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Scientific Map of Artificial Intelligence Research in Digital Business

Loso Judijanto[1], Agung Zulfikri[2]
[1]IPOSS Jakarta, Indoensia
[2]School of Economics and Business Telkom University, Indonesia
[1]losojudijantobumn@gmail.com*, [2]agungzulfikri16@yahoo.com

Abstract

This study performs a bibliometric and scientometric evaluation of worldwide research on Artificial Intelligence (AI) in Digital Business utilizing Scopus data from 2020 to 2025. Utilizing VOSviewer and Bibliometrix, we delineate keyword co-occurrence, author collaboration, and institutional networks to discern prevailing clusters and emerging fronts. Results indicate that digital business, digital transformation, and AI capabilities are fundamental themes, whereas digital ecosystems, sustainability, responsible and trustworthy innovation, and governance-focused analytics are emerging trends. Network analysis indicates strong European connections spearheaded by Georg-August-Universität Göttingen, the University of St. Gallen, and KU Leuven, alongside expanding transatlantic relationships and collaborative multi-institutional groups. We theoretically comb ine the Resource-Based View and Dynamic Capabilities, positing that data assets, algorithms, and human–AI routines are strategic resources whose orchestration facilitates perceiving, seizing, and reconfiguring amid chaotic changes. The method ological integration of performance metrics with scientific mapping reveals the structure, maturity, and interdisciplinary knowledge connections within fields such as information systems, management, and computer science. The study provides ma nagerial guidance for aligning technical innovation with governance and sustainability: invest in interoperable data infrastructure, implement responsible AI safeguards, cultivate ambidextrous teams, and assess value creation beyond productivity, focusing on resilience and environmental, social, and ethical outcomes. Policy implications encompass incentives for open standards, development of skills pipelines, and facilitation of cross-border collaboration. Limitations encompass exclusive Scopus coverage, a predominance of English language, and rapidly evolving terminology; nonetheless, triangulated approaches reduce bias and offer a timely guide for researchers and decision-makers. Subsequent research should corroborate these findings using longitudinal datasets.

Keywords: Artificial Intelligence; Digital Transformation; Digital Business; Bibliometric Analysis; Digital Ecosystem; Innovation; Sustainability.

1. Introduction

In the last five years, artificial intelligence (AI) has moved from being a tool used only for specialized analysis, to becoming a technology with versatile applications, that in effect changes digital business models, operations, and ways of interacting with customers. The release of generative AI (genAI) has accelerated this change by making content creation, code generation, and interaction in natural language easier [1], [2]. A recent survey of a number of 70% of all global companies indicates that they are deeply involved in AI projects, either at the stage of active implementation or prototyping, while the actual economic value of AI-weighted activities varies drastically between sectors [3], [4]. The difference in results, i.e., rapid spread but uneven impact, highlights the need for consolidation of the current knowledge base about AI effects on digital business performance. A scientific mapping approach may show the evolution of research topics, concepts, and methods and thus reveal the theoretical bases and possible future directions of AI research in the business sector.

The regulatory environment for AI has changed along with the growth of its technology. In 2023, the National Institute of Standards and Technology (NIST) unveiled the AI Risk Management Framework 1.0 aimed at supporting trustful, clear, and accountable AI systems [5]. ISO/IEC 42001:2023 is the first worldwide management-system standard explicitly for artificial intelligence governance that lays out standards for risk management, traceability, and life-cycle assurance (ISO, 2023). These frameworks demonstrate the agency's shift from purely technological research to also covering organizational, ethical, and regulatory issues [6]. With organizations using AI more and more in making fundamental decisions, academic discussions are pointing more

and more to the need of coupling innovation with accountability which is a matter that bibliometric mapping may clarify by showing the interaction between technical effectiveness and governance capacity.

