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Science Mapping Trends and Themes: A Bibliometric Analysis on Organizational Agility

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Abstract: This bibliometric analysis reviews research progress on organizational agility within management literature using the Scopus database. Publications in this emerging area have risen exponentially since 2014, confirming agility's paramount importance for firms facing market volatility. Through co-citation, bibliographic coupling, and keyword co-occurrence analyses, we map intellectual milestones and trace thematic developments over recent decades. Key capabilities like information technology flexibility, sensing environmental change, and reconfiguring resources dynamically enable organizational agility. While information systems and technology management initiated foundational work, strategic management, and organizational behavior perspectives now also prominently feature. Recent attention has expanded toward service industries, sustainability, and types of agility. Yet opportunities remain for the public sector, traditional industry, and cross-cultural applications. By profiling publications, authors, directions, and research networks around organizational agility, this investigation contributes an evidence-based overview to benefit scholars and practitioners.

Keywords: Bibliometric Analysis, Organization Agility, Science Mapping.

1. Introduction

In the modern business environment that is evolving faster than ever before, companies are dealing with extremely high and unfamiliar levels of doubt and unpredictability regarding the future. To successfully navigate through these challenges and remain competitive, businesses need to respond at a fast speed and effectively to alterations in their surroundings. One important concept that has emerged in response to this need is organizational agility. The concept of organizational agility, which originated in the manufacturing sector in the early 1990s (Nagel & Dove, 1998), has since expanded to encompass various industries and organizational functions. This evolution reflects the growing recognition that businesses must be able to swiftly adapt to changing market conditions, customer demands, and technological advancements to maintain their competitive edge (Teece et al., 2016). The notion of agility in business contexts was first introduced as a response to the increasing volatility and unpredictability of the market environment. Initially focused on flexible manufacturing systems, the concept quickly gained traction in other areas of business operations (Sherehiy & Karwowski, 2014). Over the years, organizational agility has transformed from a mere operational strategy to a holistic approach that permeates all aspects of an organization, including its culture, structure, and leadership (Worley & Mohrman, 2014).

Recent studies have further emphasized the multidimensional nature of organizational agility. Christofi et al. (2021) proposed a framework that integrates various dimensions of agility, including strategic sensitivity, leadership unity, and resource fluidity. This comprehensive approach highlights the

complexity of achieving and maintaining agility in modern organizations. Building on this, Mikalef et al. (2020)explored the role of big data analytics capabilities in enhancing organizational agility, demonstrating the increasing importance of data-driven decision-making in agile organizations.

The digital transformation era has brought new challenges and opportunities for organizational agility. As pointed out by Saha et al. (2017), the integration of digital technologies has become a crucial enabler of agility, allowing organizations to respond more quickly to market changes and customer needs. However, this digital shift also requires organizations to develop new capabilities and mindsets to fully leverage the potential of these technologies (Vial, 2021). The COVID-19 pandemic has further underscored the importance of organizational agility. Haneberg (2021) demonstrated how agile organizations were better equipped to navigate the unprecedented challenges posed by the global crisis, adapting their operations and strategies more effectively than their less agile counterparts. Expanding on this, Doepgen et al. (2024) conducted a systematic literature review on organizational resilience and agility in crisis situations, providing valuable insights into how organizations can build and maintain agility in the face of extreme disruptions.

In recent years, the concept of organizational agility has been increasingly linked to sustainability and long-term performance. Ashrafi et al. (2019) explored the relationship between organizational agility and sustainable competitive advantage, finding that agility plays a crucial role in achieving both economic and environmental sustainability. Furthermore, Nijssen and Paauwe (2012) proposed a conceptual model linking organizational agility to sustained competitive advantage, which has been further validated and expanded in recent empirical studies (Zhou et al., 2018).

The intersection of organizational agility and innovation has also gained significant attention in recent literature. Cai et al. (2017) investigated how organizational agility influences firms' innovation performance, highlighting the mediating role of opportunity-sensing capability. This research stream has been further developed by scholars such as Kharub et al. (2024), who examined the interplay between organizational agility, innovation capability, and firm performance in the context of emerging economies.

Despite the growing body of literature on organizational agility, there remains a need for a comprehensive understanding of how this field has evolved and what trends are shaping its future. Bibliometric analysis offers a powerful tool to map the intellectual structure of this domain, identify key research clusters, and uncover emerging themes (Zupic & Čater, 2015).

This study aims to conduct a systematic bibliometric analysis of the organizational agility literature, with a particular focus on publications from recent years. By employing advanced bibliometric techniques, we seek to:

1. Trace the evolution of organizational agility research from its inception to the present day.

2. Identify the most influential works, authors, and journals in the field.

3. Uncover the main research streams and their interconnections.

4. Highlight emerging trends and potential future directions in organizational agility research.

Through this analysis, we aim to provide researchers and practitioners with a comprehensive overview of the state of organizational agility research, facilitating a better understanding of the field's development and guiding future research endeavors

2. RESEARCH METHOD:

2.1 Study Design

As stated by Amiri et al. (2023) in their study, bibliometrics analysis refers to collections of quantitative methodologies that are employed to evaluate and quantify text and data (Goyal & Kumar, 2021; Mishra et al., 2018). Bibliometrics applies mathematical and statistical approaches to examine academic articles, encompassing journal articles and conference papers, along with metrics of impact such as citations (Ellegaard & Wallin, 2015). Modern bibliometric techniques take advantage of digital databases, for example, "Scopus" and "Web of Science" that index global scholarly research across disciplines. Advanced analytic approaches combine bibliometrics with text mining, statistics, and information visualization to yield deeper understanding. This technique involves the process of reviewing existing literature and extracting new insights and knowledge from it, informs research evaluations, and guides library collection development, which can serve as an additional material that enhances and complements research (Suominen et al., 2019); through smart search and summarization (Ellegaard & Wallin, 2015). With growing reliance on metric-based assessment of scholarly productivity, bibliometric feeds into research assessment exercises. To accomplish this goal of gaining insight through bibliometric analysis, it is essential to compile and release collections of biographies focused on a specific theme, pinpoint trends within a particular research field, and assess research publications that outline the current state of research and provide direction for further understanding (Amiri et al., 2023; Gao et al., 2021; Hossain et al., 2022). Researchers employ various bibliometric analysis techniques including authorship (studying the author), citations, bibliographic coupling (connections between citations), co-citation (frequency of citations appearing together), and co-word analysis (occurrence of certain words together) to inspect and evaluate bibliographic information (Amiri et al., 2023; Donthu et al., 2021).

