SEVEN
publicações acadêmicas

INOVAÇÃO ABERTA E GESTÃO DO CONHECIMENTO

OPEN INNOVATION AND KNOWLEDGE MANAGEMENT

INNOVACIÓN ABIERTA Y GESTIÓN DEL CONOCIMIENTO

https://doi.org/10.56238/sevened2025.026-007

Kleber Luís Celadon[1]

RESUMO

A utilização de ideias externas e internas para avançar o conhecimento é apontada como um fator que proporciona maior competitividade às empresas em geral. O fluxo de entrada e saída de conhecimento, parte integrante desse processo, envolve práticas que devem incentivar os participantes a explorar uma ampla gama de oportunidades de inovação por meio de múltiplos canais (WEST; GALLAGHER, 2006).

Diversos autores destacam que os processos de inovação não podem mais restringir-se ao know-how local ou interno, devendo priorizar profissionais capazes de maximizar sua eficácia, além de buscar fontes alternativas, como mercados ou spillovers de conhecimento (ACHA, 2006; CELADON, 2007; CHESBROUGH, 2003b; COHEN; LEVINTHAL, 1990; EASTERBY-SMITH; PRIETO, 2008; HOWELLS, 1996; NONAKA; TAKEUCHI, 1995; POLANYI, 1958). Um exemplo disso no setor de cosméticos é a busca por conhecimentos especializados e únicos – como os de perfumistas experientes –, frequentemente disponíveis em outros países. Adicionalmente, mercados emergentes podem ser explorados conforme mudanças nas conjunturas socioeconômicas.

Essa dinâmica exige interação e integração de conhecimento, relacionando-se ao conceito de Integração de Conhecimento (Knowledge Integration), definido como um processo de aprendizagem organizacional e considerado crítico para a competitividade das empresas. Tanto a Inovação Aberta quanto a Integração de Conhecimento apresentam complementaridades, mas também dimensões sobrepostas – aspectos que ainda não foram comparados em estudos anteriores. Esses conceitos podem, inclusive, revelar-se antagônicos, demandando investigações que explorem essa relação. É preciso considerar, ainda, que a formulação estratégica pode influenciar formas e práticas organizacionais (PENROSE, 1959), assim como as dimensões críticas da inovação, como ofertas, presença no mercado, clientes e processos (SAWHNEY; WOLCOTT; ARRONIZ, 2006). Essa análise é particularmente relevante em indústrias de baixa e média tecnologia, ainda pouco estudadas.

O contexto econômico atual incentiva as empresas a adotarem mecanismos de Inovação Aberta e Integração de Conhecimento para alcançarem sucesso. Assim, esta pesquisa tem como objetivo investigar como as empresas articulam esses conceitos na prática. A economia brasileira ainda é amplamente sustentada por empresas de baixa e média-baixa tecnologia, o que torna essencial o estudo dessas organizações – e não apenas das empresas de alta tecnologia – para o desenvolvimento econômico futuro do país.

[1] Doctor in Innovation Management.
Faculty of Social and Agrarian Sciences of Itapeva – FAIT.
Email: kleber.celadon@fait.edu.br

Foi realizada uma análise comparativa em um setor específico, o setor de cosméticos, produtos de higiene pessoal e perfumaria – doravante denominado simplesmente como setor/indústria de cosméticos neste trabalho.

Palavras-chave: Gestão da Inovação; Gestão do Conhecimento; Inovação Aberta.

