

Review Article

Visualizing the Future of Knowledge Sharing in SMEs in the Construction Industry: A VOSviewer Analysis of Emerging Trends and Best Practices

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This review paper systematically synthesizes existing literature on knowledge sharing (KS) and knowledge transfer (KT) in the context of small and medium-sized enterprises (SMEs) in the construction industry, updating previous research and making predictions about emerging issues. The comprehensive literature review employs three different bibliometric techniques: (1) textual analysis of keywords and abstracts to identify relevant research areas, (2) cocitation analysis of references to analyze the evolution of KS and KT in SMEs, and (3) bibliographic linkage analysis of documents to summarize the background and results. The resulting conceptual map outlines the historical development of KS and KT at individual, group, and organizational levels in the construction industry. The study emphasizes the critical significance of KS and KT for SMEs in this industry. It highlights the role of innovation and open innovation in facilitating the successful implementation of KS and KT. The analysis also reveals the need for enhanced knowledge management in SMEs through better data management, implementation of digital systems for internal management, identification of inefficiencies in KT in collaborative networks, and adjustment of knowledge management approaches to suit different cultural and geographic contexts. Finally, the paper suggests future trends in KS and KT, emphasizing the importance of collaboration, continuous learning, technological capabilities, and developing a suitable organizational culture and structure for open innovation in the construction industry. This article offers an innovative approach to KS and KT in SMEs and practical recommendations for improving knowledge management and innovation capacity in construction-related businesses. Its systematic approach and focus on SMEs in the construction industry make it highly relevant for research and business practice.

1. Introduction

Knowledge is a valuable asset that organizations utilize to enhance their performance [1, 2]. Effective knowledge management involving human, structural, and relational capital can provide a competitive advantage [3]. However, in small and medium-sized enterprises (SMEs), studying knowledge sharing (KS) and knowledge transfer (KT) is crucial, as it influences their ability to gain a competitive edge [4]. SMEs require sufficient resources to leverage their knowledge pool [5] and foster an innovative mindset [6]. Despite the extensive research on knowledge management, SMEs have received less attention despite their significance in various industries. Thus, further research is necessary to address knowledge retention in SMEs.

Effective knowledge sharing and transfer are crucial for SMEs, as they facilitate knowledge acquisition, encourage participation, drive innovation, and potentially impact a country's economy significantly [7]. Furthermore, in addition to the ongoing managerial challenges in organizations related to administration and management competencies [8], intellectual capital plays a pivotal role in achieving market excellence and superior innovation performance [3, 9]. Several reviews have explored knowledge management in SMEs, proposing avenues for further investigation. For instance, Durst and Edvardsson [4] advocated for knowledge identification and storage research in SMEs, emphasizing the need for longitudinal studies, international comparisons, and mixed methods. Massaro et al. [10] underscored the fragmented

literature on SME management, suggesting the inclusion of contributions from unconventional journals and updated findings. Cerchione and Esposito [11] emphasized adapting knowledge management tools to suit SMEs' specific needs, offering research directions to enhance validity and evaluate their impact on innovation and competitiveness.

Recent studies have emphasized the importance of knowledge and technology management in SMEs. Mohd Selamat et al. [12] proposed that SMEs adopt knowledge and data management to maximize the benefits of advanced technology. Anand et al. [13] highlighted the significance of knowledge management and transfer in SMEs, while Farooq [14] suggested integrating knowledge and performance management in research.

Furthermore, Anand and Dumazert [15] introduced innovative bibliometric techniques to enhance literature reviews. Ferrer-Serrano et al. [16] emphasized the significance of knowledge and technology management in collaborative networks for effective KT. Kafetzopoulos [17] also presented a comprehensive framework for SME research, linking antecedents, outcomes, and internal and external moderators. These advancements are expected to contribute to a better understanding and application of knowledge management in SMEs, ultimately improving their performance and competitiveness. However, noting Anand and Dumazert [15] and Ferrer-Serrano et al. [16] is essential. They also highlighted notable limitations in their studies. They underscored the potential shortcomings of relying solely on bibliometric analysis for literature reviews, citing the absence of fixed thresholds and limited keyword coverage as concerns. Ferrer-Serrano et al. [16] further emphasized the need for caution when generalizing findings from single-case studies, as well as the inconsistencies in measurement, lack of empirical definition and modeling of knowledge, limited attention to specific business configurations, inefficiencies in KT, and the importance of exploring collaboration gaps, digital systems, and the effects of implementing automated security systems in KT processes.

These investigations have paved the way for promising future research in knowledge management in SMEs. One prominent direction involves evaluating specific data and knowledge management practices tailored to SMEs. Also, developing digital systems for internal knowledge management has significant potential to improve knowledge utilization and sharing within these organizations. Another relevant area of exploration focuses on identifying and addressing inefficiencies in KT within collaborative networks in which SMEs participate. These perspectives emerge from a growing body of research in knowledge management in small firms, as Shekhar and Valeri [18] noted in their bibliometric review. However, it is crucial to keep in mind the limitations of their analysis, as it focused exclusively on journal articles from a single data source, which could have missed relevant studies that still need to meet these criteria. Therefore, it is essential to consider the inherent limitations of the database used and the quality of the studies included, as this may influence the statistical accuracy of the results. Furthermore, it is necessary to exercise caution when generalizing the conclusions to different thematic areas or types of companies, given that the study

focuses exclusively on knowledge management in small companies and does not cover other aspects of business management.

In addition, the most frequent thematic areas in this field include innovation, technology, performance, and absorptive capabilities. Future lines of research have been proposed, such as identifying the benefits of global knowledge management, adapting knowledge management practices to different cultural and geographic contexts, and exploring the identified thematic areas to address research gaps.

Current research on knowledge management in SMEs presents diverse opportunities for developing new perspectives and practices in this field. The main objective of this review article is to update the existing literature on KS and KT in the context of SMEs, corroborate future trends, and add emerging alternative branches. This goal can be achieved through complementary bibliometric techniques such as cocitation analysis of references (CCA-R) and bibliographic coupling of documents to systematically synthesize the existing literature on KS and KT in the context of SMEs and update or include emerging topics through a conceptual map.

This study aims to contribute to the literature by answering these questions:

- (i) What is the current state of research on KS and KT within the context of SMEs, and what valuable insights and advancements does the existing literature offer?
- (ii) What are the future trends in KS and KT in the context of SMEs?
- (iii) What are the emerging alternative branches in KS and KT in the context of SMEs?

Section 2 will present the detailed research design and methodology. The research findings will be carefully elucidated in Section 3, providing a thorough analysis of the obtained results. Section 4 will delve into a thought-provoking discussion, accompanied by a conceptual map, facilitating a deeper understanding of the research outcomes. Additionally, this section will explore the future implications and potential avenues for further research, thereby contributing to advancing knowledge in this field. In summary, this paper seeks to update and expand the existing knowledge on knowledge management in SMEs, providing new perspectives and practices in this field and contributing to the development of a complete understanding of how SMEs can benefit from knowledge management.

2. Methodology

We employed a systematic literature review approach, adhering to the procedural recommendations outlined by Cerchione and Esposito [11], to ensure transparency and reproducibility. Although the paper does not explicitly mention limitations, it acknowledges the challenges of developing an appropriate methodology for evidence-based management reviews through a systematic review. We provide detailed disclosure of each process stage [13].

TABLE 1: Keyword search chain used in Web of Science to filter publications.

Keyword search string used to identify articles from the Web of Science database.
 (TS = ("knowledge shar*" OR "shar* knowledge" OR "knowledge exchange" OR "exchange knowledge" OR "knowledge dissem*" OR "dissem* knowledge" OR "knowledge diffus*" OR "diffus* knowledge" OR "knowledge transfer*" OR "transfer* knowledge")) AND (TS = ("SMEs" OR "SME" OR "small and medium enterprise" OR "small business" OR "medium-sized business"))

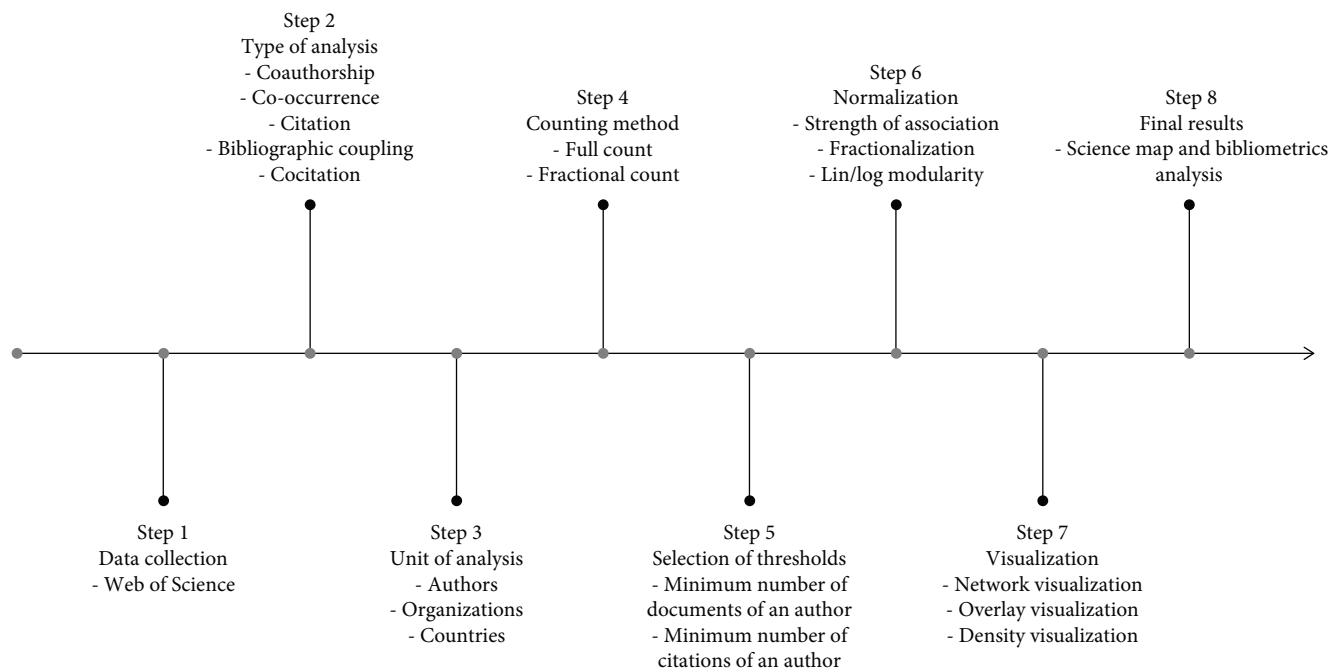


FIGURE 1: Flowchart for efficient analysis with VOSviewer.

