Open Innovation Capabilities and Competences

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Abstract: Productivity can be enhanced and competitive advantages can be gained by using an open innovation approach instead of a closed innovation approach. The successful implementation of an open innovation approach requires careful examination of the existing innovation capabilities and competences of a company. This study aims to explore and give a picture of the current level of open innovation capabilities and competences of companies with particular emphasis on companies in Finland. A quantitative approach was followed and a 13-item survey was administered. The reliability of the survey used was .957 and its items included statements regarding the five-level maturity model for open innovation. Level five of the model represents the highest maturity level and level one of the model corresponds to the lowest. Claims regarding maturity level one were excluded as innovation activities do not occur at this level. The survey was administered in both 2022 and 2024 and consisted of three questions for each maturity level from level two to level four and four questions for level three. Maturity levels four and five indicate that companies understand the significance of strategic thinking and that they also include innovation strategies within their general strategy or perceive it as an integral addition to their strategy. We conclude that the effective open innovation culture forms an essential part of the overall success of a company. Therefore, an increase in innovation culture characteristics simultaneously results in an increase in the innovation maturity level.

Keywords: Innovation maturity, Open innovation, Innovation competences

1. Introduction

Open innovation has emerged as a contemporary concept for businesses that want to capture external ideas for generating value and minimizing risks. Chesbrough (2019) coined the open innovation expression and defined it as "*a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology*". After a decade, Chesbrough and Bogers (2014) defined open innovation as *"a distributed innovation process based on purposefully managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organization's business model".* The central theme in these two definitions is that innovation is co-created in collaboration between external stakeholders.

By opening up the innovation process to employees, customers and external innovation partners, valuable insights and knowledge that will improve outcomes and benefit future activities will be gained. The internal innovation team members will work together with external networks aiming for a win-win situation for all involved stakeholders. Hence, open innovation facilitates improved employee engagement, access to talents, and creation of lucrative partnerships. The incorporation of open innovation practices in an organization signifies more than a strategic choice; it represents a paradigm shift towards collaborative, externally oriented approaches to problem-solving and value creation (Malodia et al, 2023). For example, Luan et al (2024) showed that open innovation impacts digital transformation, i.e. integration of digital technologies into all aspects of an organization. Their results offered empirical insights into the complex relationship between open innovation and technological development. They divided technological capabilities into technological maturity and technological diversity and highlighted their significance as channels through which open innovation influences digital transformation.

Siakas et al (2014) emphasized that key factors for success embrace organization specific knowledge and capacity to exploit this knowledge. Other success factors are related to collecting and building up firm specific knowledge, low levels of uncertainty regarding present and future technology developments, and understanding

of market demands and competitive threats. Hence, internal structures and processes must continuously be balanced to meet conflicting requirements regarding how to identify, capture and exploit specialized knowledge across technological fields, business functions and product divisions. Open innovation supports ideas flowing out of the organization for evaluation, sharing and exploitation and flowing back into the organization as new offerings and new business models. Moreover, ideas from other organizations may be evaluated, shared, and exploited. A core issue in open innovation is finding the right balance and mechanism between intellectual protection and openness in adopting open innovation.

The main aim of innovation is to create and sustain value (Siakas et al, 2016). The quest to innovate drives the organization to capture information and knowledge externally and transfer the obtained knowledge to the internal knowledge base for contributing to the creation and delivery of value (Lampropoulos & Siakas, 2018). This contributes to the dynamic capability of the organization which facilitates performance increase, profits, and organizational growth, reaching out to new markets. Openness promotes visible operations among dynamic capabilities through commitment of various stakeholders. Openness also facilitates understanding of opportunities and threats. Increased customer value enables companies to optimize revenue. A by-product of an open innovation approach is the identification of partners for the whole open innovation value chain.

