

Innovation Management: A Bibliometric Analysis of Research Hotspots and Citation Dynamics

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ABSTRACT

This study aims to map the intellectual structure, research hotspots, and citation dynamics in innovation management literature through a bibliometric approach. Data were collected from the Scopus database within a defined publication period and analyzed using VOSviewer to examine keyword co-occurrence, co-citation patterns, and thematic evolution. The results reveal that innovation management research is structured around three major thematic domains: sustainability-driven innovation, technology-enabled innovation, and human-centered applications. Key research hotspots include sustainable development, artificial intelligence, knowledge management, and healthcare innovation. The analysis also indicates a significant shift from traditional firm-centric innovation toward interdisciplinary and impact-oriented approaches that integrate environmental, technological, and social dimensions. Citation dynamics highlight the growing influence of digital transformation and sustainability paradigms in shaping contemporary research. This study contributes by providing a comprehensive overview of the evolution and current landscape of innovation management, offering insights into emerging trends and future research directions.

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1. INTRODUCTION

Innovation has become one of the most critical drivers of organizational competitiveness and long-term economic growth in the modern knowledge-based economy [1]. Organizations are continuously required to adapt to rapid technological change, globalization, and increasingly complex market demands. In this context, innovation

management refers to the systematic process of generating, developing, and implementing new ideas, products, services, or processes that create value for organizations and stakeholders. Effective innovation management integrates organizational knowledge, research and development activities, and strategic decision-making processes in order to enhance productivity and competitiveness in dynamic environments. As a result, innovation is no

longer viewed as a spontaneous activity but rather as a structured managerial process that requires planning, coordination, and evaluation within organizations [2], [3].

The growing importance of innovation has attracted significant attention from scholars across multiple disciplines, including management, economics, engineering, and information systems. Research on innovation management has expanded considerably over the past decades as organizations increasingly rely on innovation to maintain their competitive advantage and adapt to digital transformation. Early studies in the field primarily focused on product development, industrial management, and technological processes, emphasizing the technical and operational aspects of innovation [4]. Over time, however, the focus of research has shifted toward broader organizational and strategic perspectives, including innovation processes, entrepreneurship, knowledge management, and research and development management (R&D). This evolution reflects the multidisciplinary nature of innovation management and its integration with various organizational functions and strategic initiatives.

In addition to its conceptual development, innovation management research has experienced a significant growth in scientific publications worldwide. The increasing number of studies reflects the growing interest of researchers in exploring how innovation contributes to organizational performance, economic development, and technological advancement. As the volume of literature continues to expand, it becomes increasingly difficult for scholars to identify key research themes, influential authors, and emerging research directions within the field [5], [6]. Consequently, systematic approaches are needed to map the structure and evolution of knowledge in innovation management research. Bibliometric analysis has emerged as a valuable methodological tool for examining the development of scientific fields by quantitatively analyzing publication patterns,

citation networks, and keyword relationships across large datasets of academic literature.

Bibliometric analysis enables researchers to identify research hotspots, influential journals, collaborative networks, and citation dynamics that shape the development of a scientific discipline. By examining citation relationships and keyword co-occurrence patterns, bibliometric techniques allow scholars to visualize how research topics evolve over time and how different streams of knowledge are interconnected. These analytical approaches also help reveal emerging themes and declining areas of interest within a field, providing insights into the intellectual structure of research domains. In the context of innovation management, bibliometric analysis has been widely used to explore the evolution of research topics such as open innovation, sustainable innovation, knowledge management, and business model innovation, which represent major research hotspots in contemporary innovation studies.

Furthermore, recent technological and economic transformations—such as digitalization, artificial intelligence, and big data—have introduced new dimensions to innovation management research. These developments have influenced both organizational practices and academic research agendas, encouraging scholars to explore interdisciplinary perspectives that combine technological innovation with strategic management and entrepreneurship. As a result, the field has become increasingly complex, involving diverse theoretical frameworks, methodological approaches, and thematic clusters. Understanding these evolving research patterns requires comprehensive analytical approaches capable of capturing both the historical development and the current dynamics of innovation management literature. Bibliometric analysis therefore provides an effective framework for examining research hotspots, citation patterns, and thematic evolution within this rapidly growing field.