In the first stage, we selected the Web of Science database because of its high selectivity and rigor in indexing scientific articles, guaranteeing high-quality standards and making it a reliable source [19].

In the second stage, we identified keywords and constructed search strings in the Web of Science database. We used the inclusion criteria to select publications on specific business and management studies topics, excluding other disciplines. The specifics of the search query and the information obtained are provided in Table 1.

In the third stage, we used the strategy of the inclusion and exclusion strategy [13], selecting only publications from peer-reviewed academic journals and omitting conference proceedings, book chapters, and books. As a result, we obtained 184 articles extracted between 2006 and 2023. Careful selection of relevant topics was crucial to allow comparison of different studies. Abstracts underwent evaluation through the application of discernment derived from academic expertise, guiding the decision to include or exclude publications. Once the abstracts were analyzed, we selected publications based on the context in which knowledge strategy and user knowledge in SMEs were addressed, the level of analysis (individual, group, organizational, and network), and the theoretical framework/lens (general theoretical perspective).

In the fourth stage, an exhaustive examination was conducted employing bibliometric analysis, a methodology

successfully implemented in prior research endeavors [20]. To visualize and scrutinize our bibliometric data, we employed the science mapping software Visualization of Science Viewer, commonly known as VOSviewer [21]. This tool facilitated a comprehensive examination of the development and tendencies within a specific research domain. Figure 1 represents the flowchart used to perform the bibliometric analysis and scientific mapping through VOSviewer.

In the first step of our research, we focused on conducting a comprehensive textual analysis of 184 publications to identify the relationships between the concepts studied. For this purpose, we used co-occurrences of keywords, which allowed us to identify the most relevant themes and sub-themes in the research field and discover emerging areas through cword maps [21]. We adopted the VOSviewer software to perform this task and selected the category overlay visualization. This technique allowed us to observe the most critical keywords in a given period. It should be noted that, although the studies adopted keywords since 2006, the software limited the visual representation to avoid saturation and ensure a clear and understandable visualization due to the volume of data obtained for the selected period. It is why only the interval in which keywords started to appear to a greater extent (2017–2020) is shown, as seen in Figure 2. In this way, under-occurrence was excluded, and a more active and emerging set of keywords was represented. Nevertheless,

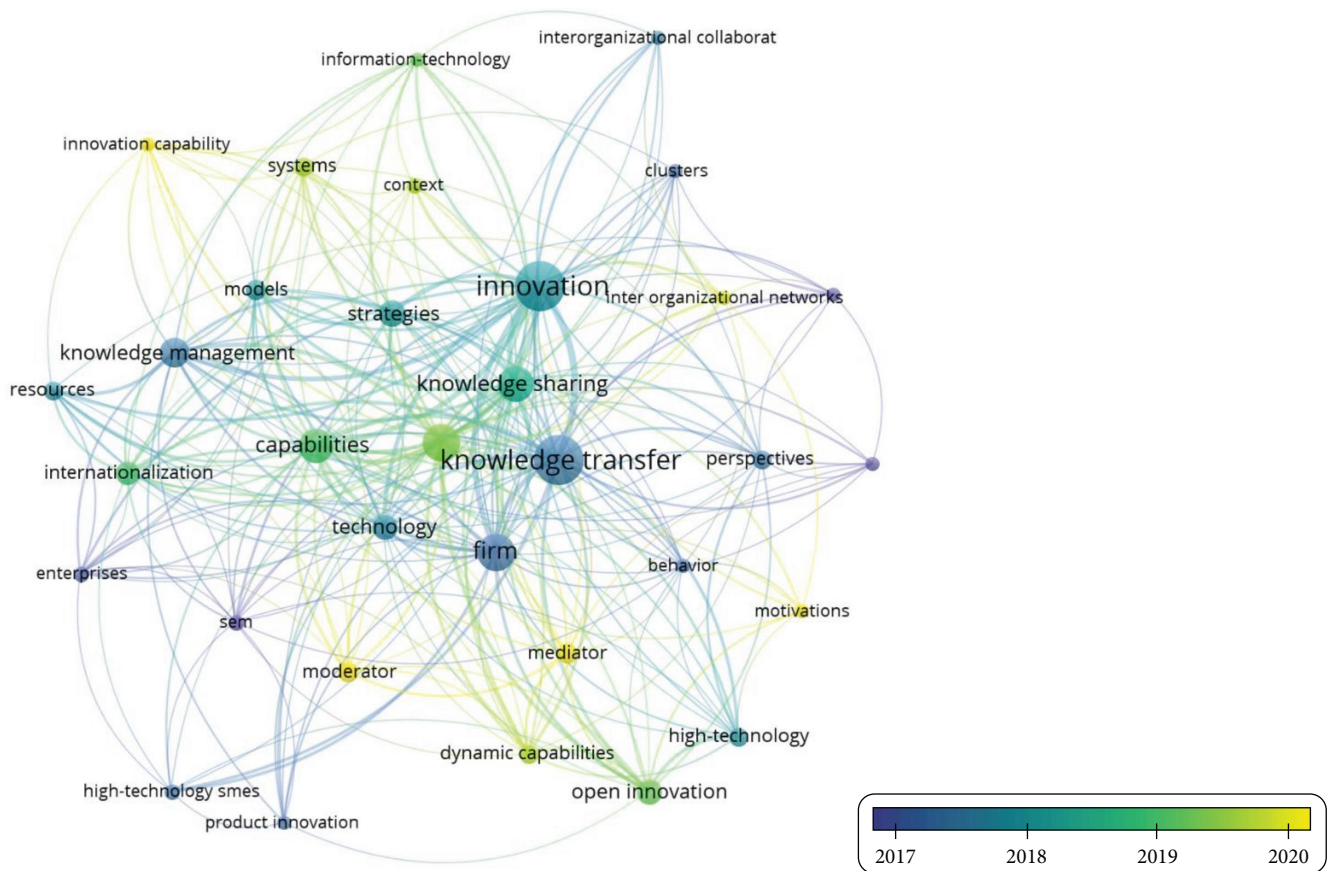


FIGURE 2: Mapping of keyword co-occurrence in research.

TABLE 2: Clusters of seminal texts identified by CCA-R algorithm.

Cluster	Citations	Journals
Red	Tsai et al. [24]	<i>Technological Forecasting and Social Change</i>
Red	Zahra and George [25]	<i>Academy of Management Review</i>
Red	Nonaka and Takeuchi [26]	<i>The Knowledge Creating Company—How Japanese Companies Create the Dynamics of Innovation</i>
Red	Cohen and Levinthal [27]	<i>Administrative Science Quarterly</i>
Blue	Barney [28]	<i>Journal of Management</i>
Blue	Fornell and Larcker [29]	<i>Journal of Marketing Research</i>
Blue	Podsakoff et al. [30]	<i>Journal of Applied Psychology</i>
Green	Dyer and Singh [31]	<i>Academy of Management Review</i>
Green	Grant [32]	<i>Strategic Management Journal</i>
Green	Nahapiet and Ghoshal [33]	<i>Academy of Management Review</i>

the saturated map has been obtained for finding the emerging trends, and the corresponding summary representing those trends has been produced.

Within the framework of the second stage, we conducted a cocitation examination based on the bibliographic citations within the chosen publications. For this purpose, we used the method of cocitation of authors (CCA-R), which considers the citations as analytical entities and allows us to differentiate between two citations originating from the same individual. The cocitation frequencies indicated the closeness of two citations [22]. With this approach, we obtained a historical perspective of the research field studied by examining the

citations referenced in the chosen publications [23]. In our study, the 184 publications analyzed contained 11,479 citations. Following Anand et al. [13] recommendations, we established a threshold and selected the most impactful articles cited at least five times. As a result, ten bibliographic references were included out of a total of 195 that met this threshold (see Table 2 and Figure 3). Thanks to this cocitation analysis, we could identify the most relevant papers and better understand the structure of the research field studied.

We carried out a bibliographic document linkage analysis (BCA-D) in the third step (see Figure 4). We used publications as the unit of analysis to identify trends and explore