Digital technologies of today enable collaboration across geographical distances with limited resources (Enkel et al, 2020; Kanakaris et al, 2019). They facilitate identification of suitable knowledge owners and partners for collaboration (Makkonen et al, 2019). Access and integration of large numbers of diverse and dispersed external unknown individuals can be achieved with the use of social media (Makkonen et al, 2020; Siakas et al, 2016) and crowdsourcing (SIakas and Siakas, 2020). When using crowdsourcing, organizations open up to the public, usually starting with their customer base to obtain ideas. Hence, it is an outside-in open innovation approach.

Open innovation provides new prospects for obtaining more and better resources, data and diverse means for carrying out a project. It also provides opportunities for networking and connecting with potential partners, collaborators and investors. Knowledge management systems are tailored to each organization separately. In order to identify potential organizations for collaboration in open innovation it is important to assess and understand the KM maturity of that organization (Peirera et al, 2021).

This paper examined the maturity of open innovations through the Open Innovation Maturity Model designed by Enkel et al (2011). The study aimed to investigate the open innovation maturity by using an online questionnaire that was responded to by 145 part-time students working in diverse Finnish companies. The aims were to increase awareness of the importance of maturity related to knowledge management and innovation practices for keeping up with globalization (see eg. Siakas et al, 2020) and for using smart technologies to a higher degree (see e.g. Lampropoulos et al, 2024).

2. The Open Innovation Maturity Model

Rocha et al (2019) emphasized that maturity is an indication of the measurement of organizational capability and maturity models offer simple but effective ways for measuring quality of processes. Companies can obtain an overview of their innovation capabilities by using maturity models. Maturity models can help meet challenges faced by a rapidly changing environment and also allow companies to enhance their competitive advantages. One maturity model of open innovation as applied in a previous study (Makkonen et al, 2023), which examines the maturity level of open innovation in any company (Enkel et al, 2011). The open innovation maturity model includes five maturity levels as follows:

> *"Level 1 —Creative individual attempts are dismissed. The organization focuses on day-to-day operations. Innovation output is inconsistent and unpredictable".*
>
> *"Level 2 —The need to innovate is identified; innovation is clearly defined. There is a basic understanding of the influential factors. Innovation output is inconsistent but traceable".*
>
> *"Level 3 —Appropriate practices, procedures and tools are in place, innovation is encouraged among employees. Outputs are consistent and ensure sustained market share and positioning".*
>
> *"Level 4 —Practices, procedures and tools for integrating innovation activities are used. A deep understanding of the internal innovation model and how it relates to business requirements has been established. Innovative outputs are consistent, diverse and a source of differentiation"*

> *"Level 5 —Practices, procedures and tools are institutional. Individuals are encouraged to innovate. Synergy is achieved through the alignment of business and innovation strategy and synchronization of activities. Outputs provide sustained competitive advantages in existing and new markets."*

This study aims to establish the maturity levels of companies, in particular their readiness to adopt and integrate open innovation by using the maturity model. Paulk et al (1993) highlight the importance of maturity models in achieving Improved performance through innovation efforts and Enkel et al (2020) note that companies can utilize open innovation strategically to enhance their innovation capabilities

3. Our Study

Using the maturity model as a basis for examining the innovation levels, a survey was conducted both during spring 2022 and during the spring of 2024. The aim of the questionnaire was to reveal the status of the open innovation maturity in the companies especially in Finland. The participants were given a set of claims in the open innovation context. It should be noted that claims regarding maturity level 1 were excluded as innovation activities do not occur at this level. Therefore, the questionnaire contained claims related to the maturity levels 2 to 5. Three innovation related claims were included for each of the maturity levels. The three claims were as follows:

Level 2:

1."The necessity of innovation is identified in your organization" (level 2)

2."The meaning of the word Innovation is clearly defined in your organization" (level 2)

3."There is a basic understanding of the influential innovation factors in your organization" (level 2)

Level 3:

4."Appropriate practices, procedures and tools are applied" (level 3)

5."Innovation is encouraged among employees" (level 3)

6."Innovation outputs are consistent and ensure sustained market share and positioning" (level 3)

