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How Does Information Technology Capabilities Impact On SMES? In Sights From Literatur Review

Bagaimana Dampak Kemampuan Teknologi Informasi Terhadap UKM? Ditinjau Dari Tinjauan Literatur

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ABSTRACT
The purpose of this study is to systematically review the existing literature on information technology capability (ITC). This research uses the systematic literature review (SLR) method based on phenomena that are answered from various studies sourced from journals that have been published following current developments related to information technology capability. This study searched all research on ITC from 1993 to 2024, found 167 articles, and used 74 articles from Scopus. The results of this study indicate that ITC offers great opportunities and has a positive impact on SMEs, but support from the government and related institutions is needed to overcome the challenges, so that SMEs can optimally utilize technology for business growth and sustainability. Therefore, this study concludes that the relationship between the antecedents and consequences of ITC shows the importance of the factors that influence ITC. By understanding and developing the right antecedents and consequences, organizations can leverage ITC to survive in increasingly complex and dynamic markets.
Keywords: *Future Research, Information Technology Capabilities, Literatur Review, Prisma, SMEs.*

ABSTRAK
Tujuan dari penelitian ini adalah untuk meninjau secara sistematis literatur yang ada tentang kemampuan teknologi informasi (ITC). Penelitian ini menggunakan metode systematic literature review (SLR) berdasarkan fenomena yang dijawab dari berbagai penelitian yang bersumber dari jurnal-jurnal yang telah dipublikasikan mengikuti perkembangan terkini terkait kapabilitas teknologi informasi. Penelitian ini mencari semua penelitian tentang ITC dari tahun 1993 hingga 2024, menemukan 167 artikel, dan menggunakan 74 artikel dari Scopus. Hasil dari penelitian ini menunjukkan bahwa ITC menawarkan peluang yang besar dan memberikan dampak positif bagi UKM, namun diperlukan dukungan dari pemerintah dan lembaga terkait untuk mengatasi tantangan yang ada, sehingga UKM dapat memanfaatkan teknologi secara optimal untuk pertumbuhan dan keberlanjutan bisnis. Oleh karena itu, penelitian ini menyimpulkan bahwa hubungan antara anteseden dan konsekuensi dari ITC menunjukkan pentingnya faktor-faktor yang mempengaruhi ITC. Dengan memahami dan mengembangkan anteseden dan konsekuensi yang tepat, organisasi dapat memanfaatkan TI untuk bertahan di pasar yang semakin kompleks dan dinamis.
Kata Kunci: Penelitian Masa Depan, Kemampuan Teknologi Informasi, Tinjauan Literatur, Prisma, UKM.

1. Introduction

Information technology capabilities play an essential role in business survival. (Dalenogare et al., 2018). In an increasingly advanced digital era, businesses are often faced with challenges that require them to utilize information technology capabilities to increase competitiveness and seize unique opportunities (Khalil-Alshaar, 2023). Limited resources both in terms of financial and human resources are one of the main problems of implementing information technology capability in SMEs (Mncube et al., 2023), the lack of budget to invest in information technology infrastructure makes many SMEs forced to use inefficient information technology and lack of skilled labor in utilizing information technology optimally. Ntorukiri et

al., (2022) found that information technology infrastructure is inadequate such as expensive network access services and antiquated hardware. Businesses that have good information technology capabilities are better able to adapt and survive market dynamics (Li & Chan, 2019). In the ever-changing business dynamics, the ability to adapt quickly is crucial for the growth of SMEs (Gagan Deep, 2023).

Responding to the problems often faced by SMEs in implementing information technology capabilities can be overcome by several stages; starting to hold training and development of human resources regarding digital literacy (Öngel et al., 2022), providing grants or subsidies from the government and financial institutions in helping SMEs invest in information technology capabilities (Jayeola et al., 2022), working with internet access service providers to improve internet accessibility and speed especially in areas that lack access support (Tognisse et al., 2021). Information technology capabilities open up global access opportunities for businesses, allowing businesses to compete in a wider market (Trieu et al., 2023). Investment in information technology capabilities can provide the competitive advantage needed to thrive in an increasingly competitive business environment (Pérez-Aróstegui & Martínez-López, 2014).

Research on information technology capabilities using the Systematic Literature Review (SLR) method is fundamental to understanding the role of information technology capabilities in influencing businesses, especially SMEs (Carrera-Rivera et al., 2022). SLR gathers evidence from various existing studies to identify key findings, gaps, and areas for future research so as to provide a more in-depth and comprehensive knowledge awareness (Alam 2024). Research on information technology capabilities in SMEs has been conducted by Gaol et al. (2022) with a research focus on information technology capabilities in the banking sector with database data from IEEE Xplore, Elsevier, SpringerLink, ACM, and AIS from 2015 to 2021, Syamfithriani et al. (2024) Focus on researching the information technology capabilities of SMEs in the culinary sector with database data from Google Scholar from 2018 to 2022, Yuwono et al. (2024) on researching information technology capabilities in SMEs in manufacturing with a database from Scopus from 2014 to 2023, Adjei-Bamfo, Maloreh-Nyamekye, and Ahenkan (2019) Focus on researching information technology capabilities in government with a database from Oxford Academic, Emerald Insight, ScienceDirect, Springer, Sage, Elsevier, Taylor and Francis, Wiley Online Library, JSTOR, and Google Scholar from 2001 to 2017 to complement the growing SLR research this research takes big data from Scopus from 1993 to 2024 (Fernandes, 2022)Scopus is a database that is popular among other databases because of the very high quality of research articles it contains. (Pujianto et al. 2023). However, SLR research that focuses on information technology capabilities in the SME sector is still limited. Therefore, this study aims to systematically review the existing literature on information technology capabilities and analyze the key variables that can influence the application of information technology capabilities in several sectors. This research develops policy recommendations that can be implemented by relevant parties in supporting SMEs to implement information technology capabilities efficiently. Therefore, the research question in this study is:

1. What are the key factors influence information technology capabilities?
2. What is the impact information technology capabilities?