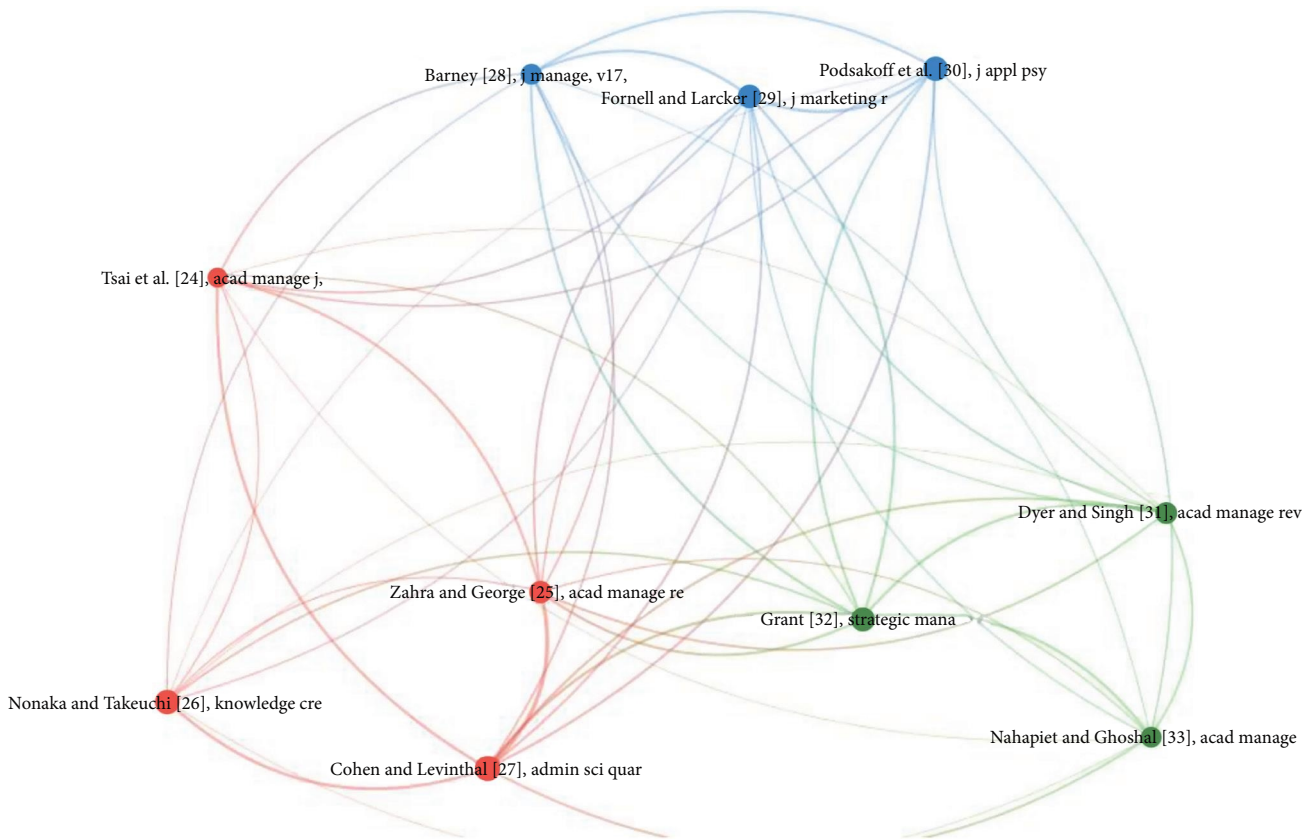


FIGURE 3: Mapping the relationship between authors using CCA-R.

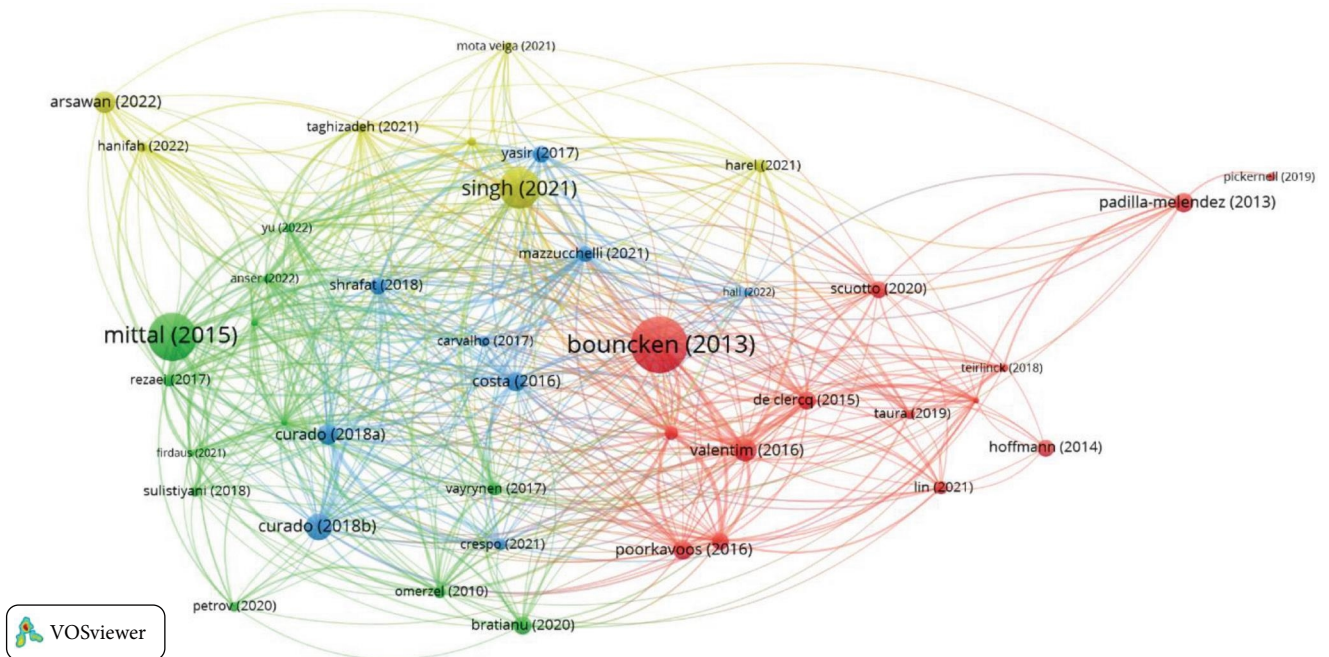


FIGURE 4: BCA-D map.

new research areas in a specific field [34]. Our database includes 184 publications released from 2006 onward. Nevertheless, we established a threshold in VOSviewer to include only those publications with a minimum of five citations, resulting in 122

publications meeting the threshold. We then read the abstracts of these publications and selected 42 relevant articles based on two main criteria [13]: (1) that the articles expressly covered the concept of KS, KT, or knowledge exchange (KE) in the SME

TABLE 3: BCA-D analysis matrix for in-depth evaluation.

Citation extracted in Web of Science	Cluster	Concept				Method			Impacted level that is investigated		
		KS	KT	KE	KD	Quali	Quanti	Review	Individual	Group	Organization
Bouncken and Kraus [35]	1	✓	—	—	—	—	—	✓	—	—	✓
De Clercq et al. [36]	1	✓	—	—	—	—	✓	—	—	✓	—
Hoffmann et al. [37]	1	—	✓	—	—	—	✓	—	—	—	✓
Lin and Lai [38]	1	✓	—	—	—	—	✓	—	—	—	✓
Padilla-Melendez et al. [39]	1	—	✓	✓	—	✓	—	—	✓	—	—
Pickernell et al. [40]	1	—	—	✓	—	—	✓	—	—	—	✓
Poorkavoos et al. [41]	1	—	✓	—	—	—	✓	—	✓	—	—
Serra et al. [42]	1	—	✓	—	—	—	✓	—	—	✓	—
Scuotto et al. [43]	1	—	✓	—	—	—	✓	—	—	—	✓
Taura and Radicic [44]	1	—	—	✓	—	—	✓	—	—	✓	—
Teirlinck [45]	1	—	—	✓	—	✓	—	—	—	—	✓
Valentim et al. [46]	1	—	✓	—	—	—	✓	—	✓	—	—
Yoo et al. [47]	1	—	✓	—	—	—	✓	—	—	—	✓
Afriyie et al. [48]	2	✓	—	—	—	—	✓	—	—	—	✓
Anser et al. [49]	2	✓	—	—	—	—	✓	—	✓	—	—
Bratianu et al. [50]	2	—	✓	—	—	—	—	✓	—	—	✓
Firdaus et al. [51]	2	✓	—	—	—	—	✓	—	—	—	✓
Kareem et al. [52]	2	✓	—	—	—	—	✓	—	—	—	✓
Mittal and Dhar [53]	2	✓	—	—	—	—	✓	—	✓	—	—
Omerzel [54]	2	—	✓	—	—	—	✓	—	—	—	✓
Petrov et al. [55]	2	✓	—	—	—	—	✓	—	—	✓	—
Rezaei et al. [56]	2	✓	—	—	—	—	✓	—	—	—	✓
Sulistiyani et al. [57]	2	✓	—	—	—	—	✓	—	✓	—	—
Vayrynen et al. [58]	2	✓	—	—	—	—	—	✓	—	—	✓
Yu et al. [59]	2	✓	—	—	—	—	✓	—	—	—	✓
Aleksic et al. [60]	3	✓	—	—	—	—	✓	—	✓	—	—
Arsawan et al. [61]	3	✓	—	—	—	—	✓	—	—	—	✓
Hanifah et al. [62]	3	✓	—	—	—	—	✓	—	—	—	✓
Harel et al. [63]	3	—	✓	—	—	—	✓	—	—	—	✓
MotaVeiga et al. [64]	3	—	✓	—	—	—	✓	—	—	—	✓
Singh et al. [65, 19]	3	✓	—	—	—	—	✓	—	—	✓	—
Taghizadeh et al. [66]	3	✓	—	—	—	—	✓	—	—	—	✓
Carvalho and Gomes [67]	4	✓	—	—	—	—	—	—	—	—	✓
Costa and Monteiro [68]	4	✓	—	—	—	—	✓	—	—	—	✓
Crespo et al. [69]	4	—	—	—	✓	—	—	✓	—	—	✓
Curado [70]	4	✓	—	—	—	✓	✓	—	—	—	✓
Curado et al. [71]	4	✓	—	—	—	✓	✓	—	—	—	✓
Hall et al. [72]	4	✓	—	—	—	—	✓	—	—	✓	—
Mazzucchelli et al. [73]	4	✓	—	—	—	—	✓	—	—	✓	—
Shrafat [74]	4	✓	—	—	—	—	✓	—	—	—	✓
Yasir and Majid [75]	4	✓	—	—	—	—	✓	—	—	—	✓

*Note: KS = knowledge sharing; KT = knowledge transfer; KE = knowledge exchange; KD = knowledge dissemination.

context, and (2) that the articles explored KS, KT, or KE from the organizational, group, or individual perspective in SMEs.

After performing the computer-assisted analysis, we distilled the results from CCA-R and BCA-D using an attributional cataloging approach akin to the methodology employed by Anand et al. [13]. In the case of CCA-R, we conducted manual coding for each synthesis, and in instances of ambiguity, a comprehensive article review was undertaken. On the

other hand, in BCA-D, each abstract was read, and the content was coded into five distinct domains: (1) context, (2) variables, (3) methodologies, (4) antecedents/consequences, and (5) results. The consolidated summary is presented in Table 3, where the information was organized logically, highlighting similarities, methodological differences, measurement tools (quantitative, qualitative, or a combination thereof), and the depth of exploration (individual, group, and organizational).

