

Intellectual Capital on Innovation Performance: The Mediating Role of Inter-Organizational Learning in Frozen Shrimp SMEs

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ABSTRACT

Purpose: This study examines the effect of intellectual capital on innovation performance of frozen shrimp SMEs in North Kalimantan, with inter-organizational learning as a mediator.

Research Method: A quantitative survey was conducted on 278 SMEs. Data were collected using structured questionnaires and analyzed with PLS-SEM to test direct and mediating relationships among variables.

Results and Discussion: Intellectual capital significantly improves both inter-organizational learning and innovation performance. Inter-organizational learning has the strongest effect on innovation, indicating that collaboration and knowledge exchange with external partners are critical. It also mediates the relationship between intellectual capital and innovation performance, showing that internal resources become more effective when supported by external learning.

Implications: The findings suggest that SMEs should strengthen knowledge-based resources and expand collaborative networks to enhance innovation. Policymakers should support capacity building and partnerships. Future studies may include additional variables or sectors for broader insights.

Keywords: intellectual capital; innovation performance; inter-organizational learning; SMEs; frozen shrimp industry.

Introduction

Small and medium-sized businesses (SMEs) in the frozen shrimp sector of North Kalimantan hold a strategic role in the local economy, particularly as a leading non-oil and gas export sector. With substantial marine resource potential and access to export markets, this sector is a significant economic pillar and a primary source of community income. However, empirical evidence indicates that many frozen shrimp-processing SMEs face serious challenges in enhancing their innovation capacity. Low innovation capability, whether in products, processes, packaging technology, or quality certification, is often driven by limited knowledge, technology, and external networks. This condition aligns with findings showing that SMEs in the fisheries sector generally experience constraints in innovation capacity due to insufficient access to technology and industry knowledge (Hidayat & Pok, 2025)



For SMEs, intellectual capital is essential. Intellectual capital comprises relational, structural, and human capital, which contribute to enhancing innovation capability, process efficiency, and adaptability to market changes. Recent studies indicate that intellectual capital significantly influences innovation and SME performance (Do et al., 2026). The Resource-Based View (RBV) perspective posits that sustainable competitive advantage can only be achieved when organizations effectively manage resources that are valuable, rare, inimitable, and non-substitutable (Aljuboori et al., 2022). Therefore, strengthening intellectual capital is essential for frozen shrimp SMEs to improve innovation and long-term competitiveness. Nevertheless, intellectual capital alone is often insufficient, especially because SMEs generally operate under internal constraints such as technological limitations and human resource capacity. Thus, inter-organizational learning becomes a crucial mechanism for expanding knowledge and enhancing innovation. Collaboration with exporters, research institutions, local government, and related industries enables SMEs to acquire new knowledge, updated technology, and best practices in processing, packaging, and quality certification. Previous studies emphasize that collaborative inter-organizational learning significantly enhances SME innovation capabilities, especially in food and fisheries-based industries (Aljuboori et al., 2022; Yuwono et al., 2026).

The current study investigates the relationship between intellectual capital and the innovation performance of frozen shrimp SMEs in North Kalimantan and examines whether inter-organizational learning mediates this relationship. This study is particularly important due to the limited empirical research in the fisheries sector, specifically the frozen shrimp industry, that integrates RBV perspectives, intellectual capital, innovation, and inter-organizational learning in a single analytical framework. Intellectual capital and innovation performance among SMEs are positively correlated, according to recent research. Improved intellectual capital, for example, boosts innovation capacities, which in turn boosts business performance, according to research on manufacturing SMEs (Aljuboori et al., 2022).

Other studies highlight the role of knowledge management processes, alongside intellectual capital, in fostering entrepreneurial orientation and innovation. Findings indicate that intellectual capital, combined with knowledge management, significantly contributes to organizational innovation (Yu et al., 2022). Further research demonstrates that organizational learning capacity facilitates or mediates the conversion of intellectual capital into organizational innovation. For example, Mamilla & Yen (2026) found that intellectual capital influences organizational learning, which subsequently drives innovation.