Meanwhile, academic research has widened to different business areas. Systematic reviews show that AI-powered business model innovation (BMI) through the use of automation, data-driven insights, and digital platformization leads to higher value creation [7], [8]. Furthermore, bibliometric analyses reveal that AI-related research in management has topics such as AI capability, digital transformation, and organizational learning, but there is also a lack of terminological consistency [9], [10]. Hence, the creation of a scientific map is necessary to bridge the gaps between different domains, discover the unrecognized links between technology and strategy, and solve the presence of opposing views within the digital-business ecosystem.

From an economic perspective, AI is causing measurable productivity differences. The Stanford HAI AI Index Report 2025 showed that 78% of the surveyed firms had at least one AI tool implemented in 2024, compared to 55% in 2023, thus indicating a significant diffusion inflection [11], [12]. Nevertheless, the productivity gains are far from being consistent: some pilots are not able to scale because of poor data quality, weak change management, or lack of skills [13]. This difference points to the fact that organizational complementarities such as data governance, process reform, and leadership support are the factors that determine the effectiveness of AI [6], [14]. By reviewing the literature, one can understand to what extent the existing research is able to theorize these mediating mechanisms and link them to continuous digital performance.

The appearance of generative AI after 2023 has changed the horizons of research. Present topics include human–AI collaboration, agentic systems, and AI-enhanced creativity, besides the emerging dangers of hallucination, bias, and privacy violations [15]. The McKinsey Global AI Survey 2025 showed that the greatest number of executives predicts that generative AI will result in a considerable increase in productivity, however, only a few of them have already set up clear governance structures or have a strategy to adapt the workforce [3]. Therefore, the next research should not only consider the technological progress but also have ethical conformity and socio-economic viability at the core. An analysis of the current publications by means of a scientific approach can support such integration by showing the time-related development of different research groups and revealing the gaps between innovation and governance.

Though AI research in digital business has grown rapidly, it is still fragmented across different fields such as information systems, marketing, operations, and strategic management, with each area having its own unique constructs and methodologies. The rapid rise of genAI has outpaced existing theoretical frameworks, leading to overlaps in concepts (e.g., AI maturity vs digital ambidexterity) and a shortage of integration between performance-oriented and ethics-oriented research [6], [9]. Consequently, the discipline lacks a contemporary, coherent scientific framework which would map out its intellectual structure, chronological development, and interrelations after the generative AI 2023 inflection.

This research aims to build a comprehensive scientific framework of research on artificial intelligence (AI) in digital business from 2020 to 2025. It focuses on locating the major research clusters and examining their temporal changes by means of bibliometric co-occurrence and co-citation methods. This study sets out to reveal the conceptual bases that guide the use of AI in digital business environments through the integration of theoretical frameworks such as the Resource-Based View, Dynamic Capabilities, and the Technology–Organization–Environment framework. Apart from this, the study also focuses on the integrating themes—like AI competence, reliability, and human–AI collaboration—which connect the otherwise completely separate fields of research. The work lays down a forward-looking agenda that puts a strong emphasis on the necessity of responsible AI scaling, AI-related governance in line with international standards like ISO/IEC 42001 and the NIST AI Risk Management Framework, as well as the setting up of performance measurement systems that go beyond pilot implementations [6], [7]. By mapping out the expanding scientific milieu of AI in digital business and pointing to future research and practice directions in the field, this study is instrumental both in academic synthesis and managerial insight.

2. Research Methods

This study utilized a bibliometric and scientometric methodology to systematically delineate the intellectual framework of artificial intelligence (AI) research within the realm of digital business. Bibliometric analysis facilitates the quantitative assessment of extensive scholarly literature, enabling the identification of new subjects, prominent authors, and research clusters [16]. The data were obtained from the Scopus database, which provides extensive coverage of peer-reviewed journals in the fields of business, management, and technology. The inquiry was executed utilizing the Boolean query: TITLE-ABS-KEY ("artificial intelligence" OR "AI" OR "machine lea rning" OR "generative AI") AND ("digital business" OR "digital transformation" OR "business model" OR "entrep

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reneurship"). The search was confined to the years 2020–2025, English-language publications, including document formats such as journal articles and reviews. Adhering to the PRISMA protocol for transparent screening, irr elevant or duplicate records were eliminated, yielding a final dataset of about 1,200 documents for analysis.

