goals. It is advisable that a person be assigned for supporting open innovation processes. In open innovation process, external environment should be scanned carefully, partners should be selected carefully and external knowledge should be integrated to the knowledge created in the firm. However; firms should think carefully whether to innovate openly or not. As stated in the literature, open innovation is not suitable for all firms and industries. Firms should think whether they need to rely on their own ideas. If this occurs, they should not innovate openly. One of the other point that needs to be considered is the need to change for open innovation. All of the partners in open innovation should change their structures, cultures and processes and change their business model. The last point that needs to be mentioned is that firms should also consider other interactive channels of knowledge transfer such as conferences, consulting and informal interactions.

In this research, a literature review open innovation and role of partnerships to have effective open innovation projects are provided. Partnerships are means of knowledge inflows and outflows in open innovation. However, there are also barriers in building effective relationships. Barriers are also explainde in this research. In future studies, each barrier should be examined in detail. In-depth interviews should be conducted in different cases related with open innovation.

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