ABSTRACT

The use of external and internal ideas to advance knowledge is pointed out as a factor that provides greater competitiveness for companies in general. The flow of knowledge in and out, an integral part of this process, involves practices that should encourage participants to explore a wide range of innovation opportunities through multiple channels (WEST; GALLAGHER, 2006).
Several authors point out that innovation processes can no longer be restricted to local or in-house know-how, and should prioritize professionals capable of maximizing their effectiveness, as well as seeking alternative sources, such as markets or knowledge spillovers (ACHA, 2006; CELADON, 2007; CHESBROUGH, 2003b; COHEN; LEVINTHAL, 1990; EASTERBY-SMITH; PRIETO, 2008; HOWELLS, 1996; NONAKA; TAKEUCHI, 1995; POLANYI, 1958). An example of this in the cosmetics sector is the search for specialized and unique knowledge - such as that of experienced perfumers - which is often available in other countries. In addition, emerging markets can be exploited according to changes in socio-economic circumstances.
This dynamic requires interaction and integration of knowledge, which is related to the concept of Knowledge Integration, defined as an organizational learning process and considered critical to the competitiveness of companies.
Both Open Innovation and Knowledge Integration show complementarities, but also overlapping dimensions - aspects that have not yet been compared in previous studies. These concepts may even prove to be antagonistic, requiring research to explore this relationship. It should also be considered that strategic formulation can influence organizational forms and practices (PENROSE, 1959), as well as the critical dimensions of innovation, such as offers, market presence, customers and processes (SAWHNEY; WOLCOTT; ARRONIZ, 2006). This analysis is particularly relevant in low and medium technology industries, which are still little studied.
The current economic context encourages companies to adopt Open Innovation and Knowledge Integration mechanisms in order to achieve success. Thus, this research aims to investigate how companies articulate these concepts in practice. The Brazilian economy is still largely sustained by low and medium-low technology companies, which makes the study of these organizations - and not just high-tech companies - essential for the country's future economic development.
A comparative analysis was carried out on a specific sector, the cosmetics, toiletries and perfumery sector - hereafter referred to simply as the cosmetics sector/industry in this work.

Keywords: Innovation Management; Knowledge Management; Open Innovation.

RESUMEN

El uso de ideas externas e internas para hacer avanzar el conocimiento se considera un factor que hace más competitivas a las empresas en general. El flujo de entrada y salida de conocimientos, parte integrante de este proceso, implica prácticas que deben animar a los participantes a explorar una amplia gama de oportunidades de innovación a través de múltiples canales (WEST; GALLAGHER, 2006).
Varios autores señalan que los procesos de innovación ya no pueden limitarse a los conocimientos locales o internos, sino que deben dar prioridad a los profesionales capaces de maximizar su eficacia, así como buscar fuentes alternativas como los mercados o los desbordamientos de conocimiento (ACHA, 2006; CELADON, 2007; CHESBROUGH,

2003b; COHEN; LEVINTHAL, 1990; EASTERBY-SMITH; PRIETO, 2008; HOWELLS, 1996; NONAKA; TAKEUCHI, 1995; POLANYI, 1958). Un ejemplo de ello en el sector de los cosméticos es la búsqueda de conocimientos especializados y únicos -como los de perfumistas experimentados- que a menudo están disponibles en otros países. Además, los mercados emergentes pueden explotarse en función de la evolución de las circunstancias socioeconómicas.
Esta dinámica requiere la interacción e integración de conocimientos, lo que está relacionado con el concepto de Integración de Conocimientos, definido como un proceso de aprendizaje organizativo y considerado crítico para la competitividad de las empresas. Tanto la innovación abierta como la integración de conocimientos muestran complementariedades, pero también dimensiones que se solapan, aspectos que aún no se han comparado en estudios anteriores. Estos conceptos pueden incluso resultar antagónicos, lo que requiere investigaciones que exploren esta relación. También hay que considerar que la formulación estratégica puede influir en las formas y prácticas organizativas (PENROSE, 1959), así como en las dimensiones críticas de la innovación, como las ofertas, la presencia en el mercado, los clientes y los procesos (SAWHNEY; WOLCOTT; ARRONIZ, 2006). Este análisis es especialmente relevante en las industrias de baja y media tecnología, todavía poco estudiadas.
El contexto económico actual anima a las empresas a adoptar mecanismos de innovación abierta e integración del conocimiento para alcanzar el éxito. Por lo tanto, esta investigación tiene como objetivo investigar cómo las empresas articulan estos conceptos en la práctica. La economía brasileña aún se sustenta en gran medida en empresas de baja y media-baja tecnología, lo que hace imprescindible el estudio de estas organizaciones -y no sólo de las empresas de alta tecnología- para el futuro desarrollo económico del país.
Se realizó un análisis comparativo de un sector específico, el sector de cosméticos, artículos de tocador y perfumería - en adelante denominado simplemente sector/industria de cosméticos en este trabajo.