2.2 Data source

We selected Scopus database for the study because it has an extensive compilation of peer- reviewed scholarly publications (Pattnaik et al., 2020) instead of WOS (Valtakoski, 2020). We used a systematic process to reach 531 articles, as shown in Table (1). Firstly, we searched for the keyword ('organization* agility'), with the operators "?" and "*" as it will include all the related terminology regarding the keywords. The primary result was 1035 documents. Following the inclusion/exclusion criteria as shown in Table (1) subject areas ('business, management and accounting', 'social sciences',' decision sciences', 'economics, and 'multidisciplinary'), were included which resulted in the inclusion of 747 documents and rest 288 were excluded. The next step was to filter document type, we only included articles and review papers which resulted in 549 documents. Lastly, the language filter when selected with the language English resulted in 542 documents excluding 7. As a result, the dataset was cleaned to avoid any error in the extracted data before proceeding with the analysis. Finally, after an erroneous record screening, we got 531 articles.

Table 1: Inclusion and exclusion Criteria for article selection

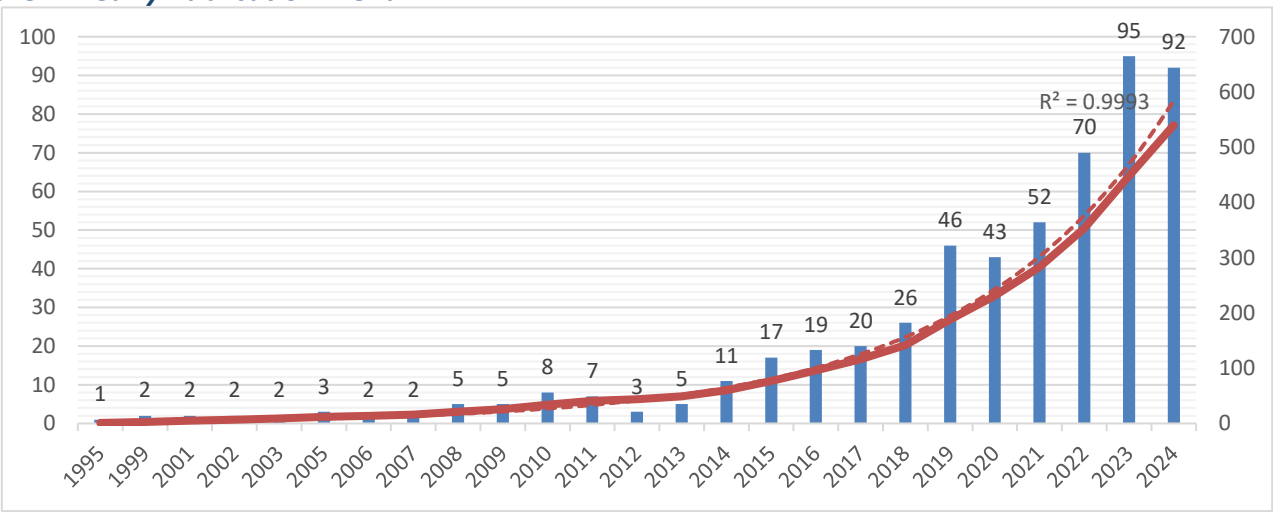
Selection Criterion	Exclude	Include
Database: "Scopus"		
Date of search: "16th September 2024"		
Period of Publications:"1994-2024"		
Search item: TITLE-ABS-KEY ("organization* agility")	-	1035
Subject area: "Business, management and accounting, Social Sciences, Decision Science, Economics, Multidisciplinary"	288	747
Publication Type: "Articles/Review Papers"	198	549
Language Screening: "English"	7	542
Erroneous Data	11	531

3. Descriptive Statistics

3.1 Yearly Publication Performance/Research Trend

The number of papers published each year is a good measure of the research trend in a particular field of study (Pal et al., 2021). The number of publications trend may provide insight into the expected research trend in the near future. A combo plot of the number of publications with the count of papers and percentage on a year-on-year basis was plotted to assess the research trend on organizational agility (Figure 1). The graph indicates that the organizational agility concept had its inception in the '90s but started expanding after 2014. In the year 2019, 46 articles were published, however the very next year in 2020 the publication dropped to 43 articles. The most productive years have been 2021 (52), 2022 (70) and 2022 (73) articles published. In the year 2024, 92 articles had already been published, indicating that this tendency is probably here to stay. From the trend line fitted using the exponential curve, an R2 value of 99.93 percent reflects that knowledge production is accelerating exponentially in this study area.

Figure 1: Yearly Publication Trend



3.2 Top Authors, Countries, and Institutions in the Organizational Agility Research Area

This section identifies the top contributing authors of published documents related to organizational agility, as well as associated countries and organizations. The leading author in terms of total citations is Tallon Paul P. with 1159, followed by Leih Sohvi. and Peteraf Margeret, both with 1147 citations. In terms of the total number of documents published within the research area of organizational agility, Suresh M. contributed the greatest number with 8 documents. Tallon Paul P. and Akter Shahriar. both contributed 3 documents each. Using the same assessment methodology, the University of California and Dartmouth College in the United States garnered the highest number of citations related to organizational agility research, with 1147 each, followed by Pfeiffer University also situated in United States with 9 citations. From a country perspective, the United States had the greatest overall citations at 7975 across 80 total documents on organizational agility, while China and United Kingdom had 1565 and 1550 total citations respectively. Based on the number of total publications, 80 document published is the top contributor to the research area of organizational agility while China and United Kingdom with 51 and 46 documents correspondingly ranks second and third.

Table 2: Top Contributing Authors, Countries, And Organizations in Organizational Agility Research

TC	Author	TP	TC	Organization	TP	TC	Country	TP
1159	Tallon, Paul P.	3	1147	"University Of California, US"	1	7975	US	80
1147	Leih, Sohvi	1	1147	"Dartmouth College, US"	1	1565	China	51
1147	Peteraf, Margaret	1	963	"Pfeiffer University, US"	1	1550	UK	42
1147	Teece, David	1	963	"University Of Wisconsin-Milwaukee, US"	1	1513	Canada	15
963	Lu, Ying	1	951	"McGill University, Canada"	2	1176	Australia	27
963	Ramamurthy, K.	1	888	"Loyola University, US"	1	1008	India	44
888	Pinsonneault, Alain	1	666	"Norwegian University of Science and Technology, Norway"	1	973	Spain	20
666	Mikalef, Patrick	1	666	"Ionian University, Greece"	1	826	France	16
666	Pateli, Adamantia	1	623	"Georgia Institute of Technology, US"	1	821	Italy	20
623	Ghosh, Soumen	1	623	"Lundquist College of Business, US"	1	760	Hong Kong	7
623	Murthy, Nagesh	1	623	"College Of Business Administration, University of Texas, US"	1	721	Norway	8
623	Swafford, Patricia M.	1	464	"City University Of Hong Kong, Hong Kong"	3	699	Greece	4
491	Akter, Shahriar	3	457	"Automation And Robotics Research Institute, The University of Texas, US"	1	664	UAE	19
457	Meade, L.M.	1	457	"Clark University, US"	1	625	Pakistan	12
457	Sarkis, J.	1	437	"Montpellier Business School, France"	1	600	Indonesia	43
445	Wamba,Samuel Fosso	2	437	"California State University, US"	1	569	Germany	20

