Rise of Artificial Intelligence Capabilities in Innovation Management: A Bibliometric Analysis

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Abstract

The rapid advancement of artificial intelligence (AI) is fundamentally reshaping how organisations manage innovation, sustain competitiveness, and respond to dynamic market environments. As AI capabilities continue to evolve, understanding their implications for innovation management has become increasingly critical for organisations seeking long-term value creation and sustainable development. Despite a growing body of research on AI-driven innovation, existing studies are largely fragmented and focus on specific applications, offering limited holistic insight into the broader evolution and future trajectory of AI capabilities within innovation management. To address this gap, this study aims to provide a comprehensive analysis of past, current, and emerging trends in AI capabilities and innovation management. Using a systematic literature network analysis (SLNA) approach, the study integrates a systematic literature review (SLR) and bibliometric analysis based on Scopus-indexed publications. The SLR follows a structured three-step process comprising study scoping, database selection, and defined selection and evaluation criteria, while bibliometric techniques are employed to examine research performance and intellectual linkages through performance analysis and science-mapping methods. The findings identify key publication trends, influential journals, leading publications, and dominant country contributions, with sustainability-oriented research emerging as a central theme and China identified as the leading contributor to scholarly output in this domain. By synthesising the intellectual structure and evolution of the field, this study offers actionable insights for researchers, practitioners, and policymakers, supporting informed decision-making on how AI capabilities can be effectively leveraged to foster innovation, enhance organisational competitiveness, and promote sustainable innovation ecosystems.

Keywords: AI Capabilities, Bibliometric, Innovation, Literature Review

Introduction

The rapid advancement of Artificial Intelligence (AI) capabilities has fundamentally altered how organisations compete, innovate, and respond to environmental uncertainty. Across industries, firms are increasingly expected to make faster, more informed, and more

adaptive decisions in the face of growing data complexity, volatile markets, and intensified competition (Abadie, 2023; Sahoo et al., 2024). However, despite significant investments in AI technologies, many organisations continue to struggle to translate AI-driven insights into effective innovation outcomes and sustained performance gains. This challenge highlights the growing need to better understand how AI capabilities contribute to innovation management in dynamic organisational contexts. AI capabilities defined by the ability to analyse large-scale data, generate predictive insights, and support intelligent decision-making are no longer merely analytical tools but have emerged as critical enablers of organisational innovation (Akter, 2021; Huang, 2023). Business-to-business (B2B) environments present heightened analytical and strategic demands due to complex metadata, inter-organisational dependencies, and rapidly changing market conditions (Sahoo et al., 2024). These characteristics make AI especially valuable, yet simultaneously raise questions regarding how such capabilities should be effectively integrated into innovation processes.

Prior research has demonstrated that AI can enhance innovation by automating routine tasks, supporting creative problem-solving, and enabling the identification of new market opportunities through advanced pattern recognition (Dwivedi et al., 2022; Badakhshan et al., 2020). More recent studies further suggest that AI plays a pivotal role in supporting open innovation by facilitating inbound and outbound knowledge flows, strengthening collaboration with external partners, and accelerating the innovation lifecycle (Aagaard, 2022; Bodendorf, 2023). Nevertheless, the existing literature remains fragmented, with most studies examining AI's role in isolated functions or specific innovation activities, offering limited insight into the broader evolution and interconnected development of AI capabilities and innovation management. The synergistic relationship between AI capabilities and open innovation has been shown to yield positive performance outcomes, including improved financial results, enhanced customer value, and sustained competitive advantage (Kumar et al., 2021; Markovic et al., 2021). Empirical evidence also highlights the importance of environmental dynamism as a contextual factor shaping these relationships (Battisti et al., 2021; Tang et al., 2021). In highly dynamic environments, AI enables organisations to sense change, anticipate emerging trends, and respond strategically through data-driven innovation decisions (Broccardo et al., 2023; Haddoud et al., 2023). However, despite these advances, the intellectual structure, knowledge development, and future trajectories of research at the intersection of AI capabilities and innovation management remain insufficiently synthesised.

Accordingly, there is a clear need for a comprehensive and systematic examination of how AI capabilities and innovation management research has evolved over time, the dominant knowledge streams that have emerged, and the future directions that may guide both academic inquiry and managerial practice. Addressing this need, the present study aims to provide an integrative analysis of past, current, and emerging trends in AI capabilities and innovation management, offering valuable insights for researchers, practitioners, and policymakers seeking to harness AI more effectively to drive sustainable innovation and competitive advantage.

Motivation and Research Objectives

Extant literature has widely examined the individual effects of artificial intelligence (AI) capabilities and innovation management on organisational performance. While these studies provide important insights, they are largely fragmented, with most investigations focusing on specific functional areas, technologies, or industry contexts. As a result, there remains limited understanding of how AI capabilities and innovation management evolve collectively as an integrated system, and how this interaction shapes long-term innovation outcomes across diverse organisational settings. Moreover, the rapid diffusion of AI technologies has introduced new managerial, ethical, and governance challenges that are insufficiently addressed in existing research. Organisations are increasingly required not only to leverage AI for innovation but also to ensure its responsible and ethical deployment within innovation ecosystems that involve multiple internal and external stakeholders. However, current studies offer limited guidance on how organisations can strategically manage the integration of AI into open and collaborative innovation processes in ways that foster creativity, knowledge sharing, and value creation while minimising associated risks.

Motivated by these gaps, this study aims to provide a comprehensive and systematic analysis of the past, present, and emerging trends in research on AI capabilities and innovation management. Specifically, by synthesising the intellectual structure and evolutionary trajectories of this research domain, the study seeks to generate evidence-based insights that can inform both academic inquiry and managerial decision-making. The findings are expected to support researchers in identifying future research directions, assist practitioners in designing effective AI-enabled innovation strategies, and guide policymakers in formulating frameworks that promote sustainable and responsible innovation.

Research Objectives
This study seeks to achieve the following objectives:
1. To analyse the evolution of research on AI capabilities and innovation management by identifying dominant publication trends, key themes, and influential knowledge streams over time.
2. To map the intellectual structure of the field by examining the relationships among core concepts, leading authors, journals, and countries contributing to research on AI-driven innovation.
3. To identify emerging research trends and future directions that can inform the effective, ethical, and sustainable integration of AI capabilities into innovation management practices.

