

# Knowledge management capability and innovation ambidexterity: The role of intellectual capital and intangible competitive advantage

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## Abstract

This study examines the impact of intellectual capital enabled knowledge capability management on innovation ambidexterity and the moderating role of intangible resources advantage through the lens of open innovation. The sample consists of 105 companies in the Thai food industry. To enhance understanding of how companies can achieve success in innovation, an interesting result of the study is that it helps companies explore new knowledge and leverage existing or new knowledge to innovate more continuously. Based on the presented findings, intangible resources advantage plays a positive moderating role in this relationship: knowledge capability management and intangible resources advantage work together to foster innovation ambidexterity.

*Keywords:* Intangible Resources Advantage, Intellectual Capital, Innovation Ambidexterity, Knowledge Capability Management

## 1. Introduction

Globalization and technological advancements have created intense competition in the business environment. As a result, companies must innovate and introduce new products or services. In today's rapidly evolving business landscape, organizations are increasingly recognizing the pivotal role of knowledge management and innovation ambidexterity in sustaining competitive advantage. The dynamic interplay between these elements can significantly influence an organization's ability to navigate the complexities of modern markets. At the heart of this interplay lies intellectual capital, encompassing the collective knowledge, skills, and experiences within an organization. The strategic management of this intellectual capital cultivates intangible competitive advantages that are crucial for long-term success.

For example, Lei et al. (2020) found that a knowledge-centered culture positively mediates the relationship between HRM practices and innovation

capability, significantly enhancing the impact of HRM practices on knowledge management capability and both exploitative and exploratory innovation. Intellectual capital, which includes human capital, structural capital, and relational capital, plays a critical role in enabling organizations to effectively manage knowledge and foster innovation. Human capital refers to the experience, education, skills, and distinctive attributes of an organization's employees (Cuganesan, 2005); structural capital refers to the procedures, systems, internal structures, and organizational culture (Lee, 2011); and relational capital refers to connections with stakeholders, including suppliers, clients, governments, and society at large. It also encompasses additional relational resources such as the firm's image and customer loyalty (Machorro et al., 2016). Together, these components form a robust foundation for knowledge management and innovation.

The concept of intangible competitive advantage, rooted in the strategic utilization of intellectual capital, emphasizes the importance of non-physical assets that provide a sustainable edge over competitors. Unlike tangible assets such as machinery and buildings, intangible assets are often harder to replicate, thereby offering a distinct source of competitive differentiation. When these intangible assets are effectively leveraged through knowledge management practices, they can drive both exploratory and exploitative innovation, thereby enhancing an organization's ambidexterity. Previous studies, such as those by Hsu and Sabherwal (2011), have examined how knowledge management mediates the impact of intellectual capital on innovation. However, most research on the interaction between intellectual capital, knowledge management strategies, and innovation has focused on industrialized countries. The relative scarcity of empirical data from emerging economies, particularly Thailand, prompted this study. This paper aims to explore the intricate relationships between knowledge management capability, innovation ambidexterity, intellectual capital, and intangible competitive advantage. By examining these interconnections, we seek to provide insights into how organizations can strategically harness their intellectual capital to foster innovation, manage knowledge effectively, and achieve a sustainable competitive advantage in the contemporary business environment.

This work makes several contributions to the field of innovation. The research objectives of this study are:

- To provide new evidence on how intellectual capital enables the management of knowledge capability to increase innovation ambidexterity in prior intellectual capital research.
- To develop this argument by focusing on knowledge capability management in the food industry.

This research follows these steps:

1. Literature review: The initial step involves reviewing literature to analyze the alignment and relationships of conceptual frameworks.
2. Theoretical explanation: The second step entails explaining theories to lay the foundation and develop research hypotheses.

3. Methodological description: The third step explains the research methodology, including sample groups, data, and measurement techniques.
4. Research analysis: The fourth step involves analyzing the research findings.
5. Discussion and conclusion: The final step includes discussing the results and summarizing the research findings.

