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Open Innovation: From Understating to Future Prospects and Perspectives

Abstract

This conceptual paper tries to encompass the development of open innovation concept from 2003 till now. Open innovation is one of hottest and most debated topic in the field of innovation management. In last decade, since the publication of the book “open innovation” by Chesbrough, the idea of open innovation has received extensive interest of scholars as well as the practitioners. The progression of thought process has been heighted in brief. Enablers of open innovation are also discussed along with the process for implementing open innovation as mentioned in the literature. Discussion on future prospects of the field along with future perspectives for the research is most significant part of the paper. Few research areas are highlighted that remained untapped in the previous decade and demands for an urgent inquiry.

Keywords: Innovation; Collaboration; Co-creation; Schooling.

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1. Introduction:

Traditional firms usually prefer to develop new technologies in order to use them for their internal products (Ahlstrom 2010). Most of 20th century scholarly work and even organizations have focused on controlled technological innovation (Bogers and West 2012) and existence of modern industries was believed to reside in the need to fund and control internal innovations. But the concept of such “closed innovation” seems to be outdated and proves as misfit in recent past due to the complex products that emphasizes a need of collaboration, coordination, co-creation, networking and strategic alliances. In recent past, closed innovation strategies are replaced with acquiring external technologies in order to complement internal knowledge base by means of in-licensing and strategic alliances (Beamish and Lupton 2009) and exploiting internally generated knowledge with actively commercializing technological knowledge by out-sourcing and strategic alliances (Lichtenthaler 2011).

Open innovation is one of hottest and most debated topic in the field of management (Bianchi et al. 2011) and innovation management (Huizingh 2011). In last decade, since the publication of the book open innovation by (Chesbrough 2003), the idea of open innovation has received extensive interest of scholars as well as the organizations (West et al. 2014). The book emphasized to span the boundaries of the firms for commercialization and creation of innovation. Henry Chesbrough’s book has cited for more than 21053 times and search in Google Scholar on “Open Innovation” has provided over 4.2 million hit (Google Scholar, May 2020). Furthermore, a wide range of disciplines including psychology, sociology, economics and cultural anthropology has shown interest in this concept. Open innovation describes innovation process in which significant amount of knowledge exploitation and exploration taken place due to extensive interaction with the stakeholders (Chesbrough 2003).

Main purpose of the article is to comprehend the idea of open innovation with the help of available literature. Understanding open innovation is the main step before exploiting from its benefits. Furthermore, future prospects of the field are explained using the idea “Schooling” by Mckinley, Mone and Moon (1999). Future perspectives that need to be explored are provided in order to guide future researchers of this field.

2. Definitions of Open Innovation:

An expanding stream of innovation management scholars have suggested to leave closed innovation model in order to cope with globalization challenges, rising R&D cost and shortening product life cycles. Now the focus should be on exploiting external knowledge as well as exploring new knowledge by mutual collaborating and co-evolution with the individuals, firms and stakeholders under the umbrella of open innovation (Von Hippel 2005). Open innovation is a new concept having different forms and tastes which highlights the richness of the concept (Huizingh 2011). Many scholars have tried to define open innovation after Chesbrough (2003).

According to Gassmann & Enkel (2004a), “open innovation means that the company needs to open up its solid boundaries to let valuable knowledge flow in from the outside in order to create opportunities for operative innovation processes with partners, customers and/or suppliers. It also includes the exploration of ideas and IP in order to bring them to market faster than competitors can”. Chesbrough (2006), “open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. [This paradigm] assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology”.

Above definitions clarifies the two-way (inbound and outbound) flows of knowledge for innovation purpose. In inbound open innovation, external knowledge is exploited internally and outbound open innovation leveraging existing capabilities outside the organizational boundaries. It is also evident that open innovation provides an umbrella for accommodating widespread activities including R&D alliances, joint ventures, licensing & acquiring technologies, scanning external environment for new ideas and looking for collaborations etc.

3. Evolution of Open Innovation in first decade:

After a decade of successful development of “Open innovation”, West et al., (2014) have tried to comprehend the evolution of this concept. They divided the evolution into three steps; 1) Germinating the idea, 2) Evolving scope of open innovation and 3) A successful decade.

