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Publication Patterns and the Evolution of the Dynamic Capabilities Concept in Global Business Literature

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ABSTRACT

This study examines the evolution, structure, and global dissemination of the dynamic capabilities (DC) concept within business and management literature through a comprehensive bibliometric analysis using VOSviewer. Drawing on data from the Scopus database covering the period 1997–2024, the study maps co-citation relationships, keyword co-occurrence, country collaboration patterns, and thematic trends. The results reveal that Teece, D.J. remains the most influential author, anchoring the field's theoretical development, while emerging scholars—especially from China and India—are contributing to its expansion. The United States leads international collaboration networks, followed by the United Kingdom and China. Thematic mapping indicates a core cluster focused on innovation, knowledge management, and enterprise resource management, while new clusters highlight intersections with artificial intelligence, machine learning, and sustainability. Temporal analysis shows a shift from system-based approaches toward digitally enabled and strategically integrated research. These findings demonstrate the growing interdisciplinarity, global reach, and strategic relevance of dynamic capabilities, providing valuable insights for scholars and practitioners seeking to navigate organizational adaptation in a rapidly changing business environment.

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1. INTRODUCTION

The dynamic capabilities (DC) framework has emerged as one of the most influential theories in strategic management and international business over the past three decades. Originally conceptualized by [1], dynamic capabilities refer to a firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments. The theory evolved in response to limitations in the resource-based view (RBV), which, while powerful, tended to emphasize static resources and lacked explanatory power in dynamic, global markets. As globalization, technological disruption, and digital transformation accelerate, dynamic capabilities have gained renewed relevance in explaining how firms achieve and sustain competitive advantage in volatile environments [2]–[4].

Over the years, the concept has expanded significantly, incorporating insights from innovation studies, knowledge management, organizational learning, and international business. Scholars have sought

to unpack the microfoundations of dynamic capabilities, linking them to sensing, seizing, and transforming activities [5]. Moreover, the concept has been applied in a wide range of contexts, including multinational enterprises, family businesses, startups, and public organizations [6], [7]. As the scope of its application widens, the need for a systematic analysis of its intellectual evolution becomes critical to understanding its theoretical coherence and future trajectory.

In recent years, the proliferation of studies on dynamic capabilities has led to an increasingly fragmented body of literature. Researchers have explored various dimensions, such as the antecedents and outcomes of dynamic capabilities, their measurement, and their role in strategic renewal and innovation. Despite the abundance of empirical studies, conceptual clarity and definitional consensus remain elusive [6]. Additionally, the interconnections between dynamic capabilities and other strategic concepts—such as absorptive capacity, organizational agility, and digital transformation—continue to evolve, raising questions about the integrative power of the DC framework in modern strategic thought.

Given this complexity, bibliometric analysis offers a valuable tool to map the intellectual structure of the dynamic capabilities literature. Bibliometrics enables researchers to systematically identify influential publications, authors, journals, and thematic clusters within a large corpus of academic work. This methodological approach provides a quantitative overview of how the concept has developed, which schools of thought have emerged, and how knowledge has diffused over time. With the growing availability of databases, bibliometric tool like VOSviewer have been increasingly used in business research to capture publication patterns and scientific evolution [8].

Furthermore, understanding the publication patterns of dynamic capabilities research is crucial for both academic and practical reasons. Academically, it helps clarify the development and convergence of theoretical frameworks. Practically, it informs business leaders, policymakers, and consultants about the strategic levers that matter in dynamic environments. In particular, as businesses confront grand challenges such as climate change, digitalization, and geopolitical instability, dynamic capabilities offer a potentially integrative lens for navigating uncertainty. Thus, mapping its scholarly landscape not only supports theory-building but also enhances its practical utility in decision-making.