To answer this, this study establishes the PRISMA review protocol applied to the Scopus database through keywords to explore related articles. (Khan et al., 2003). This research limits articles between the period 1993 to 2024 in English, 1993 became an important year for the internet, web developers at the European Organization for Nuclear Research (French acronym CERN) released Mosaic as the first open and publicly usable intrernet browser (Europ, Pour, and Recherche 2023). Furthermore, Chu et al., (2019) found that Information technology capabilities are becoming an increasingly crucial topic in the business

world, especially SMEs. ITC can provide a significant competitive advantage for SMEs. With the increasing adoption of information technology, SMEs are faced with new challenges and opportunities (Moreira et al., 2024). Strong ITC can improve the operational efficiency of SMEs, Lu & Shaharudin, (2024) ITC can help SMEs to automate business processes, cost efficiency and increase productivity. Rutainurwa et al., (2024) emphasized that good ITC can help SMEs in managing supply chains and improving coordination between departments that contribute to higher operational efficiency. ITC also plays an important role in driving innovation in SMEs (Salisu & Abu Bakar, 2020). ITC is very influential in increasing the competitiveness of SMEs (Peña-Vinces et al., 2012). Mishrif & Khan, (2023) Good ITC helps SMEs to innovate and adapt quickly to market changes which is key to maintaining competitive advantage. Neirotti et al., (2018) showed that SMEs that develop ITC can more effectively respond to customer needs and take advantage of market opportunities so as to improve the position of SMEs in the industry.

This research is expected to provide a deeper understanding of the factors that influence the application of information technology capabilities in SMEs and how the impact of its application on SMEs. This research is useful in providing insights for policy makers, government and financial institutions in facilitating SMEs related to the application of information technology capabilities, for education and training institutions this research can be a reference for the design of relevant programs in improving the digital literacy of SMEs.

2. Literature Review

Information Technology Capabilities (ITC)

Information technology capabilities are becoming an increasingly crucial topic in the business world, especially SMEs (Chu et al., 2019). ITC can provide a significant competitive advantage for SMEs. With the increasing adoption of information technology, SMEs are faced with new challenges and opportunities (Moreira, Mamede, and Santos, 2024). Strong ITC can improve the operational efficiency of SMEs. Lu & Shaharudin (2024) state that ITC can help SMEs automate business processes, increase cost efficiency, and increase productivity. Rutainurwa et al. (2024) emphasized that good ITC can help SMEs manage supply chains and improve coordination between departments, contributing to higher operational efficiency. ITC also plays a vital role in driving innovation in SMEs (Salisu and Abu Bakar, 2020). SMEs with ITC are better able to develop new products and services to adapt to market changes (Xuyao & Yan, 2021). ITC is very influential in increasing the competitiveness of SMEs (Peña-Vinces et al., 2012). Mishrif & Khan (2023) Good ITC helps SMEs to innovate and adapt quickly to market changes, which is key to maintaining competitive advantage. Neirotti et al. (2018) showed that SMEs that develop ITC can more effectively respond to customer needs and take advantage of market opportunities so as to improve the position of SMEs in the industry.

Esfandiar et al., (2019) Found that SMEs that implement ITC can help optimize resource management and accelerate the decision-making process, which increases productivity. Giannoccaro et al., (2020) It is found that SMEs that utilize ITC for marketing and customer interaction not only impact customer satisfaction or loyalty but also expand market reach, which ultimately contributes to revenue growth and competitiveness. Strategic ITC development becomes very important for SMEs to survive and thrive in a competitive business environment. (Eriana et al., 2025).

3. Research Methods

This research is a systematic literature review conducted through a transparent process into a structured study that includes theories, methods, publications, keywords and countries (Fernandes, 2022). The method used in this research uses the systematic literature review (SLR) method based on phenomena that are answered from various studies sourced

from journals that have been published following current developments related to information technology capability. SLR is used in research to review and evaluate existing research and help find novelty in a field of research. This study uses the Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) approach (Khan et al., 2003). This data was obtained through a systematic search of similar relevant literature on the Scopus database (Fernandes, 2022). Scopus was used as a database which is the most popular platform among other databases in terms of the very high quality of research-related articles (Baas et al., 2020). The literature search and screening procedure begins through identification using a combination search technique, the keyword criteria used in this study are "information technology capabilities", the field of study is limited to "business, management and accounting", document type "article", source "journal", language "English", the keyword criteria used include research conducted from 1993 to 2024. From the search results of the keyword criteria, 167 article documents were found; then of the 167 articles found, 93 were excluded because they were not relevant and there were 74 relevant articles. Then the 74 articles were downloaded in RIS format and re-analyzed using Vosviewers software. Vosviewers is used to present more relevant analysis results by displaying co-authorships, co-citations and keyword co-occurrence (Bukar et al., 2023). Vosviewers analysis is conducted to evaluate the most productive research articles and articles that have the highest citations and can create visual maps that make it easier to understand trends and patterns in research related to information technology capabilities in SMEs (Kirby, 2023). The flow design in this study is shown in Figure 1.

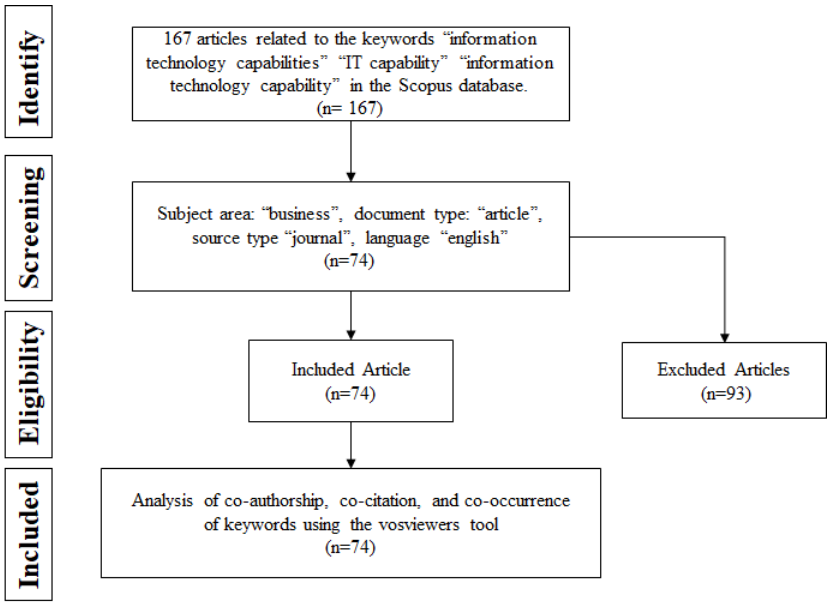

Figure 1. Research Design

4. Results and Discussions

Based on the search results, 74 articles from 1993-2024 contain the keywords "information technology capabilities" in the title, abstract, and keywords.

