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CEO, innovation, and business performance – A bibliometric analysis and literature review

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Abstract

The role of the CEO and its impact on innovation and business performance has gained increasing relevance in management and strategy research. This study examines how CEO characteristics influence business innovation and organizational outcomes, providing a theoretical framework that connects these elements. A systematic literature review and bibliometric analysis were conducted on 67 scholarly articles indexed in Scopus, applying the PRISMA methodology and using VOSviewer to identify key trends, influential authors, and thematic clusters. The findings identify five key CEO attributes that impact business innovation: transformational leadership, innovative behavior, narcissism, personality traits, and sociodemographic aspects. Transformational leadership fosters organizational creativity and strategic orientation toward innovation, while demographic factors such as gender, experience, and educational background influence how CEOs develop and implement innovation strategies. The study concludes that CEO leadership acts as a catalyst for innovation, but its impact depends on organizational and contextual factors that can amplify or limit its effect on business performance. There is no universal approach to fostering innovation; strategies must align with the CEO's attributes and the competitive environment. This study contributes to the theoretical debate on CEO and innovation while offering practical insights for academics, professionals, and businesses, guiding future research and leadership strategies to enhance innovation and competitiveness.

Keywords: Bibliometric analysis, Business performance, CEO, Innovation, Systematic review.

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1. Introduction

Business innovation is a key factor in promoting economic growth and organizational competitiveness, playing a major role in enterprises' capability to adapt to dynamic, constantly evolving environments. Diverse studies have conceptualized

innovation as a dynamic process that involves creating, developing, and implementing new ideas, products, and processes that add value to organizations and society [1, 2].

In this context, the Chief Executive Officer (CEO)'s role has been identified as a major determinant of business performance and innovation, as their individual characteristics inform the companies' strategic decision-making, orientation toward innovation, and organizational know-how management [3, 4]. The CEO's impact is, in turn, influenced by diverse factors, such as leadership Hughes, et al. [5], innovative behavior Christensen and Raynor [6] narcissism Galasso and Simcoe [7] personality dimensions Chen [8] and sociodemographic features [9].

Although the relationship between the CEO's character and innovation and business performance has attracted growing academic attention, some gaps in the holistic understanding of which factors affect this relationship remain. Previous works have approached the effects of transformational leadership, narcissism, and openness to experience in innovation in a fragmented manner, disregarding their interrelation in the context of business innovation [7, 10]. Furthermore, the scarcity of comparative studies in different industrial sectors and emerging economies limits the generalizability of their findings, which sets out the path for future research [1, 11].

The main discoveries of this literature review indicate that the CEO's transformational leadership fosters an innovation-oriented organizational culture and the exploration of new market opportunities [12, 13]. Likewise, we found that the CEO's personality traits play a crucial role in their capability to lead sustainable innovation processes [8, 14].

This review seeks to provide an integral, structured overview of the relationship between the constructs previously mentioned, as well as to identify those key factors mediating the impact of the CEO on innovation and business performance and analyze the dynamics of bibliographic production, identifying the most influential authors. Through this analysis, common themes and predominant research approaches are explored to develop an updated theoretical framework that guides future research and contributes to the consolidation of knowledge in this field.

To attain the proposed goals, we conducted a systematic review of the literature and a bibliometric analysis. We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol for the systematic review, which allowed for the identification, selection, and critical analysis of relevant research published on renowned scholarly databases, such as Scopus. The bibliometric analysis, conducted with the aid of the software VOSviewer (version 1.6.20), enhanced the visualization of co-author, co-citation, and keyword co-occurrence networks, pinpointing emerging trends pertaining to the relationship between CEO traits, innovation, and business performance.

From a theoretical perspective, this research contributes to the advancement of knowledge by offering a critical and structured synthesis of the main conceptual approaches. The integration of various theoretical frameworks facilitates progress toward a clearer model that explains how the CEO's individual, organizational, and contextual factors interact to drive business innovation. Methodologically, the systematic approach adopted provides a replicable framework that can serve as a reference for future studies, offering a solid foundation for the development of new theoretical and methodological models in this field.

2. Literature Review

2.1. Definition of Innovation

Innovation has been defined from multiple standpoints through time and is generally understood as the process of creation, development, and implementation of new ideas, products, services, or processes that add value to organizations and society [15]. This concept has evolved to integrate both organizational and individual factors that facilitate innovation [16]. Authors such as Crossan, et al. [17] describe innovation as a dynamic process based on organizational learning, which involves intuition, interpretation, integration, and institutionalization of knowledge.

Innovation can be classified into two main typologies: incremental and disruptive [6]. Incremental innovation focuses on continuous improvement and refinement of existing processes, while disruptive innovation introduces radical changes that transform markets and create new competitive opportunities. Nevertheless, a gap in the literature remains, pertaining to the articulation of these two types of innovation with leadership and organizational performance, which hinders the development of integrated models.

Authors such as Tidd and Bessant [2] conceptualize innovation as a complex phenomenon that integrates technological, organizational, and market elements to ensure long-term business sustainability. However, the literature lacks research exploring how the CEO's sociodemographics and leadership affect the effective application of innovative typologies.

2.2. Innovation and Business Performance

The relationship between innovation and business performance is widely explored in scholarly research, consistently showing that innovative enterprises possess a competitive advantage [1, 2]. Nonetheless, its impact varies depending on contextual, organizational, and individual factors, highlighting the need for studies that examine the interactions between these elements in different business environments. Zahra and George [1] suggest that innovation is a key skill that allows organizations to adapt to ever-evolving environments [1]. Along these lines, Ravens-Sieberer, et al. [18] point out the importance of understanding innovation as a continuous process driven by internal and external factors, instead of merely a tangible outcome [11].

Likewise, Yankovoy [19] argues that innovation must be managed as an integral process to maximize its impact on business competitiveness, pinpointing the importance of the interaction between technology, organizational culture, and business strategies. Nevertheless, current studies focus on tangible performance metrics, such as income growth, leaving out intangible, yet important factors, which influence organizational development.

2.3. CEO and Business Performance

CEO leadership plays a fundamental role in innovative capacity and organizational performance. Hambrick and Mason [3] and Abatecola and Cristofaro [20] through the Upper Echelons Theory, argue that CEO characteristics directly influence the companies' strategic decisions. However, the existing literature presents a lack of consensus on the key indicators that determine the CEO's impact on innovation, which makes it difficult to standardize models applicable to different organizational contexts.

Recent studies, such as that by Rego, et al. [21] highlight that the CEO's strategic orientation is crucial to integrating innovation into the organizational culture, ensuring long-term sustainable development. Furthermore, research such as that by Nadkarni and Herrmann [4] shows that the CEO's personality and strategic flexibility significantly influence business innovation. Similarly, Song highlights the importance of the CEO's experience in the adoption of high-impact innovative strategies [22].

