

Relationship Between Strategic Innovation Orientation and Organizational Performance: The Mediating Role of Intellectual*

Relación entre orientación estratégica a la innovación y desempeño organizacional: rol mediador del capital intelectual

Carlos Gilberto Restrepo-Ramírez
Universidad de Antioquia, Colombia
carlos.restrepo1@udea.edu.co

 <https://orcid.org/0000-0002-6813-7439>

Claudia Inés Sepúlveda-Rivillas
Universidad de Antioquia, Colombia
claudia.sepulveda@udea.edu.co

 <https://orcid.org/0000-0002-6400-9368>

Mariana Gómez-Montoya
Universidad de Antioquia, Colombia
mariana.gomezm@udea.edu.co

 <https://orcid.org/0000-0002-9746-6143>

Revista CEA vol. 10 núm. 23 e2989
2024

Instituto Tecnológico Metropolitano
Colombia

Recepción: 17 Enero 2024
Aprobación: 12 Abril 2024

Abstract: Purpose: This study aimed to empirically analyze the relationship between strategic innovation orientation and organizational performance through the mediation of intellectual capital.

Design/Methodology: Using a cross-sectional design with an exploratory approach, this study employed quantitative techniques such as Baron and Kenny's product of coefficients method (1986) to examine said mediating effect. The sample comprised 1,765 companies in the manufacturing sector in Colombia, and data were sourced from Colombia's Survey on Development and Technological Innovation (EDIT for its acronym in Spanish) for the 2019–2020 period.

Findings: According to the findings, there is a statistically significant relationship between strategic innovation orientation and organizational performance. In addition, intellectual capital was found to play a mediating role in this relationship.

Conclusions: It is concluded that intellectual capital is a key mechanism through which strategic innovation-oriented initiatives can lead to better organizational outcomes.

Originality: This study used observable indicators to operationalize the constructs under analysis, providing empirical evidence that aspects related to employees' knowledge and skills, enhanced organizational processes, and effective relationships with stakeholders can maximize the direct effect of strategic innovation orientation on organizational performance. Intellectual capital thus emerges as a new mediating mechanism that has not been extensively explored in the literature on strategic innovation orientation and its impact on organizational performance.

Keywords: organizational performance, intellectual capital, strategic innovation orientation, manufacturing industry, **JEL classification:** O32, M10.

Resumen: Objetivo: analizar empíricamente la relación entre la orientación estratégica a la innovación y el desempeño organizacional a través de la mediación del capital intelectual.

Diseño/metodología: el estudio siguió un diseño transversal con alcance exploratorio, usando técnicas cuantitativas, como el método de enfoque de productos de coeficientes de Baron y Kenny (1986), para analizar el efecto mediador. La muestra estuvo conformada por 1765 empresas del sector manufacturero en Colombia, obteniendo los datos a partir de la Encuesta de Desarrollo e Innovación Tecnológica (EDIT) de la industria manufacturera para el periodo 2019-2020.

Resultados: se evidenció la existencia de una relación estadísticamente significativa entre la orientación estratégica a la innovación y desempeño organizacional; además, se demostró que el capital intelectual ejerce un rol mediador en esta relación.

Conclusiones: se concluye que el capital intelectual es un mecanismo a través del cual las iniciativas estratégicas orientadas a la innovación se traducen en mejores resultados organizacionales.

Originalidad: el presente estudio utiliza indicadores observables para operacionalizar los constructos analizados, aportando evidencia empírica sobre la forma como los aspectos relacionados con conocimientos y habilidades del personal, mejora de los procesos organizacionales y relaciones efectivas con los grupos de interés, potencian el efecto directo de la orientación estratégica a la innovación en el desempeño organizacional. De esta forma, el capital intelectual representa un nuevo mecanismo mediador que ha sido poco analizado en la literatura previa sobre orientación estratégica a la innovación y su impacto en el desempeño de las organizaciones.

Palabras clave: desempeño organizacional, capital intelectual, orientación estratégica a la innovación, industria manufacturera, **Clasificación JEL:** O32, M10.

Highlights

- Strategic innovation orientation enables companies to adapt to the demands of their environment and create competitive advantages.
- Implementing strategic innovation-oriented initiatives helps organizations to improve their performance.
- Intellectual capital serves as a mechanism through which strategic innovation-oriented initiatives can lead to better organizational outcomes.
- Company managers should prioritize strengthening intellectual capital so that strategic innovation orientation translates into better organizational performance.

Highlights

- La orientación estratégica a la innovación permite a las empresas adaptarse para responder a las demandas del entorno, generando ventajas competitivas.
- La implementación de una orientación estratégica a la innovación posibilita mejorar el desempeño de las organizaciones.
- El capital intelectual representa un mecanismo a través del cual, las iniciativas estratégicas orientadas a la innovación mejoran los resultados organizacionales.
- Los directivos deberían orientar los esfuerzos a fortalecer el capital intelectual con el fin de que la estrategia orientada a la innovación se traduzca en un mejor desempeño organizacional.

1. INTRODUCTION

Strategic Innovation Orientation (SIO) refers to an organization's capacity to develop and implement innovation-focused strategies. It encourages the adoption of a proactive and creative approach to enhance efficiency and productivity while participating effectively in a competitive market, thus transforming gaps into opportunities for business growth (Hernández-Betancur et al., 2022; Serafim & Veríssimo, 2021; Chatzopoulou et al., 2022; Kornelius et al., 2021). In recent years, SIO has gained prominence in both academic and practical contexts because it enables companies to adapt to the demands and needs of their environment, fostering competitive

advantages that lead to improved organizational performance (Ganesh & Haslinda, 2023; Nugroho et al., 2022). In fact, recent studies confirm the direct impact of SIO on Organizational Performance (OP) by facilitating adaptation to change, improving efficiency and effectiveness, increasing added value for customers, and transforming human talent (Chatzopoulou et al., 2022; Kornelius et al., 2021; Dinu et al., 2023).

Literature in the field has provided theoretical and empirical evidence supporting the relationship between SIO and OP. It shows how organizations can convert internal weaknesses and external market threats into strengths and opportunities leading to organizational improvement and growth (Choi et al., 2021; Chatzopoulou et al., 2022; Schweiger et al., 2019). Additionally, it has allowed companies to evaluate and compare their performance, enabling the rethinking of objectives and strategies (Ayinaddis, 2023; Nürk, 2019). In particular, research has primarily focused on examining the direct relationship between SIO and OP, asserting that SIO enhances OP by fostering competitive advantages and reducing setbacks caused by a lack of environmental knowledge (Chatzopoulou et al., 2022; Nürk, 2019; Chmielewska et al., 2022). Moreover, some studies have identified mediating mechanisms in this relationship, such as: (i) organizational learning, which allows organizations to incorporate and apply new knowledge, yielding positive effects on their achievements and performance (Mu & Di Benedetto, 2011); (ii) organizational culture, which enables companies to effectively adapt to and respond to market demands through dynamic organizational values (Grawe et al., 2009; Hakala, 2011), and (iii) strategic change management, which helps organizations obtain competitive advantages by enabling swift and efficient responses to changing environmental demands, thereby closing existing gaps (Setiadji & Ahmadi, 2020).

Despite significant advances in the literature, today's knowledge- and innovation-based society places importance on intangible resources when implementing strategies that positively impact organizational outcomes. Therefore, more empirical evidence is needed to understand how employees' skills and knowledge, organizational structure, and relationships with stakeholders can influence the relationship between SIO and OP. Intellectual Capital (IC), for instance, is an intangible resource (Nawaz & Haniffa, 2017) that encompasses the knowledge, skills, experience, information, and relationships individuals hold within an organization (Dang & Wang, 2022; Gómez-Valenzuela, 2022; Nazir et al., 2021). IC serves as a source of competitive differentiation that drives innovation and adaptation to change, improving efficiency and productivity (Ekaningrum, 2021; Handoyo et al., 2023; Hussein et al., 2023). It also provides a solid foundation for managing a company's intangible assets and positioning it in the market (Rehman et al., 2023; Bansal et

al., 2023). Furthermore, empirical evidence supports the importance of IC dimensions in enhancing OP. When employees' knowledge, skills, and attitudes are strengthened, organizational processes improve, and relationships with stakeholders are solidified, contributing to better OP (Ekaningrum, 2021; Agostini et al., 2017; Dang & Wang, 2022). This suggests that IC may be a mechanism that enhances the relationship between SIO and OP.

In light of the above, the aim of this study is to empirically examine the relationship between SIO and OP through the mediation of IC. To that end, a cross-sectional and exploratory design was used, employing Baron and Kenny's (1986) product of coefficients method to analyze such mediating effect. This study makes two key contributions. First, it provides empirical evidence on how SIO directly impacts OP and demonstrates the mediating role of IC in this relationship. Second, the findings offer guidance for organizational managers in decision-making by emphasizing the importance of effectively allocating resources to enhance employees' skills, strengthen relationships with stakeholders, and consolidate organizational structure for improved performance.

This paper is divided into six sections, including the introduction. Section 2 presents the theoretical framework of the research. Section 3 outlines the methodology. Section 4 presents the results. Section 5 discusses the results. Finally, Section 6 details the main conclusions derived from the research.