Literature Review and Hypothesis Development

Intellectual Capital

Intellectual capital refers to the intangible resources that contribute to an organization's value creation and competitive advantage. It is commonly categorized into three main components: Relational, structural, and human capital. While organizational procedures, methods, and databases that facilitate knowledge use constitute structural capital, employees' knowledge, skills, expertise, and experience constitute human capital. Conversely, ties and networks that businesses establish with external stakeholders, such as partners, suppliers, and customers, constitute relational capital. From a theoretical perspective, intellectual capital is closely linked to the Resource-Based View (RBV), which highlights how valuable, uncommon, unique, and non-replaceable resources help businesses maintain a competitive edge. Knowledge-based resources are among the most crucial assets for enterprises, according to academics like Birger Wernerfelt and Jay Barney. Because SMEs have limited access to financial and physical resources, intellectual capital is vital. Prior research has demonstrated that



companies with high levels of intellectual capital are better equipped to foster innovation, improve organizational learning, and adjust to changing environmental conditions.

Inter-Organizational Learning

Inter-organizational learning refers to the process through which organizations acquire, share, and integrate knowledge through interactions with external entities. This includes collaboration with suppliers, customers, competitors, research institutions, and government agencies. Such learning processes enable businesses to access cutting-edge information, innovations, and best practices outside of their own walls (Scuotto, 2023). Inter-organizational learning is often associated with the concept of absorptive capacity, which describes a company's ability to identify, absorb, and use external knowledge. This capability is essential for SMEs, as it allows them to overcome internal resource limitations by leveraging external networks. Empirical research highlights that organizations engaged in active collaboration tend to demonstrate higher levels of innovation and adaptability. In industries characterized by rapid technological changes and strict quality standards, such as the frozen shrimp industry, inter-organizational learning becomes a critical mechanism for maintaining competitiveness and meeting global market requirements.

Innovation Performance

An organization's capacity to create and execute novel concepts in the form of goods, procedures, or advertising tactics is referred to as innovation performance. It is a key indicator of organizational success, particularly in dynamic and competitive environments. Innovation performance can be categorized into several dimensions, comprising process innovation (improvements in manufacturing techniques), marketing innovation, and product innovation (new or improved products and new approaches to promotion and market positioning) (Suchek & Franco, 2024). The literature consistently identifies knowledge as a fundamental driver of innovation. Superior innovation outcomes are more likely to be attained by organizations that efficiently manage and use their knowledge resources. For SMEs, innovation performance is essential not only for growth but also for survival, especially in export-oriented industries where quality standards and customer preferences are constantly evolving. Therefore, understanding the factors that influence innovation performance is critical for enhancing SME competitiveness.

The Relationship between Intellectual Capital and Inter-Organizational Learning

The relationship between intellectual capital and inter-organizational learning is grounded in the idea that internal knowledge resources enable firms to engage more effectively in external knowledge exchange. While structural capital provides the structures and procedures to incorporate such knowledge into organizational operations, firms with strong human capital have the skills to absorb and comprehend external knowledge. Relational capital further facilitates access to external networks, enhancing opportunities for collaboration and learning. Empirical studies have demonstrated that an organization's capacity to engage in inter-organizational learning is greatly improved by intellectual capital. Firms with well-developed intellectual capital are more likely to establish strategic alliances, share knowledge, and engage in collaborative problem-solving. This relationship is particularly important for SMEs, as it allows them to extend their capabilities beyond internal limitations (Sang et al., 2024).



The Relationship between Intellectual Capital and Innovation Performance

Intellectual capital is widely recognized as a key determinant of innovation performance. Human capital contributes to creativity and problem-solving, structural capital ensures the efficient implementation of innovative ideas, and relational capital provides access to external information and market insights. Together, these components form a comprehensive knowledge base that supports innovation (Capital & Review, 2021). Previous studies have repeatedly shown that intellectual capital and innovation performance are positively correlated in a variety of industries. Because they are better able to create, develop, and apply new ideas, organizations with higher levels of intellectual capital typically demonstrate greater innovation capabilities. In SMEs, this relationship is particularly significant, as intellectual capital often serves as a substitute for limited financial and technological resources.

The Relationship between Inter-Organizational Learning and Innovation Performance

Inter-organizational learning provides access to a variety of knowledge sources, which is essential for improving innovation performance. Through collaboration and knowledge exchange, firms can acquire new technologies, improve production processes, and develop innovative products. This external learning process complements internal knowledge and expands the firm's innovation capacity (Milojević et al., 2025). Research indicates that firms engaged in active inter-organizational learning are more innovative and adaptable to environmental changes. Collaborative learning enables organizations to combine many viewpoints and areas of expertise, resulting in more creative and efficient problem-solving. For SMEs in the frozen shrimp industry, such learning can involve partnerships with exporters, participation in training programs, and collaboration with research institutions, all of which contribute to improved innovation performance.

