

## **Digitalization Challenges for SMEs: A Systematic Literature Review Perspective and Future Research**

**Ietje Nazaruddin\*, Evy Rahman Utami and Evi Rahmawati**

\*Correspondence Author: [ietje.nazaruddin@umy.ac.id](mailto:ietje.nazaruddin@umy.ac.id)

Department of accounting, Faculty of economy and business, Universitas Mummadiyah Yogyakarta, Indonesia

---

### **INFO**

#### **Article History**

Received:

2023-11-04

Revised:

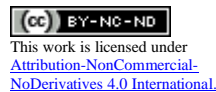
2024-03-07

Accepted:

2024-04-02

### **ABSTRACT**

SMEs are a fundamental component of the economic structure in many countries. In the contemporary era of digitalization, SMEs are undertaking various initiatives to align with the evolving business landscape. This study aims to explore and synthesize research results on the role of digitalization in developing small and medium enterprises (SMEs). The literature review used the Scopus database. The data obtained were 127 documents from 2010 to 2023. SME digitization research has been conducted in 42 countries using 92 theories from 94 journals. The results showed three research clusters: business model innovation, Enterprise Resource Planning (ERP), and Information Technology (IT) capabilities. Digital platforms and information management assist SMEs in adjusting, creating new ideas, and staying competitive in difficult business circumstances. Digital platforms assist SMEs by extending market reach, automating operations, improving marketing and promotional efforts, analyzing consumer data to make better decisions, and strengthening team communication and customer care. Future research investigates effective strategies and educational programs aimed at helping SMEs acquire digital skills, adopt digital technology, and implement advanced blockchain-based contract systems. Future research also investigates the ethical implications of SME digitalization, encompassing issues related to data privacy, digital security, and the appropriate use of emerging technologies.



**Keywords:** Digital Economy; Digital Platform; Information Technology; Enterprise resource Planning; SMEs

---

## **INTRODUCTION**

While Industry 4.0 technologies have the potential to enhance business performance, several studies caution about the challenges that small and medium-sized enterprises (SMEs) may have during the adoption of such technologies (Soni et al., 2022). SMEs are widely recognized as a fundamental component of the economic fabric in numerous countries across the globe (Soni et al., 2022). In conjunction with governmental initiatives and the advancement of information technology, SMEs must exercise prudent decision-making in their response. To enhance their competitiveness in today's intricate business landscape, it is imperative for SMEs to effectively harness information technology and develop and leverage their capabilities and competencies (Prasanna et al., 2019; Rodrigues et al., 2021; Yusuf et al., 2022). In the contemporary era of digitization, SMEs undertake various initiatives to align with evolving business landscapes. These endeavors primarily involve swiftly making informed decisions,

streamlining communication processes, and promptly reacting to dynamic changes (Hayes et al., 2018; Musiello-Neto et al., 2021; Tallon et al., 2019). This research aims to explore and synthesize research results on the role of digitalization in the development of SMEs.

Furthermore, it is imperative to enhance corporate strategies by using information technology and optimizing work processes (Mrugalska & Ahmed, 2021) to entail harnessing computer systems and enhancing the agility of business professionals in promptly addressing market demands (Chiu & Yang, 2019; Mrugalska & Ahmed, 2021; Surya et al., 2021). Information technology's (IT) significance in business is widely acknowledged (Kowerdziej et al., 2013). Explained organizations have implemented automation, digitization, and integration strategies across several aspects of their operations (Bayrak, 2013). Furthermore, digitalization is a multifaceted phenomenon that includes various dimensions, including digital entrepreneurship, digital strategies, digital processes, and digital education (Kraus et al., 2019). It is imperative to examine the elements that facilitate the digital economy to ascertain its favorable influence on the performance of SMEs.

SMEs play a substantial role in fostering economic growth, facilitating development, promoting exports, and generating employment opportunities inside a nation. SMEs play a crucial role in the Indonesian economy and make a substantial contribution. According to a press release by the Coordinating Ministry for Economic Affairs of the Republic of Indonesia in March 2023, the SMEs comprise 64.3 million business units. This sector plays a significant role in the country's economy, contributing 61.9% to the gross domestic product (GDP). Furthermore, it is a significant source of employment, absorbing 97% of the national workforce.

Nevertheless, SMEs encounter various obstacles, such as limited access to financial resources, difficulties in marketing their products or services, issues related to productivity, and struggles to maintain competitiveness in the market. To enhance competitiveness and productivity, the government is actively pursuing the development of the digital and fintech industries despite the challenges posed by prevailing conditions. The Minister of Cooperatives and Small and Medium Enterprises reported that before the COVID-19 pandemic, only 8-9 million SMEs were actively engaged in the digital ecosystem (Mishrif & Khan, 2023). However, the government has set a goal of increasing the number of SMEs participating in the digital ecosystem to 30 million (Haqqi, 2023).

The worldwide health crisis began in 2020 and impacted businesses of all sizes and industries. While many businesses have shown to be resilient or have even developed a new niche for operation, most SMEs from diverse sectors have found themselves in "new normal" working environments (Azmi et al., 2023). These policies implemented during the pandemic have negatively impacted SMEs in various nations, including Indonesia, due to their limited assets, poor capital reserves, and low productivity compared to major corporations. As a result, it jeopardizes the long-term viability of SMEs (Lutfi et al., 2020). SMEs are the most vulnerable groupings of entities since they lack the resources to weather crises (Azmi et al., 2023; Fitriasari, 2020).

Innovation and corporate transformation have been identified as critical to responding to disruptive changes induced by global phenomena such as the current pandemic, the resulting

economic crisis, and the ongoing climate disaster, especially SMEs (Popa et al., 2022; Soto-Acosta et al., 2018). Whether direct or indirect, local entrepreneur's and communities' answers acknowledge how the COVID-19 crisis highlighted the vulnerabilities of the global economic system and the drawbacks of global integration's close coupling. It is the foundation for the development of a 'new normal,' which is already being recognized by SME owners who are making entrepreneurial pivots to find and serve local customers in new ways (Hampel et al., 2020; Korsgaard et al., 2020; Morgan, 2016), one that is resilient in the face of extreme uncertainty, and one that incorporates a more inclusive and environmentally sustainable presence in and interaction with the economic system (Korsgaard et al., 2020; Palazzo, 2020). Some SMEs withheld information on digitalization because they were more focused on surviving the COVID-19 epidemic (Sánchez-Bayón, 2023). For example, China's current level of financial development still needs to be higher; SMEs require more excellent financial help but find it difficult to secure sufficient financial funds (M. Jiang et al., 2020). Globalization and the growth of internationally engaged SMEs are critical global processes (Knight, 2000; J. Y. Lee et al., 2022). This situation has created difficulties for SMEs in meeting their routine expenditures, including rent, employee salaries, and loan interest.

The World Health Organization (WHO) suggests using internet services to help stop the transmission of the Coronavirus (M. Al-Okaily et al., 2023; Almajali et al., 2022). It has recently been deemed a life-sustaining instrument in terms of crisis management such as COVID-19, as it offers the opportunity to improve service delivery, collaborative and communications efforts (A. Al-Okaily et al., 2021, 2023; M. Al-Okaily et al., 2023; Alhomdy et al., 2021; Alkhwaldi & Abdulmuhsin, 2022). Furthermore, SMEs are tasked with ensuring the continuity of their businesses amid the ongoing pandemic (Lutfi et al., 2020). We systematically review publications on the digitalization SMEs to address our questions:

RQ1: What are the key research streams in digitalization SMEs?

RQ2: What are the future research directions?

We obtained data from 127 papers from the Scopus database and systematically reviewed 94 journals. As a result, we found that 42 countries have produced digitalization SMEs. In addition, our review captured 92 theories using many research approaches, including quantitative, qualitative, mixed methods, and literature reviews. Finally, this study explored three research streams: business model innovation, Enterprise Resource Planning (ERP), and Information Technology (IT) capabilities. The findings indicated that digital platforms and knowledge management assist SMEs in remaining adaptive, inventive, and competitive in tough business conditions. Furthermore, digital platforms play an important role in assisting SMEs by providing greater market access, improving operational efficiency through automation, facilitating effective marketing and promotion, enabling customer data analysis for better decision-making, and enabling better team collaboration and efficient customer service.

This literature review provides several contributions. First, this literature review offers an overview of SME digitalization research. Researchers contribute to the knowledge and development of SMEs' digitalization. This paper provides a systematic literature review on

digitalization from an SME perspective to offer a detailed understanding of the important role of digitalization in assisting SME development. However, the issue of SMEs' digitalization varies greatly between countries. Environmental turbulence due to the COVID-19 pandemic is encouraging SMEs to innovate and digitalize worldwide. Therefore, the digitalization of SMEs is very important in mapping how successful the digitalization of SMEs will be. Second, the literature review helps to study the theories used from various perspectives from various countries. Third, the government uses the literature review as a reference in creating technological structures or digitalization in SMEs. Especially for developing countries, this paper can provide recommendations for the government to provide clear policies regarding the technology structure of SMEs. Because developing countries rely heavily on government intervention, governments need to remove technical barriers by implementing educational programs that address the use and implementation of digital in SMEs.