2. THEORETICAL FRAMEWORK

Strategic Innovation Orientation (SIO)

SIO is one of the approaches of organizational strategic orientation, which focuses on introducing and enhancing goods and services, as well as optimizing production and organizational processes to gain competitive advantages (Chou & Yang, 2011; Denicolai et al., 2018; Dogan, 2017; Chatzopoulou et al., 2022; Hakala, 2011; Gatignon & Xuereb, 2006; Kumar et al., 2012; Naranjo-Valencia et al., 2011; Yousaf et al., 2020; Mutlu & Sürer, 2016; Adams et al., 2019). Organizations that adopt this approach implement technology surveillance processes, allowing them to leverage practical knowledge to produce new technical solutions. This helps them meet customers' needs and requirements through new and improved products and services, fostering loyalty and attracting new customers (Do Hyung & Dedahanov, 2014; Yousaf et al., 2020; Mutlu & Sürer, 2016; Adams et al., 2019; Serafim & Veríssimo, 2021; Saqib et al., 2017; Lee et al., 2015; Hortinha et al., 2011; Kocak et al., 2017).

Intellectual Capital (IC)

IC is an intangible asset based on knowledge that creates value within organizations (Roos et al., 2001; Bontis, 1998; Umanto et al., 2018; Dang & Wang, 2022; Lo et al., 2020; Quintero-Quintero et al., 2021; Gómez-Bayona et al., 2020). It comprises a set of productive resources that boost a company's capabilities and competencies, enabling it to stand out within the industry and increase customer loyalty and performance (Morales Clark et al., 2020; Ibarra-Cisneros et al., 2020; Pedraza Melo & de la Gala Velásquez, 2022). Thus, the comparative advantages derived from IC are difficult to replicate, leading to a rise in intrinsic value for the company (Morales Clark et al., 2020; García Garnica & Taboada Ibarra, 2012).

According to the literature, IC includes three main components: (i) human capital, which involves employees' knowledge, skills, training, and application of this knowledge to benefit the organization; (ii) structural capital, which encompasses the organizational structure, processes, routines, and techniques that influence efficiency and effectiveness; and (iii) relational capital, which considers the quality and quantity of relationships with customers, partners, suppliers, the financial sector, allies, and other stakeholders (Zhang et al., 2019; Gómez-Valenzuela, 2022; Roos et al., 2001; Bontis, 1998; Nazir et al., 2021). Moreover, recent studies have proposed that IC can be operationalized through two dimensions: (i) internal IC, which includes aspects of human and structural capital developed internally and aligned with the company's strategic orientation, and (ii) external IC, which pertains to the organization's relationships with stakeholders, including suppliers, customers, and a country's science and technology system, all of which are related to strategy implementation (Restrepo-Ramírez, 2023).

Organizational Performance (OP)

OP refers to achieving strategic objectives to create value for stakeholders (Masa'deh et al., 2018; Chmielewska et al., 2022; Princy & Rebeka, 2019). Consequently, organizations focus their strategic actions on understanding, analyzing, and managing factors that positively impact their performance (Masa'deh et al., 2018; Ekaningrum, 2021). OP can be measured using different approaches, both financial and non-financial (Ekaningrum, 2021; Gunasekaran et al., 2015). Financial metrics include Return On Investment (ROI), profitability, return on sales, and return on invested capital (Mcgivern & Tvorik, 1998; Ekaningrum, 2021). Other indicators include Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA) (Maxim, 2023) and Economic Value

Added (EVA) (Tudose et al., 2022; Nagarajan, 2015). Non-financial measures encompass effective, efficient, and innovative performance (Rojas et al., 2018; Ekaningrum, 2021). By measuring performance, organizations can validate their competitive advantages and compare themselves with their environment, enabling them to reassess their strategy (Gehrisch & Süß, 2023; Odiri & Ideh, 2021).

Relationship between strategic innovation orientation and organizational performance

Organizations that adopt an SIO encourage employees to explore promising concepts for implementing new ideas, products, or processes, which makes it possible to achieve innovative impacts and contribute to long-term success (Deutscher et al., 2016). As a result, companies can increase productivity, thus fostering the creation of innovative goods and services, which in turn translates into improved OP (Pertuz & Pérez, 2020; Demuner Flores, 2021). SIO guides organizations to actively adopt new technologies for developing products, services, and processes, potentially enhancing their ability to thrive in competitive environments (Grinstein, 2008; Song & Jing, 2017; Walker et al., 2015).

To achieve superior performance, organizations often embrace an SIO to gain a competitive advantage and reduce the performance gap caused by environmental uncertainty (Azar & Ciabuschi, 2017). Therefore, it is possible to assert that SIO has a significant and positive impact on performance (Azar & Ciabuschi, 2017; Magnier-Watanabe & Benton, 2017; Walker et al., 2015). In fact, previous studies have shown a positive relationship between SIO and OP (Schweiger et al., 2019; Magnier-Watanabe & Benton, 2017; Walker et al., 2015; Suryantini et al., 2023). Nonetheless, although most of these studies demonstrate a strong conceptual and empirical association between the two (Schweiger et al., 2019; Demuner Flores, 2021; Ayinaddis, 2023), others have found no clear positive relationship, suggesting that SIO does not naturally result in improved OP (Mu et al., 2017; Chatzopoulou et al., 2022; Kornelius et al., 2021).

Furthermore, organizational leaders and scholars posit that innovative outcomes are beneficial for organizations, which is supported by empirical research showing that innovation strategies and activities positively influence performance (Magnier-Watanabe & Benton, 2017; Walker et al., 2015; Dinu et al., 2023). Given these considerations, the following hypothesis is proposed:

H₁: Strategic innovation orientation positively influences organizational performance.

Relationship between strategic innovation orientation and intellectual capital

The relationship between SIO and IC has not been widely studied in the literature. Most existing research has focused on specific components of SIO, such as technological innovation, process optimization, and product innovation (Bernal González et al., 2020). Hence, the need for a more comprehensive examination of the SIO–IC relationship by considering SIO as a whole. Despite limited research on this relationship, some studies have shown that the use of both tacit and explicit knowledge in SIO has a positive impact on IC (Magnier-Watanabe & Benton, 2017; Giménez, 2021). Additionally, the learning process involved in developing and designing products and services is essential for the activities stemming from SIO and IC (Lin & Chen, 2016; Coad et al., 2016). Furthermore, SIO allows companies to respond quickly and effectively to market demands by optimizing internal resources such as relationships with stakeholders, organizational structure, and employees' knowledge (Magnier-Watanabe & Benton, 2017; Dang & Wang, 2022).

In short, organizations should aim to develop a balanced portfolio of technological and organizational innovations to navigate changing environments and uncertainties and to strengthen knowledge, organizational structure, and relationships with stakeholders (Azar & Ciabuschi, 2017; Dang & Wang, 2022; Córdoba-Vega & Naranjo-Valencia, 2017; Thien & Hung, 2023). Based on this, the following hypothesis is put forward:

H₂: Strategic innovation orientation positively influences intellectual capital.

Relationship between intellectual capital and organizational performance

Previous research has provided empirical evidence of a positive relationship between IC and OP (Galeitzke et al., 2017; Masood et al., 2023). However, most studies have focused on a specific dimension of IC, i.e., human capital (Díez et al., 2010; Nguyen, 2020; Albertini & Berger-Remy, 2019), structural capital (Lin & Chen, 2016; Verbano & Crema, 2016; Ghlichlee & Goodarzi, 2023), or relational capital (Agostini & Nosella, 2017; Bontis, 1998; Edvinsson & Malone, 1998). This calls for a comprehensive assessment of the impact of IC on OP (Agostini et al., 2017). Also, IC has been studied as a mediating (Agostini et al., 2017; Magnier-Watanabe & Benton, 2017; Javed et al., 2023) or moderating factor (Adams et al., 2019; Schweiger et al., 2019; Agostini et al., 2017) in the relationship between OP and constructs such as dynamism, hostility, tacit and explicit knowledge, and technological innovation (Magnier-

Watanabe & Benton, 2017; Schweiger et al., 2019; Agostini et al., 2017; Nguyen, 2020).

By directing resources towards enhancing employees' skills and knowledge—both individually and collectively—organizations can boost productivity (Ekaningrum, 2021; Agostini et al., 2017). Companies should also strengthen relationships with internal and external stakeholders, including employees, suppliers, and customers, to bridge communication gaps and gain a competitive edge in the market (Inkinen, 2015; Nguyen, 2020; Hussein et al., 2023; Ekaningrum, 2021). Additionally, it is important for companies to identify and manage their key production processes to differentiate themselves in the market and enhance productivity (Khan et al., 2019; Ibarra-Cisneros & Hernández-Perlines, 2019; Handoyo et al., 2023). Given this, the following hypothesis is proposed:

H₃: Intellectual capital positively influences organizational performance.

