

# Thematic Clustering of Open Innovation Studies: Insights from a Systematic Review and Citation Mapping

Khalifa Ahsina<sup>1</sup>, Adraa Jafar<sup>2</sup>, Rachid Mchich<sup>3</sup>, and Zakaria Bennani<sup>4</sup>

1.Department of Management, Ibn Zohr University, Morocco

2.Department of Management, Abdelmalek Essaâdi University, Morocco

3.Department of Management, Abdelmalek Essaâdi University, Morocco

4.Department of Management, Abdelmalek Essaâdi University, Morocco

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**Abstract-** *Since its introduction by Henry Chesbrough, open innovation (OI) has become a central topic in academic research. Challenging traditional closed models of innovation, OI emphasizes the value of leveraging knowledge from both inside and outside an organization. While widely adopted in practice, its theoretical foundations continue to be debated in the literature.*

*This paper examines the evolution of OI scholarship, identifying key themes and enduring gaps. It is based on a systematic review of 5,271 peer-reviewed articles published between 2003 and 2024 across 160 Scopus-indexed journals. Following PRISMA guidelines, the study uses bibliographic coupling and co-citation analysis, with topic mapping conducted via VOSviewer software (version 1.6.20).*

*The findings reveal a sharp rise in publications since 2014, confirming OI's established role in innovation studies. Although research output remains concentrated in European and North American institutions, contributions from Asia and Oceania are growing steadily. Four major thematic clusters emerge: innovation management practices, digital transformation, public and policy engagement, and academic research methodologies—reflecting a field that is both maturing and expanding.*

*Nevertheless, significant gaps remain, particularly in case studies from emerging economies and in understanding the broader social implications of OI. Addressing these areas will be essential to enhance the relevance and applicability of open innovation in today's technological and socio-economic landscape.*

**Keywords:** *Open Innovation, Systematic Literature Review, Knowledge Management, Innovation Ecosystems, Research Trends.*

## 1. INTRODUCTION

Open innovation (OI) will be the leading innovation management paradigm instead of the conventional close model based solely on internal research and development. Open innovation was first outlined by Henry Chesbrough in 2003, and it is the phrase used to

describe the fact that external knowledge and strategic alliances are powerful predictors of innovation performance (Chesbrough, 2012).

Since its emergence, OI has attracted unprecedented popularity from scholars and business managers, which resulted in wide research on its dynamics, applications, and effects (Lichtenthaler, 2011).

Early research on OI also centered solely on technology transfers, business model development, and user-led strategies. However, subsequent research has explored in depth the interconnectedness of the relationships between firms and their stakeholders like customers, suppliers, universities, and research institutions emphasizing the intricate nature of open innovation (Brunswick, 2011). E.g., Ahsina et al. (2020) explored why Moroccan firms adopt OI using structural equation modeling to determine organizational, technological, and environmental drivers as important determinants. Other empirical research has looked into the impact of OI strategies on corporate performance and highlighted the crucial role played by internal resources like absorptive capacity and entrepreneurial attitude (Wu et al. 2013).

While the literature regarding OI is vast and expanding, it is very much fragmented by discipline and theory.

As a result, it is difficult to form a coherent understanding of how the field has evolved, what dominant themes have emerged, and which research directions remain underexplored. This study is motivated by the need to consolidate the current state of knowledge in open innovation and to provide a structured overview of its intellectual development. By mapping the key contributors, thematic clusters, and conceptual gaps, this research aims to support the academic community in identifying both the current landscape and promising avenues for future inquiry.

In line with this motivation, this article seeks to answer the following central question: How has OI research evolved in terms of thematic structuring, influential authors, and research perspectives?

To address this, we explore three key dimensions:

- The most influential authors and works shaping OI literature;
- The major thematic clusters and intellectual streams within the field;
- The gaps in the existing literature and the opportunities they offer for future research.

Our analysis is structured around four key phases. First, we outline our research methodology. Second, we provide a descriptive overview of the field, highlighting the leading authors, journals, key publications, subject areas, and the geographic distribution of research output. The third phase identifies the theoretical foundations of open innovation scholarship through a keyword co-occurrence analysis. Finally, we synthesize these findings to offer concrete recommendations for future research directions.

This article delivers a comprehensive bibliometric analysis of OI research, tracing its thematic evolution, acknowledging its most influential contributors, and—most importantly—rigorously identifying understudied and overlooked areas. It maps the scholarly origins and subsequent trajectory of open innovation, offering new insights into how the field has developed. In doing so, it establishes a foundation for future work, helps to clarify a

sometimes fragmented body of literature, and provides scholars with a clearer roadmap for subsequent research.

## 2. THEORETICAL FOUNDATIONS

Open innovation triggered a paradigm shift in innovation management that did away with the conventional "closed" approach whereby firms only dealt with internal R&D. Until the mid-20th century, it was largely believed that success was based on holding back research, development, and commercialization activities within the firm with firms investing in significant amounts to attract the greatest R&D performers and guarding knowledge tightly.

Everything changed in the early 2000s through Henry Chesbrough's original work on bringing into perspective the phenomenon of open innovation (2003). Chesbrough (2012) coined the term OI as a strategy through which firms deliberately incorporate internal and external ideas and utilize multiple channels to drive innovations to market.

The core insight is that valuable knowledge exists outside company walls with customers, suppliers, research institutions, and even competitors and tapping into these external sources can greatly improve innovation outcomes.

Since its introduction, open innovation has attracted growing attention from both academics and industry practitioners. Researchers have studied its theories, practical uses, and economic effects, while companies have adopted OI approaches to speed up development, access complementary skills, and share innovation risks.

Early research mostly focused on concrete mechanisms like technology licensing, spin-offs, and new business models involving external knowledge. Another important area looked at user-driven innovation, where customers actively shape product development. These initial studies showed how OI could transform innovation in many sectors.