Despite its prominence in strategic management literature, the evolution and diffusion of the dynamic capabilities concept remain underexplored from a bibliometric perspective. While prior studies have addressed conceptual debates and empirical challenges, there is a paucity of systematic analyses that trace its intellectual growth, thematic shifts, and collaborative structures across time and geography. This gap limits our ability to assess how the field has matured, which intellectual contributions have been most influential, and how current research aligns with the changing needs of global business. Moreover, without a comprehensive bibliometric understanding, scholars may miss critical trends, underexplored niches, or opportunities for theoretical integration. This study aims to conduct a comprehensive bibliometric analysis of global research on dynamic capabilities within the business and management domain.

2. METHOD

This study employed a bibliometric analysis to examine the intellectual structure and publication patterns of research related to the concept of dynamic capabilities in the field of global business and strategic management. Bibliometric analysis is a quantitative method that systematically evaluates the volume, structure, and impact of scientific literature using statistical and computational tools [8]. To ensure a comprehensive and high-quality dataset, bibliographic records were retrieved from the Scopus database, known for its extensive coverage of peer-reviewed journals

in management and business disciplines. The search strategy involved querying the Scopus database using the keywords "dynamic capabilities" in titles, abstracts, and keywords, refined to include only publications within the subject areas of Business, Management, and Accounting. The time span was limited from 1997 to 2024, beginning with the seminal paper by [1], which formally introduced the concept. Only articles and reviews published in English were included to ensure consistency and scholarly rigor.

The final dataset was downloaded in CSV format and analyzed using VOSviewer, a specialized software tool for building and visualizing bibliometric maps based on network data. VOSviewer was employed to perform several core analyses such as co-authorship analysis, co-occurrence analysis, citation analysis, and co-citation analysis. VOSviewer's mapping algorithms allowed for the visualization of clusters, density maps, and overlay visualizations, enabling a dynamic understanding of how research on dynamic capabilities has evolved over time. The software's capability to process large datasets and generate visual bibliometric maps provided both descriptive insights and structural perspectives, facilitating the identification of key contributions, thematic concentrations, and temporal trends in the literature.

3. RESULTS AND DISCUSSION

3.1 Results

a. Co-Authorship Analysis

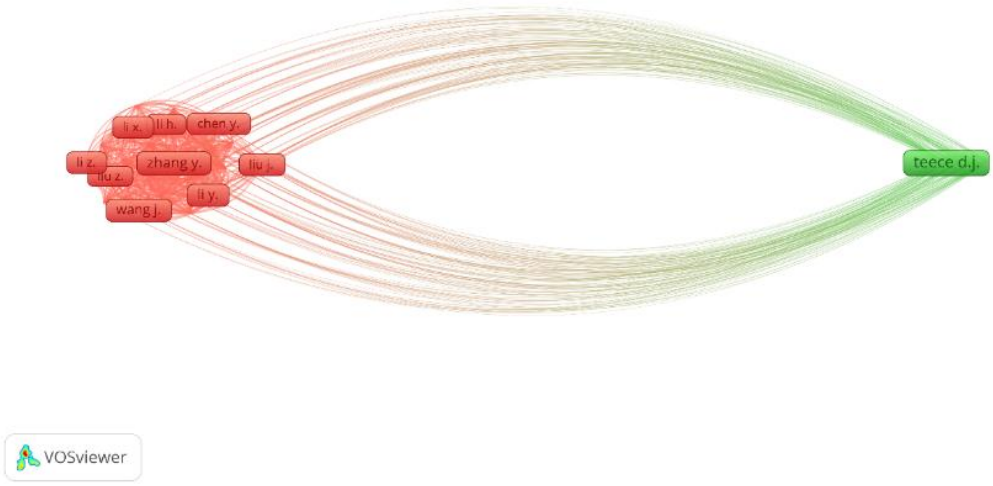

Figure 1. Author Visualization
Source: Data Analysis by VOSviewer

The VOSviewer visualization illustrates a co-authorship network, where *Teece, D.J.* appears as the most central and influential author in the dynamic capabilities literature. Positioned in isolation within the green cluster, Teece is distinctly cited by a dense group of authors represented in the red cluster—including *Zhang Y., Liu J., Chen Y., Wang J.,* and others. The clear directional lines connecting these two clusters signify frequent co-citation relationships, suggesting that Teece's foundational works serve as a theoretical cornerstone for a newer wave of scholars, many of whom appear to be affiliated with Chinese institutions. This structural pattern underscores the global diffusion of the dynamic capabilities concept and highlights how emerging research communities consistently anchor their work in Teece's theoretical contributions.