The Mediating Role of Inter-Organizational Learning

Inter-organizational learning is increasingly recognized as a mediating mechanism that links intellectual capital to innovation performance. While intellectual capital provides the necessary resources, inter-organizational learning transforms these resources into actionable knowledge that drives innovation. This mediating role highlights the importance of dynamic capabilities in leveraging internal resources for external opportunities. From the RBV perspective, resources alone are insufficient to achieve competitive advantage unless they are effectively utilized. Inter-organizational learning serves as a bridge, enabling firms to convert intellectual capital into innovation outcomes. Empirical evidence supports this mediating effect, showing that firms with strong intellectual capital achieve higher innovation performance when they actively engage in external learning processes (Lee, 2023).

Research Gap and Hypothesis Development

Few studies have examined the mediating role of inter-organizational learning, particularly in the context of SMEs in the frozen food and fisheries industries, despite a wealth of research on intellectual capital and innovation. Most prior studies focus on manufacturing or high-technology sectors, leaving a gap in understanding how knowledge resources and learning processes interact in traditional industries. The unique characteristics of frozen shrimp SMEs, such as dependency on export markets, strict quality standards, and reliance on external stakeholders, make inter-organizational learning particularly relevant. Therefore, this research attempts to close this gap by integrating



intellectual capital, inter-organizational learning, and innovation performance into a comprehensive model.

The following theories are put out in light of the theoretical and empirical review:

H_1 : Intellectual Capital positively affects Inter-Organizational Learning

H_2 : Intellectual Capital positively affects Innovation Performance

H_3 : Inter-Organizational Learning positively affects Innovation Performance

H_4 : Inter-Organizational Learning mediates the relationship between Intellectual Capital and Innovation Performance

Research Method

This study uses a survey method as part of a quantitative approach. Purposive sampling was used to select 278 respondents from the 150 frozen shrimp production SMEs in North Kalimantan that constitute the research population. A closed-ended questionnaire with a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) was used to collect data. Partial Least Squares-Structural Equation Modeling (PLS-SEM) with SmartPLS 4 was used to analyze the data. The analysis included construct validity testing, composite reliability, and hypothesis testing using path coefficients and p-values.

Among the research variables is intellectual capital, which comprises relational, structural, and human capital. Inter-Organizational Learning: including collaboration, knowledge transfer, and joint adaptation. Innovation Performance: measured through product, process, and marketing innovations.



Source: Data processed 2025

Figure 1. Research Conceptual Framework

Results and Discussion

Analysis Result

This study utilized data obtained directly from respondents' answers. The distribution and collection of questionnaires were conducted in person by the researcher with assistance from respondents, who were generally company owners or leaders participating in the study. The main challenge was securing participation from these leaders or owners, despite efforts to explain the study's benefits and provide an overview of the findings to participating companies. Some expressed reluctance due to concerns that the process would disrupt their work routines, while others declined without providing a clear reason.

The questionnaires were distributed to each participating company beginning on May 1, 2025, and the collection process was completed on November 25, 2025. A total of 300 questionnaires were distributed, with several companies requesting that their identities remain confidential. Of the questionnaires distributed, 290 were returned, yielding a response rate of 90%. The researcher conducted an initial screening of the collected questionnaires to ensure that each was completed by

the company's owner or top manager, who had been running the business for at least 5 years. Although the target respondent criteria had been clearly communicated, errors may have occurred due to respondent inattentiveness. The second stage of screening involved checking the completeness of responses for all questionnaire items. If any item was left unanswered (resulting in missing data), the survey was excluded from any additional analysis.

Table 1. Date Collection Results for Questionnaire Distribution

Information	Quantity	Percentage
Distributed questionnaires	300	100
Returned questionnaires	290	90
Unreturned questionnaires	10	3.33
Unusable questionnaires	2	6.67
Returned questionnaires that are suitable for analysis	278	92.67

Source: Data processed 2025

These two screening stages yielded 278 completed surveys eligible for further examination. The researcher judged that the final number of valid questionnaires was sufficient to test the proposed hypotheses and that the sample met the assumptions of sample adequacy. The relatively high participation rate in this study may be attributed to several factors. First, effective cooperation with the owners or leaders of the participating companies, who voluntarily agreed to participate as respondents. Conversely, for the questionnaires that were not returned, the researcher suspected that this was due to the respondents' unavailability, as company leaders or owners were often out of town. The complete results of the data collection process are presented in Table 2.

