Theoretical considerations to reduce anomalies from the globalization of innovation

Aglaya Batz
Brandenburg University of Technology
aglaya.batz@b-tu.de
Herwig Winkler
Brandenburg University of Technology

Abstract:
Globalization of innovation offers advantages by acquiring innovation's main element: Knowledge. However organizations still fail appropriating and absorbing the outcomes of exogenous innovation activities. To minimize these anomalies resulting from the externalization of innovation, network arrangements and internal organizational structures should be adjusted according to the singularities of project's innovation-model.

Keywords: Globalization of innovation, Knowledge Supply Chain, Innovation Models, dynamic Organization development.

INTRODUCTION

The idea of "globalization of innovation" implies the formation and intensification of relations between agents possessing or being able to generate and spread different types of knowledge (Archibugi and Iammarino, 2002). Although cooperation and collaboration activities between organizations have existed ever since, the emergence of new technologies has accelerated the generation and diffusion of knowledge and shaped the form in which organizations are accessing to external knowledge. Consequently, organizations are externalizing innovation activities to stimulate the generation, acquisition and absorption of knowledge and by this means accelerate the innovation process.

Yet, from an organization's perspective, innovation is considered as a new technological transformation and therefore it constitutes not just the main element to achieve growth but also the opportunity of renewal (Bessant et al. 2005; Francis and Bessant, 2005; Baregheh et al. 2009). This technological transformation is accentuated by the dynamics of the globalization of innovation forcing organizations to increase their grades of flexibility in their internal and external structures. Organizations are forced to improve their abilities to learn, to assimilate changes and thus, to cope with the new imposed dynamics resultant from the externalization of innovation. In this means, internally some organizations are trying to enrich, fashion and organize their existing knowledge and structure, while others are incentivizing their resources to gain new competences to hastily react to the market.

Archibugi and Iammarino (2002) suggested that the globalization of innovation is represented by: (1) the exploitation of innovation in a global scale, (2) the collaboration research or externalization of innovation and (3) the globally generation of innovation. In the first case, innovation, expressed as product and services, is commercialized worldwide. Therefore its results have to be protected i.e. through patents. In the second case, organizations are cooperating and collaborating with other organizations to accelerate the generation of knowledge in a defined field. This externalization of innovation implies working on innovation within network environments. In the third case, organizations are drawing out their research and development activities to different countries to increase their research capacities and leverage cultural, social or political demeanors (Plechero and Chaminade, 2013). Independently from the approach taken by the organization, as depicted in Figure 1, the type of innovation and the characterization of the innovation network are positively correlated with the internal and external structures of the organization. Thus we hypothesize that the considerations by defining the innovation process and the innovation network will automatically demand from organizations adjustments of their existing process or to define new ones to better absorb the outcomes of the globalization of innovation.

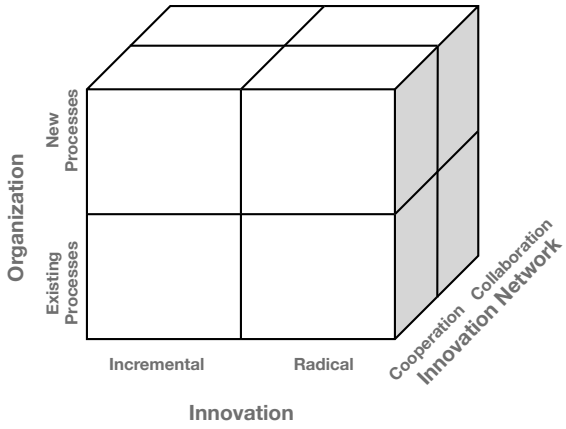

Figure 1 - Relation between innovation process, innovation network and the organizational structures

Nonetheless, even when organizations and scholars recognize the advantages of acquiring knowledge in a global scale, organizations still fail by appropriating and absorbing the outcomes of externalized innovation initiatives (Barczak et al. 2009). Consequently, organizations have to look after different models in order to re-organize their internal structures, select the main partners in terms of knowledge provision and define the strategies to absorb and appropriate the knowledge outcomes from externalized activities (Cohen and Levinthal, 1990; Enkel et al. 2009). Moreover, to avoid anomalies inherent to the globalization of innovation, this re-organization demands not just greater degrees of internal and external flexibility, but also a commutative structure by defining their innovation process.