Palabras clave: Gestión de la innovación; Gestión del conocimiento; Innovación abierta.

RESEARCH PROPOSITIONS

1. **Knowledge integration is both an activity and an essential capability for industrial innovation and competitiveness**, as it is responsible for optimizing the knowledge exchanged between professionals from different backgrounds and using it to generate value for organizations. As the cosmetics industry involves a significant level of knowledge exchange – both explicit and tacit – integration mechanisms are key to maintaining the effectiveness of innovation policies.
2. **Open innovation tends to be a relevant influence on the integration of knowledge**, since the use of external resources tends to increase the levels of complexity of innovation. In addition, it involves an even greater number of people (with different cultures and management models), as well as different perceptions among the professionals involved, representing an even greater challenge for management.

   These propositions lead to the following research question:

"Under different levels of openness (in open innovation), how do knowledge integration mechanisms and practices vary, and how does this influence innovation?"

METOLODOGIA

The relationship between the two concepts is directly correlated: the greater the intensity applied in one concept, the greater the demand in the other. Open Innovation (AI) practices imply greater complexity in Knowledge Integration (CI).

RESEARCH STRATEGY - CASE STUDY

This research aims to carry out an analysis in a specific industrial environment: the cosmetics sector in Brazil. The focus of the study is on the ability of companies to integrate knowledge under the influence of different degrees of openness to innovation, exploring the interaction of the main actors in this process. A qualitative approach was chosen, since the context is fundamental and must be analyzed in depth.

The multiple case studies method allows the replication of survey responses or the description of circumstances in which responses are not replicated (YIN, 1994). One of the participating organizations was used as a pilot case (YIN, 1994), making it possible to refine aspects of the research, such as interview scripts, questions and interview techniques. This pilot was conducted in Brazil to adapt the data collection instrument to the sociocultural environment of the study.

The choice of a specific sector, such as cosmetics, facilitates the validation of the research in its final stages, since the design of this study uses a replication approach. Each

individual case study is treated as a "complete unit", in which converging evidence on facts and conclusions is sought. The findings of each case are then considered information that needs to be replicated in other individual cases (YIN, 2009). The selection of the cosmetics industry is also relevant, as research in this sector is still incipient.

Survey data were collected from multiple sources in each case, allowing triangulation (YIN, 1994) to confirm or refute answers to survey questions. Methods such as:

- On-site *observation* of activities;
- Interviews with professionals;
- Analysis of secondary data.

Semi-structured interviews were selected as the main method of data collection in this study.

COLLECTION OF EMPIRICAL DATA

A preliminary data collection was carried out using a Likert questionnaire, applied to all companies before the interviews. It is designed to position each company on a scale, ranging from "more traditional" (closed) to "more open" innovator. The results helped to improve the ideas to be explored during the interviews. As a result of this initial study, it was possible to refine the data collection instrument.

Comparing the preliminary results with the analysis, it was concluded that:

- NA and AR companies are classified as "more open";
- BU, BT, LC and CA are "hybrids";
- AL, HN and BN are "more traditional".

The questionnaire (Phase 1) was developed based on the concepts of Open Innovation (AI) and Knowledge Integration (CI). In each company, one person completed the questionnaire – typically a chief technology/innovation officer or CEO (in large companies) or general managers/owners (in SMEs).

The rationale behind this approach was based on the fact that this study proposes a comparison between more open and more closed companies. Therefore, we sought to verify whether there was a reasonable level of difference in the opening, at least among the companies studied.