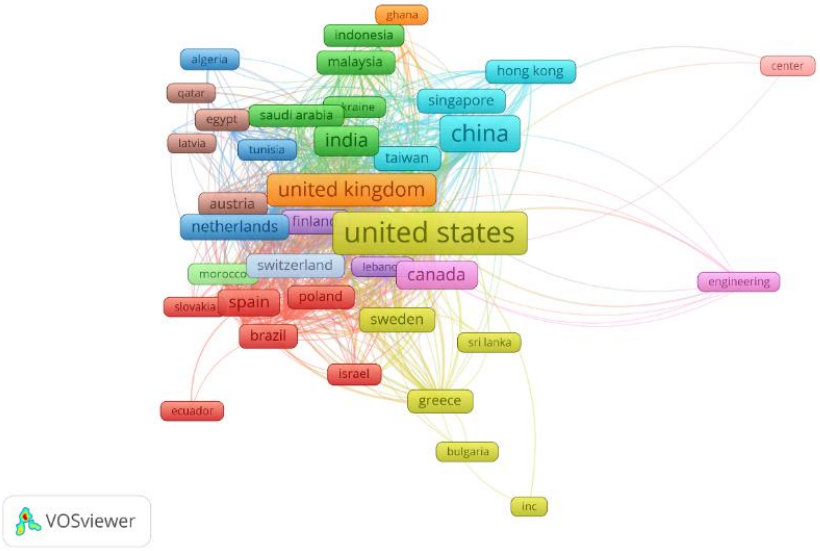

Figure 2. Country Visualization
Source: Data Analysis by VOSviewer

This map visualizes country co-authorship networks in the field of dynamic capabilities research. The United States, highlighted in bold yellow and occupying a central position, emerges as the most influential and collaborative hub, frequently co-authoring publications with countries such as the United Kingdom, China, India, Canada, and Germany. The dense interlinking of nodes indicates high international collaboration, particularly among Western countries and emerging economies in Asia. China and India, colored distinctly, demonstrate strong research activity and interconnectivity, reflecting their growing presence in global business scholarship. Clusters also suggest regional collaborations—such as the grouping of Middle Eastern and North African countries (e.g., Egypt, Qatar, Saudi Arabia) and European countries (e.g., Netherlands, Spain, Poland).