On the other hand, Pan, et al. [23] argue that the institutional and cultural context influences the CEO's role in strategic decision-making, implying that their individual characteristics must be aligned with the dynamics of the environment in which the company operates. However, the literature has not yet comprehensively addressed how CEOs' sociodemographic characteristics influence the adoption of innovative practices across different sectors and geographic regions, which represents an opportunity for future research.

3. Methods

3.1. Research Design

This study employs a systematic literature review approach based on the PRISMA method, combined with a bibliometric analysis to examine CEO dimensions and their relationship with innovation and business performance. Applying the PRISMA method Page, et al. [24] guaranteed a structured and transparent process, allowing the identification, selection, and critical evaluation of the existing literature. The systematic review allows for a rigorous synthesis of the available literature Okoli and Schabram [25] while the bibliometric analysis facilitates the identification of collaboration patterns, key research topics, and temporal trends [26]. Our study design follows the PRISMA guidelines, ensuring the transparency and reproducibility of the process.

3.2. Databases

To ensure comprehensive and high-quality coverage, the Scopus database was selected, which is recognized for its breadth in the field of business, leadership, and management [27]. The bibliometric analysis was performed using the VOSviewer tool, which allows for the visualization of keyword co-occurrence, author collaboration, and citation networks, providing a graphical representation that facilitates the interpretation of the data and offers a holistic view of the field of study [28].

3.3. Papers Retrieving – Search Query

The search query was carefully designed to include key terms related to the main constructs: "Innovation", "CEO", "Chief Executive Officer", "Manager", "Managing Director", and "Attributes". A search period from 2014 to 2024 was set, justified by the significant growth of research in recent years [29]. The search query used is: TITLE-ABS-KEY ("Innovation" AND "CEO" OR "Manager" OR "Chief Executive Officer" OR "Managing Director" AND "Attributes").

To ensure the comprehensiveness of the process, initial tests were performed incorporating variations in the key terms [30]. These tests facilitated the evaluation of the effectiveness of the selection criteria and the adjustment of the search protocol. As a result, 66 relevant articles were initially retrieved and further analyzed to determine their relevance to the study.

3.4. Inclusion and Exclusion Criteria

Clear criteria were established to select the most relevant studies:

- Inclusion Criteria: Peer-reviewed articles Page, et al. [24] published in English and Spanish, studies focused on the relationship between CEO, leadership, innovation, and business performance.
- Exclusion Criteria: Duplicate works, non-academic publications, studies outside the central objective of the research, and the defined time range.

3.5. Review Process

The review process comprises three stages.

- Initial Screening: Evaluating article titles and abstracts to determine relevance.
- Comprehensive Review: Detailed analysis of the full texts and organizing the key information (objectives, methodology, and results) in a data matrix [31].
- Thematic Coding: Classification of the data into five main constructs: leadership, innovative behavior, narcissism, personality characteristics, and sociodemographic aspects using qualitative analysis tools such as VOSviewer [28].

Following these guidelines, an initial database of 17 documents was identified after screening the original 66. To expand the sample, and based on the criteria of the PRISMA method (Page, et al. [24]), an exhaustive review of the references cited in the selected articles was carried out. As a result, 50 additional studies were incorporated, bringing the total to 67 scientific articles.

3.6. Data Analysis

A systematic review of the 67 selected articles was carried out. It was complemented with a bibliometric analysis using the VOSviewer tool. This bibliometric analysis focused on the following key dimensions:

- Co-occurrence of Keywords: Relevant terms and their thematic clusters were identified, highlighting "Innovation" as a central node, interconnected with fundamental concepts such as "firm performance" and "leadership."
- International Collaboration: Collaboration networks between countries were analyzed, showing the United States as the main contributor at a global level, followed by the United Kingdom, China, and Spain.
- Citation Network: The most influential authors in the field were identified, highlighting Venkatesh, et al. [32]; Christensen and Raynor [6], and Zahra and George [1] as fundamental references for the theoretical basis of the study area.

This rigorous methodological approach ensures the validity and reliability of the results of Harsono, et al. [33] providing a comprehensive understanding of the role of CEOs in innovation and business performance.

4. Results and Discussion

4.1. Bibliometric Analysis: Academic Production on CEO, Innovation, and Business Performance

The study of CEO characteristics, innovation, and their impact on business performance has undergone significant evolution since 1993 Peng, et al. [29] consolidating itself as an interdisciplinary field. This bibliometric analysis examines key thematic connections, temporal evolution, clusters of constructs, and international collaboration, based on quantitative data and graphical representations generated using specialized tools such as VOSviewer.

4.1.1. Overall Scientific Production and Fundamental Metrics

The data analyzed includes a total of 67 documents; the publications span from 1993 (the year of the oldest publication) to 2024 (the most recent), with an average of 2.86 authors per document, reflecting the collaborative nature of the field.

The most influential journals include Leadership Quarterly, Academy of Management Journal, and Human Relations, standing out as key for the dissemination of research on leadership and organizational performance. The thematic diversity of these sources suggests a multidisciplinary approach that integrates economics, strategy, sociology, and technology.

4.1.2. Central Node

"Innovation"

Within the keyword co-occurrence network, "innovation" emerges as the main axis of the research, connecting multiple related constructs. This central node reflects that innovation is not only an organizational objective but also a strategic factor that cuts across leadership decisions, performance metrics, and organizational processes.

4.1.3. Key Relationships of the Central Node

4.1.3.1. Innovation-Firm Performance - Innovation Performance

The central node's connections with these terms highlight how innovation is directly linked to the evaluation of organizational results, both at the financial and operational levels. This approach has evolved towards the integration of specific metrics, as evidenced by the recent work of Expósito, et al. [9].

4.1.3.2. Innovation-Leadership, and CEO

These terms highlight the relevance of strategic leadership in developing innovative capabilities within companies. Studies such as those by Zahra and George [1] and Venkatesh, et al. [32] have laid the groundwork for understanding how individual characteristics and CEO decisions influence the generation of organizational value.

4.1.3.3. Innovation-Technology, and Entrepreneurship

Technological innovation and entrepreneurship appear recurrently as key enablers in dynamic and globalized sectors. The inclusion of information technology reflects how digitalization has transformed innovative capabilities since 2010.

Figure 1 represents the co-occurrence network of key terms related to innovation visualized through VOSviewer.

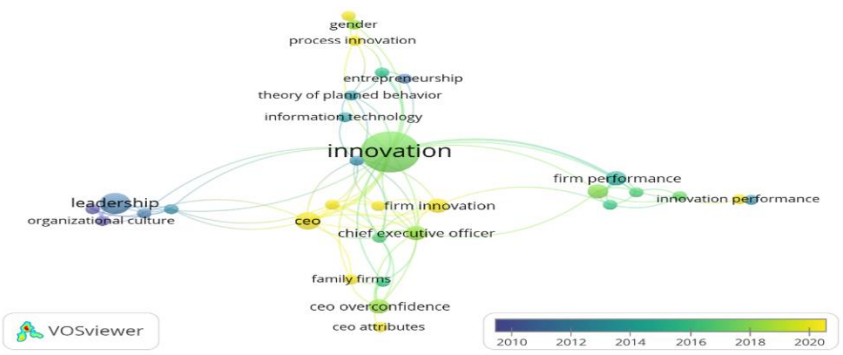

Figure 1.
Co-occurrence network of key terms related to innovation.