As the field matured, researchers began to explore the wider innovation ecosystems companies participate in. This newer research looks at how firms interact with a broad range of stakeholders suppliers, universities, governments, nonprofits showing that openness means much more than just sharing technology. It includes collaborative R&D, co-creating with users, and taking part in complex innovation networks.

For example, Ahsina and colleagues (2025) studied OI adoption in Moroccan firms and found three main factors driving success:

- Organizational: leadership support, company culture, skilled workforce
- Technological: digital tools that enable collaboration
- Environmental: market competition and regulatory frameworks.

Their work is especially valuable because it focuses on an emerging economy, a context that hasn't been deeply explored in OI research.

Other important research, like Wu et al. (2013), looked at how OI affects firm performance, highlighting two key internal capabilities:

- Absorptive capacity: the ability to recognize, absorb, and use external knowledge
- Entrepreneurial orientation: a company's readiness to innovate, take risks, and actively seek opportunities

While OI offers many benefits, it also brings challenges like intellectual property issues, coordination difficulties, and the risk of knowledge leaks. Balancing openness with protection

is increasingly important in today's digital economy, where global networks and data flows create both new opportunities and risks.

OI has now become a mature research field covering multiple industries, regions, and disciplines. The focus has shifted from isolated transactions to dynamic ecosystems, reflecting a deeper understanding of what "openness" really means. Yet, there are still important gaps especially concerning OI's use in developing countries and its wider social impact. These are key areas for future research.

### **3. RESEARCH APPROACH**

To trace how OI research has developed, this study uses bibliometrics a quantitative method that applies statistical measures to analyze scientific publications. Unlike traditional literature reviews that can be subjective, bibliometrics offers an objective and repeatable way to look at large amounts of research (Broadus, 1987; Pritchard, 1969).

#### ***3.1 Data Sources and Tools***

We chose the Scopus database for its broad coverage of peer-reviewed studies and detailed metadata. For analysis, we used VOSviewer (version 1.6.20), an easy-to-use software that visualizes relationships between authors, papers, and research topics.

Using methods like keyword co-occurrence and citation analysis, this approach helps us:

- Identify influential publications
- Track how the field has evolved
- Spot emerging research trends

The ultimate aim is to offer a clearer picture of OI's intellectual landscape and point out useful directions for future work.

#### ***3.2 Data Collection and Extraction***

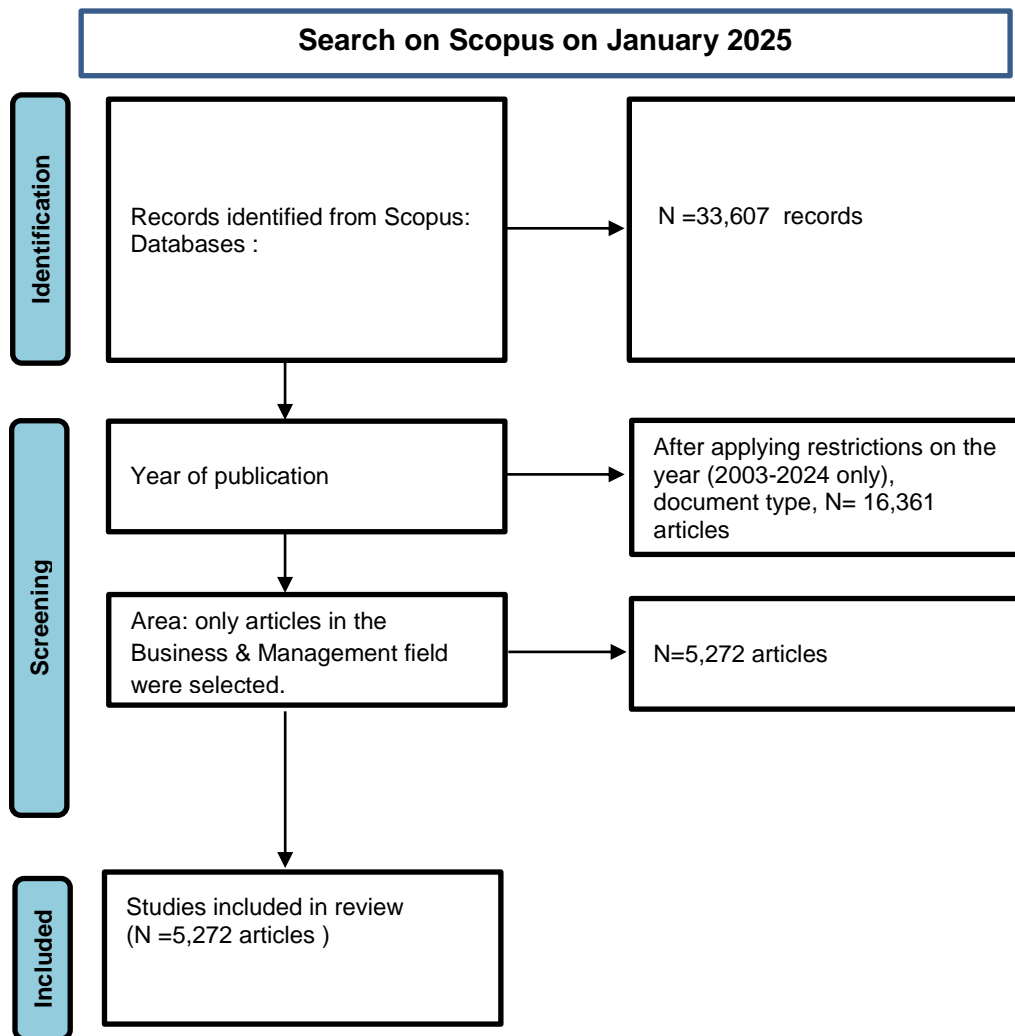
The first step in bibliometric analysis is to collect raw data, from which necessary metadata (e.g., authors, citation counts, countries) can be extracted (Carvalho et al., 2013).

In this study, similar to many management and business research studies (e.g., Saiz-Alvarez, J. M. (2024); Sikandar, Huma, et al, 2024), we used the Scopus database for our bibliometric analysis. We searched for the phrase "open innovation" in the title, abstract, or keywords. The search was conducted in January 2022.