b. Keyword Co-Occurrence Analysis

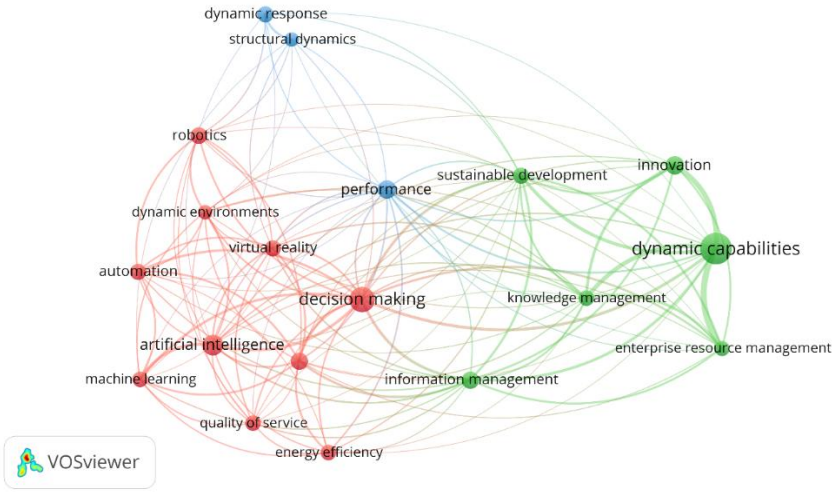

Figure 3. Network Visualization
Source: Data Analysis by VOSviewer

This keyword co-occurrence map presents a comprehensive visualization of thematic clusters within the dynamic capabilities literature. The green cluster, which includes core terms like dynamic capabilities, innovation, knowledge management, and enterprise resource management, represents the theoretical backbone of the field. These keywords form the central conceptual structure of dynamic capabilities research and emphasize the managerial and strategic functions essential for firm adaptation and renewal. The strong co-occurrence links between dynamic capabilities and innovation highlight the role of dynamic capabilities as enablers of innovation-driven competitiveness in volatile environments.

The red cluster illustrates the intersection of dynamic capabilities with emerging digital and intelligent technologies. Keywords such as artificial intelligence, machine learning, automation, virtual reality, and robotics dominate this thematic group. This cluster suggests a growing trend in the literature that explores how firms deploy digital technologies to enhance or transform their capabilities. The frequent connection of these terms with decision making and dynamic environments indicates an evolving discourse on how AI-enabled systems contribute to agile responses and strategic adaptation—an area where the dynamic capabilities framework is increasingly applied.

The blue cluster contains keywords like performance, dynamic response, and structural dynamics, representing studies that focus on outcomes and mechanisms of change. These terms point toward research that evaluates the measurable impact of dynamic capabilities on organizational performance. The presence of sustainable development and energy efficiency bridging this cluster with others implies that dynamic capabilities are being studied not just for economic returns but also for broader sustainability outcomes. The link between performance and both technology-driven and capability-driven concepts indicates an integrated evaluation of firm-level and societal impact.

This map reveals an interdisciplinary and evolving field, with the dynamic capabilities concept acting as a bridge between traditional strategic management themes and contemporary issues such as digital transformation and sustainability. The clusters are interconnected, suggesting that research on dynamic capabilities is not siloed but instead draws from and contributes to multiple streams of inquiry. This diversity underlines the concept's versatility and its relevance across various domains—from operational efficiency and technology adoption to sustainable innovation and global competitiveness.

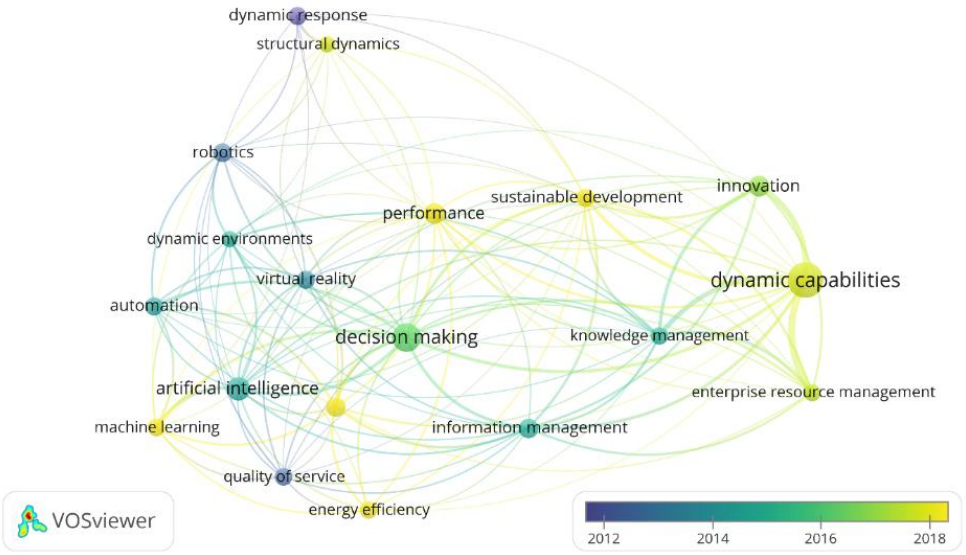

Figure 4. Overlay Visualization
Source: Data Analysis by VOSviewer

This overlay visualization map generated by VOSviewer illustrates the temporal evolution of keywords associated with dynamic capabilities research from 2012 to 2018. The color gradient—ranging from blue (earlier years) to yellow (more recent years)—helps trace how focus areas within the literature have shifted over time. Notably, foundational concepts such as dynamic capabilities, innovation, performance, and sustainable development are displayed in bright yellow, indicating that these topics have been at the forefront of recent research in the field. Their central positions and strong linkages confirm their ongoing significance in the theoretical and practical evolution of dynamic capabilities discourse.

