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A Bibliometric Analysis of Themes and Network Structures for Future Research in SMEs Sustainability

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Abstract

Objective: This study aims to develop an integrated model of innovation and resilience by examining previous research and identifying opportunities for future research.
Design/Methods/Approach: This study interprets the bibliometric analysis report for SMEs' sustainability from 2000 to 2022 based on peer-reviewed journal articles. We used the Scopus database as it is considered to have a broader range of journals. To identify the concept of the relevant topic area, we searched for the article title, abstract, and keywords of journals using keyword combinations' SME' AND 'Sustainability'. We discovered 553 articles, which consist of 1598 authors from 260 journals.
Findings: This study discover three clusters based on the bibliometric coupling analysis, which discuss the strategies for SMEs' sustainability. The strategies cover 1) sustainable innovation practice, 2) expanding the role of innovation for sustainable development (from theory to practice), and 3) Supporting SMEs to reach their sustainability. These strategies construct our integrative model for achieving SMEs' Sustainability and develop three stages: early adoption, sustainable-based growth, and full implementation. Along with the identified strategies and model, we also attempt to present two significant elements, innovation and resilience, arguing that both are complementary processes in SMEs' Sustainability.
Originality/Value: This research contributes to developing key trends in SME sustainability, delivering key clusters in this topic, and providing an integrative model for sustainability implementation for SMEs. By using bibliometric analysis, such as co-occurrence network, clustering, thematic map, and visualization of state of the art, this study may bring a valuable result in developing the literature by extending the study of innovation and resilience for business sustainability.
Practical/Policy implication: The model presented provides a clear process for researchers, managers, and organizations to analyze and adopt the necessary stages to achieve sustainable growth for SMEs. This model is expected to be a practical solution for SMEs to implement a sustainability strategy effectively in their business and promote a sustainable future.

Keywords: SME, Sustainability, Bibliometrics, Resilience, Innovation

JEL Classification: M130, L1

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1. Introduction

All Small and Medium-sized Enterprises (SMEs) aim to survive and sustain in the market for a long time. To reach this aim, they must establish sustainability strategies within their firms. In the literature, Sustainability strategy has been linked with innovation (Bos-Brouwers, 2010a; Le & Ikram, 2022a), resilience (Bachtiar & Ramli, 2023; Behera et al., 2020), leadership (Kerr, 2006), growth (Achtenhagen et al., 2010; Prastian et al., 2022), ambidexterity (Alcalde-Heras et al., 2019), business model (Zhang, 2021), where business sustainability relates to the ability of firms to survive and grow to be sustained in the market.

SMEs, in nature, have limited resources, access to banks and funding, knowledge and partnership, creativity and innovation, entrepreneurship education, and reserve funds (Adekola & Clelland, 2020; Faherty & Stephens, 2016; Keuschnigg & Nielsen, 2003; McAdam et al., 2004). Hence, they face a common challenge: their low ability to sustain their business in the market. The Telegraph reported that 60% of SMEs fail in their first three years (May, 2019). In dealing with such challenges, paying more profound attention to business sustainability is necessary. Even though the record of SMEs' motivation toward business sustainability is low (Natarajan & Wyrick, 2011), there is an emerging motivation and behaviour that come from SME owners and managers to commit more to sustainability by pushing forward the role of sustainability strategies (Biondi et al., 2002; Williams & Schaefer, 2013).

However, with the increase in industry dynamics and crises, all approaches to business sustainability changed dramatically. SMEs must apply different strategies they have employed before. Regular instability and uncertainty force SMEs to adopt more adaptive mechanisms to survive the market. In these conditions, entrepreneurs are expected to be resilient to tackle massive change and an unpredicted world. At the same time, businesses have to continue their growth by developing innovative strategies to extend their market and grab new markets. Hence, resilience and innovation are essential to pursue business sustainability as resilience enables the innovation process in the firm, and sustainability is born out of them. Both resilience and innovation also emerge in the discussions related to SMEs' sustainability in literature and become trending topics in our bibliometric analysis, as seen in Figure 1 below:

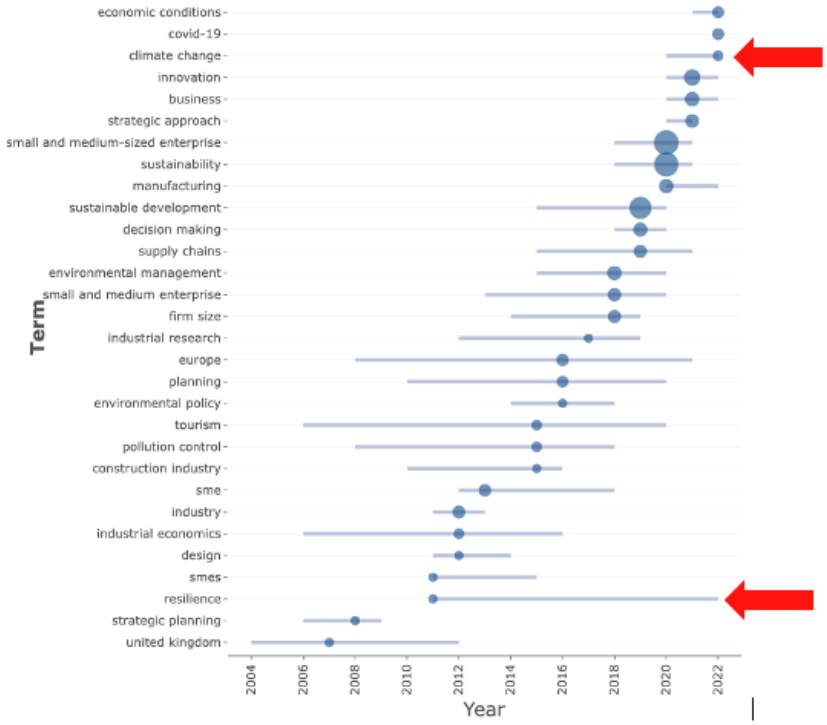

Figure 1. Trend topics for SME sustainability

Our analysis runs in trend topics featured in Bibliometric software and shows ongoing trends in SMEs and Sustainability topics: economic conditions, COVID-19, climate change, innovation, business, manufacturing, and resilience. This study picks two trend topics, innovation and resilience since both are capabilities needed for business sustainability (Carayannis et al., 2015).