Level 4:

7."Practices, procedures and tools for integrating innovation activities are used" (level 4)

8."Internal innovation model has been established in your organization which is deeply understood and it relates to the needs of your business" (level 4)

9."Innovative outputs are consistent, diverse and a source of differentiation" (level 4)

Level 5:

10."Innovative practices, procedures and tools are institutional" (level 5)

11."Individuals are encouraged to innovate" (level 5)

12."Collaboration is achieved through business and innovation strategy alignment as well as synchronization of activities" (level 5)

13."Innovation outputs provide sustained competitive advantage in both existing and new markets" (level 5)

The participants were given these aforementioned claims and were then able to provide their comments on open innovation activities. The focus was on elements and activities promoting open innovation as well as hindering it. The participants work in various fields including technology companies such as sawmills, ICT, steel and zinc industries, chemistry, public health care and public rescue services.

The data collection was undertaken by administering an online questionnaire uploaded on to the Webropol platform as well as the use of a paper-based one. The participants rated each item (variable) of attributes on a Likert scale of 1 to 5 where 1 meant "Not at all important" and 5 meant "Extremely important". Statistical analysis was carried out using Excel.

4. Data Analysis

The data collected was analyzed using IBM Statistical Package for the Social Sciences (SPSS) and descriptive statistics were used. Specifically, the data used derived from a total of 145 higher education students who were involved in this study. The students were enrolled in engineering, business and healthcare programs, representing both the public and private sector as well as a great variety of industries. However, the responses of 4 students were missing several answers to the questions of the questionnaire and they have been removed from the analysis. The Cronchbach's Alpha of the 13-item survey was .957 which renders its constructs and items highly reliable. As a result, the data of 141 higher education students, 70 female (56.03%) and 62 male (43.97%) students, are presented in this study. Students came from 17 different countries. However, as the study was mainly run in Finnish universities, the vast majority of the participants (78.01%) are students whose country of origin is Finland. Most students were pursuing Master degree programs (freq.: 81, perc: 57.45%) followed by students pursuing Bachelor degree program (freq.: 54, perc: 38.30%). Six students (4.26%) were pursuing different professional programs. Apart from one participant who did not specify whether they attended their program as a part time or full-time student, most students (freq.: 97, perc: 68.79%) were attending as part time students followed by full-time students (freq.: 43, perc: 30.50%). Given the background of the students examined, this outcome is justifiable as the vast majority of them were also working. Specifically, a total of 119 students (84.40%) answered that they were employed while 21 students (14.89%) were unemployed. One student did not disclose their working status. There was a similar distribution among the different types of companies regarding their entity being international (freq.: 49, perc: 34.75%), nationwide (freq.: 44, perc: 31.21%), or local (freq.: 40, perc: 28.37%). Eight students (5.67%) did not specify the entity of their current or previous company. The distribution of the companies' size is presented in Figure 1. Based on the results, employees from small, medium, and large companies participated in this study. When asked what their position level was, most students had a mid-level position (e.g., expert with responsibility) (freq.: 62, perc: 43.97%) followed by an operational level position (e.g., worker) (freq.: 36, perc: 25.53%) and an executive level position (e.g., management) (freq.: 35, perc: 24.82%). Eight students (5.67%) had a different position based on the options given. Students' working experience varied and the results are depicted in Figure 2.