440	Dubey, Rameshwar	2	437	"University of Wollongong, Australia"	1	537	Portugal	13
437	Gunasekaran, Angappa	1	437	"Toulouse Business School, France"	1	411	Iran	46
408	Suresh, M.	8	402	"Michigan State University, US"	1	392	Malaysia	15
402	Chakravarty, Anindita	1	402	"University of Georgia, US"	1	335	Brazil	14
402	Grewal, Rajdeep	1	402	"Pennsylvania State University, US"	1	330	Jordan	18
402	Sambamurthy, V.	1	350	"Universidade Nova De Lisboa, Portugal"	1	304	Ireland	7
363	Oliveira, Tiago	2	343	"University of Massachusetts Boston, US"	1	299	New Zealand	7
350	Côrte-Real, Nadine	1	343	"Michigan State University, US"	1	265	Finland	7
350	Ruivo, Pedro	1	341	"Universitas Islam Indonesia, Indonesia"	1	263	Turkey	15

Note: TP= Total number of publications, TP= total citations

3.3 Source citation

The source-citation relationship indicates the prominent journals where scholars prefer to publish their research (Fasogbon & Adebo, 2022; Pal et al., 2021). Table 3 presents the leading publications that have released articles related to this topic. Analyzing these citation relationships reveals the influential outlets that writers select to disseminate their findings within this field. Using the criteria of a minimum of 1 published document and a minimum of 137 citations per document, the top 25 most significant journals relevant to organizational agility research were identified, as shown in Table 3. Judging by the total number of citations, the journals that authors most commonly select to publish their work on the organizational agility research area are "Journal of Business Research", "Mis Quarterly: Management Information Systems", and "California Review" with 1942,1851 and 1147 citations respectively. Besides based on the total number of publications; the most productive journals are "Sustainability (Switzerland)" with a total number of 19 articles, "IEEE Transactions on Engineering Management" with 13 publications, and "Journal of Business Research" and "Technological Forecasting and Social Change" with 12 publications each. In order to gain a better understanding of quality of journal publications the third column in Table 3 indicates whether the journal is in "ABDC Journal Quality List". It provides a comprehensive list of quality business journals which are categorized into 4 categories. According to Table 3, "Information System Research", "Journal of Strategic System Management", "Journal of Information Technology" and "International Journal of Information Management" qualified as A* category. While "Journal of Business Research", "California Management Review", "International Journal of Production Economics" "Technological Forecasting and Social Change", "International Journal of Production Research", "Journal of Knowledge Management", "Global Journal of Flexible Systems Management", and "International Journal of Human Resource Management" and "IEEE Transactions on Engineering Management" are under A category. A current rising trend in publication in the research area is seen in the mapping of publication productivity versus various periods. The recent rising trend in the publication of articles has been seen. "Sustainability (Switzerland)" has the most recent publication of 16 documents during the time period of 2021-2024 while "Technology Forecasting and Social Change" has published 12 documents till the date of writing this research paper. "Journal of

Business Research" has 6 and 6 documents during the 2016-2020 and 2021-2023 respective periods showing gradual progress.

Table 3: Top Journal for Organizational Agility Research Area

Journal	TP	TC	ABDC	1994 - 2005	2006 - 2010	2011 - 2015	2016 - 2020	2021 - 2024
"Journal of Business Research"	12	1942	A				6	6
"Mis Quarterly: Management Information Systems"	2	1851				2		
"California Management Review"	1	1147	A				1	
"International Journal of Production Economics"	3	1120	A		2		1	
"Information Systems Research"	4	904	A*		2		1	1
"Technological Forecasting and Social Change"	12	678	A					12
"Journal of Strategic Information Systems"	3	609	A*				2	1
"International Journal of Production Research"	3	585	A	1	2			
"Journal of Knowledge Management"	5	538	A		1		2	2
"Journal of Open Innovation: Technology, Market, and Complexity"	5	392					2	3
"Sustainability (Switzerland)"	19	362					3	16
"Information and Management"	3	323		1		1	1	
"Industrial Management and Data Systems"	4	309		1			3	
"Global Journal of Flexible Systems Management"	8	302	A			2	2	4
"Benchmarking"	8	295				1	3	4
"Journal of Information Technology"	2	265	A*	1			1	
"Human Resource Management"	2	240		1			1	
"Management Decision"	9	220	B				2	7
"International Journal of Information Management"	4	207	A*				1	3
"International Journal of Human Resource Management"	2	177	A			2		
"IEEE Transactions on Engineering Management"	13	167	A				1	12
"Journal of Innovation and Knowledge"	1	165					1	
"International Journal of Industrial Ergonomics"	1	149				1		
"Industrial and Commercial Training"	4	146					4	

"Total Quality Management and Business Excellence"	5	145	C	1	4

Note: TP= Total number of publications, TP= total citations

3.4 Top Influenced Article on Organizational Agility Research Area

The top references for studies on organizational agility are shown in Table 4. based on local citations. The paper authored byTeece et al. (2016), titled "Dynamic Capabilities and Organizational Agility: Risk, Uncertainty, and Strategy in the Innovation Economy" is the top referred article with 1147 The purpose of the study was to discover the importance of developing dynamic skills that allow businesses to recognize, seize, and transform in response to market conditions. It also discusses the importance of leadership, learning, and innovation in increasing organizational agility. Similarly, Lu and Ramamurthy (2011) article "Understanding the Link Between Information Technology Capability and Organizational Agility: An Empirical Examination" has 963 total citations making it the second-highest referenced article. It illustrates how an organization's capacity to manage its IT resources and attain agility depends on its level of IT competency. "IT infrastructure capability, IT business spanning capability, and IT proactive stance" constitute the dimensions of IT capability. It has been determined that these dimensions are essential for facilitating both "operational adjustment agility and market capitalizing agility".