Innovation is a powerful tool for business growth and sustainability (Bachtiar, 2020; Begum & Sampurna, 2021; Gavrila Gavrila & De Lucas Ancillo, 2022; M. W. Johnson, 2010; Li et al., 2022; Velu & Chen, 2022). In its development, innovation shifts from a linear model of the invention, innovation, and diffusion introduced by Schumpeter (Schumpeter, 1934) to a conceptual and system approach environment, which considers the effect of the economic environment, bounded reality, and uncertainty (Greenacre et al., 2012). Innovation is not only regular to large organizations but also

SMEs. Innovative SMEs are common in competitive markets. However, to support SME innovation, linking technological assistance and local government is necessary (Doh & Kim, 2014). Recently, the concept of Business Model Innovation (Amit & Zott, 2010; Bresciani et al., 2021; Chesbrough, 2010; Evans et al., 2017; Li et al., 2022), sustainability innovation (Kusi-Sarpong et al., 2019; Le & Ikram, 2022a) and eco/green innovation (Abbas & Sağsan, 2019; Demirel & Kesidou, 2019a; Pichlak & Szromek, 2021) emerge to keep up with current situation and condition.

Following that, resilience is essential for entrepreneurs and businesses as it covers the capability to respond to different disruptive conditions (Burnard & Bhamra, 2011). However, Large Organizations (LOs) build resilience differently than SMEs. LOs promote their resilience through anticipation and planning (Iborra et al., 2020). SMEs gain an advantage in shorter bureaucracy and develop behavioural, emotional, cognitive, and relational capabilities to build their resilience in dealing with challenges. Literature on resilience also develops from only focusing on individual and managerial levels (Dahles & Susilowati, 2015) to firm resilience (DesJardine et al., 2019; Petruzzi & Loyear, 2016) and system resilience (Howard et al., 2022).

However, the scope of published studies on the impact of innovation and resilience is large and fragmented. Drawing meaningful conclusions from these studies takes much work, and the result is too broad to contribute to specific contexts such as adversity, small businesses, or even rural businesses. Hence, we focus on the impact of both elements on small business sustainability. In addition, researchers have adopted various research approaches for investigating SMEs' sustainability (Borga et al., 2009a; Bos-Brouwers, 2010b; De et al., 2020a; M. P. Johnson & Schaltegger, 2016; Le & Ikram, 2022b), and more needs to be done to integrate the findings of prior studies into practical stages and processes. Hence, drawing from sustainability, innovation and resilience theory, this research aims to deliver a comprehensive understanding of the role of innovation and resilience based on prior research and discover gaps for future research opportunities by integrating our findings from clusters coupling to develop an integrative model to SMEs Sustainability. In doing so, we interpret the bibliometric analysis report for SMEs' Sustainability from 2000 to 2022 using tools in Bibliometrix software. Hence, to reach the aim, we state some research questions as follows:

RQ1: What themes dominated the literature regarding SMEs' sustainability?
RQ2: What network structure is built in SMEs' sustainability literature?
RQ3: What further lesson can we take from the networks and themes?
RQ4: As trend topics, what impact do innovation and resilience bring to SMEs' sustainability?

This research contributes to developing key trends in SME sustainability, delivering key clusters on this topic, and providing a conceptual model for sustainability implementation in SMEs. By using bibliometric analysis, namely co-occurrence network, clustering, thematic map, and visualization of state of the art, this study may bring a valuable result in developing the study of innovation and resilience towards business sustainability.

This article will start by briefly reviewing the development of SMEs' sustainability, innovation, and resilience research. Next, we elaborate on the bibliometric analysis report and the thematic map used in our data collection and analysis. Bibliometric coupling is then applied to examine innovation and resilience's role in achieving SME sustainability. Finally, we will end this paper by delivering an integrative model for future research.

2. Overview of Literature

2.1 Sustainability, innovation, and resilience in Business.

In business, sustainability often focuses on profitability and minimizing environmental impact (Stubbs & Cocklin, 2008). Following that, Evans et al. (2017) form the sustainability value into social, environmental, and economic value. However, among all definition in the literature, this study refers to Labuschagne et al. (2005), who defines business sustainability as "adopting business strategies and activities that meet the needs of the enterprise and its stakeholders today while protecting, sustaining and enhancing the human and natural resources that will be needed in the future" (Labuschagne et al., 2005).

To sustain itself in the market, a business needs various capabilities. Innovation is one of the significant needs (Demirel & Kesidou, 2019b; Le & Ikram, 2022b; Peerally et al., 2022; Varadarajan, 2017a). Previous studies define innovation in some ways. Some refer to innovation as a new product or service, the adoption of new ideas or behaviour (Hage, 1999) , mentality that expresses itself through learning (Harkema, 2003), and others. Finally, this research refers to Harkema's (2003) definition of innovation as a knowledge process aimed at creating new knowledge and geared towards developing commercial and viable solutions (Harkema, 2002).

Finally, in the resilience study, the literature reported that resilience strongly relates to collective action, adaptation, opportunity, risks, vulnerability, and innovation (Borda-Rodriguez et al., 2016). At the same time, resilience is substantial because it relates to business growth and sustainability. A business that survives and grows is considered resilient to rapid changes in a business environment. Hence, resilience is often defined as surviving disruption conditions such as crisis, uncertainty, and other extraordinary events (Niemimaa et al., 2019).

2.2 SMEs Sustainability

Term sustainability started to gain popularity since the World Commission on Environment and Development Meeting in 1987, which suggested that people must meet their present needs without taking away the ability of future generations to meet their needs. This term translates to the Triple Bottom Line model in 1997, which promotes the balance of social, environmental, and economic efficiency (Elkington, 1998; Figge et al., 2002; Labuschagne et al., 2005). In the business field, the term develops to adopting business strategies to improve innovation, operation, strategic growth, and competitive advantage while protecting and enhancing human and natural resources and delivering sustainable values to the broader society (Cohen & Winn, 2007; Dyllick & Hockerts, 2002; Evans et al., 2017; Schaltegger et al., 2011).

This past decade, research in business sustainability dramatically arose due to the emergence of business awareness towards the environment and the social impact businesses can support. Moreover, businesses move away from green business, which focuses on processing objectives such as less pollution, to sustainable businesses (Stubbs & Cocklin, 2008). To support that aim, business sustainability blends with other business strategies, such as business models and innovation, to create more complex yet effective strategies. Hence, the literature records the new strategies, namely sustainable business model (Joyce & Paquin, 2016), sustainable business model innovation (Bocken & Geradts, 2020), and sustainable business resilience (Huang et al., 2022).