4.1.4. Temporal Evolution of the Constructs

The time perspective shows a significant evolution, with clear changes in research priorities and the theoretical construction of the topics. This development can be divided into three main periods.

4.1.4.1. Conceptual Foundations (1993-2005)

At this early stage, researchers focused on building a solid theoretical framework. Authors such as Carpenter, et al. [34] analyzed the relationship between leadership and performance, while Zahra and George [1] introduced key concepts of strategic innovation. Table 1 presents a summary of the predominant terms and their associated findings.

Table 1.
Summary of conceptual foundations.

Terms	Key Findings
"Leadership" and "Chief Executive Officer"	These concepts explore how leaders influence organizational strategy and performance.
"Organizational Culture"	The authors studied how internal culture can facilitate or inhibit innovation.
"Family Firms" and "CEO Overconfidence"	The authors emphasized the individual and contextual characteristics of CEOs, particularly in family firms.

4.1.4.2. Thematic Expansion (2006-2015)

During this period, research diversified, integrating innovation and technology as pillars of business performance. The work of Venkatesh, et al. [32] related to technological adoption, and the contributions of Rosenbusch, et al. [35] on innovation in small and medium-sized enterprises (SMEs), marked this period. Table 2 provides a summary of the most prominent research themes and their findings.

Table 2.
Thematic expansion (2006–2015).

Terms	Key Findings
"Innovation" and "Process Innovation"	Studies began to measure the impact of innovation on the companies' internal processes.
"Information Technology"	Research reflects how the adoption of digital technologies has transformed innovation.
"Top Management Teams":	Scholarly works introduce the collective role of executive teams in business strategy.

4.1.4.3. Contemporary Approach (2016-2024)

Recent research has incorporated social and cultural dynamics, as well as more specific metrics, to assess innovation. Studies such as those by Expósito, et al. [9] have made progress in integrating quantitative metrics to link innovation and organizational performance. Table 3 presents the key research themes and their associated findings.

Table 3.
Contemporary approach in research (2016–2024).

Terms	Key Findings
"Gender"	It highlights the impact of gender diversity on innovative decision-making.
"Innovation Performance" and "Polychronicity"	This emerging term analyzes how leaders manage multiple priorities and their relationship to innovation capacity.

Figure 2 illustrates the keyword co-occurrence network within the analyzed articles, providing insights into the thematic interconnections and their temporal evolution between 2010 and 2024.

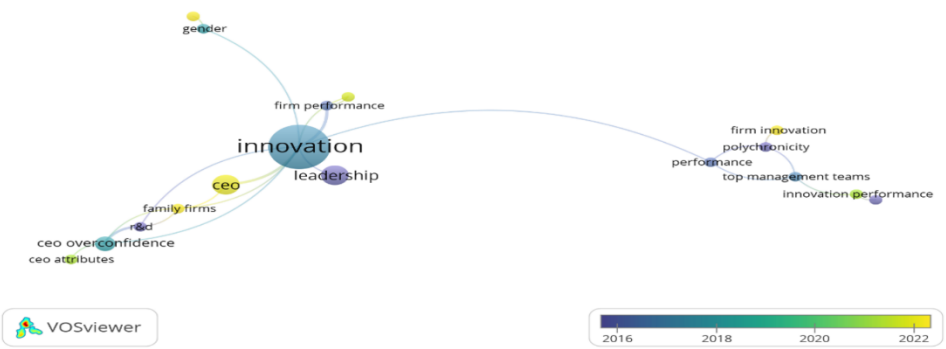

Figure 2.
Keyword co-occurrence network in analyzed manuscripts.

This visualization shows in depth the conceptual dynamics and the growth of studies on innovation and organizational performance, making the case for the relevance of interdisciplinary topics in academia and the business environment.

Figure 3 highlights the importance of seminal authors in the construction of knowledge, revealing the interdisciplinary connections and conceptual evolution of this theoretical body. Authors such as Venkatesh, et al. [32] and Zahra and George [1] emerge as key figures, as they are widely cited and act as central nodes within this network. Their work has laid the groundwork for much of the current research. Furthermore, the inclusion of more recent authors, such as Expósito, et al. [9] evidences the continuity and expansion of the field, integrating emerging topics such as innovation metrics and diversity.

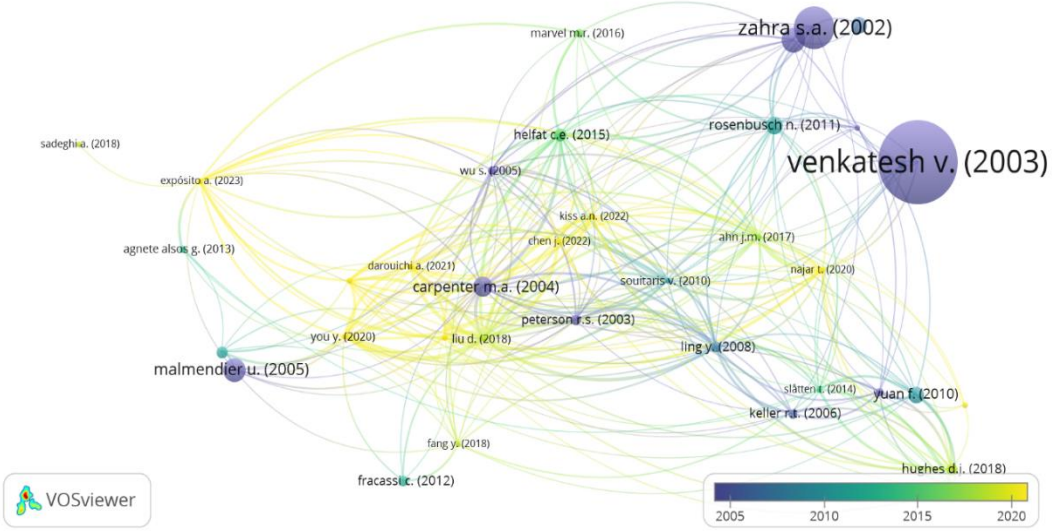

Figure 3.
Citation network of seminal authors in CEO, innovation, and business performance research.
Source: Zahra and George [1]; Marvel, et al. [36]; Helfat and Martin [37]; Rosenbusch, et al. [35]; Venkatesh, et al. [32]; Wu, et al. [38]; Sadeghi and Rad [39]; Expósito, et al. [9]; Kiss, et al. [13]; Chen [8]; Ahn, et al. [40]; Najar and Dhaouadi [41]; Slåtten [42]; Yuan and Woodman [43]; Keller [44]; Hughes, et al. [5]; Souitaris and Maestro [45]; Ling, et al. [46]; Darouichi, et al. [47]; Carpenter, et al. [34]; Peterson, et al. [48]; Loukil, et al. [49]; Liu, et al. [50]; Fang, et al. [51]; Fracassi and Tate [52]; Agnete Alsos, et al. [53] and Malmendier and Tate [54]

4.1.5. Thematic Connections and Clusters

4.1.5.1. Leadership and Performance

The cluster headed by the terms "Leadership" and "CEO Attributes" focuses on analyzing the influence of leaders, especially in family firms, on strategic decision-making. Research in this area has emphasized how CEO overconfidence can increase risk propensity in innovation processes, as evidenced by the studies of Malmendier and Tate [54]. Likewise, Hughes, et al. [5] point out that the individual characteristics of leaders play a determining role in the design and implementation of organizational strategies, which underscores the importance of understanding CEO attributes to optimize business performance and innovation capability.