Table 4: Top influenced article of Organizational Agility Research Area

Author	TC	Title
Teece et al. (2016)	1147	"Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy"
Lu and Ramamurthy (2011)	963	"Understanding the link between information technology capability and organizational agility: An empirical examination"
Tallon and Pinsonneault (2011)	888	"Competing perspectives on the link between strategic information technology alignment and organizational agility: Insights from a mediation model"
Mikalef and Pateli (2017)	666	"Information technology-enabled dynamic capabilities and their indirect effect on competitive performance: Findings from PLS-SEM and fsQCA"
Swafford et al. (2008)	623	"Achieving supply chain agility through IT integration and flexibility"
Meade and Sarkis (1999)	457	"Analyzing organizational project alternatives for agile manufacturing processes: An analytical network approach"
Wamba et al. (2020)	437	"The performance effects of big data analytics and supply chain ambidexterity: The moderating effect of environmental dynamism"
Chakravarty et al. (2013)	402	"Information technology competencies, organizational agility, and firm performance: Enabling and facilitating roles"
Côrte-Real et al. (2017)	350	"Assessing business value of Big Data Analytics in European firms"
Lee et al. (2015)	343	"How does IT ambidexterity impact organizational agility?"
Priyono et al. (2020)	341	"Identifying digital transformation paths in the business model of smes during the covid-19 pandemic"
Ravichandran (2018)	340	"Exploring the relationships between IT competence, innovation capacity and organizational agility"

Shahzad (2020)	307	"Exploring the influence of knowledge management process on corporate sustainable performance through green innovation"
Tallon et al. (2019)	267	"Information technology and the search for organizational agility: A systematic review with future research possibilities"
Alnuaimi et al. (2022)	245	"Mastering digital transformation: The nexus between leadership, agility, and digital strategy"
Troise et al. (2022)	242	"How can SMEs successfully navigate VUCA environment: The role of agility in the digital transformation era"
Breu et al. (2002)	236	"Workforce agility: The new employee strategy for the knowledge economy"
Cegarra-Navarro et al. (2016)	232	"Structured knowledge processes and firm performance: The role of organizational agility"
Zain et al. (2005)	182	"The relationship between information technology acceptance and organizational agility in Malaysia"
Crocitto and Youssef (2003)	177	"The human side of organizational agility"
Al-Omoush et al. (2020)	165	"The impact of social capital and collaborative knowledge creation on e-business proactiveness and organizational agility in responding to the COVID-19 crisis"
Felipe et al. (2016)	156	"An explanatory and predictive model for organizational agility"
Harsch and Fasting (2020)	155	"Dynamic talent management capabilities and organizational agility—A qualitative exploration"
Felipe et al. (2017)	152	"Impact of organizational culture values on organizational agility"
Sherehiy and Karwowski (2014)	149	"The relationship between work organization and workforce agility in small manufacturing enterprises"

Note: TC = total number of citations

3.5 Top Referred Article of Organizational Agility Research Area

In this segment, we conduct a detailed examination of the most frequently referenced publications within the Organizational Agility corpus to elucidate the foundational inquiries driving research in this domain. This analysis also provides a valuable opportunity to identify important articles that may have been unintentionally overlooked in our primary investigation due to their specialized nature. The most-cited publications, according to local and global citation metrics, are illustrated in Table 5. Local citations indicate the frequency with which other works within the organizational agility research field reference an article. Conversely, global citations represent the instances where an article, potentially outside the realm of organizational agility, is cited by publications within this research area. The most referred article by Lu and Ramamurthy (2011), "Understanding the Link between Information Technology Capability and Organizational Agility: An Empirical Examination" has a local citation of 151 and a global citation of 963. The ratio of local citation and global citation is 15.68 for the article. This study discusses the relationship between IT capability and organizational agility, emphasizing how superior IT capabilities enhance both markets capitalizing agility and operational adjustment agility. The study highlights the paradox of IT spending, where increased expenditure does not necessarily lead to greater agility and suggests that strategically enhancing IT capabilities is essential for firms to remain competitive in rapidly

changing environments. Similarly, the study of Teece et al. (2016) titled "Dynamic Capabilities and Organizational Agility: Risk, uncertainty, and strategy in the innovation economy" has local citation of 99 while global citation of 1147 which the second most referred article according to local citation criterion and 8.63 local citation upon global citation ratio. The study explores the evolution of organizational agility and dynamic capabilities in response to changing business environments, contrasting traditional vertical integration with modern flexible sourcing strategies. It emphasizes the importance of maintaining organizational slack, decentralized structures, and open innovation to enhance agility, while introducing the "lean startup" methodology for rapid product development.

Table 5: Top referred article in the organizational agility research area

LC	Document	Title	GC	LC/GC Ratio (%)
151	Lu Y (2011)	"Understanding the link between information technology capability and organizational agility: An empirical examination"	963	15.68
99	Teece D (2016)	"Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy"	1147	8.63
95	Tallon P.P (2011)	"Competing perspectives on the link between strategic information technology alignment and organizational agility: Insights from a mediation model"	888	10.70
65	Chakravarty A (2013)	"Information technology competencies, organizational agility, and firm performance: Enabling and facilitating roles"	402	16.17
63	Ravichandran T (2018)	"Exploring the relationships between IT competence, innovation capacity and organizational agility"	340	18.53
49	Felipe C.M (2016)	"An explanatory and predictive model for organizational agility"	156	31.41
47	Tallon P.P (2019)	"Information technology and the search for organizational agility: A systematic review with future research possibilities"	267	17.60
40	Crocitto M (2003)	"The human side of organizational agility"	177	22.60
35	Mikalef P (2017)	"Information technology-enabled dynamic capabilities and their indirect effect on competitive performance: Findings from PLS-SEM and fsQCA"	666	5.26
32	Zain M (2005)	"The relationship between information technology acceptance and organizational agility in Malaysia"	182	17.58
29	Cegarra-Navarro J-G (2016)	"Structured knowledge processes and firm performance: The role of organizational agility"	232	12.50
29	Harraf A (2015)	"Organizational agility"	115	25.22
29	Breu K, (2002)	"Workforce agility: The new employee strategy for the knowledge economy"	236	12.29
28	Nijssen M, (2012)	"HRM in turbulent times: How to achieve organizational agility?"	134	20.90