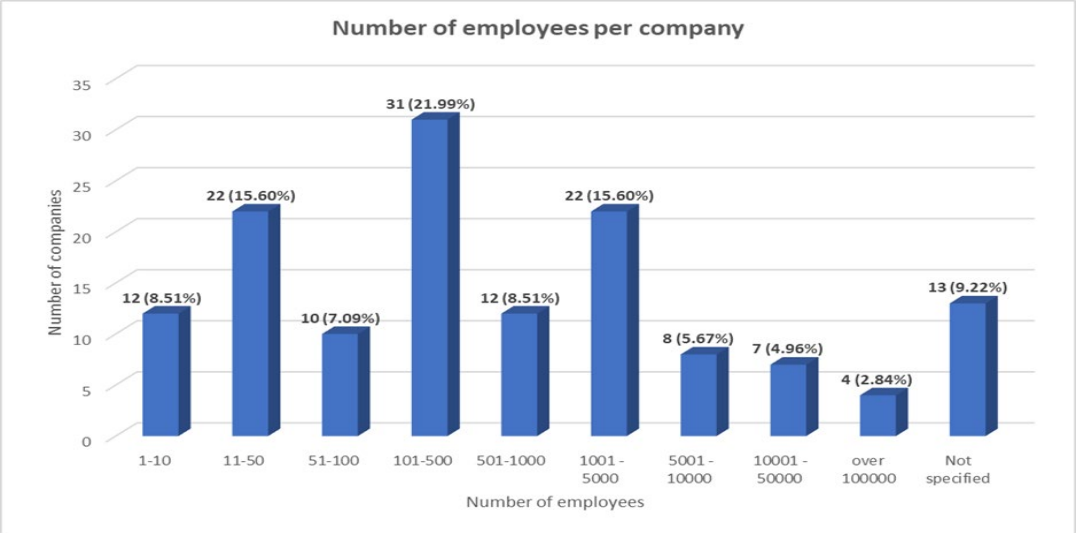

Figure 1: Distribution of company size

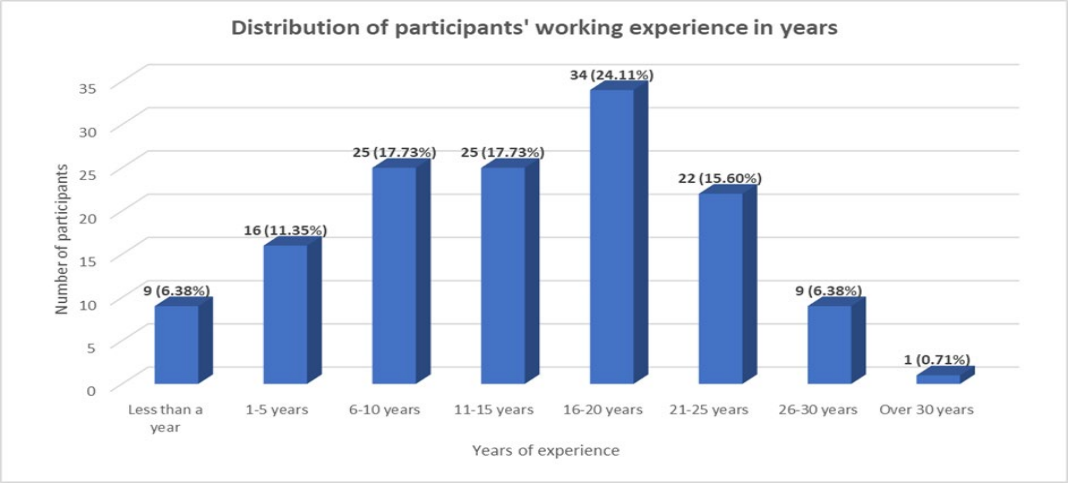

Figure 2: Distribution of participants' working experience

Furthermore, the responses to the 13-items of the questionnaire related to companies' maturity level are presented in Figure 3. Questions 1-3 refer to maturity level 2, questions 4-6 are related to maturity level 3, questions 7-9 refer to maturity level 4, and questions 10-13 are related to maturity level 5. All questions used a Likert scale from 1 to 5. Based on the results, it is obvious that mostly positive responses in terms of the importance of the practices and statements are observed. However, the neutral responses are also high. On the contrary, there are fewer responses which regard these matters to be of lesser or no importance at all.