Restrictions were then applied based on:

- Time period: only articles published between 2003 and 2024 were included.
- Document type: only scientific articles were retained, excluding book chapters and conference proceedings.
- Language: only articles written in English were considered.
- Field: only articles in the Business & Management field were selected.

The search was conducted in January 2025. The initial search returned 33,607 records. After applying restrictions on the year (2003-2024 only), document type (articles only, excluding book chapters and proceedings), and language (English only), the sample was refined to 16,361 articles. Based on these inclusion/exclusion criteria, our final result was 5,272 records.



**Figure 1. PRISMA flow diagram illustrating the systematic review process**

## 4. Results

This section addresses two key points: first, a descriptive analysis of publication trends, leading authors, journals, and citation impact in OI literature (2003–2024); second, a bibliometric analysis using VOSviewer to identify and visualize emerging knowledge clusters, offering a deeper understanding of the intellectual structure of this research field.

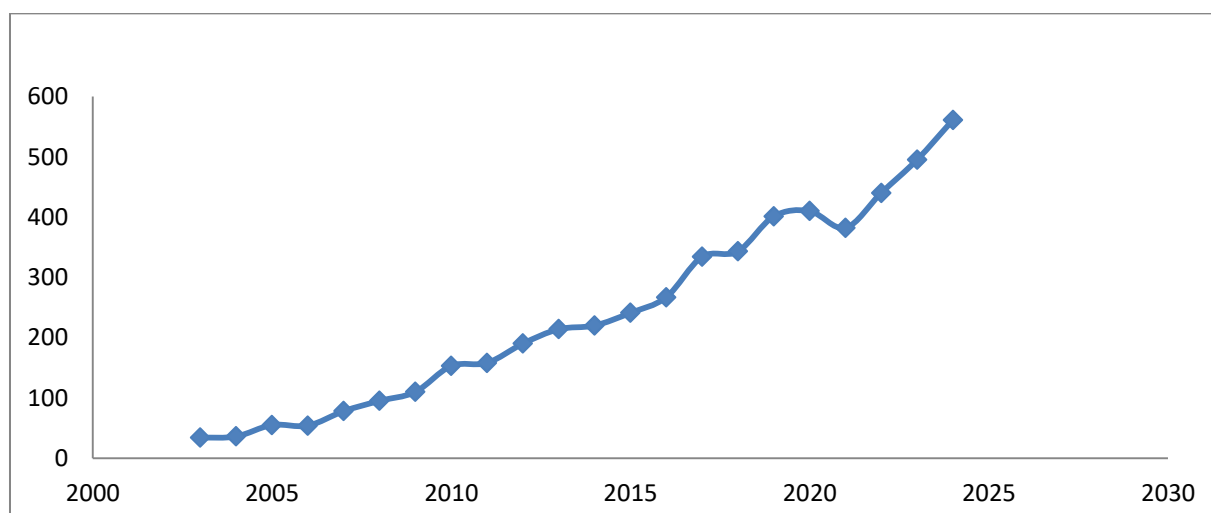
### 4.1 Descriptive Analysis of Bibliometric Data

The yearly trend in publications on Open Innovation (OI) shows a clear and sustained rise in scholarly attention since the concept first emerged in 2003. In its early years (2003–2006), research activity was relatively modest, with between 34 and 55 papers published annually.

The early phase of open innovation (OI) research coincided with Henry Chesbrough’s seminal work, which introduced the OI framework and attracted scholarly attention. From 2007 to 2013, the number of publications increased from 78 to 214 per year, as OI concepts became

more established across various fields, backed by stronger theories and a growing empirical base.

Between 2014 and 2017, annual outputs continued to increase, hitting a peak of 334 papers in 2017, led by the enhancement of digital technologies and the spread of collaborative innovation platforms. Between 2018 and 2023, this rise accelerated even further, to 495 publications in 2023, and is indicative of increasing interest in artificial intelligence, innovation ecosystems, and knowledge management. By 2024, with 561 articles published, OI's importance and focus on open, collaborative, and digital innovation models were firmly established.



**Figure 2. Distribution of publications over time**

*Source: Authors' own elaboration*

#### ***4.1.1 Landmark studies in the centre of open innovation literature***

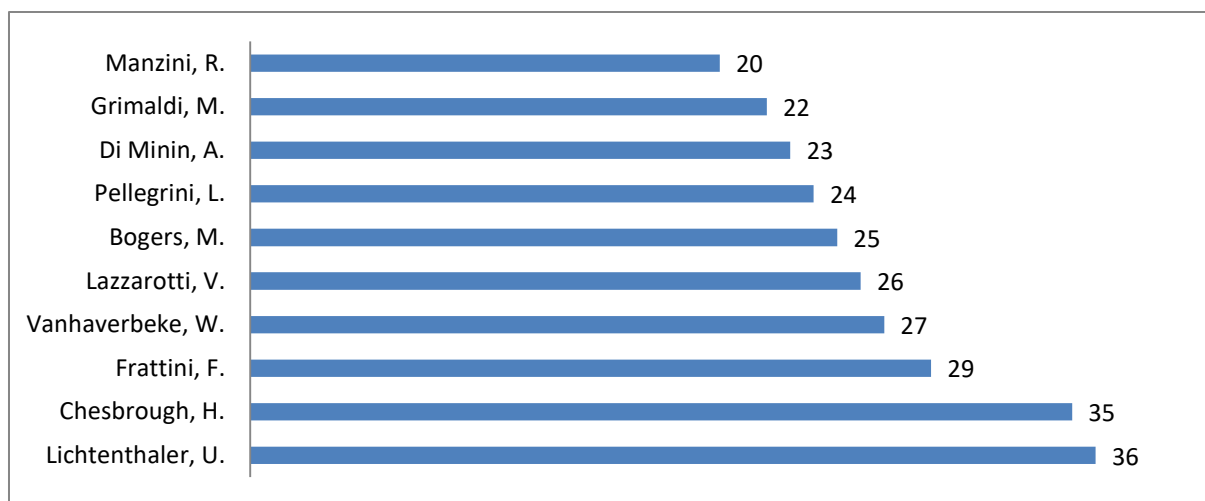
Examining the most cited articles in open innovation (OI) reveals the groundbreaking papers that have been pivotal to the field.

