Firm's Innovation Ecosystem: Barriers, Key Success Factors and Strategies

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Abstract

Strategic positioning fosters the firm performance in an ecosystem. Companies in an innovation ecosystem use strategic tools to connect different business units. The systematic literature review was used to search for the articles used in this review. Google Scholar search engine was employed to filter the references of each selected paper. In total, 41 papers published in journal and conference proceedings have been used for the review. The review shows that companies challenges as shortage of willingness to share insights and intellectual property, confusion over management methods need to create sustainable value, lack of coordination within the ecosystem, lack of an innovation plan, failure to pay attention to a new set of risks and costs associated with network-types of practices when innovating through an ecosystem. The review highlights specific key success factors such as management commitment, consumer value, and value chains linked to customers' expectations, and organisational culture that supports change processes, well-articulated goals, timelines and milestones, and embracing risk-taking and understanding the nature of risks in collaborative networks. Furthermore, the review also identified the balanced scorecard multiplying risks and value blueprint as strategic tools used to evaluate the performance of companies within an ecosystem. The study concludes that managers should evaluate the ecosystems' ability and the potential of their firms to survive.

Keywords

Balanced Scorecard, Firm Performance, Innovation Ecosystem, Management Commitment, Strategic Positioning, Strategic Tools, Value Chains.

Introduction

The positive role of relationships of the inter-organizations and networks to innovation are acknowledged widely (Valkokari et al., 2017). Research is shifting focus to value co-creation and collaborative innovation in communities or networks of individuals. These

perspectives offer a unique understanding of specific distributed innovation processes, connections across them is limited. As such, Small and Medium Sized Enterprises with the abbreviation of SMEs must consider the methods to build-up and capture value internally and within their ecosystem (Chesbrough & Bogers, 2014). The concept of "ecosystems" suggests a different number of interactions and inter-connections among firms in the innovation activities and Ecosystems are within framework of the business operation in industries like communication technologies and software (Muegge, 2013).

An ecosystem must align the collective vision and self-interests of factors to promote and motivate those actions. The innovation ecosystem approach fosters growth, interaction, and innovative startups (Engel & Del-Palacio, 2011). From the strategy perspective, the ecosystem strategy must address the questions on the competition place, time, and approaches (Adner, 2006). Strategic thinking, concurrent collaboration, and competition are crucial to achieving success in an ecosystem (Zahra & Nambisan, 2011). Innovation ecosystems are characterized by their adaption and evolvement abilities and develop from the interaction between different actors, systems, and policies. And innovation or entrepreneurial ecosystems could provide different learning opportunities to organizations through collaborations (Spigel, 2017). For instance, technology corporations that have similar core technology share knowledge and networks related to new business opportunities (Spigel, 2017).

In the current world of business, ecosystems and its establishment become universal and sophisticated (Iansiti & Levien, 2004). Yet, the global dimension of innovation ecosystems and entrepreneurial ecosystems have received less attention (Valkokari & Valkokari, 2014; Suominen et al., 2016). Ecosystem's collaborative innovation depends on the advancements of strategic manoeuvring and the ability of the business to manage strategic interactions linked to the innovation activities. Aiming of this paper is an exploration of the innovation ecosystem based on the systematic review and investigation of the existing literature. The author argues that a thorough consideration of the existing literatures on the innovation ecosystem will enhance our knowledge and comprehension of the innovation ecosystem concept and stimulate future research. This paper is well organized in 5 parts. The first is to present an overview of the concepts of the innovation ecosystem. Next, that is a discussion of the research method used, thereafter, presentation of discussion, conclusion and recommendations are followed.