Table 1 - Companies divided by level of openness (Phase 1) / * Data obtained by questionnaire

	More open	More open	Hybrid	Hybrid	Hybrid	Hybrid	More closed	More closed	More closed
Enterprise	IN	BT	BOO	RA	LC	CA	AL	HN	BN
Size	Big	Big	Average	Big	Small	Small	Average	Small	Average
Local	São Paulo	Curitiba	Curitiba	Curitiba	Curitiba	Curitiba	Curitiba	Manaus	Curitiba
Aperture levels	+ OPEN ⟷ HYBRID ⟷ + CLOSED								

Table 2 – Total Open Innovation Practices (Phase 2)

Total Open Innovation practices	38	33	20	31	12	15	7	6	9
Companies	IN	BT	BOO	RA	LC	CA	AL	HN	BN
Aperture	More open		Hybrid				More closed		

Although the methodology is not intended to generalize the results, it was decided to select a diversified sample to enrich the study. The second and most important stage of the analysis (Phase 2) consisted of the application of semi-structured interviews, whose results were compared with the data obtained in the initial questionnaires, seeking to identify possible discrepancies between the two methods.

ORGANIZATIONAL DIFFERENCES

It was found that only large companies use project-based strategies to integrate knowledge, while SMEs rely more on informal mechanisms. The sharing of common knowledge occurs more frequently among professionals with similar academic backgrounds, particularly in pharmacy, biology or chemistry. However, a certain degree of rigidity was observed in the sharing of knowledge between different departments.

INTERDISCIPLINARY COLLABORATION

Collaboration across areas and disciplines is more common in large companies, especially in international partnerships. In SMEs, knowledge tends to be concentrated in a few people, and the owner usually holds great decision-making power. Relevant studies in the area point to a dialogical approach, seeking to understand how face-to-face dialogues generate new organizational knowledge: "the dialectic of the statements themselves is an important mechanism through which cognitive change and, consequently, new knowledge can emerge" (TSOUKAS, 2009, p. 942).

BRAZILIAN CONTEXT

The educational level in Brazil has not yet kept up with the country's recent economic development, resulting in a shortage of skilled and technical labor. Consequently, companies need to invest heavily in internal training policies to overcome market limitations.

There are few suppliers of chemical inputs for the cosmetic industry in Brazil, usually large multinationals (such as Givaudan) established in the country. This particularity creates an interesting characteristic in the sector, as competing companies depend on these same suppliers. Consequently, **vertical collaboration** becomes an essential modus operandi, where **trust** plays a key role.

EXTERNAL TECHNOLOGICAL INTEGRATION

External technological integration requires that the skills of companies are aligned with the technologies offered externally, allowing the assimilation and replication of the knowledge acquired from external sources. As Iansiti and Clark (1994, p. 571) point out, "this external knowledge cannot simply be acquired through a reactive search in the existing pool of available technical information".

COLLABORATION PATTERNS

Horizontal **collaboration** is more common among large companies, which have their own legal departments to handle intellectual property issues. An exemplary case is that of the NA Company, which created a specific department for academic relations, with employees dedicated to interacting with universities and research institutes.

INTERNAL TRAINING

All of the companies surveyed, without exception, implement internal training programs at some level. It should be noted that:

- **Large companies** focus on international trends
- **SMEs** focus on quality assurance programs

This observation corroborates with researchers who state: "internal knowledge or technical capabilities remain crucial in determining the innovative capabilities and financial performance of companies, even as they increasingly direct their attention to external knowledge" (VANHAVERBEKE et al., 2007, p. 2).