3. METHODOLOGY

Sample and data collection

Data for this study were sourced from the most recent version of Colombia's Survey on Development and Technological Innovation in the Manufacturing Industry (EDIT for its acronym in Spanish) for the 2019–2020 period. This survey was conducted by the National Administrative Department of Statistics (DANE, 2021), covering a population of 7,769 organizations. The analysis focused on companies classified by DANE into the “strict” or “broad” categories, representing companies that achieved innovative results during the study period in both domestic and international markets. Hence, the sample comprised 1,765 organizations falling under these two categories.

Variables and measurements

Indicators from the EDIT associated with each of the constructs under study were identified following Restrepo-Ramírez's (2023) approach. This author developed a conceptual model using observable indicators from the EDIT linked to the constructs of SIO, IC, and OP and their respective dimensions. His approach comprises three main steps: (i) conducting a literature review to understand the theoretical content of the constructs; (ii) identifying possible indicators from the EDIT that reasonably represent the constructs under study; and (iii) validating content with experts.

Considering this, the measurement scales have already been validated in prior studies, including Restrepo-Ramírez's work (2023),

using the Kuder–Richardson test (Durán-Pérez & Lara-Abad, 2021) to assess reliability. This enabled their adoption in the present study.

Table 1 shows the number of indicators for each construct and dimension. Particularly, it outlines the distribution of the 88 indicators from the EDIT associated with each construct under study. Additionally, two example indicators are provided for each construct or dimension.

Table 1

Indicators associated with the constructs

Construct	Number of indicators	Examples
SIO	9	· New goods or services in the international market. · Introduction of new organizational methods in internal operations
Internal IC	21	· Trained personnel and master's degree education. · Average personnel involved in scientific, technological, and innovation activities
External IC	38	· Interns or research and development assistants. · Competitors or other companies in the sector
OP	20	· Increased productivity. · Invention patents
Total	88	

Tabla 1. Indicadores asociados a los constructos

Source. Own work.

Procedure

Descriptive statistics: Since dichotomous variables (1: presence of the attribute; 0: absence of the attribute) were employed, the frequency of each value (1 and 0) was counted for every variable, and the relative frequency was calculated based on the total to determine the importance of each variable in the behavior of the construct.

Mediation model: The proposed mediation model was tested using Baron and Kenny's product of coefficients method (1986), which involves the following three sequential steps to verify the relationships between the dependent variable (X), the independent variable (Y), and the mediator (M) (Hayes, 2009; Zhao et al., 2010; Pardo & Román, 2013):

1) Estimating the regression coefficient for the direct relationship between the dependent and independent variables: This first step involves confirming that *X* and *Y* are related—i.e., the regression coefficient should be different from zero (Hayes, 2009; Zhao et al., 2010; Pardo & Román, 2013)—following the expected direction, as indicated in Equation 1.

$$Y = i_1 + cX + e_1 \quad (1)$$

Here, i_1 is the intercept, c is the regression coefficient relating X to Y , and e_1 are the random errors (i.e., the portion of Y not explained by X). These errors are assumed to be normally distributed with constant variance and independent from one another.

2) Determining whether the independent variable has a significant effect on the mediating variable: This second step involves checking if the coefficient estimated by the linear regression between X and M (represented by a) is different from zero (Hayes, 2009; Zhao et al., 2010; Pardo & Román, 2013), as shown in Equation 2.

$$M = i_2 + aX + e_2 \quad (2)$$

3) Testing the relationship between the variable of interest and the mediator to estimate the total direct and indirect effects of the model: This third step involves examining whether M and Y are related after controlling for the effect of X . This means that coefficient b should be different from zero (Hayes, 2009; Zhao et al., 2010; Pardo & Román, 2013). This condition is verified by performing a linear regression analysis of Y explained by X and M , as indicated in Equation 3.

$$Y = i_3 + aX + bM + e_3 \quad (3)$$

As a result, the relationship between X and Y should significantly decrease when controlling for the effect of M . In other words, the estimated coefficient c from Equation 1 should decrease when testing the entire mediation model (Equation 3) (Hayes, 2009; Zhao et al., 2010; Pardo & Román, 2013).

Moreover, Baron and Kenny's (1986) method recommends using the Sobel test (Preacher & Leonardelli, 2001) to estimate the indirect effect of the mediation model between a and b , as shown in Equation 4. Here, a is the estimated effect between X and M from Equation 2, b is the regression coefficient between M and Y from Equation 3, and s_a and s_b are their respective standard deviations (Zhao et al., 2010).

$$z = \frac{a \times b}{\sqrt{b^2 s_a^2 + a^2 s_b^2}} \quad (4)$$

Where:

z : statistical significance value

a : estimated effect of SIO on IC

b : estimated effect of IC on OP

s_a and s_b : standard errors of the respective estimated effects

The entire procedure was conducted using the *mediation* package in RStudio, performing bootstrapping with 500 estimates. This involves simulating the model multiple times with randomly sampled subsets from the dataset to ensure results within confidence intervals. Bootstrapping allows for the estimation of the impact of one variable on another, as well as its level of significance. The level of significance should be less than 0.05 to reject the null hypothesis that the estimated parameters are equal to zero, concluding that there is a significant relationship between the variables under analysis (Rivas-Ruiz et al., 2013).

4. RESULTS

Descriptive statistics

Table 2 presents the descriptive statistics of the *strategic innovation orientation* construct.

Table 2

Descriptive statistics of strategic innovation orientation

SIO		
Indicator	No. 1	Percentage
New services or goods (company only)	599	33.93%
Significantly improved services or goods (company only)	547	30.99%
New goods or services in the international market	7	0.39%
Significantly improved goods or services in the domestic market	34	1.93%
Significantly improved goods or services in the international market.	7	0.004%
Introduced new or significantly improved production, distribution, delivery, and logistics methods within the company	832	47.14%
Introduced new organizational methods for the internal operations of the company	445	25.21%
Total investment in scientific, technological, and innovation activities	1,476	83.63%
Introduced new marketing techniques within the company	575	32.58%

Tabla 2. Estadística descriptiva OEI

Source: Own work.

As observed, a vast majority (84 %) of manufacturing companies in Colombia invested in scientific and technological activities, demonstrating an interest in focusing their strategy on innovation. Furthermore, a significant percentage of companies directed their strategy towards internal innovation: 47 % focused on improving production, distribution, and logistics methods; 25 % developed or enhanced organizational methods; and 33 % concentrated on improving and introducing new marketing techniques. In addition, 34 % and 31% of the companies developed new or significantly improved services or goods for the company, respectively. Moreover, there was limited intention to pursue outward innovation, as evidenced by the higher focus on creating new goods on a national scale (31 %) rather than in the international market (0.4 %).

Table 3 reports the descriptive statistics of the *internal intellectual capital* construct. Particularly, it provides information about the internal IC of manufacturing companies, including the internal personnel assigned to the different areas (based on their education and training) who participate in scientific, technological, and innovation activities, as well as the internal sources of innovative ideas.

Table 3

Descriptive statistics of internal intellectual capital

Internal IC			
Indicator		No. 1	Percentage
Personnel: total number of men and women who participated in scientific, technological, and innovation activities, by company area			
General management		673	38.13%
Administration		682	38.64%
Marketing and sales		561	31.78%
Production		860	48.73%
Accounting and finance		302	17.11%
Research and development technicians		315	17.85%
Total average employed personnel who participated in scientific, technological, and innovation activities		1303	73.82%
Personnel: total average number of men and women with higher education who participated in scientific, technological, and innovation activities			
Exact sciences (chemistry, physics, mathematics, and statistics)		646	36.6%
Health sciences		89	5.04%
Engineering, architecture, urban planning, and related fields		996	56.43%
Social sciences		415	23.51%
Humanities and fine arts		160	9.07%
Total average number of trained personnel who participated in scientific, technological, and innovation activities		1315	74.5%
Trained personnel with master's degree		37	2.09%
Trained personnel with graduate diploma		50	2.83%
Trained personnel with at least 40 hours of education and training		295	16.71%
Personnel trained and/or financed. Trained people in 2019		317	17.96%
Sources of innovative ideas: internal company departments		1765	100%
Sources of innovative ideas: suppliers		747	42.32%
Did your company hire external consultants to carry out scientific, technological, and innovation activities?		294	16.66%
Number of consultants providing services outside the company		311	17.62%

Tabla 3. Estadística descriptiva CI interno

Source: Own work.

As can be seen, 74 % of the companies allocated personnel for scientific, technological, and innovation activities. Additionally, in 75 % of the companies, personnel with higher education participated

in these activities. Regarding sources of innovative ideas, all companies primarily resorted to their internal departments.

Table 4 shows the descriptive statistics of the *external intellectual capital* construct. Specifically, it outlines the components of external IC, including external personnel by area dedicated to scientific, technological, and innovation activities, as well as external sources of innovative ideas and the relationships with actors in the science, technology, and innovation system.