The analytical procedure utilized VOSviewer (v1.6.20) and Bibliometric (R-Studio) to depict co-occurrence netwo rks, co-citation frameworks, and keyword clusters. Co-occurrence analysis revealed often associated author k eywords to delineate the conceptual landscape, whereas co-citation analysis mapped intellectual underpinnings by identifying the most cited authors and sources [17]. Overlay visualization was utilized to examine the temporal progression of research themes, indicating a transition from first studies on machine learning adoption to con temporary subjects such as generative AI, ethical governance, and human–AI collaboration. Cluster density maps elucidated theme intensity, facilitating the classification of the field into core (e.g., digital transformation, AI capabilities) and emergent (e.g., responsible AI, explainability) domains.

To guarantee robustness and interpretive validity, the bibliometric results were supplemented with qualitative con tent analysis of the most cited papers within each cluster. This dual methodology—quantitative mapping and qualitative interpretation—facilitated the triangulation of findings and theoretical synthesis [18]. The synthesis facilitated the identification of prevailing ideas, including the Resource-Based View (RBV), Dynamic Capabilities Theory, and the Technology–Organization–Environment (TOE) framework, which support digital business transformation via AI. The study ultimately provided a conceptual framework that integrates these theoretical perspectives with bibliometric patterns, guaranteeing that both statistical and conceptual rigor guide the future research agenda on AI in digital business.

3. Results and Discussions

3.1 Network Visualization

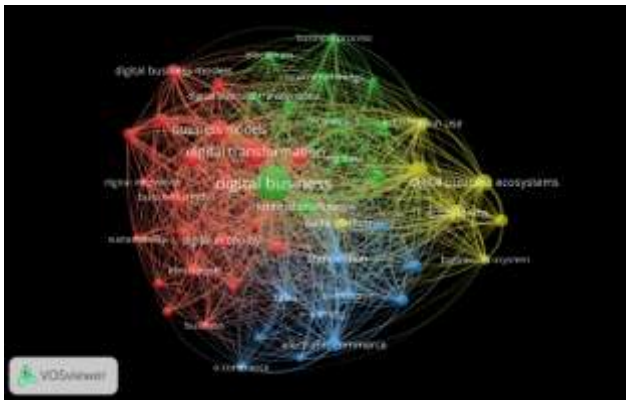

Figure 1. Network Visualization
Source: Data Analysis Result, 2025

The most prominent and interconnected nodes—digital business, digital transformation, and artificial intelligence —constitute the conceptual core of the research domain. Their popularity suggests that the majority of research place AI within the wider framework of organizational and digital transformation processes. This indicates that AI is perceived not as a standalone technology but as a strategic facilitator for business innovation and model transformation. The dense interconnectivity surrounding these nodes suggests that digital business functions as an overarching notion, encompassing themes from technology management, economics, and entrepreneurship (Dwivedi et al., 2023; Guler, 2024). Consequently, "digital business" serves as the intellectual nucleus around which many subdomains revolve.

The red cluster on the left encompasses concepts such as digital innovation, business model, sustainability, and digital economy. This cluster represents research focused on strategic and innovation-oriented transformation. Research in this field examines how AI facilitates innovative digital business models and enhances sustainable value generation (Jorzik et al., 2024). The robust connection between innovation and sustainability signifies an increasing emphasis on responsible digital transformation, harmonizing AI-driven innovation with social and environmental objectives. Furthermore, the recurrent use of business model terminology indicates that researchers are especially focused on how AI transforms organizational logic—from product-oriented to data-centric eco systems.