SMEs, like large companies, combine knowledge in distinct and specific ways:

1. **BU Company**: Your main source of external knowledge is a network of therapists distributed throughout the Brazilian territory.
2. **LC Company**: Originating from a large company, of which it became the main supplier of soaps, it developed an almost 'symbiotic' process of knowledge integration. Recently, it has been adopting new strategies to emancipate itself from this relationship, seeking to identify market needs not met by its main client.
3. **CA Company**: Specializing in certified organic cosmetics, it obtains knowledge from developed countries, although it uses domestic raw materials. The integration of knowledge occurs mainly at the administrative level, a characteristic resulting from its creation in an incubator with government support.
4. **BN Company**: Manufacturer of hair color products that competes directly with multinationals such as L'Oréal, standing out for intense marketing and advertising campaigns.

CONCLUSION

This comparative analysis aimed to examine different degrees of openness to innovation and their implications for knowledge integration, as well as their influence on innovative processes.

Main Results:

1. **Business Size**: It proved to be a determining factor due to the high costs and complexity associated with Open Innovation (AI) practices. Large companies have demonstrated an advantage in structuring processes that facilitate AI, as well as superior capacity in launching new products, benefiting from:
   - Favorable financial condition for large marketing investments
   - Own laboratory infrastructure
   - Ability to compete in category 2 products (cosmetics with higher regulation)

Degrees of Openness: The preliminary questionnaire (Phase 1) classified the nine companies studied into:

- 2 'more open' companies
- 4 'hybrids'
- 3 'More traditional'

2. **Data Consistency**: The 33 interviews conducted in Phase 2 partially corroborated the initial results, revealing that:
   - More open companies practiced knowledge integration more intensively
   - There was proportionality between the degrees of openness and integration of knowledge
   - Except for the BU (hybrid) company, whose practices proved to be more traditional than

expected.

Finally, all the companies analyzed demonstrated **a considerably high level** of intensity in knowledge integration practices. Knowledge acquired externally is usually **'filtered'** by internal needs and strategic direction.

IMPLICATIONS FOR MANAGEMENT THEORIES

This study contributed to the **theoretical expansion** of the two concepts chosen as a basis:

1. **Open Innovation**
2. **Knowledge Integration**

Key Theoretical Findings:

- A relationship of direct proportionality **between the concepts** was evidenced
- More open companies showed **greater intensity** in knowledge integration practices
- External knowledge is **systematically filtered** by internal strategies in all the companies studied

"The results suggest that innovation management theories (focused on open innovation) and knowledge integration theories can and should be expanded and compared in future studies"

IMPLICATIONS FOR PUBLIC POLICIES

Sector Context:

- Government policies have fostered economic growth through **sectoral strategies**
- **Sustainability and environmental issues** are a priority in the cosmetics sector

Structural Challenges:

1. **Technology Division**:
   - Large disparity between medium/large (category 2) and small (category 1) enterprises
   - Corresponding to a **'knowledge gap'**:
     - Category 2 companies: highly skilled workforce
     - SMEs (category 1): one-off hiring of specialists
2. **Competitive Strategies**:
   - SMEs adopt **niche markets** (e.g., organic products)
   - Differentiation via marketing (not just technology)

Socioeconomic Context:

The growth in cosmetics consumption in Brazil is intrinsically linked to **recent socioeconomic developments**, a factor that deserves further investigation in future research.

STUDY LIMITATIONS

This research focused on a cluster of the cosmetics industry in the southern region of Brazil. This delimitation should be considered to avoid generalizations that may not reflect the reality in other regions. The cosmetics sector has different particularities from high-tech sectors, such as information technology. Therefore, the findings of this study should not be automatically replicated to other industries, even those with similar regulations.

Advances in the Knowledge Integration (CI) Literature

The literature on HF has presented important developments, including studies on:

- Knowledge flows (VOLBERDA et al., 2010)
- Intra-organizational knowledge (KOCH, 2011)
- Tacit knowledge (HONG; SUH; KOO, 2011)
- Microdynamics (STRAMBACH; KLEMENT, 2012)

These advances indicate that future research on CI may benefit from more developed concepts, offering more nuanced understandings for researchers.