Table 4

Descriptive statistics of external intellectual capital

External IC			
Indicator		No. 1	Percentage
Personnel: total number of men and women who participated in scientific, technological, and innovation activities, by company area			
Researchers		498	28.22%
Interns or research and development assistants		154	8.73%
Natural sciences		95	5.38%
Trained personnel with doctoral qualifications		12	0.67%
Sources of innovative ideas			
Other related companies		163	9.24%
Research and development department (other company)		139	7.88%
Competitors or other companies in the sector		172	9.75%
Companies from other sectors		213	12.06%
Sector associations and/or organizations		170	9.63%
Chambers of commerce		246	13.94%
Technology development centers		81	4.59%
Autonomous research centers		61	3.46%
Business incubators for technology-based companies		13	0.74%
Technology parks		21	1.19%
Regional productivity centers		43	2.43%
Universities		231	13.08%
Training centers and/or technoparks		38	2.12%
Consultants or experts		311	17.62%
Fairs and exhibitions		442	25.04%
Seminars and conferences		389	22.03%
Books, magazines, or catalogs		469	26.57%
Industrial property information systems		112	6.35%
Copyright information systems		52	2.95%
Internet		970	54.96%
Scientific and technological databases		313	17.73%
Standards and technical regulations		565	32.01%
Public institutions		195	11.05%
Number of relationships with actors in Colombia's Science, Technology, and Innovation System (SNCTI for its acronym in Spanish)		163	9.25%
Cooperation to conduct scientific, technological, and innovation activities:			
Customers		272	15.41%

Competitors	31	1.76%
Consultants	174	9.86%
Universities	175	9.92%
Technology development centers	35	1.98%
Autonomous research centers	32	1.81%
Technology parks	13	0.74%
Regional productivity centers	18	1.02%
Non-governmental organizations	38	2.15%
Government	74	4.19%

Tabla 4. Estadística descriptiva CI externo

Source: Own work.

As observed, 28% of the companies had researchers involved in scientific, technological, and innovation activities. Additionally, approximately 1% of the companies under analysis had personnel with doctoral qualifications dedicated to these activities. Regarding the most significant external sources of innovative ideas, 55% of the companies relied on the internet, 25% used fairs and exhibitions, and 32% resorted to standards and technical regulations. The most common actors with whom the companies cooperated were customers (15%), universities (10%), and consultants (10%).

Table 5 presents the descriptive statistics of the *organizational performance* construct. It highlights aspects of organizational performance such as efficiency, effectiveness, and innovative performance.

Table 5

Descriptive statistics of organizational performance

OP		
Indicator	No. 1	Percentage
Efficiency and effectiveness		
Increased productivity	1312	74.33%
Reduction in labor costs	915	51.84%
Reduction in the use of raw materials	796	45.09%
Reduction in energy consumption	770	43.63%
Reduction in water consumption	637	36.09%
Reduction in communication costs	600	33.99%
Reduction in transportation costs	624	35.35%
Reduction in maintenance and repair costs	751	42.55%
Use of manufacturing waste	938	53.14%
Improvement in quality of goods or services	1341	75.98%
Expansion of the range of goods or services	1262	71.5%
Has maintained its participation in its geographic market	1454	82.38%
Entered a new geographic market	956	54.16%
Improved compliance with regulations, standards, and technical standards	1021	57.85%
Decrease in tax payments	496	28.1%
Invention patents	76	4.31%
Utility model patents	43	2.44%
Copyright	18	1.02%
Software registrations	30	1.69%
Registration of industrial designs	101	5.72%

Tabla 5. Estadística descriptiva DO

Source: Own work.

Regarding efficiency, 74 % of the companies reported an increase in productivity, and 52 % reduced labor costs thanks to scientific, technological, and innovation activities. As for effectiveness, 76 % of companies reported improvements in the quality of goods and services, while 82 % maintained their participation in the market. Innovative performance, for its part, showed poor results, as, for example, only 6 % of the companies registered industrial designs.

Mediation model

Table 6 shows the results of the mediation model.

Table 6

Mediation model

Step 1: Direct relationship		
Relationship	Estimate	P-value or significance*
SIO–OP	1.0009	0***
Step 2: introduction of the mediating variable		
Relationship	Estimate	P-value or significance
SIO–IC	2.8404	0***
Step 3: Mediation model		
Relationship	Estimate	P-value or significance
SIO–OP	0.70766	0***
IC–OP	0.1033	0***
SIO–IC–OP	0.293	0***

Tabla 6. Modelo con mediación

Source: Own work using RStudio.

Note: p-value: * < 0.05; ** < 0.01; *** < 0.001.

Based on the significance value of the direct relationship ($p < 0.05$), there is a positive and significant relationship between SIO and OP, which confirms hypothesis 1. After introducing the mediating variable, the relationship between the independent variable (SIO) and the mediator (IC) was tested. This analysis rejected the null hypothesis that the estimated parameters are zero ($p < 0.05$), confirming that SIO positively influences IC and thus confirming hypothesis 2. Then, the mediation model was analyzed, showing that IC has a positive impact on OP, confirming hypothesis 3. Importantly, the mediating effect was examined by considering IC as a whole, rather than focusing on the mediation of each dimension of the construct.

Thus, according to the results of the mediation model, there is a total, positive, and significant indirect effect as a result of the multiplication of the coefficients of the SIO–IC–OP relationship. In other words, IC absorbs a portion of the effect that SIO has on OP, indicating partial mediation.

Table 7 reports the estimated direct and indirect effects based on the coefficients calculated in the linear regression analysis.

Table 7

Direct and indirect effects

Effects	Estimate	Lower bound of the 95% confidence interval	Upper bound of the 95% confidence interval	P-value*
ACME (SIO– IC–OP)	0.293	0.204	0.40	0.00***
ADE (SIO– OP)	0.708	0.554	0.86	0.00***
Total effect (ACME+ ADE)	1.001	0.865	1.13	0.00***

Tabla 7. Efectos directos e indirectos

Source: Own work using RStudio.

Note: p-value: * < 0.05; ** < 0.01; *** < 0.001.

**Bootstrapping with 500 simulations

As can be seen, the Average Causal Mediation Effect (ACME) of 0.293 indicates the indirect effect of SIO on OP mediated through IC. This effect ranged from 0.204 to 0.40 within a 95% confidence interval. Based on the p-value ($p < 0.05$), IC significantly explains the relationship between SIO and OP. The Average Direct Effect (ADE) of 0.708, for its part, represents the direct effect of SIO on OP without mediation through IC. This effect ranged from 0.554 to 0.86 within a 95% confidence interval.

The total effect (ACME + ADE) reflects the direct effect of SIO on OP and its indirect effect through IC mediation. Note that the estimated value of the direct relationship before including mediation (1.0009, see Table 6) decreased significantly when IC was introduced as the mediating variable in the model (0.708). This highlights the importance of IC as a mediating mechanism in explaining the relationship between the two constructs. Furthermore, ADE (SIO–OP) was greater than ACME (SIO–IC–OP), which was calculated using the Sobel test (Preacher & Leonardelli, 2001), as shown in Table 8.

Table 8

Indirect effect

Unstandardized coefficients			
a	b	C	Indirect (a.b)
2.84***	0.1033***	0.71***	0.293***

Tabla 8. Efecto indirecto

Source: Own work.

Note: p-value: * < 0.05; ** < 0.01; *** < 0.001.

Figure 1 illustrates the research model with the estimated results. As shown in this figure, introducing mediation into the model reduced the direct effect of SIO on OP to an estimated coefficient of 0.70, which is statistically significant. This suggests that IC partially mediates the relationship between SIO and OP.

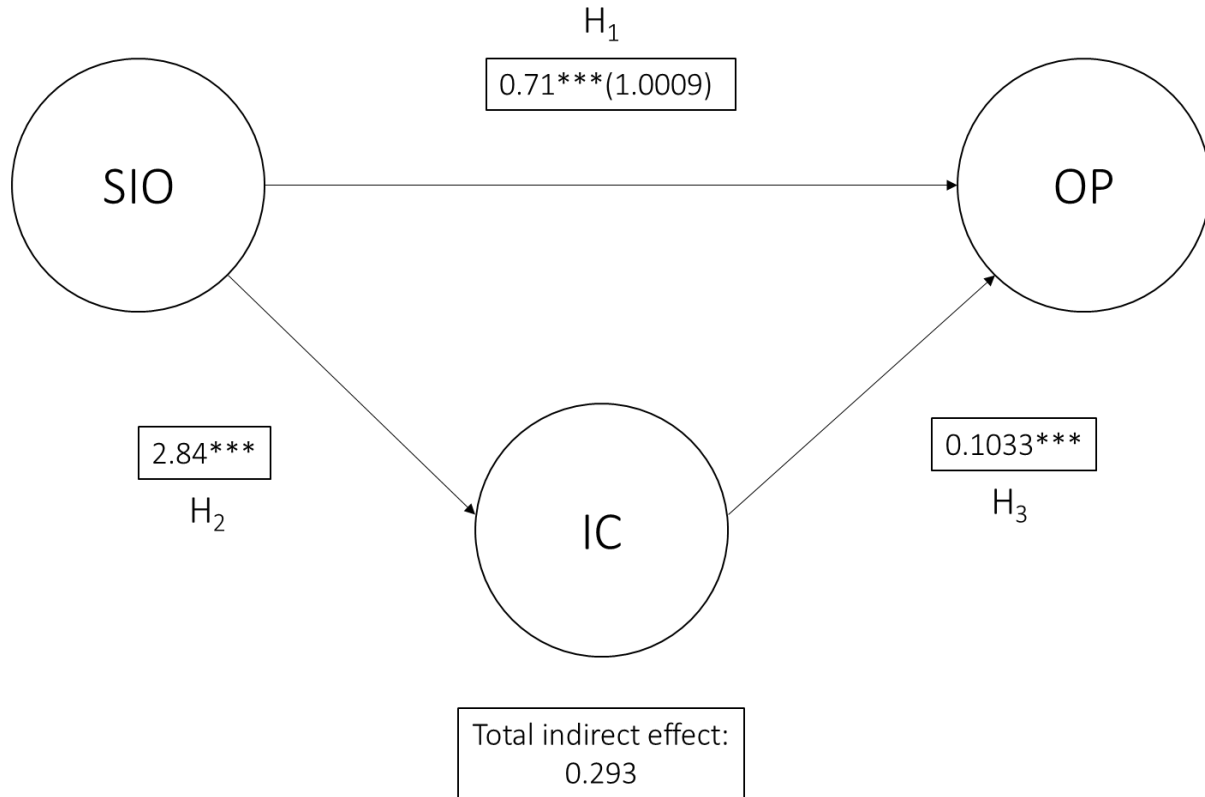


Figure 1

Research model

Figura 1. Modelo de investigación

Source: Own work.