2.2. Innovation in SMEs

In recent years, innovation development has focused on collaborative innovation (Smolinski & Bodek, 2021), business model innovation (Carayannis et al., 2015; Evans et al., 2017; Wirtz, 2017), convergence innovation (Lee & Trimi, 2021). Privileges of innovation cover creating competitive advantage, increasing brand image, sustaining and expanding business, and more. With those numerous advantages, pursuing innovation for Large Organizations (LOs) and SMEs is necessary. The need for innovation is emerging for both.

Innovation undoubtedly possesses a substantial role in business. Numerous works of literature have claimed that businesses' sustainability depends on innovation (Chesbrough, 2010; Sahut & Peris-Ortiz, 2014; Standish et al., 2014; Wagner & Hansen, 2005) along with their ability to survive (Bos-Brouwers, 2010a; Sahut & Peris-Ortiz, 2014; Xiong et al., 2020) However, other literature argues that sustainability drives social and green innovation (Desa & Jia, 2020)(Saunila et al., 2018). Hence, the role of innovation in SME sustainability still needs to be consistent. This study looks deeper into the state of the art in literature to untangle the confusion and set the exact role of innovation on SMEs' sustainability.

In implementing sustainable innovation, Managers should discover the drivers of Sustainable Innovation Orientation (SIO) within their firms, whether from industry forces or institutional pressures. These drivers can be a baseline for creating SIO (Varadarajan, 2017b). The author also explains that sustainable innovation should cover environmental, marketing, financial, and employee. At the same time, firms need to convince customers to shift to their green or sustainable products as a result of sustainable innovation. As Ozaki (2011) mentioned, customers' sympathy towards environmental issues does not directly make them adopt green products. Firms must change the 'intention to adapt' to 'actual adoption' by combining perceived customer benefit, social influence, and normative beliefs (Ozaki, 2011).

Following that, businesses also turn their business model to business model innovation for sustainability to fit the strategy and firms' future vision. Even though the process is challenging, firms should support the sustainable business model concept to develop a more appropriate business model (Evans et al., 2017). Companies are not only aiming to link production and consumption but broader than that, and they must explore their value proposition, supply chain, customer interface, and financial model to catch more meaning than selling but meeting a need and expectation, improve social and environmental effects and promote co-creation between stakeholders.

2.3. SMEs' Resilience

In SME discussions, literature believes that SMEs have higher resilience levels than larger organizations due to the nature of SMEs, which operate in uncertain conditions, informal organizational settings, and lack of resources, networks, education, and skill (Branicki et al., 2018; Bachtiar, 2022; Prastian et al., 2022). From a business perspective, resilience is needed from the intention of starting the business (Bullough et al., 2014), during the business operations (Bachtiar, 2020), and more importantly, during the crisis and uncertainty (Simms et al., 2022; Sahebjamnia et al., 2018).

Since the term resilience is commonly adopted in business and entrepreneurship fields, resilience develops from entrepreneur resilience (Bullough et al., 2014), supply chain resilience (Ayyildiz, 2021; Belhadi et al., 2021) to organizational resilience (Baldwin, 2019; Herbane, 2019) all with one aim: to survive in the market and sustain the business. Entrepreneurial resilience creates high self-efficacy, motivation, strong intention, and capacity to face uncertainty. Conversely, organizational resilience pushes the resilience role higher by providing adaptive agility and strong flexibility to bounce back from crisis. Moreover, previous literature states the role of resilience as a bottom-line strategy for business sustainability (Bachtiar & Ramli, 2023; Carnahan et al., 2010).

3. Methodology

3.1. Sample selection

In searching the literature, we focus on peer-reviewed journal articles and exclude books, conference papers, reviews, and editorial notes. We used the Scopus database as it is considered to have a broader range of journals that may limit the risks, biases, and potential omissions of using a narrower set of journals (Pizzi et al., 2020). Following that, Scopus has a significant advantage in functionality and quality of record processing over Web of Science (WOS) and Google Scholar (Norris & Oppenheim, 2007; Pato & Teixeira, 2016). We directly search the article from scopus.com and access the database. For this study, we limit the papers to the articles published between January 2000 to December 2022.

To identify the concept of the relevant topic area, we searched for the article title, abstract, and keywords of journals using keyword combinations' SME' AND 'Sustainability'. We chose those keywords since both keywords are well-developed topics in literature. We intended to start broadly and later focus on the trend topics in those keywords to discover research gaps and more contributions to the literature. For this search, we found 1025 articles from different subject areas such as business, management and accounting, social science, environmental science, engineering, energy, economics, and computer science. Secondly, we limit the articles to business, management, and accounting areas between 2000 and 2020. Finally, 553 articles were collected, comprising 1598 authors from 260 journals, with annual article growth reaching 20.81%. Table 1 explains the inclusion and exclusion criteria for this research:

Table 1. Inclusion and exclusion criteria

Inclusion Criteria
Articles listed indexed in the Scopus database
Publication year: January 2000 until December 2022
Document type: peer-reviewed articles
The articles' subject areas are business, management and accounting, social science, environmental science, engineering, energy, economics, and computer science.
Keywords: SMEs AND Sustainability
Exclusion Criteria
Publication before January 2000 and after December 2022
Book chapters, conference papers, reviews, book, and editorials note
Article not referring to "SMEs AND Sustainability"