Methodology
Study Design
According to Tranfield et al. (2003), "an SLR is a form of research that deals with existing publications and follows a systematic methodology for synthesizing data that is already published". According to Kraus (2020), "an SLR is a review of an existing body of literature that follows a transparent and reproducible methodology in searching, assessing its quality and synthesizing it, with a high level of objectivity".

A systematic literature review (SLR) is a useful strategy for evaluating a large amount of information in an organized and efficient manner. However, some limitations have been identified with this approach. For example, many SLRs focus on a single type of analysis and

do not consider alternative perspectives. Additionally, SLRs often rely on a limited database, which can lead to bias in the selection of articles. Additionally, search strategies are not always clearly outlined (Dahabreh et al., 2012). To address these limitations, this study employs a novel approach known as Systematic Literature Network Analysis (SLNA). According to Inamdar et al (2020), SLNA is a two-step methodology that includes an SLR to identify relevant articles and a bibliometric analysis to explore the transfer and development of knowledge. This approach is divided into two phases, as recommended by Colicchia and Strozzi (2012): an SLR and a bibliometric analysis.

Systematic Literature Review

To perform the systematic literature review, a three-step process was adopted, which include study scope, database, and selection & evaluation criteria.

Scope of the Study

The scope of the study is set in the initial step of SLR in accordance with research objectives and questions. According to Denyer and Tranfield (2009), the study scope should be based on CIMO logic (context, intervention, mechanism, and outcomes). Thus, the scope of the study is limited to digital capabilities and similar terms in the management domain from 2010 to 2023.

Search Strategy and Data Sources

In the second step, the search string and database were selected. Based on the prior literature, a combination of keywords with Boolean operators was used to identify the relevant documents. In identifying the relevant studies, a combination of keywords was used. Based on the past literature, the first keyword is "artificial intelligence capability" or "AI capability" or "Digital capability" or "Generative AI capability" or "Gen-AI capability" and the second keyword is "innovation" or "innovation practice" or "innovation management". This study utilized the Scopus database to gather articles for analysis. The database is considered a reputable source for identifying high-quality journals worldwide (Elaish et al., 2022) and the articles in this database are well-organized in terms of research quality (Elaish et al., 2021). This search was performed in March 2024 and 795 documents were found. By limiting the search to journal articles, a total of 331 documents were kept for further selection.

Selection Criteria and Quality Assessment

For selecting the primary documents, the inclusion criteria were defined. Studies containing both keywords in the business and management domain were selected. Studies dealing with factors to the adoption and acceptance of digital capabilities in the management domain were also selected. The included studies were published in English language from 2010 to 2023 both years were included. The selection criteria are briefly explained in Table 1.1 below.

Table 1.1
Study inclusion and exclusion criteria

Inclusion	Exclusion

Should involve both keywords; digital capability and innovation management, and related keywords	Keywords used in other context like medical (neuroscience, nursing, pharmacology, genetic and medical & medicine technology), computer sciences (experimental, informatics, software development) and applied sciences (mathematics, material sciences, arts & humanities, biochemistry).
Should involve organizational context	Review, editorial, theses, and non-peer review articles
Should be written in English language	Paper published in other than English
Should be published between 2010- 2023	

In addition to the inclusion and exclusion criteria, the selected articles were evaluated using a quality assessment checklist consisting of 9 criteria (N = 331). This checklist was adapted from Kitchenham & Charters (2007) and was not intended as a form of criticism of any scholars' work. Each criterion was rated on a three-point scale, with "Yes" receiving 1 point, "No" receiving 0 points, and "Partially" receiving 0.5 points. This resulted in a possible score range of 0-9, with higher scores indicating that the study more effectively addresses the research questions. To present the SLR, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) diagram was used. Figure 1 shows the PRISMA diagram.
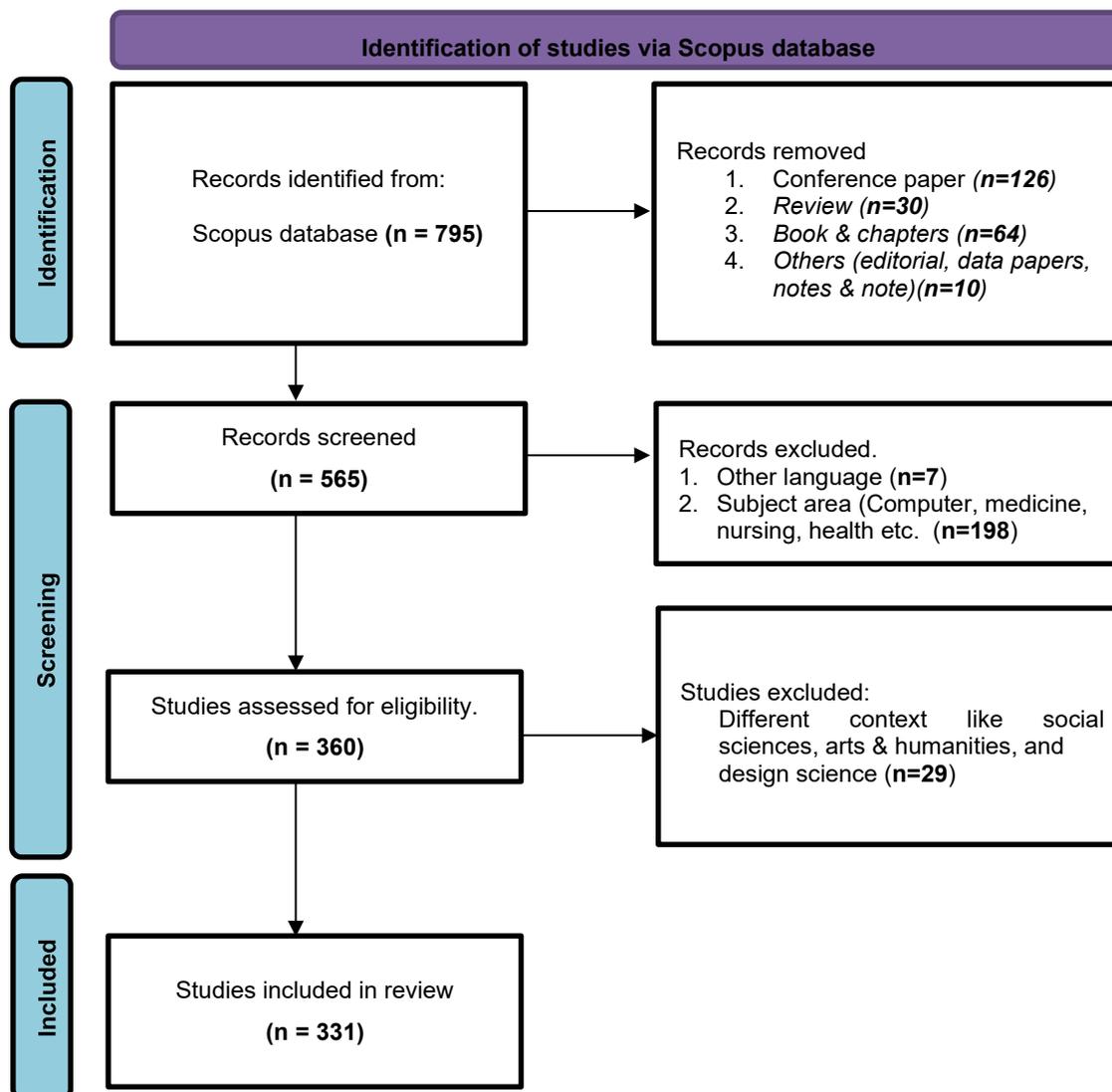
Identification of studies via Scopus database