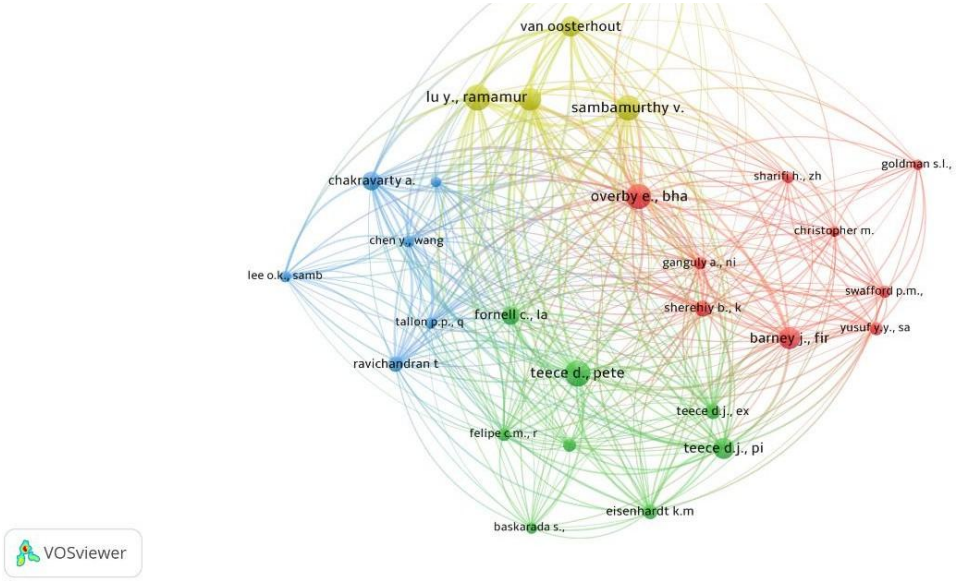
26	Appelbaum S.H, (2017)	"The challenges of organizational agility (part 1)"	96	27.08
25	Swafford P.M, (2008)	"Achieving supply chain agility through IT integration and flexibility"	623	4.01
24	Mao H, (2015)	"How the effects of IT and knowledge capability on organizational agility are contingent on environmental uncertainty and information intensity"	90	26.67
23	Liu S, (2018)	"Understanding the effect of cloud computing on organizational agility: An empirical examination"	98	23.47
22	Nejatian M, (2018)	"A hybrid approach to achieve organizational agility: An empirical study of a food company"	50	44.00
19	Harsch K, (2020)	"Dynamic talent management capabilities and organizational agility—A qualitative exploration"	155	12.26
18	Walter A-T, (2021)	"Organizational agility: ill-defined and somewhat confusing? A systematic literature review and conceptualization"	128	14.06
18	Panda S, (2016)	"Investigating the structural linkage between IT capability and organizational agility: A study on Indian financial enterprises"	43	41.86
18	Sherehiy B, (2014)	"The relationship between work organization and workforce agility in small manufacturing enterprises"	149	12.08
18	Shafer R.A, (2001)	"Crafting a human resource strategy to foster organizational agility: A case study"	85	21.18
17	Alnuaimi B.K, (2022)	"Mastering digital transformation: The nexus between leadership, agility, and digital strategy"	245	6.94

Note: LC= total number of local citations, GC= total number of global citations

4.1 Co-citation Analysis

Co-citation analysis is an advanced technique used to examine the conceptual knowledge structure within a scientific field. It involves identifying which pairs of publications are frequently cited together in the reference lists of source articles (Surwase et al., 2011). Tracking these co-cited publication pairs provides a method to map the connections and relationships between impactful ideas in the literature Co-citation analysis exposes the semantic connections between frequently co-cited references, which illustrate the core knowledge base and foundations underlying a particular topic (Amiri et al., 2023; Donthu et al., 2021). Figure 2 shows a co-citation map of authors who were cited at least 18 times in the literature reviewed. The total of 28 authors were divided into four distinct clusters of authors, suggesting they have been highly influential in separate sub-areas related to research on organizational agility. Lee O.K, Chakravarty, Ravichandran, Tallon and Chen (blue nodes) are co-cited authors representing core works in one branch on organizational agility. Sambamurthy, Lu Y, Van Oosterhout, and Dove (yellow nodes) are another group of frequently co-cited authors in research specifically examining organizational agility. Overby, Sharifi, Sherehiy, Barney, Yusuf and Swafford (red nodes) are co-cited scholars focused on research methods applicable to the study of organizational agility. Teece, Eisenhard, Felipe, Fornell and Baskarada (Green nodes) form a cluster of co-cited authors dealing with specific field of study on organizational agility research. This co-citation analysis demonstrates how organizational agility, contains several concentrated sub-fields investigated extensively by well-connected influential researchers

Figure 2: Co-citation map of



Note: The nodes represent individual cited references and also clusters of references grouped by similar themes or topics. The size of each node conveys the degree of local citation - larger nodes indicate that a particular reference is cited more frequently within the collection of papers being examined. Links between two nodes signify that those references are co-cited, meaning they are cited together within another paper. The thickness of the co-citation link conveys the degree of co-citation between references - thicker lines mean those two references appear together more often in the citation lists of papers in the analyzed collection.

4.2 Thematic analysis through bibliographic coupling

4.2.1 Research Themes and Influences through Bibliographic Coupling

Table 5 shows clusters of related research themes on organizational agility identified through bibliographic coupling analysis. The major themes that emerged include agility measurement, industry specific implications, information technology capabilities, performance, digital transformation, agility, dynamic capabilities, strategic implications and business model. For each clustered theme, the table lists the most influential highly cited articles associated with that research area. This bibliographic coupling thematic mapping categorizes sub-domains within the broader organizational agility literature and identifies key publications connected to each of those sub-fields.

Cluster 1 includes agility measurement and industry specific application. Swafford et al. (2008) study examines the relationship between a firm's competitive performance, supply chain agility, flexibility, and information technology integration. The findings suggest that enhancing supply chain flexibility and integrating IT capabilities positively impact supply chain agility. The study highlights how crucial agility is to a company's competitive strategy and offers a conceptual framework for comprehending these connections. Meade and Sarkis (1999) described agility as the capacity to deal with unforeseen change efficiently. It may be broken down into four areas: maximizing the influence of people and information;

managing change and ambiguity; enhancing customer happiness; and working together to increase competitiveness. The paper put forth a networked hierarchical analytical model that considers the different attributes and factors that determine agility and permits interdependencies between them.

Cluster 2 is concerned with Information Technology capabilities and performance in the organizational agility research area. Lu and Ramamurthy (2011) explored the connection between a company's information technology (IT) capabilities and organizational agility, highlighting both the potential benefits and drawbacks of IT capabilities. To build the critical IT capabilities needed to achieve higher agility, it highlights the significance of prudent IT spending and proactive IT management. The findings suggested IT spending that is directed toward improving IT capabilities can lead to increased agility. IT capability is also favorably correlated with both market capitalizing and operational adjustment agility. The study by Chakravarty et al. (2013) explores the intricate relationships between Information Technology (IT) competencies, organizational agility, and firm performance, particularly in the context of B-to-B electronic marketplaces. It employs confirmatory factor analysis and concomitant latent class regression analysis to validate IT competencies as a second-order latent construct, revealing that the effectiveness of these competencies varies significantly across different environmental conditions. The findings suggest that while IT competencies enhance both entrepreneurial and adaptive agility, their impact diminishes in highly dynamic environments, necessitating a nuanced understanding of how these factors interact to influence overall firm performance.