## 2. Literature Review

### 2.1. Intellectual Capital and Knowledge Management Capability

The relationship between intellectual capital and knowledge management capability is fundamentally synergistic. Intellectual capital, which includes human capital (skills, knowledge, and expertise of employees), structural capital (processes, databases, and organizational routines), and relational capital (networks and relationships with stakeholders), provides the essential resources for knowledge creation and utilization. These three forms of intellectual capital are critical to both company performance (Ahmed et al., 2019; Pedro et al., 2018) and innovation (Allameh, 2018). Knowledge management capability leverages these intellectual assets by systematically acquiring, organizing, sharing, and applying knowledge within the organization. This capability ensures that the valuable insights and expertise embedded in intellectual capital are effectively utilized to enhance decision-making, foster innovation, and improve overall organizational performance. According to Kaufmann and Schneider (2004) and Youndt *et al.* (2004), intellectual capital consists of knowledge and intangible assets that an organization can use to its advantage in order to create economic value and obtain a competitive edge. Thus, a robust knowledge management capability maximizes the potential of intellectual capital, leading to a more knowledgeable, agile, and competitive organization.

### 2.2. Knowledge Management Capability and Innovation Ambidexterity

Knowledge management, defined as the systematic process of creating, sharing, and utilizing knowledge to achieve organizational objectives, serves as the foundation for fostering innovation ambidexterity. Knowledge management capability leverages this capital by systematically acquiring,

sharing, and applying knowledge, thereby enabling the organization to utilize its intellectual assets effectively. This capability is crucial for fostering innovation ambidexterity, the balanced pursuit of both exploratory and exploitative innovations. By effectively managing knowledge, organizations can enhance their ability to innovate continuously, thereby creating a virtuous cycle where successful innovations further enrich intellectual capital, ultimately driving sustained competitive advantage and growth.

While exploitation refers to knowledge obtained through the selection, improvement, and repurposing of current routines built upon consolidated knowledge bases, exploration entails a shift toward new knowledge pathways (Messeni Petruzzelli, 2019). The process of exploration involves creating new knowledge, recombining existing diverse knowledge vectors, or combining old and new knowledge (Carnabuci & Operti, 2013). Ambidextrous businesses are able to explore new opportunities and capitalize on their current competencies with equal dexterity (Lubatkin et al., 2006).

According to Cabrilo and Dahms (2020), innovation ambidexterity can be facilitated by intellectual capital, as it can augment a company's capacity to explore and obtain novel insights and methods that surpass its current expertise. Tseng (2016) suggests that the concept of knowledge management capability (KMC) defines the functional boundaries of an organization's capacity to manipulate knowledge, encompassing the generation, transfer, integration, sharing, and application of information to generate new knowledge. Innovation ambidexterity, which refers to the capability of an organization to simultaneously explore new opportunities (exploratory innovation) and exploit existing capabilities (exploitative innovation), is essential for maintaining a competitive edge in both stable and turbulent environments.

### **2.3. Intangible Competitive Advantage as Moderator for Knowledge Management Capability and Innovation Ambidexterity**

According to Barney (1991) and Kim and Oh (2004), the idea of leveraging an organization's resources to gain a competitive edge suggests that resources such as competencies, assets, capabilities, information, and knowledge can set an organization apart and create unique opportunities. Academics and organizational managers have categorized resources

into five groups: physical, human, technological, financial, and organizational resources (Hofer and Schendel, 1978). According to Penrose's (1959) Resource-Based View of the Firm (RBV), effective resource use is the foundation for organizational expansion. Organizations can use these resources, which include assets, skills, processes, and knowledge, to develop and implement competitive strategies.

According to Hall (1992), intangible resources consist of non-financial elements, whereas tangible resources are composed of financial aspects or physical assets. Intangible Competitive Advantage (ICA) moderates the relationship between Knowledge Management Capability (KMC) and Innovation Ambidexterity (IA) by leveraging non-physical assets such as brand reputation, organizational culture, intellectual property, and unique capabilities. These intangible assets enhance the effectiveness of knowledge management processes by facilitating better knowledge sharing, resource allocation, and strategic alignment. As a result, organizations can more effectively balance and manage both exploratory (radical) and exploitative (incremental) innovation activities, thereby sustaining long-term competitiveness and adaptability in dynamic market environments.