Records identified from:

Scopus database **(n = 795)**

Records removed
1. Conference paper *(n=126)*
2. *Review (n=30)*
3. *Book & chapters (n=64)*
4. *Others (editorial, data papers, notes & note)(n=10)*

Identification

Records screened

(n = 565)

Records excluded.
1. Other language **(n=7)**
2. Subject area (Computer, medicine, nursing, health etc. **(n=198)**

Screening

Studies assessed for eligibility.

(n = 360)

Studies excluded:
Different context like social sciences, arts & humanities, and design science **(n=29)**

Studies included in review

(n = 331)

Included

Figure 1.1 PRISM flow diagram

Bibliometric Analysis

The second phase of the SLNA approach is bibliometric analysis, which involves using quantitative methods to assess the academic quality of journals or authors through citation rates (Ahamer et al., 2014). It is important to carefully develop the quality criteria for article selection before conducting bibliometric analysis to prevent misunderstandings of the meaning of quality. According to Fonseca and Borges-Tiago (2021), the bibliometric analysis includes both quantitative and qualitative statistical methods to analyze the contents, references, citations, and co-authorship of publications. This analysis allows researchers to explore citation patterns, author networks, knowledge bases, trends, reader usage, and the impact and significance of the subject (Inamdar et al., 2021).

In this study, bibliometric analysis was used to evaluate the performance and connections within the agile methods research field. Results were presented in two categories: performance analysis and science mapping. Performance analysis techniques were used to identify the contribution of research to a specific field (Donthu et al., 2021). This type of analysis typically includes descriptive measures such as the number of publications and

citations per year, as well as the contributions of authors, countries, institutions, and journals. These measures are used because publication is a proxy for productivity and citations measure the influence and impacts of the research (Donthu et al., 2021). On the other hand, science mapping techniques pertain to the structural connections and intellectual interactions among research constituents. This type of analysis includes a wide range of techniques, such as citation & co-citation, co-word, co-authorship, and bibliographic coupling. These techniques allow researchers to explore the connections and relationships within the field, providing a deeper understanding of the agile project methods research. Overall, bibliometric analysis is a valuable tool for evaluating the performance and connections within a specific field of research (Donthu et al., 2021).

Performance Analysis

Based on past studies and recommendations by Donthu et al. (2021), performance analysis is the first step, which highlights the overall performance of any research domain (Kumar et al. 2022). In this study, the performance analysis consists of publication trends, impactful journals, most influential publications, and countries.

Publication Trends

Based on the 331 of studies from Scopus database, Figure 1.2 highlight the publication trends from 2010 to 2023. In 2015, the first article was published to explain the relationship between AI capabilities and innovation management. From 2015 to 2018, the field witnessed minimal activity, with only one or two articles published annually, reflecting its early developmental stage. A noticeable shift occurred in 2019, with a moderate increase to 10 articles, followed by a sharp rise of 26 in 2020, 34 in 2021, and 86 in 2022. The most substantial growth occurred in 2023, with 175 articles published, indicating a rapidly expanding research domain. Furthermore, Figure 2 shows the citation from 2015 to 2023. The citation trend until 2018, which remained negligible. Starting in 2019, citations increased markedly, reaching 1,585, then doubling to 2,546 in 2020. The citation count peaked in 2021 at 5,277, slightly declined to 5,197 in 2022, and rose again to 5,495 in 2023.

Figure 1.2 Publication trends from 2010-2023

Most Relevant Journals

The analysis of 331 Scopus-indexed studies on AI capabilities and innovation management reveals the most influential journals contributing to this research area as shown in Figure 1.3. "Technological Forecasting and Social Change" leads significantly, publishing 33