Table 2. Respondent Characteristics Based on Company and Business Category

No	Information	Frequency	Percentage	Amount
1	Company Age			278
	a. 5 to 10 years	136	48.92	
	b. 11 to 20 years	93	33.45	
	c. >20 years	49	17.63	
2	Business categories			278
	a. Medium-sized businesses	94	33.81	
	b. Small businesses	184	66.19	
3	Respondents by Age			278
	a. 20–25	23	8.27	
	b. 26–30	52	18.71	
	c. 31–35	67	24.1	
	d. >35	136	48.92	
4	Respondents by gender			278
	a. Male	189	67.99	
	b. Female	89	32.01	
5	Respondents by education level			278
	a. High school	159	57.19	
	b. Bachelor's degree	99	35.62	
	c. Master's degree	20	7.19	

Source: Data processed 2025

The majority of respondents were 35 years old and below (48.92%). Adolescence is the stage of life when individuals are considered capable of taking responsibility for themselves, making adult decisions, and functioning autonomously within society. Table 2 presents the age distribution of the respondents. Of the total participants, 189 (67.99%) were male, and 89 (32.01%) were female. This indicates that the respondent group was predominantly male. Men are commonly associated with characteristics such as a tendency to prioritize logic, interest in technical or mechanical domains, and a propensity to engage in bold or risky actions in certain situations. The data illustrate a reasonably balanced distribution between genders. For a comparison between male and female respondents, refer to Table 2.

Regarding the respondents' educational level, 159 individuals (57.19%) had at least a high school education, 99 held a bachelor's degree (35.62%), and 20 held a Master's degree (7.19%). Information on the participants' specific attributes by highest educational attainment is available in the corresponding table. Education plays an essential role in personal development across all areas of life. It not only provides knowledge and practical skills but also influences individuals' cognitive processes, understanding of their environment, and social interactions. Furthermore, education facilitates better economic and social prospects.

Validity And Reliability Test Results

To assess construct reliability, the measurement model (outer model) requires a reliability test in addition to a validity test. The objective of a reliability test is to demonstrate an instrument's precision, consistency, and capacity to measure a construct. A construct is deemed reliable if its Cronbach's alpha or composite reliability exceeds 0.70 (Chin, 1998, as cited in Achjari, 2004).

Table 3. Cronbach's Alpha & Composite Reliability

Variable	Cronbach's Alpha	Composite Reliability
Intellectual Capital (IC)	0.963	0.966
Inter Organizational (IO)	0.922	0.936
IC*IO*IR	1.000	1.000
Innovation Performance (IP)	0.908	0.932

Source: Data processed 2025

Indicating that all variables are good and reliable from Table 3. Furthermore, based on Table 4, it is concluded that all measurement items have good convergent and discriminant validity values according to the conditions that have been set following (Hair, et.al 2019), so that the structural model test stage (inner model) can be carried out.

Table 4. Discriminant Validity Analysis

Variable	IC	IO	IC*IO*IP	IP
Intellectual Capital (IC)	0.817			
Inter Organizational (IO)	0.519	0.789		
IC*IO*IR	0.589	0.728	1.000	
Innovation Performance (IP)	0.524	0.624	0.702	0.844

Source: Data processed 2025

Structural Model Analysis (Inner Model)

Focusing on the significance of the p-value can help determine whether a hypothesis is supported. Consequently, in the bootstrapping method, estimates and standard errors are obtained from empirical data rather than from statistical assumptions. A hypothesis in this study is considered supported if the p-value is less than 0.05. On the other hand, if the p-value is greater than 0.05. The hypothesis is not supported (Hair, 2019)

Table 5. Results of Structural Model Analysis

Hypothesis	Original Sample	Statistik T (O/STDEV)	Pvalues	Result
H1: IC → IO	0.494	5.246	0.000	Supported
H2: IC → IP	0.663	6.697	0.000	Supported
H3: IOL → IP	0.674	10.579	0.000	Supported
H4: IC → IOL → IP	0.633	5.320	0.000	Supported