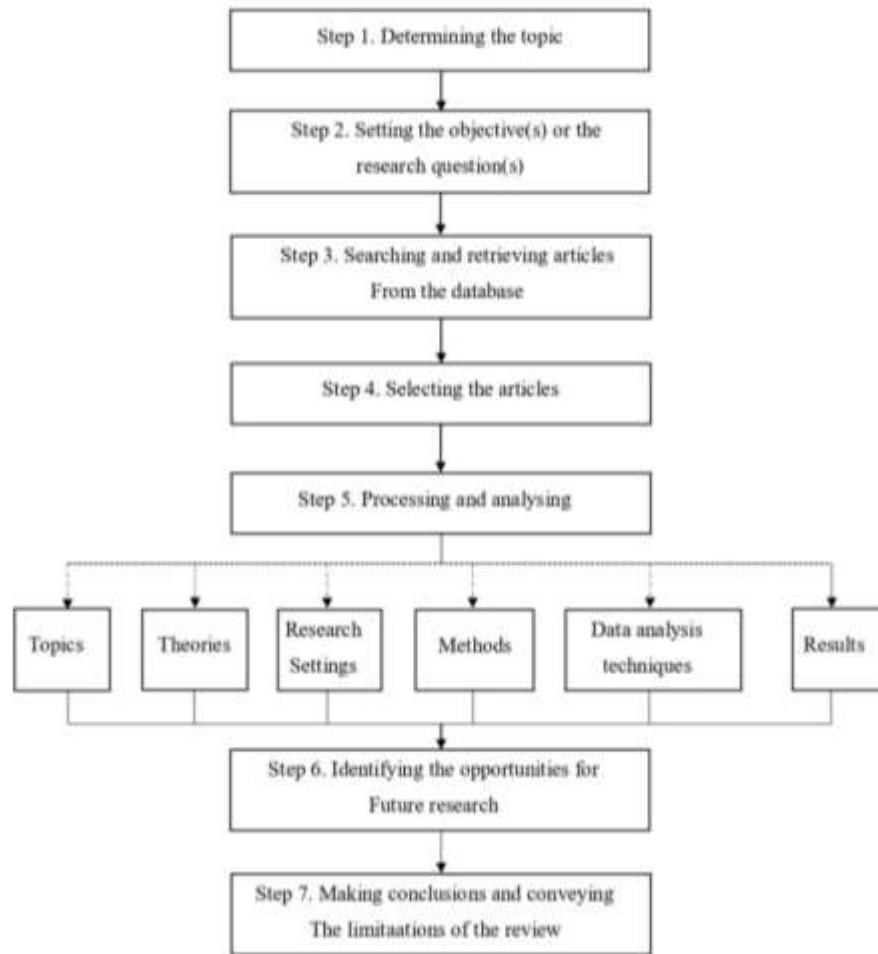
## **LITERATURE REVIEW**

Digitalization is the utilization of digital platforms and tools to enhance the profitability and value of enterprises (Monzavi et al., 2023). Digital transformation refers to how small and medium-sized enterprises (SMEs) use cloud computing, artificial intelligence, and other digital technologies to transform their business processes and operations (K. Z. Lin et al., 2017). It is a crucial element of digitalization and digital transformation, which entails utilizing digital technologies to enhance company processes and generate new development prospects (Monzavi et al., 2023). Besides that, digitalization has shifted the relationship between science, technology, and production, emphasizing the value of information and knowledge. Digital technologies have revolutionized production, exchange, and communication, affecting all areas of the economy and benefiting businesses of all sizes (Vitolla et al., 2021). Digital technologies, including electronic commerce, big data analysis, the Internet of Things, and machine learning, enable companies to create value (C.-C. Lee et al., 2023).

Digitalization helps SMEs overcome internal constriction, grow their user base, and capitalize on overseas market prospects. Digital technologies have the potential to reduce trade distances and restrictions, opening up previously inaccessible markets (Vitolla et al., 2021). Digital technologies enable efficient communication between employees, customers, and suppliers, as well as information creation, sharing, and exchange across multiple communities (Leonardi & Vaast, 2017; Lombardi & Secundo, 2021). Therefore, digitalization enables SMEs to participate in digitalized value chains Chen et al. (2019) and become part of integrated business networks (Rehm & Goel, 2017). SMEs are increasingly investing in information and communication technologies (ICTs) to enhance the synchronization and integration of their supply chains (Bharadwaj et al., 2007; Yu et al., 2017). From a supply chain standpoint, digitalization offers improved availability and real-time access to information, optimizes logistics by enhancing supply chain visibility, increases productivity, enhances product quality, provides flexibility, reduces time to market, and improves sustainability (Kiebach et al., 2022).

## METHODS

This study uses a phases strategy to conduct an organized literature review, as proposed by N. Anggraini et al. (2022); Hoque (2014); Poje and Zaman Groff (2022) as presented at Figure 1. There are at least two reasons for implementing the procedures. In the initial phase, we choose to investigate digitalization SMEs, followed by (N. Anggraini et al., 2022; Hoque, 2014). The second stage involved establishing the study's objective and research questions, as well as determining how far current studies have proceeded and where future research should go. In the third stage, we specified our inclusion criteria with keywords before starting the data collection procedure. We employ a Scopus Boolean function to locate digital economy bibliographies. "Digital economy, "Or" digital platform," Or "information technology," And "Small and medium-sized enterprises" SMEs were the final keywords.



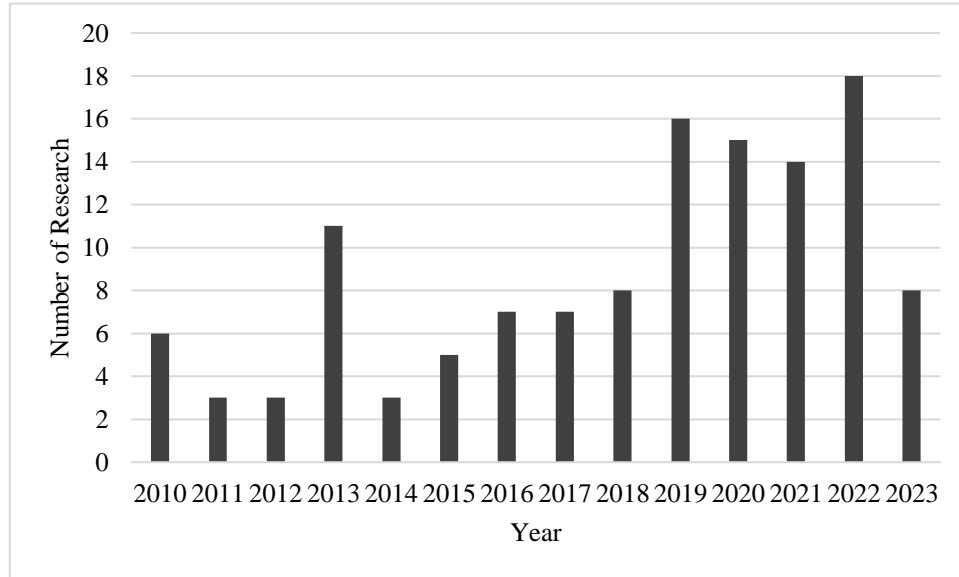
**Figure 1. Literature Review Process, Adapted from Hoque (2014) and P. G. Anggraini et al. (2022) with Modifications**

## RESULTS AND DISCUSSIONS

### Distribution of Articles by Year

The distribution of papers by year is shown in Figure 2. The results of this investigation show that SMEs' digitalization and innovation challenges are gaining greater attention every

year. Between 2019 and 2020, the number of publications on SMEs' innovation and digitalization decreased; this trend continued in 2021 before picking back up in 2022. The number of SME innovation and digitalization publications increased in 2021 and 2022. Due to the global COVID-19 epidemic, SMEs' publications on innovation and digitization dropped in 2020. However, SMEs' innovation and digitization publications began to pick up again in 2022, demonstrating once more that 2020 was a transition year due to the pandemic's influence on the economy. Some SMEs withheld information on digitalization because they were more focused on surviving the COVID-19 epidemic (Acharya et al., 2016).



**Figure 2. The Distribution of Articles by Year**

**Journal Distribution and Ranking by Scimagojr**

Table 1 provides an overview of the various journals and their respective rankings. The most requested journal for researching issues related to the digital economy is Technology Forecasting and Social Change. It is widely recognized as a Q1-ranked journal in technology and studies technology policy and ethics (Ahmed et al., 2022; Hameed et al., 2023; Won & Park, 2020). In addition, researchers also found that the Journal of Business Research is ranked Q1 in the field of business management. In particular, it promotes an interdisciplinary approach to business-related research (Cenamor et al., 2019; Christen et al., 2022; Mazzucchelli et al., 2021). The Journal of Knowledge Management is indexed in Q1 and addresses strategic issues related to knowledge management, an important topic in modern businesses and organizations. In addition, it discusses how information technology can be used to support knowledge management (Popa et al., 2022; Soto-Acosta et al., 2018; Wang & Han, 2011). Then there is Technology in Society, ranked Q1, which discusses issues highly relevant in the modern context where technology has changed many aspects of our lives. It covers the impact of technology on culture, politics, economics, the environment, and society at large (Alvarez et al., 2016; Bayrak, 2013; Zhang et al., 2022).

**Table 1. Journal Distribution and Ranking by Scimagojr**

Ranking	Journal	N	Frequency
Q1	Accounting Research Journal	1	1%
Q1	Business Process Management Journal	1	1%
Q1	California Management Review	1	1%
Q1	European Journal of Innovation Management	1	1%
Q1	European Management Review	1	1%
Q1	Futures	1	1%
Q1	Group & Organization Management	1	1%
Q1	IEEE Transactions on Engineering Management	1	1%
Q1	Industrial Management and Data Systems	2	2%
Q1	Industrial Marketing Management	1	1%
Q1	International Business Review	1	1%
Q1	International Journal of Accounting Information Systems	1	1%
Q1	International Journal of Information Management	2	2%
Q1	International Journal of Lean Six Sigma	1	1%
Q1	International Journal of Logistics Management	1	1%
Q1	International Journal of Operations & Production Management	1	1%
Q1	International Journal of Production Research	1	1%
Q1	International Journal of Productivity and Performance Management	1	1%
Q1	International Journal of Technology	1	1%
Q1	International Small Business Journal	1	1%
Q1	International Small Business Journal: Researching Entrepreneurship	1	1%
Q1	Journal of Business & Industrial Marketing	2	2%
Q1	Journal of Business Research	5	5%
Q1	Journal of Construction Engineering and Management - ASCE	1	1%
Q1	Journal of Enterprise Information Management	1	1%
Q1	Journal of Family Business Management	1	1%
Q1	Journal of International Management	1	1%
Q1	Journal Of Internet Commerce	1	1%
Q1	Journal of Knowledge Management	5	5%
Q1	Journal of Small Business and Enterprise Development	3	3%
Q1	Journal Of Small Business Management	1	1%
Q1	Journal of Small Business Management	2	2%
Q1	Journal of World Business	1	1%
Q1	Knowledge Management Research and Practice	2	2%
Q1	Management Decision	2	2%
Q1	Management Research Review	1	1%
Q1	Review of Managerial Science	1	1%
Q1	Small Business Economics	1	1%
Q1	Society and Economy	1	1%
Q1	Technological Forecasting and Social Change	10	11%
Q1	Technology in Society	5	5%
Q1	Telecommunications Policy	1	1%
Q1	Thunderbird International Business Review	2	2%
Q1	Tourism Management	1	1%
Q1	TQM Journal	1	1%
Q2	Asian Journal of Technology Innovation	1	1%
Q2	Change Management	1	1%
Q2	European Journal of International Management	1	1%
Q2	International Journal of Business Information Systems	1	1%
Q2	International Journal of Human Capital and Information Technology Professionals	1	1%
Q2	International Journal of Industrial Engineering and Management	1	1%
Q2	International Journal of Innovation Management	1	1%

