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Entrepreneurial Leadership and Intrapreneurial Behaviour in Digital Transformation: A Bibliometric Mapping and Conceptual Framework

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Abstract

This study offers a comprehensive bibliometric and conceptual synthesis exploring the evolving nexus between entrepreneurial leadership (EL) and intrapreneurial behaviour (IB) within the digital era. Utilizing a dataset of 273 Web of Science publications from 2001–2025, advanced bibliometric methods, including co-authorship, co-citation, and keyword co-occurrence analyses were applied to map intellectual structures and thematic trajectories. The findings reveal four dominant clusters: the EL–IB relationship, digital transformation drivers, psychological and behavioural mediators, and innovation-sustainability outcomes. Central mediators such as psychological empowerment, digital readiness, and organizational support emerge as critical mechanisms linking EL and IB. Building on these insights, the study proposes a novel integrative conceptual framework and a future research agenda that deepens theoretical understanding and offers actionable implications for scholars and practitioners seeking to foster intrapreneurship in digitally transforming organizations. This work advances entrepreneurial leadership theory by contextualizing it within contemporary technological disruption and organizational innovation dynamics.

Keywords: Entrepreneurial leadership; Intrapreneurial behaviour; Digital transformation; Innovation; Bibliometric analysis; Psychological empowerment.

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Introduction:

The contemporary business environment is undergoing unprecedented change due to the accelerating pace of digital transformation. Technologies such as artificial intelligence, big data analytics, cloud computing, and platform-based ecosystems are reshaping how firms operate and compete (Verhoef et al., 2021; Kraus et al., 2021). In this context, the ability of organizations to continuously innovate and adapt is not only a strategic option but an imperative for survival. Scholars have increasingly argued that such adaptability is rooted as much in leadership approaches and employee-driven innovation processes as in technological investments (Kraus et al., 2021; Nambisan et al., 2019).

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One leadership style that has gained traction in this regard is entrepreneurial leadership (EL). Entrepreneurial leaders are distinguished by their ability to combine vision, opportunity recognition, risk-taking, and the capacity to mobilize followers towards innovative goals (Gupta et al., 2004; Renko et al., 2015). Unlike transactional or transformational leadership, EL is explicitly

oriented toward fostering innovation and opportunity exploitation, enabling organizations to remain agile in turbulent environments (Leitch & Volery, 2017; Ravet-Brown et al., 2024). Parallel to this, intrapreneurial behaviour (IB); the entrepreneurial actions of employees within established organizations has long been recognized as a driver of organizational renewal and sustainable performance (Antoncic & Hisrich, 2003; Kuratko & Audretsch, 2013). IB involves risk-taking, proactive opportunity pursuit, and internal venture creation, linking individual initiative to firm-level innovation outcomes (Covin & Slevin, 1991; Zahra, 1996).

The intersection of EL and IB has become particularly salient in the digital era, where organizations increasingly depend on leaders who can create a climate that empowers employees to exploit digital affordances and champion innovative solutions (Osiyevskyy & Dewald, 2015). Emerging evidence suggests that EL plays a crucial role in enhancing employees' psychological empowerment, self-efficacy, and digital readiness, which in turn stimulate intrapreneurship (Bagheri, 2017; Newman et al., 2018). At the same time, organizational contexts shaped by sustainability imperatives, global competition, and technological disruption are reframing intrapreneurship as a pathway to not only competitive advantage but also societal value creation (Rauter et al., 2019).

Despite its growing importance, this research domain remains fragmented. Studies have examined EL and IB separately, while others have linked them in specific contexts such as small and medium-sized enterprises or technology-driven industries. However, the literature lacks a systematic synthesis of how the relationship between EL and IB has evolved, how digital transformation has redefined this relationship, and what mediating mechanisms and thematic clusters are emerging. Existing reviews of corporate entrepreneurship or digital leadership (e.g., Kraus et al., 2020) offer valuable insights but do not integrate EL, IB, and the digital context into a single knowledge framework. This gap constrains theoretical progress and limits practical understanding of how organizations can leverage leadership to foster intrapreneurship in digitally transforming environments.

