# Summary

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| Paper Title | A review of literature on open innovation in small and medium-sized enterprises |
| Paper Author | Mokter Hossain |
| Tags | Open innovation, SMEs, Network, Strategy, Literature review |
| Summary Conductor | Ann-Kathrin Wacker |

# Key Takeaways

1. SMEs can strongly benefit from open innovation, interacting with customers, suppliers, universities, network partners etc.
2. However, OI is more useful for commercialization than early stage activities such as R&D and OI is more relevant for new product innovation than incremental innovation
3. Intellectual property and a good but small choice of the network are very sensitive topics
4. Open innovation is essential for continuous growth of SMEs especially in high-tech industries
5. Policies and support from the state have important impact on SME innovation

# Paper Overview

* Literature review on open innovation in SMEs: the paper gives an overview of the current research topics on open innovation and points out topics for further research in the future. Following reviews were made:
* Searching strategy: open innovation is based on the development of an appropriate searching strategy. For that, interaction with external sources such as customers, suppliers, universities and network partners, is crucial. SMEs need to partially reveal their internal development to gain from external sources but should focus on the selection of practices and partners.
* Challenges for innovation management: scarce resources, complexity of scientific field, coordination of the operative functions of the firm, access to up-to-date scientific excellence. Open innovation can incur high transaction costs. Other issues: organizational and cultural issues to deal with external contacts. In developing countries, governments should offer agencies using innovation hubs to connect SMEs with independent innovator and other parties. Challenges for international competitiveness for SMEs: R&D capacities, managerial structures and competencies, open innovation practices and the ability to attract government grants for R&D.
* Policy for open innovation: Many public policies do not support sufficiently open innovation processes for SMEs. Appropriate policy initiatives such as tax incentives could help SMEs to participate more into open innovation. SMEs need an internal system that encourages creativity, criticism, self-discipline and cooperation. Policy makers are not aware of the importance of networks for SMEs.
* Absorptive and desorptive capacities: they play a significant role in the interaction of potential cooperation partners. Absorptive: firm’s ability to sense, value, assimilate and apply new knowledge; Desorptive: firm’s capability of external knowledge exploitation. SMEs lack absorptive capacities and hence need technology intermediaries. Research cooperation and R&D outsourcing offer possibilities to complement internal research resources.
* Collaboration: SMEs’ collaboration with external agencies increases chances of launching products and services. Important in the commercialization stage, more than in early stages of collaboration. Vertical collaboration for radical innovation, horizontal for incremental innovation. Collaboration is more than science and technology, it includes value chain partnerships that bring new knowledge bases.
* Dynamic capabilities: factors that accelerate development and management of open innovation systems: size of the firm, organization stage, capability to develop partnerships. Important is a broad knowledge base.
* Patenting: benefits from patenting, by licensing out knowledge to external parties. Bianchi et al. (2010) developed a methodology for SMEs to identify out-licensing opportunities. Jeon et al. (2011) developed an approach for finding external partners through patent information. Three steps for finding partners: data collection and preprocessing, transforming patent document into co-occurrence vectors, deriving potential technology partners based on similarity indicators. Patenting as important strategy to fully benefit from innovation activities.
* Networking: effective way to facilitate open innovation but network primarily used for activities such as data collection. Innovative SMEs are more inclined into network with other SMEs and institutions but important to keep the networking approach closed, focused and consistent to get high innovation performance. Goal complementarity, resource complementarity, trust. Living labs provide innovation services as well.
* Open innovation performance: SMEs’ open innovation with external collaboration is positively correlated to innovative efficiency and inter-firm organizations have highest positive impact on innovation performance. The more open an SME is, the more it can gain from external sources. Creation of innovation requires openness, but commercialization of innovations requires protection.
* Benefits of open innovation: Most SMEs still pursuing closed innovation over open innovation, firms that provide ideas to external parties are more product innovative than non-providers, mutual exchange raise the probability for SMEs to benefit from contribute to other firms product development projects. Market performance through collaboration with suppliers of similar knowledge-base
* Commercialization: Overcome limitations through collaboration with partners, industry incumbents and intermediaries at the commercial stage