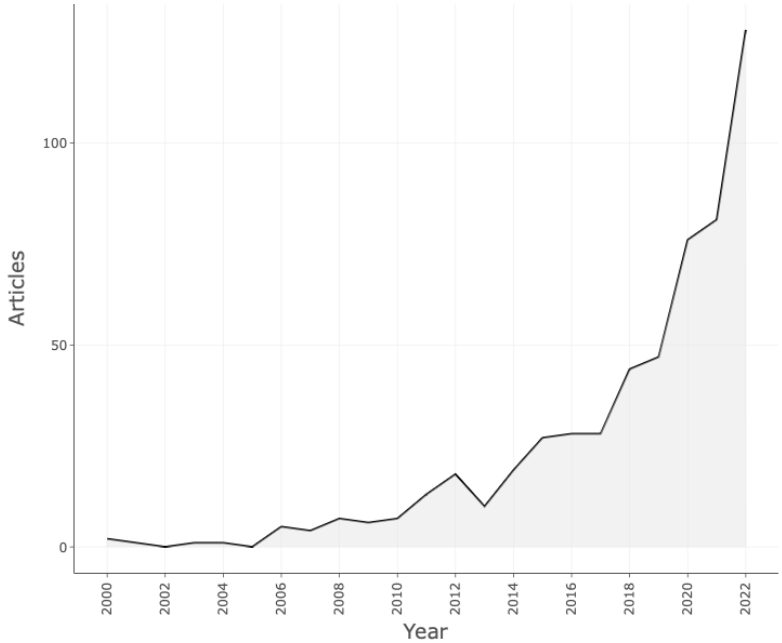

Figure 2. Annual scientific production

Following that, we run annual scientific production to determine the number of articles and annual improvements. Table 2 and Figure 1 may show the result. Table 2 shows the exact number of articles regarding SMEs' Sustainability based on our inclusion process. As we can see, the topics were not yet popular in early 2000. However, it has gained popularity in recent years primarily due to the high awareness of sustainable business and its social, environmental, and economic impact. Further, Figure 1 indicates that research in SME sustainability is increasing over time, with sharp

improvements starting in 2013 and continuing to climb up to the present year. With this enhancing trend, it will be interesting to forecast the trend within SMEs' sustainability in the future with all its development through the year.

Table 2. Number of articles annually

Year	Articles
2000	2
2001	1
2002	0
2003	1
2004	1
2005	0
2006	5
2007	4
2008	7
2009	6
2010	7
2011	13
2012	18
2013	10
2014	19
2015	27
2016	28
2017	28
2018	44
2019	47
2020	76
2021	81
2022	128

3.2. Sources and Articles

Figure 2 explains the most relevant sources in SMEs and Sustainability literature. In total, 260 sources in the Scopus database discuss these topics. As we can see, the Sustainability Journal is the most pertinent source, followed by the Journal of Cleaner Production, Business Strategy and the Environment and Corporate Social Responsibility and Environmental.

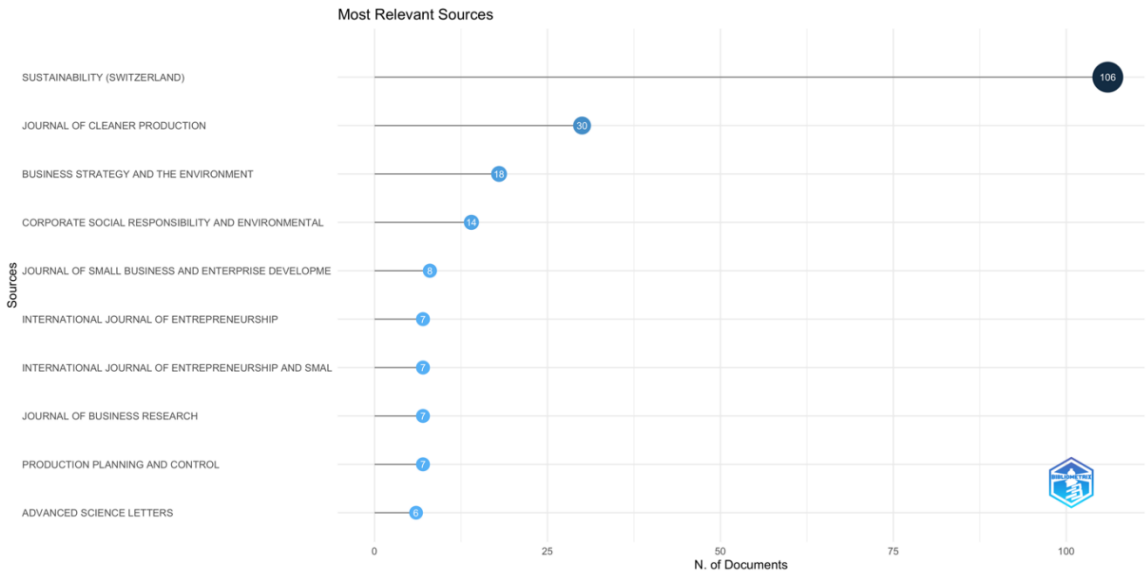

Figure 3. Most relevant sources

Table 3 illustrates the highly cited articles in SMEs' Sustainability literature. Bos-Browers (2010) is the most cited article discussing that innovation is incremental and companies with sustainability integrated into their orientation and innovation processes show value creation. In the second place, Moore and Manring (2009) discover how SMEs may optimize their sustainability and reach sustainable enterprise resilience, from becoming valuable, sustainable investment

targets and creating competitive networks to becoming highly efficient suppliers. Following that, as we can see in Table 3, innovation and resilience show up regularly in SME sustainability discussions (Ates & Bititci, 2011a; Bos-Brouwers, 2010b; Gunasekaran et al., 2011a; Halme & Korpela, 2014; M. P. Johnson & Schaltegger, 2016; Moore & Manring, 2009).

Table 3. Most cited references

Authors	Journal	Title	Year	Cited
Hilke Elke Jacke Bos-Brouwers	Business Strategy and the Environment	Corporate sustainability and innovation in SMEs: Evidence of themes and activities in practice	2010	438
Samuel B. Moore and Susan L. Manring	Journal of Cleaner Production	Strategy development in small and medium-sized enterprises for sustainability and increased value creation	2009	276
Andrea Revell and Robert Blackburn	Business Strategy and the Environment	The business case for sustainability? An examination of small firms in the UK's construction and restaurant sectors	2007	249
Mike Wright, Paul Westhead and Deniz Ucbasaran	Regional Studies	Internationalization of Small and Medium-sized Enterprises (SMEs) and International Entrepreneurship: A Critique and Policy Implications	2007	219
Angappa Gunasekaran, Bharatendra K. Rai and Michael Griffin	International Journal of Production Research	Resilience and competitiveness of small and medium-sized enterprises: an empirical research	2011	194
Matthew P. Johnson and Stefan Schaltegger	Journal of Small Business Management	Two Decades of Sustainability Management Tools for SMEs: How Far Have We Come?	2016	166
Helen Walker and Lutz Preuss	Journal of Cleaner Production	Fostering sustainability through sourcing from small businesses: public sector perspectives	2008	166
Minna Halme and Maria Korpela	Business Strategy and the Environment	Responsible Innovation Toward Sustainable Development in Small and Medium-Sized Enterprises: A Resource Perspective	2014	163
Aylin Ates and Umit Bititci	International Journal of Production Research	Change process: a key enabler for building resilient SMEs	2011	160
Sue Cassells and Kate Lewis	Corporate Social Responsibility and Environmental Management	SMEs and environmental responsibility: Do actions reflect attitudes?	2011	136

3.3. Bibliographic Analysis

This study employs the quantitative bibliometrics method to analyze the innovation and resilience research chosen from the key trend topics in SMEs' stainability and identify future research opportunities (Pizzi et al., 2020). This method provides an evolution of scientific knowledge and visualizes topics in large publications (Ciarli & Ràfols, 2019). This approach has another privilege in handling the wealth of data and filtering a field's important works and underlying structure (Coombes & Nicholson, 2013; Zupic & Cater, 2015).