A small group of key publications stands out for their substantial influence in developing both the theoretical frameworks and empirical insights that underpin OI across disciplines.

Topping the list is David J. Teece's 2007 *Strategic Management Journal* article, though it is not solely an OI article, gave us the dynamic capabilities theory—a centrally important concept for strategically managing innovation. Coupled with this, the study of Laursen and Salter in 2006 gives us useful empirical facts on firm performance and openness based on UK manufacturing industry evidence.

The conventional definition of OI as a specific concept emanates from Henry Chesbrough's ground-breaking 2003 paper in the *MIT Sloan Management Review*. Chesbrough emphasized flows of knowledge both within internal groups and external partners as being especially essential, setting the stage for extensive study into collaborative innovation. Building on this, studies like Dahlander and Gann's 2010 study of different levels of openness and De Jong et

al.'s 2009 investigation into OI in small and medium-sized enterprises broadened theoretical and practical understanding of the topic.



**Figure 3. The most prolific authors in the field of open innovation**

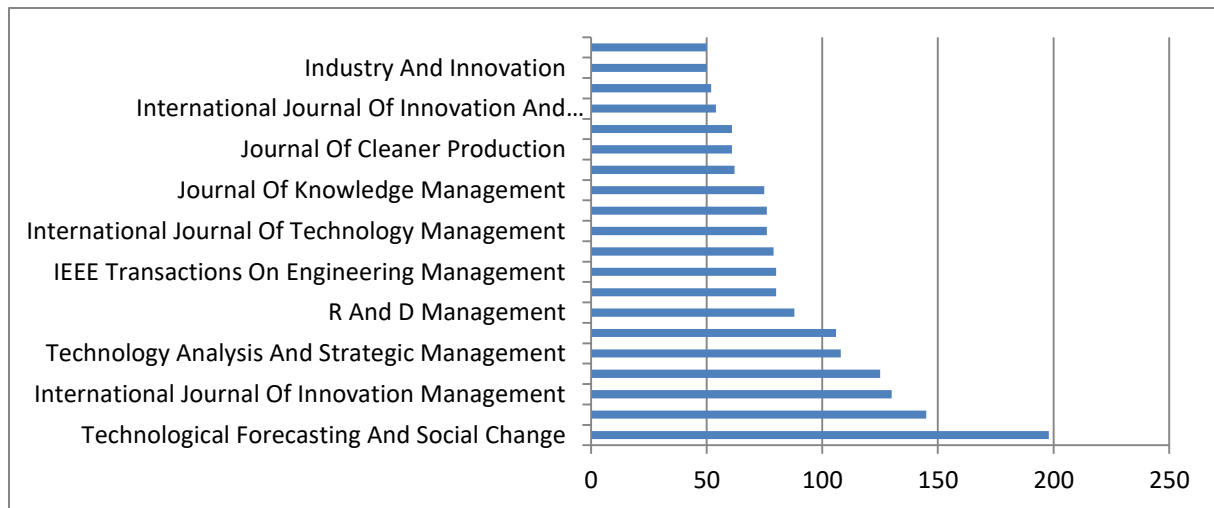
*Source: Authors' own elaboration*

#### **4.1.2 Most influential journals in open innovation**

In addition to the analysis of key authors, reviewing the most influential journals in the field of Open Innovation (OI) helps identify the primary platforms through which research is disseminated. Technological Forecasting and Social Change leads with 198 articles, followed by Research Policy (145), International Journal of Innovation Management (130), Technovation (125), and Technology Analysis and Strategic Management (108). These journals are widely recognized for their focus on innovation strategy and technology management.

OI research spans a broad academic spectrum. Journals such as R&D Management and Journal of Product Innovation Management focus on innovation processes, while Strategic Management Journal and Organization Science explore strategic and organizational dimensions. Engineering and technology transfer are addressed in outlets like IEEE Transactions on Engineering Management and Journal of Technology Transfer. Entrepreneurship and SME-related themes are increasingly covered in journals such as Small Business Economics and International Journal of Entrepreneurship and Innovation Management.

While the top ten journals account for 47% of publications, research is also dispersed across a wider set of journals, with 71 having published at least ten articles. Recent trends highlight a growing interest in sustainability and ethics, indicating that OI is evolving into a multidimensional field, involving large corporations, startups, and academic perspectives on future innovation strategies.



**Figure 4. Most influential journals in open innovation**

*Source: Authors' own elaboration*

#### **4.1.3 Major Works in Open Innovation**

The most cited research papers highlight the seminal studies that have significantly contributed to open innovation (OI) development. The seminal articles have greatly influenced the theoretical basis and practical expertise of OI in different disciplines.

Headed by David J. Teece's 2007 article in the Strategic Management Journal, which, although not entirely focused on OI, provided the seminal insight of dynamic capabilities a concept that is still fundamental to strategic innovation management. A pivotal moment for Open Innovation research came in 2006 with the work of Laursen and Salter. Their landmark study of the UK manufacturing sector provided some of the first robust empirical evidence that a company's openness to external ideas and partnerships has a direct and measurable impact on its performance.

However, the concept of Open Innovation as a formal paradigm was first introduced a few years earlier by Henry Chesbrough. In his seminal 2003 article, Henry Chesbrough introduced a paradigm-shifting model in the MIT Sloan Management Review, contending that a company's most valuable ideas can—and must—originate from beyond its own walls. He championed the critical importance of knowledge sharing, not only within internal teams but with a broad ecosystem of external partners. This foundational principle broke from traditional, closed innovation models and laid the groundwork for a new field of study focused on how firms collaborate to drive growth.