4.1.5.2. Innovation and Metrics

The cluster formed by the terms "Innovation Performance" and "Firm Performance" is evidence of a transition towards more quantitative approaches in research on innovation and business performance. These studies underline the need to measure innovation performance in a global context, which allows for an accurate assessment of the impact of innovation strategies on organizational competitiveness. In addition, they emphasize the importance of metrics as key tools to justify research and development (R&D) investments, providing concrete data that facilitates strategic decision-making and efficient resource allocation.

4.1.5.3. Diversity and Inclusion

Terms such as “Gender” and “Organizational Culture” underscore a recent focus on gender diversity and its impact on innovation. This research suggests that diverse teams are more effective in creating innovative solutions.

4.1.6. International Collaboration

The international collaboration network shown in Figure 4 positions the United States as the central node in research related to the dimensions of CEOs, innovation, and business performance, followed by the United Kingdom and China. This network reveals the following relevant nodes:

Europe: Countries such as France, Italy, and Switzerland form a well-connected cluster, with collaborative projects spanning multiple disciplines.

Developing Nodes: Malaysia and Tunisia stand out for their recent incorporation into global research, reflecting an interest in innovation from emerging economies.

Figure 4 presents the global research collaboration network, identifying major contributing regions and their interconnected academic efforts in the study of CEOs, innovation, and business performance.

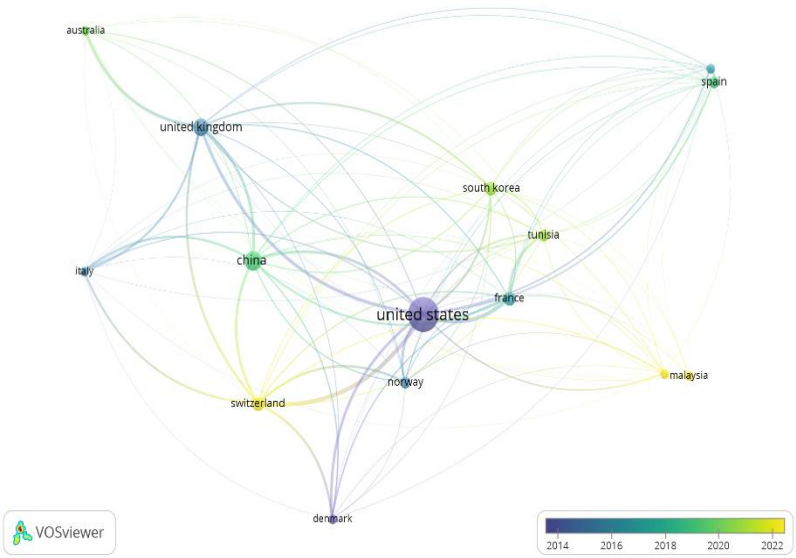

Figure 4.
International collaboration network.

4.2. Results of the Systematic Review

The bibliometric analysis reveals that CEO dimensions have a significant and multifaceted impact on innovation and business performance. From the systematic review of the 67 papers, five key constructs were identified that organize and structure the findings: innovative behavior, sociodemographic aspects, narcissism, leadership, and personality characteristics. These constructs not only reflect the main lines of research but also provide a robust framework for analyzing how the decisions and characteristics of business leaders influence organizations.

4.2.1. Leadership

Leadership, identified by terms such as "leadership," "organizational culture," and "top management teams," is one of the most studied innovation-related constructs in the literature [34]. This construct includes the transformational leadership style, which inspires and motivates teams, as well as participative leadership, which encourages collaborative decision-making.

The review suggests that CEOs who implement transformational leadership are more effective in leading innovative processes and aligning them with organizational strategies. In addition, interaction with top management teams is critical in translating the CEO's strategic vision into tangible results [35].

4.2.2. Innovative Behavior

Innovation, identified as a central node in co-occurrence analyses, is directly linked to concepts such as 'firm performance' and 'innovation performance.' This construct reflects how CEOs promote creative initiatives and manage the adoption of disruptive technologies within their organizations [1, 34].

The reviewed research highlights that CEOs exhibiting innovative behavior strategically align the firm's capabilities with the demands of the environment, generating a direct impact on performance metrics, such as revenues, operational efficiency, and market positioning [14].

4.2.3. Narcissism

Narcissism, linked to the term “CEO overconfidence,” is another central construct in the analysis. This trait, characterized by high levels of confidence and an orientation toward bold decisions, can have dual impacts on organizational performance. While a moderate level of narcissism can drive innovation and strategic risk-taking, an excess of this trait can lead to impulsive decisions and excessive risk-taking [54].

4.2.4. Personality Characteristics

The individual characteristics of CEOs, such as resilience, adaptability, and achievement orientation, constitute a key construct. Terms such as “CEO attributes” and “family firms” underline the importance of these dimensions in the ability of leaders to cope with uncertainties and make strategic decisions [1].

In particular, CEOs with high levels of adaptability are more effective in leading companies toward sustainable innovations, especially in family businesses, where interpersonal dynamics have a significant impact on strategy [54].

4.2.5. Sociodemographic Aspects

Sociodemographic factors, such as gender, age, educational level, and international experience, were identified as relevant to business leadership, with contributions from 155 unique authors spread across 44 scientific sources.

The literature suggests that CEOs with diverse backgrounds tend to adopt more inclusive and creative perspectives, favoring more dynamic and innovation-oriented organizational cultures [35]. In addition, international experience and high educational levels are associated with a broader strategic vision [32].

Segmentation into these five constructs allows for a deeper and more structured understanding of how CEO dimensions influence innovation and business performance. Moreover, these constructs interact dynamically. For instance, a CEO with moderate narcissistic traits and a transformational approach to leadership may foster innovative behavior in diverse contexts. In turn, sociodemographic aspects enrich these dynamics by providing diverse and global perspectives.

The systematic review emphasizes that CEO dimensions are key determinants of innovative capacity and organizational performance. The identified constructs provide a robust conceptual framework that not only organizes the findings but also opens up opportunities for future research on how individual and contextual characteristics of leaders can be leveraged to address the challenges of the business environment.