1) Germinating the idea:

Open innovation term is an outcome of Chesbrough (2003, 2006) observation of large innovation firms. It's a return towards late 19th and 20th century innovation model with external oriented R&D, diverse technologies (Mowery 2009) and more like a horizontal structure.

Large firms do not abandon the innovation model of vertically integration and rather expand their existing R&D by inbound sourcing of external technologies and careful outbound licensing (Chesbrough 2006). Although open innovation is a newly emerged phenomenon but it builds upon three basic antecedents of innovation that not only help in enabling the idea of innovation but also its acceptance among scholars and practitioners (West et al. 2014).

First, it is a common belief among innovation management scholars that innovation originates from outside the organizations. Many researches have proved this argument as correct like Freeman's research in chemical industry (Freeman and Soete 1974), Allen's technology transfer of knowledge in R&D labs (Allen 1977), Von Hippel seminal paper on role of users in generating innovative ideas (Von Hippel 1986) and Chesbrough's inbound, outbound innovation idea (Chesbrough 2006a). Second, open innovation builds on the framework mentioning the profiting from the innovation. There is a need to closely look at the asymmetric relationship between innovation agents and how profit can be shared among them. Third, there is an increasing interest in the role of business models as they mediate between technical inputs and economic benefits of technology.

2) Evolving Scope of open innovation:

Concept of Open innovation has continuously evolved during last decade. Scholars have re-conceptualized the concept based on the practical learning and inclusion of different dimensions in open innovation. Chesbrough (2003) has initially defined open innovation as:

Open Innovation means that valuable ideas can come from inside or outside the company and can go to market from inside or outside the company as well. This approach places external ideas and external paths to market on the same level of importance as that reserved for internal ideas and paths.

After three years of practical learning, Chesbrough (2006) has redefined open innovation by emphasizing on intentionality of knowledge flows as:

Open Innovation is the use of purposive inflows and out-flows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively.

Due to increasing interest in non-pecuniary knowledge flows, Chesbrough et al., (2014) has extended the concept given in 2006:

We define open innovation as a distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organization's business model.

3) A successful decade:

Scholars and practitioners have taken extra-ordinary interest in this concept during last decade. According to West et al., (2014), open innovation appears in the title of 687 publications according to Scopus and 3150 according to Google Scholars. Similarly, Chesbrough's book on open innovation (Chesbrough 2006a) has cited for 21053 times and search in Google Scholar on "Open Innovation" has provided over 4.2 million hit (Google Scholar, October 2015).

4. Types of open innovation

Chesbrough (2006) has distinguished open innovation in two conceptually divided dimensions: 1) inbound or outside-in open innovation which emphasizes on leveraging the innovations of others and works on opening-up of relationships with others with an intention to improve firm's innovation capabilities; 2) outbound or inside-out innovation suggests to use external sources to commercially exploit innovative opportunities rather than relying only on internal factors. All the researchers have used inbound and outbound open innovation categories in their respective researchers but few have further categorized with respect to pecuniary vs non-pecuniary aspects of open innovation (Huizingh 2011). Dahlander & Gann (2010) have categorized open innovation into four types; 1)

Inbound innovation sourcing (Non-Pecuniary) ; 2) Inbound Innovation acquiring (Pecuniary); 3) Outbound innovation revealing (Non-Pecuniary); 4) Outbound innovation selling (Pecuniary).

5. Process of open innovation

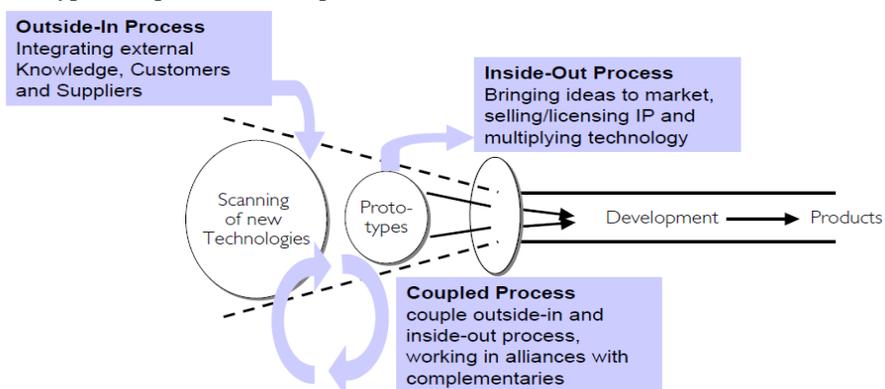
Differentiating factor among open and closed innovation is the intention of the firms to interact with the external entities in order to improve the innovation process for efficiency and effectiveness.