Number of publications, journal outlets, and publication sectors

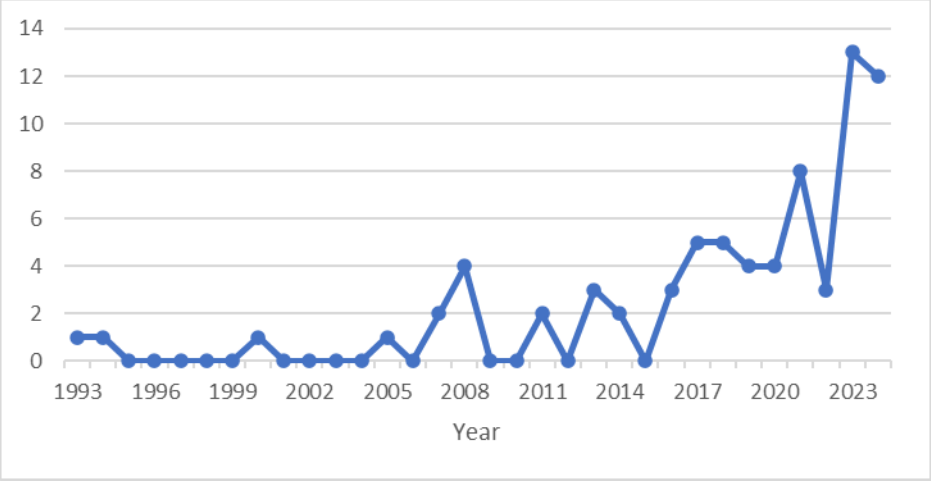

Figure 2. Publication of articles related to the keyword "information technology capabilities."

Figure 2. shows that within 31 years, there were 74 articles related to the keyword "information technology capabilities" in the business sector published in Scopus from 1993 to 2024. Figure 2. It can be shown that the publication of articles analyzed through Scopus shows that the number of publications from 1993 to 2024 has increased in publications every year with the keywords used in the study, namely "information technology capabilities" in the business sector.

Table 1. List of journal outlets

Scopus index	Journal name		Total
Q1	PSU Research Review	2	42
	Journal of Innovation and Knowledge	1	
	Information Systems Research	1	
	R and D Management	1	
	Operations Management Research	1	
	Humanities and Social Sciences Communications	1	
	Journal of Financial Reporting and Accounting	1	
	Journal of Engineering and Technology Management - JET-M	1	
	International Journal of Accounting Information Systems	1	
	International Journal of Operations and Production Management	1	
	Industrial Management and Data Systems	3	
	Journal of Supply Chain Management	1	
	Technological Forecasting and Social Change	3	
	Accounting Horizons	1	
	Journal of Strategic Information Systems	1	
	MIS Quarterly: Management Information Systems	1	
	Information and Management	1	
	Journal of Global Information Management	1	
	IEEE Transactions on Engineering Management	1	
	Journal of Enterprise Information Management	1	
	European Management Journal	1	
	Journal of Operations Management	1	
	Journal of Cleaner Production	1	
	Contemporary Accounting Research	1	
	Technology in Society	1	
	Asia Pacific Management Review	1	
	Journal of Management Information Systems	6	

	Uncertain Supply Chain Management	1	
	Journal of Management Studies	1	
	Uncertain Supply Chain Management	1	
	Multinational Business Review	1	
	Tourism Management Perspectives	1	
Q2	International Journal of Innovation and Technology Management	1	13
	International Journal of Emerging Markets	1	
	Journal of Indian Business Research	1	
	Managerial and Decision Economics	1	
	Journal of High Technology Management Research	1	
	Uncertain Supply Chain Management	1	
	International Journal of Business Information Systems	1	
	International Journal of Emerging Markets	1	
	Journal of Hospitality and Tourism Technology	1	
	Journal of Contingencies and Crisis Management	1	
	Journal of Management and Organization	1	
	International Journal of Business Information Systems	1	
	Decision Sciences	1	
Q3	Journal of Information Systems	3	13
	Information Technology and Management	1	
	Academy of Entrepreneurship Journal	1	
	AIS Transactions on Replication Research	1	
	International Journal of Supply Chain Management	3	
	International Journal of Business Excellence	1	
	International Journal of Business and Society	1	
	Journal of Technology Management and Innovation	1	
	Journal of Management Information and Decision Sciences	1	
Q4	International Journal of Recent Technology and Engineering	1	6
	Journal of East European Management Studies	1	
	International Journal of Supply Chain Management	1	
	Journal of Modern Project Management	1	
	Management Research	1	
	Journal of Managerial Issues	1	

Table 1 shows journals that publish articles related to information technology capability categorized based on the Scopus ranking index. In assessing these journals, Scopus categorizes journal quality using the term “quartile,” with four quartile levels: Q1, Q2, Q3, and Q4. Q1 is the highest or most significant cluster in terms of journal quality, with 42 articles, followed by Q2 with 13 articles, Q3 with 12 articles, and Q4 with 6 articles.

Table 2. Bibliometric search results by research sector

Sector	F	Presentation
Business, Management and Accounting	33	44,8%
Decision Science	14	19,4%
Computer Science	12	16,4%
Economics, Econometrics and Finance	4	5,5%
Engineering	4	5,5%
Social Science	3	3,6%
Psychology	2	2,4%
Environmental Science	1	1,2%
Art and Humanities	1	0,6%

Table 2 shows that the business, management, and accounting sectors conducted the most research related to “information technology capabilities” from 1993 to 2024. This

indicates that researchers often use research analysis related to “information technology capabilities” to analyze information technology capabilities in these sectors.