The present contribution aims on setting the focus of research on improving external innovation activities, especially by the representations (2) and (3) of the globalization of innovation made by Archibugi and Iammarino (2002). However, the question that should be firstly answered is, whether adapting the internal organizational structures based on the requirements of innovation process and the innovation networks can reduce anomalies caused by the globalization of innovation. Therefore a literature review will be performed to catch a glimpse of the liaison between (1) innovation models, (2) innovation network arrangements and (3)

organizational structures. Based on this analysis, critical success factors (CSF) and the challenges by adopting those success factors are going to be pointed out. Finally, further research questions around this topic are going to be identified

CONSIDERATIONS BY DEFINING THE INNOVATION PROCESS AND THE INNOVATION NETWORK

The innovation process and the globalization of innovation

A structured innovation process enables organizations to configure and carry out the tasks related to innovation. Scholars have been dedicated to analyze the process of innovation and its implications in different industries and from different perspectives (Cooper 1990; Chesbrough 2004; Gupta 2006; Gronlund et al. 2010). There is not a one-size-fits-all model in the subject of innovation, and it hardly will be. Even models defined within organizations or defined to satisfy an industry (Tether 2003; Vence and Trigo, 2009; Gassmann et al. 2010), still not cover the dynamics to which organizations are confronted. Hence, organizations tend to delineate their own process based on the different models found in the literature. Moreover, the innovation model has to be adjusted by organizations each time a new innovation project is going to be started. This endeavor will help clarifying the type of innovation model the project has to assume in order to increase its probabilities of success. For many years scholars assumed that innovation in the area of services for example, could be managed based on the innovation models defined for the manufacturing industry (Tether 2003; Vence and Trigo, 2009). Although there are some similarities between the manufacturing industry and the service industry, there are some innovation characteristics that have to be handled differently.

The globalization of innovation increases this predicament and even goes further by creating scenarios where organizations can take part on different types of innovations. In projects were it is intended to generate a new product and carry it out within network environments; the innovation model should consider characteristics of the innovation itself and counteracted them with the strategic objectives of each organization participating in its development. As stressed by Vence and Trigo (2009) an evolutionary classification of the patterns has been given to handle service innovations. In this type of innovations particularly, knowledge diffusion between "innovation-relevant knowledge sources" will empower the whole network (Hipp and Grupp, 2005), therefore the network character should even be considered as a transversal characteristic and be present along the innovation process.

Scholars are including network characteristics in the definition of the innovation process. Nonetheless, most of these constitute small modifications of the stage-gate-model from Cooper (Cooper 1990; Cooper et al. 2002a) and are oriented to satisfy the needs of a focal organization. Innovation carried out within collaboration environments is still a subject of research. Special considerations towards working out innovation within network environments are barely considered in the innovation models found in the literature. It cannot be said that innovation resulting from collaboration activities should follow different innovation paths, yet there are characteristics proper of collaboration environments that should be considered to generate more stability in the execution of the innovation process.

Finally, most Scholars aim attention at the advantages of having an innovation model and encourage organizations to use them, since they give structure and define the guidelines to better perform innovation (Barczak et al. 2009).

CSF1: In order to increase the probabilities of success and reduce execution times, organizations have to define the innovation process to be followed before starting the innovation project as well as to identify the type of innovation the project is aiming to achieve.
CSF2: Network management strategies have to be defined along side the innovation process.
CSF3: Innovation has to be considered in the form of a project. Therefore, project management strategies will enhance the execution of innovations.

Considerations to design the innovation process within network environments

Some studies have shown that the implementation of formal innovation models are reducing the time from the idea generation to the market launch rather than controlling the success of innovation (Manion and Cherion 2009). This behavior could have different explanations. Barczak et al. (2009) stress the importance of: being more radical; using knowledge and project management strategies; accelerating the R&D Phase through strategies like: rapid prototyping or simulation systems; seeing innovation as a project with clear goals and objectives; using market research tools like: Beta Testing and Customer Site Visits and including strategies to reward teams.