Literature Reviews

Innovation and Entrepreneurial Ecosystems

The innovation ecosystem approach focuses on the promotion of the growth, the interaction, and the innovative startups around knowledge axis (Engel & Del-Palacio, 2011). Innovation ecosystem forms the economic movements of the composite relationships among factors and/or entities to boost development of the technology and innovation (Jackson, 2011). Arguably, the innovation ecosystem is achieved by exchanging fundamental knowledge, management savvy, infrastructure, and financial and non-financial resources within the boundaries of a virtual cycle. Valkokari and Valkokari (2014) depict that ecosystem management consists of composing and orchestration tasks. The composing phase explains how ecosystems come into existence. Orchestration is the dynamics executed by a factor considered as the cornerstone (Iansiti & Levien, 2004), as a leader of the ecosystem (Adner, 2012), or as coordinator for the ecosystem (Jansen & Cusumano, 2013). Silicon Valley is a good example of a successful (local) innovation ecosystem by many interplays and interconnections among businesses. The innovation ecosystem describes an innovation developing from the interaction between various participants or distinguishes them from the policies and the innovation systems (Suominen et al., 2016). Spigel (2017) asserts that an entrepreneurial ecosystem is a common tool used to examine the high-growth entrepreneurship geography. From a practical perspective, innovation or entrepreneurial ecosystems may provide different learning opportunities for firms based on their structure and participants. In this context, development-oriented SMEs and startups in the regional/ national innovation ecosystems require bigger mainstay firms to get connected to the worldwide business competition (Viitanen, 2016). Nonetheless, several companies have experienced failure in an attempt at ecosystem innovation, as a result of a new set of risks (Adner, 2006). Indeed, to survive, businesses must formulate the strategies of the ecosystem and develop the springiness and the strength of the overall and holistic ecosystem (Seppänen et al., 2015). The concept of ecosystem resilience or health which is explained as a state of ecosystem equilibrium in natural ecosystems is "fuzzy" and does not benefit all the actors involved (Valkokari, 2015). The ecosystem's border is complicated (Iansiti & Levien, 2004), more dynamic and fuzzier than the borders of the business ecosystem (Valkokari et al., 2016). Furthermore, ecosystems border changes in space and time, also, the lifetime of the innovation ecosystem continues from the new technology discovery to the effective commercialization for that technology (Dedehayir & Seppänen, 2015).

Why do Firms Innovate through Ecosystems?

Innovation focuses on creating value for divergent stakeholders. Value creation and sustainable competitive edge are accorded the highest level of priorities in any firm vision statement. Innovation is crucial for creating new products and exploring new markets. Jackson (2011) submits that innovation is the fundamental source of wealth creation within an economy. Why would a firm prefer to innovate through a co-creation network or innovation ecosystem? The answers to this question may depend on the nature of the business. For instance, the telecommunication industry decides to join, develop, and create innovation ecosystems because of two reasons: external and internal forces. The external forces include the behaviours of customers, suppliers, competitors, industry standards, and world economics. More so, the telecommunication industry is experiencing rapid transformation. These firms may need an innovation ecosystem to adapt to the acceleration of new product development, sophisticated in technology complexity of products and services, and dynamic and uncertain business environment. Thus, collaboration can solve all the rising problems effectively and rapidly (Traitler, Watzke & Saguy, 2011). Another external force motivating firms towards partnership and co-development in underperforming elements on the value chain of telecommunications services. It could be that a company need another firm to succeed in their innovation or need someone else to adopt your service to offer it to the client. According to Adner (2006), those underperforming elements can leave an enterprise to be behind in comparison with the others. Hence, involvement in innovation partnerships and co-development agreements could help a firm reduce the impact of underperforming elements in the supply chain. Customers exert significant external pressure because of changing tastes, preferences, and expectations. For this reason, companies need to partner with them to extend the scope of their offering with a complete coherent one. Internal forces focus on understanding the firm's internal motivations towards innovation ecosystems. The new business model emphasizes reducing the assets ownership and assessing resources by the cooperation with others (Walters & Rainbird, 2007). One of the internal motives for innovating through ecosystems is to complement a firm's capabilities. In this context, companies may extend their knowledge and skills boundaries, aligning resources with other firms, and using their assets. Furthermore, companies may need to join, develop and engage with innovation ecosystems to minimize risks to cope with external forces.