Building on this foundation, a wave of subsequent research has refined our understanding of open innovation. Influential studies, such as Dahlander and Gann's 2010 analysis on the varying levels of openness and the work of De Jong and others on its application within small and medium-sized enterprises, have expanded the framework into a nuanced and practical discipline.



This growing body of work has been propelled by leading academic journals. Publications like Strategic Management Journal, Research Policy, and the MIT Sloan Management Review itself have served as major platforms, consistently publishing key studies that have defined and advanced the field.

It began as a set of preliminary ideas and evolved into a more developed set of evidence and theory, and more recently explored areas like digital transformation as well as innovation ecosystems.

Together, these early works show how OI was based in strategic management and organizational theory but continued to adapt to add new technology shifts as well as interdisciplinary thought.

**Table 1. Key Studies in Open Innovation**

Authors	Title	Year	Journal Citations	Number of publications
Teece, David J	Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance	2007	Strategic Management Journal	8662
Laursen, Keld et Salter, Ammon	Open for innovation: The role of openness in explaining innovation performance among U.K. manufacturing firms	2006	Strategic Management Journal	4487
Geels, Frank W.	From sectoral systems of innovation to socio-technical systems: Insights about dynamics and change from sociology and institutional theory	2004	Research Policy	2641
Chesbrough, Henry W.	The era of open innovation	2003	MIT Sloan Management Review	2084
Nambisan, S., Lyytinen, K., Majchrzak, A., & Song, M.	Digital innovation management: Reinventing innovation management research in a digital world	2017	MIS Quarterly: Management Information Systems	1957
Dahlander, L., & Gann, D. M.	How open is innovation?	2010	Research Policy	1943
Yoo, Y., Boland Jr, R. J., Lyytinen, K., & Majchrzak, A.	Organizing for innovation in the digitized world	2012	Organization Science	1873
De Jong, J., Vanhaverbeke, W., Van de Vrande, V., & de Richemont, M.	Open innovation in SMEs: Trends, motives and management challenges	2009	Technovation	1630
Owen-Smith, J., & Powell, W. W.	Knowledge Networks as Channels and Conduits: The Effects of Spillovers in the Boston Biotechnology Community	2004	Organization Science	1592
Hippel, E. V., & Krogh, G. V.	Open source software and the "private-collective" innovation model: Issues for organization science	2003	Organization Science	1531

*Source: Authors' elaboration based on the Scopus database*

#### 4.1.4 Analysis of Scientific Production in Open Innovation by Universities

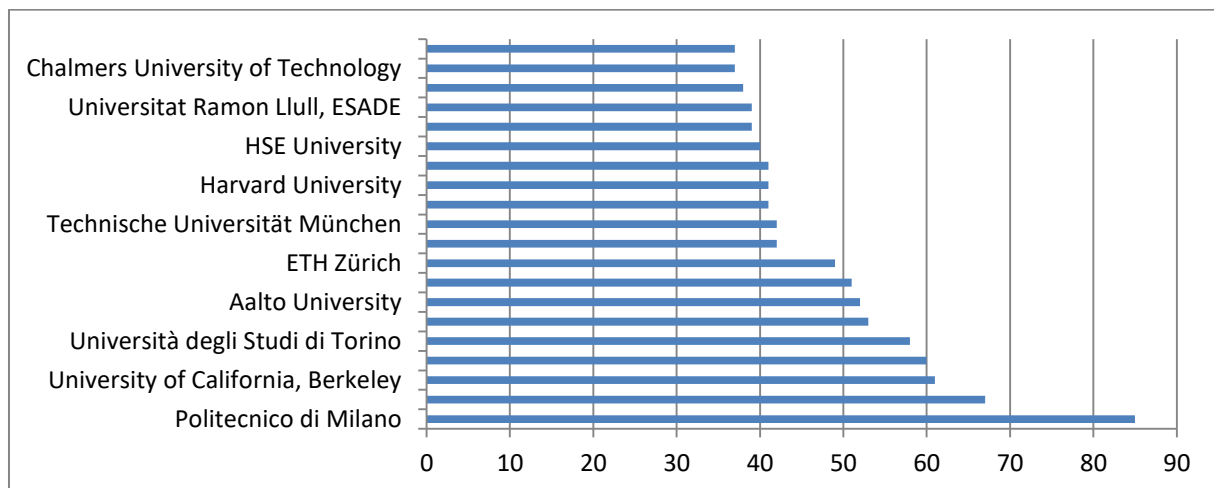
An examination of academic contributions to open innovation (OI) reveals 155 universities that have been making significant contributions based on Scopus publications from 2003-2024. Some universities stand out prominently as evidence of rising global interest in OI studies.

Then comes Politecnico di Milano with 85 publications, followed closely by LUT University with 67 and the University of California, Berkeley with 61. Others in the list of top contributors include Copenhagen Business School, the University of Turin, Tsinghua University, and Aalto University. This wide spread from technical universities to business school and full-service institutions indicates a variety of viewpoints that are contributing to OI scholarship.

Geographically, European universities dominate, making up nearly 60% of the leading contributors. Countries such as Italy, the UK, Germany, France, and the Netherlands are well represented, with prestigious institutions like ETH Zurich, TU München, the University of Cambridge, Bocconi University, and CNRS. Prominent business schools like ESADE, NEOMA, Warwick, and HEC Montréal also contribute significantly.

In North America, renowned universities including Harvard, Stanford, MIT, and the University of Southern California are active, often through their business schools. Canadian institutions such as HEC Montréal and the University of Ottawa also feature prominently. Meanwhile, in Asia and Australia, universities like Tsinghua, Zhejiang, the National University of Singapore, and the University of Queensland are emerging as key players.

Although the top 10 universities account for almost one-third of all OI publications, a wider range of institutions is increasingly engaging with this field, reflecting its growing importance in global innovation research.