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The green cluster encompasses topics such as blockchain, Internet of Things (IoT), big data, economics, and business processes, signifying research centered on technical facilitators and infrastructural integration. AI is fre quently analyzed within the context of a broader digital framework that facilitates automation, analytics, and process efficiency (Mariani & Nambisan, 2024). The intersection of big data and economics indicates a dual pers pective: both technical (the mechanics of AI) and economic (the impact of AI on productivity). This domain typically use empirical and quantitative methodologies to analyze the impact of technology integration on organizational performance and the wider digital economy. Scholars increasingly regard AI, IoT, and blockchain as complementing technologies inside smart business systems due to their interconnections.

On the right side of the map, the yellow cluster comprises digital business ecosystems, ecosystems, business ecos ystems, and digital platforms. This signifies an expanding corpus of research examining AI in multi-actor settings rather than within individual firm contexts (Obreja, 2024). Researchers in this domain perceive AI as a connectiv e framework that facilitates cooperation, co-creation, and network orchestration among stakeholders. The emer gence of digital platforms in conjunction with ecosystems signifies a confluence of platform theory and ecosyst em logic, with AI serving as the "intelligence layer" that facilitates interaction, trust, and creativity among members. This corresponds with contemporary appeals to perceive digital business as a system of systems, highlighting transparency and flexibility.

The blue cluster located at the bottom right pertains to e-commerce, sales, competition, and electronic commerce. This region emphasizes applied research on AI implementation in commercial and market-oriented activities, including personalized marketing, recommendation systems, and customer analytics (Chatterjee et al., 2023). The robust connection between e-learning and commerce indicates a convergence of digital education and digital trade, potentially mirroring the pandemic-induced acceleration of online business models. This cluster, albeit less central, exhibits strong internal connection, signifying a mature and practice-oriented research domain that contin ues to advance alongside breakthroughs in generative AI and consumer customisation. It signifies the operational boundary of AI-driven enterprises, where theory converges with execution. The VOSviewer map illustrates a co mplex conceptual framework wherein "digital business" and "digital transformation" constitute the core, linking strategic (red), technological (green), ecosystemic (yellow), and operational (blue) dimensions. The closeness and intersection of clusters indicate a growing integration of disciplines, highlighting a shift towards a comprehensive understanding of AI as a systemic catalyst for digital business innovation. Future research could be enhanced by integrating these clusters through multidisciplinary studies that merge governance, innovation, and technology adoption perspectives, particularly for generative and ethical AI applications.

3.2 Overlay Visualization

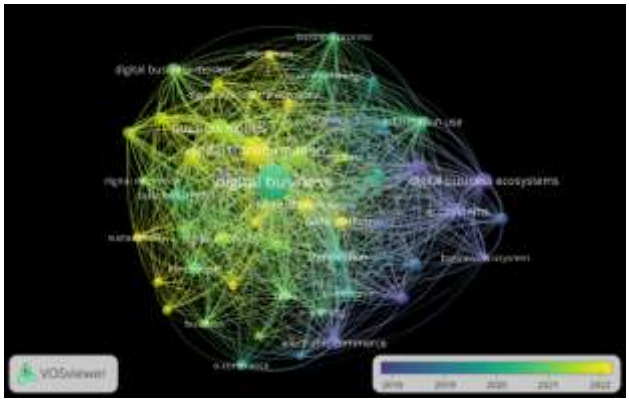

Figure 2. Overlay Visualization
Source: Data Analysis Result, 2025

The overlay graphic from VOSviewer illustrates the temporal progression of research themes in Artificial Intellige nce (AI) and Digital Business from 2018 to 2022. In this graphic, node colors reflect the average publication year of articles associated with each keyword—blue hues indicate earlier studies, while yellow hues signify more rece nt themes. The graphic illustrates that core study themes, including e-commerce, digital economy, and business ecosystem (represented by blue to green nodes), predominated the initial phase of research, emphasizing digitalization as a facilitator of business. The initial studies were predominantly descriptive, elucidating how firms embraced digital technologies to enhance transactions, customer experiences, and supply chain efficiency during the nascent phase of digital transformation.