4.3 Discussion: Results of the Literature Review on the Effects of CEO Dimensions and their Relationship with Innovation and Business Performance

This section comprehensively addresses the influence of CEOs on innovation and organizational performance, analyzing five key constructs: Innovative Behavior, Narcissism, Leadership, Personality Characteristics, and Sociodemographic Aspects. This approach is based on the review of 67 selected studies, which highlight the relevance of these themes as pillars in the literature on leadership and innovation.

4.3.1. Leadership

Leadership is one of the most critical factors in fostering resilient and innovative organizational cultures. Through their vision and ability to inspire, CEOs drive creativity and teamwork, integrating styles such as transformational leadership and other strategic approaches that strengthen resilience and adaptability in dynamic environments.

4.3.1.1. Transformational Leadership

Hughes, et al. [5] found that CEOs who adopt a transformational leadership style inspire their teams toward a shared vision, fostering an environment that values innovation and enhances organizational creativity. Ling, et al. [46] highlighted that this approach strengthens cohesion among management teams, boosts corporate entrepreneurship, and enhances adaptability to dynamic and changing markets.

On the other hand, Peterson, et al. [48] emphasized that transformational leaders generate trust, motivation, and internal cohesion, fundamental elements for the development of creative solutions and disruptive approaches that allow companies to remain competitive.

4.3.1.2. Hierarchical Succession

Leadership transitions, especially those through hierarchical successions, are key moments for fostering innovation and organizational performance. Sarfraz, et al. [55] observed that these transitions can promote exploratory innovation, particularly in dynamic and technological industries. This process introduces new perspectives and strategies, boosting the ability of organizations to identify and take advantage of emerging opportunities in volatile markets.

4.3.1.3. Resilience and Adaptability

In complex sectors, such as government services, Plimmer, et al. [56] demonstrated that CEO resilience is critical to leading innovative transformations. Resilient leaders adapt quickly to change, manage crises effectively, and motivate their teams toward creative solutions. This approach not only fosters innovation but also ensures organizational stability in contexts of high uncertainty.

Table 4 provides a detailed overview of leadership and its impact on innovation and organizational performance. The analyzed studies examine how different leadership styles, strategic decision-making, and CEO characteristics influence corporate entrepreneurship, technological adoption, resilience, and knowledge management. The findings highlight the role of leadership in fostering organizational creativity, optimizing R&D initiatives, and strengthening business adaptability in evolving environments.

4.3.2. Innovative Behavior

The innovative behavior of CEOs is fundamental to leading disruptive and sustainable strategies, as it implies proactivity, motivation toward open innovation, risk-taking, and technological compatibility—essential factors for maintaining competitiveness in dynamic markets. According to Dyer, et al. [11], innovative leaders are characterized by skills such as questioning, observation, and experimentation, which enhance their ability to identify disruptive opportunities and develop creative solutions. These competencies not only foster the generation of innovative ideas but also enable CEOs to align organizational culture with strategic goals. Christensen and Raynor [6] emphasize that CEOs must foster environments that support continuous learning and exploration of emerging technologies, integrating their innovative behavior with organizational practices that drive sustainability and disruption in changing markets.

Table 4.
Summary of key studies on leadership and its impact on innovation and organizational performance.

Authors	Publication Year	Country	Key Findings
Tidd and Bessant [2]	2021	Several Countries	The CEO's strategic vision is essential to embed innovation.
Plimmer, et al. [56]	2021	United Kingdom	Resilience makes it possible to lead transformations in crisis contexts.
Sarfraz, et al. [55]	2019	China	Hierarchical leaps in CEO succession boost corporate innovation.
Sadeghi and Rad [39]	2018	Iran	Knowledge-oriented leadership enhances organizational innovation.
Hughes, et al. [5]	2018	United Kingdom, Australia	Leadership drives creativity and innovation through motivational, affective, and cognitive mechanisms.
Chiu and Fogel [57]	2017	Taiwan	CEO Influencing Strategies Facilitate Innovation Implementation.
Slåtten [42]	2014	Norway	Transformational leaders increase creative self-efficacy.
Ling, et al. [46]	2008	United States	Transformational leadership drives corporate entrepreneurship.
Keller [44]	2006	United States	Transformational leadership improves R&D projects.
Subramaniam and Youndt [58]	2005	United States	CEOs integrate knowledge to maximize innovation.
Elkins and Keller [59]	2003	International literature review	Transformational CEOs further lead to research and development.
Venkatesh, et al. [32]	2003	United States	CEO leadership directly influences organizational technology acceptance.
Peterson, et al. [48]	2003	United States	Transformational leadership improves team dynamics and fosters innovative performance.
Zahra and George [1]	2002	Global Conceptual Review	CEO vision strengthens organizational absorptive capacity.
Crossan, et al. [17]	1999	International literature review	CEOs manage tensions and facilitate key organizational processes.

4.3.2.1. Motivation and Proactivity

CEOs' attitude towards open innovation drives the exploration of new opportunities while allowing a strategic balance with the exploitation of existing resources Bennat and Sternberg [12] and Ahn, et al. [40]. Bennat and Sternberg [12] highlight that this orientation facilitates the adoption of models such as Doing-Using-Interacting (DUI), which optimize both internal and external knowledge flow. Ahn, et al. [40] found that CEOs with a positive attitude toward open innovation promote collaborative ecosystems, aligning business practices with long-term strategic objectives.

In addition, Kiss, et al. [13] emphasized that CEO proactivity enhances organizational ambidexterity, allowing an effective balance between the exploration of new ideas and the efficient utilization of existing resources, an aspect especially relevant in technological and constantly evolving sectors.

4.3.2.2. Technological Compatibly

The CEO's technological compatibility plays a crucial role in the adoption and implementation of technological innovations. Bataineh, et al. [60] demonstrated that CEOs with strong technological knowledge promote the integration of innovative systems in their organizations. Zahra and George [1] complemented this perspective by highlighting that effective strategic leadership strengthens the absorption of external knowledge, which enhances organizational competitiveness. These findings underscore that CEOs, by aligning technological resources with adaptive strategies, can overcome barriers to innovation and foster an organizational culture based on continuous learning and technological evolution.

4.3.2.3. Organizational Learning

CEO management exerts a significant influence on organizational learning processes. Crossan, et al. [17] demonstrated that leaders strengthen internal capabilities by promoting the exchange of ideas and the incorporation of new knowledge into operational plans. [61] extended this perspective by remarking that customer-perceived legitimacy plays a crucial role as a mediator in innovation strategies, especially in social markets. These findings highlight the importance of external perceptions of strategic decisions in organizational success.

4.3.2.4. Collaboration and External Networks

Participation in networks and clusters plays a key role in driving innovation, especially in SMEs. Djukic, et al. [62] pointed out that CEOs who promote external collaboration can access key resources, such as funding, talent, and expertise. These resources are essential to overcome structural constraints and develop long-term sustainable competitive advantages.