RECOMMENDATIONS FOR FUTURE RESEARCH

This study represents the first initiative to compare the concepts of open innovation and knowledge integration in the cosmetics industry, with the aim of contributing to resource-based theories (RUBENSTEIN-MONTANO et al.). Most previous research has focused on high-tech companies in other industries, primarily information technology or biotechnology. Thus, the differential of this research opens up new possibilities for investigation by presenting the characteristics of an average technology industry in a developing country.

REFERENCES

1. Acha, V. (2008). Open by design: The role of design in open innovation. *Academy of Management Proceedings, 2008*(1), 1–6. https://doi.org/10.5465/ambpp.2008.33653210

2. Brown, J. S., & Duguid, P. (1991). Organizational learning and communities-of-practice: Toward a unified view of working, learning, and innovation. *Organization Science, 2*(1), 40–57. https://doi.org/10.1287/orsc.2.1.40

3. Celadon, K. L. (2007). Knowledge share management: The case of a Brazilian high-tech company. Paper presented at the EURAM 2007 Conference, Paris, France.

4. Chesbrough, H. (2003a). *Open innovation: The new imperative for creating and profiting from technology*. Harvard Business Review Press.

5. Chesbrough, H. (2003b). The era of open innovation. *MIT Sloan Management Review, 44*(3), 35–41.

6. Chesbrough, H. (2007). Why companies should have open business models. *MIT Sloan Management Review, 48*(2), 22–28.

7. Chesbrough, H. (2011). *Open services innovation: Rethinking your business to grow and compete in a new era*. Jossey-Bass.

8. Chesbrough, H., & Appleyard, M. M. (2007). Open innovation and strategy. *California Management Review, 50*(1), 57–76. https://doi.org/10.2307/41166416

9. Chesbrough, H., & Crowther, A. K. (2006). Beyond high tech: Early adopters of open innovation in other industries. *R&D Management, 36*(3), 229–236. https://doi.org/10.1111/j.1467-9310.2006.00428.x

10. Chesbrough, H., Vanhaverbeke, W., & West, J. (Eds.). (2006). *Open innovation: Researching a new paradigm*. Oxford University Press. https://doi.org/10.1111/j.1467-8691.2008.00502.x

11. Clark, K. B., & Wheelwright, S. C. (1993). *Managing new product and process development: Text and cases*. Free Press.

12. Cockburn, I. M., & Henderson, R. M. (1998). Absorptive capacity, coauthoring behavior, and the organization of research in drug discovery. *Journal of Industrial Economics, 46*(2), 157–182. https://doi.org/10.1111/1467-6451.00067

13. Cohen, S. I., & Allen, T. J. (1969). Information flow in research and development laboratories. *Administrative Science Quarterly, 14*(1), 12–19. https://doi.org/10.2307/2391357

14. Cohen, W. M., & Levinthal, D. A. (1989). Innovation and learning: The two faces of R&D. *Economic Journal, 99*(397), 569–596. https://doi.org/10.2307/2233763

15. Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly, 35*(1), 128–152. https://doi.org/10.2307/2393553

16. Cook, S. D. N., & Brown, J. S. (1999). Bridging epistemologies: The generative dance between organizational knowledge and organizational knowing. *Organization Science, 10*(4), 381–400. https://doi.org/10.1287/orsc.10.4.381

17. Cook, S. D. N., & Yanow, D. (1993). Culture and organizational learning. *Journal of Management Inquiry, 2*(4), 373–390. https://doi.org/10.1177/105649269324010

18. Dahlander, L., & Gann, D. M. (2007). How open is innovation? Paper presented at the DRUID Summer Conference 2007, Copenhagen, Denmark. https://doi.org/10.4337/9781848441248.00009

19. DeFillippi, R., Arthur, M. B., & Lindsay, V. J. (2006). *Knowledge at work: Creative collaboration in the global economy*. Blackwell Publishing. https://doi.org/10.1111/j.1467-9310.2007.00475_2.x