articles, indicating its central role in advancing discourse on future-oriented technological strategies and innovation. Following closely is the "Journal of Business Research" with 24 publications, reflecting strong interest in how AI capabilities intersect with business and management practices. The International Journal of Innovation Management also makes a notable contribution with 10 articles, emphasizing scholarly focus on innovation processes and organizational transformation. Other key sources include Industrial Marketing Management and Technovation, each with 9 publications, highlighting the importance of AI in marketing strategies and technological innovation. Several other journals, Business Process Management Journal, Journal of Cleaner Production, Journal of Innovation and Knowledge, and Technology in Society, each contributed 8 articles, reflecting the interdisciplinary nature of this field, touching on sustainability, operational processes, and societal impacts. The International Journal of Production Economics, with 7 publications, underscores the role of AI in enhancing production efficiency and economic decision-making.
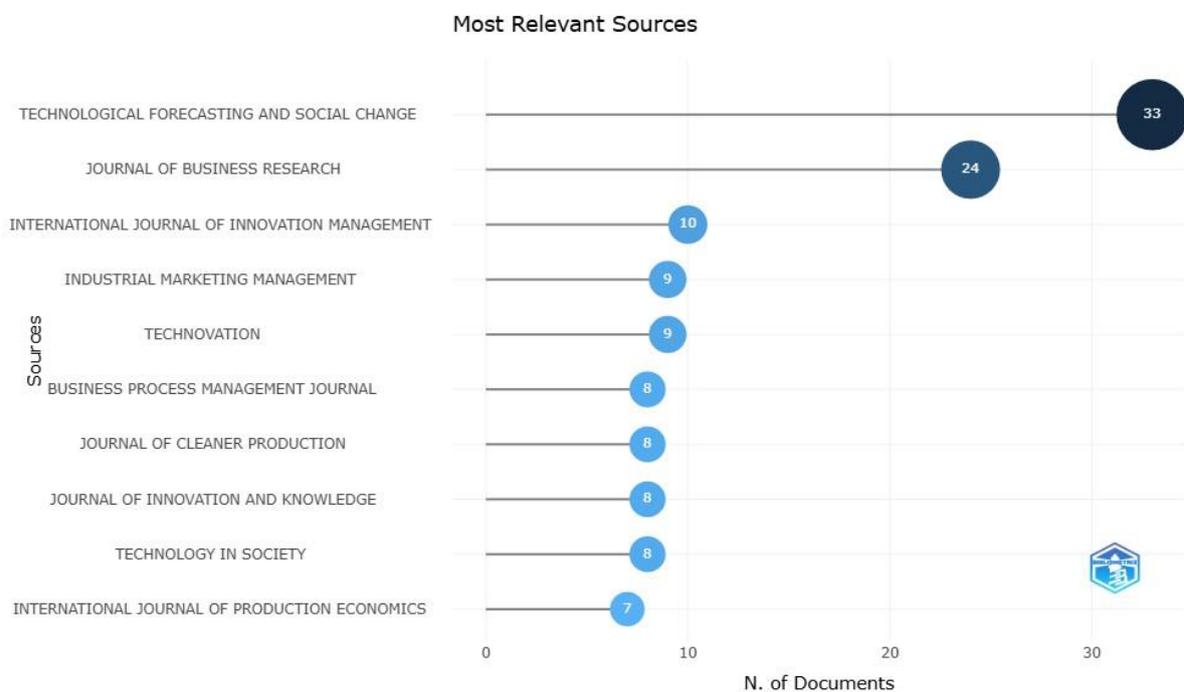

Figure 1.3 Most relevant journals

Most Relevant Authors

The analysis of 331 Scopus-indexed studies on AI capabilities and innovation management identifies the most relevant and influential authors in this growing field as shown in Figure 1.4. Parida V stands out as the leading contributor with 16 publications, signifying a prominent role in shaping the discourse around digital transformation and AI-driven innovation. Sjödin D follows closely with 10 articles, also indicating substantial scholarly influence and collaboration within the domain. A group of other notable authors including Mikalef P, Vincent J, and Zhang H have each contributed 4 publications, reflecting consistent engagement with research topics at the intersection of AI and innovation. Additionally, authors such as Akter S, Arias-Pérez J, Feng T, Frank AG, and Jovanovic M have each authored 3 studies, underscoring their active participation and growing impact in the field. This distribution of contributions highlights a blend of core thought leaders and emerging scholars who collectively drive the development of knowledge in AI capabilities and innovation management.
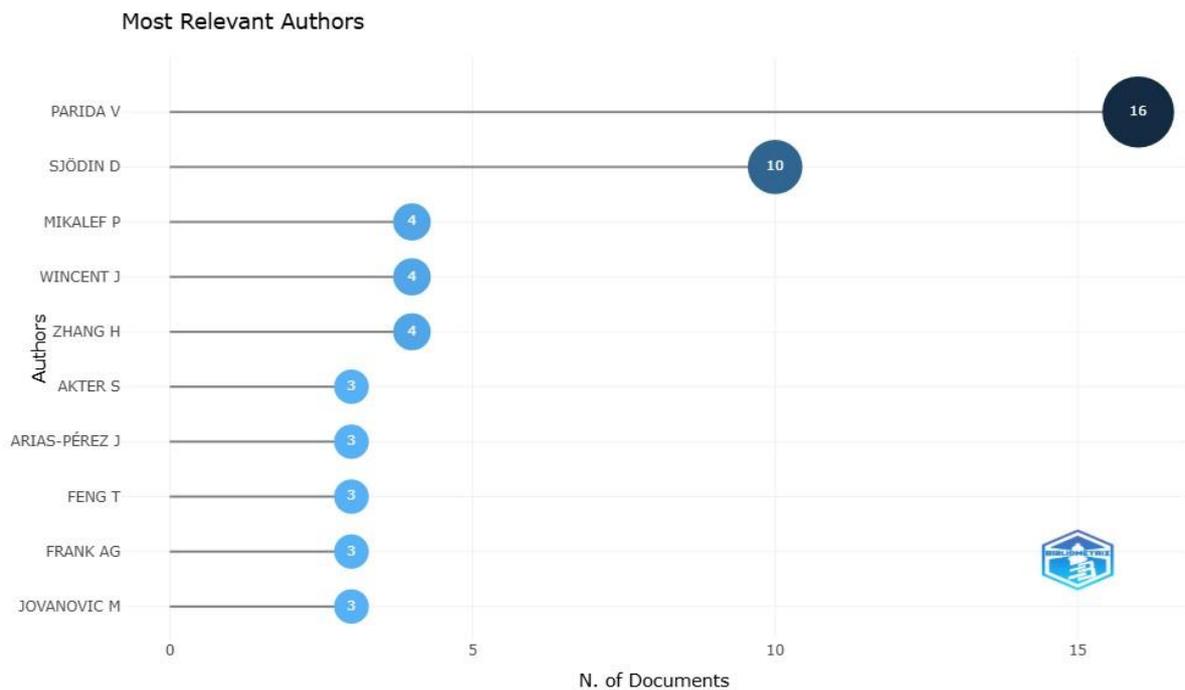
Figure 1.4 Most relevant authors