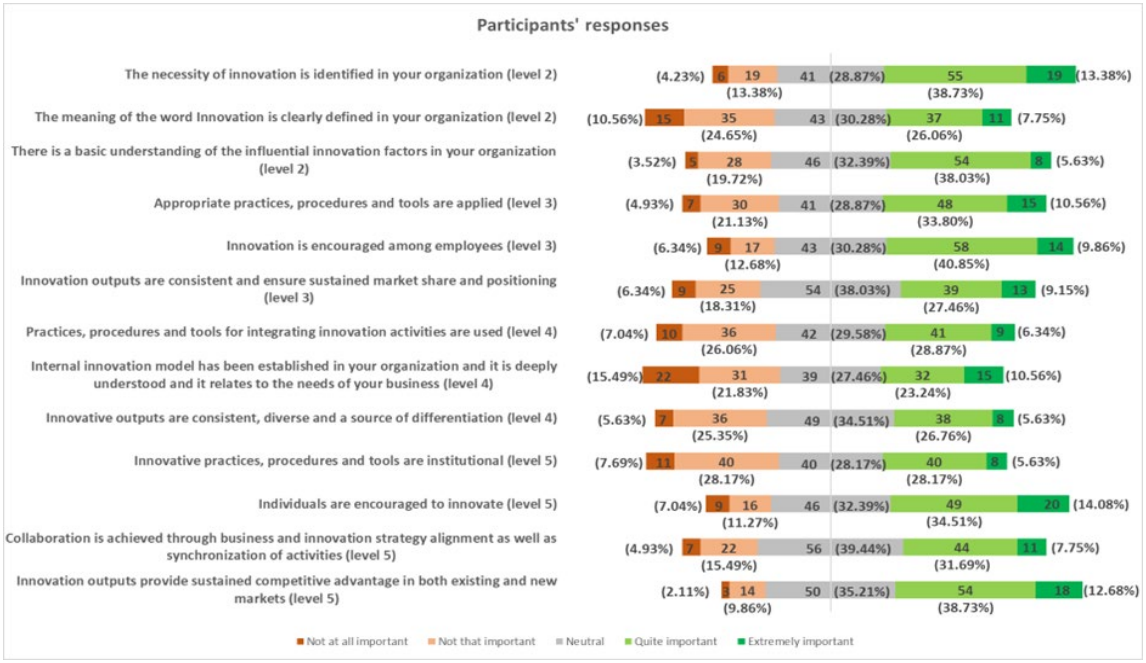

Figure 3: Distribution of participants response to each question related to company's maturity level

Moreover, Tables 1-4 present the mean value of the participants' responses to each question. Based on the outcomes, when taking the mean value of the participants' responses into account, it can be inferred that the open innovation thinking capabilities of the companies examined are mostly focused on maturity Levels 5, 3, and 2 while Level 4 has the lowest mean value. Therefore, companies should focus more on actions that would also help them improve in that regard to achieve better innovation competences and organization cultures. From Table 3 it can be observed that lowest mean value has been received to the response " our organization internal innovation model has been establish and it is deeply understood and it has relation to the needs of our business ", thus greater emphasis should be given to establishing innovation models and to understanding the correlation between business needs and innovation models.

Table 1: Maturity Level 2 statements

Statement	Average
The necessity of innovation is identified in your organization (in Finnish Tarve innovaatiotoiminnalle on identifioitu organisaatiossasi)	3.44
In your organization the meaning of the word Innovation is clearly defined (in Finnish Innovaation käsite on organisaatiossasi selkeästi määritelty)	2.96
In your organization there is a basic understanding of the influential innovation factors (in Finnish Organisaatiossasi on perusymmärtämys innovaatioihin vaikuttavista tekijöistä)	3.23
Mean of responses at Maturity Level 2	3.21

Table 2: Maturity Level 3 statements

Statement	Average
Appropriate practices, procedures and tools are applied (in Finnish: Asianmukaiset käytänteet ja toimintatavat ovat käytössä)	3.24
Innovation is encouraged among employees (in Finnish: Työntekijöiden keskuudessa innovaatioihin rohkaistaan)	3.36
Innovation outputs are consistent and ensure sustained market share and positioning (in Finnish: Innovaatiotoiminnan tulokset ovat yhdenmukaisia ne varmistaa vakaan aseman markkinoilla)	3.16
Mean of responses at Maturity Level 3	3.25