Table 5 summarizes the main findings on how CEOs' innovative behavior (including factors such as proactivity, technological compatibility, and organizational learning) contributes to the development of disruptive and sustainable procedures in different organizational contexts.

Table 5.
Summary of key studies on CEO, innovative behavior, and its impact on organizational performance.

Authors	Publication Year	Country	Key Findings
Bataineh, et al. [60]	2024	Jordania	The CEO's innovativeness and technological know-how promote the use of advanced systems.
Duygan, et al. [63]	2023	Switzerland	Relative advantages and compatibility are key in the adoption of digital innovations, along with environmental and cultural factors.
Espasandín-Bustelo, et al. [61]	2023	Spain	Legitimacy granted to the CEO by customers enhances innovative performance.
Bennat and Sternberg [12]	2022	Germany	CEO values and soft skills are crucial for fostering DUI innovations.
Kiss, et al. [13]	2022	United Estates	CEO proactivity improves innovation and organizational ambidexterity, positively impacting performance.
Najar and Dhaouadi [41]	2020	Tunisia	The CEO's entrepreneurial orientation and positive attitude favor a climate of innovation and the adoption of open strategies.
Ahn, et al. [40]	2017	South Korea	CEO characteristics affect the adoption of open innovation.
Liu, et al. [50]	2016	China	Organizational tenure affects innovative behavior, mediated by culture and status hierarchy.
Djukic, et al. [62]	2015	Serbia	Cooperation with local customers enhances innovation capacity; business incubators are key to open innovation practices.
Yuan and Woodman [43]	2010	United Estates	Supportive leadership fosters innovative employee behaviors.
Jensen, et al. [64]	2007	Denmark	Learning strategies are key to innovation.
Rosenbusch, et al. [35]	2009	United Estates	Innovation can have different impacts depending on the context.
Dyer, et al. [11]	2008	Several Countries	Innovative behaviors add organizational value.

CEOs' innovative behavior is not only limited to their internal decisions within the organization. The findings also suggest that external perceptions, inter-organizational relationships, and market dynamics play a complementary role in the success of innovation strategies.

4.3.3. Narcissism

Narcissism in CEOs, although polarizing, can be a driver of innovation, particularly in highly competitive contexts. Narcissistic characteristics, such as overconfidence and an inclination toward risk-taking, generate both opportunities and challenges.

4.3.3.1. Disruptive Innovation

Galasso and Simcoe [7] pointed out that narcissistic leaders tend to drive bold innovation strategies, especially in highly competitive industries where product or service differentiation is crucial. However, this inclination comes with a high level of uncertainty, as strategic decisions are often made without a thorough analysis of the associated risks, which may compromise long-term sustainability.

4.3.3.2. Family Business

In the context of family firms, Rovelli, et al. [65] found that narcissistic CEOs aggressively leverage internal resources, maximizing strategic opportunities and fostering an environment conducive to disruptive innovation. This ability to make bold decisions is particularly valuable in these organizations, where risk management tends to be more centralized and long-term oriented.

On the other hand, Zulfiqar, et al. [10] found that narcissism is linked to risky strategic approaches, which benefit family firms seeking to differentiate themselves in highly saturated markets. This approach allows such firms, under the leadership of narcissistic CEOs, to excel in innovation, especially in sectors characterized by high competitiveness.

4.3.3.3. Associated Risks

Although narcissistic CEOs can bring value through innovative strategies, Malmendier and Tate [54] identified that their overconfidence often leads to overinvestment in R&D, underestimating the associated risks. In addition, they tend to impose their vision on strategic decisions, minimizing the participation of their collaborators and promoting an organizational culture centered on their figurehead.

Galasso and Simcoe [7] pointed out that, although these bold decisions can generate high-impact innovations, they also compromise long-term sustainability. This can lead to internal conflicts, inefficient allocation of resources, and deterioration of the organization's financial performance. Table 6 summarizes the influence of narcissism on innovation and organizational performance, highlighting how the narcissistic characteristics of CEOs can foster disruptive innovation.

Table 6 presents a summary of studies examining the relationship between CEO narcissism, innovation, and organizational performance, highlighting how narcissistic traits can drive disruptive innovation while also introducing strategic risks.

Table 6.
Summary of key studies on CEO narcissism and its impact on innovation and organizational performance.

Authors	Publication Year	Country	Key Findings
Li and Zhang [66]	2022	China	CEO overconfidence impacts innovation quality and direction.
Rovelli, et al. [65]	2022	Italy, Switzerland, United Kingdom, China, United States	Narcissistic CEOs in family firms foster more comprehensive strategic decisions and greater opportunities for innovation.
Zulfiqar, et al. [10]	2021	China	Risk-taking results in disruptive but risky innovations. Overconfident CEOs in family businesses prioritize R&D investment.
Galasso and Simcoe [7]	2010	United States	Overconfidence drives disruptive innovation.
Malmendier and Tate [54]	2005	United States	Overconfidence leads to higher cash flow-based investments.

In technology and creative industries, where disruptive innovation is key to success, narcissistic CEOs can be valuable assets. However, in organizations where sustainability and organizational cohesion are essential, narcissistic traits can be counterproductive. Unilateral decision-making can generate internal tensions and compromise team effectiveness.

The findings suggest that a moderate approach may be the most effective, where the advantages of narcissism are leveraged without compromising organizational stability. Interventions such as implementing counterbalances within leadership groups may be useful in this context.

4.3.4. Personality Traits

CEO personality traits, such as openness to experience, emotional intelligence, polychronicity, and inter-organizational networks, play a key role in how organizations address innovative challenges. These individual characteristics directly impact strategic design, group dynamics, and competitive capability in global markets.

4.3.4.1. Openness to Experience

This trait enables CEOs to design innovative strategies in uncertain environments. Han, et al. [14] point out that it fosters a culture of continuous learning, essential for organizational adaptation in dynamic markets. Furthermore, Crossan, et al. [17] emphasize that leaders with this trait promote processes of intuition, interpretation, and integration, strengthening organizational learning. Leading with openness encourages the exploration of new ideas and calculated risk-taking, fundamental factors in industries where incremental and radical innovation coexist as drivers of business growth.

4.3.4.2. Polychrony

Polychrony, defined as the CEO's ability to manage multiple tasks simultaneously, is a key factor in improving organizational efficiency and fostering group creativity. Chen [8] demonstrated that CEOs with high levels of polychronicity can effectively manage complex environments, prioritizing innovative projects without losing sight of long-term objectives.

This feature is especially relevant in industries characterized by rapid cycles of technological change, where agile and coordinated decision-making is critical to maintaining a competitive advantage. Furthermore, polychrony not only enhances innovation results but also strengthens organizational dynamics, promoting better collaboration and adaptability within the company.