Top Author, Affiliation, and Country

From the results of data analysis based on Scopus database searches, it can be shown that the authors with the most contributions in research related to “information technology capabilities.” The author's contribution is measured by the number of writings per year and the number of derivative articles that cite his name as a research citation. Table 3. Shows that the authors with the most contributions to “information technology capabilities” research are Arora, B. & Rahman, Z, with a total of four publications, followed by Wei, S, Xu, D., Liu, H with a total of three publications, followed by Frost, T S, He, Z., Huangfu, J, Lim, J.-H. with a total of three publications.

Table 3. Top author

No.	Author	Publication	Cite	Journal
1.	Chae, H.-C., Koh, C E, Park, K O (Chae et al., 2018)	2	373	MIS Quarterly: Management Information Systems (2014) (Q1)
			165	Information and Management (2018) (Q1)
2.	Wei, S, Xu, D, Liu, H (Liu H et al., 2022)	3	107	International Journal of Operations and Production Management (2016) (Q1)
			46	European Journal of Innovation Management (2022) (Q1)
			41	Industrial Management and Data Systems (2021) (Q1)
3.	Frost, T S, He, Z Huangfu, J, Lim, J.-H. (Lim, J.H. et al., 2024)	3	0	Journal of Information Systems (2024) (Q3)
			73	Journal of Management Information Systems (2013) (Q1)
			83	Journal of Management Information Systems (2011) (Q1)
4.	Alkatheeri, H. B, Jabeen, F, Mehmood, K, Santoro, G (Alkatheeri et al., 2023)	2	17	International Journal of Emerging Markets (2023) (Q2)
			13	Journal of Hospitality and Tourism Technology (2023) (Q2)
5.	Arias-Pérez ,J, Alegre, J, Villar, C (Arias-Pérez et al., 2021)	2	3	Management Research (2021) (Q4)
			83	Multinational Business Review (2019) (Q1)
6.	Zhang, M, Chen, M, Zhang, M, Liu, H (Chen,M et al., 2023)	2	41	Industrial Management and Data Systems (2021) (Q1)
			7	Industrial Management and Data Systems (2023) (Q1)
7.	Alkatheeri, H B, Jabeen, F, Mehmood, K, Santoro, G (Jabeen et al., 2023)	2	17	International Journal of Emerging Markets (2023) (Q2)
			13	Journal of Hospitality and Tourism Technology (2023) (Q4)
8.	Rittiboonchai, W, Pinyokul, K, Na-Nakorn, N, Jermsittiparsert, K (Jermsittiparsert et al., 2021)	2	10	International Journal of Supply Chain Management (2020) (Q4)
			1	Journal of Management Information and Decision Sciences (2021) (Q4)
9.	Arora, B Rahman, Z (Arora & Rahman, 2017)	4	0	International Journal of Business Excellence (2017) (Q4)
			0	International Journal of Business Information Systems (2017) (Q2)
			30	International Journal of Emerging Markets (2017) (Q2)
			0	International Journal of Business Information Systems (2017) (Q2)

Furthermore, when viewed from the number of citations used in the research conducted by these researchers, the study conducted by Chae, H.-C., Koh, C E, Park, K.O. in two journal publications have the most citations, namely 373 citations and 165 citations, then Wei, S, Xu, D, Liu, H. in three journal publications as many as 107 citations, 47 citations and 41 citations, then Frost, T S, He, Z, Huangfu, J, Lim, J.-H. in three journal publications only two have citations, namely 83 citations and 73 citations. Alkatheeri, H.B, Jabeen, F, Mehmood, K, Santoro, G. in two journal publications have two citations of 17 citations and 13 citations, Arias-Pérez, J, Alegre, J, Villar, C. in two journal publications have 83 citations and 3 citations, Zhang, M, Chen, M, Zhang, M, Liu, H in two journal publications have 41 citations and 7 citations.

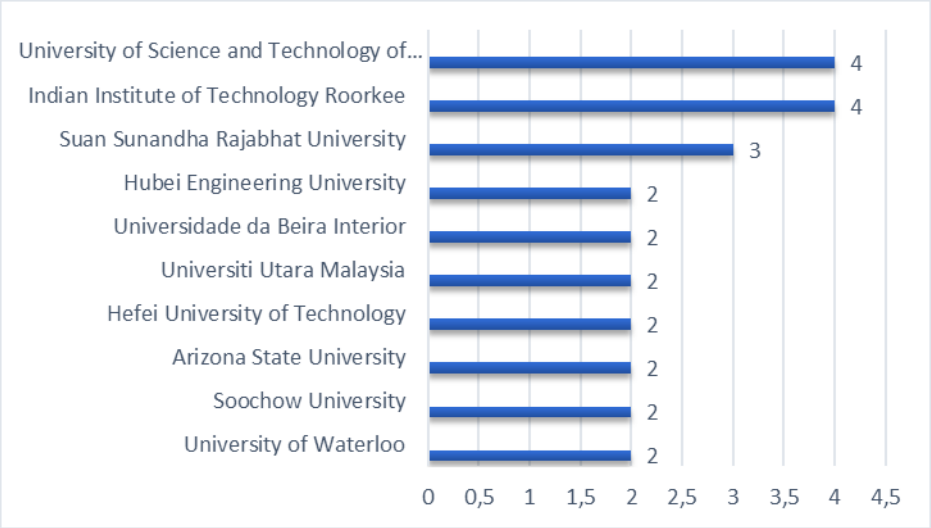

Figure 3. Affiliation

Figure 3. shows that research related to “information technology capabilities” is conducted chiefly or written by researchers from the University of Science and Technology of China and the Indian Institute of Technology Roorkee with a total of four published articles, followed by Suan Sunandha Rajabhat University with a total of three published articles, then Hubei Engineering University, Universidade da Beira Interior, University Utara Malaysia, Hefei University of Technology, Arizona State University, Soochow University, University of Waterloo with two published articles each.