After gathering 553 articles from the Scopus database, we examined and organized the literature to identify the structure between disciplines and authors by importing the data from the Scopus database into Bibliometric software and exploiting several features. Firstly, we run the trend topics feature to discover the trends in SMEs' Sustainability based on the literature. Next, we run the thematic map feature to discover the basic theme, motor theme, niche theme, and emerging or declining theme in literature for SMEs' Sustainability to be analyzed further. After that, we run the coupling feature to detect the connection between documents, authors, and journals that share the same references. This method is useful to map current trends and future priorities as they are reflected at the forefront of the research (Vogel & Güttel, 2013). The coupling method produces cauterizations between documents that can be analyzed more in-depth.

4. Result and Discussion

4.1. Conceptual Structure

We employ two bibliometric techniques in Bibliometric software to shape a conceptual structure: co-occurrence and thematic map. We employ the most relevant sources, most cited documents, trend topics, thematic maps, clustering by coupling, and co-occurrence network features in the Bibliometric software. We first conduct a thematic analysis through the thematic map feature in the Bibliometric software to build a conceptual structure. A thematic map is used to describe the diversity and maturity of the literature. This analysis has two dimensions, centrality and density, and four quadrants: basic team, motor theme, niche theme, and emerging/declining theme. The early developed theme is embodied in the basic theme. Following that, more important topics in the structure are explained in the motor theme. Mature and well-developed topics are incorporated into the niche theme. Finally, declining and emerging topics on SME sustainability are included in reducing/emerging themes. Figure 3 shows the thematic map from the SME sustainability literature's co-occurrence analysis. As described, the thematic map consists of four quadrants. The first quadrant is the basic theme quadrant, which shows the baseline topics that communities have agreed upon, such as sustainable development, environmental management, and decision-making. Next, the second quadrant is the motor theme quadrant, which illustrates promising growth areas such as SMEs, sustainability, innovation, manufacturing, and supply chain. Following that, the third quadrant is the niche theme quadrant, which describes clearly defined and recognizable topics such as competitive advantage, enterprise resource planning, and lean production. Finally, the declining or emerging theme quadrant consists of either early development groups or dwindling topics. This may be due to the topics needing to be used together or another new combination arising, such as investment and human. The mentioned themes also answer our first research questions about what themes dominated the literature regarding SMEs' sustainability.

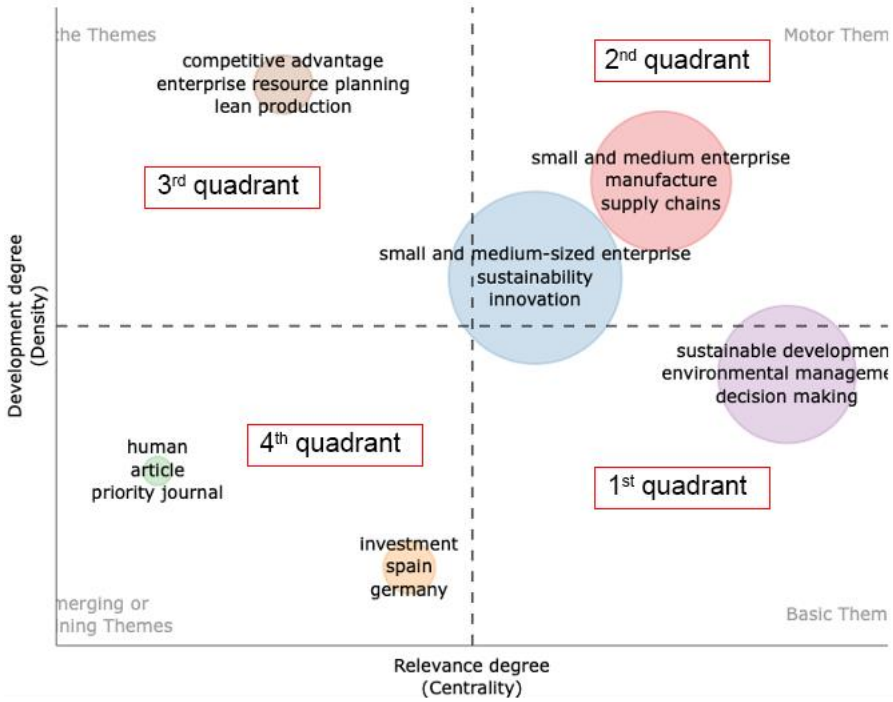

Figure 4. Thematic map

Moreover, after reviewing the quadrants carefully, we provide details on our renamed theme according to its overreaching theme, composition, centrality, and density rank, as seen in Table 4. Table 4 shows the most frequent keywords for each cluster, from 8 to 123. We label each cluster based on popular topics and themes found in the existing literature body, which will show the role of innovation and resilience. The First rank in the composition order has five density ranks consisting of keywords such as SMEs, Sustainability, Innovation, Business, and Manufacturing. We label this group as a Core element of SMEs. The next position has three density ranks: Sustainability Development, Environmental Management, Decision Making, Supply Chain Management, and Environmental Impact. We label this group as Sustainability Development – External Force since this group focuses on environmental impact related to sustainability. We label the last group as Business-industry Dynamics due to the keywords in the group related to the dynamic patterns in the business, such as planning, supply chain, and competition, and also industry-based, namely

manufacture and industry. This composition order will assist the analysis process in cluster analysis to develop the integrative model finally.