Ranking	Journal	N	Frequency
Q2	International Journal of Technology Management	1	1%
Q2	International Journal of the Economics of Business	1	1%
Q2	Journal of Business Economics and Management	1	1%
Q2	Journal of Financial Reporting and Accounting	1	1%
Q2	Journal of Organizational and End User Computing	1	1%
Q2	Journal of Science & Technology Policy Management	2	2%
Q2	Management and Production Engineering Review	1	1%
Q2	Marketing Intelligence & Planning	2	2%
Q2	Problems and Perspectives in Management	1	1%
Q2	Review of International Business and Strategy	1	1%
Q2	South African Journal of Economic and Management Sciences	1	1%
Q2	Southeast European Journal of Economics and Business	1	1%
Q2	Technology Analysis & Strategic Management	4	4%
Q2	Technology in Society	1	1%
Q2	Technology Innovation Management Review	1	1%
Q3	Benchmarking: An International Journal	1	1%
Q3	Business Informatics	1	1%
Q3	Business Perspectives and Research	1	1%
Q3	Finance: Theory and Practice	1	1%
Q3	Gadjah Mada International Journal of Business	1	1%
Q3	International. Journal Entrepreneurship and Small Business	1	1%
Q3	International Journal of Business and Society	1	1%
Q3	International Journal of Economics and Business Administration	1	1%
Q3	International Journal of Innovation and Learning	2	2%
Q3	International Journal of Management Practice	2	2%
Q3	Journal of Asia-Pacific Business	1	1%
Q3	Journal of Information Technology Management	1	1%
Q3	Journal of Small Business & Entrepreneurship	1	1%
Q3	Journal of Small Business Strategy	1	1%
Q3	Studies in Business and Economics	1	1%
Q4	Corporate Governance and Organizational Behavior Review	1	1%
Q4	Global Business and Economics Review	1	1%
Q4	International. Journal Information Systems and Change Management	1	1%
Q4	International Journal of Business and Systems Research	1	1%
Q4	International Journal of Management and Enterprise Development	1	1%
Q4	International Journal of Services, Technology and Management	1	1%
Q4	Investment Management and Financial Innovations	1	1%
Q4	Sinergie	1	1%

### Distribution of Articles Based on Research Settings

Table 2 presents publications by country in this emerging field of study. It can be seen that researchers from Europe (thirteen) have the highest number of publications, followed by China (twelve) and the UK (eleven). Due to resource limitations, European SMEs focus more on creating exploitative breakthroughs to build on prior exploratory attempts (Popa et al., 2022). China's financial development is still in its infancy; SMEs require greater financial help but find it challenging to secure enough funding. The state has implemented many financial assistance measures for SMEs in the form of government intervention, "financial rescue," by serving the real economy and preventing the formation of systemic financial concerns under the influence of the epidemic (M. Jiang et al., 2020). Another country, such as the UK, remains uncertain whether adopting various stages of E-commerce development has led to enhanced revenues or



merely introduced additional costs and complexities for SME entrepreneurs. For instance, creating and maintaining a commercial website demands substantial financial capital (Saridakis et al., 2017).

**Table 2. Research Settings**

<b>Country</b>	<b>N</b>	<b>Country</b>	<b>N</b>
West Africa	3	Kazakhstan	1
South Africa	4	Korea	6
North Africa	1	Malaysia	4
United States	2	New Zealand	2
North America	6	Nigeria	1
Australia	4	Pakistan	3
Belgium	1	Portugal	4
Brunei	1	French	2
Bulgaria	1	Czech Republic	1
China	12	Romania	1
Denmark	3	Russia	1
Europe	13	Saudi Arabia	6
Finland	1	Singapore	1
Hungarian	1	Spain	5
India	7	Sweden	1
Indonesian	4	Swiss	1
Inggris	11	Taiwan	4
Iran	1	Thailand	2
Italy	6	Uruguay	1
Germany	5	Jordan	1
Jordan	2	Greece	2

Meanwhile, developing countries such as Indonesia have yet to contribute to the topic of SMSE digitalization, and this needs to be further explored. In Indonesia, small and medium-sized enterprises (SMEs) encounter challenges similar to those of their counterparts in various nations. Government control policies have compelled numerous SMEs to cease their operations. Implementing social restrictions, self-isolation measures, and travel constraints has significantly impacted the economy, leading to job layoffs (Lutfi et al., 2020; Nicola et al., 2020). This situation has created difficulties for SMEs in meeting their routine expenditures, including rent, employee salaries, and loan interest. Furthermore, SMEs are tasked with ensuring the continuity of their businesses amid the ongoing pandemic (Lutfi et al., 2020).

**Theories**

Table 3 is presented based on the theory used. The most widely used theories are contingency theory, innovation theory, and resource-based view (RBV), with seven papers each. Contingency theory explains that the best way to organize a company depends on the internal and external situation (Lawrence & Lorsch, 1967). In a dynamic environment, medium-sized firms tend to use IT to improve external orientation, while small firms fail to do so (Neirotti et al., 2013).

**Table 3. Theory**

<b>Theory</b>	<b>N</b>	<b>Theory</b>	<b>N</b>
Adaptive Structuration Theory	1	Resource Theory	1
Agency Theory	4	Resource-Based Perspective	4
Ambidexterity	1	Resource-Based View (RBV)	8
Appropriate Theory	1	Responsive Market Orientation Theory	1
Classic Technology Adoption Theory	1	Schema Theory	1
Complementarity Organisation Theory	1	Self-Efficacy Theory	1
Configurational Theory	1	Signaling Theory	1
Contingency Theory	7	Social Capital Theory	1
Cross- Border E-Commerce	1	Social Exchange Theory	1
Digital Platform Capabilities Theory	1	Stackelberg Game Theory	1
Digital Technology Adoption Theory	1	Strategic Orientation Theory	1
Dynamic Capabilities Theory	6	Structuration Theory	1
E-Commerce Technologies	1	Suitable Theory	1
Economic Theory	2	Supply Chain Management Theory	1
Entrepreneurial Orientation Theory	1	Systemic Theory	1
Entrepreneurship Theory	7	Technology Acceptance Model (TAM)	5
Establishment Chain Theory	1	Technology–Organization–Environment Theory (TOE)	9
Evolutionary Theory	3	The Cooperative Game Theory	1
Expectancy Theory	1	The Diffusion of Innovation Theory	3
Family Theory	1	The Digital Transformation	1
Foreign Market Knowledge Acquisition	1	The Product Fitness Theory	1
Framework of Value Co-Creation Theory	1	The Social Exchange Theory	1
Fuzzy Set Theory	1	Theory of Acceptance and Use of Technology (UTAUT)	3
General Testability of Theories	1	Theoretical Diversity	1
Grounded Theory	1	Theory Collaborative Networks	1
Inductive Theory Building	1	Theory Development	2
Industry Theory	1	Theory Diffusion of innovative	1
Information and Communication Technology (ICT)	1	Theory E-Leadership	1
Information Richness Theory	1	Theory Foresight	1
Innovation Capability Theory	1	Theory Mass Customization (Mc)	1
Innovation Diffusion Theory	1	Theory of Human Capital	1
Innovation Theory	8	Theory of Organizational Knowledge	1
Knowledge Management Theory	2	Theory of Planned Behaviour	2
Legitimacy	1	Theory of Reasoned Action	3
Linkage Theory	1	Theory of The Relationship	1
Network Capabilities Theory	1	Theory of Trust	1
Network Learning Theory	1	Theory on Strategic Networks	1
Organization Learning Theory	1	Theory Sensitivity	1
Organization Theory	3	Theory Transformational	1
Organizational Boundary Theory	1	Theory Uberisas	1
Participatory Theory	1	Transaction Cost Theory	3
Prospect Theory	1	Transaction Costs Economics (TCE) Theory	1
Relationship Marketing	1	Triple Helix Theory	1
Research and Development Theory	1	Weak Ties Theory	1
Resource Orchestration Theory	1		

Based on contingency theory, small firms are less likely to use IT intensively in business development and thus need to design an organizational structure that suits their competitive environment. The reason for small firms to limit IT investment may not only lie in resource limitations. However, it may also stem from the need for clear relative advantages for IT adoption, especially under high market volatility.

Furthermore, the innovation theory used relates to encouraging organizations to be more open-minded and functionally coordinated (F. Lin et al., 2022). Open-mindedness and cross-functional coordination reflect internal learning and sharing of ideologies and values, which help develop the foundation for integrating external knowledge and achieving knowledge creation and new outputs (Chen et al., 2019; Herrmann et al., 2007). Finally, smaller firms generally have more limited in-house IT resources (Anderson et al., 2012; Forsman, 2008), making implementing and using IT in innovation processes harder. Even if they successfully implement IT, they benefit less from the scalability of IT solutions (Kyobe, 2004). Furthermore, smaller firms often benefit from a lower degree of formalization, which implementing IT counters (Cohen & Klepper, 1996; Kamien & Schwartz, 1975).

## **Research Method**

Literature classified several approaches, as shown in Table 4. Quantitative approaches encompass the archival method, which systematically collects and analyses data derived from pre-existing sources, such as documents, records, financial reports, and archives. This methodology employs historical data to analyze and comprehend the observed study phenomenon (M. Jiang et al., 2020). The method used in this study was identified in a maximum of one research investigation. The survey method is a frequently employed research technique scholars utilize to gather data from individuals who serve as representatives of a specific demographic. Researchers use this methodology to construct a questionnaire or instrument comprising a sequence of inquiries directed toward participants (Haug et al., 2023; Neirotti et al., 2013). The present study examines innovation surveys among SMEs. Most research, precisely 51%, employed this methodology. The experimental technique systematically establishes a causal relationship between existing variables (Bootz et al., 2022). The method employed in this study was identified in a maximum of one research investigation.

Qualitative research methods encompass using interviews as a primary data collection technique. Researchers directly interact with respondents and use structured or semi-structured dialogue to enhance their comprehension of the research subject (E. Costa et al., 2017; Marchand & Raymond, 2018; Yang et al., 2023). The researcher administers a set of relevant inquiries to the participants to get insight into their perspectives, perceptions, experiences, and understanding of the topic being investigated, as evidenced by 14 studies employing this methodology. The mixed methods approach is a sophisticated research methodology integrating multiple quantitative and qualitative techniques. Hence, incorporating different methods facilitates a more profound and comprehensive comprehension of the investigated phenomenon (Heim et al., 2019; Korsgaard et al., 2020; Pelletier & Cloutier, 2019). The utilization of mixed methods in innovation research inside SMEs is 5% based on this approach.