Table 3: Maturity Level 4 statements

Statement	Average
Practices, procedures and tools for integrating innovation activities are used (in Finnish: Käytänteet, toimintatavat ja työkalut on integroitu käytössä oleviin innovaatioaktiviteetteihin)	3.02
In our organization internal innovation model has been establish and it is deeply understood and it has relation to the needs of our business (in Finnish: On olemassa sisäinen innovaatiomalli meidän organisaatiossa ja se on syvällisesti ymmärretty ja sillä on yhteys liiketoiminnan tarpeisiin)	2.91
Innovative outputs are consistent, diverse and a source of differentiation (in Finnish: Innovatiiviset tuotokset ovat johdonmukaisia, monipuolisia ja erilaistamisen lähteitä)	3.03
Mean of responses at Maturity Level 4	2.99

Table 4: Maturity Level 5 statements

Statement	Average
Innovative practices, procedures and tools are institutional (in Finnish: Innovatiiviset käytänteet, toimintatavat ja työkalut ovat vakiintuneita)	2.96
Individuals are empowered to innovate (in Finnish: Yksilöt ovat oikeutettuja innovoimaan)	3.39
Collaboration is achieved through business and innovation strategy alignment as well as synchronization of activities (in Finnish: Onnistunut yhteistyö saavutetaan niveltämällä liiketoiminta- ja innovaatiostrategia sekä synkronisoimalla aktiviteetit)	3.21
Innovation outputs provide sustained competitive advantage in both existing and new markets (in Finnish: Innovaatiotuotokset antavat pysyvän kilpailuedun nykyisillä ja uusilla markkinoilla)	3.50
Mean of responses at Maturity Level 5	3.27

5. Discussion

The general findings suggest that open innovations have been accepted in the companies examined at a moderate level. This means that strategy-driven innovation work should be introduced and enhanced. Creating networks and ecosystems utilizing both internal and external capabilities should be set up to enhance the open innovation maturity levels (Chesbrough, 2019). Organizations that have more advanced innovation maturity levels also have better performance across key financial as well as innovation metrics. Their innovation speed, scale, and effectiveness is better than their competitors. They can also convert their innovations into financial outcomes more rapidly and efficiently than their peers. Mature companies are more likely to outperform their less mature peers on profitability and also achieve higher operating margins (Densik et al, 2023).

An increased effort should be made to change the organizational culture towards a more innovation driven one, allowing idea generation and other innovation activities such as brainstorming amongst their employees. Organization support in addition to open innovation activities enhance innovation (Zang et al, 2022) and should thus also be taken into consideration. The significance of corporate change management should also be taken into consideration in addition to organizational support in the innovation enhancement process of a company. Adopting an open innovation culture also requires changes in the organizational management. For a smooth innovation enhancement process, companies should consider and apply appropriate approaches and methods ensuring motivated employees and also short-term and long-term benefits, such as the one presented by Kotter (1996).

6. Conclusion

Overall, it can be concluded that companies with a high level of open innovation maturity are better positioned to take advantage of the full potential of external knowledge and resources in order to drive innovation, obtain and maintain a competitive advantage. As the main aim of innovation is creating and sustaining value, organizations should utilize their innovation capabilities to their full potential in order to enhance their performance, increase profits, and enable organizational growth as well as maintaining or gaining competitive advantages within their market position. Open innovation allows for innovation utilizing both internal and external capabilities and also allows for a better understanding of opportunities and threats. Our findings conclude that the importance of the innovation practices and statements observed, a small number of responses could be noted, which regarded these matters to be of lesser or no importance. Therefore, companies should focus more on actions that would also help them improve in that regard to achieve better innovation competences and organization cultures.