Additional assertions that may be hindering the innovation process could be: (1) Most of the innovation models are defined within research and development departments and the integration to other departments of the organization is rather low; (2) Organizations have modularized the innovation process, but have not achieved a grade of modularization nor increased their processes' flexibility; (3) Organizations working within collaborative environments are failing by selecting their partners and the network arrangements; and (4) Organizations could be failing in the identification and selection of strategies to enhance their innovation model (Kotter and Schlesinger 2008); i.e. the patterns of innovation are not matching the patterns of the organization, limiting the proper absorption of the innovation outputs. Furthermore, innovation activities are dynamic, since those activities are happening inside living organizations. Besides the already discussed assertions, organizations trying to take advantage of the globalization of innovation have to build their innovation models considering characteristics and influences coming from network arrangements and the modularization of the organizational structures.
CSF4: Innovation is an activity impacting the whole organization. Therefore, its execution should include strategies oriented to manage the impact of the innovation in the different areas of the organization.
CSF5: The innovation process has to be complementary to the operational activities of the organization.

INNOVATION NETWORKS TO MANAGE THE GLOBALIZATION OF INNOVATION

Innovation can be understood as the collection of different knowledge; collaboration activities should be fostered within industries, since collaboration's most important criterion is the synthesis of knowledge. New products are going to be generated through the combination of different perspectives achieving a uniqueness that each organization could not create by it's own (Kaye 1992). Thereby organizations are keen trying to link themselves with external agents in order to enhance the process of innovation. In an industrial context, agents are organizations,

associations, research centers, universities and even the government (Edquist and Hommen, 1999; Freel 2003)

Yet, the complexity in a network is defined by the number of agents and the amount of interactions between them (Berardo 2009). The globalization of innovation increases automatically the complexity of the network, since at least two organizations will join forces to accelerate the innovation production. An innovation network has to be perceived then, as an interactional system, where those interactions are triggered by a set of relationships between participating organizations or organizational units (Windeler and Sydow, 2001; Sydow and Windeler, 2003). Innovation networks should focus its efforts on analyzing the relationships and connections within all agents related to knowledge generation, stimulating in this way innovation among the networks' agents. In this sense, an agent will have network-characteristics and will be considered part of the network only if its participation contributes, in a direct or indirect way, to reach the network's goals.

Consequently, innovation networks should have at least: (1) interconnectivity between the network's agents, which means that they should be related to at least other agent of the network. Those relations will give a (2) structure to the network and meanwhile every agent of the network will have to give a contribution, helping to reach the common goal. This contribution is going to be the (3) function of each agent within the network. Moreover the combination of interconnectivity, structure and function, will define the (4) behavior of the network; embodying the strategies followed by the network to meet its goals (Johnson 2001). Hence, to define the innovation network's structure and understand how linkages between agents could be generated, five considerations should be taken into account:

First, and as the main objective pursued by innovation network is to lump together the best conditions to enable innovation production; this creation should be perceived as a cumulative process, where the main ingredient of its workflow is knowledge. It means that the process to create innovation goes beyond the use of science and R&D and appeals to the diffusion (Midgley et al. 1992), absorption and use of the resultant knowledge.

Second, from the perspective of an innovation network, 'knowledge' activates the process to create innovation and represents one of the strongest reasons why agents are coming together (Tether 2003). Actually, one can argue that in any innovation network, the strength between linkages could be associated to complementarity in terms of knowledge, between agents (Granovetter 1983) and the particularity of exchanging knowledge could be seen as their intrinsic characteristic, which is going to be defined via both, formal and informal means. Thus, any incentive that is going to be set within an innovation network should pursue the acquisition, transformation and use of knowledge and at the same time, attempt to get it, embodied in every process and relationship within the agents (Dosi et al. 1999).

Third, an innovation network will not be focused on one sector or technology, but in every part where an agent that can participate in reaching the innovation goal, could exist. Therefore relationships within agents are generated through vertical, horizontal or diagonal ties. Horizontal ties refer to the relationship generated between organizations sharing the same value chain and belonging to the same industry. Likewise, vertical ties are relationships between organizations from different value chains, but still belonging to the same industry. In contrast, diagonal ties indicate relationships made between organizations from different value chains and different industries. Usually diagonal ties corresponds to the weak ties of the system (Granovetter 1983).

Fourth, Agents within innovation networks could be classified by its capacity to absorb knowledge; this means that two types of absorptive capacity could be identifiable: those working as receptors of knowledge or passive learners and, those improving knowledge or active learners

(Juma et al. 2001). This absorptive capacity will be reflected through the management of the linkages within the system.

Fifth, as an innovation network has to avoid the agents' isolation and break knowledge monopolies, it should promote collaboration within the system's agents and not confide the process of knowledge production just to one agent (Rohrbeck et al. 2009). Therefore, knowledge production has to be characterized by having a grade of openness, reaching as much agents as possible and allowing them to use internal and external paths to accelerate knowledge production (Chesbrough 2004). Thus, linkages have to be flexible allowing the system to leverage knowledge from every source as well as making knowledge reachable by any agent that could need it to produce innovation.