3. Results

3.1. Text Analysis of Keywords. The outcomes of keyword analysis are depicted in Figure 2, portraying a network of co-occurring keywords. A total of 1,050 keywords were detected across the 184 publications by the software. Of these, 34 surpassed the co-occurrence threshold, indicating a minimum occurrence frequency of five instances. Previously, and before visualizing the network of keywords, the keyword “SMEs” was manually eliminated as it was related to most of the items—the examination distilled down to 33 keywords, with the color-coded differentiation denoting various years. Adhering to the methodology advocated by Zupic and Čater [76] for map interpretation, a pervasive pattern across all keywords was observed. Notably, “Knowledge transfer” held eminence as the predominant keyword in SME research during 2017–2018, succeeded by the ascendancy of “innovation” circa 2018. The temporal trajectory between 2018 and 2020 revealed the incorporation of “Knowledge sharing” (KS) and “Open innovation” (OI) as prevalent keywords. The bubbles on the visual representation signify terms encountered more than five times, with more giant bubbles indicative of higher occurrence scores. The proximity of circles denotes the frequency of simultaneous appearance, while the thickness of connecting lines underscores the significance of co-occurrences. Color gradients represent word co-occurrence in distinct clusters [34].

Specifically, crucial expressions such as “organizational culture” and “business intelligence,” originating from a corporation’s learning trajectory, were notably absent from the keyword mapping. The mapping additionally unveiled the main terms, with “Internationalization” and “Absorptive capacity” taking center stage in SMEs research, particularly from 2018 to 2019. The data we obtained unveiled a growing emphasis on the term “dynamic capabilities” in SME investigations. Since 2020, this concept has increasingly been associated with “Open innovation” and “Knowledge transfer.” Notably, “Innovation capability” and “inter-organizational network” emerged as significant keywords from 2020 onward. Our observations reveal that research methodologies employing structural equation modeling (SEM), encompassing both mediation and moderation analyses, have become the predominant approach for evaluating the innovation capability of SMEs.

3.2. Examining Connections between References through Cocitation Analysis. This segment unveils the outcomes from the cocitation examination conducted using the CCA-R methodology. Figure 3 shows the citation map representing the linkage between authors through their citations. The line width indicates the robustness of the relationship between publications, while their proximity between them represents the cocitation association. The findings unveiled three main groupings (red, blue, and green), each representing the linkage among citations from articles authored by different researchers. Additional particulars regarding the publications recognized as seminal papers are presented in Table 2. Through our author mapping analysis, these publications were identified as seminal works in explaining the progression of KS and KT, which have

been cited by many researchers and have served as a basis for constructing new theories. It is suggested that these investigations be considered in any comprehensive examination of KS within the existing literature.

3.3. Grouping Seminal Publications on Knowledge Sharing and Transfer in SMEs through Clustering. Leveraging the cocitation analysis of authors (CCA-R), we have organized the foundational articles identified in Table 2 into three distinct clusters, as depicted in Figure 3.

3.3.1. Cluster Red—Key Perspectives on Organizational Learning and Innovation. The red cluster, consisting of four publications, focuses on knowledge acquisition and application at the organizational level, highlighting its impact on innovation and competitiveness. Tsai et al. [24] and Zahra and George [25] delve into the significance of social capital and absorptive capacity in facilitating knowledge sharing and acquisition within firms. Their studies shed light on the mechanisms through which organizations can effectively tap into external knowledge sources and integrate them into their internal processes.

Furthermore, Nonaka and Takeuchi [26] propose a comprehensive model of organizational knowledge creation, emphasizing the crucial role of tacit knowledge and cross-functional collaboration in fostering innovation. Their work emphasizes the importance of creating a knowledge-friendly culture and leveraging the diverse expertise of employees across different functional areas. Additionally, Cohen and Levinthal [27] introduce the concept of absorptive capacity, focusing on how organizations can effectively absorb, assimilate, and apply external knowledge to foster innovation. Their groundbreaking research provides valuable insights into the role of absorptive capacity in enhancing a firm’s ability to capitalize on new knowledge. Collectively, these articles not only offer a comprehensive and up-to-date overview of organizational learning and innovation but also make significant contributions to the broader literature on management and business strategy.

3.3.2. Cluster Blue—Management and Business Strategy: Resources, Capabilities, and Research Methodologies. The blue cluster, comprising three publications, has significantly impacted the literature concerning management and business strategy. One of the influential articles within this cluster is Barney’s [28] work, which thoroughly explores the intricate relationship between a firm’s resources and capabilities and its capacity to maintain a sustainable competitive advantage. This article sheds light on the pivotal role of internal factors in driving long-term success. Another notable contribution within the blue cluster is the study by Fornell and Larcker [29], which centers on evaluating structural equation models involving unobservable variables and measurement error. This research offers valuable insights into methodological advancements in accurately assessing complex relationships in business contexts. Lastly, the third article by Podsakoff et al. [30] tackles the issue of common method biases in business research and proposes practical approaches to mitigate their impact. The critical review of these articles provides an updated and comprehensive perspective on the significance

of internal resources and capabilities as sources of sustainable competitive advantage. It offers practical methodologies for evaluating measurements and minimizing potential biases in business research. Together, these publications advance our understanding of fundamental management and business strategy aspects, making them indispensable sources of knowledge in the field.

3.3.3. Green Cluster—New Perspectives on Competitive Advantage in Corporate Governance. The green cluster, consisting of three publications, delves into competitive advantages within corporate governance. One notable contribution by Dyer and Singh [31] introduces a fresh perspective on competitive advantage by emphasizing the significance of resources embedded in interorganizational relationships and the notion of relational rents. Grant [32] offers a knowledge-based theory to elucidate how firms attain sustainable competitive advantage, underscoring the crucial role of knowledge creation and utilization within organizations. Additionally, Nahapiet and Ghoshal [33] explore the intricate relationship between social and intellectual capital as a source of competitive advantage. They highlight the significance of social capital's structural, relational, and cognitive dimensions in fostering intellectual capital's creation and achieving superior long-term organizational performance. These studies present novel viewpoints on competitive advantage within business management literature, shedding light on the importance of inter-organizational relationships, knowledge, and social capital in driving organizational success.

3.4. Analysis of Document Cocitations Using Bibliographic Coupling (BCA-D). The findings from BCA-D and the intricate relationship between citations and author centrality within the 184 publications of the bibliographic network are thoroughly examined. The acquired data undergoes comprehensive analysis to evaluate its developmental trajectory and future implications within a specific domain. As illustrated by the software in Figure 4, the network's representation organizes article authors using a color-coded system. The size of the circle and the corresponding label are directly proportional to the significance of the contribution. Distinctive colors visually highlight the grouping of elements, and lines delineate connections among items. Fundamentally, the proximity of articles, as expounded by van Eck and Waltman [21] in 2010, indicates their affinity. A close association between two articles implies a higher level of shared cited literature.

3.4.1. Identifying Clusters of Emerging Trends in Research on Knowledge Sharing and Transfer in Small and Medium-Sized Enterprises. At this juncture, we discern patterns associated with KS and KT in SMEs by utilizing a BCA-D map with the qualitative coding elucidated in Table 3 to gain insights into emerging tendencies. Subsequently, we distill this information into the clusters illustrated in Figure 5.

Cluster 1. Coopetition and collaboration: critical factors for enhancing innovation and competitiveness in SMEs. This cluster, comprising 14 publications, focuses on the pivotal role of coopetition and collaboration in driving innovation

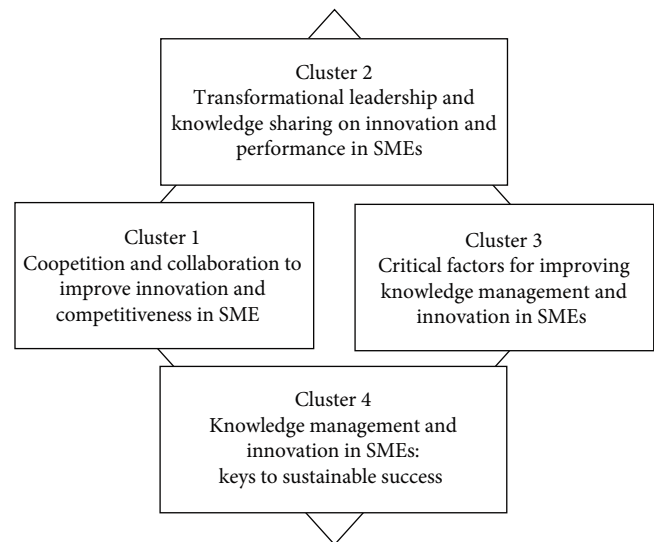


FIGURE 5: Emerging patterns in the field depicted through BCA-D clusters.

and improving competitiveness within SMEs. Coopetition, which involves simultaneous collaboration and competition between firms, has gained recognition as a practical approach for fostering innovation in SMEs. Numerous studies have delved into the impact of coopetition on innovation and have identified key factors that influence the innovative capabilities of SMEs.

For instance, Bouncken and Kraus [35] emphasized the significance of interdependence and entrepreneurial orientation as essential drivers of innovation within SMEs. De Clercq et al. [36] developed a comprehensive model that underscores the criticality of creativity, learning, and collaboration in promoting innovation.

When considering factors affecting the technological capabilities of SMEs, [37, 38] found that collaboration, learning, and cooperation play crucial roles in driving innovation. Likewise, Padilla-Melendez et al. [39] and Pickernell et al. [40] highlighted the importance of collaboration and participation in entrepreneurial networks and universities for facilitating open innovation and entrepreneurship.

Creativity and collaboration were identified as fundamental factors for innovation in SMEs in the studies conducted by Poorkavoos et al. [41] and Taura and Radicic [44]. Furthermore, Serra et al. [42] investigated the influence of network relationships and prior knowledge on developing knowledge absorption, application, and creation capabilities within low technology-intensive clusters.