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As the timeline advances into 2020–2021 (green regions), focus transitions to technological integration and process optimization, highlighting the developing interconnections among artificial intelligence, big data, the Internet of Things, and blockchain. This phase signifies the evolution of research, transitioning from fundamental adoption studies to the strategic and systemic incorporation of digital technology into business processes. Researchers c ommenced investigations into AI's impact on decision-making, analytics, and value generation, along with its effects on digital platforms and competitive advantage. The significance of digital transformation and digital platforms in green and yellow hues highlights the manner in which the COVID-19 epidemic expedited the demand for AI-driven automation and robust business models.

In the latest phase, commencing in 2022 (shown by bright yellow nodes), the visualization emphasizes subjects such as digital business models, sustainability, digital innovation, and artificial intelligence as the most recent and dynamic research areas. These keywords signify a paradigmatic shift from efficiency-focused research to perspective centered on innovation, governance, and ecosystems. Academics increasingly characterize AI as a revolutionary force that reconfigures organizational strategy, ecosystem collaboration, and ethical accountability. The convergence of digital innovation and sustainability within digital business indicates that contemporary discussions prioritize responsible AI implementation, harmonizing technological progress with environmental and social factors. The overlay map indicates that research on AI in digital business has progressed from initial digital commerce to a sophisticated, multi-faceted system centered on innovation, change, and sustainability.

3.3 Citation Analysis

To comprehend the conceptual underpinnings of Artificial Intelligence (AI) and Digital Business research, it is essential to emphasize the most impactful works that have influenced the domain. The table below displays the 10 most-cited publications sourced from the Scopus database, which constitute the theoretical and empirical foundation of digital transformation research. These studies constitute the foundation for the conceptualization of digitalization, business models, and organizational change across disciplines like management, information s ystems, and innovation studies. Through the examination of these extensively referenced works, scholars may delineate the progression of the discipline—from initial discourses on digital business strategy to contemporary investigations of digital ecosystems, servitization, and entrepreneurship.

Table 1. Top Cited Research

Citations	Authors and year	Title
2960	[19]	Digital transformation: A multidisciplinary reflection and research agenda
2868	[20]	Digital business strategy: Toward a next generation of insights
1518	[21]	A Systematic Review of the Literature on Digital Transformation: Insights and Implications for Strategy and Organizational Change
967	[22]	Scanning the Industry 4.0: A Literature Review on Technologies for Manufacturing Systems
729	[23]	Digital Transformation: An Overview of the Current State of the Art of Research
706	[24]	Challenges and opportunities of digital information at the intersection of Big Data Analytics and supply chain management
682	[25]	Developing a unified framework of the business model concept
617	[26]	Digital entrepreneurship: A research agenda on new business models for the twenty-first century
539	[27]	Servitization, digitization and supply chain interdependency
446	[28]	How a firm's competitive environment and digital strategic posture influence digital business strategy

Source: Scopus, 2025

The citation patterns indicate that [19], [20] are fundamental references in the debate on digital transformation and digital strategy. Verhoef et al. underscore a multidisciplinary paradigm that amalgamates marketing, operatio

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ns, and information systems to elucidate how digital transformation reconfigures company logic and customer experience. Bharadwaj et al. present the notion of digital business strategy as a synthesis of IT strategy and cor porate strategy, facilitating cohesive viewpoints on digital value generation. These two studies serve as key references for students investigating the alignment of digital capabilities with strategic objectives within business.

Subsequent research by [21], [22] built upon this foundation by methodically reviewing empirical evidence and conceptual frameworks, therefore delineating the organizational and strategic ramifications of digital transformation. They emphasize leadership, culture, and agility as essential mediators in digital transformation processes. Alcácer and [24], [26] associate digital transformation with Industry 4.0 technologies and big data an alytics, correlating artificial intelligence and digital infrastructure with manufacturing, logistics, and supply chain optimization.