Figure 2 depicts the scatter plot of the mediated relationship. As observed, the model exhibits partial mediation, as the indirect effect explains part of the relationship between SIO and OP but not entirely. Nonetheless, including IC as a mediating variable is crucial because it helps explain what the direct relationship does not fully capture. Note the difference between the model without mediation (black line) and the model after introducing the mediating variable (blue line), indicating partial mediation.

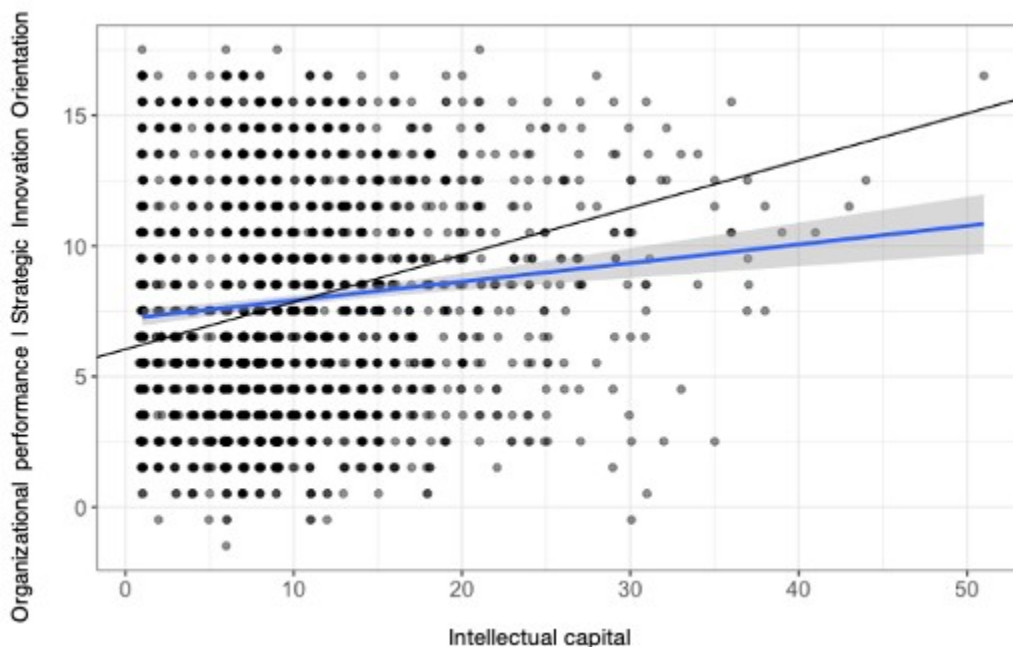


Figure 2

Scatter plot of the mediated relationship

Figura 2. Diagrama de dispersión de la relación mediada

Source: Own work using RStudio.

5. DISCUSSION

In recent years, SIO has gained significance both theoretically and practically due to its potential impact on the success and sustainability of organizations in highly competitive and dynamic markets (Setiadji & Ahmadi, 2020; Pertuz & Perez, 2020; Demuner Flores, 2021; Bansal et al., 2023). In addition, SIO enhances IC by fostering creative thinking, enabling the acquisition, generation, and transfer of knowledge within organizations (Chen & Lin, 2021; Dang & Wang, 2022; Bernal González et al., 2020; Ayinaddis, 2023; Rehman et al., 2023). Understanding market demands and addressing them with innovative strategies has allowed organizations to achieve high returns. This, in turn, helps them identify new opportunities to expand their range of goods and services, thereby creating differentiation and competitive advantages (Chatzopoulou et al., 2022; Dinu et al., 2023; Hussein et al., 2023).

The results of this study are consistent with those of previous research, providing empirical evidence that supports the positive relationship between innovative strategies and organizational performance (Chatzopoulou et al., 2022; Demuner Flores, 2021; Dinu et al., 2023; Purnomo et al., 2022; Ayinaddis, 2023). Furthermore, this research demonstrated that intellectual capital serves as a new mediating mechanism—an area previously

underexplored in the relationship between strategic orientation and organizational performance. These findings are also in line with earlier studies showing the impact of knowledge-based intangible resources such as intellectual capital on organizational performance and market growth (Nguyen, 2020; Gehrisch & Süß, 2023; Handoyo et al., 2023; Hussein et al., 2023).

Moreover, in line with the results of this study, authors such as Nugroho et al. (2022), Dang and Wang (2022), and Bernal González et al. (2020) have emphasized the importance of directing company resources and capabilities towards key areas of knowledge and innovation to achieve better organizational outcomes.

Finally, this study also provides empirical evidence from manufacturing companies in Colombia, highlighting intellectual capital as a new mediating mechanism in the relationship between strategic innovation orientation and organizational performance. By using observable indicators to operationalize the constructs under study, this research contributes an original perspective to the existing body of literature.

6. CONCLUSIONS

This study empirically analyzed the relationship between Strategic Innovation Orientation (SIO) and Organizational Performance (OP) both directly and through the mediation of Intellectual Capital (IC). According to the results, there was a partial mediation of IC in this relationship, indicating that IC is a mechanism through which SIO can enhance OP.

The study makes two significant contributions. First, it provides empirical evidence of both the direct and indirect relationship between SIO and OP. It also emphasizes the importance of strengthening IC within organizations to achieve better performance outcomes through SIO. Second, the results suggest that organizational managers should focus on adopting an SIO to adapt to changing market conditions and develop competitive advantages that boost performance. This includes enhancing intangible resources such as IC to maximize positive impacts on performance.

This study, however, also has limitations. First, it used a cross-sectional design, which does not allow for the analysis of changes in variables over time. To overcome this, future research could consider using a longitudinal approach. Second, IC was analyzed as a whole without considering its individual dimensions; hence, future studies could conduct analyses considering each dimension separately. Finally, the research focused on manufacturing companies in Colombia, so future work could explore other sectors and contexts to validate the generalizability of the results.

REFERENCIAS

- Adams, P., Bodas Freitas, I. M., & Fontana, R. (2019). Strategic orientation, innovation performance and the moderating influence of marketing management. *Journal of Business Research*, 97, 129-140. <https://doi.org/10.1016/j.jbusres.2018.12.071>
- Agostini, L., & Nosella, A. (2017). Enhancing radical innovation performance through intellectual capital components. *Journal of Intellectual Capital*, 18(4), 789-806. <https://doi.org/10.1108/JIC-10-2016-0103>
- Agostini, L., Nosella, A., & Filippini, R. (2017). Does intellectual capital allow improving innovation performance? A quantitative analysis in the SME context. *Journal of Intellectual Capital*, 18(2), 400-418. <https://doi.org/10.1108/JIC-05-2016-0056>
- Albertini, E., & Berger-Remy, F. (2019). Intellectual capital and financial performance: A meta-analysis and research agenda. *M@n@gement*, 22, 216-249. <https://doi.org/10.3917/mana.222.0216>
- Ayinaddis, S. G. (2023). The effect of innovation orientation on firm performance: evidence from micro and small manufacturing firms in selected towns of Awi Zone, Ethiopia. *Journal of Innovation and Entrepreneurship*, 12(1), 26. <https://doi.org/10.1186/s13731-023-00290-3>
- Azar, G., & Ciabuschi, F. (2017). Organizational innovation, technological innovation, and export performance: The effects of innovation radicalness and extensiveness. *International Business Review*, 26(2), 324-336. <https://doi.org/10.1016/j.ibusrev.2016.09.002>
- Bansal, S., Garg, I., Jain, M., & Yadav, A. (2023). Improving the performance/competency of small and medium enterprises through intellectual capital. *Journal of Intellectual Capital*, 24(3), 830-853. <https://doi.org/10.1108/JIC-07-2021-0189>
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, 51(6), 1173-1182. <https://doi.org/10.1037/0022-3514.51.6.1173>
- Bernal González, I., Pedraza Melo, N. A., & Castillo Hernández, L. (2020). El capital humano y su relación con el desempeño organizacional. *Revista Espacios*, 41(22), 213–227. <https://www.revistaespacios.com/a20v41n22/a20v41n22p14.pdf>
- Bontis, N. (1998). Intellectual capital: an exploratory study that develops measures and models. *Management Decision*, 36(2), 63–76. <https://doi.org/10.1108/00251749810204142>