Country Scientific Contributions

The analysis of 331 Scopus-indexed studies on AI capabilities and innovation management identifies the most relevant and influential countries in this growing field as shown in Figure 1.5. From the analysis, China emerges as the most prolific contributor, leading with 146 publications, reflecting its significant influence and investment in AI and innovation research. Following China, Germany stands out with 87 publications, showcasing its strength in technology and engineering sectors. In Europe, the United Kingdom and Italy are also key players, contributing 74 and 76 publications respectively, positioning them as notable hubs for this research area. The United States, a recognized leader in AI, contributes 46 publications, indicating a strong but relatively smaller output within this specific dataset. Beyond these top contributors, other countries like India with 51 publications, Brazil with 48, and Indonesia, Malaysia, and Australia with 38, 38, and 36 publications respectively, also demonstrate notable research activity. In contrast, regions such as parts of Africa, the Middle East, and some European countries are shaded lightly or in gray, suggesting fewer or no publications.
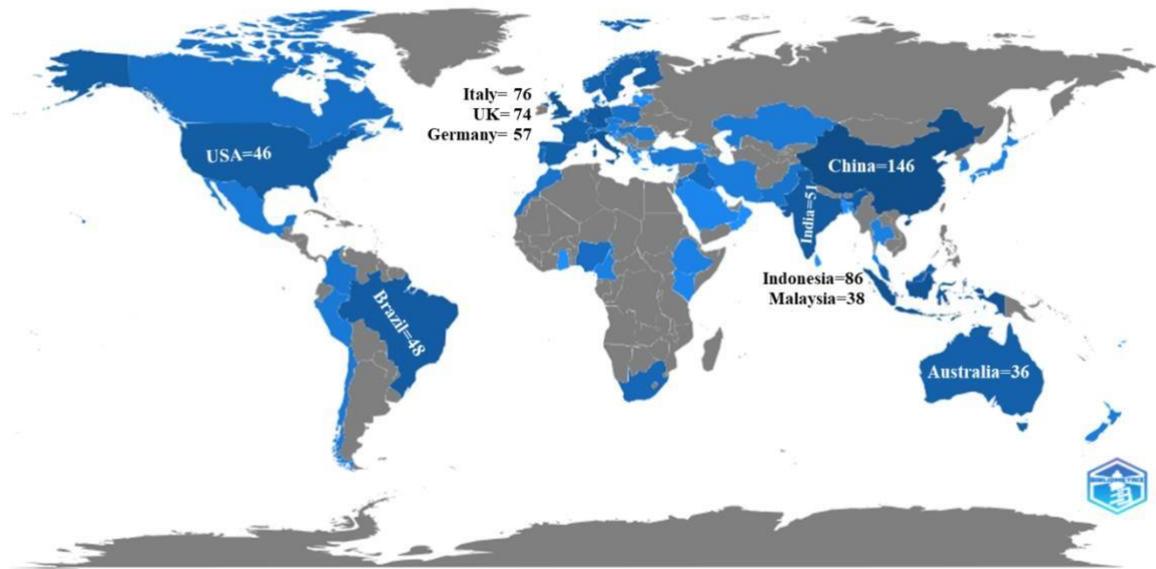
Figure 1.5 Countries scientific contributions

Science Mapping

Science mapping in bibliometric analysis investigates the relationship between research elements. The science mapping is carried out using techniques such as word cloud analysis and thematic evolution. The following sub-sections explain in detail.

Thematic Analysis

The corpus of 331 studies highlights the thematic analysis based on three-fold diagram, as shown in Figure 1.6. The three-fold diagram shows the relationship among keywords, abstract and title. Based on the figure, the left side highlight the keywords, the middle layer indicates the abstract, and the right side highlight the title. Recurring terms such as "digital," "capabilities," "innovation," "performance," and "transformation" appear across all three layers, highlighting their central role in the analyzed literature. The color coding enhances this visualization, with deeper shades indicating greater significance or frequency. Overall, the diagram provides a comprehensive overview of how key concepts evolve and are prioritized from detailed abstract keywords to the broader scope of publication titles, offering valuable insights into the thematic structure of the bibliometric analysis.
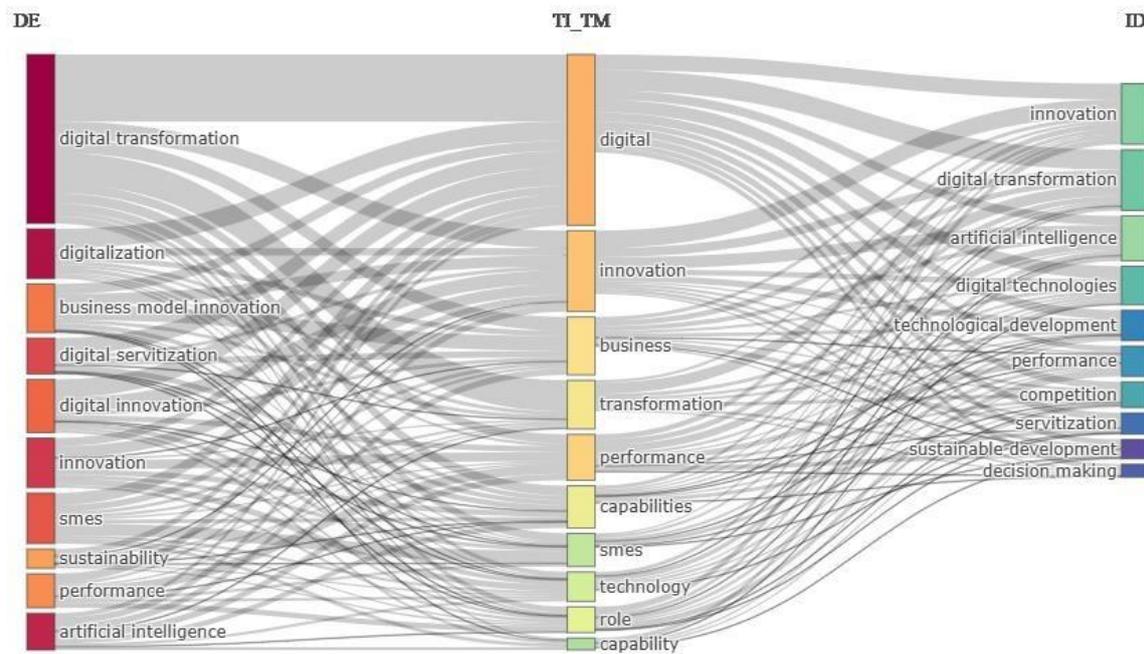
Figure 1.6 Three-fold plot based on keywords-abstract-title