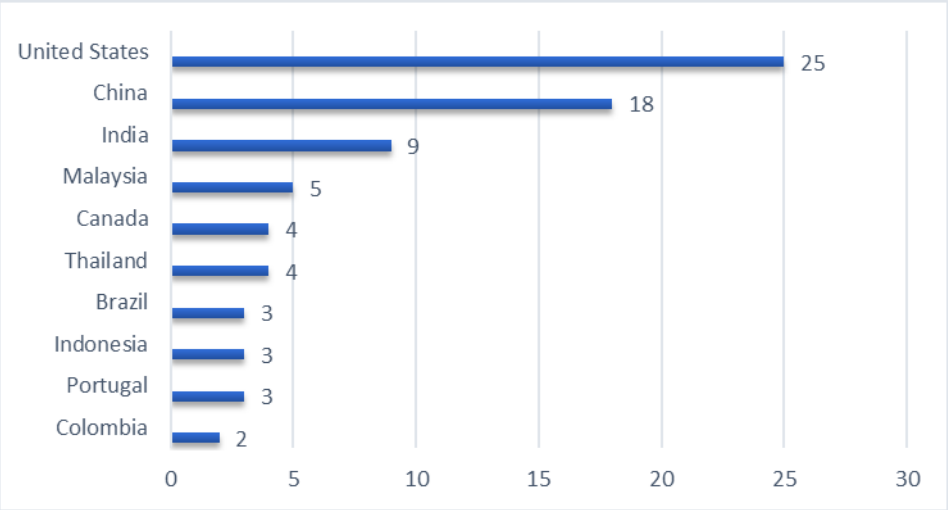

Figure 4. Country

Based on Figure 4, the country with the most research contributions related to "information technology capabilities" in the business sector is the United States, with 25 published articles. China follows this with 18 published articles, India with 9 articles, Malaysia with 5 articles, Canada and Thailand with 4 articles, Brazil, Indonesia, and Portugal with 3 articles each, and Colombia with 2 articles.

Co-occurrence keywords

Keywords in published studies indicate the most frequently used words in a study. Based on the results of the Vos viewers analysis, word extraction was found from titles and abstracts with 333 co-occurrence connections through 23 clusters and a total link strength of 2285, shown in Figure 5 visualization.

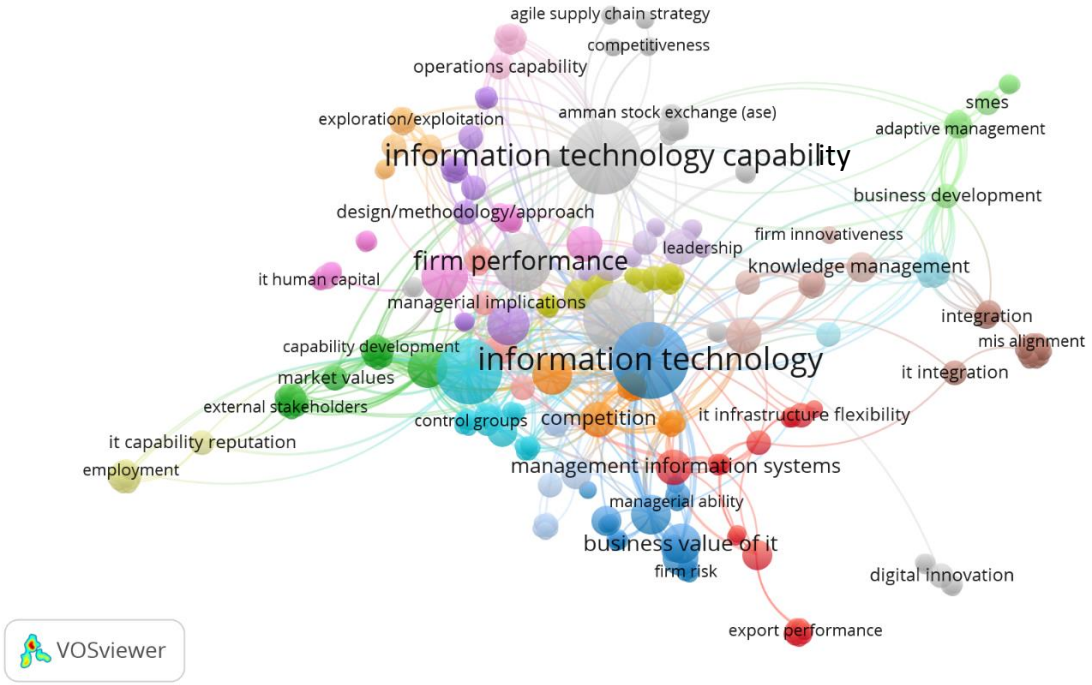

Figure 5. Visualization of keyword occurrence.

Table 4. Favorite keywords

Rating	Keywords	Total Link Strength	Occurrences
1.	Information Technology	19	186
2.	IT Capabilities	14	153
3.	Information Technology Capability	18	145
4.	IT Capability	16	118
5.	Firm Performance	11	100
6.	Commerce	5	70
7.	Competition	4	51
8.	Financial Performance	6	50
9.	Information Technology Capabilities	7	45
10.	Industry	3	42

The visualization above shows that "information technology capabilities" have been used as a research topic. Figure 5 shows that there are 10 favorite keywords related to other keywords, namely information technology, IT capabilities, IT capabilities, firm performance,

commerce, competition, financial performance, information technology capabilities, and industry, as described in Table 4. These keywords were the most frequently used and analyzed in the study.

Table 5. Infrequently used keywords

Rating	Keywords	Total Link Strength	Occurrences
1.	Management forecast	1	2
2.	Differentiation	1	2
3.	Competitiveness	1	2
4.	Audit pricing	1	2
5.	Analyst forecast	1	2
6.	Supply performance	1	3
7.	Supply chain management components	1	3
8.	Supply chain collaboration	1	3
9.	Strategy and policy	1	3
10.	Relational governance	1	3

Figure 5 also shows that the 10 keywords that are least used but affect keyword relationships are management forecast, differentiation, competitiveness, audit pricing, analyst forecast, supply performance, supply chain management components, supply chain collaboration, strategy and policy, and relational governance, as described in Table 5.

Antecedents and consequences of information technology capability

Having discussed conceptual definitions, theoretical research frameworks, and methodological applications, this paper now synthesizes the empirical evidence reviewed regarding the factors influencing ITC and the impact of ITC on performance in this context. In addition, the paper discusses mediating and moderating variables that influence the mechanisms and contexts in which ITC can affect outcomes. These findings are derived from 74 empirical studies identified in the systematic literature review. The outline in Figure 3 provides an overview of the findings.