Cluster 3 is concerned with digital transformation and agility. Wamba et al. (2020) study developed a conceptual model, and hypotheses based on the dynamic capabilities view and contingency theory to examine the impacts of big data analytics and supply chain ambidexterity on organizational performance. Additionally, it assessed the moderating role of environmental dynamism. Sensing, seizing, and reconfiguring are the three sub-capabilities that make up BDA, which is viewed as a dynamic capability. Shahzad et al. (2020) study investigated how organizational agility and green innovation in knowledge management processes influence sustainable performance in businesses.

Cluster 4 discussed dynamic capabilities and strategic implications in the organizational agility research area. Teece et al. (2016) defined organizational agility as a firm’s ability to efficiently and effectively shift its resources into higher-value activities in response to external environmental changes. To further understand and enable organizational agility under conditions of extreme unpredictability, they drew upon the theoretical lens of dynamic capabilities. They identified three clusters of key dynamic capabilities that facilitate agility: sensing capabilities to identify threats and opportunities; seizing capabilities to mobilize resources to address changes; and transforming capabilities to continually renew the resource base. (Tallon and Pinsonneault (2011) provides a review of the existing body of research exploring the relationship between organizational agility and strategic alignment of information technology (IT). It discusses two competing perspectives on this link. One perspective argues that alignment leads to agility, as IT resources are effectively utilized to respond to changing market conditions. The other perspective suggests that agility drives alignment, as organizations with a flexible and agile structure can better align their IT resources with business goals

Cluster 5 describes about agility and business model in the organizational agility research area. Corte-Real et al. (2017) investigated the impact of Big Data Analytics (BDA) on organizational agility and competitive advantage in European firms, revealing that BDA enhances knowledge management and process performance. It establishes that agility partially mediates the relationship between knowledge assets and performance, explaining significant variations in competitive advantage. The research employs a robust empirical model, highlighting the importance of integrating BDA with strategic

management theories. Overall, it provides insights for executives on leveraging BDA investments to maximize business value. Priyono et al. (2020) study explored how small and medium enterprises (SMEs) in Indonesia, navigate digital transformation through partnerships with external digital firms. It categorizes SMEs into three groups based on their digital maturity: high digital literacy, moderate digital literacy with financial distress, and low digital literacy but strong social capital. The research emphasizes the importance of continuous digital adaptation to maintain competitiveness, especially during the COVID-19 pandemic. It highlights that effective governance and integration of online and offline models are crucial for managing complexity.

Table 5: Research Themes and Influences through Bibliographic Coupling

Research Theme	Author	Title of the article	TC
Agility Measurement and Industry Specific Application	Swafford et al. (2008)	"Achieving supply chain agility through IT integration and flexibility"	623
	Meade and Sarkis (1999)	"Analyzing organizational project alternatives for agile manufacturing processes: An analytical network approach"	457
	Breu et al. 2002)	"Workforce agility: The new employee strategy for the knowledge economy"	236
Information Technology Capabilities and Performance Implications	Lu and Ramamurthy (2011)	"Understanding the link between information technology capability and organizational agility: An empirical examination"	963
	Chakravarty et al. (2013)	"Information technology competencies, organizational agility, and firm performance: Enabling and facilitating roles"	402
	Lee et al. (2015)	"How does IT ambidexterity impact organizational agility?"	343
Digital Transformation and Agility	Wamba et al. (2020)	"The performance effects of big data analytics and supply chain ambidexterity: The moderating effect of environmental dynamism"	437
	Shahzad et al (2020)	"Exploring the influence of knowledge management process on corporate sustainable performance through green innovation"	307
	AlNuaimi et al. (2022)	"Mastering digital transformation: The nexus between leadership, agility, and digital strategy"	245
Dynamic Capabilities and Strategic Implications	Teece et al. (2016)	"Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy"	1147
	Tallon and Pinsonneault A (2011)	"Competing perspectives on the link between strategic information technology alignment and organizational agility: Insights from a mediation model"	888
	Mikalef and Pateli (2017)	"Information technology-enabled dynamic capabilities and their indirect effect on competitive performance: Findings from PLS-SEM and fsQCA"	666

Agility and Business model	Côrte-Real et al. (2017)	"Assessing business value of Big Data Analytics in European firms"	350
	Priyono et al. (2020)	"Identifying digital transformation paths in the business model of SMEs during the covid-19 pandemic"	341
	Felipe et al. (2016)	"An explanatory and predictive model for organizational agility"	156

Note: TC= Total number of citations

4.2.2 Thematic Trend through co-occurrence analysis

Co-occurrence analysis of author-selected keywords was utilized to further map themes and trends in organizational agility research, complementing the areas and fundamental works identified through co-citation and bibliographic coupling. The author's keywords were filtered chronologically to chart how topics related to organizational agility have evolved in the literature. Specifically, keywords were analyzed if they appeared in at least three reviewed papers. This allows us to identify the most prominent topics and how they have developed over time. The figures below (Figures 3-6) visually depict the evolution of research themes and topics related to organizational agility over time, based on the filtered co-occurrence analysis of keywords from the reviewed literature. These graphical representations illustrate the progression of key focus areas in the organizational agility field across articles published in recent decades. By mapping the longitudinal co-occurrence patterns of keywords, these visualizations chronicle how concentration has shifted within this domain since the mid-1990s. This depicts the rising, falling, and shifting focus of research attention on different aspects of organizational agility within the scholarly community.