Temporal Analysis Using Word-Cloud

The word cloud analysis based on keywords visually represents in Figure 1.7 & 1.8, which show the frequency and significance of terms related to innovation and its associated concepts within a specific research domain. Figure 1.7 visually presents the the most frequently occurring terms algorithmically extracted from the literature. In this diagram, the size and boldness of each keyword indicate its frequency and significance within the dataset. The most prominent keywords are "innovation," "digital technologies," "performance," "competition," and "business models", reflecting the central themes of the research. "Innovation" stands out as the largest and most dominant term, suggesting it is the cornerstone of the studies, likely focusing on how AI fosters new ideas and processes. "Digital technologies" follows closely, emphasizing the pivotal role of technological advancements in driving innovation. "Performance" highlights a recurring focus on outcomes, such as how AI capabilities enhance organizational or economic efficiency. "Competition" points to an interest in competitive dynamics shaped by AI, while "business models" indicates exploration of how AI transforms business frameworks to support innovation. Smaller but notable keywords, such as "servitization," "digitalization," "entrepreneur," "co-creation," and "sustainability," are scattered around the central terms, adding depth to the research scope.

Figure 1.7. Word cloud-based keywords plus

Whereas, word cloud of Figure 1.8 is based on authors keywords from the corpus of 331 Scopus studies. The most prominent keywords are "artificial intelligence," "digitalization," "innovation," "digital servitization," and "business model innovation", which highlight the authors' specific priorities in AI capabilities and innovation management. "Artificial intelligence" emerges as the largest and most central term, underscoring its foundational role in the studies and its direct relevance to AI-driven innovation. Additional, less dominant terms like "SMEs performance," "digital capabilities," "sustainability," and "industry 4.0" appear in smaller fonts, indicating secondary but significant foci.

Figure 1.8 Word cloud-based author's keywords

Network Analysis

The goal of network analysis is to improve the evaluation of bibliometric analysis by shedding light on the relative relevance of research constituents. The network analysis was

presented in the following subsections in the form of co-occurrence and co-citation methodologies.

Co-citation Analysis

To unravel the intellectual structure of the research domain, a co-citation analysis was performed. This technique assumes that publications that are cited together are frequently similar thematically. In this research, co-citation analysis has been performed based on authors and sources. Figure 1.8 and 1.9 highlight the co-citation analysis based on journals and authors respectively.

Figure 1.8 highlight the co-citation analysis based on cited references. The 1st cluster is represented in red colour with 54 items. This cluster represent the most influential research in the study domain. The 2nd cluster is represented in green colour with 44 items and slightly overlapped with red colour. The focus of this cluster on qualitative aspects and theory building particularly through inductive approaches and case studies. The 3rd clusters are represented in blue colour with 36 items. This cluster highlights digital platforms and servitization, emphasizing the role of digital technologies in transforming service-oriented business models. The cluster 4, with 28 items, is marked in yellow. This cluster has dual focus on qualitative and quantitative research. Finally, cluster 5 is the smallest with 10 items and shown in pink colour. This cluster indicating a niche focus on quantitative research methods and statistical analysis.
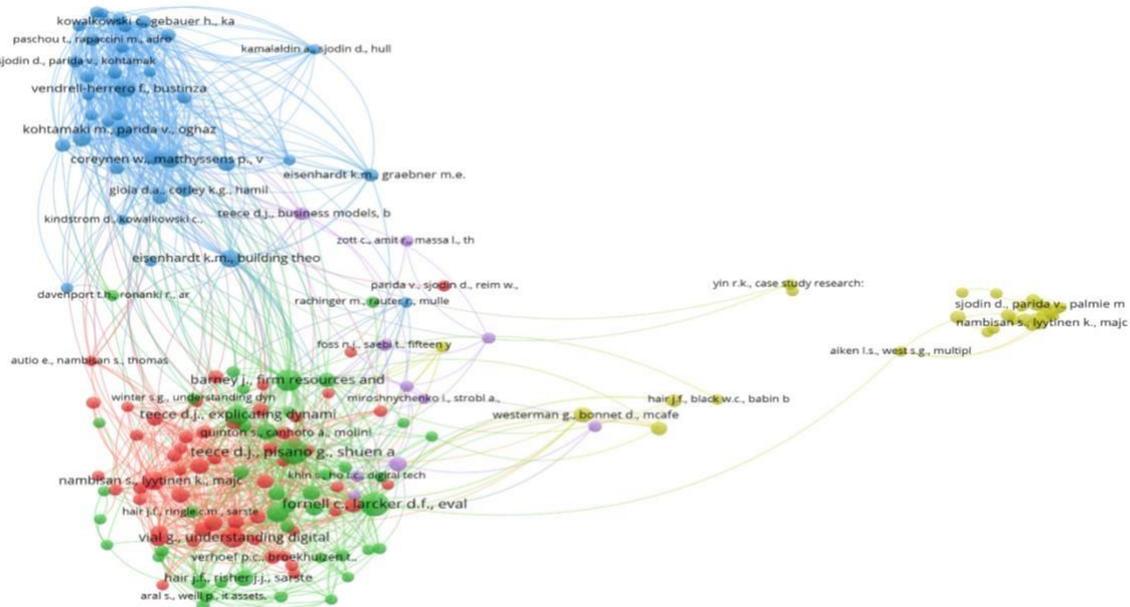