Despite the rapid growth of innovation management research, the expanding body of literature has created challenges in identifying the main research hotspots, influential publications, and citation dynamics that shape the intellectual development of the field. Previous studies often focus on specific subtopics of innovation, such as open innovation or technological innovation, rather than providing a comprehensive overview of the entire innovation management domain. Moreover, limited studies systematically analyze citation networks and thematic evolution to understand how knowledge in this field has developed over time. As a result, there is a need for a comprehensive bibliometric analysis that maps the structure of innovation management research, identifies key research clusters, and examines citation dynamics to better understand the intellectual landscape and emerging directions of this field.

Based on the identified research gap, this study aims to conduct a bibliometric analysis of innovation management research in order to identify major research hotspots, analyze citation dynamics, and map the intellectual structure of the field.

2. METHODS

This study employs a bibliometric analysis approach to examine the development of research in the field of innovation management. Bibliometric analysis is a quantitative research method used to evaluate scientific publications through statistical and mathematical techniques. It allows researchers

to systematically analyze large volumes of academic literature in order to identify research patterns, influential publications, collaboration networks, and emerging themes within a specific field. This method is widely used in management and innovation studies because it provides a structured overview of the intellectual landscape and the evolution of scientific knowledge. By analyzing bibliographic data such as authors, keywords, citations, and publication sources, bibliometric analysis enables researchers to map research trends and identify major research hotspots in innovation management literature.

The data used in this study were collected from a reputable academic database that indexes high-quality peer-reviewed publications. Relevant publications were retrieved using keywords related to “innovation management” and associated research terms. The search process was limited to articles, reviews, and conference papers published in English to ensure the consistency and reliability of the dataset. After the initial search, the retrieved documents were screened and refined based on relevance to the research topic. Bibliographic information such as author names, titles, abstracts, keywords, publication years, and citation counts was then exported for further analysis. This dataset provides the basis for identifying publication trends, influential authors, and citation patterns within the innovation management research domain.

3. RESULT AND DISCUSSION

3.1 Citation Analysis

Table 1. Top Cited Literature

Citations	Authors and year	Title	Source
24,489	[7]	Dynamic capabilities and strategic management	Strategic Management Journal, 18(7), pp. 509–533
12,252	[8]	Toward a knowledge-based theory of the firm	Strategic Management Journal, 17(S2), pp. 109–122
8,675	[9]	The balanced scorecard – measures that drive performance	Harvard Business Review, 70(1), pp. 71–79

7,035	[10]	Development of an instrument to measure the perceptions of adopting an information technology innovation	Information Systems Research, 2(3), pp. 192–222
6,375	[11]	Understanding information technology usage: A test of competing models	Information Systems Research, 6(2), pp. 144–176
5,876	[12]	Business models, business strategy and innovation	Long Range Planning, 43(2–3), pp. 172–194
5,746	[13]	Clusters and the new economics of competition	Harvard Business Review, 76(6), pp. 77–90
5,740	[14]	Outcomes for implementation research: Conceptual distinctions, measurement challenges, and research agenda	Administration and Policy in Mental Health and Mental Health Services Research, 38(2), pp. 65–76
5,409	[15]	Diffusion of innovations in service organizations: Systematic review and recommendations	Milbank Quarterly, 82(4), pp. 581–629
4,866	[16]	Open for innovation: The role of openness in explaining innovation performance among UK manufacturing firms	Strategic Management Journal, 27(2), pp. 131–150