### **2.4. Conceptual Framework and Hypotheses**

Based on the conceptual framework of the research stated previously, the hypotheses of this research were as follows:

**H1:** Intellectual capital was positively associated with knowledge management capability.

**H2:** Intangible resources advantage positively moderated the relationship between knowledge management capability and innovation ambidexterity.

**H3:** knowledge management capability was positively associated with innovation ambidexterity.

## **3. Research Methodology**

### **3.1. Sample**

The online questionnaire was designed to assess the fundamental constructs outlined in the conceptual model. The survey, distributed online, was sent to 395 companies listed in the database of registered food manufacturing firms in Thailand. Utilizing the sampling frame, an email containing a letter detailing the rationale and objectives of the study was sent to the provided email address of each company. Among the

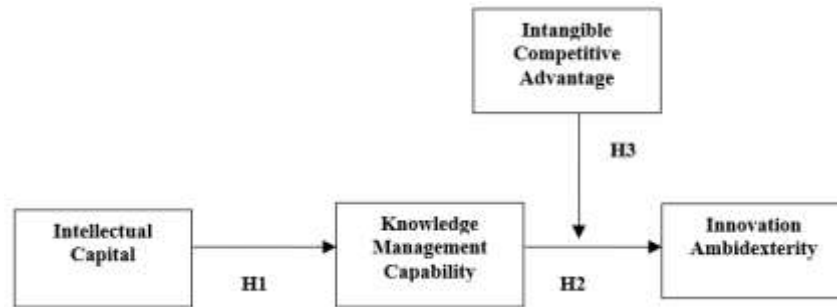


Fig. 1. Research framework.

112 responses initially received, 105 were deemed complete and suitable for analysis related to the variables of interest in our study. The data set gathered encompassed a diverse spectrum of firms in terms of age, size, and type, resulting in an estimated response rate of around 20%.

Furthermore, a test for non-response bias (Armstrong & Overton, 1977) was conducted by comparing demographic characteristics (firm size and firm age) between the earliest and latest responses. Additionally, comparisons between respondent firms and the entire manufacturing firms' population for two available population-level variables firm size and firm age were performed. In addition to the primary constructs outlined in the hypothesis model, this study incorporates control variables recognized to influence firms' competitive advantages: firm size and firm age, evaluated through two items adapted from Jaworski & Kohli (1993). The non-response bias for firm size and firm age was not significant.

### 3.2. Measures

Each item was measured using a five-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The study examined existing literature to create items relevant to various aspects of intellectual capital, knowledge management capability, and innovation ambidexterity. Additionally, a structured survey tool was developed to collect the necessary data.

## 4. Results

### 4.1. Descriptive Statistics and Construct Validity

Prior to conducting data analysis, the Kaiser-Meyer-Olkin (KMO) test yielded a value of 0.694, indicating the suitability of the data for factor analysis of the variable constructs. The minimum threshold for

this test, as per Hair et al. (2006), is 0.50. Tables 1 and 2 present the means, standard deviations, and zero-correlation matrix for all variables.

Table 1 includes the mean, standard deviation, factor loadings and Cronbach's alphas. The average ratings for firms' intellectual capital, knowledge management capability, intangible resources advantage, and innovation ambidexterity were 4.015, 3.533, 3.993, and 4.062, respectively (with standard deviations of 0.441, 0.705, 0.457, and 0.444, respectively). These figures suggest a high level of competence in intellectual capital and knowledge management capability, indicating their significant role in achieving firm success. This analysis utilized factor loadings for each item greater than 1, employing a cutoff value of 0.40 as per Nunnally and Bernstein (1994). As summarized in Table 1, all reliability coefficients for the constructs (0.79–0.90) exceeded the 0.70 benchmark. The measured reliability for intellectual capital, knowledge management capability, innovation ambidexterity, and intangible resources advantage were 0.844, 0.901, 0.790, and 0.835, respectively.