5.1. Three Archetypes of Open innovation Process:

Gassmann, O., & Enkel, E (2004b) have identified three core open innovation processes (Figure 1) based on the empirical data of 124 companies: 1) The outside-in process: Enhancing company's knowledge base and innovativeness by integrating with suppliers, customers, complementors and other external sources; 2) The inside-out process: Exploitation of internally generated innovative ideas/products in different markets by selling IP and multiplying technologies; 3) The coupled process: dealing with both inbound and outbound open innovation with the help of alliances where give and take are used for success. Authors conceptualized the process in terms of focus (Inbound, Outbound & Coupled) of open innovation and indicated that companies didn't utilize every process at the same time, rather use one as core process and integrate some elements of the other.

Alongwith implementing processes, organizations also required to possess necessary capabilities like absorptive, multiplicative and relational capacity to fully grasp the fruits from the process (Gassmann and Enkel 2004a).

Figure 1: Three archetypes of open innovation process.



Source: "Towards a theory of open innovation: three core process archetypes," by Gassmann, O., & Enkel, E, 2004, *Paper presented at R & D management conference.*

6. Drivers of open innovation:

Other than understanding the process, the drivers of open innovation are important to successfully implement the process. Literature provides several drivers that require proper attention before going for open innovation.

6.1. Innovation partnerships and networks:

Random linkages and interactions no longer fruitful for today's organizations facing high level of dynamism, competition and urgency for innovation. For positive results, planned networking, collaborations, partnerships and alignments are required for cross-fertilization survival and synergy ((Traitler, Watzke, and Saguy 2011). Open innovation requires, strong collaboration and networking for inbound and outbound innovations with universities and research institutions (Perkmann and Walsh 2007), suppliers , users (West and Lakhani 2008) and other stakeholders.

6.2. Internal context characteristics:

Internal organizational characteristics include No. of employees, age, location, market share, sales, strategic approach and culture etc. Size is one of critical factors in striving for open innovation. Small companies can benefit a lot from open innovation but they have less resources available for collaborative networks, alliances and enforce intellectual property rights (Huizingh 2011). Strategic orientation also has significant impact on open innovation adoption. It is observed that technology aggressiveness have negative impact on inbound and positive effect on outbound innovation (Lichtenthaler and Ernst 2009).

Structure also needs to be aligned with open innovation requirements. Internal re-organization is the integral part of change process during implementation of open innovation process (Chiaroni, Chiesa, and Frattini 2011).

6.3. External context characteristics:

There are many external context characteristics including globalization, new business models, technology fusion & intensity and industry (Gassmann 2006). But most common external characteristic is industry. Studies are available on many industries like automotive, financial services,, chemical industry, food and Bio pharmaceutical. According

to Keupp, M. M & Gassmann, O. (2009), open innovation adoption is more a matter of strategic orientation of business rather than industry, that's why internal context matters more than external factor characteristics in the adoption of open innovation.

7. Future Prospects:

A decade journey of open innovation is considered to be one of successful stories in the field of innovation management. It is successful in labeling itself as a mainstream area of research in the field of innovation. But question still stands that how far it will go and for how much time it will keep on attracting the intentions of researcher? Answer of these questions can be provided by using the concept of "schooling in organization theory" as mentioned in the article of McKinley, Mone, & Moon (1999). Although the article talks about the development of paradigms that secure a distinct status as dealing with greater shift in the field of organization theory; but the principles given in the articles can also be applied on management fields like open innovation.

McKinley, Mone & Moon (1999) have emphasized on three attributes to achieve school status; novelty, continuity and scope; where novelty refers to the relatively new, unique and different theoretical framework than the ones already existed discipline in the past. Similarly, Continuity ensures linkages with the already familiar intellectual frameworks. Scope signifies the characteristics of a developing school and the range of phenomenon encompassed by a theory.

1) **Novelty:** Novelty cannot be established in the sense of innovation, as innovation is under discussion in the field of management well before the concept of open innovation. But a collective effort for making innovation is a novel idea. A policy of closed innovation is considered as key success factor before the propagation of open innovation concept (Bogers and West 2012). But open innovation received extensive interest of the scholars as well as the organizations (West et al. 2014).