Subsequently, an innovation network will involve relationships among agents through which the resultant knowledge will be disseminated. Moreover, based on the globalization of innovation and leveraging IT-features, the innovation network could build a virtual organizations around projects to have better control over risks and increase the rate of success. Hence, an innovation network could not be perceived as linear and the linkages within the agents are dynamic and bidirectional (Krajewski et al. 2007).

CSF6: The type of innovation network in which the innovation process is going to be executed, will greatly influence the definition of management strategies in each participant organization.

CSF7: The degree of complementarity between agents has to be defined at the beginning of each innovation project. This evaluation will allow to better defining the innovation network.

ORGANIZATIONAL STRUCTURES MATCHING THE PATTERNS OF COLLABORATIVE INNOVATION NETWORKS

Organizational strategies to enhance collaborative innovation networks

Preparing the organization's structures to be project oriented is one of the big challenges for organizations aiming to take advantage of the globalization of innovation. Hence, organizations will have to be keen by increasing the flexibility through modularizing their structures. As shown in Figure 2, organizations will have to dismantle their departments in smaller working units, define project management strategies and train their teams to cope with the challenges of project working groups. Additionally, as the complexity increases due to the participation of different organizations within the network and based on the inherent characteristics of innovation, strategies have to be set up to better cope with the effects of innovation (Barczak et al. 2009). As depicted in Figure 2, the innovation process has to be amended alongside with strategies towards Project Management, Customer Management, Change Management, Risk Management, Operations management, Knowledge management and Network Management (Manion and Cherion 2009). Further research has to be done regarding the eligible strategies based on the innovation network topologies and the organizational characterization to string along with the innovation process. Likewise, before starting the process of innovation, an evaluation of the innovation to be performed, a definition of the strategies to be taking towards minimizing risks, an identification of the suitable knowledge and a definition the structure of innovation networks. Scholars acknowledge that organization structures will be differently affected based on the degree, type and scope of innovations (Francis and Bessant, 2005; Adegoke Oke et al. 2007).