4.2. Co-Occurrence Network

A co-occurrence provides an analysis of the keywords to investigate the conceptual structure of the field (López-Fernández et al., 2016). The keywords analysis in co-occurrence is believed that particular associations can distinguish research speciality between keywords. Co-occurrence is not limited to indicators that allow this analysis to grab important recent works (Pizzi et al., 2020). This method can detect the current trend and future possibility of research as they reflect the forefront research (Vogel & Güttel, 2013). To conduct this analysis, we run Co-Occurrence Network features in the network approach in Bibliometric software. Figure 4 shows the result of the Co-Occurrence Network that answers our second research question about the network structure built in SMEs' Sustainability literature. We interpret the clusters shown in Figure 4 based on their keywords, publication titles, and content. We read the 553 publications, discussed the structure, and reached a consensus of interpretation. Through detailed references, we established three clusters, namely: 1) sustainable innovation practice; 2) expanding the role of innovation for sustainable development (from theory to practice); and 3) supporting SMEs to reach their sustainability.

Table 4. Thematic map composition order

Theme Table	Centrality Rank	Density Rank	Keyword	Keyword Occurrence
SMEs- Core Elements	1	5	SMEs	123
			Sustainability	119
			Innovation	29
			Business	20
			Manufacturing	19
Sustainability Development – External Force	2	3	Sustainability Development	87
			Environmental Management	18
			Decision Making	16
			Supply Chain Management	15
			Environmental Impact	10
Business- Industry Dynamics	3	1	Manufacture	13
			Supply Chain	13
			Industry	12
			Competition	10
			Planning	8

4.2.1. Cluster 1: Sustainable Innovation Practice

This cluster, consisting of 33 nodes, is the most dominant. This cluster is dominated by SMEs and Sustainability, where the work focuses on innovation, profitability, entrepreneurship, performance assessment, economic growth, leadership, management practice, and business-related nodes. Regarding sustainability, articles in this cluster discuss creating awareness, understanding, and adopting sustainable tourism practices with integrated sustainability issues (Vernon et al., 2003). One of the issues that emerged is SMEs' negative response and voluntary commitment to sustainability since being environmentally sustainable may add to the cost of production (Revell & Blackburn, 2007). In this case, the role of policymakers or, in this case, the government is fundamental to encourage firms to consider environmental obligation as a business expense (Revell & Blackburn, 2007) and establish a policy to manage and communicate social and environmental aspects (Borga et al., 2009b).

In this cluster, articles emphasize the advantage of being environmentally sustainable for firms' competitive advantage. Hence, to support sustainability, articles in this cluster focus on three main strategies: leadership, collaboration, and innovation. Leadership can facilitate the development process of a firm's management system. The ideal leadership model that can develop SMEs' core competencies to operate sustainably is essential (Kerr, 2006). Following that, the collaborative path can be another tool to provide opportunities for SMEs to overcome barriers in environmental initiatives (Lewis et al., 2015). Finally, the strategy discussed in this cluster is the importance of innovation for corporate sustainability. Value creation or competitive advantage can be shaped through the integrated process of sustainable innovation and innovation for sustainability (Bos-Brouwers, 2010a). Innovation is necessary for SMEs' survival. However, the emergence of sustainable innovation transforms conventional innovation to benefit the business and the environment more.

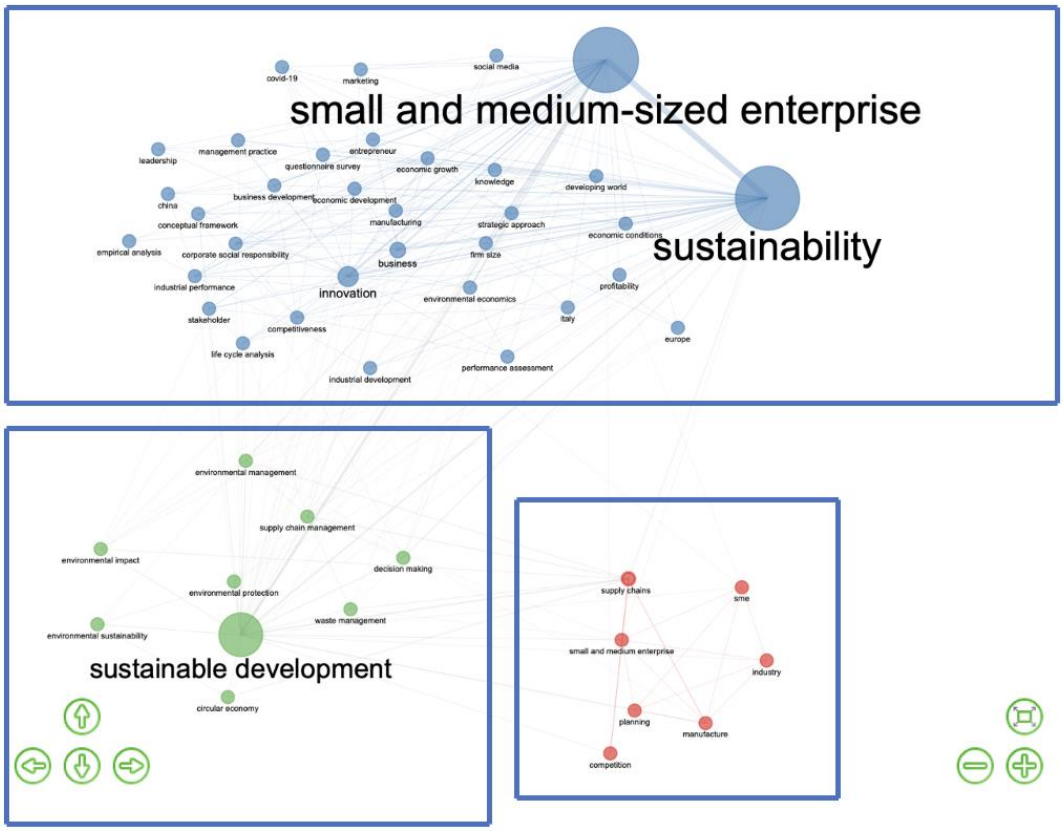

Figure 4. Clusters and their article members resulting from bibliometric coupling

4.2.2. Cluster 2: Expanding the role of innovation for sustainable development (from theory to practice)

This cluster relates to sustainable development, where environmental-based nodes dominate the cluster. This cluster comprises environmental management, environmental protection, environmental impact, waste management, and supply chain management. To achieve sustainability, articles in this cluster explain the important role of the environment and how to fully push the impact by employing innovation in the system. The articles underline the practical guidelines to achieve sustainability, from creating a business guide to choosing eco-design tools by first identifying the barriers to eco-design implementation and creating guidelines to choose eco-design tools (Rousseaux et al., 2017). Another practical implementation is structuring the Industrial Symbiosis (IS) framework to track business sustainability factors and assess strategies for sustainability (Mulrow et al., 2017).