- Chatzopoulou, E.-C., Manolopoulos, D., & Agapitou, V. (2022). Corporate social responsibility and employee outcomes: interrelations of external and internal orientations with job satisfaction and organizational commitment. *Journal of Business Ethics*, 179(3), 795-817. <https://doi.org/10.1007/s10551-021-04872-7>
- Chen, Y., & Lin, Z. (2021). Business intelligence capabilities and firm performance: A study in China. *International Journal of Information Management*, 57, 102232. <https://doi.org/10.1016/j.ijinfomgt.2020.102232>
- Chmielewska, M., Stokwiszewski, J., Markowska, J., & Hermanowski, T. (2022). Evaluating Organizational Performance of Public Hospitals using the McKinsey 7-S Framework. *BMC Health Services Research*, 22(1), 1-12. <https://doi.org/10.1186/s12913-021-07402-3>
- Choi, J., Kim, B., Han, C. H., Hahn, H., Park, H., Yoo, J., & Jeong, M. K. (2021). Methodology for assessing the contribution of knowledge services during the new product development process to business performance. *Expert Systems with Applications*, 167, 113860. <https://doi.org/https://doi.org/10.1016/j.eswa.2020.113860>
- Chou, C., & Yang, K. P. (2011). The interaction effect of strategic orientations on new product performance in the high-tech industry: A nonlinear model. *Technological Forecasting and Social Change*, 78(1), 63-74. <https://doi.org/10.1016/j.techfore.2010.07.018>
- Coad, A., Segarra, A., & Teruel, M. (2016). Innovation and firm growth: does firm age play a role? *Research Policy*, 45(2), 387-400. <https://doi.org/10.1016/j.respol.2015.10.015>
- Córdoba-Vega, J. M., & Naranjo Valencia, J. C. (2017). Incidencia de la inversión en innovación en las ventas de productos innovadores. Evidencia empírica en empresas manufactureras de Colombia. *Información tecnológica*, 28(2), 153-166. <http://dx.doi.org/10.4067/S0718-07642017000200017>
- Dang, V. T., & Wang, J. (2022). Building competitive advantage for hospitality companies: The roles of green innovation strategic orientation and green intellectual capital. *International Journal of Hospitality Management*, 102, 103161. <https://doi.org/10.1016/j.ijhm.2022.103161>
- Demuner Flores, M. del R. (2021). Capacidad de innovación en empresas mexicanas: mediación en la relación orientación al aprendizaje-rendimiento empresarial. *Acta Universitaria*, 31, 1-19. <https://doi.org/10.15174/au.2021.3185>
- Denicolai, S., Zucchella, A., & Moretti, F. (2018). Not So Similar After All: Exploring the Diversity of Strategic Orientations for Innovation.

International Journal of Innovation Management, 22(04), 1850036.
<https://doi.org/10.1142/s1363919618500366>

- Departamento Administrativo Nacional de Estadística. (2021). *Boletín Técnico. Encuesta de Desarrollo e Innovación Tecnológica en la Industria manufacturera (EDIT X). 2019-2020*. <https://www.dane.gov.co/index.php/estadisticas-por-tema/tecnologia-e-innovacion/encuesta-de-desarrollo-e-innovacion-tecnologica-edit>
- Deutscher, F., Zapkau, F. B., Schwens, C., Baum, M., & Kabst, R. (2016). Strategic orientations and performance: A configurational perspective. *Journal of Business Research*, 69(2), 849–861. <https://doi.org/10.1016/j.jbusres.2015.07.005>
- Díez, J. M., Ochoa, M. L., Prieto, M. B., & Santidrián, A. (2010). Intellectual capital and value creation in Spanish firms. *Journal of Intellectual Capital*, 11(3), 348–367. <https://doi.org/10.1108/14691931011064581>
- Dinu, E., Vătamănescu, E.-M., Stăneiu, R.-M., & Rusu, M. (2023). An exploratory study linking intellectual capital and technology management towards innovative performance in KIBS. *Sustainability*, 15(2), 1356. <https://doi.org/10.3390/su15021356>
- Do Hyung, L., & Dedahanov, A. (2014). Firm performance and entrepreneurial, market and technology orientations in Korean technology intensive SMEs. *Asian Social Science*, 10(22), 37–47. <https://doi.org/10.5539/ass.v10n22p37>
- Dogan, E. (2017). A strategic approach to innovation. *Journal of Management Marketing and Logistics*, 4(3), 290-300. <http://doi.org/10.17261/Pressacademia.2017.491>
- Durán-Pérez, F. B., & Lara-Abad, G. E. (2021). Aplicación del coeficiente de confiabilidad de Kuder Richardson en una escala para la revisión y prevención de los efectos de las rutinas formadas durante el periodo de confinamiento a partir de la identificación del seguimiento de medidas de seguridad de comida y de descanso. *Boletín Científico de La Escuela Superior Atotonilco de Tula*, 8(15), 51–55. <https://doi.org/10.29057/esat.v8i15.6693>
- Edvinsson, L., & Malone, M. (1998). *Capital intelectual: descubriendo o valor real de sua empresa pela identificação de seus valores internos*. Makron Books.
- Ekaningrum, Y. (2021). The influence of intellectual capital elements of company performance. *The Journal of Asian Finance, Economics and Business*, 8(1), 257–269. <https://scholar.unair.ac.id/en/publications/the-influence-of-intellectual-capital-elements-on-company-perform>

- Galeitzke, M., Steinhöfel, E., Orth, R., & Kohl, H. (2017). Intellectual capital-driven technology and innovation management. *International Journal of Innovation and Technology Management*, 14(05), 1750028. <https://doi.org/10.1142/S0219877017500286>
- Ganesh, R., & Haslinda, A. (2023). Contributory role of innovative capabilities in Malaysian small and medium enterprises performance. *International Journal of Services, Economics and Management*, 14(1), 78-107. <https://doi.org/10.1504/IJSEM.2023.129594>
- García Garnica, A., & Taboada Ibarra, E. L. (2012). Teoría de la empresa: Las propuestas de Coase, Alchian y Demsetz, Williamson, Penrose y Nooteboom. *Economía: Teórica y Práctica. Nueva Época*, (36), 9-42. https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0188-33802012000100002
- Gatignon, H., & Xuereb, J.-M. (2006). Strategic Orientation of the Firm and New Product Performance. *Journal of Marketing Research*, 34(1), 77-90. <https://doi.org/10.2307/3152066>
- Gehrisch, M. G., & Süß, S. (2023). Organizational behavior in international strategic alliances and the relation to performance – a literature review and avenues for future research. *Management Review Quarterly*, 73, 1045–1107. <https://doi.org/10.1007/s11301-022-00268-7>
- Ghlichlee, B., & Goodarzi, A. (2023). Strategic human resource practices and new product development performance: the mediating role of intellectual capital. *Journal of Intellectual Capital*, 24(3), 730-756. <https://doi.org/10.1108/JIC-11-2020-0360>
- Giménez, M. (2021). Capital Intelectual: Gestión Innovadora En Las Organizaciones Inteligentes. *Gerentia*, (2), 101–126. <https://investigacionuft.net.ve/revista/index.php/Gerentia/article/view/476/563>
- Gómez-Bayona, L., Londoño-Montoya, E., & Mora-González, B. (2020). Modelos de capital intelectual a nivel empresarial y su aporte en la creación de valor. *Revista CEA*, 6(11), 165–184. <https://doi.org/10.22430/24223182.1434>
- Gómez-Valenzuela, V. (2022). Intellectual capital factors at work in Dominican firms: understanding their influence. *Journal of Innovation and Entrepreneurship*, 11(1), 1–24. <https://doi.org/10.1186/s13731-022-00205-8>
- Grawe, S. J., Chen, H., & Daugherty, P. J. (2009). The relationship between strategic orientation, service innovation, and performance. *International Journal of Physical Distribution & Logistics Management*, 39(4), 282–300. <https://doi.org/10.1108/09600030910962249>