**Table 4. Research Method (n=127)**

Type	Quantitative (n/%)	Qualitative (n/%)	Mixed (n/%)	Literature Review (n/%)
<b>Quantitative</b>				
Archival	3(2%)			
Survey	65(51%)			
Experiment	1(1%)			
<b>Total quantitative</b>	<b>69(54%)</b>			
<b>Qualitative</b>				
Interview, Observation, Case study		19(15%)		
<b>Total qualitative</b>		<b>19(15%)</b>		
<b>Mixed method</b>				
Survey, Interviewt			11(9%)	
Survey, Eksperiment			0(0%)	
Interview, Literatur Review			0(0%)	
Interview, Dokumentary Analisis			0(0%)	
<b>Total mixed methods</b>			<b>11(9%)</b>	
<b>Literature review</b>				<b>28(22%)</b>
<b>Total</b>	<b>69(54%)</b>	<b>19(15%)</b>	<b>11(9%)</b>	<b>28(22%)</b>

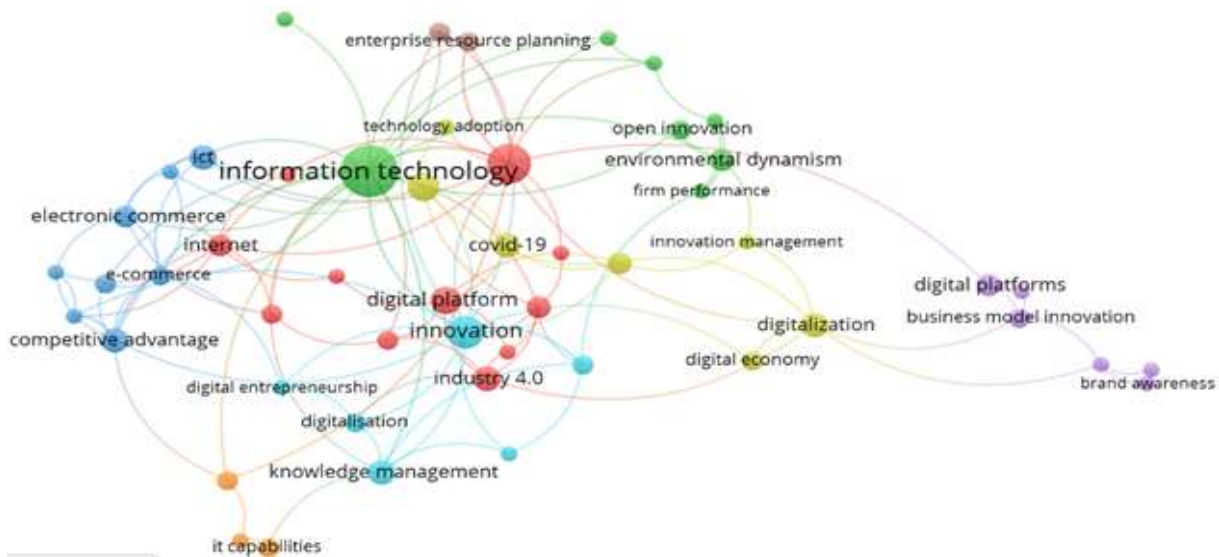
The literature review methodology entails the systematic gathering, critical assessment, and integration of scholarly investigations about the subject of inquiry or interest. The primary objective of this methodology is to get a complete comprehension of the subject matter by synthesizing and consolidating the findings of scholarly literature (Cocca et al., 2022; Garg et al., 2010; S.-W. Lin, 2016). The present study focuses on a comprehensive literature analysis of innovation inside SMEs.

## DISCUSSIONS

### *Existing Research Findings by Research Streams*

Based on the Vosviewer and the researcher's judgment, the area was classified into numerous clusters. Despite the publications containing unique bibliographies for distinct research fields, there was no perfect categorization (Secundo et al., 2020). Figure 3 shows the co-word analysis of the 127 papers. The magnitude of the keyword's circle indicated its prevalence among the article's keywords. The colors represent the frequency with which terms appear together in an article's keywords (N. Anggraini et al., 2022)—the closer and thicker the line connecting the concepts, the stronger the relationship between them. Figure 2 demonstrates that information technology dominated this review, as indicated by the largest circles. VOSviewer discovered numerous digitalization SME clusters based on color. Some keywords

were misgrouped because they were sorted by frequency. The researcher altered the number of clusters multiple times. The researchers divided the clusters into three clusters: business model innovation, enterprise resource planning (ERP), and information technology (IT) capabilities.



**Figure 3. Co-Word Analysis**

### *Business Model Innovations (BMI)*

Business model innovation (BMI) refers to the intentional and significant modification of the fundamental components constituting an organization's business model (Hock-Doepgen et al., 2021). Innovation is the inclination to adopt novel concepts as a significant element of a company's organizational culture (Bouwman et al., 2019). Comprehending the significance of fostering digital cooperation is vital for managers of SMEs. The current economic challenges businesses encounter have led to a growth in business innovation among managers of small and medium-sized enterprises (SMEs) (Castela et al., 2018).

Explained the landscape of business innovation in digital marketing is expected to transform the dynamics between sellers and buyers, resulting in enhanced ease of interaction (Chong et al., 2010). To successfully implement e-marketing, marketers must undertake several vital steps (Lutfi et al., 2020): 1) to identify contextual factors that may impact their e-marketing efforts. 2) selecting an appropriate B2B e-marketplace is essential for effective e-marketing. 3) allocating investments in ICT infrastructure is necessary to support the e-marketing initiatives. Moreover, integrating corporate marketing strategies and policies is vital for aligning e-marketing with overall business objectives. Furthermore, identifying the various components of e-marketing is essential for comprehensive implementation. Additionally, marketers should familiarize themselves with the e-marketing tools available in B2B e-marketplaces.

The claim is that incorporating digital platforms holds promise in expediting the innovation process for small and medium-sized firms (SMEs) (X. Xie et al., 2022). Prominent corporations affirm that the emergence of digital technology notably influences the business-to-business (B2B) sector (Chong et al., 2010). Moreover, digital platforms can facilitate rapid

innovation for small and medium-sized firms (SMEs) through their more adaptable strategies and comparatively expedited decision-making processes compared to larger enterprises (X. Xie et al., 2022). The adoption of information technology (IT), the competencies of personnel, and the execution of digital initiatives have a significant impact on the digitalization of small and medium-sized firms (SMEs) (Eller et al., 2020). As a result, the digitalization process significantly influences the financial performance of small and medium-sized enterprises (SMEs).

Previous studies have examined business models in three distinct domains: the Internet, mobile technology (including marketplaces), and information technology's influence on firms at both the infrastructure and application levels (Ballon, 2007; Chong et al., 2010). Additionally, he highlights the importance of strategic considerations on firm performance and value creation. SMEs should embrace contemporary technology and leverage digital platforms to enhance operational efficiency and expand their market reach. Utilizing technological innovation and management in SMEs can facilitate the development of novel products or services, enhance operational efficiency, and explore untapped markets (Casadesus-Masanell & Ricart, 2010). Technology management plays a crucial role in effectively overseeing the technology assets of small and medium-sized enterprises (SMEs), guaranteeing the dependability of systems, and using information technology to facilitate corporate expansion (Waldner et al., 2015). Wu et al. (2016) argued that using social media and marketing strategies has enhanced organizational learning and innovation orientation, bolstering overall organizational performance (Tu & Wu, 2021).

#### *Enterprise Resource Planning (ERP)*

Enterprise Resource Planning (ERP) system is a comprehensive software solution encompassing many business activities, facilitating organizations in obtaining a comprehensive and interconnected perspective of their enterprise (AL-Shboul, 2019). ERP automates fundamental organizational tasks and enhances information and resource management efficiency across the complete supply chain (Y. Xie et al., 2014). Furthermore, ERP has facilitated direct communication between large firms and their clients through e-commerce, resulting in intense rivalry for SMEs. Implementing ERP enhances sales and offers improved marketing prospects for SMEs (Khan & Trzeciński, 2018). Implementing ERP facilitates enhanced collaboration across various organizational and functional units. A comprehensive comprehension of business processes is essential in ERP systems (Bansal & Agarwal, 2015). de Salas et al. (2017) explained that a comprehensive comprehension of business processes is crucial for enhancing competitive advantage within SMEs. Hence, SMEs adopt ERP to enhance their competence and efficiency.

Nevertheless, it is worth noting that SMEs often have a deficiency in managing IT effectively and professional information systems, including ERP (AL-Shboul, 2019; Chang et al., 2012; S.-Y. Hung et al., 2014). ERP strongly correlates with organizational process reengineering, necessitating seamless integration with corporate software and hardware infrastructure. The deployment of ERP incurs significant expenses in software and consulting

fees, as these systems utilize software modules to coordinate various organizational operations across multiple units within an organization, all while utilizing a centralized data repository (AL-Shboul, 2019; Peng & Nunes, 2013).

Furthermore, Cloud-ERP is a viable alternative for integrating digital technologies within SMEs. SMEs' utilization of cloud-based ERP is attributed to the ability to access third-party hosted applications and IT resources effectively, as opposed to physical (AL-Shboul, 2019; Gangwar et al., 2015). Consequently, there is no necessity to physically deploy software modules on users' personal computers or store associated data on local servers, resulting in reduced hardware investment and expenditures (AL-Shboul, 2019; Dutta et al., 2013). Furthermore, it can be observed that the expenditure associated with operating a thousand servers over one hour is commensurate with the expenditure incurred by operating a single server for one thousand hours. The utilization of cloud computing has resulted in a decrease in operating expenses as a result of the swift allocation or de-allocation of resources based on demand.

The utilization of conventional ERP packages poses challenges for SMEs as a result of their organizational structure characterized by inadequate IT infrastructure, expenses related to hardware and maintenance, scarcity of proficient IT professionals to facilitate ERP installation, and lower allocation of funds towards IT by businesses (Yii et al., 2015). Cloud-ERP offers numerous appealing benefits to SMEs due to their cost-effectiveness and time efficiency. SMEs are not obligated to possess their IT infrastructure; they can lease technology and pay for the necessary services. Utilizing and operationalizing ERP via cloud computing significantly benefits precise data acquisition, documentation, amalgamation, administration, and dissemination (AL-Shboul, 2019).