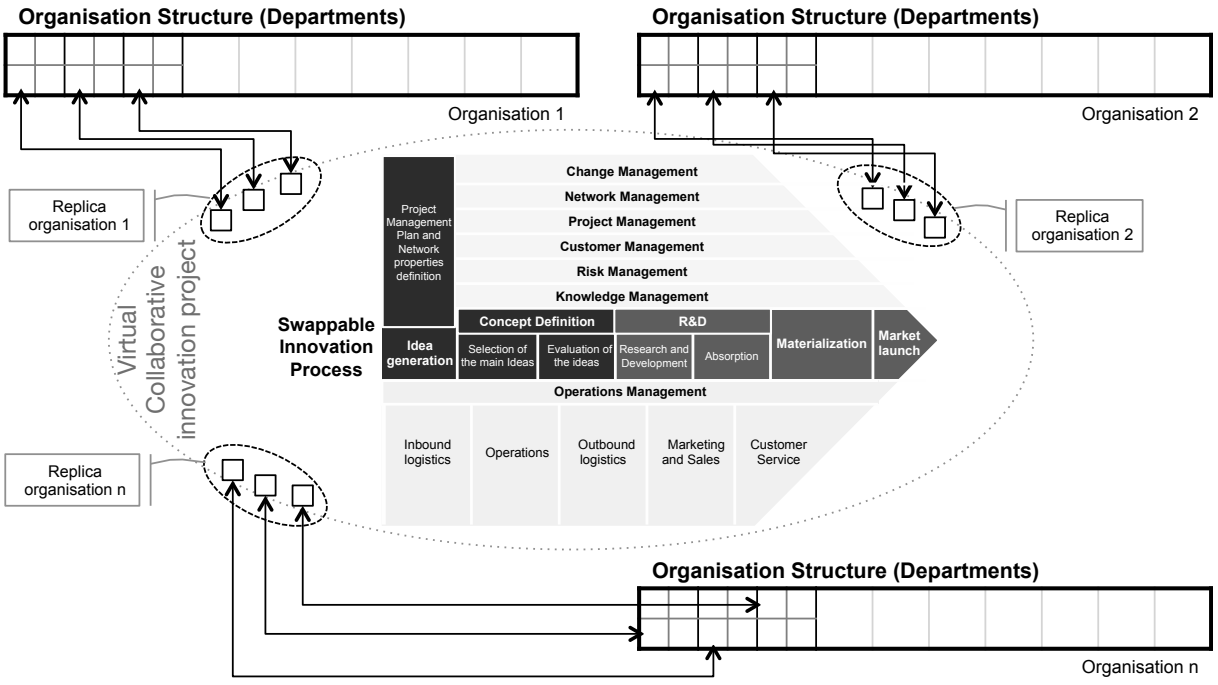

Figure 2 - Innovation Template building up the relationships with the organizational structures

Organizations focused on radical-product innovations are more likely to have to generate new processes in order to support the production of the outcomes. On the contrary, organizations centered on the production of incremental-product innovations are more likely to optimize their production process to support the manufacturing of the new outcomes. The proper characterization of the innovation leads to a proper identification of risks, since the level of uncertainty varies from incremental to radical innovations. Consequently, the characterization of the innovation at the beginning of the innovation process enables not just the selection of the network topology, but also the selection of the strategies and the proper definition of the innovation process itself.

CSF8: Organizations have to modularize their structures to become more flexible and react better to the challenges of the globalization of innovation.

Organizational strategies to enhance collaborative innovation networks

To take the decision of participating in a collaborative innovation project, organization will have to be aware of their knowledge capacity and structure. Before being added the tacit knowledge, explicit knowledge is no more than information (Nonaka 1994; Takeuchi and Nonaka, 2000) and therefore, information cannot follow just one pattern that led to no meaning. Organizations have to look for that kind of information that allow them to follow their structural pattern and that fit or couples perfectly with their organizational structures. In this sense the information worthy for the organizations and even for their innovation process or the innovation project in which they participate should follow a pattern that agrees with the pattern of their structures. In this sense, knowledge management must to be rethought emphasizing the identification of information patterns suitable for the organizations structure.

Moreover, once innovation is performed, whereas inside organizations or through network arrangements, internal organizational structures are going to be directly impacted. Internal

processes within the participant organization have to be adjusted to cope with the needs of innovation. As portrayed in Figure 2, the dismantlement of the organizational structures has to bear in mind the patterns of the organization. Thus, working units will have embedded the main characteristics of the organizations. Once participating in innovation projects within network structures, the organization will be able to mobilize the necessary working groups to ensembles a 'mini'-replica or representation of the organization.

Organizations will be in some way suppliers of their own working units, providing the resources for the development, production and commercialization of innovations (Winkler 2009). Concepts like 'just in time' will have to be adjusted to work from inside the organization and deliver the resources to the innovation network. Therefore operation management strategies have to be clearly defined and condensed in the way that the working groups can deploy the operation management strategies in the innovation network. Thus patterns from organization an innovation network are more likely to match. Nonetheless, Change Management strategies have to be defined alongside with the innovation process to make more resilient the absorption of knowledge and the resultant of the innovation process. Change management has to be embedded in the organizations and be measure alongside the established innovation process.

DISCUSSION AND FURTHER RESEARCH

The globalization of innovation has brought different challenges for organizations. One of those is showing that organizations will have to achieve greater flexibility if they want to remain competitive. New organizational structures will have to be created to achieve innovation within collaborative environments. The current work has presented a glimpse of the existing liaison between (1) innovation models, (2) innovation network arrangements and (3) organizational structures is essential. Likewise, critical success factors and the main challenges to achieve innovation within collaborative environments have been pointed out.

Externally, two main behaviors are affecting the way organizations are nourishing their innovation processes. First, organizations are aware of the advantages brought by the globalization of innovation and are intensifying their efforts towards the external generation and diffusion of technologies (Archibugi and Iammarino, 2002; Gassmann et al. 2010). This externalization has created a new field of research aiming to understand the dynamics involved in the globalization of innovation (Gassmann et al. 2010). Second, Information Technologies (IT) have taken all over the industries' processes and new scenarios are pulling harder to achieve a degree of interaction, where knowledge could be automatically generated. Organizations should therefore start being more explorative and try to link themselves with other agents aiming the acquisition and at last the absorption of new knowledge. Hence organizations will be able to widespread their innovation activity, and those combining the internal and external sources of knowledge are going to improve their outputs from their innovation process (Cassiman and Veugelers, 2006).