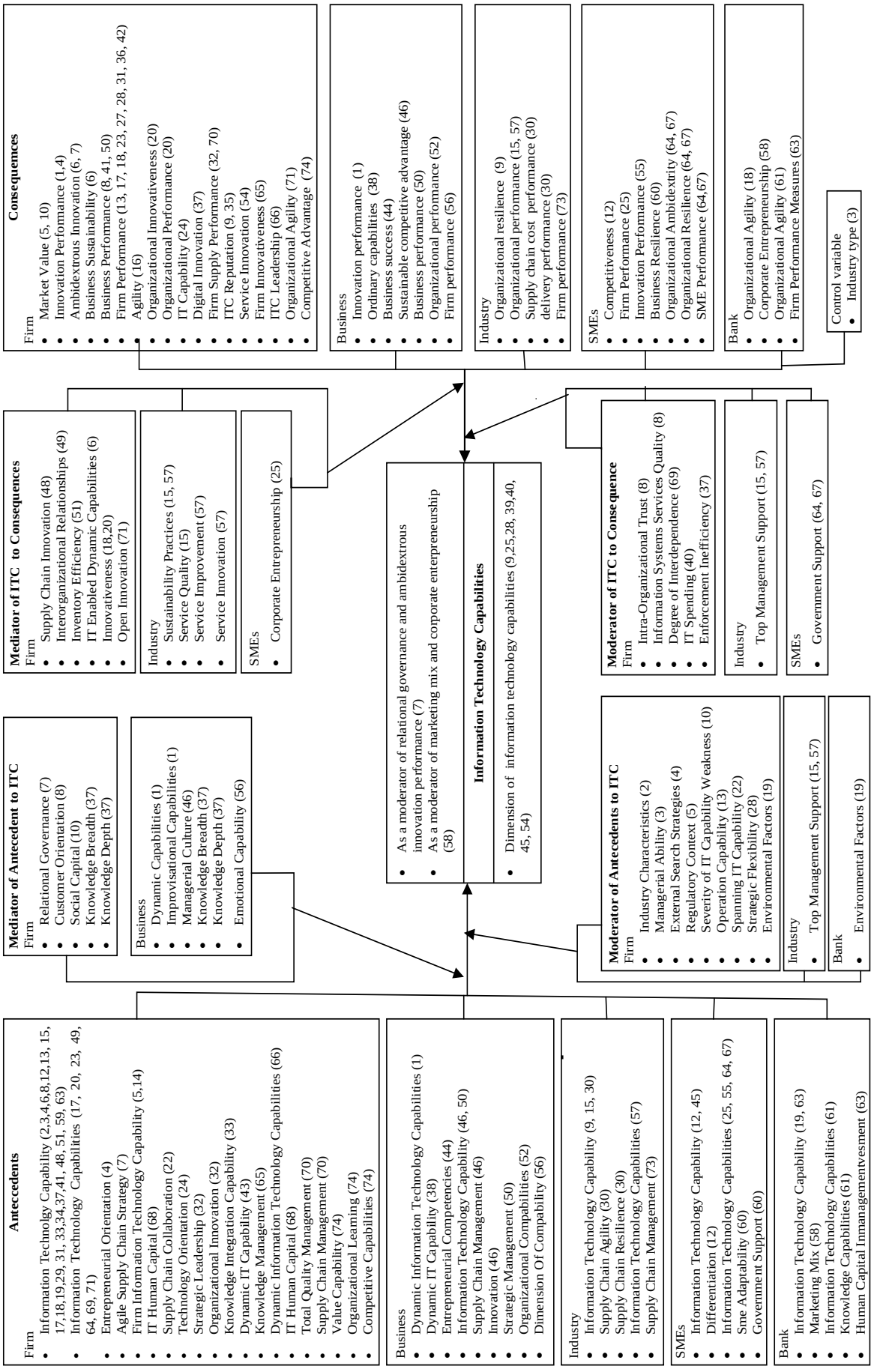
Antecedents
Firm
Information Technolgy Capability (2,3,4,6,8,12,13, 15, 17,18,19,29, 31, 33,34,37,41, 48, 51, 59, 63)
Information Technology Capabilities (17, 20, 23, 49, 64, 69, 71)
Entrepreneurial Orientation (4)
Agile Supply Chain Strategy (7)
Firm Information Technology Capability (5,14)
IT Human Capital (68)
Supply Chain Collaboration (22)
Technology Orientation (24)
Strategic Leadership (32)
Organizational Innovation (32)
Knowledge Integration Capability (33)
Dynamic IT Capability (43)
Knowledge Management (65)
Dynamic Information Technology Capabilities (66)
IT Human Capital (68)
Total Quality Management (70)
Supply Chain Management (70)
Value Capability (74)
Organizational Learning (74)
Competitive Capabilities (74)
Business
Dynamic Information Technology Capabilities (1)
Dynamic IT Capability (38)
Entrepreneurial Competencies (44)
Information Technology Capability (46, 50)
Supply Chain Management (46)
Innovation (46)
Strategic Management (50)
Organizational Compability (52)
Dimension Of Compability (56)
Industry
Information Technology Capability (9, 15, 30)
Supply Chain Agility (30)
Supply Chain Resilience (30)
Information Technology Capabilities (57)
Supply Chain Management (73)
SMEs
Information Technology Capability (12, 45)
Differentiation (12)
Information Technology Capabilities (25, 55, 64, 67)
Sme Adaptability (60)
Government Support (60)
Bank
Information Technology Capability (19, 63)
Marketing Mix (58)
Information Technology Capabilities (61)
Knowledge Capabilities (61)
Human Capital Inmanagementvesment (63)
Mediator of Antecedent to ITC
Firm
Relational Governance (7)
Customer Orientation (8)
Social Capital (10)
Knowledge Breadth (37)
Knowledge Depth (37)
Business
Dynamic Capabilities (1)
Improvisational Capabilities (1)
Managerial Culture (46)
Knowledge Breadth (37)
Knowledge Depth (37)
Emotional Capability (56)
Mediator of ITC to Consequences
Firm
Supply Chain Innovation (48)
Interorganizational Relationships (49)
Inventory Efficiency (51)
IT Enabled Dynamic Capabilities (6)
Innovativeness (18,20)
Open Innovation (71)
Industry
Sustainability Practices (15, 57)
Service Quality (15)
Service Improvement (57)
Service Innovation (57)
SMEs
Corporate Entrepreneurship (25)
As a moderator of relational governance and ambidextrous innovation performance (7)
As a moderator of marketing mix and corporate enterpreneurship (58)
Information Technology Capabilities
Dimension of information technology capabilities (9,25,28, 39,40, 45, 54)
Moderator of Antecedents to ITC
Firm
Industry Characteristics (2)
Managerial Ability (3)
External Search Strategies (4)
Regulatory Context (5)
Severity of IT Capability Weakness (10)
Operation Capability (13)
Spanning IT Capability (22)
Strategic Flexibility (28)
Environmental Factors (19)
Industry
Top Management Support (15, 57)
Bank
Environmental Factors (19)
Moderator of ITC to Consequence
Firm
Intra-Organizational Trust (8)
Information Systems Services Quality (8)
Degree of Interdependence (69)
IT Spending (40)
Enforcement Inefficiency (37)
Industry
Top Management Support (15, 57)
SMEs
Government Support (64, 67)
Consequences
Firm
Market Value (5, 10)
Innovation Performance (1,4)
Ambidextrous Innovation (6, 7)
Business Sustainability (6)
Business Performance (8, 41, 50)
Firm Performance (13, 17, 18, 23, 27, 28, 31, 36, 42)
Agility (16)
Organizational Innovativeness (20)
Organizational Performance (20)
IT Capability (24)
Digital Innovation (37)
Firm Supply Performance (32, 70)
ITC Reputation (9, 35)
Service Innovation (54)
Firm Innovativeness (65)
ITC Leadership (66)
Organizational Agility (71)
Competitive Advantage (74)
Busines
Innovation performance (1)
Ordinary capabilities (38)
Business success (44)
Sustainable competitive advantage (46)
Business performance (50)
Organizational performance (52)
Firm performance (56)
Industry
Organizational resilience (9)
Organizational performance (15, 57)
Supply chain cost performance (30)
delivery performance (30)
Firm performance (73)
SMEs
Competitiveness (12)
Firm Performance (25)
Innovation Performance (55)
Business Resilience (60)
Organizational Ambidextrity (64, 67)
Organizational Resilience (64, 67)
SME Performance (64,67)
Bank
Organizational Agility (18)
Corporate Entrepreneurship (58)
Organizational Agility (61)
Firm Performance Measures (63)
Control variable
Industry type (3)