Source. Data processed 2025

Table 5 shows the outcomes of the partial least squares structural equation modeling (PLS-SEM) structural model testing. Overall, the four hypotheses tested showed positive path coefficients with significant T-statistics at the 0.05 significance level (p-value < 0.05). This indicates that all the model's variables have been shown to have meaningful associations and are consistent with theory and prior research. Intellectual Capital's Impact on Inter-Organizational Learning (H1: IC → IO) Coefficient value = 0.494; T = 5.246; p = 0.000 Hypothesis Supported.

This indicates that intellectual capital has a positive and significant influence on inter-organizational learning. Accordingly, the better the SMEs' human, structural, and relational capital is, the greater their ability to build collaborations, transfer knowledge, and adapt to external partners. This result is consistent with research by Kianto et al. (2020), which shows that intellectual capital is closely related to learning processes and knowledge creation within organizations. Similarly, Wernerfelt (2020) and Barney (1991), using the Resource-Based View (RBV) perspective, assert that organizations with strong knowledge-based resources are better able to leverage external networks to expand their capabilities. In the context of frozen shrimp SMEs in North Kalimantan, these results demonstrate that SMEs with strong human resource competencies, structured work systems, and strong networks, for example, with exporters, research institutions, or the government, are better able to engage in cross-organizational learning processes.

Intellectual capital's impact on innovation performance (H2: IC → IP) Coefficient value = 0.663; T = 6.697; p = 0.000 Hypothesis Supported. Intellectual capital has been shown to contribute significantly to innovation performance, including marketing, process, and product innovation. The coefficient of 0.663 indicates that this effect is statistically strong. This result is consistent with research. (Hidayat & Pok, 2025) which found that intellectual capital is an important factor driving innovation in manufacturing SMEs. In addition, (Kianto et al., 2017) also emphasized that intellectual capital is a key driver of organizational innovation through knowledge creation and management. In the context of frozen shrimp SMEs, human capital such as technical expertise, processing experience, and food quality training plays a significant role in generating process innovations and new quality standards. Structural capital, such as SOPs, quality documentation, and quality management systems, enables SMEs to

increase the efficiency and stability of innovation. Meanwhile, relational capital, such as relationships with exporters and suppliers, encourages product and marketing innovation.

The Effect of Inter-Organizational Learning on Innovation Performance (H3: IO → IP) Coefficient value = 0.674; T = 10.579; p = 0.000 Hypothesis Supported. With the largest coefficient in the model, the inter-organizational learning variable most strongly influences innovation performance. These results indicate that the intensity of collaboration, knowledge exchange, and mutual adaptation between SMEs and external parties has a major effect on SMEs' capacity to enhance innovation in production, packaging, and marketing lines. This finding confirms the statement by Salvador & Antonia (that cross-organizational learning is an important driver of innovation performance, especially in the food processing sector. This is also supported by Rizky et al. (2026), who found that active collaboration among SMEs encourages greater innovation in both products and processes. Given the circumstances of the frozen shrimp industry, inter-organizational learning can occur through collaboration with exporters, government-led food-quality training, collaborative research on freezing technology with research institutions, or partnerships with raw-material suppliers. These activities have been proven to increase SMEs' ability to produce relevant innovations that meet export market standards.

Intellectual Capital's Indirect Impact on Innovation Performance Inter-Organizational Learning (H4: IC → IO → IP) Coefficient value = 0.633; T = 5.320; p = 0.000 Hypothesis Supported. These results indicate that inter-organizational learning significantly mediates the effect of intellectual capital on innovation performance. In other words, intellectual capital not only directly influences innovation but also operates through external learning mechanisms to further strengthen it. These results are highly relevant to the RBV (Barney, 1991), where high-value resources (such as relational, structural, and human capital) can only yield advantages if they are processed through the right organizational capability, in this case, inter-organizational learning.

Furthermore, research by (Salvador & Antonia, 2026) and (Yuwono et al., 2026) confirms that organizations better skilled at leveraging external networks are more adept at assimilating and applying knowledge to drive innovation. This aligns with the statement by (Martin-rios et al., 2022) that cooperation and collaboration between business actors are crucial bridges for transforming knowledge into innovation. Therefore, these results confirm that frozen shrimp SMEs not only require internal resources (intellectual capital) but also actively foster interactions, collaborations, and learning with external parties to maximize their innovation potential.