**Figure 5. Scientific Production in Open Innovation by Universities**

*Source: Authors' own elaboration*

#### 4.1.5 Scientific Production in Open Innovation by Country

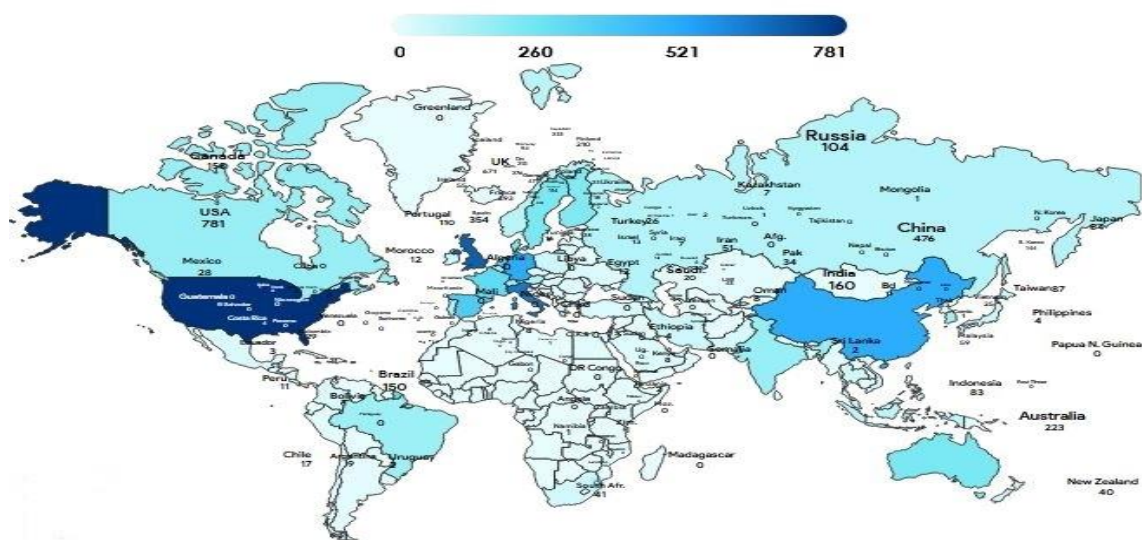
A Scopus indexed review of Open Innovation (OI) studies for the period 2003-2024 names 155 institutions that are major contributors to the area. A number of those institutions are leading because of their large number of publications, reflecting the growing worldwide

scholarly interest in OI. The leader is Politecnico di Milano with 85 publications, then LUT University (67) and the University of California, Berkeley (61).

Other notable contributors include Copenhagen Business School, University of Turin, Tsinghua University, and Aalto University. This mix of technical universities, business schools, and cross-disciplinary institutions is a representation of the heterogeneity of expertise shaping OI research across the globe. Europe has the greatest number of contributors with nearly 60% of highly ranked institutions, including Italy, the UK, Germany, France, and the Netherlands with central actors being ETH Zürich, TU München, Cambridge, Bocconi, and CNRS.

In North America, elite institutions such as MIT, Harvard, Stanford, and UC Berkeley play a central role, supported by business schools like Sloan, HBS, and Marshall. Canada's contribution is visible through HEC Montréal and the University of Ottawa. Meanwhile, Asia and Australia are gaining momentum with active participation from Tsinghua, Zhejiang, the National University of Singapore, and the University of Queensland.

Despite concentration among top performers, broader institutional engagement signals growing international interest in OI as a transformative force in research and practice.



**Figure 6. Scientific Production in Open Innovation by Country**

Source: Authors' own elaboration

#### **4.2 Network Analysis: Structure of Knowledge in Open Innovation**

Following the previous point, which provided an overview of publications on Open Innovation (OI), this point addresses the second research question of the study:

*What are the main knowledge clusters that have emerged within the OI literature?*

The main results of the analysis of the knowledge structure in OI are summarized in Figures 7 which illustrate the clusters resulting from the keyword co-occurrence analysis conducted with VOSviewer. More precisely, we used network analysis techniques to examine the connections between similar concepts. In particular, the more co-occurrences there are, the more central the node (i.e., a specific keyword) is in the network. Similarly, the more

frequently a pair of keywords is used simultaneously by researchers, the stronger and more robust the link between them. The frequency at which a keyword is repeated, the larger its node (De Bernardi et al., 2021).

#### 4.2.1. Keyword Analysis

At the forefront is leading Politecnico di Milano with 85 published papers, which is followed by LUT University at 67 and the University of California, Berkeley, at 61. The other major contributors include Copenhagen Business School, the University of Turin, Tsinghua University, and Aalto University. The diversity of institutions ranging from technical universities, business schools, and multidisciplinary research institutes is evidence of the broad range of perspectives and skills driving progress in OI research around the world.

On the whole, this setting reflects both the global trend of OI research as well as the high diversity of academic institutions behind its development, underlining its rising significance as a global strategic research area.

**Figure 7. The most relevant topics related to OI**  
*Source: Authors' own elaboration*

#### ***4.2.2. Gaps and Opportunities Remaining in the Field of Open Innovation***

Looking closely at the keywords used in Open Innovation research helps us understand the main themes driving the field. At the same time, it uncovers areas that remain underexplored, pointing to opportunities for future study and new directions to deepen our understanding of OI.

First, the examination of dominant keywords highlights the most frequently addressed themes, such as collaboration, innovation ecosystems, R&D, and knowledge sharing. These topics, often placed at the center of the figure, demonstrate in-depth coverage in the existing literature. Conversely, some keywords appear on the periphery or are less connected to other concepts, suggesting less explored or emerging themes.

The organization of keywords into thematic clusters allows for a deeper analysis. Thus, groupings around OI in large firms, startups and SMEs, as well as technological tools facilitating OI, are observed. However, the presence of small or weakly connected clusters indicates the existence of under-explored niches, which could constitute promising research avenues.

Moreover, the identification of absent or underrepresented themes reveals several potential research directions. Some intersections remain understudied, such as the relationship between OI and artificial intelligence, the circular economy, or social inclusion. Similarly, research on OI primarily focuses on developed economies, leaving a significant gap regarding its application in developing countries or specific sectors such as public administrations or NGOs.