Obstacles to Innovating through Ecosystems

Companies are faced with barriers when they engage and innovate through collaborations. One of such challenges is confusion. Corkill (2007) notes that firms are faced with the problem of understanding; Who has control? Who and how can members profit from the initiative? What happens to intellectual property rights? Partners may not be willing to share their insights and intellectual property because of relational issues, lack of confidence between collaborators, and complications to networks. Another reason is confusion over the management methods required to create sustainable value. Lack of coordination within the ecosystem and poorly aligned peer functions (such as accounts, procurement, sales, etc) can create confusion to current and potential actors, presenting a barrier to innovation (Corkill, 2007). Furthermore, the lack of an innovation plan can mask where critical issues exist, thereby, affecting the timing of the project. Business conditions such as organizational cultures, expectations, mindsets, and behaviour can create the related capital development capital and management of alliances networks very expensive. In the same manner, having an undifferentiated value proposition for network collaborators may not confer a competitive advantage to firms (Corkill, 2007). Another hindrance stem from the failure to pay attention to a new set of risks presented within the innovation ecosystems (Adner, 2006). The cost for human resources engagement required for evaluation, selection and negotiation with external contributors on the innovation activities may discourage companies from innovating through the ecosystem (Traitler, Watzke & Saguy, 2011).

Key Factors for Success

To overcome barriers, specific central success factors have been acknowledged in the business ecosystems literature. The key success factors are based on relationship-based because networks are based on relationships. As such, management commitment is needed to foster those interactions and optimize desired relationships. Consumer value and value chains that are linked to the expectations of final customers promote sustainable competitive advantage. Traitler, Watzke and Saguy (2011) submit that firms must match the value chain to customer-centric innovations by collaborating with customers. Hence, stakeholders need to share needs and offering for a successful ecosystem innovation. In this context, the firm culture must support change processes and accommodate new partners as well as cope with risks. Also, it is essential to have a well-articulated goal, timelines, and milestones and guidance of when, where, and how their participation is required. All the actors must understand what is expected of them as this will ensure that the innovation objective is achieved. To manage and drive the innovation process, the hub

firm should have internal experts and highly skilled people. Adner, (2006) points out that creating a strategy that minimizes bottlenecks and inherits the collaborative networks is key to succeeding. Likewise, embracing risk-taking and understanding the nature of risks inherent in collaborative networks is important. Appropriate metrics (quantitative and qualitative) to measure the innovativeness must link with the benchmarking, key performance indicators, and reward policies (Traitler, Watzke & Saguy, 2011).

Ecosystem Strategies

In a firm, the strategic thinking, intentions, and recent position in an ecosystem determine its ecosystem strategy. Iansiti and Levien (2004) posit that ecosystem strategies including the three of the keystone, the dominator, or the niche should be connected to the actors' positions within the network structure. Network researchers opine that a central position in a network promotes actors' innovativeness, through accessibility to different knowledge sources (Zaheer & Bell, 2005). Networking, co-creation, and exchange with partners of innovation ecosystem are strategies for the innovation ecosystem that foster a firm's success (Pellikka & Ali-Vehmas, 2016).

The coevolving and changing the nature of an ecosystem could make a niche actor to become a major actor in a newly rising ecosystem. The co-evolution of an ecosystem is along with the "competition time" question (Adner, 2006). From a firm's perspective, the strategies of the ecosystem positioning are depend on the networks of the firms and other inter-organizational relationships (Valkokari, 2014). Valkokari et al. (2017) conduct a qualitative study of 35 businesses operating in the metal and engineering industries. The study focussed on positioning strategies in their ecosystems and enhancing relational business practices. They observed that ecosystem competencies are essential duet to the requirements of all factors in an ecosystem, regardless of the positions. Also, the management ability of dynamic strategic interactions associated with innovation is crucial. The study concluded that ecosystem competence allows the firms to assure the success and the life of the ecosystem and their business in the future.