4.3.4.3. Emotional Intelligence (EI)

CEOs' EI significantly influences the organization's ability to manage innovative processes. Karia [67] states that components such as self-confidence, empathy, and stress management enhance team performance and facilitate the execution of innovative plans.

Emotionally intelligent CEOs foster a collaborative environment, manage conflict, and reinforce a culture of trust, which is especially valuable on complex projects where tensions between teams can be a major challenge.

4.3.4.4. Interorganizational Networks

CEOs' external connections, particularly through inter-organizational networks, are essential to accessing strategic resources and fostering innovative collaborations. Fracassi and Tate [52] emphasize that these networks facilitate the integration of external knowledge and access to financial resources, strengthening the organizations' R&D capabilities. Table 7 summarizes the key findings on how CEO personality traits—openness to experience, polychronicity, emotional intelligence, and inter-organizational networks—directly influence innovation and organizational performance by shaping team dynamics and strategic decisions.

Table 7.
Summary of key studies on CEO personality traits and their impact on innovation.

Authors	Publication Year	Country	Key Findings
Chen [8]	2022	China	The CEO's preference for multitasking (polychrony) favors business innovation.
Karia [67]	2021	Malaysia	CEO emotional intelligence (self-confidence and self-innovation) improves business performance, highlighting self-vision and self-innovation as key factors.
Han, et al. [14]	2017	South Korea	CEO awareness and openness enhance learning, growth, and business performance.
Gritzo, et al. [68]	2017	United States	CEO's technical and interpersonal skills are essential in R&D leadership.
Djukic, et al. [62]	2015	Serbia	Cooperation with customers and suppliers drives innovation in SMEs.
Helfat and Martin [37]	2015	United States and The European Union	Dynamic CEO capabilities further strategic change.
Fracassi and Tate [52]	2012	United States	Inter-organizational social networks facilitate access to critical resources.
Souitaris and Maestro [45]	2010	United Kingdom	Polychromic CEOs improve strategic decisions and results.
Marcati, et al. [69]	2008	Italy	CEO personality affects innovation adoption.
Peterson, et al. [48]	2003	United States	CEO personality impacts management team dynamics.
Damanpour [70]	1991	International meta-analysis	Managers with an attitude toward change promote innovation.

Furthermore, CEO personality characteristics interact with other contextual factors, such as organizational culture and market conditions, to determine the impact on innovative outcomes. For example, CEOs with high levels of openness to experience may have a limited impact if they operate in companies with change-resistant cultures. Similarly, emotional intelligence may be less influential in environments where innovation processes are highly structured and centralized.

4.3.5. Sociodemographic Aspects

The socio-demographic aspects of CEOs, such as gender, age, educational background, professional experience, and seniority in the organization, are central factors that influence business innovation processes. These elements not only affect leadership and decision-making but also determine the sustainability and scope of innovative initiatives.

4.3.5.1. Gender and Leadership Style

The CEO's gender plays a fundamental role in the conception and execution of innovative endeavors. Expósito, et al. [9] emphasize that women leaders tend to prioritize sustainable strategies aligned with ethical and environmental principles, while men tend to opt for more disruptive strategies, taking greater risks and focusing on immediate results. These findings underscore the importance of fostering gender diversity at leadership levels, as the combination of complementary perspectives strengthens organizational adaptability and resilience.

In addition, recent studies suggest that female CEOs are particularly skilled at managing change in dynamic environments, thanks to their focus on sustainability and social impact, which contributes to balanced and responsible business growth.

4.3.5.2. Age and Professional Experience

The CEO's age and professional experience significantly influence their ability to implement innovations. Loukil, et al. [49] argue that young CEOs are more receptive to disruptive innovations, while older ones tend to adopt a more conservative approach, prioritizing organizational stability. However, both profiles have distinctive advantages: Young leaders drive rapid and bold transformations, while more experienced ones bring stability and a long-term strategic vision.

On the other hand, Liu, et al. [50] emphasize that the CEO's seniority in the organization is also a determining factor, as those with a long track record have a better understanding of the internal structures, which allows them to implement incremental innovations effectively and without generating disruptions in the company's overall operations.

4.3.5.3. Educational Background

The CEO's academic background significantly influences innovation capability and organizational performance. Hamza, et al. [71] identified that CEOs with science and engineering backgrounds tend to prioritize investment in R&D, which strengthens the firm's competitiveness in advanced technological sectors. Rovelli, et al. [65] support this finding, stressing the importance of designing professional development programs that combine technical training with leadership skills, enabling CEOs to successfully meet the challenges of an increasingly digitized environment.

4.3.5.4. Demographic and Cultural Diversity

Demographic diversity in top management, encompassing gender, age, and cultural background, positively influences innovative strategies. Wang, et al. [72] suggest that media exposure and public visibility of CEOs can act as catalysts for the adoption of disruptive technologies, as leaders with high exposure tend to be more receptive to emerging innovations. Fang, et al. [51] outlined that CEO professional diversity stimulates organizational creativity, particularly in dynamic markets. These perspectives demonstrate that diversity represents not only an inclusive value but also a key competitive advantage in the field of innovation.

Table 8 presents key findings on how sociodemographic factors—including gender, educational background, and professional experience—affect innovation strategies and long-term business sustainability.

Table 8.
Summary of key studies on sociodemographic factors and their impact on innovation.

Authors	Publication Year	Country	Key Findings
Expósito, et al. [9]	2023	Spain	The CEO's gender and educational background influence cooperative behavior in R&D.
Zhang, et al. [73]	2022	China and Singapore	The CEO's marital status and social networks influence strategic innovation decisions.
Loukil and Yousfi [74]	2022	France	The CEO's age, gender, and educational background affect innovation performance.
Darouichi, et al. [47]	2021	Switzerland, Denmark, United States.	The CEO's term length affects motivations, power, and social capital, with strategic implications.
Ali, et al. [75]	2021	Pakistan, China, United Kingdom	CEO attributes, such as education and experience, improve investment decisions and business performance.
Hamza, et al. [71]	2020	Saudi Arabia	A higher educational background encourages greater investment in innovation.
Loukil, et al. [49]	2020	France	Technical education promotes investment in R&D.
Wang, et al. [72]	2020	China	CEO media exposure influences eco-innovation decisions, mediated by environmental regulation.
Fang, et al. [51]	2018	United States	CEO demographic and professional diversity advance innovation and mergers/acquisitions.
Marvel, et al. [36]	2016	Several Countries	CEO's experience and skills reinforce competitive advantages.
Liu, et al. [50]	2016	Several Countries	The organizational seniority of the CEO influences incremental innovation.
Agnete Alsos, et al. [53]	2013	United States and the European Union	Gender inclusiveness influences innovation and leadership.

Authors	Publication Year	Country	Key Findings
Mina, et al. [76]	2005	United Kingdom	CEO skills are essential to implement innovation.
Wu, et al. [38]	2005	United States	The CEO's tenure affects innovative success depending on the environment.
Carpenter, et al. [34]	2004	United States	CEO demographics influence organizational outcomes.
Phillips and O'Reilly [77]	1998	United States	Diversity influences organizational decisions and performance.
Huffman and Hegarty [78]	1993	Several Countries	The CEO's executive experience impacts innovation decisions.