2) **Continuity:** Open innovation has provided scholarship, fame and umbrella to many of concepts that already existed in the literature like collaborative innovation, business ecosystem and distributed creativity etc. while exclusively propagating the needs for opening up the process of innovation by collaborating with the stakeholders. According to West et al., (2014), open innovation is a newly emerged phenomenon but it builds upon the basic antecedents of innovation that not only help in enabling the idea of innovation but also its acceptance among scholars and practitioners. In this way, open innovation is a blend of novelty and continuity.

3) **Scope:** According to Huizingh (2011), one reason of open innovation attractiveness and popularity is the potential of the concept to provide ample opportunities to the scholars for theory building, determining the process of open innovation and how to implement it. After sufficient level of research in last decade, there are still many questions to be answered. Many areas are unexplored including research on coupled open innovation, non-pecuniary open innovation, culture conducive for open innovation and factor causing failure in the implementation of open innovation etc (Dahlander and Gann 2010, West et al. 2014, Bogers and West 2012, Santos 2015).

Open innovation has met all the criteria provided by McKinley, Mone & Moon (1999) for development of school in organization theory. Future of open innovation can be concluded in the words of Gassmann et al., (2010),

"It seems clear to us that open innovation has quite a long life left ahead of it, as there is a long and growing list of phenomena that it can help us understand and interpret. However, we should note that it is unlikely that 'the last word' will ever be spoken on a topic as dynamic as innovation. Open innovation should instead perhaps be viewed as *the next word*."

8. Future perspectives of open innovation:

Open innovation has recently attracted scholars from the field of management and innovation. Nowadays, it has shifted from research interest of few people to a mainstream research area. Initially cited in the area of technology and innovation management, it is now cited in organizational behavior, strategy and general management journals (Gassmann, Enkel, and Chesbrough 2010). Although a large number of scholars have taken interest in this field and have published their scholarly work from different dimensions but still there are many unexplored areas. Few scholars have given future perspectives/themes that need to be investigated in order to make it aligned and integrated with existing innovation and management theories.

West et al., (2014) have analyzed the performance after a decade journey of open innovation concepts. Being an authority in the field of open innovation, they also suggested few areas to be explored in this field for future researchers. First, according to them, most of the open innovation scholars have focused on inbound and outbound open innovation. Only few scholars have introduced "couple" mode of innovation by combining both inbound and outbound innovation (Piller and West 2014, Gassmann and Enkel 2004b). Second, there is an increasing interest in the field of non-pecuniary open innovation activities (Dahlander and Gann 2010). Non-pecuniary innovation includes universities, not for profit organizations and government agencies in its domain. Although the area is attractive but only few researches are available in this context.

After extensive analysis, Santos (2015) also highlighted few hot topics that call for the attention of future researchers. Role of public policy in creating an environment conducive for open innovation is one of very less explored areas. Few studies have been conducted to understand the impact of public policy on innovation adoption and analyzing collaborative partnerships among private & public entities. But, this limited research is not enough to completely comprehend the importance of public policy for open innovation.

9. Conclusion:

In last decade, since the publication of the book “open innovation” by Chesbrough, the idea of open innovation has received extensive interest of scholars as well as the practitioners. Closed innovation strategies are replaced with acquiring external technologies in order to complement internal knowledge base by means of in-licensing, co-evolution, co-creation and strategic alliances collectively named as open innovation. In order for the firms to co-evolve, they need to align their vision, goods & services so that research and development initiatives as well as investments are synergetic and mutually supportive.

Continuous progress in conceptual understanding, empirical rigor, theorizing, citations of major works in the field and articles publishing in top journals of the world are sufficient proves to recognize the popularity of the topic in the academic group. All this is possible because of genuine and inbuilt capacity to inquire in open innovation field. Although much of the dimension are already been studies in this field but due to its inbuilt capacity to welcome further inquiry, it is not difficult to conceptualize a brighter future of this field. Future scholars are suggested to inquire about the collaboration stage, modalities of coupled & non-pecuniary open innovation, open innovation in non-western countries & in low tech companies, role of public policy in successful implementation open innovation and its failure factors.

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