Strategic Tools for Managing Innovation Ecosystems

The overall performance of firms in an ecosystem most times depends on strategic positioning or strategy execution. As such companies participating in an innovation ecosystem need a strategic tool to control communication and link different business units. Forces in the business environment compel companies to use collaborative alliances as an important strategy (Cravens, Piercy & Cravens, 2000). Thus, there is a need to evaluate the performance between those collaborative alliances and related firms. The

balance scorecard is one such performance measurement tool of which is built up by Robert Kaplan and David Norton to give administrators executives a more "balanced" view of the organizational performance (Sharma, 2009). The balance scorecard framework combines both the strategic non-financial and the traditional financial metrics driven by the mission and strategy of the whole organization (Chavan, 2007). It is a crucial tool that allows an enterprise to match its strategy with the whole innovation ecosystem performance. In the orchestration of the innovation ecosystems, the balanced scorecard enables managers to effectively communicate, capture all the synergies from the co-development alliance, and quantify their strategic capability based on current performance, and changing business environment (Chavan, 2007). The balanced scorecard concentrates on the four standpoints/ perspectives in terms of the financial perspective, the customer perspective, the internal business process perspective, and the learning and growth. The risk assessment factor is another tool for managing the innovation ecosystem's success. Arguably, risk management plays an important role in orchestrating innovation ecosystems. The co-innovation risk is contingent on the joint probability that each of the partners can meet their commitments on the innovation actions within a specific duration (Adner, 2012). In ecosystems environment, it is important to conduct due diligence and to assess the interaction between companies. To do this, firms use multiplying risks tool which is based on the theory of joint probabilities. Hence, in co-innovation developments, the probability of finishing a project in time and shape depends on the multiplication of them. Multiplying risks tool is useful in assessing risks and probabilities in new projects created through innovation ecosystems. According to Adner (2012), the value blueprint tool enables the ecosystem and dependencies of the project to be clear to all the actors involved. A new product or service must create value for customers. Value proposition connotes the future value the innovation will create for users. Through innovation ecosystems, when the value proposition is created, understanding and agreeing on how these elements should come together is crucial for the partners (Adner, 2012). Adner (2012) proposes eight steps to follow when using the value blueprint; first, identify end customer, second, identify the project, third, identify suppliers/partners, fourth, identify intermediaries, fifth, identify complementors, sixth, identify the level of risk for each element along a green-yellow-red traffic light continuum, seventh, evaluate un-greening reasons and provide an effective solution, and eighth, revise the blueprint on regular basis.

Methodology

The author used a systematic literature review (Senyo, Addae & Boateng, 2018) to search for the articles used in this paper. This approach was chosen to achieve comprehensive

literature coverage and thorough analysis. To conduct a quality review, articles from high-quality journals and database have been used. According to Webster and Watson (2002), high-quality contributions are mostly found in reputable sources such as academic journals and conference papers. The author has defined the search terms as "innovation ecosystem", "entrepreneurial ecosystem, "ecosystem strategies" and "collaborative network" to grab both innovation ecosystem and relative articles. To ensure complete coverage, online databases such as Google Scholar, ProQuest, and Scopus were searched using the defined terms, the titles, keywords, and abstracts keywords. In total, 103 papers from journals and conference proceedings have been collated for further consideration and analysis. More of that, the papers and studies on relevant concepts of innovation ecosystem for further refinement have been included. The author filtered and removed carefully those that did not meet the inclusion criteria. In terms of the literature refinement, the title, abstract, and the main text of the sampled papers have been read well.

Findings and Discussion

The increasing complexity of ideas and the specialization of technologies have led to a search for collaborators to complement companies' skills and assets, share their risk and returns, and evolve into an innovation ecosystem. This paper reviews the concept of the innovation ecosystem, barriers, key success factors, innovation ecosystem strategies, and strategic tools to measure performance within an ecosystem. The review suggests that companies must execute ecosystem strategies and enhance the resilience of the whole ecosystem to survive in the marketplace. Innovating through an ecosystem allows a firm to build value they would not have been able to achieve alone. Effective network management competencies through partnerships enable firms to provide a customer-facing solution, create and sustain competitive advantage on ecosystems dynamics. The membership of an ecosystem facilitates the sustainable innovation co-development and wipe out resources and time-pressure from a single partner (Traitler, Watzke & Saguy, 2011). Arguably, all members in an ecosystem have the advantage of sharing complementary technological resources and capabilities which foster sustainable innovation performance. In this context, the ability to access assets and resources through virtual integration becomes more important (Walters & Rainbird, 2007). Companies can have access to other firms' resources and other firms' can use their own resources. This access to new skills could promote the rapid growth of the innovation, market access, etc. (Cassiman & Veugelers, 2002). In terms of collaborative innovation in ecosystems, a firm need to optimize its key success factor and ecosystem competence to manage the dynamic strategic interactions associated with innovation. The review shows that firms face some