- Grinstein, A. (2008). The relationships between market orientation and alternative strategic orientations: A meta-analysis. *European Journal of Marketing*, 42(1–2), 115–134. <https://doi.org/10.1108/03090560810840934>
- Gunasekaran, A., Irani, Z., Choy, K.-L., Filippi, L., & Papadopoulos, T. (2015). Performance measures and metrics in outsourcing decisions: A review for research and applications. *International Journal of Production Economics*, 161, 153-166. <https://doi.org/10.1016/j.ijpe.2014.12.021>
- Hakala, H. (2011). Strategic orientations in management literature: Three approaches to understanding the interaction between market, technology, entrepreneurial and learning orientations. *International Journal of Management Reviews*, 13(2), 199–217. <https://doi.org/10.1111/j.1468-2370.2010.00292.x>
- Handoyo, S., Suharman, H., Ghani, E. K., & Soedarsono, S. (2023). A business strategy, operational efficiency, ownership structure, and manufacturing performance: The moderating role of market uncertainty and competition intensity and its implication on open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, 9(2), 100039. <https://doi.org/10.1016/j.joitmc.2023.100039>
- Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, 76(4), 408-420. <https://doi.org/10.1080/03637750903310360>
- Hernández-Betancur, J. E., Montoya-Restrepo, L. A., & Montoya-Restrepo, I. A. (2022). Momento de la decisión estratégica: caso de estudio en el sector textil. *Revista CEA*, 8(16), e1878. <https://doi.org/10.22430/24223182.1878>
- Hortinha, P., Lages, C., & Lages, L. F. (2011). The trade-off between customer and technology orientations: Impact on innovation capabilities and export performance. *Journal of International Marketing*, 19(3), 36–58. <https://doi.org/10.1509/jimk.19.3.36>
- Hussein, M. K., Al-tekreeti, R. B. N., Hasan, M. F., & Flayyih, H. H. (2023). The Moderate Role of the Perceived Orientation of Information Technology in the Relationship between Human Capital and Organizational Innovation Mediating Orientations to Learning: Literature Review. *Ishtar Journal of Economics and Business Studie*, 4(1), 1-8. <https://ishtareconomics.org/index.php/About/article/view/14>
- Ibarra-Cisneros, M. A., & Hernández-Perlines, F. (2019). La influencia del capital intelectual en el desempeño de las pequeñas y medianas empresas manufactureras de México: el caso de Baja California.

Innovar, 29(71), 79-96. <https://doi.org/10.15446/innovar.v29n71.76397>

- Ibarra-Cisneros, M. A., Hernández-Perlines, F., & Rodríguez-García, M. (2020). Intellectual capital, organisational performance and competitive advantage. *European Journal of International Management*, 14(6), 976-998. <https://roderic.uv.es/rest/api/core/bitstreams/0efe5c67-024c-45a5-a0af-414fc8723088/content>
- Inkinen, H. (2015). Review of empirical research on intellectual capital and firm performance. *Journal of Intellectual Capital*, 16(3), 518-565. <https://doi.org/10.1108/JIC-01-2015-0002>
- Javed, H. A., Khan, N. A., Michalk, S., Khan, N. U., & Kamran, M. (2023). High-performance work system and innovation capabilities: The mediating role of intellectual capital. *Administrative Sciences*, 13(1), 23. <https://doi.org/10.3390/admsci13010023>
- Khan, N. U., Shuangjie, L., Khan, S. Z., & Anwar, M. (2019). Entrepreneurial orientation, intellectual capital, IT capability, and performance. *Human Systems Management*, 38(3), 297-312. <https://doi.org/10.3233/HSM-180393>
- Kocak, A., Carsrud, A., & Oflazoglu, S. (2017). Market, entrepreneurial, and technology orientations: impact on innovation and firm performance. *Management Decision*, 55(2), 248-270. <https://doi.org/10.1108/MD-04-2015-0146>
- Kornelius, H., Supratikno, H., Bernato, I., & Widjaja, A. W. (2021). Strategic Planning and Firm Performance: The Mediating Role of Strategic Maneuverability. *Journal of Asian Finance, Economics, and Business*, 8(1), 479-486. <https://doi.org/10.13106/jafeb.2021.vol8.no1.479>
- Kumar, K., Boesso, G., Favotto, F., & Menini, A. (2012). Strategic orientation, innovation patterns and performances of SMEs and large companies. *Journal of Small Business and Enterprise Development*, 19(1), 132-145. <https://doi.org/10.1108/14626001211196442>
- Lee, D. H., Dedahanov, A. T., & Rhee, J. (2015). Moderating role of external networks and mediating effect of innovation performance on the relationship between technology orientation and firm performance. *Asian Journal of Technology Innovation*, 23(3), 321-334. <https://doi.org/10.1080/19761597.2015.1120498>
- Lin, Y.-L., & Chen, T.-Y. (2016). How does strategic orientation influence intellectual capital through value creating activities. *Business Research Review*, 2(1), 13-32. https://brr-net.com/issues/Vol_2_No_1_June_2016/2.pdf

- Lo, C., Wang, C., & Chen, Y.-C. (2020). The mediating role of intellectual capital in open innovation in the service industries. *Sustainability*, 12(12), 5220. <https://doi.org/10.3390/su12125220>
- Magnier-Watanabe, R., & Benton, C. (2017). Management innovation and firm performance: The mediating effects of tacit and explicit knowledge. *Knowledge Management Research and Practice*, 15(3), 325–335. <https://doi.org/10.1057/s41275-017-0058-6>
- Masa'deh, R., Al-Henzab, J., Tarhini, A., & Obeidat, B. Y. (2018). The associations among market orientation, technology orientation, entrepreneurial orientation and organizational performance. *Benchmarking: An International Journal*, 25(8), 3117–3142. <https://doi.org/10.1108/BIJ-02-2017-0024>
- Masood, F., Channa, K. A., & Shah, S. M. M. (2023). The effect of the components of intellectual capital on organisational performance: evidence from the telecom industry. *International Journal of Knowledge Management Studies*, 14(4), 457-479. <https://doi.org/10.1504/IJKMS.2023.133858>
- Maxim, L. G. (2023). EBITDA, one of the most important indicators regarding the financial sustainability of retail companies. *Economic convergence in European Union*, XXX, 134-143.
- Mcgivern, M. H., & Tvorik, S. J. (1998). Vision driven organizations: Measurement techniques for group classification. *Management Decision*, 36(4), 241–264. <https://doi.org/10.1108/00251749810211045>
- Morales Clark, L. E., Jacobo-Hernández, C. A., Ochoa-Jiménez, S., & Ibarra-Morales, L. E. (2020). Intellectual capital and organizational performance: the case of basic education institutions in Mexico. *Revista Científica Pensamiento y Gestión*, (47), 180–202. <https://doi.org/10.14482/pege.47.6342>
- Mu, J., & Di Benedetto, C. A. (2011). Strategic orientations and new product commercialization: mediator, moderator, and interplay. *R&D Management*, 41(4), 337–359. <https://doi.org/10.1111/j.1467-9310.2011.00650.x>
- Mu, J., Thomas, E., Peng, G., & Di Benedetto, A. (2017). Strategic orientation and new product development performance: The role of networking capability and networking ability. *Industrial Marketing Management*, 64, 187–201. <https://doi.org/10.1016/j.indmarman.2016.09.007>
- Mutlu, H. M., & Sürer, A. (2016). Effects of market, e-marketing, and technology orientations on innovativeness and performance in

- Turkish health organizations. *Health marketing quarterly*, 33(2), 95-111. <https://doi.org/10.1080/07359683.2016.1166807>
- Nagarajan, K. (2015). Economic Value Added (Eva): A Performance Measure of Strategic Finance. *CLEAR International Journal of Research in Commerce & Management*, 6(11), 89-91. https://ijrcm.org.in/article_info.php?article_id=6047
- Naranjo-Valencia, J. C., Jiménez-Jiménez, D., & Sanz-Valle, R. (2011). Innovation or imitation? The role of organizational culture. *Management Decision*, 49(1), 55-72. <https://doi.org/10.1108/00251741111094437>
- Nawaz, T., & Haniffa, R. (2017). Determinants of financial performance of Islamic banks: an intellectual capital perspective. *Journal of Islamic Accounting and Business Research*, 8(2), 130-142. <https://doi.org/10.1108/JIABR-06-2016-0071>
- Nazir, M. I., Tan, Y., & Nazir, M. R. (2021). Intellectual capital performance in the financial sector: Evidence from China, Hong Kong, and Taiwan. *International Journal of Finance & Economics*, 26(4), 6089-6109. <https://doi.org/10.1002/ijfe.2110>
- Nguyen, V. C. (2020). Human capital, capital structure choice and firm profitability in developing countries: An empirical study in Vietnam. *Accounting*, 6(2), 127-136. <https://doi.org/10.5267/j.ac.2019.11.003>
- Nugroho, A., Prijadi, R., & Kusumastuti, R. D. (2022). Strategic orientations and firm performance: the role of information technology adoption capability. *Journal of Strategy and Management*, 15(4), 691-717. <https://doi.org/10.1108/JSMA-06-2021-0133>
- Nürk, J. (2019). Smart information system capabilities of digital supply chain business models. *European Journal of Business Science and Technology*, 5(2), 143-184. <https://doi.org/10.11118/EJOBSAT.V5I2.175>
- Odiri, V. I. O., & Ideh, A. O. (2021). Determinants of organizational performance in Nigeria: Evidence from service firms. *Humanities and Social Sciences Letters*, 9(1), 86-95. <https://doi.org/10.18488/journal.73.2021.91.86.95>
- Pardo, A., & Román, M. (2013). Reflections on the Baron and Kenny model of statistical mediation. *Anales de psicología*, 29(2), 614-623. <https://www.redalyc.org/pdf/167/16726244036.pdf>
- Pedraza Melo, N. A., & de la Gala Velásquez, B. (2022). The mediating role of structural capital in the relationship between human capital and performance in the public administrations of Mexico and Peru. *Estudios Gerenciales*, 38(164), 320-333. <https://doi.org/10.18046/j.estger.2022.164.5087>