### *Information Technology (IT) Capabilities*

Information technology (IT) capabilities describe a company's capacity to set up, use, integrate, and change the configuration of resources from IT systems to improve business strategy. IT capabilities improve knowledge acquisition, assimilation, and implementation by processing contextual intelligence, which benefits learning (Azyabi, 2021). Besides that, IT capabilities improve both the pursuit of new business possibilities and the exploitation of existing market opportunities for capitalizing on market opportunities (Soto-Acosta et al., 2018). Stronger digital platform reconfiguration capabilities make platform subjects behave in a loosely coupled state and encourage businesses' flexibility and mobility to adjust current cooperative relationships. Furthermore, a strong digital platform optimizes platform resource allocation and improves cooperating subjects' effectiveness in joint problem-solving (H. Jiang et al., 2023). Businesses can catalyze their processes and support their plans with this approach. IT capability is anticipated to improve data collection and processing (Chaudhuri et al., 2011; Soto-Acosta et al., 2018).

Similarly, IT capabilities may improve the exploitation of capabilities for seizing chances in the market and looking into new ones to address issues in emerging markets (Soto-Acosta et al., 2018). Organizations can achieve various results using different strategies (Azyabi, 2021).

Network management skills may improve due to the interdependencies between digital platform capabilities (Cenamor et al., 2019). IT talent indirectly boosts a company's performance. These conditions help us better understand how IT capabilities function in the context of SMEs (Azyabi, 2021; Mithas & Rust, 2016).

IT capabilities include various aspects, such as IT Infrastructure, Software, IT Security, IT Project Management, Data Analysis, Database management, Application Development, Business Process Management, Technical Skills, Innovation Skills, and IT Management. A strong IT infrastructure is not a key requirement for achieving high innovative performance and high productivity in the context of IT for exploration, meaning that its presence is "possible" but not "determinant" (Marchand & Raymond, 2018). Integrated IT infrastructures, which provide people with quicker and more effective access to information, facilitate the knowledge management process (Shiranifar et al., 2019). IT enables the vertical and horizontal distribution of structural information as a result. Information technologies greatly speed up the transmission of knowledge among employees, but it's important to remember that they are only a part of the solution (Alvarez et al., 2016). Compared to SMEs, major firms apply IT governance measures significantly more broadly (Alvarez et al., 2016; Y. Hung et al., 2005). IT resources assist a company in achieving significant advantages and defeating significant competitors (Melville et al., 2004; Usman Shehzad et al., 2023; Wade & Hulland, 2004). Information technology (IT) has become crucial for managing knowledge transfers within and between organizations (Katemukda et al., 2018; Usman Shehzad et al., 2023).

### *Future Research*

Digital platforms cannot be avoided and must be responded to by preparing all aspects of the organization. The organization must rethink its current strategy to adapt to the changes that will be implemented (Suwanto et al., 2022). Digital platforms have a critical role in supporting small and medium enterprises (SMEs) by providing wider access to markets, increasing operational efficiency through automation, facilitating effective marketing and promotions, enabling analysis of customer data for better decision-making, and enabling better team collaboration and efficient customer service. Apart from that, digital platforms also open up opportunities for business model innovation and help SMEs to compete in the digital era (Katemukda et al., 2018; Tu & Wu, 2021).

Digital platforms enable SMEs to collect, store and manage knowledge more efficiently (R. V Costa et al., 2014; Sánchez-Bayón, 2023). It means important information, documents, and knowledge can be easily accessed by team members, even from different locations, enhancing effective collaboration and knowledge sharing. In addition, digital platforms also support rapid information search and discovery, assist in knowledge data analysis, and enable SMEs to track knowledge performance. With the combination of Knowledge Management and digital platforms, SMEs can maximize the value of their knowledge, support innovation, and remain competitive in an increasingly digitalized business environment (J. Y. Lee et al., 2022).

Digital platforms enable SMEs to access real-time information, make rapid decisions, and dynamically adapt their strategies to market changes (Canhoto et al., 2021). Knowledge



Management integrated with digital platforms enables faster access to knowledge and insights that support appropriate decision-making in conditions of uncertainty. Effective collaboration and accurate data analysis are also key in dealing with rapid changes in a turbulent business environment. Thus, digital platforms and knowledge management help SMEs remain adaptive, innovative, and competitive in facing the challenges of a changing business environment.

Future research explores effective strategies for developing digital skills that include efficient methods and training programs to assist SMEs in digital adoption (Sarango-Lalangui et al., 2023). SMEs are considered to have stronger adaptation to digitalization in accounting systems, so several studies such as (Jackson et al., 2022; Moll & Yigitbasioglu, 2019) recommend implementing a smart contract system using a blockchain system. In addition, future research can investigate the ethical implications of the digitalization of SMEs, such as issues of data privacy, digital security, and responsible use of emerging technologies (Sarango-Lalangui et al., 2023). It is important to understand how SMEs conduct business ethically in an increasingly complex digital environment. Researchers can also identify strategies to ensure fair access to digitalization for SMEs in remote areas.

From an environmental perspective, SMEs are constrained by various stakeholders (e.g., customers, competitors, suppliers, government, and wider society). It is important to have an ecosystem that supports the achievements of SMEs in terms of digitalization. The government is one of the environmental factors that play the most role; the support provided by the government to SMEs in adopting digital technology can be in the form of fiscal incentives, technical assistance, training, and development programs (Hanaysha et al., 2022). The dynamic environment will influence policymakers to continue updating policies related to SME digitalization. So, future researchers will continue to pay attention to the importance of environmental influences and government support in the digitalization of SMEs. Furthermore, governance issues are also becoming increasingly interesting in relation to digitalization. Digitalization and corporate governance will support each other in achieving SME performance.

Future research can develop mixed methods in research methodology because the use of this method is still relatively limited. The use of the mixed method will support a more in-depth study of the research results. The diversity and capabilities of SMEs are very diverse, so a mixed-method approach is appropriate. For example, researchers can conduct interviews and surveys or interviews with experimenters.

## **CONCLUSION**

This literature review aims to identify trends and future research for developing digitalization in SMEs during 2010-2023 using various criteria. It is a review based on journal distribution, year of publication, theory, research setting, and methods. We found 127 papers from 42 countries. This literature review uses 92 theories with various research approaches, such as quantitative and qualitative research, interviews, and literature reviews. Furthermore, the distribution of papers from various journals indexed by Scopus is mostly from journals indexed Q1-Q2. Interestingly, the issue of SMEs' digitalization occurs across countries. The most widely used method for SME digitalization research is surveys.

This research has several implications. First, the results of this literature review can be used by regulators to provide a digitalization ecosystem in each country. Regulators must facilitate SMEs' expansion of their products through digitalization, especially in developing countries like Indonesia. SMEs in developing countries need to be strengthened with digital literacy. Second, the literature review provides various theories for academics to develop research on the issue of the digitalization of SMEs. There are many theories and cross-disciplines for the successful digitalization of SMEs in various countries, so synergy between various parties is needed. Third, the world of education must also focus on research and service in the digitalization of SMEs. SMEs need assistance from academics in developing digitalization. A literature review has several limitations. First, the literature review only comes from the Scopus database. Furthermore, this research does not limit the review to empirical or theoretical papers, so the results combine both.

**Acknowledgment.** The researchers would like to extend their gratitude to the Ministry of Research, Technology and Higher Education (Kemenristekdikti), which is the main sponsor of this research. Thank you to Aaqilatul Mumtaazah Hafiluddin, Tiyas Puji Utami, and Indah Yani have been supporting this research. The Kemenristekdikti funds this research under Penelitian Fundamental 2023 scheme entitled "Meningkatkan Keunggulan Kompetitif UMKM Melalui Digitalisasi: Perspektif Contingency Theory Letter of Assignment Number: 181/E5/PG.02.00.PL/2023 Contract Number: 0423.7/LL5-INT/AL.04/2023.

## REFERENCES

- Acharya, D., Rani, A., Agarwal, S., & Singh, V. (2016). Application of adaptive Savitzky–Golay filter for EEG signal processing. *Perspectives in Science*, 8, 677–679. <https://doi.org/10.1016/j.pisc.2016.06.056>
- Ahmed, A., Bhatti, S. H., Gölgeci, I., & Arslan, A. (2022). Digital platform capability and organizational agility of emerging market manufacturing SMEs: The mediating role of intellectual capital and the moderating role of environmental dynamism. *Technological Forecasting and Social Change*, 177, 121513. <https://doi.org/10.1016/j.techfore.2022.121513>
- Al-Okaily, A., Al-Okaily, M., & Teoh, A. P. (2023). Evaluating ERP systems success: evidence from Jordanian firms in the age of the digital business. *VINE Journal of Information and Knowledge Management Systems*, 53(6), 1025–1040. <https://doi.org/10.1108/VJKMS-04-2021-0061>
- Al-Okaily, A., Ping, T. A., & Al-Okaily, M. (2021). Towards business intelligence success measurement in an organization: A conceptual study. *Journal of System and Management Sciences*, 11(2), 155–170. <https://doi.org/10.33168/JSMS.2021.0210>
- Al-Okaily, M., Alkhwaldi, A. F., Abdulmuhsin, A. A., Alqudah, H., & Al-Okaily, A. (2023). Cloud-based accounting information systems usage and its impact on Jordanian SMEs' performance: the post-COVID-19 perspective. *Journal of Financial Reporting and Accounting*, 21(1), 126–155. <https://doi.org/10.1108/JFRA-12-2021-0476>
- AL-Shboul, M. A. (2019). Towards better understanding of determinants logistical factors in SMEs for cloud ERP adoption in developing economies. *Business Process Management Journal*, 25(5), 887–907. <https://doi.org/10.1108/BPMJ-01-2018-0004>