These results suggest that sociodemographic factors act as mediators in the strategic decisions of CEOs, in interaction with other concepts such as leadership and personality characteristics. However, gaps in the literature are also identified, particularly in how these factors influence sustainability and inclusion decisions in emerging markets.

4.3.6. Analysis of the Relationships Between Constructs

The analysis of the 67 reviewed articles reveals significant relationships among the key constructs, demonstrating that they do not operate in isolation, but that their interaction significantly influences the ability of CEOs to foster innovation and improve organizational performance.

4.3.6.1. Leadership

Transformational leadership is positively related to creativity and organizational resilience. Ling, et al. [46] argue that this leadership style strengthens team cohesion and fosters a culture of corporate entrepreneurship. In turn, Peterson, et al. [48] remark emotional intelligence is a key mediating factor for transformational leadership effectiveness.

Likewise, the CEO's age and professional experience significantly influence their ability to implement effective and sustainable leadership strategies, contributing to the long-term adaptability and growth of the organization.

4.3.6.2. Innovative Behavior

The innovative behavior of CEOs is closely related to various organizational and personal factors. Bennat and Sternberg [12] emphasize that transformational leadership strengthens innovativeness by fostering an adaptive organizational culture. Similarly, Kiss, et al. [13] stress that CEO proactivity promotes organizational ambidexterity, allowing the exploration of new opportunities without compromising operational efficiency.

Sociodemographic factors such as professional diversity and educational background play a moderating role in this relationship. Expósito, et al. [9] note that female CEOs tend to prioritize sustainable strategies, while Hamza, et al. [71] evidence that a background in science and engineering drives greater investment in R&D, strengthening the organization's innovative capacity.

4.3.6.3. Narcissism

Narcissism in CEO leadership generates ambivalent effects on organizational innovation. On the one hand, Galasso and Simcoe [7] point out that narcissistic CEOs tend to adopt bold and disruptive strategies, driving radical innovation. However, Zulfiqar, et al. [10] warn that excessive narcissism can negatively affect internal collaboration and increase organizational risk.

In addition, the CEO's experience and gender influence this relationship. Expósito, et al. [9] highlights that narcissism is perceived as more effective in male leadership environments within highly competitive technology sectors, where quick decision-making and self-confidence may represent competitive advantages.

4.3.6.4. Personality Traits

Individual CEO traits, such as openness to experience and multitasking management skills, directly influence entrepreneurial innovativeness. Han, et al. [14] and Chen [8] suggest that leaders with open-mindedness and polychrony skills are more effective in driving organizational change initiatives. In addition, the CEO's seniority in the organization moderates the influence of these traits, contributing to the long-term sustainability of innovation.

4.3.6.5. Sociodemographic Aspects

Sociodemographic factors, such as gender and education, interact significantly with leadership and innovative behavior. Loukil and Yousfi [74] found that CEO professional diversity drives innovation, especially in dynamic and globalized markets. Likewise, Liu, et al. [50] concluded that CEOs with considerable organizational seniority are more effective in implementing incremental innovation strategies.

The integrated analysis of the relationships between the constructs reviewed underscores that innovation and organizational performance do not depend on a single factor, but on the dynamic interaction between leadership, personality,

innovative behavior, and sociodemographic factors. A CEO with a transformational leadership approach, combined with an open mind and a strong educational background, is better prepared to face the challenges of the business environment and lead sustainable and competitive innovation strategies.

Moreover, the results show that these dimensions do not operate in isolation but interact dynamically. For example, a CEO with resilient personality traits can exercise transformational leadership that fosters innovative behavior in diverse teams. This interplay between constructs opens up new research opportunities to explore how these dimensions integrate and enhance each other.

5. Implications of this Research

From a theoretical perspective, this study offers a comprehensive synthesis of existing literature, providing a solid foundation on which future research can be built and explore new dimensions of CEO, business performance, and innovation. By identifying common patterns across diverse studies, this research contributes to bridging gaps between different disciplines, promoting a more integrated understanding of the constructs. Our findings not only allow for the development of new theories but also the improvement and validation of existing conceptual frameworks related to knowledge management, innovation, and business value creation. Furthermore, this research identifies gaps in current literature, guiding future researchers toward areas that are underexplored or that require deeper analysis, thus contributing to the advancement of knowledge in the field of innovation.

First, there is a persistent lack of consensus around the key indicators that determine the success of the CEO dimensions regarding innovation and business management. This missing consensus creates difficulties for the standardization of models applicable to different organizational contexts. Additionally, while there is growing evidence of the influence of CEO leadership on innovation processes, the specific mechanisms through which individual leader characteristics interact with organizational and external factors are still not fully understood.

Furthermore, the literature has not yet comprehensively addressed how CEOs' sociodemographic and cultural characteristics influence the adoption of innovative practices across different sectors and geographic environments.

Finally, current studies tend to focus on tangible performance metrics, such as revenue growth or the number of patents, leaving aside essential intangible factors, such as innovation culture, knowledge absorption capacity, and organizational adaptability.

6. Research Limitations and Future Research

Despite the significant contributions of this study, several limitations are identified that should be considered when interpreting the results. First, the research is based on a bibliometric analysis and a systematic review, which indicates that the findings are limited to the sources available in the selected academic database. This may lead to publication bias, excluding non-indexed studies or publications in languages other than English and Spanish.

On the other hand, the implemented methodology does not allow for establishing causal relationships between the variables. While the study identifies key relationships and patterns in the literature, the absence of direct empirical analysis limits the ability to validate these findings in real business environments.

Furthermore, this research focuses on topics such as knowledge management, R&D, product innovation, and product development. However, other equally relevant factors, such as the impact of organizational culture or regulatory aspects, were not addressed in the same depth, leaving room to broaden the study's scope in future research.

Furthermore, although CEO gender diversity has been shown to enhance collaborative actions, there is little evidence of its impact on SMEs or in less industrialized sectors. This presents an opportunity for future research, especially in diverse geographical and cultural contexts.

- Future Research Lines

Based on the findings of this research, several opportunities are raised for future research that could address the identified limitations and enrich knowledge in the field of sustainable innovation.

Future research could incorporate qualitative methods, such as case studies or interviews with industry experts, to complement quantitative findings. The combination of mixed methods would allow for a more comprehensive exploration of the underlying mechanisms and contextual particularities that influence sustainable innovation.

Likewise, it is suggested to extend the research towards emerging markets and specific industrial sectors to identify particular innovation patterns and explore how companies from different environments face sustainability and innovation challenges.

These lines of research will contribute to strengthening the theoretical and empirical basis on the dimensions of the CEO and their relationship with innovation and business performance, providing valuable information for academics, practitioners, and policymakers.

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