Scuotto et al. [43] revealed that collaboration and innovation are essential for enhancing the competitiveness of SMEs. Teirlinck [45] also emphasized the importance of collaboration and innovation in SMEs as crucial drivers for improving competitiveness. Finally, Yoo et al. [47] explored the concepts of absorptive capacity and relational capital in alliance learning within SMEs.

These studies collectively underline the criticality of collaboration and learning as vital factors for driving innovation in SMEs. By embracing coopetition, fostering collaboration,

and leveraging key factors such as interdependence, entrepreneurial orientation, creativity, and knowledge absorption, SMEs can enhance their innovation capabilities, improve competitiveness, and thrive in today's dynamic business landscape.

Cluster 2. The influence of transformational leadership and knowledge sharing on innovation and performance in SMEs. This group, comprising 12 publications in this subtopic, delves into the intricate relationships among transformational leadership, knowledge sharing, innovation, and performance within SMEs. The findings shed light on the vital role of these factors in driving SME success and competitiveness amidst the dynamic business environment.

Afriyie et al. [48] empirical study conducted in an emerging economy provides valuable insights into the positive influence of transformational leadership on various types of innovation. Additionally, it highlights the positive impact of knowledge sharing on marketing performance. Notably, transformational leadership acts as a mediating factor between knowledge sharing and marketing performance. Anser et al. [49] demonstrate how functional flexibility facilitates innovative work behavior among SME workers through knowledge sharing.

Bratianu et al. [50] identify latent variables such as learning culture, learning systems, and knowledge management that foster SMEs' transformation into learning organizations. Firdaus et al. [51] emphasize the significance of knowledge sharing and innovative work behavior in enhancing SME performance. Kareem et al. [52] underscore the positive effects of accounting information systems, knowledge management capabilities, and innovation on SME performance.

Mittal and Dhar [53] reveal the positive impact of transformational leadership on employee creativity, with knowledge sharing playing a crucial role in strengthening this relationship. Omerzel [54] provides evidence supporting the positive influence of knowledge management on SME growth and profitability. Petrov et al. [55] emphasize the significance of group social capital in facilitating effective knowledge sharing within SMEs.

Rezaei et al. [56] demonstrate the positive impact of knowledge sharing on the relationship between cultural excellence and organizational performance. Sulistiyani et al. [57] reveal the significant influence of transformational leadership and knowledge sharing on creative performance within Indonesian SMEs. Vayrynen et al. [58] highlight the unique challenges SMEs face in knowledge management for open innovation compared to larger firms. Lastly, Yu et al. [59] reveal the substantial positive impact of expectations and support from top management teams on managerial innovation within SMEs.

These studies underscore the critical role of knowledge management, transformational leadership, and knowledge sharing in driving SME performance, growth, and profitability. SMEs should accord due priority to these elements if they genuinely aim to navigate the challenges that lie ahead. Moreover, the insights derived from this data offer a valuable avenue for augmenting innovation capabilities within SMEs, nurturing a culture of knowledge sharing, and adeptly harnessing transformational leadership for enduring success.

Cluster 3. Critical factors for enhancing knowledge management and fostering innovation in SMEs. This cluster, comprising nine publications, sheds light on the pivotal factors contributing to improving knowledge management and innovation within SMEs. It explores strategies to augment innovative capacity and performance in the dynamic business landscape. The significance of knowledge and its management for achieving business success has garnered recognition in recent years, leading to a surge in studies exploring learning processes and innovation across firms of varying sizes and sectors. Specifically, the academic literature has extensively examined interfirm knowledge sharing, the absorptive capacity of knowledge, HRM (Human resource management), and their collective influence on innovation within SMEs. These investigations aim to discern the factors that substantially impact the innovative performance of these firms.

Carvalho and Gomes [67] uncover a positive association between knowledge-sharing capacity and innovation, demonstrating that firms with a higher propensity for sharing knowledge tend to exhibit more outstanding innovative capabilities. Costa and Monteiro [68] and Flor et al. [77] emphasize the critical role of knowledge absorption capacity in facilitating learning processes and fostering innovation within firms. Crespo et al. [69] propose a fresh perspective that positions absorptive knowledge capacity as a pivotal factor influencing innovation. Curado [70] delves into the contribution of HRM to innovation in SMEs, highlighting the substantial impact of innovative work behavior on overall performance. Curado et al. [71] further unveil the vital role played by employee creativity, learning culture, and learning systems in driving creative and innovative outcomes within organizations.

Additionally, Hall et al. [72] underscore the significance of trust, communication, and collaboration as critical factors influencing the success of knowledge sharing within small business networks. Mazzucchelli et al. [73] ascertain that social capital and technological support are indispensable factors for enhancing the innovative capability of geographically dispersed research and development (R&D) teams. Finally, Shrafat [74] and Yasir and Majid [75] investigate the factors influencing the adoption of knowledge management systems and knowledge-sharing practices in SMEs operating in emerging economies, emphasizing the pivotal role of trust in facilitating successful knowledge-sharing endeavors.

In conclusion, the scholarly literature has diligently explored multiple facets of knowledge management and innovation within SMEs. Through rigorous analysis, it has discerned various critical factors that significantly influence these enterprises' innovative capacity and performance. The knowledge gained from these studies contributes to the development of practical strategies to enhance knowledge utilization, promote innovation, and foster the long-term success of SMEs.

Cluster 4. Knowledge management and innovation in SMEs: keys to sustainable success. This cluster, consisting of seven publications, delves into the critical factors contributing to sustainable success in SMEs by fostering an innovation culture, facilitating knowledge sharing, effectively managing

intellectual capital, and implementing innovative strategies in dynamic environments. In the context of SMEs, knowledge management and innovation play a pivotal role in maintaining a sustainable competitive advantage. Several studies have explored the relationship between shared knowledge, innovation culture, and the success of SMEs, shedding light on their significance.

For instance, Aleksic et al. [60] emphasize that knowledge sharing, support, and a collaborative attitude serve as crucial micro-foundations for open innovation in SMEs. Arsawan et al. [61] underscore the sustainability and competitive advantage that can be derived from an innovation culture and knowledge sharing within SMEs. Furthermore, Hanifah et al. [62] find that intellectual capital and entrepreneurial orientation positively influence SMEs' innovative performance through knowledge sharing. Conversely, Harel et al. [63] highlight the importance of promoting innovation processes for SME success, cautioning against potential hindrances caused by managerial dominance.

In the realm of knowledge management, Mota Veiga et al. [64] present the "spinner" model of innovation, which emphasizes the interplay between knowledge creation, KT, and innovation within SMEs. Similarly, Singh et al. [65] underscore the significance of knowledge sharing by top management in fostering open innovation and enhancing organizational performance. Additionally, Taghizadeh et al. [66] explore the role of knowledge management capability, environmental dynamics, and innovation strategy in Malaysian firms, highlighting knowledge management as a critical factor in SME innovation strategy within changing environments.

4. Discussion

The discussion in this research centered on two key aspects: identifying knowledge management gaps and examining them from the perspective of SMEs. Following the recommendations of Durst and Edvardsson [4], additional research was conducted to improve the understanding of knowledge management in this domain. It has allowed us to delve deeper into less known areas, such as knowledge identification and storage, and has broadened the academic knowledge on knowledge management in SMEs.

In addition, the practical approach suggested by Massaro et al. [10] has been adopted by broadening the selection of journals used in the study. Instead of focusing only on mainstream journals, more recent publications were included to update current and future trends in knowledge management in SMEs. This practice has allowed capturing the most recent and relevant advances in the field, strengthening the knowledge base for decision-making in enterprise knowledge management.

Also, following the gap identified by Mohd Selamat et al. [12], special attention has been paid to research and future trends in knowledge management in SMEs. This consideration is critical to keep up to date with emerging developments in the field and to identify opportunities to improve the efficiency and competitiveness of SMEs in today's business environment.

The research has also addressed the gaps suggested by Anand et al. [13], particularly about the need for more understanding of knowledge management in SMEs and updating emerging branches. There has been a focus on the human aspect, including organizational culture and structure, to promote open innovation, which has resulted in a better understanding of how knowledge management affects business performance at the SME level.

In line with the recommendations of Farooq [14], a comprehensive analysis has been conducted that has revealed the most recent developments in the knowledge management literature. The aforementioned has allowed an assessment of the relevance and timeliness of the existing literature and has provided a more accurate picture of recent developments in the field.

Finally, the gap identified by Anand and Dumazert [15] has been addressed by applying bibliometric techniques to strengthen the quality of literature reviews and understand the evolution of knowledge sharing in knowledge management. These techniques have provided a more comprehensive and complex perspective of the existing literature, allowing the identification of patterns and trends that enrich knowledge about knowledge management in SMEs.

Transforming the concept of knowledge management in organizations, especially SMEs, comes from addressing the gaps mentioned above and adapting to the changing demands of today's business environment. By addressing these critical areas, this study contributes to the field by providing a solid foundation for future research and business practices, which can boost SMEs' competitiveness and success in the global marketplace.