challenges when innovating through an ecosystem; lack of willingness to share insights and intellectual property, confusion over management methods needed to create sustainable value, lack of coordination within the ecosystem, lack of an innovation plan, failure to pay attention to a new set of risks and costs associated with network-types of practices. Furthermore, the review identified specific key success factors such as management commitment, consumer value, and value chains linked to customers' expectations, and organizational culture that supports change processes, well-articulated goals, timelines, and milestones, and embracing risk-taking and understanding the nature of risks in collaborative networks. The literature highlights three strategies of the ecosystem as the keystone, the dominator, and the niche as well as strategies of innovation ecosystem as the networking, the co-creation, and the interaction. The review also identified the strategic tools used to evaluate the performance of companies within an ecosystem. Firms use the balanced scorecard, multiplying risks and value blueprint tools.

Conclusions and Practical Implications

The paper explores the innovation ecosystem concept upon the review and analysis of the literature. An innovation or entrepreneurial ecosystem consists of several actors as entrepreneurs, accelerators, venture capitalists, vendors, innovators, and academic institutions. Great understanding and knowledge on the innovation ecosystem provides valuable managerial implications for firms. Managers should optimize innovation ecosystems and profile their corporate's role and kind of ecosystem to assess the ecosystems' ability and their survival potentials. This could enrich their understanding of how and where to collaborate for innovation. Managers should measure the performance of their firm in an ecosystem using strategic tools such as balance scorecard, multiplying risks, and value blueprint. In so doing, they can better understand the risks that are inherent in an ecosystem and mitigate them. This study highlights potential areas for further studies. While ecosystem research is increasing, innovation ecosystem studies are lacking in emerging markets, especially in the African context. Thus, more empirical research should be conducted in this area. The present study focused on the review of empirical studies on the innovation ecosystem which somewhat limits its applicability. Nevertheless, it informs managers and entrepreneurs on the importance of implementing ecosystem strategies.

References

Adner, R. (2006). Match your innovation strategy to your innovation ecosystem match your innovation strategy to your innovation ecosystem. *Harvard Business Review, 84*(4), 98–107.

Adner, R. (2012). *The wide lens: a new strategy for innovation.* New York, NY: Portfolio/Penguin.

Cassiman, B., & Veugelers, R. (2002). R&D cooperation and spillovers: some empirical evidence from Belgium. *American Economic Review*, *92*(4), 1169-1184.

Chavan, M. (2007). *The balanced scorecard: a new challenge.* Emerald Insight. Business Department, Division of Economic and Financial Studies. North Ryde, Macquarie University, Australia.

Chesbrough, H., & Bogers, M. (2014). *Explicating open innovation: clarifying an emerging paradigm for understanding innovation.* In H. Chesbrough, W. Vanhaverbeke, J. West (Eds.), New Frontiers in Open Innovation. Oxford University Press, Oxford, 3–28.

Corkill, D. (2007). Why can't we do it alone? *IET Engineering Management*, 36-39.

Cravens, K., Piercy, N., & Cravens, D. (2000). Assessing the performance of strategic Alliances: matching metrics to strategies. *European Management Journal*, *18*(5), 529-541.

Dedehayir, O., & Seppänen, M. (2015). Birth and Expansion of Innovation Ecosystems: A Case Study of Copper Production. *Journal of Technology Management & Innovation*, *10*(2), 145–153.

Engel, J.S., & Del-Palacio, I. (2011). Global Clusters of Innovation: The Case of Israel and Silicon Valley. *California Management Review*, *53*(2), 27–49.