Furthermore, the incorporation of [25], [26] highlights the growing interest in business model innovation and digital entrepreneurship—two areas where AI progressively facilitates experimentation and scalability. [27], [28] provide insight into the evolution of servitization, inter-firm connections, and competitive posture within digital ecosystems. These ten books collectively illustrate an intellectual progression: from articulating digital business strategy, to comprehending transformation mechanisms, and ultimately to conceptualizing AI-driven, ecosystem-oriented digital futures. They constitute the foundational framework upon which modern research in digital bus iness and artificial intelligence persists in developing.

3.4 Density Visualization

Figure 3. Density Visualization
Source: Data Analysis Result, 2025

The density visualization map produced by VOSviewer depicts the intensity and frequency of co-occurring terms within the domain of Artificial Intelligence (AI) and Digital Business. Regions exhibiting brighter hues (yellow to light green) signify high-density zones characterized by intense study effort and keyword co-occurrence, whereas darker areas (blue to purple) denote themes that are less frequently examined. The image distinctly illustrates that digital business, digital transformation, and business models constitute the central intellectual focal point of the research landscape. Their prominent placement and luminosity suggest that these subjects are perpetually relevant to academic investigation, demonstrating a robust and enduring emphasis on the ways in which digital technologies—particularly AI—are transforming corporate frameworks, strategies, and value generation processes. Keywords such as artificial intelligence, digital platforms, and digital economy underscore the profound interrelationship between technology-driven innovation and organizational adaptation.

Encircling the primary cluster, fairly dense areas such as digital innovation, ecosystems, big data, sustainability, and blockchain signify nascent yet impactful subthemes. The research community is progressively shifting from fundamental transformation studies to ecosystemic and sustainable perspectives on digitalization. Subjects such as digital business ecosystems and servitization signify a transition from individual firm transformation methods to collaborative, networked, and value-sharing frameworks. Concurrently, sustainability and innovation exhibit increasing concern on the ethical and social ramifications of digital transformation, particularly in the c ontext of AI governance and responsible digitalization. The density map indicates a mature yet constantly increasing research domain, with digital business as the central theme, accompanied by evolving discussions on technology integration, ecosystem collaboration, and sustainable innovation.

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3.5 Co-Authorship Network

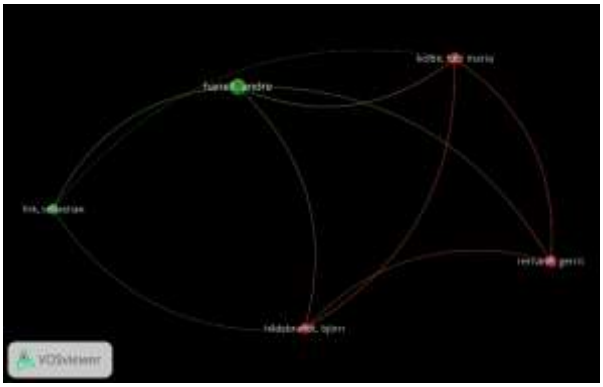

Figure 4. Author Visualization
Source: Data Analysis Result, 2025

The co-authorship visualization illustrates a compact yet clearly delineated network of prominent researchers contributing to the domains of digital transformation and artificial intelligence in business research. Each node signifies an author, whereas the linkages denote co-authored publications. The visualization emphasizes two in terrelated clusters, spearheaded by André Hanelt and Lutz Maria Kolbe, who emerge as pivotal figures with several collaboration connections. Hanelt's cluster (in green) is linked to Sebastian Firk, signifying a research trajectory centered on organizational transformation, digital strategy, and the structural ramifications of AI on enterprises. The closeness of their nodes indicates regular collaboration and intellectual congruence on subjects like business model innovation and digital capabilities development.