The current state of research on KS and KT in the context of SMEs has experienced significant growth. The existing literature offers valuable insights and advances in various areas, such as knowledge identification and storage, adoption of knowledge management tools, business performance improvement, interorganizational collaboration, and open innovation. In essence, the studies presented in this article highlight the indispensable role of knowledge management and innovation in driving the sustainable success of SMEs. They provide valuable insights into promoting these practices in the specific context of SMEs. Our primary research goal, aligning with Anand et al. [13], was to systematically synthesize the literature concerning KS and KT within the context of SMEs. However, our study goes beyond a mere review by incorporating a comparative analysis and updating emerging trends in this field. To achieve this objective, we have developed a qualitative conceptual map (Figure 6) that effectively captures the background, primary findings, and future lines of research in this area. This visual representation is supported by the meticulous use of various methods, such as joint citation analysis with relevant overlap (CCA-R), bibliographic linkage analysis with the distance between documents (BCA-D), and qualitative analysis, giving it a solid foundation. In the subsequent discussion, we elaborate on these issues, elucidating the contribution of this research to the literature update through three significant aspects: (1) theoretical contributions,

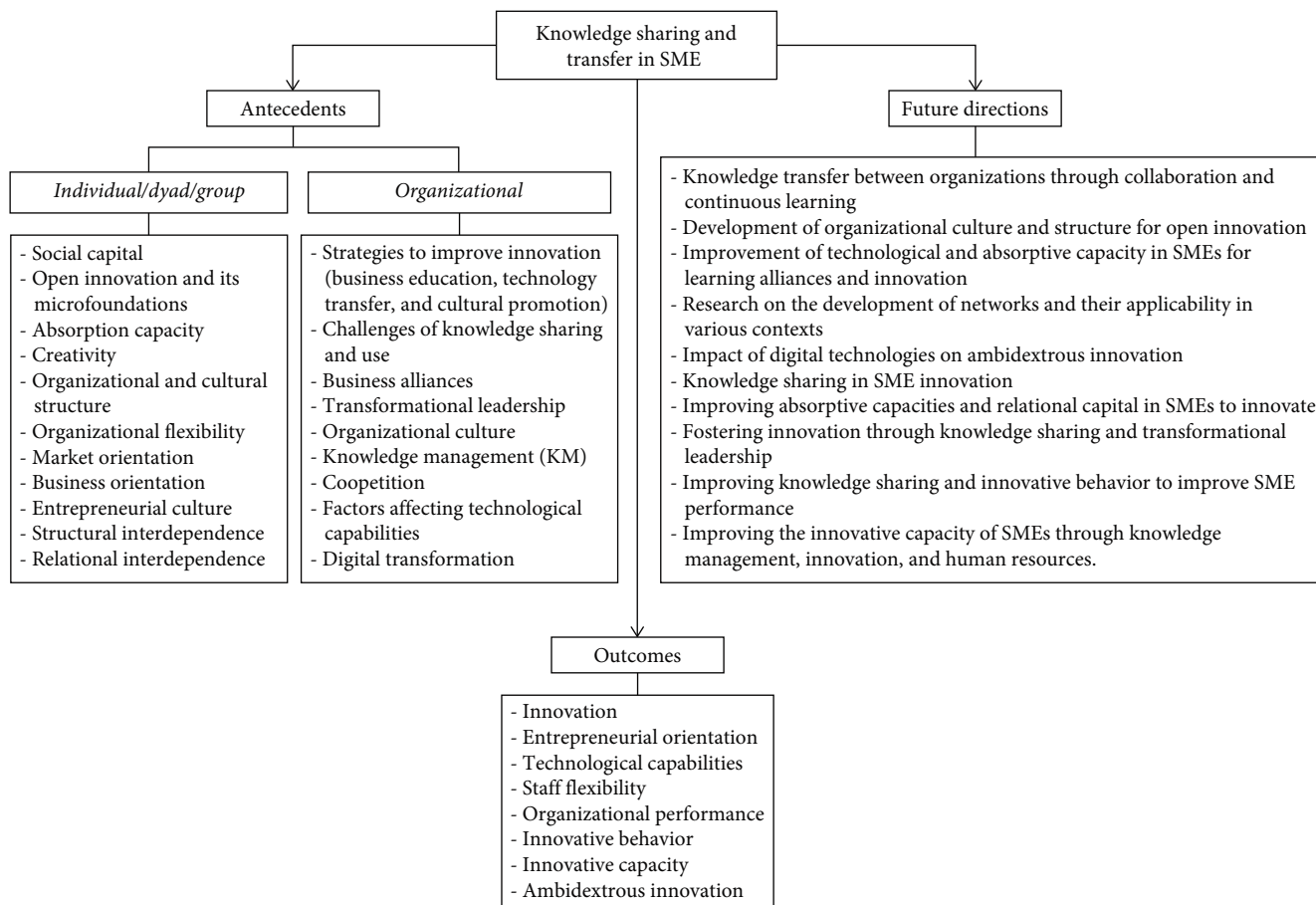


FIGURE 6: Qualitative concept map of the research agenda for SMEs.

(2) methodological improvements in the bibliometric literature review, and (3) possible avenues for future research.

Future trends in KS and KT in the SME field focus on interorganizational KT, open innovation, and the development of technological capabilities (see Figure 6). Increased attention is given to human resource factors, including organizational culture and structure, to promote open innovation. SMEs are expected to increasingly recognize human-centered approaches' crucial role in facilitating effective knowledge sharing and transfer.

Emerging alternative branches of KS and KT in the field of SMEs include the study of technological and absorptive capacity enhancement, developing networked relationships and their applicability in different contexts, and the impact of digital technologies on ambidextrous innovation and knowledge sharing. A more holistic and systematic view of KS and KT in SMEs is suggested, involving all organization members, fostering collective learning, and developing collaborative networks with other companies, universities, and research centers.

4.1. Theoretical Contribution. Based on the work of Anand et al. [13], our study adopts a dual perspective, encompassing both descriptive and predictive elements, to delve into the realm of KM within SMEs. In tandem, we comprehensively

synthesized existing literature pertinent to SMEs. The meticulous analysis undertaken has yielded a systematic categorization of the existing literature into two discernible clusters: The first cluster is devoted to the exploration of KS and KT at the individual level, extending its inquiry to encompass group dynamics for a more nuanced understanding of absorptive capacity, organizational culture, and creativity. Conversely, the second cluster directs its focus toward the organizational level, scrutinizing strategies aimed at bolstering innovation, addressing knowledge sharing and use challenges, exploring organizational culture, and navigating the digital transformation landscape.

It has been substantiated that both KS and KT play pivotal roles in fostering innovation and organizational development within large enterprises, as evidenced by studies [24, 78]. Conversely, within SMEs, the review confirms the strategic importance of KS and KT, reflected in improved innovativeness and organizational performance. It was also found that the positive outcomes of KS and KT in SMEs are diverse and extend to subjective aspects such as flexibility, innovative behavior, and improved technological capabilities.

Overall, the text provides a comprehensive overview of the factors that influence knowledge management and innovation in SMEs and the importance of effective management practices to improve performance and competitiveness in the

marketplace. It also suggests critical areas for future research, such as collaboration and continuous learning for KT between organizations.

4.2. Methodological Contribution of Bibliometric Literature Reviews. Our research presents a structured literature review using bibliometric techniques based on previous work by Thorpe et al. [79] and Anand et al. [13]. We complement interpretive, narrative, and advanced meta-reviews approaches using CCA-R and BCA-D techniques. We generated a conceptual map (Figure 6) that guides future research on KS and KT in SMEs, enriching understanding in this field.

Our study has significantly contributed to advancing KS research by applying CCA-R and BCA-D techniques. We identified new research areas and established a solid foundation for future rigorous studies in the field. We expanded existing literature reviews and overcame previous limitations [10, 13] by focusing on indexed journals that address KS and KT from a management perspective.

The innovation of our study lies in the combination of interpretive, narrative, and systematic literature review approaches. We also incorporate the fractional counting method proposed by Perianes-Rodriguez et al. [80], which gives equal importance to each action without considering variables such as the number of authors or citations. We also took advantage of various analysis and visualization methods in exploring the evolution of bibliometric network analysis.

Although bibliometric methods do not directly measure quantity, quality, and connections between publications, our study differed from previous work by considering impact factors and the H-index to assess quality. We broaden everyone's understanding of emerging and innovative topics in the field of research.

We considered several software options, such as HistCite, SciMAT, and Pajek, but chose VOSviewer for its ease of use, specific bibliometric functionalities, customized visualizations, and active user community. This choice allowed us to take full advantage of the tool in our research.

4.3. Future Research. After systematically exploring the literature, several directions for future research have been identified in the fields indicated in the conceptual map in Figure 6. It is suggested to investigate the barriers and facilitators that influence KT in inter-organizational collaboration and develop an appropriate organizational culture and structure for open innovation in SMEs, including the role of leaders and staff training. In addition, it is essential to deepen the study of the improvement of technological and absorptive capacity in SMEs, as well as research on the development of network relationships and their applicability in different contexts.

Other possible research areas could include digital technologies' impact on ambidextrous innovation and knowledge sharing. In addition, ways to improve the innovative capacity of SMEs through knowledge management, human resource innovation, and innovative behavior could be investigated, as well as deepening the study of business intelligence, i.e., the learning process of a firm. A more holistic and systematic approach to KS and KT in SMEs is recommended. For

example, this would involve involving all organization members, fostering collective learning, and developing collaborative networks with other companies, universities, and research centers. This approach would represent a departure from the technological approach to KS and KT.

Based on the bibliometric analysis, we postulate that HRM research could contribute to three critical aspects of SMEs, namely (1) creating a culture of learning and collaboration, (2) promoting the transfer of knowledge and skills both internally and externally, and (3) fostering network relationships and their applicability in different contexts. In the long term, HRM can also contribute to developing an innovative organizational culture, improving technological and absorptive capabilities, and fostering continuous learning and creativity among staff, which can lead to a greater capacity for innovation and, thus, to a sustainable competitive advantage in the marketplace.

It is recommended that researchers adopt more practical and action-oriented approaches in their KS and KT research. It is suggested to foster collaboration and collective learning, develop a culture of innovation, enhance specific skills and competencies, design knowledge management systems, and establish performance measures. One approach that could be useful for implementing daily practices and a better understanding of how employees apply the KS and KT strategy in their localized contexts would be to achieve systematization as a regular practice.

5. Conclusions

This review article focused on analyzing the existing literature on the importance of KS and KT in SMEs, using various bibliometric techniques such as textual analysis, reference cocitation analysis, and bibliographic document linkage analysis. The results revealed that innovation and open innovation are vital for SMEs' success in implementing influential KS and KT. In addition, the study deepened the topic and complemented the development of previous concept maps, strengthening the background, results, and future directions in the field. Overall, this study provided a deeper understanding of KS and KT in SMEs and provided continuity to previous research using structured approaches and bibliometric techniques.

This article highlights the need to improve knowledge management in SMEs and suggests the evaluation of data management and the creation of digital systems for internal management. It also identifies the need to explore inefficiencies in KT in collaborative networks and to adapt knowledge management practices to different cultural and geographical contexts.

Future trends in KS and KT highlight the importance of collaboration and continuous learning, as well as the enhancement of technological capabilities to improve knowledge management and the innovative capacity of SMEs. The key areas identified in this article provide an important direction for future research.