Prominent topics of research in the "period of 1995-2015"

The study conducted in the years 1995 to 2015 on the theme of organizational agility was more focused on Information Systems, Project Management (blue nodes), and Agility and Agile Manufacturing (red nodes) and Organizational Performance and Organizational Agility (green node). This was the initial period of the theme of organizational agility and in later years it moved towards more dimensions of agility

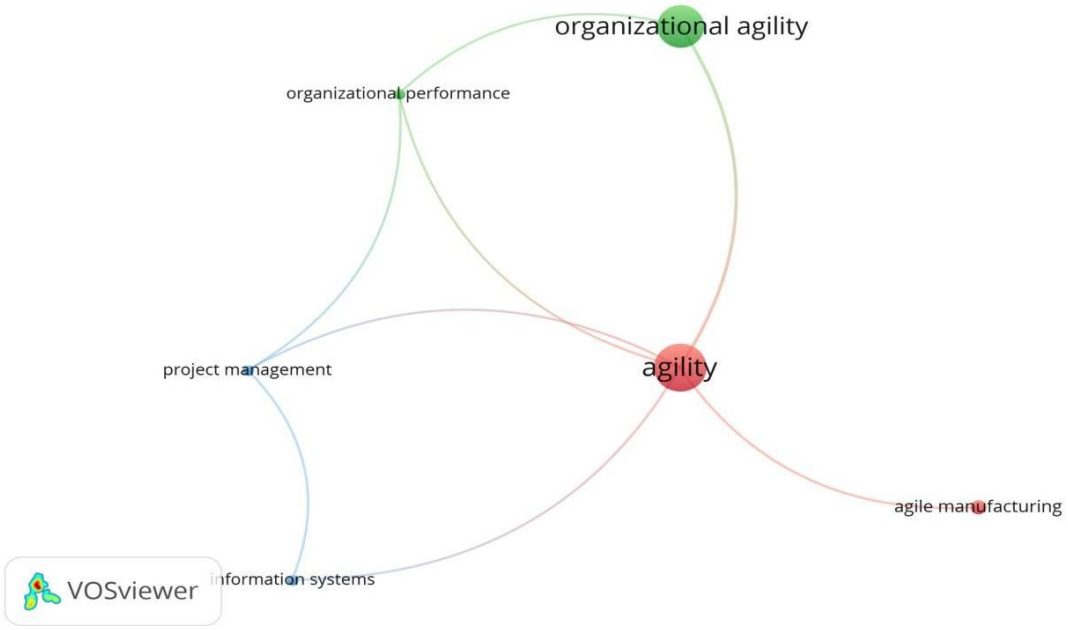


Figure 3: Research Theme from 1995-2015

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Prominent topics of research in the "period of 2016-2020"

The study conducted between 2016-2020 on organizational agility was done on themes such as agility, organizational culture, leadership, innovation, big data, ambidexterity, knowledge management and open innovation (red nodes); and business model innovation, and customer experience orientation, (blue nodes); and themes such as organization learning and intellectual capital (yellow nodes); and information technology and flexibility(orange nodes); and competitive advantage, entrepreneurial orientation IT competence and organizational agility(green nodes). Organizational transformation, dynamic capabilities and absorptive capacity (purple nodes), IT spending, interaction-moderation and environment uncertainty (light blue nodes) were also themes during this period.

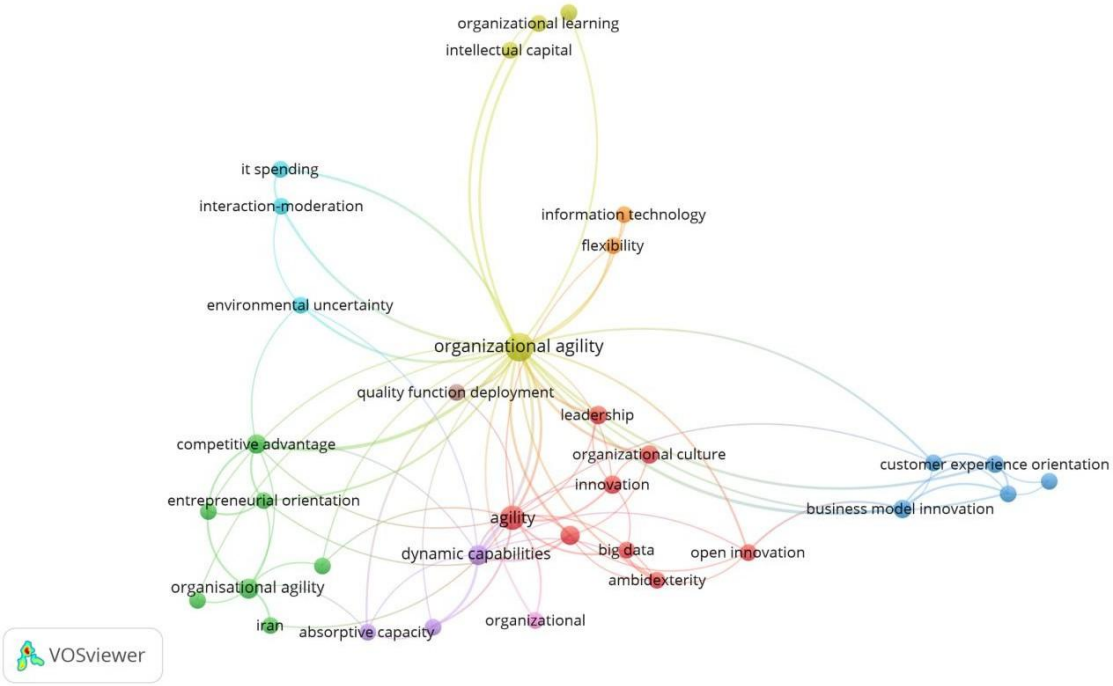

Figure 4: Research Theme from 2016-2020

Prominent topics of research in the "period of 2021-2024"

The study conducted during last four years 2021-2024 on organizational agility were based on the themes business agility, strategic agility, and dynamic capability(purple nodes); bibliometric analysis, workforce agility, competitive advantage, strategic management and dynamic capabilities (blue nodes); knowledge management and sustainable competitive advantage (light blue nodes); leadership, covid 19, change management, organizational performance, innovation, digital transformation and IT capability(green nodes); agility, flexibility, digitalization and structural equation modelling(yellow nodes); organizational agility, open innovation, absorptive capacity, firm performance, SMEs, and industry 4.0 (red nodes);