To address this gap, this study undertakes a bibliometric analysis of publications on entrepreneurial leadership and intrapreneurial behaviour in the digital era. Bibliometric techniques provide a systematic and replicable approach to analyse large volumes of academic output, allowing the identification of publication trends, intellectual structures, and thematic developments (Donthu et al., 2021; Zupic & Čater, 2015). Specifically, this study applies performance analysis and science mapping methods including co-authorship, co-citation, keyword co-occurrence, and bibliographic coupling to map the evolution of this field and highlight its emerging trajectories.

Based on this approach, the study is guided by the following research questions (RQs):

- *RQ1:* How has research on entrepreneurial leadership and intrapreneurial behaviour evolved over time in terms of publication output and impact?
- *RQ2:* Who are the most influential authors, institutions, countries, and journals shaping this domain?
- *RQ3:* What are the dominant intellectual foundations and thematic clusters linking entrepreneurial leadership and intrapreneurial behaviour in the digital era?
- *RQ4:* What mediating factors and future research directions emerge from the bibliometric mapping?

By addressing these questions, this study makes three contributions. First, it provides the first bibliometric synthesis integrating EL, IB, and digital transformation, thereby offering a consolidated knowledge map. Second, it identifies key mediating mechanisms such as psychological empowerment, organizational support, and digital readiness, advancing theoretical understanding of how leadership fosters intrapreneurship. Third, it proposes a forward-looking research agenda that positions EL and IB as strategic levers for innovation and sustainability in digitally enabled organizations. Collectively, these contributions enrich academic discourse and provide actionable insights for practitioners navigating the complexities of the digital economy.

Literature Review

Entrepreneurial Leadership: Beyond Traditional Leadership Models

Entrepreneurial leadership (EL) has emerged as a distinctive construct within leadership research, characterized by opportunity recognition, vision creation, calculated risk-taking, and the ability to mobilize followers toward innovative goals (Gupta et al., 2004; Renko et al., 2015; Khoshnaw, 2024). Unlike transformational leadership, which emphasizes follower development, or transactional leadership, which centres on performance control, EL explicitly orients leaders toward driving innovation and organizational renewal (Leitch & Volery, 2017;). Empirical studies highlight its role in enhancing creativity, innovation work behaviour, and opportunity recognition, particularly in volatile and technology-intensive contexts (Bagheri, 2017; Newman et al., 2018; Adu, 2024).

This literature indicates that EL is not only a leadership style but a strategic mechanism enabling organizations to adapt to uncertain environments. Yet, the theoretical boundaries between EL and other leadership models remain under-explored, raising questions about how it uniquely shapes intrapreneurial outcomes (RQ3).

Intrapreneurial Behaviour: Linking Employee Initiative to Innovation

Intrapreneurial behaviour (IB) refers to entrepreneurial actions undertaken by employees within established organizations. It encompasses opportunity pursuit, risk-taking, internal venture creation, and innovation championing (Antoncic & Hisrich, 2003; Kuratko & Audretsch, 2013). IB is widely recognized as a driver of organizational renewal, competitiveness, and sustainable performance (Covin & Slevin, 1991; Zahra, 1996).
Research shows that IB is fostered in organizational contexts characterized by autonomy, resource access, and tolerance for failure (Spreitzer, 1995; Amabile & Pratt, 2016; Blomkvist et al., 2024). IB has also been theorized as the behavioural link through which leadership translates into firm-level innovation (Ling et al., 2008). However, while many studies underscore the role of leadership in fostering IB, there is limited consensus on which leadership approaches are most effective, and under what contextual conditions (Hyttinen, 2023; Andriamanantena et al., 2025). This gap highlights the need to map how EL and IB are linked conceptually and empirically across studies (RQ3, RQ4).