There is sufficient framework for organizations to personalize their internal innovation processes. However, there is a lack on innovation models working out the dynamics of the globalization of innovation. The new scenarios of the globalization of innovation pose that organizations could take part of different types and degrees of innovations. Therefore, even in projects were it is intended to generate a new product, the innovation model should consider more characteristics of the innovation itself and counteracted them with the strategic objectives of each organization participating in its development. Moreover, organizations will have to adjust

their internal structures before the process of innovation takes place. By adjusting their internal structures, organizations will be able to leverage the outcomes of the externalized process. Yet, these adjustments will have to be performed in short periods of time to assure the risk reduction and excel their innovation process (O'Regan et al. 2006).

An innovation model layout, on which organizations can base their strategies facing the globalization of innovation, has been proposed. This first approach should allow structuring the innovation network as and independent body for each innovation project that wants to be carried out (Winkler 2009). Yet, further research around the patterns followed by each kind of innovation has to be done to better personalize the innovation process before each innovation project starts.

Regarding innovation network arrangements, this work has shown that neither a proper categorization of networks nor a defined topology has been examined. A proper identification of the influences of working innovation within collaborative environments has not been clarified. Further research towards a proper characterization of Innovation Network Topologies considering (1) the external patterns under which innovations are taking place; (2) characteristics of the agents within innovation networks and (3) the influences of innovation on the structure of the networks is desirable.

Finally, at a glance, it is favorable for organizations to adapt their internal structures according to the innovation process in order to reduce anomalies caused by the globalization of innovation. It has already been established that companies following a defined innovation process are more successful and they increase their rate of success, by combining or adding different strategies to the innovation process; ergo by personalizing their innovation process to suit their needs (Barczak et al. 2009; Manion and Cherion, 2009). Nonetheless, it has been demonstrated that the only definition of the innovation process is not going to guarantee the success of the innovation. Therefore, to work out innovation within network environments, five new considerations have to be further examined: (1) the structure of the innovation process although important, has to be personalized for each innovation attempt; (2) organizations should guarantee that the formal arrangement defined to configure the innovation process will include all structures of the organization; (3) network arrangements have to be defined in the conceptualization of the innovation to better manage the project; (4) organization have to modularize their structures, and each module has to represent the organization and (5) the patterns of innovation have to match the patterns of the organization, in order to proper absorb the innovation outputs.

BIBLIOGRAPHY

Adegoke Oke, Gerard Burke, and Andrew Myers, 2007. Innovation types and performance in growing UK SMEs. *International Journal of Operations & Production Management*, **27** (7), 735–753.

Archibugi, D. and Iammarino, S., 2002. The globalization of technological innovation: definition and evidence. *Review of International Political Economy*, **9** (1), 98–122.

Barczak, G., Griffin, A., and Kahn, K.B., 2009. Perspective: trends and drivers of success in NPD practices: results of the 2003 PDMA best practices study*. *Journal of product innovation management*, **26** (1), 3–23.

Baregheh, A., Rowley, J., and Sambrook, S., 2009. Towards a multidisciplinary definition of innovation. *Management decision*, **47** (8), 1323–1339.

Berardo, R., 2009. Processing Complexity in Networks: A Study of Informal Collaboration and its Effect on Organizational Success. *Policy Studies Journal*, **37** (3), 521–539.

Bessant, J., Lamming, R., Noke, H., and Phillips, W., 2005. Managing innovation beyond the steady state. *Technovation*, **25** (12), 1366–1376.

Cassiman, B. and Veugelers, R., 2006. In search of complementarity in innovation strategy: Internal R&D and external knowledge acquisition. *Management science*, **52** (1), 68–82.

Chesbrough, H., 2004. Managing open innovation. *Research-Technology Management*, **47** (1), 23–26.