As for the emerging alternative branches in KS and KT in the context of SMEs, it is suggested to go back to the basics of

human resources and develop an organizational culture and structure suitable for open innovation.

Data Availability

All data necessary to reproduce the findings presented in this article are included in the main body of the paper and the appendices.

Additional Points

Limitations. First, it should be noted that the systematic literature search was based exclusively on articles published in leading knowledge management journals. Although this approach ensures the quality of the data sources, it could also have excluded essential contributions from other papers. Second, the study focused specifically on KS and KT in small firms, which limits the generalizability of the results to other subject areas or types of firms. Therefore, caution should be exercised when applying these results to other contexts. In addition, the search was limited to the Web Of Science database only, which could have resulted in excluding some relevant papers not included in the database. Therefore, it is suggested that future research include data from other databases to be more robust. Finally, papers not written in English were excluded, which means that essential contributions from other geographical and cultural areas not considered in this study could have been excluded.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this article.

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References

- [1] T. Castillo, L. F. Alarcón, and E. Pellicer, "Finding differences among construction companies management practices and their relation to project performance," *Journal of Management in Engineering*, vol. 34, no. 3, pp. 1–13, 2018.
- [2] V. Yepes and S. López, "Knowledge management in the construction industry: current state of knowledge and future research," *Journal of Civil Engineering and Management*, vol. 27, no. 8, pp. 671–680, 2021.
- [3] A. Alrowwad, S. H. Abualoush, and R. Masa'deh, "Innovation and intellectual capital as intermediary variables among transformational leadership, transactional leadership, and organizational performance," *Journal of Management Development*, vol. 39, no. 2, pp. 196–222, 2020.
- [4] S. Durst and I. R. Edvardsson, "Knowledge management in SMEs: a literature review," *Journal of Knowledge Management*, vol. 16, no. 6, pp. 879–903, 2012.
- [5] A. Calvo-Mora, A. Navarro-García, M. Rey-Moreno, and R. Periañez-Cristobal, "Excellence management practices, knowledge management and key business results in large organisations and SMEs: a multi-group analysis," *European Management Journal*, vol. 34, no. 6, pp. 661–673, 2016.
- [6] V. Yepes, E. Pellicer, L. F. Alarcón, and C. L. Correa, "Creative innovation in Spanish construction firms," *Journal of Professional Issues in Engineering Education and Practice*, vol. 142, no. 1, 2016.
- [7] C. Torres-Machí, A. Carrión, V. Yepes, and E. Pellicer, "Employability of graduate students in construction management," *Journal of Professional Issues in Engineering Education and Practice*, vol. 139, no. 2, pp. 163–170, 2013.
- [8] V. Yepes, E. Pellicer, and A. J. Ortega, "Designing a benchmark indicator for managerial competences in construction at the graduate level," *Journal of Professional Issues in Engineering Education and Practice*, vol. 138, no. 1, pp. 48–54, 2012.
- [9] A. W. Alkhatib and M. Valeri, "Can intellectual capital promote the competitive advantage? Service innovation and big data analytics capabilities in a moderated mediation model," *European Journal of Innovation Management*, vol. 27, no. 1, pp. 263–289, 2022.
- [10] M. Massaro, K. Handley, C. Bagnoli, and J. Dumay, "Knowledge management in small and medium enterprises: a structured literature review," *Journal of Knowledge Management*, vol. 20, no. 2, pp. 258–291, 2016.
- [11] R. Cerchione and E. Esposito, "Using knowledge management systems: a taxonomy of SME strategies," *International Journal of Information Management*, vol. 37, no. 1, pp. 1551–1562, 2017.
- [12] S. A. Mohd Selamat, S. Prakoonwit, and W. Khan, "A review of data mining in knowledge management: applications/findings for transportation of small and medium enterprises," *SN Applied Sciences*, vol. 2, no. 5, pp. 1–15, 2020.
- [13] A. Anand, B. Muskat, A. Creed, A. Zutshi, and A. Csepregi, "Knowledge sharing, knowledge transfer and SMEs: evolution, antecedents, outcomes and directions," *Personnel Review*, vol. 50, no. 9, pp. 1873–1893, 2020.
- [14] R. Farooq, "Knowledge management and performance: a bibliometric analysis based on Scopus and WOS data (1988–2021)," *Journal of Knowledge Management*, vol. 27, no. 7, pp. 1948–1991, 2022.
- [15] A. Anand and J.-P. Dumazert, "Knowledge sharing in organization: reviewing the foundations of the field and current themes using bibliometrics," *Knowledge and Process Management*, vol. 29, no. 3, pp. 270–283, 2022.
- [16] M. Ferrer-Serrano, L. Fuentelsaz, and M. P. Latorre-Martinez, "Examining knowledge transfer and networks: an overview of the last twenty years," *Journal of Knowledge Management*, vol. 26, no. 8, pp. 2007–2037, 2021.
- [17] D. Kafetzopoulos, "Performance management of SMEs: a systematic literature review for antecedents and moderators," *International Journal of Productivity and Performance Management*, vol. 71, no. 1, pp. 289–315, 2022.
- [18] Shekhar and M. Valeri, "Trends in knowledge management research in small businesses," *European Business Review*, vol. 35, no. 5, pp. 573–599, 2023.
- [19] V. K. Singh, P. Singh, M. Karmakar, J. Leta, and P. Mayr, "The journal coverage of Web of Science, Scopus and Dimensions: a comparative analysis," *Scientometrics*, vol. 126, no. 6, pp. 5113–5142, 2021.
- [20] N. Donthu, S. Kumar, D. Mukherjee, N. Pandey, and W. M. Lim, "How to conduct a bibliometric analysis: an overview and guidelines," *Journal of Business Research*, vol. 133, pp. 285–296, 2021.
- [21] N. J. van Eck and L. Waltman, "Software survey: VOSviewer, a computer program for bibliometric mapping," *Scientometrics*, vol. 84, no. 2, pp. 523–538, 2010.

- [22] H. D. White and B. C. Griffith, "Author cocitation: a literature measure of intellectual structure," *Journal of the American Society for Information Science*, vol. 32, no. 3, pp. 163–171, 1981.
- [23] S. Raghuram, P. Tuertscher, and R. Garud, "Research note—mapping the field of virtual work: a cocitation analysis," *Information Systems Research*, vol. 21, no. 4, pp. 983–999, 2010.
- [24] Y.-H. Tsai, H.-C. Ma, C.-P. Lin, C.-K. Chiu, and S.-C. Chen, "Group social capital in virtual teaming contexts: a moderating role of positive affective tone in knowledge sharing," *Technological Forecasting and Social Change*, vol. 86, pp. 13–20, 2014.
- [25] S. A. Zahra and G. George, "Absorptive capacity: a review, reconceptualization, and extension," *The Academy of Management Review*, vol. 27, no. 2, pp. 185–203, 2002.
- [26] I. Nonaka and H. Takeuchi, *The Knowledge Creating Company—How Japanese Companies Create the Dynamics of Innovation*, Oxford University Press, New York, 1995.
- [27] W. M. Cohen and D. A. Levinthal, "Absorptive capacity: a new perspective on learning and innovation," *Administrative Science Quarterly*, vol. 35, no. 1, pp. 128–152, 1990.
- [28] J. Barney, "Firm resources and sustained competitive advantage," *Journal of Management*, vol. 17, no. 1, pp. 99–120, 1991.
- [29] C. Fornell and D. F. Larcker, "Evaluating structural equation models with unobservable variables and measurement error," *Journal of Marketing Research*, vol. 18, no. 1, pp. 39–50, 1981.
- [30] P. M. Podsakoff, S. B. MacKenzie, J.-Y. Lee, and N. P. Podsakoff, "Common method biases in behavioral research: a critical review of the literature and recommended remedies," *Journal of Applied Psychology*, vol. 88, no. 5, pp. 879–903, 2003.
- [31] J. H. Dyer and H. Singh, "The relational view: cooperative strategy and sources of interorganizational competitive advantage," *The Academy of Management Review*, vol. 23, no. 4, pp. 660–679, 1998.
- [32] R. M. Grant, "Toward a knowledge-based theory of the firm," *Strategic Management Journal*, vol. 17, no. S2, pp. 109–122, 1996.
- [33] J. Nahapiet and S. Ghoshal, "Social capital, intellectual capital, and the organizational advantage," *The Academy of Management Review*, vol. 23, no. 2, pp. 242–266, 1998.
- [34] Y. Li and Z. Xu, "A bibliometric analysis and basic model introduction of opinion dynamics," *Applied Intelligence*, vol. 53, no. 13, pp. 16540–16559, 2023.
- [35] R. B. Bouncken and S. Kraus, "Innovation in knowledge-intensive industries: the double-edged sword of coepetition," *Journal of Business Research*, vol. 66, no. 10, pp. 2060–2070, 2013.
- [36] D. De Clercq, D. Dimov, and N. Thongpapanl, "Structural and relational interdependence and entrepreneurial orientation in small and medium-sized enterprises: the mediating role of internal knowledge-sharing," *International Small Business Journal: Researching Entrepreneurship*, vol. 33, no. 5, pp. 514–536, 2015.
- [37] V. E. Hoffmann, G. S. C. Lopes, and J. J. Medeiros, "Knowledge transfer among the small businesses of a Brazilian cluster," *Journal of Business Research*, vol. 67, no. 5, pp. 856–864, 2014.
- [38] F.-J. Lin and C. F. Lai, "Key factors affecting technological capabilities in small and medium-sized enterprises in Taiwan," *International Entrepreneurship and Management Journal*, vol. 17, no. 1, pp. 131–143, 2021.
- [39] A. Padilla-Meléndez, A. R. Del Aguila-Obra, and N. Lockett, "Shifting sands: regional perspectives on the role of social capital in supporting open innovation through knowledge transfer and exchange with small and medium-sized enterprises," *International Small Business Journal: Researching Entrepreneurship*, vol. 31, no. 3, pp. 296–318, 2013.
- [40] D. Pickernell, A. Ishizaka, S. Huang, and J. Senyard, "Entrepreneurial university strategies in the UK context: towards a research agenda," *Management Decision*, vol. 57, no. 12, pp. 3426–3446, 2019.
- [41] M. Poorkavoos, Y. Duan, J. S. Edwards, and R. Ramanathan, "Identifying the configurational paths to innovation in SMEs: a fuzzy-set qualitative comparative analysis," *Journal of Business Research*, vol. 69, no. 12, pp. 5843–5854, 2016.
- [42] F. A. R. Serra, J. A. Carneiro-da-Cunha, L. Vils, and C. R. Rossetto, "The role of network relations and previous knowledge in the ACAP of low-tech intensity clusters," *Competitiveness Review: An International Business Journal*, vol. 32, no. 5, pp. 797–820, 2022.
- [43] V. Scuotto, E. Arrigo, E. Candelo, and M. Nicotra, "Ambidextrous innovation orientation effected by the digital transformation: a quantitative research on fashion SMEs," *Business Process Management Journal*, vol. 26, no. 5, pp. 1121–1140, 2019.
- [44] N. Taura and D. Radicic, "Intra-cluster knowledge exchange and frequency of product innovation in a digital cluster," *Journal of Small Business Management*, vol. 57, no. sup2, pp. 350–373, 2019.
- [45] P. Teirlinck, "Pathways for knowledge exchange in SMEs in software-driven knowledge-intensive business services," *R & D Management*, vol. 48, no. 3, pp. 343–353, 2018.
- [46] L. Valentim, J. V. Lisboa, and M. Franco, "Knowledge management practices and absorptive capacity in small and medium-sized enterprises: is there really a linkage?" *R&D Management*, vol. 46, no. 4, pp. 711–725, 2016.
- [47] S.-J. Yoo, O. Sawyerr, and W.-L. Tan, "The mediating effect of absorptive capacity and relational capital in alliance learning of SMEs," *Journal of Small Business Management*, vol. 54, pp. 234–255, 2016.
- [48] S. Afriyie, J. Du, and A.-A. Ibn Musah, "The nexus among innovation types, knowledge sharing, transformational leadership, and marketing performance in an emerging economy: an empirical study," *Journal of Indian Business Research*, vol. 12, no. 4, pp. 529–548, 2020.
- [49] M. K. Anser, Z. Yousaf, M. Yasir et al., "How to unleash innovative work behavior of SMEs' workers through knowledge sharing? Accessing functional flexibility as a mediator," *European Journal of Innovation Management*, vol. 25, no. 1, pp. 233–248, 2022.
- [50] C. Bratianu, G. Prelipcean, and R. Bejinaru, "Exploring the latent variables which support SMEs to become learning organizations," *Management & Marketing. Challenges for the Knowledge Society*, vol. 15, no. 2, pp. 154–171, 2020.
- [51] A. Firdaus, E. Ahman, E. Disman, and E. Suryadi, "Knowledge sharing and innovative work behavior as the keys to success in improving SMEs performance," *Quality—Access to Success*, vol. 22, no. 181, pp. 35–39, 2021.
- [52] H. M. Kareem, K. A. Aziz, R. Maelah, Y. M. Yunus, A. Alsheikh, and W. Alsheikh, "The influence of accounting information systems, knowledge management capabilities, and innovation on organizational performance in Iraqi SMEs," *International Journal of Knowledge Management*, vol. 17, no. 2, pp. 72–103, 2021.
- [53] S. Mittal and R. L. Dhar, "Transformational leadership and employee creativity mediating role of creative self-efficacy and moderating role of knowledge sharing," *Management Decision*, vol. 53, no. 5, pp. 894–910, 2015.