Confirmatory factor analysis (CFA) was applied to evaluate convergent and discriminant validity. Convergent validity was assessed by examining whether the indicators of the same construct have high correlations among themselves. The loadings of each item should be higher than 0.7, indicating good convergent validity. For discriminant validity, all item loadings should have the strongest loadings on their corresponding construct compared with other constructs. The discriminant validity of all constructs was found to be good.

Table 2 presents the correlations between different variables. This study assessed construct reliability, as well as convergent and discriminant validity, to ensure that all reflective constructs are reliable and valid. To assess reliability and average

variance extracted (AVE) should be higher than 0.7 and 0.5, respectively. Table 2 shows that intellectual capital exhibits the strongest correlation with knowledge management capability ( $r = 0.352^{**}$ ,  $p \leq 0.001$ ). Additionally, knowledge management capability demonstrates the strongest correlation with innovation ambidexterity ( $r = 0.466^{**}$ ,  $p \leq 0.001$ ). After examining the relationships among each variable, the analysis reveals a spectrum of low to moderate, positive, and significant relationships. There is no evidence of multicollinearity among the variables, as indicated by variance inflation factor (VIF) values ranging from 1.004 to 1.525 (Hair et al., 2010). A VIF of 1.0 suggests the absence of multicollinearity, while a maximum VIF exceeding 10.0 indicates its presence. As depicted in Table 1, there are no issues of collinearity in this dataset, as the correlations between the independent variables are not high.

#### 4.2. Hypotheses Testing

Table 3 shows the hierarchical regression analysis between the independent and dependent variables. Both steps 2 and 4 provide strong support for the hypotheses. Specifically, the analysis revealed highly significant coefficients for the relationship between intellectual capital and knowledge management capability ( $\beta = 0.363$ ,  $p < 0.001$ ) and for

the relationship between knowledge management capability and innovation ambidexterity ( $\beta = 0.257$ ,  $p < 0.01$ ). This robust statistical evidence solidly supports hypotheses H1 and H2.

The analysis yielded an  $R^2$  value of 0.173, suggesting that 17.3% of the variance in knowledge management capability could be accounted for by intellectual capital. Additionally, 35.1% of the variation in knowledge management capability was found to be positively associated with innovation ambidexterity. Step 4 focused on testing the moderating influence of intangible resources advantage through interaction for hypothesis H3. The results from the moderated regression analysis in step 3 were statistically significant, leading to a significant increase in explained variance (adjusted  $R^2 = 0.348$ ). In this step, it was observed that intangible resources advantage had a positive moderating effect ( $\beta$  intangible resources advantage  $\times$  knowledge management capability = 0.128,  $p < 0.05$ ) on the interactive relationship between knowledge management capability and innovation ambidexterity.

Comparing these four steps revealed incremental increases in  $R^2$  at each stage of the hierarchical analysis, suggesting the direct effects of the independent variables (Cohen et al., 1983). To aid in interpreting the moderating effects, graphical representations of the interactions are presented.

**Table 1.** Summary statistics of the measurement analysis.

Variables	Mean	SD	Item loadings	Cronbach's alphas ( $\alpha$ )
Intangible resources advantage	3.993	0.457	0.818–0.863	0.790
Knowledge capability management	3.533	0.705	0.802–0.898	0.901
Intellectual capital	4.015	0.441	0.716–0.842	0.844
Innovation ambidexterity	4.062	0.444	0.734–0.849	0.835

Notes: **\*\***Correlation is significant at the 0.01 level (2-tailed).