Figure 3. Antecedents and consequence

Antecedents

As shown in Figure 3, this study has identified a number of relevant antecedents in various sectors of analysis, including companies, businesses, SMEs, industries, and banks, to explain the factors that support or hinder the development of ITC. A total of 50 articles proposed antecedents in the corporate sector; 8 articles examined the business sector, 5 articles studied the industry sector, 7 articles discussed the SME sector, and 4 articles examined the banking sector. In companies, a leader who has a good vision and understanding of technology can encourage investment in IT technology infrastructure and can facilitate the adoption of new technologies. (Pawar & Dhumal, 2024)In the banking sector, top management support is crucial because it can ensure that ITC is integrated into the overall business strategy. (Wali et al., 2023)Adopting ITC is still challenging for SMEs because they often experience limited access and resources; however, ITC can encourage SMEs to compete with large companies. (Chandavarkar & P. S., 2023). Industries that operate in a dynamic and competitive environment tend to adopt ITC faster to stay relevant. (Vaaler & McNamara, 2010). Antecedents to ITC vary widely depending on the sector and organizational context. However, understanding these factors can help companies, businesses, SMEs, industries, and banks to develop more effective ITC strategies and achieve a competitive advantage. (Peña-Vinces et al., 2012).

Consequences

Strong ITC has a significant impact on the performance and success of organizations in various sectors. (Mogoale et al. 2021). In the corporate sector, good ITC can improve operational efficiency and increase productivity. (Prince, 2019). In the banking sector, by utilizing ITC, banks can offer faster and more efficient services, e.g., mobile banking applications. ITC helps banks manage risk better with complex data analysis to detect fraud (Pujianto et al. 2023). In the business sector, ITC plays a crucial role because it can affect various aspects of operations; the development of ITC can be seen from the increase in innovation that helps businesses be competitive. (Peña-Vinces et al., 2012). This is in line with the role of ITC in SMEs, namely, creating new solutions to increase sales growth and improve competitiveness. (Meier et al., 2025). Utilizing ITC in the industrial sector can help manage resources, support collaboration between organizations, and increase innovation and responsiveness to market demand. (Bettiol et al., 2023).

Mediating Effect

The mediating effect in this study is divided into two: mediating antecedent to ITC and mediating ITC to consequences. The mediating effect bridges the relationship between the antecedent and ITC. For example, top management support is an essential antecedent for ITC development; in this context, communication strategies can function as a mediating variable. (Meddour et al., 2019). Strong management support can improve communication within the organization, which will strengthen ITC. (Sicotte & Delerue, 2021). Mediating effects can occur between ITC and the resulting consequences, e.g., ITC and organizational performance with product innovation as a mediating variable. (Lee et al., 2024). With good ITC, companies can innovate, which will have an impact on improving performance. (Soto-Acosta et al., 2018). The mediating effect in the context of antecedents to ITC and ITC to consequences shows the role of mediating variables in mediating the relationship between factors that influence ITC and the desired results. (Montasser et al., 2023).

Moderating Effect

Moderating variables can affect the relationship between antecedents and ITC and ITC and consequences. Moderating variables can strengthen or weaken the affected variables (Arnold, 1982). Moderating effect antecedent to ITC, e.g., financial resources as a moderating variable, the availability of financial resources can moderate the relationship between managerial ability and ITC (Ullah et al., 2024). Organizations with good organizational ability and supported by sufficient financial resources can be more effective in developing ITC (Inam Bhutta et al., 2021). However, when managerial skills are good but with limited financial resources, it will not be able to encourage maximum ITC development (Makhloufi et al., 2018). The moderating effect of ITC on consequences, e.g., strategic flexibility, can moderate the relationship between ITC and innovation (Yunis et al., 2018). Conversely, if strategic flexibility is lacking, ITC cannot contribute maximally to innovation (Awais et al., 2023).