- [54] D. G. Omerzel, "The impact of knowledge management on SME growth and profitability: a structural equation modelling study," *African Journal of Business Management*, vol. 4, no. 16, Article ID 3417, 2010.
- [55] V. Petrov, D. Celic, Z. Uzelac, and Z. Draskovic, "Specific influence of knowledge intensive and capital intensive organizations on collaborative climate and knowledge sharing in SMEs," *Strategic Management*, vol. 25, no. 1, pp. 3–11, 2020.
- [56] G. Rezaei, H. Gholami, A. B. M. Shaharou, M. Z. M. Saman, L. Sadeghi, and N. Zakuan, "Shared knowledge mediated correlation between cultural excellence and organisational performance," *Total Quality Management & Business Excellence*, vol. 28, no. 3-4, pp. 427–458, 2017.
- [57] E. Sulistiyani, A. S. Udin, and E. Rahardja, "Examining the effect of transformational leadership, extrinsic reward, and knowledge sharing on creative performance of Indonesian SMEs," *Quality - Access to Success*, vol. 19, no. 167, pp. 63–67, 2018.
- [58] H. Vayrynen, N. Helander, and T. Vasell, "Knowledge management for open innovation: comparing research results between SMEs and large companies," *International Journal of Innovation Management*, vol. 21, no. 5, Article ID 1740004, 2017.
- [59] C. Yu, Y. Wang, T. Li, and C. Lin, "Do top management teams' expectations and support drive management innovation in small and medium-sized enterprises?" *Journal of Business Research*, vol. 142, pp. 88–99, 2022.
- [60] D. Aleksic, K. Rangus, and A. Slavec Gomezel, "Microfoundations of SME open innovation: the role of help, knowledge sharing and hiding," *European Journal of Innovation Management*, vol. 25, no. 6, pp. 178–203, 2021.
- [61] I. W. E. Arsawan, V. Koval, I. Rajiani, N. W. Rustiarini, W. G. Supartha, and N. P. S. Suryantini, "Leveraging knowledge sharing and innovation culture into SMEs sustainable competitive advantage," *International Journal of Productivity and Performance Management*, vol. 71, no. 2, pp. 405–428, 2022.
- [62] H. Hanifah, N. Abd Halim, A. Vafaei-Zadeh, and K. Nawaser, "Effect of intellectual capital and entrepreneurial orientation on innovation performance of manufacturing SMEs: mediating role of knowledge sharing," *Journal of Intellectual Capital*, vol. 23, no. 6, pp. 1175–1198, 2022.
- [63] R. Harel, D. Schwartz, and D. Kaufmann, "The relationship between innovation promotion processes and small business success: the role of managers' dominance," *Review of Managerial Science*, vol. 15, no. 7, pp. 1937–1960, 2021.
- [64] P. Mota Veiga, R. Figueiredo, J. J. M. Ferreira, and F. Ambrosio, "The spinner innovation model: understanding the knowledge creation, knowledge transfer and innovation process in SMEs," *Business Process Management Journal*, vol. 27, no. 2, pp. 590–614, 2021.
- [65] S. K. Singh, S. Gupta, D. Busso, and S. Kamboj, "Top management knowledge value, knowledge sharing practices, open innovation and organizational performance," *Journal of Business Research*, vol. 128, pp. 788–798, 2021.
- [66] S. K. Taghizadeh, A. Karini, G. Nadarajah, and D. Nikbin, "Knowledge management capability, environmental dynamism and innovation strategy in Malaysian firms," *Management Decision*, vol. 59, no. 6, pp. 1386–1405, 2021.
- [67] N. Carvalho and I. Gomes, "Knowledge sharing between enterprises of the same group," *International Journal of Knowledge Management*, vol. 13, no. 1, pp. 34–52, 2017.
- [68] V. Costa and S. Monteiro, "Knowledge processes, absorptive capacity and innovation: a mediation analysis," *Knowledge and Process Management*, vol. 23, no. 3, pp. 207–218, 2016.
- [69] N. Crespo, C. Curado, M. Oliveira, and L. Muñoz-Pascual, "Entrepreneurial capital leveraging innovation in micro firms: a mixed-methods perspective," *Journal of Business Research*, vol. 123, pp. 333–342, 2021.
- [70] C. Curado, "Human resource management contribution to innovation in small and medium-sized enterprises: a mixed methods approach," *Creativity and Innovation Management*, vol. 27, no. 1, pp. 79–90, 2018.
- [71] C. Curado, L. Muñoz-Pascual, and J. Galende, "Antecedents to innovation performance in SMEs: a mixed methods approach," *Journal of Business Research*, vol. 89, pp. 206–215, 2018.
- [72] P. Hall, D. Ellis, and B. McArthur, "Knowledge sharing enablers in small business networks," *International Journal of Knowledge Management*, vol. 18, no. 1, 2022.
- [73] A. Mazzucchelli, R. Chierici, D. Tortora, and S. Fontana, "Innovation capability in geographically dispersed R&D teams: the role of social capital and IT support," *Journal of Business Research*, vol. 128, pp. 742–751, 2021.
- [74] F. D. Shrafat, "Examining the factors influencing knowledge management system (KMS) adoption in small and medium enterprises SMEs," *Business Process Management Journal*, vol. 24, no. 1, pp. 234–265, 2018.
- [75] M. Yasir and A. Majid, "Impact of knowledge management enablers on knowledge sharing: is trust a missing link in SMEs of emerging economies?" *World Journal of Entrepreneurship, Management and Sustainable Development*, vol. 13, no. 1, pp. 16–33, 2017.
- [76] I. Zupic and T. Čater, "Bibliometric methods in management and organization," *Organizational Research Methods*, vol. 18, no. 3, pp. 429–472, 2015.
- [77] M. L. Flor, S. Y. Cooper, and M. J. Oltra, "External knowledge search, absorptive capacity and radical innovation in high-technology firms," *European Management Journal*, vol. 36, no. 2, pp. 183–194, 2018.
- [78] R. Tassabehji, J. L. Mishra, and C. Dominguez-Péry, "Knowledge sharing for innovation performance improvement in micro/SMEs: an insight from the creative sector," *Production Planning & Control*, vol. 30, no. 10–12, pp. 935–950, 2019.
- [79] R. Thorpe, R. Holt, A. Macpherson, and L. Pittaway, "Using knowledge within small and medium-sized firms: a systematic review of the evidence," *International Journal of Management Reviews*, vol. 7, no. 4, pp. 257–281, 2005.
- [80] A. Perianes-Rodriguez, L. Waltman, and N. J. van Eck, "Constructing bibliometric networks: a comparison between full and fractional counting," *Journal of Informetrics*, vol. 10, no. 4, pp. 1178–1195, 2016.