The second cluster (in red) is centered on Lutz Maria Kolbe, Björn Hildebrandt, and Gerrit Remané, creating a parallel yet interconnected network that emphasizes digital ecosystems, IT governance, and servitization. The i ntersection of Kolbe's and Hanelt's clusters—illustrated by bridging lines—exemplifies a cross-institutional collaboration that enhances the theoretical advancement of digital business transformation. This connection represents a cohesive European research community, particularly from German universities, that significantly influences current discussions on digital transformation. The co-authorship network illustrates a cohesive and collaborative research core, wherein joint publications among these prominent researchers serve as the intellectual foundation propelling the progress of digital transformation and AI-related management research.

Figure 5. Affiliation Visualization
Source: Data Analysis Result, 2025

The depiction of institutional collaboration illustrates the geographic and intellectual network facilitating research on digital transformation and artificial intelligence in business. Each node signifies a university or research institution, whilst the connecting lines denote the degree of co-authorship and institutional collaboration. The figure illustrates three principal clusters indicative of robust regional collaborations among Germany, Switzerland, Belgium, and Italy. The red cluster, focused on Georg-August-Universität Göttingen, is a highly active German research hub, significantly contributing to the literature on digital business models, organizational transformation, and AI integration. The internal cohesiveness of this cluster signifies a highly collaborative atmosphere among German scholars promoting digital transformation research.

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The green cluster, consisting of the University of St. Gallen (Switzerland), KU Leuven (Belgium), and the Free University of Bozen-Bolzano (Italy), exemplifies a transnational European collaboration that integrates management science, information systems, and innovation studies. Their collaboration exemplifies a transdiscipl inary and transnational approach, integrating empirical, analytical, and theoretical research on AI-driven business ecosystems and digital strategy. To the right, the blue and yellow nodes, primarily associated with Universität Bayreuth (Germany), signify the development of institutional collaboration focused on multidisciplinary research related to entrepreneurship and digital economy themes. The image indicates that Europe, especially the DACH region (Germany, Austria, Switzerland), serves as the intellectual nucleus of digital transformation studies, pr omoting robust academic collaboration through regional collaborations and research networks.

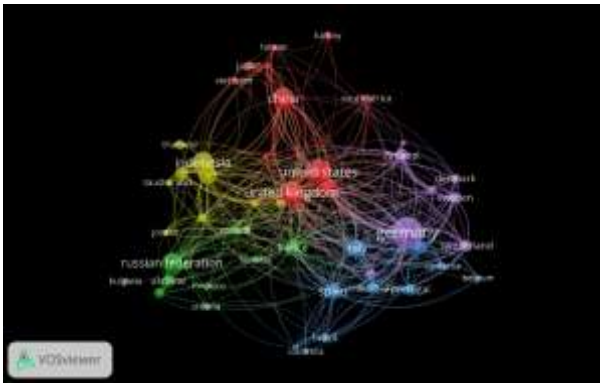

Figure 6. Country Visualization
Source: Data Analysis Result, 2025

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The institutional co-authorship network reveals a compact, well connected European scientific community. Each node represents a university, while the linkages indicate the frequency of co-occurrence of these institutions in academic papers. A concentrated red cluster surrounding Georg-August-Universität Göttingen signifies one of Ge rmany's foremost hubs for digital business and AI transformation research, where scholars engage in interdisciplinary collaboration. Their work is mostly intellectual and managerial, concentrating on strategy and organizational transformation.

The University of St. Gallen serves as a conduit linking partners like KU Leuven in Belgium and the Free University of Bozen-Bolzano in Italy within the green cluster. This tri-national consortium exemplifies a tr ansnational European alliance that integrates management, information systems, and innovation viewpoints. A blue-to-yellow chain, initiated by Universität Bayreuth, indicates burgeoning connections in entrepreneurship, sustainability, and digital economy research. The map illustrates the DACH region and its neighboring areas as the intellectual center of digital transformation research, centered on Göttingen and St. Gallen, with expanding institutional connections throughout continental Europe.