Cohen, W.M. and Levinthal, D.A., 1990. Absorptive capacity: a new perspective on learning and innovation. *Administrative science quarterly*, 128–152.
Cooper, R.G., 1990. Stage-gate systems: A new tool for managing new products. *Business Horizons*, **33** (3), 44–54.
Cooper, R.G., Edgett, S.J., and Kleinschmidt, E.J., 2002a. Optimizing the stage-gate process: what best-practice companies do—I. *Research-Technology Management*, **45** (5), 21–27.
Dosi, G., Marengo, L., Bassanini, A., and Valente, M., 1999. Norms as emergent properties of adaptive learning: The case of economic routines. *Journal of Evolutionary Economics*, **9** (1), 5–26.
Edquist, C. and Hommen, L., 1999. Systems of innovation: theory and policy for the demand side. *Technology in society*, **21** (1), 63–79.
Enkel, E., Gassmann, O., and Chesbrough, H., 2009. Open R&D and open innovation: exploring the phenomenon. *R&D Management*, **39** (4), 311–316.
Francis, D. and Bessant, J., 2005. Targeting innovation and implications for capability development. *Technovation*, **25** (3), 171–183.
Freel, M.S., 2003. Sectoral patterns of small firm innovation, networking and proximity. *Research policy*, **32** (5), 751–770.
Freeman, C., 1987. Innovation Process Imparts Uneven Ripple Effects. *Agricultural Engineering*, **68** (6), 16–17.
Gassmann, O., Enkel, E., and Chesbrough, H., 2010. The future of open innovation. *R&d Management*, **40** (3), 213–221.
Granovetter, M., 1983. The strength of weak ties: A network theory revisited. *Sociological theory*, **1** (1), 201–233.
Gronlund, J., Sjodin, D.R., and Frishammar, J., 2010. Open Innovation and the Stage-Gate Process: A REVISED MODEL FOR NEW PRODUCT DEVELOPMENT. *California Management Review*, **52** (3), 106–+.
Gupta, V.K., 2006. Firm strategy and knowledge management in strategic supply chain relationships: a knowledge-based view. University of Missouri–Columbia.
Hipp, C. and Grupp, H., 2005. Innovation in the service sector: The demand for service-specific innovation measurement concepts and typologies. *Research policy*, **34** (4), 517–535.
Johnson, A., 2001. Functions in innovation system approaches. *In*: *Paper for DRUID's Nelson-Winter Conference*.
Juma, C., Watal, J., and others, 2001. *Global Governance and Technology*. Human Development Report Office (HDRO), United Nations Development Programme (UNDP).
Kaye, A., 1992. Learning together apart. *In*: *Collaborative learning through computer conferencing*. Springer, 1–24.
Kotter, J.P. and Schlesinger, L.A., 2008. Choosing strategies for change. *Harvard business review*, **86** (7/8), 130.
Krajewski, L.J., Ritzman, L.P., and Malhotra, M.K., 2007. Operations management: processes and value chains.
Manion, M.T. and Cherion, J., 2009. Impact of Strategic Type on Success Measures for Product Development Projects*. *Journal of Product Innovation Management*, **26** (1), 71–85.
Midgley, D.F., Morrison, P.D., and Roberts, J.H., 1992. The effect of network structure in industrial diffusion processes. *Research Policy*, **21** (6), 533–552.
Nonaka, I., 1994. A dynamic theory of organizational knowledge creation. *Organization science*, 5 (1), 14–37.
O'Regan, N., Ghobadian, A., and Sims, M., 2006. Fast tracking innovation in manufacturing SMEs. *Technovation*, **26** (2), 251–261.
Plechero, M. and Chaminade, C., 2013. The influence of micro-characteristics in different modes of globalization of innovation: A comparative study of Indian (Pune) and Chinese (Beijing) firms. *Industry and Innovation*, **20** (7), 661–682.
Rohrbeck, R., Hölzle, K., and Gemünden, H.G., 2009. Opening up for competitive advantage–How Deutsche Telekom creates an open innovation ecosystem. *R&d Management*, **39** (4), 420–430.
Sydow, J. and Windeler, A., 2003. Knowledge, trust, and control: Managing tensions and contradictions in a regional network of service firms. *International Studies of Management & Organization*, **33** (2), 69–100.
Takeuchi, H. and Nonaka, I., 2000. Classic work: Theory of organizational knowledge creation. *Knowledge management: Classic and contemporary works*.
Tether, B.S., 2003. The sources and aims of innovation in services: variety between and within sectors. *Economics of Innovation and new technology*, **12** (6), 481–505.
Vence, X. and Trigo, A., 2009. Diversity of innovation patterns in services. *Service Industries Journal*, **29** (12), 1635–1657.
Windeler, A. and Sydow, J., 2001. Project networks and changing industry practices collaborative content production in the German television industry. *Organization Studies*, **22** (6), 1035–1060.
Winkler, H., 2009. How to improve supply chain flexibility using strategic supply chain networks. *Logistics Research*, **1** (1), 15–25.