20. Dosi, G., Faillo, M., & Marengo, L. (2008). Organizational capabilities, patterns of knowledge accumulation and governance structures in business firms: An introduction. *Organization Studies, 29*(8–9), 1165–1185. https://doi.org/10.1177/0170840608094775

21. Dougherty, D. (1992). Interpretive barriers to successful product innovation in large firms. *Organization Science, 3*(2), 179–202. https://doi.org/10.1287/orsc.3.2.179

22. Easterby-Smith, M., Lyles, M. A., & Tsang, E. W. K. (2008). Inter-organizational knowledge transfer: Current themes and future prospects. *Journal of Management Studies, 45*(4), 677–690. https://doi.org/10.1111/j.1467-6486.2008.00773.x

23. Easterby-Smith, M., & Prieto, I. M. (2008). Dynamic capabilities and knowledge management: An integrative role for learning? *British Journal of Management, 19*(3), 235–249. https://doi.org/10.1111/j.1467-8551.2007.00543.x

24. Eisenhardt, K. M., & Okhuysen, G. A. (2002). Integrating knowledge in groups: How formal interventions enable flexibility. *Organization Science, 13*(4), 370–386. https://doi.org/10.1287/orsc.13.4.370.2947

25. Grant, R. M. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal, 17*(S2), 109–122. https://doi.org/10.1002/smj.4250171110

26. Grant, R. M. (1997). The knowledge-based view of the firm: Implications for management practice. *Long Range Planning, 30*(3), 450–454. https://doi.org/10.1016/S0024-6301(97)00025-3

27. Hong, D., Suh, E., & Koo, C. (2011). Developing strategies for overcoming barriers to knowledge sharing based on conversational knowledge management: A case study of

a financial company. *Expert Systems with Applications, 38*(12), 14417–14427. https://doi.org/10.1016/j.eswa.2011.04.072

28. Iansiti, M., & Clark, K. B. (1994). Integration and dynamic capability: Evidence from product development in automobiles and mainframe computers. *Industrial and Corporate Change, 3*(3), 557–605. https://doi.org/10.1093/icc/3.3.557

29. Koch, A. (2011). Firm-internal knowledge integration and the effects on innovation. *Journal of Knowledge Management, 15*(6), 984–996. https://doi.org/10.1108/13673271111179325

30. Lam, A. (2000). Tacit knowledge, organizational learning and societal institutions: An integrated framework. *Organization Studies, 21*(3), 487–513. https://doi.org/10.1177/0170840600213001

31. Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. Oxford University Press. https://doi.org/10.1017/S1472669608000170

32. Nonaka, I., & Teece, D. J. (Eds.). (2001). *Managing industrial knowledge: Creation, transfer and utilization*. Sage Publications. https://doi.org/10.1002/kpm.183

33. Penrose, E. T. (1959). *The theory of the growth of the firm*. Oxford University Press.

34. Pisano, G. P. (1994). Knowledge, integration, and the locus of learning: An empirical analysis of process development. *Strategic Management Journal, 15*(S1), 85–100. https://doi.org/10.1002/smj.4250150907

35. Polanyi, M. (1958). *Personal knowledge: Towards a post-critical philosophy*. University of Chicago Press. https://doi.org/10.1017/S0033291700040204

36. Polanyi, M. (1967). *The tacit dimension*. Doubleday & Co.

37. Sawhney, M., Wolcott, R. C., & Arroniz, I. (2006). The 12 different ways for companies to innovate. *MIT Sloan Management Review, 47*(3), 75–81.