To fully utilize open innovation, agile business models and processes for managing partnerships as well as a culture of collaboration should be established (Lampropoulos & Siakas, 2018). Our study finds lowest mean values for the establishment of the organization's internal innovation model, its deep understanding and its relation to the needs of the business. Thus, greater emphasis should be put on the innovation models. The innovation levels should be continuously assessed and adapted by using performance metrics as well as market feedback to further enhance and encourage innovation activities. Activities such as idea-sharing platforms and both internal and external partner networks with an organizational culture allowing for mistakes and experimentation and thus learning are key elements of an innovative organization. Furthermore, open innovation maturity could be enhanced by expanding the awareness of diverse innovation opportunities, fostering collaboration with external partners across different dimensions of innovation, aligning innovation efforts with strategic objectives, and optimizing resource utilization. By establishing a holistic approach to innovation and also enhancing a culture of openness and continuous improvement, organizations can leverage external resources more effectively, cultivate innovation ecosystems, and remain competitive in dynamic markets. (Keely et al, 2013). It should be noted that the survey was completed by university students, thus the results of the study are limited thereto, and further studies should be completed by giving the survey directly to companies. The aim of this study was to establish the maturity levels prevailing in different companies and also to highlight the need for innovation activities, in particular open innovation. Our study provides guidelines for the implementation and the overall level of open innovation activities. Open innovation maturity should be enhanced to harness external knowledge, resources and capabilities to further foster and drive growth, innovation and competitive advantages in today's rapidly changing business environment.

References

Chesbrough, H.W. (2003). Open Innovation: The New Imperative for Creating and Profiting from Technology, Harvard Business Press, Boston, MA.

Chesbrough, H. and Bogers, M. (2014). Explicating open innovation: Clarifying an emerging paradigm for understanding innovation. New Frontiers in Open Innovation. Oxford: Oxford University Press, Forthcoming, 3-28.

Chesbrough, H. (2019). Open Innovation Results: Going Beyond the Hype and Getting Down to BusinessGoing Beyond the Hype and Getting Down to Business. https://doi.org/10.1093/oso/9780198841906.001.0001

Dencik, J., Fisher, L.-G., Higgins, L., Lipp, A., Marshall, A. and Palmer, K. (2023). Factors that make open innovation more successful than traditional approaches. Strategy & Leadership, 51(5), 22–29. https://doi.org/10.1108/SL-05-2023-0057

Enkel, E., Bell, J., and Hogenkamp, H. (2011). Open innovation maturity framework. International Journal of Innovation Management, 15(06), 1161-1189. https://doi.org/10.1142/S1363919611003696

Enkel, E., Bogers, M., and Chesbrough, H. (2020). Exploring open innovation in the digital age: A maturity model and future research directions. R & D management, 50(1), 161-168. https://doi.org/10.1111/radm.12397

Kanakaris, V., Lampropoulos, G., and Siakas, K. (2019). A Survey and a Case-Study Regarding Social Media Security and Privacy on Greek Future IT Professionals. International Journal of Human Capital and Information Technology Professionals (IJHCITP), 10(1), 22–37. https://doi.org/10.4018/IJHCITP.2019010102

Keeley, L., Pikkel, R., Quinn, B., and Walters, H. (2013). Ten Types of Innovation: The Discipline of Building Breakthroughs. John Wiley & Sons.

Lampropoulos, G., Rahanu, H., Georgiadou, E., Siakas, D., and Siakas, K. (2024). Reconsidering a Sustainable Future Through Artificial Intelligence of Things (AIoT) in the Context of Circular Economy. In Artificial Intelligence of Things for Achieving Sustainable Development Goals (pp. 1-20). Cham: Springer Nature Switzerland.https://doi.org/10.1007/978-3-031-53433-1_1

Lampropoulos, G., and Siakas K. (2018). Communication in Distributed Agile Software Development: Impact of Social Media – Social Networking. In Proceedings of BCS Quality Specialist Group's Annual International 26th Software Quality Management (SQM) conference, London, United Kingdom, pp. 43–59.