**Table 2.** Inter-factor correlations and related AVEs.

Construct	(1)	(2)	(3)	(4)
(1) Intangible resources advantage	<b>0.879</b>			
(2) Knowledge capability management	<b>0.557<sup>**</sup></b>	<b>0.927</b>		
(3) Intellectual capital	<b>0.765<sup>**</sup></b>	<b>0.352<sup>**</sup></b>	<b>0.893</b>	
(4) Innovation ambidexterity	<b>0.551<sup>**</sup></b>	<b>0.466<sup>**</sup></b>	<b>0.477<sup>**</sup></b>	<b>0.888</b>

Notes: The bold, underlined figures on the diagonal are AVEs.

**Table 3.** Hierarchical regression analysis.

	Knowledge capability management		Innovation ambidexterity		VIF
	Step 1	Step 2	Step 3	Step 4	
Firm size	-0.051	-0.064	0.057	0.051	1.199
Firm age	0.339	0.366	-0.134	-0.110	1.236
Intellectual capital		0.363***			1.004
Knowledge capability management			0.257**	0.302**	1.525
Intangible resources advantage			0.407***	0.383***	1.492
Knowledge capability management *Intangible resources advantage				0.128*	1.067
F	2.244	7.053**	13.545***	12.123***	
R <sup>2</sup>	0.042	0.173	0.351	0.380	
Adjusted R <sup>2</sup>	0.023	0.149	0.325	0.348	

Notes: \*\*\*Significant at the 0.001 level; \*\*Significant at the 0.01 level; \*Significant at the 0.05 level.

### 5. Discussion and Contributions

This study aimed to explore how intellectual capital and knowledge management capability influence each other, with a particular focus on the moderating role of intangible resources advantage in enhancing innovation ambidexterity. The results revealed distinct patterns in the adoption of knowledge management capability based on levels of intellectual capital (refer to Table 3). Notably, an intriguing finding was the positive and statistically significant interaction of intangible resources advantage on the relationship between knowledge management capability and innovation ambidexterity. To better illustrate this interaction, graphical representations of the relationship between knowledge management capability and innovation ambidexterity under varying levels of intangible resources advantage are provided in Table 3.

Following this, a detailed discussion on all three proposed hypotheses is presented. Hypothesis H1 suggested that intellectual capital significantly influences knowledge management capability. As demonstrated in regression step 2 of Table 3, this proposition received empirical support. Additionally, these results corroborated a prior study by Tsou and Chen (2020), which proposed that human capital (HC) positively impacts a firm's learning capabilities by enabling individuals to learn and apply their knowledge and experiences within organizations to generate innovative ideas. Indeed, strong human capital allows organizations to acquire new information and enhance individual abilities. This, in turn, creates opportunities for learning capability development, the integration of new knowledge with

existing knowledge, and reconfiguration in response to environmental changes (Altintas & Ambrosini, 2019).

Highly educated, skilled, and experienced workers are better able to recognize opportunities and risks and adapt to changing conditions. Employees' capacity to effectively integrate, reconfigure, and reallocate resources and capabilities, as well as learn, apply, and share essential and valuable information, are the primary drivers of this process.

The results of H2 indicated that knowledge management capability has a positive effect on innovation ambidexterity, as shown in regression step 3 of Table 3. Therefore, the research findings align with those of researchers like Soto-Acosta et al. (2018), who elucidated that organizations' capacity to employ exploratory and exploitative innovation is contingent upon their ability to promptly respond to external shifts brought about by changes in customer preferences, technological advancements, or fluctuations in product demand, in addition to the development of various internal capabilities like information technology and knowledge management. According to Del Giudice and Della Peruta (2016) and Abubakar et al. (2019), the proliferation of knowledge and knowledge management systems (KMSs) has led to the development of integrated and shared systems that enhance corporate performance.

Furthermore, while earlier research (López-Sáez et al., 2010) suggested that acquiring knowledge from external sources and assimilating and applying it aids companies in pursuing new market opportunities and improving innovation performance, the present study's findings provide a more nuanced understanding of

how knowledge management capabilities foster innovation ambidexterity. This result is consistent with the findings of innovation research, which suggests that knowledge is a company's most strategic source of capital for innovation potential (Martinez Conesa et al., 2017; Soto-Acosta et al., 2016).