Figure 1.9 Co-citation analysis based on cited references

On the other hand, Figure 1.10 presents a co-citation analysis based on authors and organized into three clusters. Cluster 1, the largest with 140 items, is shown in red. The focus of this cluster is on strategic management and dynamic capabilities. Cluster 2, with 93 items, is depicted in green. This cluster emphasizes methodological and statistical research approaches, notably partial least squares and structural equation modelling. These authors provide the quantitative tools essential for empirical research in the field. Finally, Cluster 3,

comprising 72 items, is highlighted in blue. The focus of this cluster is on qualitative research methods, particularly case study methodologies and theory building.
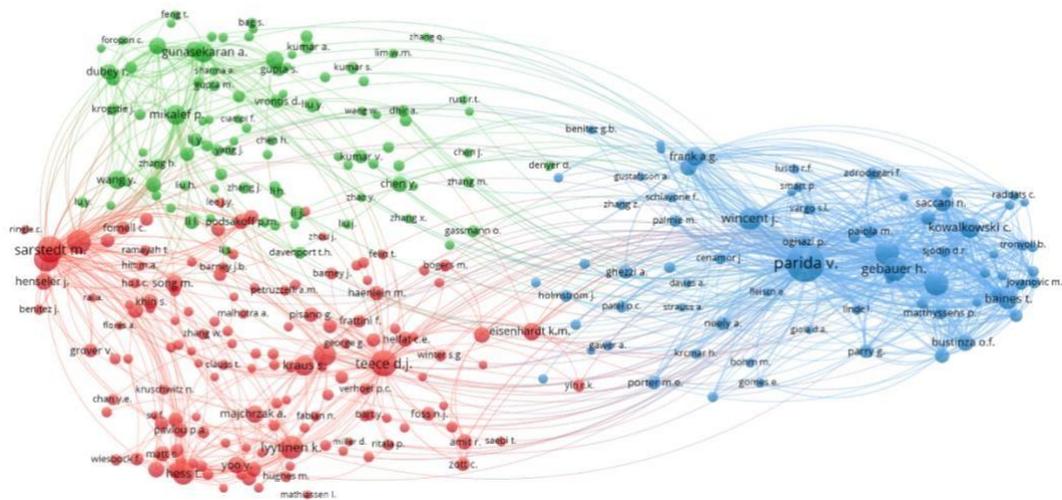

Figure 1.10 Co-citation analysis based on authors

Co-Occurrence Analysis

According to Donthu et al. (2021), the concept of co-occurrence analysis examines the linkages between two or more items that appears together in the same research publications. The purpose of co-occurrence analysis to gain insights into trends and patters within a specific research domain. Figure 10 shows the co-occurrence analysis based on keywords. Based on 331 studies, more than 8 clusters have been formulated. The prominent keywords are digital transformation, artificial intelligence, innovation and sustainability.

Figure 1.11 explain the co-occurrence based on authors keywords. The keywords are grouped into 15 clusters based on their co-occurrence patterns, each representing a distinct research theme. In this study, top five clusters are explained. The cluster 1 is representing in red colour with 22 items. The prominent keywords are circular Economy, digital management, firm performance, strategies, RBV. The focus of this cluster is on digital management and firm performance. Whereas, 2nd cluster is represented in green colour with 17 items. The prominent keywords are fintech, entrepreneurship, e-commerce, and start-up. Overall, this cluster is centred on financial institutions and financial technology (fintech). The 3rd cluster is highlighted with blue colour with 17 items. The most occurring keywords are competition, future of work, social capital, transformational leaders, and customer satisfaction. Generally, this cluster is centered on competition and leadership. Furthermore, 4th cluster is represented with yellow colour with 16 items. The most occurring keywords are ambidexterity, dynamic capabilities, SME (Small and Medium Enterprises), resilience, agility, business model innovation. Overall, the focus of this cluster is on organizational capabilities in SMEs. Finally, 5th cluster is represented in pink colour with 16 items. The mot occurring keywords are HRM, sustainable value creation, agility, individual entrepreneurship. The focus of this cluster is on HRM and sustainable entrepreneurship.

Figure 1.11 Co-occurrence analysis based on keywords

Bibliographic Coupling

To unravel the conceptual structure of selected publications, bibliographic coupling analysis was performed on the 331 corpora of studies. This technique assumes that two publications that shared a common reference are also similar in their content (Donthu et al., 2021). The results of bibliographic coupling were performed on author's documents. Figure 1.12 highlight the bibliographic coupling and formulate more than seven clusters. All the clusters are interconnected with each other's.

The visualization in Figure 1.12 reveals a complex web of relationships among authors, with dense connections within clusters and varying degrees of overlap between them. Cluster 1 (Red, 39 items), Cluster 2 (Green, 27 items), Cluster 3 (Blue, 22 items), Cluster 4 (Yellow, 12 items), and Cluster 5 (Pink, 5 items). Larger clusters (red, green, and blue) form the core of the network, indicating well-established research areas with strong interconnections, while smaller clusters (yellow, and pink) are more peripheral, suggesting specialized or emerging topics.

Figure 1.12 Bibliographic coupling analysis based on authors

Significance of the Study

This study is significant in several important respects, contributing to theory, practice, and policy in the domain of artificial intelligence (AI) capabilities and innovation management. As organisations increasingly rely on AI to drive innovation and sustain competitiveness, a systematic understanding of how AI capabilities shape innovation practices and outcomes has become essential. By offering a comprehensive synthesis of past, current, and emerging research trends, this study addresses a critical need for clarity in a rapidly expanding yet fragmented body of literature.

From a theoretical perspective, this study advances the innovation management and AI literature by integrating dispersed research streams into a coherent intellectual framework. While prior studies have examined AI or innovation in isolation, this research provides a holistic view of their interrelationship, thereby enhancing conceptual understanding of how AI capabilities evolve alongside innovation strategies. The identification of dominant themes, influential works, and emerging research trajectories also contributes to theory development by highlighting underexplored areas and informing future empirical and conceptual studies. From a practical perspective, the findings offer valuable insights for managers and practitioners responsible for designing and implementing AI-enabled innovation initiatives. By clarifying how AI capabilities have been applied across different organisational contexts and innovation models, this study supports evidence-based decision-making related to technology investment, innovation strategy, and capability development. The synthesis of research trends further assists practitioners in anticipating future developments and aligning AI adoption with organisational goals while considering ethical and governance challenges.