- Alhomdy, S., Thabit, F., Abdulrazzak, F. H., Haldorai, A., & Jagtap, S. (2021). The role of cloud computing technology: A savior to fight the lockdown in COVID 19 crisis, the benefits, characteristics and applications. *International Journal of Intelligent Networks*, 2, 166–174. <https://doi.org/10.1016/j.ijin.2021.08.001>
- Alkhwaldi, A. F., & Abdulmuhsin, A. A. (2022). Crisis-centric distance learning model in Jordanian higher education sector: factors influencing the continuous use of distance learning platforms during COVID-19 pandemic. *Journal of International Education in Business*, 15(2), 250–272. <https://doi.org/10.1108/JIEB-01-2021-0001>
- Almajali, D., Al-Okaily, M., Barakat, S., Al-Zegaier, H., & Dahalin, Z. M. (2022). Students' Perceptions of the Sustainability of Distance Learning Systems in the Post-COVID-19: A Qualitative Perspective. *Sustainability*, 14(12), 7353. <https://doi.org/10.3390/su14127353>
- Alvarez, I., Zamanillo, I., & Cilleruelo, E. (2016). Have information technologies evolved towards accommodation of knowledge management needs in Basque SMEs? *Technology in Society*, 46, 126–131. <https://doi.org/10.1016/j.techsoc.2016.04.006>
- Anderson, S. E., Jones, L. C., & Reed, T. N. (2012). Insurance Fraud: Losses, Liabilities, and September 11. *Issues in Accounting Education*, 27(4), 1119–1130. <https://doi.org/10.2308/iace-50248>
- Anggraini, N., Berliana, D., & Yolandika, C. (2022). The Strength of Motives in Food Choosing Behaviour in Fishermen Based on Social Layers in the Coastal area of Bandar Lampung, Indonesia. *IOP Conference Series: Earth and Environmental Science*, 1012(1), 012007. <https://doi.org/10.1088/1755-1315/1012/1/012007>
- Anggraini, P. G., Utami, E. R., & Wulandari, E. (2022). What happens to the stock market during the COVID-19 pandemic? A systematic literature review. *Pacific Accounting Review*, 34(3), 406–425. <https://doi.org/10.1108/PAR-11-2021-0184>
- Azmi, N. P. N. A., Hamid, N. A., Rasit, Z. A., Norizan, S., & Shafai, N. A. (2023). Investigating the success factors of small and medium-sized enterprises in sustaining business operations during COVID-19. *Corporate Governance and Organizational Behavior Review*, 7(3), 165–176. <https://doi.org/10.22495/cgobrv7i3p13>
- Azyabi, N. (2021). How do information technology and knowledge management affect SMEs' responsiveness to the coronavirus crisis? *Business Informatics*, 15(2), 75–90. <https://doi.org/10.17323/2587-814X.2021.2.75.90>
- Ballon, P. (2007). Business modelling revisited: the configuration of control and value. *Info*, 9(5), 6–19. <https://doi.org/10.1108/14636690710816417>
- Bansal, V., & Agarwal, A. (2015). Enterprise resource planning: identifying relationships among critical success factors. *Business Process Management Journal*, 21(6), 1337–1352. <https://doi.org/10.1108/BPMJ-12-2014-0128>
- Bayrak, T. (2013). A decision framework for SME Information Technology (IT) managers: Factors for evaluating whether to outsource internal applications to Application Service Providers. *Technology in Society*, 35(1), 14–21. <https://doi.org/10.1016/j.techsoc.2012.11.001>

- Bharadwaj, S., Bharadwaj, A., & Bendoly, E. (2007). The Performance Effects of Complementarities Between Information Systems, Marketing, Manufacturing, and Supply Chain Processes. *Information Systems Research*, 18(4), 437–453. <https://doi.org/10.1287/isre.1070.0148>
- Bootz, J.-P., Michel, S., Pallud, J., & Monti, R. (2022). Possible changes of Industry 4.0 in 2030 in the face of uberization: Results of a participatory and systemic foresight study. *Technological Forecasting and Social Change*, 184, 121962. <https://doi.org/10.1016/j.techfore.2022.121962>
- Bouwman, H., Nikou, S., & de Reuver, M. (2019). Digitalization, business models, and SMEs: How do business model innovation practices improve performance of digitalizing SMEs? *Telecommunications Policy*, 43(9), 101828. <https://doi.org/10.1016/j.telpol.2019.101828>
- Canhoto, A. I., Quinton, S., Pera, R., Molinillo, S., & Simkin, L. (2021). Digital strategy aligning in SMEs: A dynamic capabilities perspective. *The Journal of Strategic Information Systems*, 30(3), 101682. <https://doi.org/10.1016/j.jsis.2021.101682>
- Casadesus-Masanell, R., & Ricart, J. E. (2010). From Strategy to Business Models and onto Tactics. *Long Range Planning*, 43(2–3), 195–215. <https://doi.org/10.1016/j.lrp.2010.01.004>
- Castela, B. M. S., Ferreira, F. A. F., Ferreira, J. J. M., & Marques, C. S. E. (2018). Assessing the innovation capability of small- and medium-sized enterprises using a non-parametric and integrative approach. *Management Decision*, 56(6), 1365–1383. <https://doi.org/10.1108/MD-02-2017-0156>
- Cenamora, J., Parida, V., & Wincent, J. (2019). How entrepreneurial SMEs compete through digital platforms: The roles of digital platform capability, network capability and ambidexterity. *Journal of Business Research*, 100, 196–206. <https://doi.org/10.1016/j.jbusres.2019.03.035>
- Chang, S.-I., Hung, S.-Y., Yen, D., & Lee, P.-J. (2012). Critical Factors of ERP Adoption for Small- and Medium- Sized Enterprises: An Empirical Study. In F. Tan (Ed.), *International Comparisons of Information Communication Technologies: Advancing Applications* (pp. 205–230). IGI Global. <https://doi.org/10.4018/978-1-61350-480-2.ch009>
- Chaudhuri, S., Dayal, U., & Narasayya, V. (2011). An overview of business intelligence technology. *Communications of the ACM*, 54(8), 88–98. <https://doi.org/10.1145/1978542.1978562>
- Chen, D. B., van der Beek, J., & Cloud, J. (2019). Hypothesis for a Risk Cost of Carbon: Revising the Externalities and Ethics of Climate Change. In *Understanding Risks and Uncertainties in Energy and Climate Policy* (pp. 183–222). Springer International Publishing. [https://doi.org/10.1007/978-3-030-03152-7\\_8](https://doi.org/10.1007/978-3-030-03152-7_8)
- Chiu, C.-N., & Yang, C.-L. (2019). Competitive advantage and simultaneous mutual influences between information technology adoption and service innovation: Moderating effects of environmental factors. *Structural Change and Economic Dynamics*, 49, 192–205. <https://doi.org/10.1016/j.strueco.2018.09.005>
- Chong, W. K., Shafaghi, M., Woollaston, C., & Lui, V. (2010). B2B e-marketplace: an e-marketing framework for B2B commerce. *Marketing Intelligence & Planning*, 28(3), 310–329. <https://doi.org/10.1108/02634501011041444>

- Christen, T., Hess, M., Grichnik, D., & Wincent, J. (2022). Value-based pricing in digital platforms: A machine learning approach to signaling beyond core product attributes in cross-platform settings. *Journal of Business Research*, 152, 82–92. <https://doi.org/10.1016/j.jbusres.2022.07.042>
- Cocca, P., Schiuma, G., Viscardi, M., & Floreani, F. (2022). Knowledge management system requirements to support Engineering-To-Order manufacturing of SMEs. *Knowledge Management Research & Practice*, 20(6), 814–827. <https://doi.org/10.1080/14778238.2021.1939174>
- Cohen, W. M., & Klepper, S. (1996). A Reprise of Size and R & D. *The Economic Journal*, 106(437), 925. <https://doi.org/10.2307/2235365>
- Costa, E., Lucas Soares, A., & Pinho de Sousa, J. (2017). Institutional networks for supporting the internationalisation of SMEs: the case of industrial business associations. *Journal of Business & Industrial Marketing*, 32(8), 1182–1202. <https://doi.org/10.1108/JBIM-03-2017-0067>
- Costa, R. V, Fernández-Jardon Fernández, C., & Figueroa Dorrego, P. (2014). Critical elements for product innovation at Portuguese innovative SMEs: an intellectual capital perspective. *Knowledge Management Research & Practice*, 12(3), 322–338. <https://doi.org/10.1057/kmrp.2014.15>
- de Salas, K., Lewis, I. J., & Huxley, C. (2017). Using the critical process targeting method to improve SMEs’ process understanding. *Business Process Management Journal*, 23(2), 425–447. <https://doi.org/10.1108/BPMJ-06-2014-0052>
- Dutta, A., Peng, G. C. A., & Choudhary, A. (2013). Risks in Enterprise Cloud Computing: The Perspective of it Experts. *Journal of Computer Information Systems*, 53(4), 39–48. <https://doi.org/10.1080/08874417.2013.11645649>
- Eller, R., Alford, P., Kallmünzer, A., & Peters, M. (2020). Antecedents, consequences, and challenges of small and medium-sized enterprise digitalization. *Journal of Business Research*, 112, 119–127. <https://doi.org/10.1016/j.jbusres.2020.03.004>
- Fitriasari, F. (2020). How do Small and Medium Enterprise (SME) survive the COVID-19 outbreak? *Jurnal Inovasi Ekonomi*, 5(02). <https://doi.org/10.22219/jiko.v5i3.11838>
- Forsman, H. (2008). Business development success in SMEs: a case study approach. *Journal of Small Business and Enterprise Development*, 15(3), 606–622. <https://doi.org/10.1108/14626000810892382>
- Gangwar, H., Date, H., & Ramaswamy, R. (2015). Understanding determinants of cloud computing adoption using an integrated TAM-TOE model. *Journal of Enterprise Information Management*, 28(1), 107–130. <https://doi.org/10.1108/JEIM-08-2013-0065>
- Garg, A., Goyal, D. P., & Lather, A. S. (2010). The influence of the best practices of information system development on software SMEs: a research scope. *International Journal of Business Information Systems*, 5(3), 268. <https://doi.org/10.1504/IJBIS.2010.031930>
- Hameed, Z., Naeem, R. M., Misra, P., Chotia, V., & Malibari, A. (2023). Ethical leadership and environmental performance: The role of green IT capital, green technology innovation, and technological orientation. *Technological Forecasting and Social Change*, 194, 122739. <https://doi.org/10.1016/j.techfore.2023.122739>