The temporal analysis of keywords also allows for tracking the evolution of trends. Concepts frequently cited in older works seem to have been thoroughly researched, while some recent themes, such as the impact of the COVID-19 pandemic on OI, remain underdeveloped.

In conclusion, this analysis highlights several gaps in the OI literature. Future research could deepen the role of OI in sustainability, the adoption of emerging technologies (AI, blockchain, IoT), or its social and cultural impact. A systematic review of the most recent work would confirm these gaps and guide future research toward these still underexplored axes.

#### ***4.2.3. Analysis of authors publishing in the field of OI***

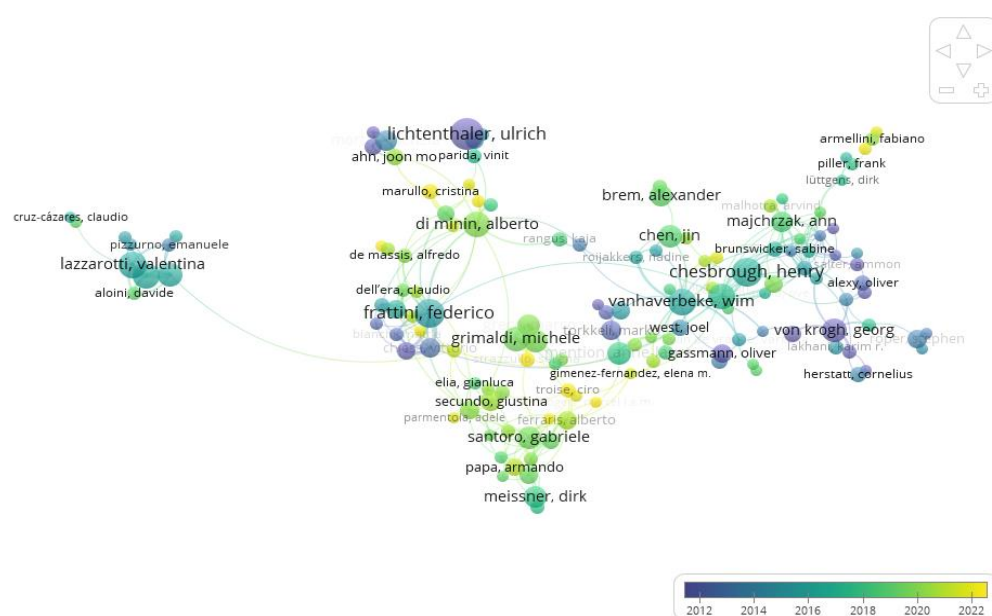
The bibliometric analysis of authors publishing in the field of OI highlights several key elements regarding the structuring and evolution of this research field.

First, the examination of thematic clusters reveals the existence of several groups of authors sharing strong links in terms of citations and collaborations. Among these clusters, a central group stands out, including researchers such as Grimaldi Michele, Frattini Federico, and Di Minin Alberto, who appear to be strongly interconnected and specialized in specific sub-themes of OI. Another significant cluster groups influential authors such as Chesbrough Henry, Von Krogh Georg, and Gassmann Oliver, key figures in this field.

Next, the analysis of links between authors allows for the identification of collaboration and cross-citation relationships. The more central an author is in the network and connected to other researchers, the more significant their role in the diffusion of knowledge on OI. In this regard, Chesbrough Henry, considered the founder of the OI concept, stands out as a key player, with numerous connections to other influential researchers.

Moreover, the figure highlights a temporal evolution of publications. The color scale used (ranging from blue for the oldest publications to yellow for the most recent) allows for the observation of the evolution of the research field over the period 2012-2022. Some authors, such as Chesbrough Henry and Gassmann Oliver, were present when there were still only the first few years of analysis going on, while others, such as Armellini Fabiano, are relatively newer and represent newer trends in the field.

The research highlights the most important authors in Open Innovation, with authors like Chesbrough, Von Krogh, and Gassmann being highlighted due to their high citation rates and research contributions. Smaller circles of researchers such as Lazzarotti Valentina and Cruz-Cázares Claudio, however, have dedicated specific themes or individual research groups to them. Overall, this paper gives us a clear snapshot of the structure of the field, leading players, collaboration patterns, and developing trends, and hence a better understanding of its evolution.



**Figure 8. The most influential authors in the field of OI**

*Source: Authors' own elaboration*

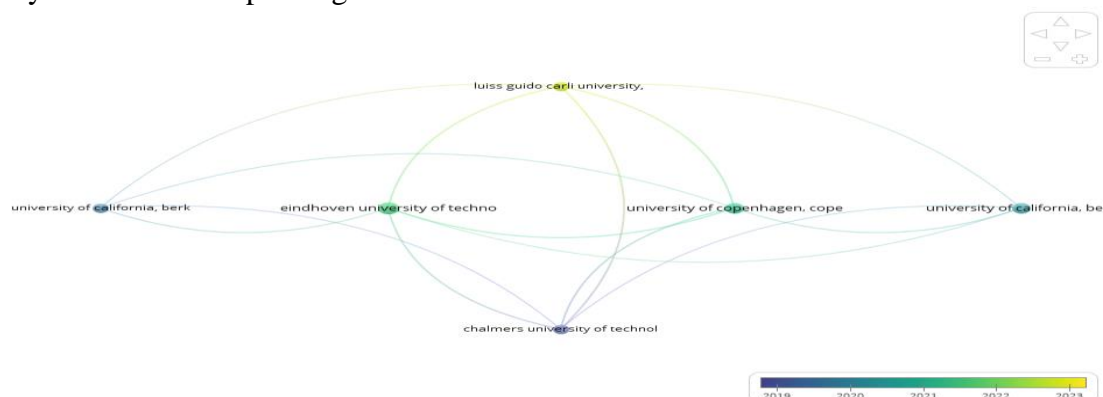
#### **4.2.4. Top Universities and Collaborative Networks Analysis in Open Innovation Research**

The intellectual landscape of Open Innovation has been shaped by a distinct hierarchy of influential thinkers. At its foundation stand seminal scholars like Henry Chesbrough, Georg von Krogh, and Oliver Gassmann, whose prolific and highly cited publications form the canonical core of the discipline's theoretical framework.