Source: Scopus Database

3.2 Keyword Co-Occurrence Network Visualization

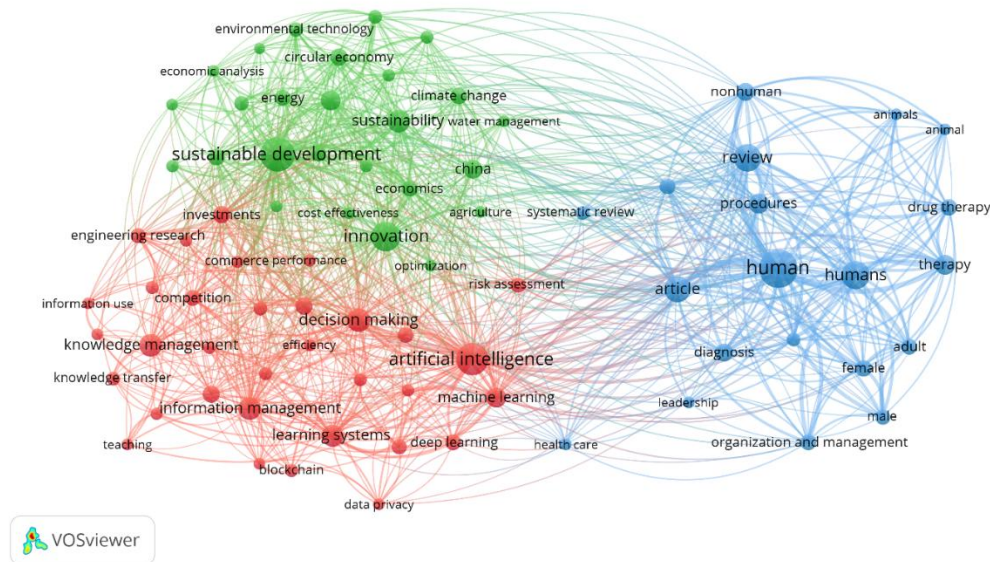


Figure 1. Network Visualization

Source: Data Analysis

Figure 1 reveals the intellectual structure of innovation management research through three dominant thematic clusters, each representing interconnected research streams. The green cluster is centered on innovation and strongly linked with sustainable development,

circular economy, climate change, and environmental technology. This indicates that a significant portion of innovation management research has evolved toward sustainability-oriented innovation. The dense connections among these keywords suggest that

sustainability is no longer a peripheral topic but has become a central paradigm, integrating economic, environmental, and technological perspectives within innovation discourse.

The red cluster highlights the technological and managerial dimensions of innovation, with core nodes such as artificial intelligence, decision making, knowledge management, and information management. The presence of terms like machine learning, deep learning, and blockchain reflects the increasing integration of advanced digital technologies into innovation processes. This cluster suggests a strong research emphasis on how organizations leverage data-driven technologies to enhance decision-making, optimize performance, and support knowledge transfer. It also indicates a shift toward intelligent and automated innovation systems, where digital capabilities play a critical role in shaping competitive advantage.

Meanwhile, the blue cluster appears to represent a more application-oriented and interdisciplinary domain, particularly linked to human, health care, diagnosis, and drug therapy. Although this cluster may initially seem distinct from traditional innovation

management themes, its presence highlights the diffusion of innovation research into applied fields such as healthcare and life sciences. The inclusion of terms like organization and management and leadership suggests that innovation management principles are increasingly being applied to improve human-centered systems, particularly in sectors where innovation directly impacts societal well-being.

The connections between clusters further demonstrate the interdisciplinary nature of innovation management research. For example, artificial intelligence (red cluster) is closely linked to health care (blue cluster), indicating the growing importance of AI-driven innovation in medical and organizational contexts. Similarly, innovation (green cluster) bridges sustainability and technological advancement, reinforcing the idea that modern innovation management operates at the intersection of environmental responsibility and digital transformation. These inter-cluster linkages reflect a convergence of themes, where innovation is not confined to a single domain but spans across multiple sectors and disciplines.