In contrast, terms like structural dynamics, dynamic response, robotics, virtual reality, and automation appear in darker shades of blue, suggesting that these themes were more prominent in earlier phases of the literature. These keywords likely reflect an earlier wave of interest in systems-based or engineering-oriented applications of dynamic capabilities, particularly in high-tech or manufacturing settings. However, their relatively peripheral positions on the map and diminished recency indicate a possible shift away from purely technical or mechanistic interpretations of the concept toward broader, more strategic perspectives.

The emergence of terms like artificial intelligence, machine learning, and decision making in green and yellow hues suggests that the literature is currently embracing more data-driven and digitally enhanced strategic themes. These terms form bridges between earlier automation-focused work and current innovation-centric discourse, highlighting the growing relevance of digital transformation in dynamic capabilities research. The temporal visualization thus reveals a clear trajectory: the field has moved from operational and technical foundations toward more strategic, innovation-led, and digitally infused inquiries—reflecting the broader digital disruption shaping modern global business environments.

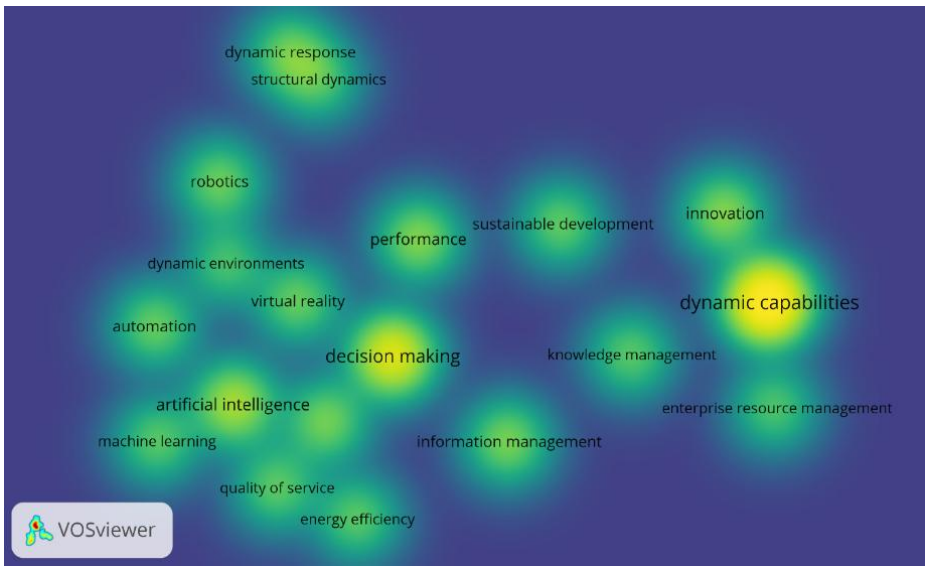

Figure 5. Density Visualization
Source: Data Analysis by VOSviewer

This heatmap visualization from VOSviewer highlights the density and intensity of keyword occurrences in dynamic capabilities research. The bright yellow areas—most notably around dynamic capabilities, decision making, and innovation—indicate the highest frequency of co-occurrence, signaling that these topics are the most extensively discussed and interconnected within the literature. Their central positioning reinforces their conceptual significance in the field, with dynamic capabilities acting as the dominant anchor around which much of the scholarly conversation revolves. The strong density around innovation and decision making suggests that these are not only common topics but also critical lenses through which dynamic capabilities are often operationalized or studied.