To test the moderating role of intangible resources advantage in the relationship between knowledge management capability and innovation ambidexterity, the forecasting results indicate that the interaction effect of intangible resources advantage increases the predictive power from 32.5% to 34.8%. This demonstrates that the relationship between knowledge management capability and innovation ambidexterity significantly strengthens when an organization possesses an advantage in intangible resources, as shown in the analysis in step 4 of H3. Saunila and Ukko (2014) stated that innovation capabilities are largely derived from intangible assets, which Itami (1987) described as including employee know-how, managerial systems, company reputation, intellectual property, and informal social networks.

### 5.1. Practical Implications

The practical significance of this research lies in highlighting the vital connection between intellectual capital and knowledge management capability, which holds importance for both researchers and practitioners. The study underscores that intellectual capital plays a crucial role in knowledge management capability, and its integration with intangible resource advantage has a positive moderating effect. This finding offers valuable insights for firms aiming to enhance their understanding of the benefits associated with developing knowledge management capability and fostering innovation ambidexterity. Consequently, managers and organizations may face challenges in exerting managerial control to ensure the success of innovation ambidexterity.

The insights derived from the study of knowledge management capability, innovation ambidexterity, intellectual capital, and intangible competitive advantage offer several practical implications for organizations striving to maintain a competitive edge in today's dynamic business environment.

First, organizations should prioritize the development and enhancement of their intellectual capital. This includes continuous investment in employee training and development (human capital),

refining organizational processes and systems (structural capital), and fostering strong relationships with external stakeholders (relational capital). The Knowledge-based View (KBV) holds that knowledge management capability (KMC) is an essential component of organizations (Tseng, 2016) and plays a major role in the growth of innovation (Taghizadeh et al., 2020). By doing so, companies can create a robust foundation for effective knowledge management and innovation. Second, implementing comprehensive knowledge management systems is crucial. Organizations should develop systematic processes for creating, sharing, and utilizing knowledge. This can be achieved through the use of advanced technologies such as knowledge management software, intranets, and collaborative platforms. Encouraging a culture of knowledge sharing and continuous learning within the organization is also essential. Third, to achieve innovation ambidexterity, organizations need to balance exploratory and exploitative innovation activities. This requires a dual focus on exploring new opportunities and refining existing capabilities. Companies should establish dedicated teams or departments for both types of innovation, ensuring that resources and support are allocated appropriately to each. March (1991) asserts that innovation can produce desired performance benefits when exploration and exploitation are balanced. Fourth, organizations should recognize the value of intangible assets such as brand reputation, intellectual property, and customer relationships. These assets often provide a sustainable competitive advantage that is difficult for competitors to replicate. Effective management and strategic utilization of these intangible assets can enhance both exploratory and exploitative innovation efforts. Fifth, creating an organizational culture that supports innovation is vital. Leadership should encourage risk-taking, experimentation, and creativity. Providing employees with the freedom to explore new ideas and recognizing and rewarding innovative contributions can drive a culture of continuous improvement and innovation.

Therefore, organizations should establish metrics to assess the effectiveness of their knowledge management practices. This includes measuring the creation, sharing, and application of knowledge within the organization. Despite the fact that knowledge is a valuable resource with significant strategic potential for any business, that business needs a Knowledge Management Capability to assess and react swiftly to rivals' actions (Yang, 2020). Regular evaluation of

these metrics can help identify areas for improvement and ensure that knowledge management efforts are aligned with organizational goals. Besides that, integrating knowledge management and innovation strategies into the overall business strategy is essential. This ensures that knowledge management and innovation efforts are aligned with the organization's strategic objectives, enhancing coherence and effectiveness. Senior leadership should actively participate in and support these initiatives to demonstrate their importance.

## 5.2. Limitations and Future Research Directions

This study has certain limitations that open up avenues for future research. One limitation is the use of cross-sectional data, which prevents a clear determination of the temporal sequence in the relationships between intellectual capital, knowledge management capability, intangible resource advantage, and innovation ambidexterity. Therefore, developing a time-series analysis and conducting research within a longitudinal framework would offer greater insights into causality. Additionally, further exploration in different countries and contexts is necessary to generalize the findings and broaden the understanding of these relationships.