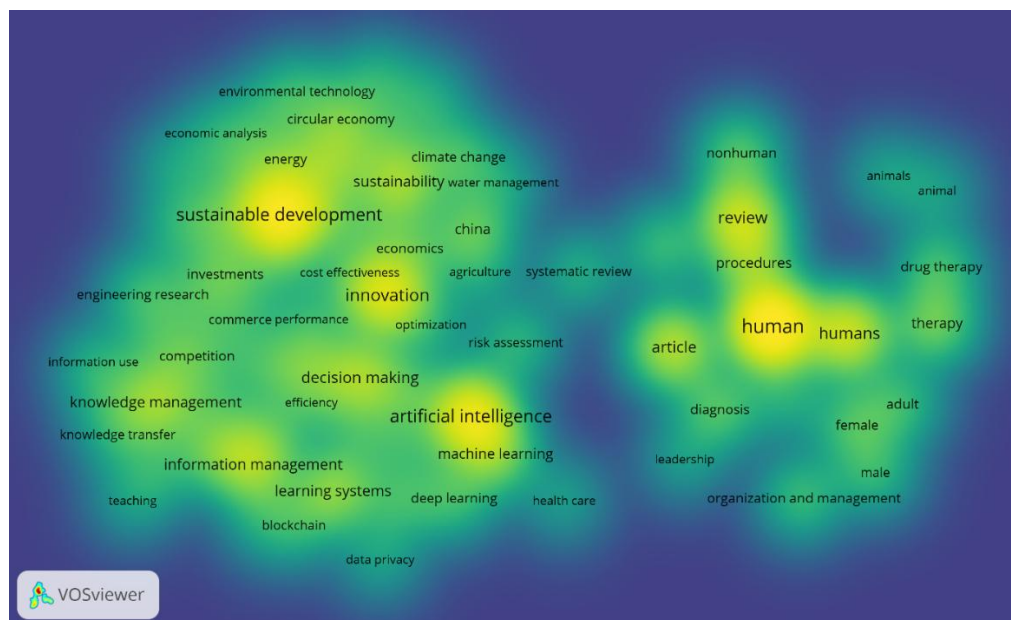


Figure 2. Density Visualization

Source: Data Analysis

Figure 2 highlights the most concentrated and frequently occurring themes within innovation management research. The brightest (yellow) areas indicate the highest research intensity, with human, innovation, sustainable development, and artificial intelligence emerging as the core focal points. The prominence of sustainable development alongside innovation suggests that sustainability-driven innovation has become a dominant research agenda, integrating environmental concerns such as climate change, circular economy, and energy. At the same time, the strong presence of artificial intelligence and related terms like machine learning and deep learning reflects the rapid rise of digital technologies as key enablers of innovation processes, particularly in decision-making and organizational efficiency.

In addition, the visualization reveals a clear dual concentration: one cluster centered on technological and sustainability-oriented innovation, and another on human-centered and applied domains, particularly in healthcare. The high density around human, therapy, diagnosis, and drug therapy indicates that innovation management research is increasingly applied in interdisciplinary contexts where human impact is central. Supporting themes such as knowledge management, information management, and decision making appear in moderately dense areas, suggesting their role as foundational mechanisms that connect technological advancements with practical applications.

Discussion

The findings of this bibliometric analysis reveal that innovation management research has undergone a significant transformation, shifting from a traditionally firm-centered and process-oriented perspective toward a more complex, interdisciplinary, and impact-driven domain. The prominence of keywords such as innovation, sustainable development, and artificial intelligence indicates that contemporary research is no

longer limited to improving organizational efficiency but is increasingly oriented toward addressing global challenges. This evolution reflects the growing recognition that innovation plays a strategic role not only in achieving competitive advantage but also in supporting long-term sustainability and societal well-being.

One of the most notable insights from the analysis is the strong integration between innovation management and sustainability-related themes. The high density and connectivity of terms such as circular economy, climate change, and environmental technology suggest that sustainability has become a central pillar of innovation research. This aligns with the broader shift toward sustainable innovation paradigms, where organizations are expected to balance economic performance with environmental and social responsibility. The findings imply that future innovation strategies will likely be evaluated not only based on financial outcomes but also on their contribution to sustainable development goals.

In parallel, the increasing prominence of artificial intelligence, machine learning, and deep learning highlights the growing role of digital technologies in reshaping innovation processes. These technologies are enabling more data-driven, predictive, and adaptive decision-making, thereby enhancing organizational capabilities in managing innovation. The integration of AI into innovation management also reflects a transition toward intelligent systems that can support knowledge creation, process optimization, and strategic decision-making. This suggests that digital capability is becoming a critical determinant of innovation success in modern organizations.

Another important dimension identified in this study is the expansion of innovation management into human-centered and applied domains, particularly healthcare. The strong presence of terms such as human, therapy, and diagnosis indicates that innovation is increasingly being applied to

improve quality of life and societal outcomes. This reflects a broader trend toward user-centered and impact-oriented innovation, where the focus extends beyond technological advancement to include human experience and well-being. It also underscores the interdisciplinary nature of innovation management, as it intersects with fields such as health sciences, social sciences, and organizational studies.

4. CONCLUSION

This bibliometric study demonstrates that innovation management research has evolved into a dynamic and interdisciplinary field characterized by the convergence of sustainability, digital transformation, and

human-centered applications. The identification of key research hotspots—such as sustainable development, artificial intelligence, and healthcare-oriented innovation—highlights a shift from traditional efficiency-driven innovation toward impact-oriented and technology-enabled approaches. Citation dynamics further indicate a growing emphasis on integrating advanced digital capabilities with strategic and environmental considerations. This study provides a comprehensive mapping of the intellectual structure and emerging directions in innovation management, offering valuable insights for future research and guiding scholars toward more integrative, sustainable, and technology-driven innovation frameworks.

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