38. Söder undoing, J. (2010). Knowledge entrainment and project management: Approaching knowledge integration in complex R&D. *Academy of Management Proceedings, 2010*(1), 1–6. https://doi.org/10.1016/j.ijproman.2009.11.010

39. Strambach, S., & Klement, B. (2012). Cumulative and combinatorial micro-dynamics of knowledge: The role of space and place in knowledge integration. *European Planning Studies, 20*(11), 1843–1866. https://doi.org/10.1080/09654313.2012.723424

40. Teece, D. J., & Pisano, G. P. (1994). The dynamic capabilities of firms: An introduction. *Industrial and Corporate Change, 3*(3), 537–556. https://doi.org/10.1093/icc/3.3.537-a

41. Teece, D. J., Pisano, G. P., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal, 18*(7), 509–533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z

42. Tell, F. (2011). Knowledge integration and innovation: A survey of the field. In C. Berggren, A. Bergek, L. Bengtsson, M. Hobday, & J. Söderlund (Eds.), *Knowledge integration and innovation: Critical challenges facing international technology-based firms* (pp. 20–58). Oxford University Press.

43. Tsekouras, G. (2006). Gaining competitive advantage through knowledge integration in a European industrialising economy. *International Journal of Technology Management, 36*(1–3), 126–147. https://doi.org/10.1504/IJTM.2006.009965

44. Tsoukas, H. (2009). A dialogical approach to the creation of new knowledge in organizations. *Organization Science, 20*(6), 941–957. https://doi.org/10.1287/orsc.1090.0435

45. Tushman, M. L. (1977). Special boundary roles in the innovation process. *Administrative Science Quarterly, 22*(4), 587–605. https://doi.org/10.2307/2392402

46. Tushman, M. L., & Scanlan, T. J. (1981). Boundary spanning individuals: Their role in information transfer and their antecedents. *Academy of Management Journal, 24*(2), 289–305. https://doi.org/10.2307/255842

47. Vanhaverbeke, W., Cloodt, M., & Van de Vrande, V. (2007). *Connecting absorptive capacity and open innovation* (SSRN Working Paper). https://doi.org/10.2139/ssrn.1091265

48. Volberda, H. W., Foss, N. J., & Lyles, M. A. (2010). Absorbing the concept of absorptive capacity: How to realize its potential in the organization field. *Organization Science, 21*(4), 931–951. https://doi.org/10.1287/orsc.1090.0503

49. von Hippel, E. (1986). Cooperation between rivals: Informal know-how trading. *Research Policy, 16*(6), 291–302. https://doi.org/10.1016/0048-7333(87)90015-1

50. Wallin, M. W., & von Krogh, G. (2010). Focus on the integration of knowledge. *Organizational Dynamics, 39*(2), 145–154. https://doi.org/10.1016/j.orgdyn.2010.01.010

51. Weber, J. M., & Villebonne, J. C. (2002). Differences in purchase behavior between France and the USA: The cosmetic industry. *Journal of Fashion Marketing and Management, 6*(4), 396–407. https://doi.org/10.1108/13612020210448673

52. Wenger, E. (1998). Communities of practice: Learning as a social system. *Systems Thinker, 9*(5), 2–3. https://doi.org/10.1007/978-1-84996-133-2_7

53. West, J., & Gallagher, S. (2006). Challenges of open innovation: The paradox of firm investment in open-source software. *R&D Management, 36*(3), 319–331. https://doi.org/10.1111/j.1467-9310.2006.00436.x

54. Wu, Y. (2009). China's cosmetics industry: An analysis of SCP model. *The 5th International Symposium for Corporate Governance*, 188–192. https://doi.org/10.1109/itime.2012.6291425

55. Yang, J. (2005). Knowledge integration and innovation: Securing new product advantage in high technology industry. *The Journal of High Technology Management Research, 16*(1), 121–135. https://doi.org/10.1016/j.hitech.2005.06.007

56. Yin, R. K. (1994). *Case study research: Design and methods* (2nd ed.). Sage Publications.

57. Yin, R. K. (2009). *Case study research: Design and methods* (4th ed.). Sage Publications.

58. Zahra, S. A., & George, G. (2002). Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review, 27*(2), 185–203. https://doi.org/10.5465/amr.2002.6587995

59. Zarifian, P. (1996). *Travail et communication: Essai sociologique sur le travail dans la grande entreprise industrielle*. Presses Universitaires de France. https://doi.org/10.2307/3322791