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## References

- Abubakar, A.M., Elrehail, H., Alatailat, M.A. & Elçi, A. (2019). Knowledge management, decisionmaking style and organizational performance, *Journal of Innovation and Knowledge*, 4(2),104–114.
- Ahmed, S.S., Guozhu, J., Mubarik, S., Khan, M. & Khan, E. (2019). Intellectual capital and business performance: the role of dimensions of absorptive capacity, *Journal of Intellectual Capital*, 21(1), 23–39.
- Allameh, S.M. (2018). Antecedents and consequences of intellectual capital, *Journal of Intellectual Capital*, 19(5), 858–874.
- Altintas, G., & Ambrosini, V. (2019). *Dynamic Managerial Capabilities*, Oxford Research Encyclopedia of Business and Management.
- Armstrong, S. J. & Overton, T. S. (1977). Estimating non-response bias in mail survey, *Journal of Marketing Research*, 14, 396–420.
- Barney, J.B. (1991). Firm resources and sustained competitive advantage, *Journal of Management*, 17(1), 99–120.
- Carnabuci, G. & Operti, E. (2013). Where do firms' recombinant capabilities come from? Intraorganizational networks, knowledge, and firms' ability to innovate through technological recombination, *Strategic Management Journal*, 34(13), 1591–1613.
- Castaneda, D. I., & Cuellar, S. (2020). Knowledge sharing and innovation: A systematic organizational learning practices in innovation performance, *European Management Review*, 17(4), 835–855.
- Cohen, S., Kamarck, T. & Mermelstein, R. (1983). A global measure of perceived stress, *Journal of Health and Social Behavior*, 24, 385–396.
- Cuganesan, S. (2005). Intellectual capital-in-action and value creation, *Journal of Intellectual Capital*, 6(3), 357–373.
- Del Giudice, M. and Della Peruta, M.R. (2016). The impact of IT-based knowledge management systems on internal venturing and innovation: a structural equation modeling approach to corporate performance, *Journal of Knowledge Management*, 20(3), 484–498.
- Hair, J.F Jr., Black, W.C., Babin, B.J., Anderson, R.E. & Tathan, R.L. (2006). *Multivariate Data Analysis*, 6th ed. Upper Saddle River, New Jersey: Prentice-Hall.
- Hair, J.F Jr., Black, W.C., Babin, B.J. & Anderson, R.E. (2010). *Multivariate Data Analysis a Global Perspective*, Upper Saddle River, New Jersey: Prentice-Hall.