From a policy and societal perspective, this study provides relevant implications for policymakers and regulatory bodies concerned with promoting responsible and sustainable innovation. By mapping global research contributions and identifying emerging discourse on ethical and responsible AI, the study informs policy deliberations on AI governance, innovation ecosystems, and national competitiveness. The insights generated can support the formulation of frameworks and guidelines that encourage the effective and ethical integration of AI into innovation processes, benefiting organisations and society at large. Overall, this study offers a comprehensive reference point for researchers, practitioners, and policymakers seeking to understand and leverage the transformative potential of AI capabilities in innovation management, thereby contributing to sustainable innovation and long-term competitive advantage.

Discussion

This study provides a systematic and structured overview of the research landscape at the intersection of AI capabilities and innovation management through bibliometric and network analyses. By integrating performance analysis, science mapping, and collaboration network analysis, the findings illuminate the intellectual structure, thematic evolution, and social dynamics shaping this rapidly expanding field. The observed growth in publication output over recent years reflects the increasing strategic importance of AI capabilities in innovation management. This upward trend signals a shift from exploratory conceptual discussions toward more structured and applied research, indicating that the field is transitioning into a more mature phase of scholarly development. Consistent with prior

empirical evidence (e.g., Sahoo et al., 2024), the growing scholarly attention mirrors real-world organisational reliance on AI to enhance innovation performance, particularly in complex and dynamic environments.

The prominence of journals such as Industrial Marketing Management and Technological Forecasting and Social Change suggests that research in this domain is strongly oriented toward both managerial relevance and long-term technological implications. This dual focus highlights the interdisciplinary nature of AI-driven innovation research, bridging strategic management, marketing, and technology forecasting. Such positioning underscores the practical utility of AI not only as a technological enabler but also as a strategic resource supporting value creation and competitive advantage. Analysis of influential authors and country contributions reveals a concentration of research activity within specific geographical regions, indicating uneven global participation in AI and innovation scholarship. This concentration may reflect disparities in digital infrastructure, research funding, and institutional capabilities, while also pointing to potential opportunities for broader international collaboration. Expanding cross-regional research engagement could enrich theoretical perspectives and enhance the contextual relevance of AI-driven innovation studies. Thematic analysis further reveals that core concepts such as open innovation, business performance, and environmental dynamism form the backbone of the field's intellectual landscape. The strong linkage between AI capabilities and open innovation reinforces the view that AI functions not merely as a technological tool but as an integrative mechanism for managing knowledge flows across organisational boundaries. Additionally, the emphasis on environmental dynamism highlights the growing recognition that AI capabilities are particularly valuable in volatile and uncertain contexts, where rapid sensing, adaptation, and decision-making are crucial.

Collaboration network analysis demonstrates the presence of well-defined research clusters and international partnerships, reflecting the global and interdisciplinary nature of AI research. These networks serve as important conduits for knowledge exchange and methodological advancement, accelerating innovation in both theory and practice. However, the presence of centralised hubs also suggests the risk of intellectual dominance, underscoring the need for more inclusive and diversified scholarly collaboration. Collectively, these findings extend existing literature by offering an integrative perspective on how research on AI capabilities and innovation management has evolved, how knowledge is structured, and where future scholarly efforts may be most productively directed.

Limitations and Future Directions

Despite its contributions, this study is subject to several limitations that should be acknowledged and that offer opportunities for future research. First, the bibliometric analysis was based solely on publications indexed in the Scopus database. Although Scopus provides broad and high-quality coverage of scholarly literature, relevant studies indexed in other databases such as Web of Science may have been excluded. Future research could integrate multiple databases to provide a more comprehensive and robust mapping of research on AI capabilities and innovation management.

Second, this study provides a cross-sectional snapshot of the research landscape at a specific point in time. As AI technologies and innovation practices continue to evolve rapidly,

longitudinal bibliometric analyses are needed to examine how research themes, collaboration networks, and scholarly influence develop over time. Such studies would offer deeper insights into the dynamic evolution of the field and its responsiveness to technological and environmental changes.

Third, the bibliometric approach predominantly relies on quantitative indicators, such as publication counts, citations, and network relationships. While this enables systematic mapping of the intellectual structure of the field, it does not capture the substantive content or contextual richness of individual studies. Future research could complement bibliometric techniques with qualitative approaches, including systematic literature reviews and in-depth content analysis, to develop a more nuanced understanding of theoretical frameworks, methodological choices, and practical implications.

Finally, the findings of this study may not be fully generalisable across all industries or organisational contexts, particularly given the diverse ways in which AI is applied in innovation processes. Future studies could focus on specific sectors, organisational types, or geographical regions to generate more context-sensitive insights and enhance the applicability of research outcomes. Additionally, emerging data-driven and machine learning–based analytical approaches may further enrich future investigations by enabling more granular exploration of large-scale, cross-country datasets.

Conclusion

This study set out to systematically examine the evolution, intellectual structure, and emerging trends in research on AI capabilities and innovation management through a comprehensive bibliometric analysis. By integrating performance analysis, science mapping, and collaboration network analysis, the study provides a holistic overview of how this research domain has developed over time and how its key themes and actors are interconnected.

The findings underscore the growing strategic importance of AI capabilities in shaping innovation practices, particularly in dynamic and competitive environments. The increasing volume of research, concentration of influential journals and authors, and dominance of themes such as open innovation and business performance collectively demonstrate the central role of AI in contemporary innovation management discourse. At the same time, the uneven geographical distribution of research activity highlights opportunities for more inclusive and globally representative scholarship. From a practical standpoint, the results offer guidance for managers and practitioners seeking to understand how AI has been leveraged within innovation ecosystems and how future developments may shape innovation strategies. For policymakers, the study provides insights into global research trends that can inform the design of frameworks supporting responsible, ethical, and sustainable AI-driven innovation.

Despite its contributions, this study is subject to certain limitations. The analysis is based on Scopus-indexed publications, which may exclude relevant studies from other databases. Future research could expand the dataset to include additional sources, incorporate qualitative content analysis, or examine sector-specific applications of AI in innovation management. Longitudinal and empirical investigations are also encouraged to

validate and extend the patterns identified in this bibliometric review. In conclusion, this study contributes to both theory and practice by clarifying the structure and direction of research on AI capabilities and innovation management. By outlining dominant knowledge streams and emerging trajectories, it provides a valuable foundation for future research aimed at advancing sustainable, effective, and responsible innovation in an AI-enabled world.

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