Surrounding these hot spots are moderate-density regions shaded in green, including terms like artificial intelligence, knowledge management, enterprise resource management, and sustainable development. These keywords represent active yet slightly more peripheral themes, indicating their growing relevance in linking dynamic capabilities to technological advancement and broader organizational goals. Meanwhile, areas with lower density—such as robotics, virtual reality, and structural dynamics—reflect emerging or more specialized subfields. The heatmap effectively visualizes the conceptual landscape, highlighting both dominant themes and thematic opportunities for future exploration within the dynamic capabilities literature.

c. Citation Analysis

Table 1. Most Cited Article

Citations	Author and Year	Title
2940	[9]	Model predictive control: Theory and practice-A survey
2828	[10]	The dynamic resource-based view: Capability lifecycles
1701	[11]	Dynamic capabilities: A review and research agenda
1608	[12]	The dynamics of product innovation and firm competences

Citations	Author and Year	Title
1280	[13]	Dynamic Capabilities: A review of past research and an agenda for the future
1263	[14]	Advances in cognitive radio networks: A survey
1209	[15]	The foundations of enterprise performance: Dynamic and ordinary capabilities in an (economic) theory of firms
1195	[16]	Managerial cognitive capabilities and the microfoundations of dynamic capabilities
1116	[17]	Business model evolution: In search of dynamic consistency

Source: Scopus, 2025

3.2 Discussion

The findings from the bibliometric analysis offer a comprehensive view of the intellectual development, thematic diversity, and geographical expansion of the dynamic capabilities (DC) literature in the global business context. By examining co-citation networks, keyword clusters, country-level collaboration, and temporal patterns, the study not only reveals the foundational roots of the field but also maps its transformation in response to evolving global business challenges.

One of the most striking observations from the co-citation analysis is the dominant and enduring influence of Teece, D.J., who appears isolated in a green cluster, representing the theoretical core of dynamic capabilities. The dense connections from an emerging cluster of authors—primarily affiliated with Chinese institutions—highlight how foundational works continue to anchor contemporary scholarship. This reflects a pattern common in strategic management literature, where a few seminal contributions serve as theoretical anchors for extended research streams. The bridging of these newer scholars to Teece suggests not only theoretical dependency but also intellectual continuity and global dissemination of foundational ideas. However, the lack of reciprocal citations among the newer cluster may point to fragmentation or the early stage of theoretical consolidation in non-Western contexts.

The country collaboration map further underscores the globalization of dynamic capabilities research. The United States leads the field in both volume and influence, acting as a central hub in the international co-authorship network. It is followed by the United Kingdom, China, India, and Canada, all of which have shown increasing engagement with dynamic capabilities, either as theoretical contributors or application-based researchers. The visualization shows strong transcontinental connections—especially between North America, Europe, and Asia—indicating a maturing and interconnected research ecosystem. Notably, the active participation of emerging economies such as China, India, and Malaysia highlights the applicability of the DC framework beyond traditional Western-centric business contexts. This expansion may reflect a growing interest in understanding how firms from developing economies adapt and innovate in volatile environments, often under conditions of institutional voids and rapid market evolution.

The keyword co-occurrence map presents a rich and evolving thematic structure. At the core of the literature lies a cohesive green cluster centered on dynamic capabilities, innovation, enterprise resource management, and knowledge management. These themes represent the traditional foundation of DC theory, emphasizing how firms build, integrate, and reconfigure competencies to generate innovation and

respond to changing environments [18]. The prominence of these terms confirms the persistent centrality of innovation as both an outcome and enabler of dynamic capabilities, and highlights the continued interest in exploring the internal mechanisms and routines that support organizational adaptability.

Surrounding this core, the literature is branching into digitally-oriented domains, as seen in the red cluster containing artificial intelligence, machine learning, automation, and virtual reality. These keywords signal an emergent convergence between dynamic capabilities and digital transformation research. As firms increasingly rely on data-driven decision-making and AI-based systems, scholars are beginning to examine how these technologies enhance, replace, or redefine dynamic capabilities. For instance, the integration of machine learning into strategic sensing or the use of AI in capability recombination processes introduces new dimensions to the original DC framework. This emerging intersection underscores the need for theoretical adaptation that accommodates digitally augmented capabilities, possibly moving beyond Teece's traditional triad of sensing, seizing, and transforming.