- Hall, R. (1992). The strategic analysis of intangible resources, *Strategic Management Journal*, 13(2): 135–144.
- Hofer, C. & Schendel, D. (1978). *Strategy formulation: Analysis concepts*, St. Paul, MN: West Publishing.
- Hsu, I. C., & Sabherwal, R. (2011). From intellectual capital to firm performance: The mediating role of knowledge management capabilities, *IEEE Transactions on Engineering Management*, 58(4), 626–634.
- Lei, H., Khamkhoutlavong, M. & Le, B.P. (2020). Fostering exploitative and exploratory innovation through HRM practices and knowledge management capability: the moderating effect of knowledge-centered culture, *Journal of Knowledge Management*, 25(8), 1926–1946.
- Jaworski, B. J., & Kohli, A. K. (1993). Market orientation: antecedents and consequences, *Journal of Marketing*, 57(3), 53–70.
- Itami, H. (1987). *Mobilizing invisible assets*, Harvard University Press, Cambridge. MA.
- Kaufmann, L. & Schneider, Y. (2004). Intangibles: a synthesis of current research, *Journal of Intellectual Capital*, 5(3), 366–388.
- Kim, B.Y. & Oh, H. (2004). How do hotel firms obtain a competitive advantage? *International Journal of Contemporary Hospitality Management*, 16(1), 65–71.
- Lee, J.Y. (2011), *Incremental Innovation and Radical Innovation: The Impacts of Human, Structural, Social, and Relational Capital Elements, Operations and Sourcing Management*. PhD Thesis, Michigan State University,
- López-Sáez, P., Navas-López, J., Martín-de-Castro, G., & Cruz-González, J. (2010). External knowledge acquisition processes in knowledge-intensive clusters, *Journal of Knowledge Management*, 14(5), 690–707.
- Lubatkin, M.H., Simsek, Z., Ling, Y. & Veiga, J.F. (2006). Ambidexterity and performance in small to medium-sized firms: the pivotal role of top management team behavioral integration, *Journal of Management*, 32(5), 646–672.
- Machorro Ramos, F., Mercado Salgado, P., Cernas Ortiz, D.A. & Romero Ortiz, M.V. (2016). Influence of relational capital on the organizational performance of institutions of higher technological education, *Innovar*, 26(60), 35–50.
- Martinez-Conesa, I., Soto-Acosta, P. & Carayannis, E.G. (2017). On the path towards open innovation: assessing the role of knowledge management capability and environmental dynamism in SMEs, *Journal of Knowledge Management*, 21(3), 553–570.
- Melia, M. R., Pérez, A., B., & Dobon, S. R. (2010). The influence of innovation orientation on the internationalisation of SMEs in the service sector, *The Service Industries Journal*, 30(5), 777–791.
- Messeni Petruzzelli, A. (2019). Trading knowledge for status: Conceptualizing R&D alliance formation to achieve ambidexterity, *Technological Forecasting and Social Change*, 145, 36–42.
- March, J.G. (1991). Exploration and exploitation in organizational learning, *Organization Science*, 2(1), 71–87.
- Nunnally, J. C. (1978). *Psychometric Theory*, second ed. McGraw-Hill, New York.
- Nunnally, J.C. & Bernstein, I.H. (1994). *The Assessment of Reliability*, *Psychometric Theory*, 3, 248–292.
- Pedro, E., Leitao, J. & Alves, H. (2018). Intellectual capital and performance: taxonomy of components and multidimensional analysis axes, *Journal of Intellectual Capital*, 19(2), 407–452.
- Penrose, E.T. (1959). *The Theory of the growth of the firm*. Oxford University Press: New York.
- Saunila, M. & Ukko, J. (2014). Intangible aspect of innovative capability in SMEs: Impacts of size and industry, *Journal of Engineering and Technology Management*, 33, 32–46.

Soto-Acosta, P., Popa, S. & Palacios-Marques, D. (2016), E-business, organizational innovation and firm performance in manufacturing SMEs: an empirical study in Spain, *Technological and Economic Development of Economy*, 22(6),885–904.

Soto-Acosta, P., Popa, S., & Martinez-Conesa, I. (2018). Information technology, knowledge management and environmental dynamism as drivers of innovation ambidexterity: A study in SMEs, *Journal of Knowledge Management*, 22(4), 824–849.

Taghizadeh, S.K., Karini, A., Nadarajah, G. & Nikbin, D. (2020). Knowledge management capability, environmental dynamism and innovation strategy in Malaysian firms, *Management Decision*, 59(6), 1386–1405.

Tseng, S.M. (2016). The effect of knowledge management capability and customer knowledge gaps on corporate performance, *Journal of Enterprise Information Management*, 29(1),51–71.

Tsou, H. T., & Chen, J. S. (2020). Dynamic capabilities, human capital and service innovation: The case of Taiwan ICT industry,

*Asian Journal of Technology Innovation*, 28(2), 181–203.

Yang, X. (2020). Potential consequences of COVID-19 for sustainable meat consumption: the role of food safety concerns and responsibility attributions, *British Food Journal*, 123(2), 455–474.

Youndt, M.A., Subramaniam, M. & Snell, S.A. (2004). Intellectual capital profiles: an examination of investments and returns, *Journal of Management Studies*, 41(2), 335–361.

## AUTHOR BIOGRAPHIES



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