- Hampel, C. E., Tracey, P., & Weber, K. (2020). The Art of the Pivot: How New Ventures Manage Identification Relationships with Stakeholders as They Change Direction. *Academy of Management Journal*, 63(2), 440–471. <https://doi.org/10.5465/amj.2017.0460>
- Hanaysha, J. R., Al-Shaikh, M. E., Joghee, S., & Alzoubi, H. M. (2022). Impact of Innovation Capabilities on Business Sustainability in Small and Medium Enterprises. *FIIB Business Review*, 11(1), 67–78. <https://doi.org/10.1177/231971452111042232>
- Haqqi, H. (2023). The Government’s Policy in Encouraging the Global Competitiveness of Indonesian MSMEs through the Digital Ecosystem. *Journal of Economics, Management and Trade*, 29(8), 66–76. <https://doi.org/10.9734/jemt/2023/v29i81115>
- Haug, A., Adsbøll Wickstrøm, K., Stentoft, J., & Philipsen, K. (2023). The impact of information technology on product innovation in SMEs: The role of technological orientation. *Journal of Small Business Management*, 61(2), 384–410. <https://doi.org/10.1080/00472778.2020.1793550>
- Hayes, S., Freudenberg, B., & Delaney, D. (2018). Role of Tax Knowledge and Skills: What Are the Graduate Skills Required by Small to Medium Accounting Firms. *Journal of Australasian Tax Teachers Association*, 13(1), 152–186.
- Heim, I., Kalyuzhnova, Y., Li, W., & Liu, K. (2019). Value co-creation between foreign firms and indigenous small- and medium-sized enterprises (SMEs) in Kazakhstan’s oil and gas industry: The role of information technology spillovers. *Thunderbird International Business Review*, 61(6), 911–927. <https://doi.org/10.1002/tie.22067>
- Herrmann, E., Call, J., Hernández-Lloreda, M. V., Hare, B., & Tomasello, M. (2007). Humans Have Evolved Specialized Skills of Social Cognition: The Cultural Intelligence Hypothesis. *Science*, 317(5843), 1360–1366. <https://doi.org/10.1126/science.1146282>
- Hock-Doepgen, M., Clauss, T., Kraus, S., & Cheng, C.-F. (2021). Knowledge management capabilities and organizational risk-taking for business model innovation in SMEs. *Journal of Business Research*, 130, 683–697. <https://doi.org/10.1016/j.jbusres.2019.12.001>
- Hoque, Z. (2014). 20 years of studies on the balanced scorecard: Trends, accomplishments, gaps and opportunities for future research. *The British Accounting Review*, 46(1), 33–59. <https://doi.org/10.1016/j.bar.2013.10.003>
- Hung, S.-Y., Chen, C. C., & Huang, N.-H. (2014). An Integrative Approach To Understanding Customer Satisfaction With E-Service Of Online Stores. *Journal of Electronic Commerce Research*, 15(1).
- Hung, Y., Huang, S., Lin, Q., & -Tsai, M. (2005). Critical factors in adopting a knowledge management system for the pharmaceutical industry. *Industrial Management & Data Systems*, 105(2), 164–183. <https://doi.org/10.1108/02635570510583307>
- Jackson, D., Michelson, G., & Munir, R. (2022). New technology and desired skills of early career accountants. *Pacific Accounting Review*, 34(4), 548–568. <https://doi.org/10.1108/PAR-04-2021-0045>
- Jiang, H., Yang, J., & Gai, J. (2023). How digital platform capability affects the innovation performance of SMEs—Evidence from China. *Technology in Society*, 72, 102187. <https://doi.org/10.1016/j.techsoc.2022.102187>

- Jiang, M., Hu, Y., & Li, X. (2020). Financial Support for Small and Medium-Sized Enterprises in China Amid COVID-19. *Finance: Theory and Practice*, 24(5), 6–14. <https://doi.org/10.26794/2587-5671-2020-24-5-6-14>
- Kamien, M. I., & Schwartz, N. L. (1975). Market Structure and Innovation: A Survey. *Journal of Economic Literature*, 13(1), 1–37.
- Katemukda, N., Kropsu Vehkaperä, H., Comepa, N., & Sudasna na Ayudhya, P. (2018). Productivity enhancement through intellectual capital and information technology. *International Journal of Management and Enterprise Development*, 17(3), 267. <https://doi.org/10.1504/IJMED.2018.10014493>
- Khan, I., & Trzecieliński, S. (2018). Information Technology Adaptation in Indian Small and Medium Sized Enterprises: Opportunities and Challenges Ahead. *Management and Production Engineering Review*, 9(3), 41–48.
- Kiebach, R., Pirou, S., Martinez Aguilera, L., Haugen, A. B., Kaiser, A., Hendriksen, P. V., Balaguer, M., García-Fayos, J., Serra, J. M., Schulze-Küppers, F., Christie, M., Fischer, L., Meulenberg, W. A., & Baumann, S. (2022). A review on dual-phase oxygen transport membranes: from fundamentals to commercial deployment. *Journal of Materials Chemistry A*, 10(5), 2152–2195. <https://doi.org/10.1039/D1TA07898D>
- Knight, G. (2000). Entrepreneurship and Marketing Strategy: The SME under Globalization. *Journal of International Marketing*, 8(2), 12–32. <https://doi.org/10.1509/jimk.8.2.12.19620>
- Korsgaard, S., Hunt, R. A., Townsend, D. M., & Ingstrup, M. B. (2020). COVID-19 and the importance of space in entrepreneurship research and policy. *International Small Business Journal: Researching Entrepreneurship*, 38(8), 697–710. <https://doi.org/10.1177/0266242620963942>
- Kowrdziej, R., Parka, J., Krupka, J., Olifierczuk, M., Nowinowski-Kruszelnicki, E., Jaroszewicz, L., & Chojnowska, O. (2013). Dielectric properties of highly anisotropic nematic liquid crystals for tunable microwave components. *Applied Physics Letters*, 103(17). <https://doi.org/10.1063/1.4826504>
- Kraus, S., Roig-Tierno, N., & Bouncken, R. B. (2019). Digital innovation and venturing: an introduction into the digitalization of entrepreneurship. *Review of Managerial Science*, 13, 519–528. <https://doi.org/10.1007/s11846-019-00333-8>
- Kyobe, M. E. (2004). Investigating the Strategic Utilization of IT Resources in the Small and Medium-Sized Firms of the Eastern Free State Province. *International Small Business Journal: Researching Entrepreneurship*, 22(2), 131–158. <https://doi.org/10.1177/0266242604041311>
- Lawrence, P. R., & Lorsch, J. W. (1967). Differentiation and Integration in Complex Organizations. *Administrative Science Quarterly*, 12(1), 1–47. <https://doi.org/10.2307/2391211>
- Lee, C.-C., He, Z.-W., & Yuan, Z. (2023). A pathway to sustainable development: Digitization and green productivity. *Energy Economics*, 124, 106772. <https://doi.org/10.1016/j.eneco.2023.106772>
- Lee, J. Y., Yang, Y. S., Ghauri, P. N., & Park, B. II. (2022). The Impact of Social Media and Digital Platforms Experience on SME International Orientation: The Moderating Role of COVID-19 Pandemic. *Journal of International Management*, 28(4), 100950. <https://doi.org/10.1016/j.intman.2022.100950>

- Leonardi, P. M., & Vaast, E. (2017). Social Media and Their Affordances for Organizing: A Review and Agenda for Research. *Academy of Management Annals*, 11(1), 150–188. <https://doi.org/10.5465/annals.2015.0144>
- Lin, F., Evans, R. D., Kharel, R., & Williams, R. A. (2022). Competitor Intelligence and Product Innovation: The Role of Open-Mindedness and Interfunctional Coordination. *IEEE Transactions on Engineering Management*, 69(2), 314–328. <https://doi.org/10.1109/TEM.2019.2943359>
- Lin, K. Z., Cheng, S., & Zhang, F. (2017). Corporate Social Responsibility, Institutional Environments, and Tax Avoidance: Evidence from a Subnational Comparison in China. *The International Journal of Accounting*, 52(4), 303–318. <https://doi.org/10.1016/j.intacc.2017.11.002>
- Lin, S.-W. (2016). The critical success factors for a travel application service provider evaluation and selection by travel intermediaries. *Tourism Management*, 56, 126–141. <https://doi.org/10.1016/j.tourman.2016.03.028>
- Lombardi, R., & Secundo, G. (2021). The digital transformation of corporate reporting – a systematic literature review and avenues for future research. *Meditari Accountancy Research*, 29(5), 1179–1208. <https://doi.org/10.1108/MEDAR-04-2020-0870>
- Lutfi, M., Chintya Dewi Buntuang, P., Kornelius, Y., Erdiyansyah, & Hasanuddin, B. (2020). The impact of social distancing policy on small and medium-sized enterprises (SMEs) in Indonesia. *Problems and Perspectives in Management*, 18(3), 492–503. [https://doi.org/10.21511/ppm.18\(3\).2020.40](https://doi.org/10.21511/ppm.18(3).2020.40)
- Marchand, M., & Raymond, L. (2018). Performance measurement and management systems as IT artefacts. *International Journal of Productivity and Performance Management*, 67(7), 1214–1233. <https://doi.org/10.1108/IJPPM-08-2017-0206>
- Mazzucchelli, A., Chierici, R., Tortora, D., & Fontana, S. (2021). Innovation capability in geographically dispersed R&D teams: The role of social capital and IT support. *Journal of Business Research*, 128, 742–751. <https://doi.org/10.1016/j.jbusres.2019.05.034>
- Melville, Kraemer, & Gurbaxani. (2004). Review: Information Technology and Organizational Performance: An Integrative Model of IT Business Value. *MIS Quarterly*, 28(2), 283. <https://doi.org/10.2307/25148636>
- Mishrif, A., & Khan, A. (2023). Technology adoption as survival strategy for small and medium enterprises during COVID-19. *Journal of Innovation and Entrepreneurship*, 12(1), 53. <https://doi.org/10.1186/s13731-023-00317-9>
- Mithas, S., & Rust, R. T. (2016). How Information Technology Strategy and Investments Influence Firm Performance: Conjecture and Empirical Evidence. *MIS Quarterly*, 40(1), 223–245. <https://doi.org/10.25300/MISQ/2016/40.1.10>
- Moll, J., & Yigitbasioglu, O. (2019). The role of internet-related technologies in shaping the work of accountants: New directions for accounting research. *The British Accounting Review*, 51(6), 100833. <https://doi.org/10.1016/j.bar.2019.04.002>
- Monzavi, M., Chen, Z., Hussain, A., & Chaouki, J. (2023). High quality products from microwave catalytic pyrolysis of heavy oil and polyethylene. *Applied Thermal Engineering*, 230, 120722. <https://doi.org/10.1016/j.applthermaleng.2023.120722>