Luan, X., Wang, X., and Li, N. (2024). Open innovation, digital transformation, the mediating effect of technological maturity and diversity. Technology analysis & strategic management, 1-16. https://doi.org/10.1080/09537325.2024.2311294

Makkonen, P., Lampropoulos, G., and Siakas, K. (2020). Effect of Social Media on Knowledge Work. International Journal of Social and Business Sciences, 14(12), 1274-1280. Available at https://publications.waset.org/10011689/effect-of-social-media-on-knowledge-work

Makkonen, P., Lampropoulos, G. and Siakas, K. (2019). Security and privacy issues and concerns about the use of social networking services. In S. Carliner (Ed.), Proceedings of E-Learn: World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education. Association for the Advancement of Computing in Education (AACE). New Orleans, Louisiana, United States, pp. 457–466. https://www.learntechlib.org/primary/p/211113

Makkonen, P., Siakas, K., Lampropoulos, G., and Brusila-Meltovaara, K. (2023, September). Open Innovation Maturity in Companies. In European Conference on Innovation and Entrepreneurship (Vol. 18, No. 1, pp. 545-551). https://doi.org/10.34190/ecie.18.1.1622

Malodia, S., Chauhan, C., Jabeen, F. and Dhir, A. (2023). Antecedents and Consequences of Open Innovation: Conceptual Framework. International Journal of Entrepreneurial Behavior & Research, https://doi.org/10.1108/IJEBR-03-20220235

Paulk, M. C., Curtis, B., Chrissis, M. B., and Weber, C. V. (1993). Capability maturity modelSM for software, version 1.1. IEEE software, 10(4), 18-27.https://doi.org/10.21236/ADA263403

Pereira, L., Fernandes, A., Sempiterno, M., Dias, Á. L., da Costa, R. J. L., and dos Santos António, N. J. (2021). Knowledge management maturity contributes to project-based companies in an open innovation era. Journal of open innovation, 7(2), 1-20. https://doi.org/10.3390/joitmc7020126

Rocha, G. V., Mello, C. H. P., Paiva, A. P. d., Pereira, T. F. and Turrioni, J. B. (2019). Using factorial analysis for validating a maturity measurement instrument in open innovation. Acta scientiarum. Technology, 41(1), 37470-e37470. https://doi.org/10.4025/actascitechnol.v41i2.37470

Siakas, K., Georgiadou, E., and Siakas, D. (2016). The influence of national and organisational culture on knowledge sharing in distributed teams. International Journal of E-Entrepreneurship and Innovation (IJEEI), 6(1), 19-37. https://doi.org/10.4018/978-1-7998-0417-8

Siakas, D. and Siakas. K. (2020). Value Proposition through Knowledge Sharing and Crowd-Sourcing: Engaging Users of Social Networking, Journal of Media Management and Entrepreneurship (JMME), IGI Global, Vol. 2 Iss. 1, pp. 124-138. https://doi.org/10.4018/JMME.2020010108

Siakas, D. and Siakas, K. (2016). User Orientation through Open Innovation and Customer Integration. In: Kreiner, C., O'Connor, R., Poth, A., Messnarz, R. (eds) Systems, Software and Services Process Improvement. EuroSPI 2016. Communications in Computer and Information Science, vol 633. Springer, Cham. https://doi.org/10.1007/978-3-319-44817-6_28

Siakas, K., Kermizidis R., and Kontos K. (2014). Using Social Media in Business as a Tool for Open Innovations, Business-Related Scientific Research Conference (ABSRC 2014), Milan, Italy, December 10-12.

Zhang, Y., Xi, W., and Xu, F. Z. (2022). Determinants of employee innovation: an open innovation perspective. Journal of Hospitality Marketing & Management, 31(1), 97–124. https://doi.org/10.1080/19368623.2021.1934933