Discussion

This study offers solid empirical support for the idea that inter-organizational learning and intellectual capital can boost the creativity performance of SMEs in the frozen shrimp industry in North Kalimantan. Overall, all proposed hypotheses are supported, indicating that both internal resources and external learning mechanisms are essential to promoting creativity.

First, findings confirm that inter-organizational learning benefits greatly from intellectual capital. This finding implies that SMEs with higher levels of relational, structural, and human capital are better positioned to engage in collaborative learning with external partners. This supports the Resource-Based View (RBV), particularly the argument of Jay Barney and Birger Wernerfelt, which emphasizes that valuable, rare, and inimitable resources enable firms to build strategic capabilities. In this context, a fundamental resource that improves the company's ability to absorb information is intellectual capital, which allows SMEs to effectively acquire, share, and utilize knowledge from external networks. For frozen

shrimp SMEs, this is reflected in their ability to collaborate with exporters, government agencies, and research institutions to improve production practices and meet export standards.

Second, intellectual capital has been found to have a significant direct impact on innovation performance. This indicates that SMEs with well-developed knowledge resources are better able to generate product, process, and marketing innovations. This finding reinforces prior studies highlighting intellectual capital as a key driver of innovation. Practically, human capital, such as technical expertise in shrimp processing and quality control, contributes to process improvements, while structural capital, such as standardized procedures, ensures consistency and scalability. In addition, relational capital enables SMEs to identify market trends and customer demands, thereby facilitating more market-oriented innovations. Thus, intellectual capital not only serves as a strategic asset but also directly enables innovation outcomes.

Third, inter-organizational learning emerges as the most influential variable affecting innovation performance, as indicated by the highest path coefficient. This research emphasizes the crucial role of external cooperation in promoting innovation, particularly for SMEs with limited internal funding. SMEs can obtain new information, technology, and best practices that might not be available internally through relationships with external stakeholders. This supports the view that innovation is increasingly a collaborative process rather than an isolated internal activity. In the frozen shrimp industry, such learning occurs through joint training programs, partnerships with exporters, and collaboration with research institutions on processing and preservation technologies. These activities significantly enhance SMEs' ability to produce innovative products that meet international quality standards.

Finally, according to the mediation study, inter-organizational learning plays a major mediating role in the relationship between innovation performance and intellectual capital. This suggests that, to maximize innovation, intellectual capital alone is insufficient unless it is effectively leveraged through external learning processes. In line with RBV, resources must be transformed into capabilities to generate competitive advantage. Inter-organizational learning serves as a critical mechanism for converting intellectual capital into tangible innovation performance. This finding also aligns with the notion that businesses with stronger ties to the outside world are better able to leverage knowledge for innovation.

This paper expands the RBV framework theoretically by integrating inter-organizational learning as a key capability that bridges internal resources and innovation outcomes. From a practical standpoint, the results imply that SMEs in the frozen shrimp sector should not only invest in developing intellectual capital but also actively engage in collaborative networks to enhance learning and innovation. Strengthening partnerships with government agencies, exporters, and research institutions is essential to sustain competitiveness in the global market.

Conclusion

This study examines the relationships among inter-organizational learning, intellectual capital, and innovation performance in frozen shrimp SMEs in North Kalimantan. The findings indicate that intellectual capital has a major impact on innovation performance and inter-organizational learning. Furthermore, inter-organizational learning emerges as a key mechanism that strengthens innovation outcomes. The results also confirm that inter-organizational learning acts as an important mediating variable, linking internal knowledge resources with innovation capabilities. Overall, the study



emphasizes how internal resources and external learning processes are intertwined in supporting SME innovation.

This study advances our understanding by extending the Resource-Based Perspective by incorporating inter-organizational learning as a strategic capability. It emphasizes that innovation is driven not only by internal resources but also by firms' ability to collaborate and learn from external partners. Practically speaking, the study provides policymakers and SME managers, especially in the food processing and fishing industries, with information to prioritize the development of intellectual capital and foster collaborative networks. Strengthening partnerships with stakeholders such as government agencies, exporters, and research institutions can enhance knowledge exchange and support sustainable innovation.