- Pertuz, V., & Pérez, A. (2020). Organizational learning conditions and innovation management practices: An analysis of medium-sized firms. *Información Tecnológica*, 31(3), 209–218. <https://doi.org/10.4067/S0718-07642020000300209>
- Preacher, K. J., & Leonardelli, G. J. (2001). *Calculation for the Sobel test: An interactive calculation tool for mediation tests*. <https://quantpsy.org/sobel/sobel.htm>
- Princy, K., & Rebeka, E. (2019). Employee commitment on organizational performance. *International Journal of Recent Technology and Engineering*, 8(3), 891-895. <https://www.ijrte.org/wp-content/uploads/papers/v8i3/C4078098319.pdf>
- Purnomo, S., Purwandari, S., & Sentosa, I. (2022). Sustainability MSMEs Performance and Income Distribution: Role of Intellectual Capital and Strategic Orientations. *Journal of Distribution Science*, 20(4), 85-94. <https://doi.org/10.15722/JDS.20.04.202204.85>
- Quintero-Quintero, W., Blanco-Ariza, A. B., & Garzón-Castrillón, M. A. (2021). Intellectual capital: A review and bibliometric analysis. *Publications*, 9(4), 1–23. <https://doi.org/10.3390/publications9040046>
- Rehman, S. U., Ashfaq, K., Bresciani, S., Giacosa, E., & Mueller, J. (2023). Nexus among intellectual capital, interorganizational learning, industrial Internet of things technology and innovation performance: a resource-based perspective. *Journal of intellectual capital*, 24(2), 509-534. <https://doi.org/10.1108/JIC-03-2021-0095>
- Restrepo-Ramírez, C. G. (2023). *Orientación estratégica a la innovación como motor de desarrollo del desempeño organizativo a través del fortalecimiento del capital intelectual: evidencia estructural basada en datos objetivos* [Tesis Doctoral, Universidad de Valencia].
- Rivas-Ruiz, R., Castelán-Martínez, O. D., Pérez, M., & Talavera, J. O. (2013). Clinical research XVII. χ^2 test, from the expected to the observed. *Revista Médica del Instituto Mexicano del Seguro Social*, 51(5), 552-557. <https://www.medigraphic.com/cgi-bin/new/resumenI.cgi?IDARTICULO=45299>
- Rojas, M., Jaimes, L., & Valencia, M. (2018). Efectividad, eficacia y eficiencia en equipos de trabajo. *Espacios*, 39(6), 1–15. <https://www.revistaespacios.com/a18v39n06/a18v39n06p11.pdf>
- Roos, G., Bainbridge, A., & Jacobsen, K. (2001). Intellectual capital analysis as a strategic tool. *Strategy & Leadership*, 29(4), 21–26. <https://doi.org/10.1108/10878570110400116>
- Saqib, M., Baluch, N. H., & Udin, Z. M. (2017). Moderating role of technology orientation on the relationship between knowledge

- management and SMEs' performance in Oman: A conceptual study. *International Journal of Economic Perspectives*, 11(1), 433–441. <https://www.proquest.com/openview/718ca15363b6f84054c92ebab9b282ed/1?pq-origsite=gscholar&cbl=51667>
- Schweiger, S. A., Stettler, T. R., Baldauf, A., & Zamudio, C. (2019). The Complementarity of Strategic Orientations: A Meta-Analytic Synthesis and Theory Extension. *Strategic Management Journal*, 40(11), 1822–1851. <https://doi.org/10.1002/smj.3042>
- Serafim, G. H., & Veríssimo, J. M. C. (2021). The relationship between strategic orientation, service innovation, and performance in hotels in Angola. *Sustainability*, 13(11), 6256. <https://doi.org/10.3390/su13116256>
- Setiadji, A., & Ahmadi, M. (2020). The Assessment of Strategic Planning and Strategic Change Management to Improve Organizational Performance. *International Journal of Advanced Science and Technology*, 29(5), 682–698. <http://serisc.org/journals/index.php/IJAST/article/view/9598>
- Song, L., & Jing, L. (2017). Strategic orientation and performance of new ventures: empirical studies based on entrepreneurial activities in China. *International Entrepreneurship and Management Journal*, 13(4), 989–1012. <https://doi.org/10.1007/s11365-017-0433-z>
- Suryantini, N. P. S., Moeljadi, M., Aisjah, S., & Ratnawati, K. (2023). The sustainable competitive advantage of SMEs towards Intellectual Capital: the role of technology adoption and strategic flexibility. *Intellectual Economics*, 17(1), 30-56. <https://doi.org/10.13165/IE-23-17-1-02>
- Thien, T. H., & Hung, N. X. (2023). Intellectual capital and investment efficiency: The mediating role of strategic management accounting practices. *Cogent Business & Management*, 10(2), 2207879. <https://doi.org/10.1080/23311975.2023.2207879>
- Tudose, M. B., Rusu, V. D., & Avasilcai, S. (2022). Financial performance – determinants and interdependencies between measurement indicators. *Business, Management and Economics Engineering*, 20(1), 119-138. <https://doi.org/10.3846/bmee.2022.16732>
- Umanto, Wijaya, C., & Atmoko, A. W. (2018). Intellectual capital performance of regional development banks in Indonesia. *Banks and Bank Systems*, 13(3), 36-47. [http://dx.doi.org/10.21511/bbs.13\(3\).2018.04](http://dx.doi.org/10.21511/bbs.13(3).2018.04)
- Verbano, C., & Crema, M. (2016). Linking technology innovation strategy, intellectual capital and technology innovation performance in

manufacturing SMEs. *Technology Analysis & Strategic Management*, 28(5), 524–540. <https://doi.org/10.1080/09537325.2015.1117066>

Walker, R. M., Chen, J., & Aravind, D. (2015). Management innovation and firm performance: An integration of research findings. *European Management Journal*, 33(5), 407–422. <https://doi.org/10.1016/j.emj.2015.07.001>

Yousaf, S., Anser, M. K., Tariq, M., Sahibzada Jawad, S. U. R., Naushad, S., & Yousaf, Z. (2020). Does technology orientation predict firm performance through firm innovativeness? *World Journal of Entrepreneurship, Management and Sustainable Development*, 17(1), 140–151. <https://doi.org/10.1108/WJEMSD-11-2019-0091>

Zhang, M., Lettice, F., & Pawar, K. (2019). Effects of intellectual capital and university knowledge in indigenous innovation: evidence from Indian SMEs. *Production Planning and Control*, 30(10–12), 799–812. <https://doi.org/10.1080/09537287.2019.1582090>

Zhao, X., Lynch Jr, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research*, 37(2), 197–206. <https://doi.org/10.1086/651257>

Notes

* Impacto de la orientación estratégica en el desempeño empresarial: el efecto mediador del capital intelectual

- CONFLICTS OF INTEREST

The authors declare no conflict of financial, professional, or personal interests that may inappropriately influence the results that were obtained or the interpretations that are proposed here.

- AUTHORS' CONTRIBUTIONS

Carlos Gilberto Restrepo-Ramírez: Principal investigator of the research project. He contributed to the conception and design of the study, the preparation of the database, data processing and analysis, the literature review, the writing of the manuscript, and the responses to the reviewers' and editors' comments.

Claudia Inés Sepúlveda-Rivillas: Co-investigator of the research project. She contributed to the conception and design of the study, data processing and analysis, the literature review, the writing of the manuscript, and the responses to the reviewers' and editors' comments.

Mariana Gómez-Montoya: Research assistant. She contributed to data processing and analysis, the literature review, the writing of the manuscript, and the responses to the reviewers' and editors' comments.

Información adicional

How to cite: Restrepo-Ramírez, C. G., Sepúlveda-Rivillas, C. I., & Gómez-Montoya, M. (2024). Relationship Between Strategic Innovation Orientation and Organizational Performance: The Mediating Role of Intellectual Capital. *Revista CEA*, 10(23), e2989. <https://doi.org/10.22430/24223182.2989>



Disponible en:

<https://www.redalyc.org/articulo.oa?id=638177328009>

Cómo citar el artículo

Número completo

Más información del artículo

Página de la revista en redalyc.org

Sistema de Información Científica Redalyc
Red de revistas científicas de Acceso Abierto diamante
Infraestructura abierta no comercial propiedad de la
academia

Carlos Gilberto Restrepo-Ramírez,
Claudia Inés Sepúlveda-Rivillas, Mariana Gómez-Montoya
**Relationship Between Strategic Innovation Orientation
and Organizational Performance: The Mediating Role of
Intellectual***
**Relación entre orientación estratégica a la innovación y
desempeño organizacional: rol mediador del capital
intelectual**

Revista CEA
vol. 10, núm. 23, e2989, 2024
Instituto Tecnológico Metropolitano, Colombia
revistacea@itm.edu.co

ISSN: 2390-0725
ISSN-E: 2422-3182

DOI: <https://doi.org/10.22430/24223182.2989>



CC BY-NC-SA 4.0 LEGAL CODE

**Licencia Creative Commons Atribución-NoComercial-
CompartirIgual 4.0 Internacional.**