5. Conclusions

Summary of Findings

Information technology capabilities play a crucial role in determining the success of organizations in various sectors. Various antecedents such as organizational innovation, top management support, and knowledge management significantly influence ITC development. Consequences of effective ITC development are wide-ranging and include service improvement, loyalty and achieving competitive advantage. The relationship between the antecedents and consequences of ITC shows the importance of effective management of the factors that influence ITC. Mediating becomes a bridge between antecedent to ITC e.g. top management support which is important for ITC development and mediating ITC to consequences e.g. product innovation which mediates ITC and organizational performance. Moderating antecedent to ITC e.g. managerial ability and ITC moderated by the availability of financial resources, moderating ITC to consequences e.g. strategic flexibility that moderates ITC and innovation. By understanding and developing the right antecedents, consequences as well as mediating and moderating, organizations can utilize ITC to improve performance, innovation and customer satisfaction and can survive in an increasingly complex and dynamic market.

This study has a contribution to the development of future research as a whole on the factors that influence ITC that have an impact on SMEs. This study fills a gap in the literature by scientifically discussing the contributions and highlighting key issues with previous research findings regarding the dimensions that compose it as well as the antecedent and consequence of ITC. The results of this study can serve as a foundation for future research, using other key variables as well as extending the existing literature and providing suggestions for policy makers to support or facilitate information technology capability in SMEs.

Theoretical Implications

The results of research using Vosviewers show that the keyword “information technology capability” is the most frequently analyzed keyword. Therefore, other researchers need to be more thorough and careful when using these keywords as research topics. Researchers are advised to explore more relevant and unique topics to ensure a high level of originality.

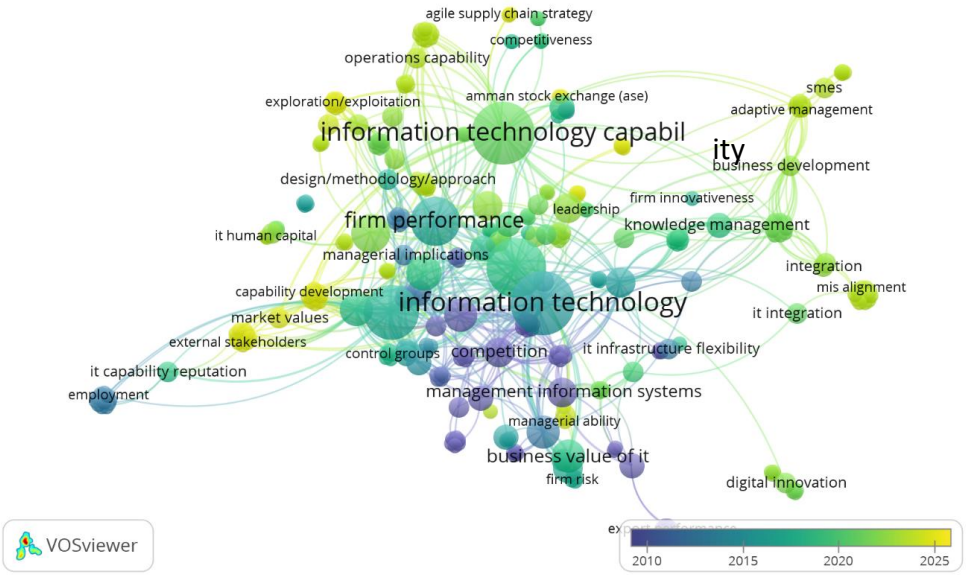

Figure 6. Keyword overlay visualization

Figure 6. shows that the more yellow the color of a keyword, the less frequently it is used. From the analysis, nine keywords that are rarely used in research related to "information technology capabilities" in the business sector have been identified from 1993 to 2024. These keywords include management forecast, differentiation, competitiveness, audit pricing, analyst forecast, supply performance, supply chain management components, supply chain collaboration, strategy and policy, and relational governance. Future research could capitalize on these nine underused keywords as this suggests that these issues are still under-discussed in existing research, thus providing opportunities for more in-depth exploration.

Limitation and Future Research

This research has limitations in that it only uses the Scopus database to analyze research topics. This shows that there are still many related studies that have not been comprehensively mapped. Therefore, future research is recommended to conduct bibliometric analysis by utilizing a broader database, such as Science Direct, Google Scholar, Emerald Insight, JSTOR, or PubMed. Variables suggested for future research are antecedents in the firm sector; supply chain management, and technology orientation in the business sector; strategic management, and innovation in the industry sector; supply chain agility, supply chain resilience in the SMEs sector; differentiation, sme adaptability, government support, in the bank sector; marketing mix, knowledge capability. Consequences suggested in the firm sector: competitive advantage, organizational agility in the business sector; innovation performance, business success in the industry sector; delivery performance, organizational performance, in the SMEs sector; sme performance, business resilience, organizational ambidexterity, in the bank sector; corporate entrepreneurship, organizational agility. Moderator variables of antecedent to ITC suggested in the firm sector; industry characteristics, managerial ability, industry sector; top management support, bank sector; environmental factors, moderator variables of ITC to consequences in the firm sector; IT spending, intra-organizational trust, degree of interdependence, industry sector; top management support, SMEs sector; government support. Mediator variables of antecedent to ITC are suggested in the firm sector; relational government, customer orientation, social capital, in business; emotional capability, managerial culture, improvisational capabilities, the mediator of ITC to consequences in the firm sector; supply chain innovation, inventory efficiency open innovation, in the industry;

service quality, sustainability practices, service improvement, SMEs sector; corporate entrepreneurship. Suggested variables based on keywords: competitiveness, audit pricing, supply performance, supply chain collaboration, strategy, and policy. Thus, it is expected that future research can provide a more complete and in-depth picture of the topic under study.

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