Business performance and growth are also becoming trend topics in this cluster. The combination of lean and sustainability-oriented innovation supports business growth (De et al., 2020b). Conversely, technology innovation exploitation is necessary to assist business performance and enhance its image to stakeholders (Chege & Wang, 2020). Finally, environmental protection becomes the main highlight among all discussions in this cluster. Mulrow et al. (2017) emphasize that social and human factors with environmental saving may create a local circular economy to support sustainable development. Chege and Way (2020) underline that environmentally friendly innovation supported by positive management can successfully lead to environmental sustainability practices.

4.2.3. Cluster 3: Support for SMEs to reach their sustainability.

This cluster delivers the support SMEs need to pursue sustainable practices within their business. Articles in this cluster mention several supports, from financial support (Moore & Manri, 2009; Walker & Preuss, 2008), procurement (Walker & Preuss, 2008), circular bioeconomy business model (D'Amato et al., 2020), and else. Articles in this cluster underline how incentives to SMEs can optimize the sustainability process, where SMEs are arranged to be suitable partners in supply and fit targets for Large Organizations' investment (Moore & Manring, 2009). At the same time, another article indicates that buying and sourcing from a small business can lead to local economic development and foster sustainable development (Walker & Preuss, 2008). Nevertheless, the major takeaway from this cluster is the creation of resilience in SMEs. When most SMEs focus on short-time planning, operational and internal aspects, they will be more vulnerable regarding change. To build resilient SMEs, managers should anticipate and plan changes around them (Ates & Bititci, 2011b). Following that, to be resilient, SMEs need external support that may assist them with diverse resources. Key factors such as organizational behaviour, managerial characteristics, supply chain integration, use

of technology, capital generation, location marketing, and globalization are associated with SMEs' resilience and competitiveness (Gunasekaran et al., 2011b).

4.3. Towards Integrative Process Model for SMEs Sustainability

This study argues that achieving SMEs' sustainability requires stages and steps. Hence, we further the bibliometric result to analyze how the thematic map and co-occurrence network shape certain patterns for SMEs' sustainability. This study discovers that the clusters framed from the bibliometric analysis can construct a process towards SMEs' sustainability and, at the same time, can answer RQ3: What further lesson can we take from the networks and themes? Figure 5 below demonstrates the approaches in every stage of the SME sustainability process.

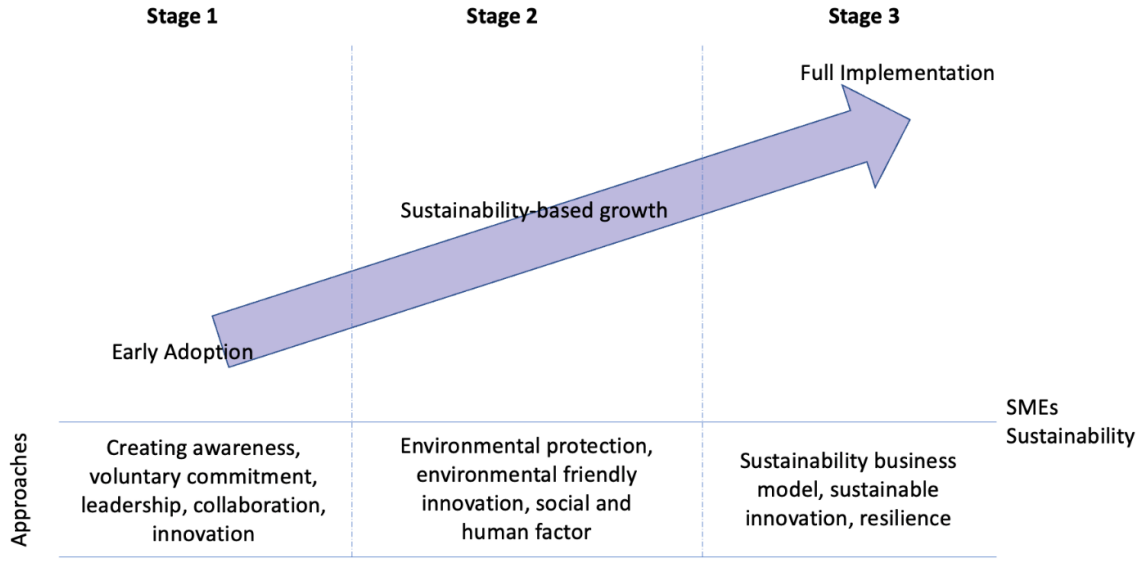

Figure 5. SMEs sustainability implementation model

From cluster 1 discovery, we find that creating awareness, voluntary commitment, leadership, collaboration, and innovation are the baselines for Stage 1, which we label as early adoption to SME sustainability. Next, from cluster 2 in our analysis, we learn that environmental protection, environmentally friendly innovation, and social and human factors play a big role in stage 2 of the SME sustainability process, and we label it as sustainability-based growth. Lastly, to fully implement sustainability practices in the business, approaches like sustainability business model, sustainable innovation and resilience are substantial. We label the last stage as full implementation, where all approaches have fully adopted the purpose of sustainability.

Apart from illustrating the stages, figure 5 above is completed by strategic approaches in each step or stage. In a situation such as the early adoption of sustainability, where SMEs still try to adapt and adopt sustainability practices, building awareness is important as a starting point. As Vernon et al. (2003) stated, SMEs need to realize the sustainability issue within their practices. The awareness then led SMEs to commit to sustainability practices voluntarily. This approach is challenging in ensuring SMEs spend a specific amount of their income for sustainability. To do so, the role of leader or leadership is needed to surpass this stage successfully. Kerr (2006) underlines the role of leaders in developing their management system to operate sustainably. The leadership approach is completed by two essential strategies: innovation and collaboration. Bor-Browers (2010) states that SMEs with integrated sustainability and innovation most likely show value creation, and collaborative relationships will provide more opportunities for SMEs, especially those related to sustainability practice (Lewis et al., 2015).