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Discussions

Practical Implications

This bibliometric and scientometric study yields numerous useful insights for legislators, corporate executives, and digital strategists involved in the incorporation of Artificial Intelligence (AI) into digital business ecosystems. The identification of essential research clusters—digital transformation, business models, AI capabilities, and digital ecosystems—underscores the necessity of integrating technical innovation with organizational and managerial preparedness. Practitioners may utilize this mapping to prioritize investments in AI governance frameworks, data infrastructure, and digital competencies that promote sustainable transformation. Secondly, the co-authorship and institutional partnership maps illustrate Europe's preeminence, especially in the DACH region (Germany, Austria, Switzerland), in promoting research-driven digital initiatives. This indicates that organizations and governments beyond these regions can utilize European institutions as a reference for policy formulation and innovative methods in the successful integration of AI into strategic management. Ultimately, the increasing convergence of digital sustainability and AI-driven innovation highlights the necessity for organizations to implement responsible AI strategies, reconciling profitability with social and environmental responsibility.

Theoretical Contributions

This paper theoretically enhances the existing literature on AI-driven digital transformation by providing a detailed scientific mapping of its intellectual framework, development, and fundamental theoretical underpinnings. It co nsolidates disparate research streams into a unified framework that connects the Resource-Based View (RBV), Dynamic Capabilities Theory, and Technology–Organization–Environment (TOE) framework. The study illu strates that AI operates not just as a technology resource but also as a dynamic capability that improves strategic agility and ecosystem adaptation. The bibliometric network indicates a transition in academic emphasis from firm-centric models to ecosystemic and collaborative paradigms, highlighting the emergence of platform thinking and AI-driven value networks. The identification of theoretical clusters enhances the conceptualization of responsible digital transformation by including governance, ethics, and sustainability components into existing models—an growing research area vital for the future of digital business study.

Limitations and Future Research Directions

This study offers a comprehensive quantitative analysis of the field, although many limitations should be recognized. The analysis relies exclusively on the Scopus database, which, although extensive, may exclude pe rtinent papers indexed in Web of Science, IEEE Xplore, or Google Scholar. Future research may amalgamate several databases to enhance the representativeness and reliability of bibliometric findings. Secondly, bibliometric analysis elucidates structural links (e.g., keyword co-occurrence, citation patterns) but fails to comprehensively elucidate causal mechanisms or qualitative subtleties underlying subject interconnections. Complementary qualitative procedures, like systematic literature reviews, meta-syntheses, and expert interviews, could enhance interpretive insights. The study's chronological scope (2020–2025) encompasses the initial development of gener ative AI (genAI) but may not adequately represent its long-term theoretical and managerial consequences. Future study should do longitudinal mapping to examine how generative and agentic AI transform digital business theor y, strategy, and ecosystem governance over time.

4. Conclusion

This study offers an extensive delineation of the scientific framework of Artificial Intelligence (AI) research wit hin digital business, indicating that the discipline has progressed from fundamental discourse on digital strategy and transformation to ecosystem-centric, innovation-focused, and sustainability-driven paradigms. The bibliom etric analysis reveals that digital business and digital transformation constitute the intellectual nucleus, encircled by nascent themes including AI governance, digital ecosystems, and responsible innovation. The co-authorship and institutional studies highlight Europe’s academic preeminence—especially in Germany, Switzerland, and Belgium—in influencing the theoretical and empirical progress of this field. Integrating AI with digital transformation enables firms to develop adaptable skills, enhance inter-firm collaboration, and seek lasting competitive advantage. This research offers a conceptual framework and a practical guide for scholars and practitioners aiming to negotiate the evolving convergence of technology, strategy, and organizational change.

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