- Morgan, J. (2016). Corporation tax as a problem of MNC organisational circuits: The case for unitary taxation. *The British Journal of Politics and International Relations*, 18(2), 463–481. <https://doi.org/10.1177/1369148115623213>
- Mrugalska, B., & Ahmed, J. (2021). Organizational Agility in Industry 4.0: A Systematic Literature Review. *Sustainability*, 13(15), 8272. <https://doi.org/10.3390/su13158272>
- Musiello-Neto, F., Rua, O. L., Arias-Oliva, M., & Silva, A. F. (2021). Open Innovation and Competitive Advantage on the Hospitality Sector: The Role of Organizational Strategy. *Sustainability*, 13(24), 13650. <https://doi.org/10.3390/su132413650>
- Neirotti, P., Paolucci, E., & Raguseo, E. (2013). Is it all about size? Comparing organisational and environmental antecedents of IT assimilation in small and medium-sized enterprises. *International Journal of Technology Management*, 61(1), 82. <https://doi.org/10.1504/IJTM.2013.050245>
- Nicola, M., Alsafi, Z., Sohrabi, C., Kerwan, A., Al-Jabir, A., Iosifidis, C., Agha, M., & Agha, R. (2020). The socio-economic implications of the coronavirus pandemic (COVID-19): A review. *International Journal of Surgery*, 78, 185–193. <https://doi.org/10.1016/j.ijsu.2020.04.018>
- Palazzo, G. (2020). *From corona anxiety towards a new Enlightenment – Why a return to normal is not a meaningful option*. *Business & Society*. <http://businessandsociety.org/from-corona-anxiety-towards-a-new-enlightenment-why-a-return-to-normal-is-not-a-meaningful-option/>
- Pelletier, C., & Cloutier, L. M. (2019). Conceptualising digital transformation in SMEs: an ecosystemic perspective. *Journal of Small Business and Enterprise Development*, 26(6/7), 855–876. <https://doi.org/10.1108/JSBED-05-2019-0144>
- Peng, G. C. A., & Nunes, M. B. (2013). Establishing and Verifying a Risk Ontology for Surfacing ERP Post-Implementation Risks. In M. N. Ahmad, R. Colomb, & M. Abdullah (Eds.), *Ontology-Based Applications for Enterprise Systems and Knowledge Management* (p. 25). IGI Global. <https://doi.org/10.4018/978-1-4666-1993-7.ch003>
- Poje, T., & Zaman Groff, M. (2022). Mapping Ethics Education in Accounting Research: A Bibliometric Analysis. *Journal of Business Ethics*, 179(2), 451–472. <https://doi.org/10.1007/s10551-021-04846-9>
- Popa, S., Soto-Acosta, P., & Palacios-Marqués, D. (2022). A discriminant analysis of high and low-innovative firms: the role of IT, human resources, innovation strategy, intellectual capital and environmental dynamism. *Journal of Knowledge Management*, 26(6), 1615–1632. <https://doi.org/10.1108/JKM-04-2021-0272>
- Prasanna, R., Jayasundara, J., Naradda Gamage, S. K., Ekanayake, E., Rajapakshe, P., & Abeyrathne, G. (2019). Sustainability of SMEs in the Competition: A Systemic Review on Technological Challenges and SME Performance. *Journal of Open Innovation: Technology, Market, and Complexity*, 5(4), 100. <https://doi.org/10.3390/joitmc5040100>
- Rehm, S.-V., & Goel, L. (2017). Using information systems to achieve complementarity in SME innovation networks. *Information & Management*, 54(4), 438–451. <https://doi.org/10.1016/j.im.2016.10.003>

- Rodrigues, M., Franco, M., Silva, R., & Oliveira, C. (2021). Success Factors of SMEs: Empirical Study Guided by Dynamic Capabilities and Resources-Based View. *Sustainability*, 13(21), 12301. <https://doi.org/10.3390/su132112301>
- Sánchez-Bayón, A. (2023). Digital Transition and Readjustment on EU Tourism Industry. *Studies in Business and Economics*, 18(1), 275–297. <https://doi.org/10.2478/sbe-2023-0015>
- Sarango-Lalangui, P., Rodríguez, J., Tapia Carreño, K., & Galarza, B. (2023). Evolution and Trends in SME Digitization Research: A Bibliometric Analysis. *Journal of Technology Management & Innovation*, 18(1), 53–66. <https://doi.org/10.4067/S0718-27242023000100053>
- Saridakis, G., Lai, Y., & Cooper, C. L. (2017). Exploring the relationship between HRM and firm performance: A meta-analysis of longitudinal studies. *Human Resource Management Review*, 27(1), 87–96. <https://doi.org/10.1016/j.hrmr.2016.09.005>
- Secundo, G., Ndou, V., Vecchio, P. Del, & De Pascale, G. (2020). Sustainable development, intellectual capital and technology policies: A structured literature review and future research agenda. *Technological Forecasting and Social Change*, 153, 119917. <https://doi.org/10.1016/j.techfore.2020.119917>
- Shiranifar, A., Rahmati, M., & Jafari, F. (2019). Linking IT to supply chain agility: does knowledge management make a difference in SMEs. *International Journal of Logistics Systems and Management*, 34(1), 123. <https://doi.org/10.1504/IJLSM.2019.102066>
- Soni, G., Kumar, S., Mahto, R. V., Mangla, S. K., Mittal, M. L., & Lim, W. M. (2022). A decision-making framework for Industry 4.0 technology implementation: The case of FinTech and sustainable supply chain finance for SMEs. *Technological Forecasting and Social Change*, 180, 121686. <https://doi.org/10.1016/j.techfore.2022.121686>
- Soto-Acosta, P., Popa, S., & Martinez-Conesa, I. (2018). Information technology, knowledge management and environmental dynamism as drivers of innovation ambidexterity: a study in SMEs. *Journal of Knowledge Management*, 22(4), 824–849. <https://doi.org/10.1108/JKM-10-2017-0448>
- Surya, B., Menne, F., Sabhan, H., Suriani, S., Abubakar, H., & Idris, M. (2021). Economic Growth, Increasing Productivity of SMEs, and Open Innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(1), 20. <https://doi.org/10.3390/joitmc7010020>
- Suwanto, S., Sunarsi, D., & Achmad, W. (2022). Effect of Transformational Leadership, Servant Leadershi, and Digital Transformation on MSMEs Performance and Work Innovation Capabilities. *Central European Management Journal*, 30(4). <https://doi.org/10.57030/23364890.cemj.30.4.71>
- Tallon, P. P., Queiroz, M., Coltman, T., & Sharma, R. (2019). Information technology and the search for organizational agility: A systematic review with future research possibilities. *The Journal of Strategic Information Systems*, 28(2), 218–237. <https://doi.org/10.1016/j.jsis.2018.12.002>
- Tu, Y., & Wu, W. (2021). How does green innovation improve enterprises' competitive advantage? The role of organizational learning. *Sustainable Production and Consumption*, 26, 504–516. <https://doi.org/10.1016/j.spc.2020.12.031>

- Usman Shehzad, M., Zhang, J., Le, P. B., Jamil, K., & Cao, Z. (2023). Stimulating frugal innovation via information technology resources, knowledge sources and market turbulence: a mediation-moderation approach. *European Journal of Innovation Management*, 26(4), 1071–1105. <https://doi.org/10.1108/EJIM-08-2021-0382>
- Vitolla, F., Raimo, N., Rubino, M., & Garegnani, G. M. (2021). Do cultural differences impact ethical issues? Exploring the relationship between national culture and quality of code of ethics. *Journal of International Management*, 27(1), 100823. <https://doi.org/10.1016/j.intman.2021.100823>
- Wade, M., & Hulland, J. (2004). Review: The Resource-Based View and Information Systems Research: Review, Extension, and Suggestions for Future Research. *MIS Quarterly*, 28(1), 107–142. <https://doi.org/10.2307/25148626>
- Waldner, F., Poetz, M. K., Grimpe, C., & Eurich, M. (2015). Antecedents and Consequences of Business Model Innovation: The Role of Industry Structure. In *Business Models and Modelling (Advances in Strategic Management, Vol. 33)* (pp. 347–386). Emerald Group Publishing Limited. <https://doi.org/10.1108/S0742-332220150000033009>
- Wang, C., & Han, Y. (2011). Linking properties of knowledge with innovation performance: the moderate role of absorptive capacity. *Journal of Knowledge Management*, 15(5), 802–819. <https://doi.org/10.1108/13673271111174339>
- Won, J. Y., & Park, M. J. (2020). Smart factory adoption in small and medium-sized enterprises: Empirical evidence of manufacturing industry in Korea. *Technological Forecasting and Social Change*, 157, 120117. <https://doi.org/10.1016/j.techfore.2020.120117>
- Wu, Y., Schuster, M., Chen, Z., Le, Q. V., Norouzi, M., Macherey, W., Krikun, M., Cao, Y., Gao, Q., Macherey, K., Klingner, J., Shah, A., Johnson, M., Liu, X., Kaiser, Ł., Gouws, S., Kato, Y., Kudo, T., Kazawa, H., ... Dean, J. (2016). Google's Neural Machine Translation System: Bridging the Gap between Human and Machine Translation. *ArXiv Preprint ArXiv:1609.08144*, 1–23. <http://arxiv.org/abs/1609.08144>
- Xie, X., Han, Y., Anderson, A., & Ribeiro-Navarrete, S. (2022). Digital platforms and SMEs' business model innovation: Exploring the mediating mechanisms of capability reconfiguration. *International Journal of Information Management*, 65, 102513. <https://doi.org/10.1016/j.ijinfomgt.2022.102513>
- Xie, Y., James Allen, C., & Ali, M. (2014). An integrated decision support system for ERP implementation in small and medium sized enterprises. *Journal of Enterprise Information Management*, 27(4), 358–384. <https://doi.org/10.1108/JEIM-10-2012-0077>
- Yang, Y., Kobbacy, Y., Onofrei, G., & Nguyen, H. (2023). Entrepreneurial strategies for coping with supply chain disruptions in the grocery-retail sector. *Journal of Small Business and Enterprise Development*, 30(2), 213–233. <https://doi.org/10.1108/JSBED-04-2022-0201>
- Yii, C. C., Rohani, M. N. K. ., Isa, M., Hassan, S. I. ., Ismail, B., & Hussin, N. (2015). Multi-end partial discharge location algorithm based on trimmed mean data filtering technique for MV underground cable. *2015 IEEE Student Conference on Research and Development (SCOREd)*, 345–350. <https://doi.org/10.1109/SCORED.2015.7449353>
- Yu, Y., Jia, T., & Chen, X. (2017). The 'how' and 'where' of plant microRNAs. *New Phytologist*, 216(4), 1002–1017. <https://doi.org/10.1111/nph.14834>

- Yusuf, M., Surya, B., Menne, F., Ruslan, M., Suriani, S., & Iskandar, I. (2022). Business Agility and Competitive Advantage of SMEs in Makassar City, Indonesia. *Sustainability*, 15(1), 627. <https://doi.org/10.3390/su15010627>
- Zhang, X., Gao, C., & Zhang, S. (2022). The niche evolution of cross-boundary innovation for Chinese SMEs in the context of digital transformation--Case study based on dynamic capability. *Technology in Society*, 68, 101870. <https://doi.org/10.1016/j.techsoc.2022.101870>