This study has several shortcomings despite its merits. First, the study's focus on frozen shrimp SMEs in North Kalimantan may limit the applicability of its findings to other sectors of the economy or geographic areas. The cross-sectional design, which comes in second, does not capture dynamic changes over time in intellectual capital and learning processes. Future research is encouraged to expand the scope across sectors and geographical contexts and to employ longitudinal approaches to understand causal relationships better. Additionally, future studies may explore other mediating or moderating variables, such as digital capabilities or organizational culture, to provide a more comprehensive understanding of SMEs' innovation performance.

References

- Aljuboori, Z. M., Singh, H., Haddad, H., Al-ramahi, N. M., & Ali, M. A. (2022). Intellectual Capital and Firm Performance Correlation: The Mediation Role of Innovation Capability in Malaysian Manufacturing SMEs Perspective. *Capital, I., & Review, L.* (2021). Intellectual Capital and Innovation Performance: Systematic Literature Review. 1–19.
- Do, H., Nguyen, B., & Dao, M. (2026). Social capital and SME innovations: the importance of knowledge combination and customer demands. *Small Business Economics*, 66, (1). Springer US. <https://doi.org/10.1007/s11187-025-01105-3>
- Hair, E. al. (2019). Article information: When to use and how to report the results of PLS-SEM.
- Hidayat, A. S., & Pok, W. C. (2025). Empowering SMEs' innovation through intangible factors. *Journal of Innovation and Entrepreneurship*, 1–25. <https://doi.org/10.1186/s13731-024-00437-w>
- Kianto, A., Sáenz, J., & Aramburu, N. (2017). Knowledge-based human resource management practices, intellectual. *Journal of Business Research*, 81(August), 11–20. <https://doi.org/10.1016/j.jbusres.2017.07.018>
- Lee, C. (2023). Knowledge sharing and innovation performance: a case study on the impact of organizational culture, structural capital, human resource management practices, and relational capital of real estate agents. 51, 1–16. <https://doi.org/10.1057/s41599-023-02185-w>
- Mamilla, R., & Yen, Y. Y. (2026). Intellectual capital and innovation in higher education institutions: the mediating role of knowledge management and technology usefulness. January. <https://doi.org/10.3389/feduc.2026.1742992>
- Martin-Rios, C., Erhardt, N. L., & Manev, I. M. (2022). Interfirm collaboration for knowledge resources interaction among small innovative firms. *Journal of Business Research*, 153(December 2020), 206–215. <https://doi.org/10.1016/j.jbusres.2022.08.024>
- Milojević, M., Omarova, B., Trifonov, I., Tsvetkova, L., & Duisebayeva, A. (2025). The influence of innovative components of intellectual capital on commercial success.
- Rizky, I., Hutabarat, K., Fitriadi, M., & Hadawiyah, A. (2026). Strategic Knowledge Management terhadap Intellectual Capital dan Innovation Performance UKM Manufaktur di Kota Bandar Lampung.
- Salvador, N., & Antonia, B. (2026). Enhancing open innovation in Argentine SMEs: the role of intellectual capital dimensions.



- Sang, B., Noor, R., Mohd, E., & Aghamohammadi, N. (2024). How does supply chain collaboration improve innovation performance of SMEs? The roles of absorptive capacity and business environment. 9(July).
- Scuotto, V. (2023). The effect of social networking sites and absorptive capacity on SMES ' innovation performance. The Journal of Technology Transfer, 42(2), 409–424. <https://doi.org/10.1007/s10961-016-9517-0>
- Suchek, N., & Franco, M. (2024). Inter - organisational Cooperation Oriented Towards Sustainability Involving SMEs: a Systematic Literature Review. Journal of the Knowledge Economy, 1952–1972. <https://doi.org/10.1007/s13132-023-01196-x>
- Yu, Q., Aslam, S., Murad, M., Jiatong, W., & Syed, N. (2022). The Impact of Knowledge Management Process and Intellectual Capital on Entrepreneurial Orientation and Innovation. 13(May), 1–19. <https://doi.org/10.3389/fpsyg.2022.772668>
- Yuwono, W., Seputra, J. K., & Kesumahati, E. (2026). Business: Development Of Innovation Capability Through Intellectual Capital, Psychological Capital, Authentic Leadership, And Knowledge Management In The Trading Industry. 27.

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