A particularly interesting development is the strong linkage between decision making and both digital and strategic themes. Appearing centrally in multiple clusters, decision making serves as a conceptual bridge—indicating its role as a mediator between data-driven tools and capability execution. This aligns with recent debates in the literature suggesting that managerial cognition, analytics capability, and real-time decision systems are critical antecedents of dynamic capabilities in the digital era [19]. The emphasis on decision making thus supports an expanded understanding of dynamic capabilities, one that integrates behavioral, cognitive, and technological elements.

The temporal overlay visualization confirms this thematic evolution over time. Earlier research (pre-2014), shown in blue tones, focused on structural and system-based themes such as structural dynamics, dynamic response, and robotics. These topics suggest an initial interest in applying DC principles to operations management and engineering contexts. However, the shift toward yellow tones—representing more recent years—indicates a growing emphasis on innovation, performance, sustainable development, and AI. This evolution mirrors broader shifts in the global business environment, where firms face increasing pressure to innovate not only for competitive advantage but also for sustainability and resilience in the face of climate change, global pandemics, and geopolitical disruptions.

The sustainability dimension also deserves special mention. Keywords like sustainable development and energy efficiency have become more integrated into the conceptual landscape, suggesting that scholars are now exploring how dynamic capabilities contribute to long-term societal and environmental value creation, not just short-term performance. This aligns with recent scholarship on dynamic capabilities for sustainability [20], where firms are expected to develop new routines and reconfigure operations to address environmental challenges. The intersection of DC with ESG (Environmental, Social, Governance) themes represents a fertile ground for future research, especially as sustainability transitions become a strategic imperative.

The heatmap further reinforces the centrality of dynamic capabilities, decision making, and innovation as the densest regions in the literature. These hotspots suggest both frequency and centrality of co-occurrence, meaning that these concepts are not only popular but also structurally integral to the network.

Surrounding topics such as information management, knowledge management, and artificial intelligence show moderate intensity, indicating their increasing but not yet dominant role. Meanwhile, lower-density terms like virtual reality and quality of service reflect more niche or emerging areas of inquiry, potentially offering opportunities for novelty and exploration.

The bibliometric findings indicate that dynamic capabilities research is in a phase of theoretical diversification and contextual broadening. The field retains a strong foundation in classical strategic management, but it is increasingly influenced by interdisciplinary inputs from information systems, artificial intelligence, sustainability science, and behavioral decision theory. This diversification reflects the adaptability of the DC framework itself—aptly mirroring its central premise of organizational agility and transformation. However, this also presents a risk: as the field expands into new territories, there is a need for theoretical cohesion to avoid dilution or conceptual fragmentation. Future research may benefit from revisiting and refining the core constructs, especially in light of technological augmentation and sustainability pressures.

4. CONCLUSION

This study presents a comprehensive bibliometric analysis of the dynamic capabilities literature within the global business context, uncovering its intellectual structure, key contributors, thematic evolution, and emerging research directions. The analysis reveals that while foundational works—especially those by Teece—continue to anchor the field, dynamic capabilities research has progressively diversified to include themes such as digital transformation, artificial intelligence, sustainability, and strategic decision-making. The United States, China, and the United Kingdom emerge as major contributors, reflecting both mature and rapidly growing research ecosystems. Thematic clusters and temporal trends demonstrate a shift from mechanistic and system-based approaches toward digitally enabled and innovation-driven frameworks, underscoring the adaptive relevance of the DC concept in turbulent environments. As the literature continues to expand across disciplines and geographies, maintaining conceptual coherence while integrating new domains will be essential for sustaining the theoretical and practical significance of dynamic capabilities in modern strategic management.

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