Moving forward to the next stage, namely sustainability-based growth. The partial adoption of sustainability practices designates this stage. Most SMEs have applied the sustainability practice in their process. However, this stage is crucial because SMEs can only continue the practice with significant value and mission. Hence, social and human factors are premier (Mulrow et al., 2017). In this stage, SMEs should focus on environmental protection and environmentally friendly innovation. The last stage of the sustainability implementation model is a full implementation of sustainability practice. In this stage, SMEs apply sustainability in their process and all aspects of the business. This claim can be seen by shifting their business model towards the sustainability business model (D'Amato et al., 2020; Evans et al., 2017), changing their innovation from conventional sustainable innovation (Boons et al., 2013). Hence, this proposed process model can also answer RQ3: What further lesson can we take from the networks and themes?

4.4. The Impact of Innovation and Resilience on SMEs' Sustainability

Similar to another strategy in business, innovation is evolving. As mentioned above, we are familiar with the terms eco-innovation (Demirel & Kesidou, 2019a; Kiani Mavi et al., 2019), green innovation (Abbas & Sağsan, 2019), business model innovation (Andreini & Bettinelli, 2017; Inigo et al., 2017) and the recent one, following the emerging awareness of business sustainability, sustainable innovation becomes a common strategy in business (Ozaki, 2011; Varadarajan, 2017b). Innovation undoubtedly improves firm performance and competitiveness. Le and Ikram (2022) further find that sustainability innovation has the strongest effect on financial performance (Le & Ikram, 2022a). This study argues that innovation is not only a result and capability needed for SME sustainability, as mentioned in previous studies (Carayannis et al., 2015; Evans et al., 2017; Halme & Korpela, 2014), but innovation is a complementary process of SMEs sustainability as innovation term shows continually in the motor theme of SMEs sustainability, composition order, and each cluster discovered in this research.

At the same time, resilience remains continuously in the literature during this research. We discover that resilience is discussed mostly in cluster 3, the support needed to reach SMEs' sustainability. In that cluster, articles frequently mention resilience as the basic capability required by SMEs, the main support of SMEs' sustainability, and the response to reach SMEs' sustainability. However, the literature seems inconsistent in position resilience and SME sustainability. Some literature states resilience as the cause of SMEs sustainability (Bachtiar & Ramli, 2023; Prastian et al., 2022), whereas others indicate resilience and sustainability as two different aims (Rai et al., 2021; Trabucco & Giovanni, 2021; Winnard et al., 2015). Hence, based on the cluster analysis conducted for this study, we argue that resilience and SME sustainability are integrated and complement each other. As seen in the integrative model proposed in this study, resilience is one of the approaches to fully implementing SME sustainability in the business.

The above explanation relates the impact of innovation and resilience on SMEs' sustainability based on the bibliometric analysis and the integrative process model delivered in this study. We believe that innovation and resilience are results, triggers, or capabilities and, more importantly, complementary processes of SMEs' sustainability. Three of them are integrated into one another. This finding also answers RQ 4: As trend topics, what impact do Innovation and Resilience bring to SMEs' sustainability?

5. Conclusion

This study uses bibliometric analysis to elaborate on the trend topics in SMEs' sustainability, innovation and resilience. The co-occurrence network and thematic map present in this paper show that conversation in SMEs' sustainability is divided into three big clusters: sustainable innovation practice, Expanding the role of innovation for sustainable development, and Supporting SMEs to reach their sustainability. Furthermore, this research aims to answer 4 research questions. Firstly, this research answers what theme dominates in SMEs' Sustainability literature by showing a thematic map consisting of four quadrants and analyzing it using composition order. We get three main themes: SME-Core Elements, Sustainability Development-External Force, and Business-Industry Dynamics. Secondly, we answer the next research question by showing the structure of networks we get from the co-occurrence analysis, which presents us with three main clusters based on the literature. Next, we read the articles in each cluster and delivered three themes based on the analyses of the papers in each cluster. Each cluster constructs a stage, and the combination develops an integrative process model to achieve SMEs' sustainability.

To complete the main aim of this research, we develop a proposed process model for SMEs to achieve their sustainability. The process consists of early adoption for SME sustainability, sustainable-based growth, and full implementation of SME sustainability. This discovery answers research question 3. Finally, we also answer the last research question by showing the impact of innovation and resilience. Our research argues that innovation and resilience are more important than only acting as results, triggers, or capabilities; they are primarily complementary processes of SMEs' sustainability. Three of them are integrated into one another.

6. Implication and Contribution

This study brings several implications for the literature. Firstly, this study indicates the key trends in SMEs and Sustainability topics, enlightening us about the most significant capabilities in SMEs' Sustainability: resilience and innovation. Next, this study demonstrated the thematic map, which presents the topic's basic theme, motor theme, niche theme, and declining/emerging theme. This study illustrates three major clusters in the topic to align the state of the art in literature. Finally, this study broadens the study of SME sustainability, innovation, and resilience literature by challenging previous studies that state innovation and resilience are limited as the trigger, result, or capability needed to achieve SME sustainability (Carayannis et al., 2015; Evans et al., 2017; Halme & Korpela, 2014) but more importantly as the complementary process in pursuing SMEs sustainability. In developing innovation and resilience theories, this study may become a starting point to research the benefits of both innovation and resilience factors for business sustainability and apply both advantages. In practice, we believe this study's proposed integrative process model can assist entrepreneurs and SMEs to achieve and implement SME sustainability. By applying the model, we expect the business to

know each approach they must fulfil in every stage of their SME sustainability implementation process. Carrying out the correct strategy may help businesses surpass a certain stage and get beyond the next stage to implement SMEs' sustainability fully.

7. Limitation and Future Research Direction

This research is not without limitations. For a literature review paper, the findings of this research essentially have not yet been tested empirically. Specifically, the proposed integration model is a conceptual model based on literature. Hence, further study is expected to test the model empirically for SMEs. Next, this research only focuses on understanding the impact of capabilities, innovation, and resilience on SME sustainability. However, as seen in trend topics, crisis and uncertain conditions also play a significant role in SMEs' sustainability. Hence, future research may relate innovation and resilience in crises and uncertain conditions. Finally, as mentioned above, this research can be a starting point for digging deeper into the impact of innovation and resilience on SMEs' Sustainability. Future research can see the perspective of culture, values and complexity in creating innovation and resilience in the business. Looking at both elements through the lens of social theory may deliver a richer picture of how to push SME sustainability and what social factor underlines it.

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Author Contribution

Author 1: Conceptualization, writing original draft, data curation, formal analysis, investigation, methodology.
Author 2: Review and editing, writing review, and editing, supervision, validation, visualization, data analysis, data running.

Conflict of Interest

The authors declare that the research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

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