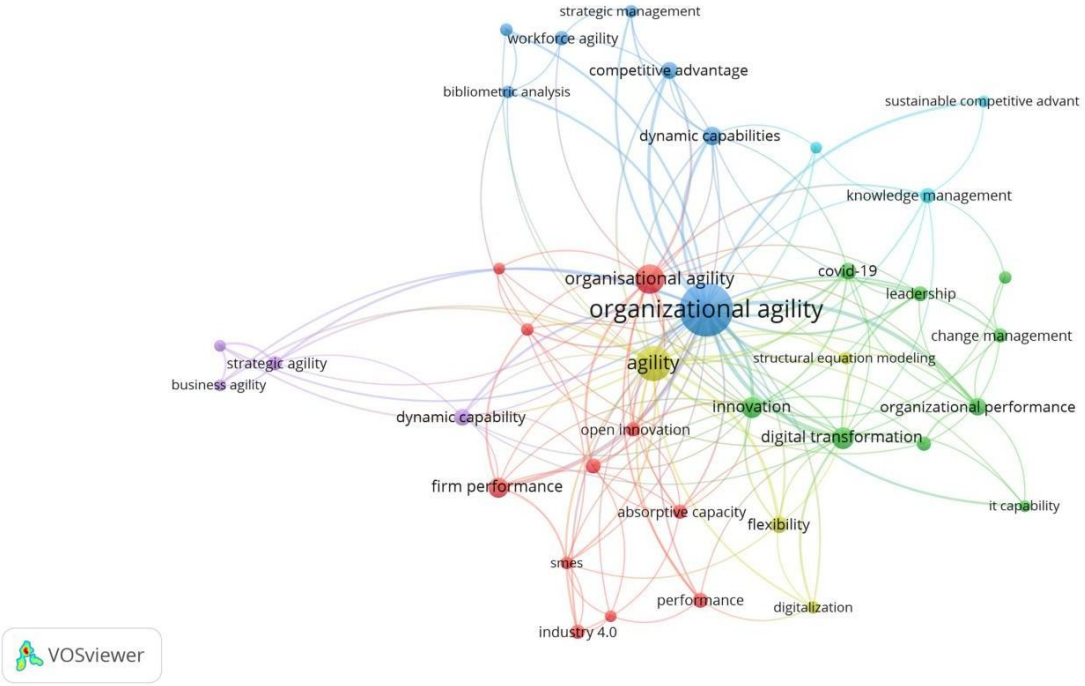

Figure 5: Research Theme from 2021-2024

Future Research Direction

Evaluating studies on organizational agility from a historical standpoint is essential for ascertaining contemporary and prospective implications. Through careful examination of relevant literature, this study may construct a foundational basis for the emerging field of organizational agility research, thus enabling subsequent researchers to investigate its practical applications and benefits.

A future study might examine how the newest technological breakthroughs facilitate organizational agility to elevate performance within local and global markets across multiple sectors and industries. During the initial phase of the organizational agility research area from 1995 to 2015, the studies focused on organizational performance, agile manufacturing, and project management. While from 2016 to 2020 were more focused and diversified on flexibility, innovation, entrepreneurship, organizational culture, learning, leadership, technology, organizational change, and adaptation. Furthermore, from 2021 onwards, the studies focused on strategic management and competitive advantages, digital transformation and innovation, organizational capabilities and performance, agility types, and leadership and change. The study also reveals the emerging themes that reflect the field's responsiveness to contemporary challenges and technological advancements. Notably, the presence of "COVID-19" as a topic in recent times indicates a surge of research examining organizational agility in the context of global disruptions. Similarly, the "Industry4.0" suggests growing interest in exploring organizational agility within the framework of the fourth industrial revolution.

Exploring the function of various agility types in strategic management and competitive advantage is a promising research avenue. Comparative studies could unveil how business, strategic, workforce, and organizational agility distinctly influence strategic positioning and competitive edge. Contextual factors like industry category, company scale, or market fluctuations may clarify the efficacy of different agility forms. Researchers could direct their attention to strategic agility in competitive sectors or workforce agility in knowledge-driven industries. Furthermore, investigating synergies or conflicts among agility types in achieving strategic objectives could generate significant insights. This may encompass evaluating how the integration of multiple agility forms can cultivate sustainable competitive advantage and identifying obstacles in pursuing them simultaneously. Longitudinal research on the evolving interplay between agility types and competitive advantage, particularly during market upheavals or technological transformations, would enhance our understanding of these phenomena.

Another fascinating domain of exploration is the examination of how innovation and digital transformation influence organizational abilities and effectiveness. Researchers could investigate how digital technology adoption, especially AI and blockchain, boosts organizational competencies. Examining the influence of various innovation types on organizational performance may yield noteworthy findings. This could encompass assessing open innovation's effect on financial outcomes or how business model innovation impacts market share and customer loyalty. The repercussions of digital transformation on organizational structures and processes, and their resultant performance effects, offer another compelling research direction. Potential topics may involve evaluating digital transformation's influence on agility and responsiveness or how digitalization affects cross-functional collaboration and innovation capabilities. Further, examining the role of Industry 4.0 technologies in developing or fostering new organizational capabilities, like data analytics in the manufacturing sector or the effect of IoT on supply chain strategies, could uncover essential understandings for theory and practical applications.

The importance of leadership and change management in enhancing agility, particularly amidst external factors like COVID-19, offers a third significant avenue for future research. Researchers might investigate the influence of various leadership styles on organizational agility and workforce adaptability during crises and remote working conditions. Exploring diverse change management strategies and their contributions to organizational agility could unveil important insights. This may include assessing top-down versus bottom-up approaches in implementing agile practices or examining cultural change initiatives that enhance flexibility. Analyzing leadership behaviors during crises, such as those presented by COVID-19, could yield essential understanding for crisis management. Relevant topics may involve evaluating leadership communication methods that bolster organizational responsiveness in pandemics or assessing how crisis decision-making affects rapid adaptability. Furthermore, researching how organizations maintain agility and flexibility beyond immediate crises could enhance knowledge of enduring agility practices. This might involve creating frameworks to integrate agility into organizational culture post-crisis or assessing the long-term implications of crisis-driven agility on performance. Lastly, investigating the influence of cultural dynamics on leadership strategies for promoting agility in global organizations could provide insightful cross-cultural comparisons, including contrasts between Eastern and Western leadership approaches or how multinational corporations tailor strategies to enhance agility across diverse cultural contexts.

Conclusion

Bibliometric analysis is a useful tool with several applications - it can inform collection building, reveal institutional research strengths and citation behaviors, and illuminate observable networks of research

schools of thought through co-citation visualizations. This current study leveraged bibliometrics to map out research patterns, analyze how topics have progressed over time, and identify impactful scholarship related to organizational agility. Using the Scopus database, the largest bibliographic resource, we extracted data and conducted analyses to showcase the evolution of organizational agility research across various periods. The study traces the development path this field has taken within strategic management literature and highlights open questions for prospective investigation. Scholars may build on this still emerging area to generate improved insights for policy makers and practitioners. Ultimately, by profiling the growth, rising topics, and future frontiers of this domain, this bibliometric investigation leads to enhanced understanding of organizational agility research progress. However, the study is limited to Scopus data only. Future efforts could incorporate combined bibliography information from both Scopus and Web of Science since some high-quality articles are unique to one or the other. Additionally, scholars could apply bibliometrics specifically to articles published in prestigious, selective journals to reveal patterns within top-tier publications only.

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