Iansiti, M., & Levien, R. (2004). *The keystone advantage: what the new dynamics of business ecosystems mean for strategy, innovation, and sustainability*. Boston: Harvard Business School Press.

Jackson, D.J. (2011). What is an Innovation Ecosystem?. *National Science Foundation*, 1-13.

Jansen, S., & Cusumano, M.A. (2013). *Defining software ecosystems: a survey of software platforms and business network governance.* In S. Jansen, S. Brinkkemper, & M. A. Cusumano (Eds.), Software Ecosystems: Analyzing and Managing Business Networks in the Software Industry, Cheltenham, UK: Edward Elgar.

Muegge, S. (2013). Platforms, communities, and business ecosystems: lessons learned about technology entrepreneurship in an interconnected world. *Technology Innovation Management Review*, *3*(2), 5–15.

Pellikka, J., & Ali-Vehmas, T. (2016). Managing Innovation Ecosystems to Create and Capture Value in ICT Industries. *Technology Innovation Management Review*, *6*(10), 17–24.

Senyo, P.K., Addae, E., & Boateng, R. (2018). Cloud computing research: a review of research themes, frameworks, methods and future research directions. *International Journal of Information Management*, *38*(1), 128-139.

Seppänen, M., Dedehayir, O., Still, K., Valkokari, K., & Suominen, A. (2015). Platform Competences to Enhance Network Effects in Business Ecosystems. *In ISPIM Innovation Symposium. The International Society for Professional Innovation Management (ISPIM).*

Sharma, A. (2009). Implementing Balanced Scorecard for Performance Measurement. *The IUP Journal of Business Strategy*, *6*(1), 1-16.

Spigel, B. (2017). The relational organization of entrepreneurial ecosystems. *Entrepreneurship Theory and Practice*, *41*(1), 49–72.

Suominen, A., Seppänen, M., & Dedehayir, O. Innovation systems and ecosystems: a review and synthesis. *In ISPIM innovation symposium. The International Society for Professional Innovation Management (ISPIM)* 2016.

Traitler, H., Watzke, H.J., & Saguy, I.S. (2011). Reinventing R&D in an open innovation ecosystem. *Journal of food science*, *76*(2), 62-68.

Valkokari, K., & Valkokari, P. (2014). How SMEs can manage their networks – lessons learnt from communication in animal swarms. *International Journal of Inspiration Economy*, *1*(1), 111–128.

Valkokari, K. (2015). Business, innovation, and knowledge ecosystems: How they differ and how to survive and thrive within them. *Technology Innovation Management Review*, *5*(8), 17–24.

Valkokari, K., Amitrano, C.C., Bifulco, F., & Valjakka, T. (2016). *Managing Actors, Resources, and Activities in Innovation Ecosystems – A Design Science Approach.* In H. Afsarmanesh, L.Camarinha-Matos, & A. Lucas Soares (Eds), Collaboration in a Hyperconnected World. PRO-VE 2016. IFIP Advances in Information and Communication Technology, Cham, Switzerland: Springer, 521-530.

Valkokari, K., Seppänen, M., Mäntylä, M., & Jylhä-Ollila, S. (2017). Orchestrating innovation ecosystems: a qualitative analysis of ecosystem positioning strategies. *Technology Innovation Management Review*, *7*(3), 12-24.

Viitanen, J. (2016). Profiling Regional Innovation Ecosystems as Functional Collaborative Systems: The Case of Cambridge. *Technology Innovation Management Review*, *6*(12), 6–25.

Walters, D., & Rainbird, M. (2007). Cooperative innovation: a value chain approach. *Emerald Insight*, 595-607.

Webster, J., & Watson, R.T. (2002). Analyzing the past to prepare for the future: Writing a literature review. *MIS Quarterly*, *26*(2).

Zaheer, A., & Bell, G.G. (2005). Benefiting from network position: firm capabilities, structural holes and performance. *Strategic Management Journal*, *26*(9), 809–825.

Zahra, S.A., & Nambisan, S. (2011). Entrepreneurship in Global Innovation Ecosystems. *Academy of Marketing Science (AMS) Review*, *1*(1), 4.