Beyond this central group, a vital ecosystem of specialized researchers drives the field's expansion into new territories. Scholars such as Valentina Lazzarotti and Claudio Cruz-Cázares exemplify this trend, focusing on niche topics within smaller, dedicated research communities. This structure reveals that the evolution of Open Innovation is not solely dictated by a central cohort but is significantly advanced by a distributed network of specialist clusters. These groups operate across disciplinary boundaries, developing novel applications and refining solutions for specific contexts.



Collectively, this analysis provides a nuanced cartography of the Open Innovation research domain. By mapping influential authors, tracing their collaborative networks, and identifying emerging specialties, we gain a clearer understanding of the field's dynamic evolution. This examination helps identify both the established pillars of OI scholarship and the new, dynamic frontiers pushing the field forward.



**Figure 9. Institutional hubs and collaborative networks in Open Innovation research**

*Source: Authors' own elaboration*

## 5. DISCUSSION

The evidence is unequivocal: Open Innovation (OI) has transitioned from a novel concept to a cornerstone of modern innovation management. Evolving from Chesbrough's foundational propositions (2003, 2012) and refined by later scholars like Lichtenthaler (2011), its influence is now undeniable. This ascent is quantitatively clear; annual scholarly publications on OI have surged since 2014, culminating in 561 publications in 2024. This trajectory signals more than just academic curiosity—it underscores the paradigm's growing practical adoption as firms increasingly pivot toward open, collaborative, and adaptive innovation strategies.

Scientifically, the journey of OI reveals its intrinsically diverse and multidisciplinary character. The field has broadened from its initial focus on business models and technology transfer to incorporate critical themes such as dynamic capabilities, innovation ecosystems, and digital transformation. While this theoretical richness is an asset, it also presents a challenge, raising concerns about potential fragmentation and spurring calls for greater conceptual unity (Bogers et al., 2019). The rise of specialized research clusters—investigating topics from AI to co-working spaces—illustrates how OI is being leveraged to tackle contemporary, digitally-driven challenges. The initial neglect of these areas further highlights the field's ongoing effort to assimilate rapidly evolving technological realities.

From a practical perspective, a clear realization is taking hold: unlocking OI's full potential depends on mastering digital technologies and the strategic orchestration of ecosystems. Studies focusing on small and medium-sized enterprises (e.g., De Jong et al., 2009) advocate for flexible and adaptable OI frameworks tailored to their unique constraints. Conversely, the application and adaptation of OI within large corporations represent a significant and under-explored area, indicating a crucial direction for future research to provide a more complete understanding of OI across the organizational spectrum.

Visibility of key researchers such as Chesbrough and Lichtenthaler, and top institutions such as Politecnico di Milano and UC Berkeley, indicates the field's solid academic foundation, but simultaneously raises concerns about a lack of diversity in terms of perspectives and theoretical debates. The global research landscape is marked by a European core at the center,

complemented by intensifying global collaboration, with Asian institutions like Tsinghua University becoming more prominent. The geographical trend identifies the manner in which organisational and cultural environments shape the adoption of OI, particularly in developing economies.

Thematic analysis identifies some general themes—innovation management, digital transformation, public policy, and research practices—accompanied by hot topics like AI and digital platforms. However, significant gaps in the literature remain. Notably, the integration of sustainability into OI models is still peripheral, despite its clear relevance to the circular economy and inclusive innovation. Furthermore, while interest is growing, non-Western contexts—particularly in the Global South—remain critically under-explored. These lacunae present a compelling case for rigorous, systematic inquiry into areas like "social open innovation," its relationship to the UN Sustainable Development Goals (SDGs), and the use of mixed-methods approaches to better understand complex innovation ecosystems. Longitudinal studies are also needed to explore how digital technologies like AI and blockchain interact with established concepts of absorptive capacity and knowledge integration, building on the foundational work of Cohen and Levinthal (1990).

## 6. CONCLUSION

This study has provided a qualitative bibliometric analysis of two decades of Open Innovation research, tracing its journey from a nascent concept to a standardized theme in innovation management. Since its initial conceptualization by Chesbrough in 2003, OI has matured into both a core academic focus and a widely adopted managerial strategy.

Our analysis reveals several defining trends: the growing alignment of OI with digital transformation, the impact of emerging technologies, and its increasingly central role in public policy. The findings from this analysis consistently point to the foundational role of collaboration, knowledge exchange, and ecosystem dynamics in the ongoing evolution of open innovation.

It is important to acknowledge the limitations of this study. By restricting our analysis to Scopus-indexed publications, we may have overlooked significant contributions from other databases or non-English language sources. While bibliometric methods effectively reveal structural patterns across the literature, they cannot convey the depth and nuance of individual qualitative studies. Additionally, our focus on formal academic publications may have excluded valuable insights from industry reports and grey literature that capture practical applications of open innovation.

Despite these limitations, this review provides a constructive foundation for future research. It suggests the need for greater theoretical diversity, more varied methodological approaches, and increased attention to previously overlooked contexts—particularly in emerging economies and non-Western settings. From a practical perspective, our results emphasize the importance of cultivating open organizational cultures, developing strategic partnerships with research institutions and startups, and leveraging digital technologies to strengthen innovation capabilities. Promising research directions include more thorough investigations of AI and blockchain applications in open innovation, examination of cultural and institutional factors affecting OI adoption in developing economies, and the use of interdisciplinary, longitudinal approaches to better understand OI's evolving role across different societal and geographic contexts.



In short, Open Innovation is now a well-established yet dynamic field. Its future trajectory depends on its ability to weave together digitalization, diversity, and sustainability, ensuring its continued relevance in a rapidly evolving technological and socio-economic landscape.

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