The Digital Era as a Transformative Context

The digital era introduces new dynamics that reshape both EL and IB. Digital transformation compels organizations to reconfigure strategies, structures, and innovation processes (Verhoef et al., 2021). Entrepreneurial leaders play a crucial role in mobilizing intrapreneurial behaviours that leverage digital technologies such as AI, big data, and Industry 4.0 solutions (Kraus et al., 2021).
At the same time, digital environments amplify challenges of uncertainty, complexity, and speed of change, requiring leaders to cultivate digital readiness and ambidexterity among employees

(Osiyevskyy & Dewald, 2015). Intrapreneurial behaviour itself is evolving, shifting from internally focused initiatives to more ecosystem-oriented forms of innovation, where employees engage in platform collaboration and digital ecosystems (Nambisan et al., 2019).

While case-based and conceptual studies have begun to highlight these dynamics, systematic evidence remains scarce. A bibliometric synthesis can reveal how digital transformation is shaping the EL–IB nexus, addressing RQ1 (evolution over time) and RQ3 (thematic clusters).

Mediating Mechanisms and Contextual Moderators

Several studies have identified psychological and organizational mechanisms that mediate the EL–IB relationship. These include psychological empowerment (Spreitzer, 1995), self-efficacy (Newman et al., 2018), intrinsic motivation, and organizational support (Amabile & Pratt, 2016). Such mechanisms explain how leadership behaviours translate into employee initiative, creativity, and intrapreneurial actions (Bagheri, 2017; Cao et al., 2025; Jewapatarakul et al., 2024). Contextual moderators such as industry digital intensity, firm size, and national culture further shape these dynamics (Ling et al., 2008; Kraus et al., 2021). However, the literature remains fragmented, with mediators and moderators often examined in isolation (Ataei et al., 2024; Bejjani et al., 2023). This fragmentation underscores the need for an integrated thematic mapping to identify which mechanisms are most frequently studied and which remain underexplored (RQ4).

The Case for a Bibliometric Synthesis

Although prior reviews exist on corporate entrepreneurship, digital leadership, and innovation (e.g., Kraus et al., 2020), none have systematically integrated entrepreneurial leadership, intrapreneurial behaviour, and the digital transformation context into a single framework. Traditional narrative reviews are limited in scope and may suffer from subjectivity, whereas bibliometric analysis offers an objective, large-scale, and reproducible synthesis (Donthu et al., 2021; Zupic & Čater, 2015).

By mapping the evolution of this literature, identifying influential contributors, and revealing thematic clusters, bibliometric analysis directly addresses the research questions guiding this study (RQ1–RQ4). Such an approach is timely, as it not only consolidates a fragmented domain but also establishes a forward-looking agenda for future empirical and theoretical work at the intersection of leadership, intrapreneurship, and digital transformation.

Methodology

Research Design

This study adopts a bibliometric approach to systematically analyse the intellectual, collaborative, and thematic structure of research on entrepreneurial leadership and intrapreneurial behaviour in the digital era. Bibliometric methods are increasingly recognized as rigorous tools for mapping scientific landscapes, identifying knowledge clusters, and tracing the evolution of research domains (Donthu et al., 2021; Zupic & Čater, 2015). Unlike narrative or systematic reviews, bibliometrics allows for an objective, quantitative synthesis of large volumes of academic literature, thereby offering a holistic overview of a fragmented and interdisciplinary field.

Data Source and Justification

The Web of Science (WoS) Core Collection was selected as the primary database for this analysis. WoS is widely considered a reliable and comprehensive database for bibliometric research due to its rigorous journal indexing policies,

structured metadata, and citation coverage across disciplines (Falagas et al., 2008). Moreover, WoS has been frequently used in bibliometric studies in the domains of entrepreneurship, leadership, and innovation, ensuring both comparability and reproducibility of results (Kraus et al., 2020).

Search Strategy and Query Formulation

To capture relevant literature, a structured keyword search was conducted, guided by prior research and keyword refinement. The search string combined three sets of terms:

TS = ("entrepreneurial leader*" OR "entrepreneurship leader*" OR ("entrepreneur*" "leadership") AND ("intrapreneur*" OR "intrapreneurial" OR "intra-preneur*" OR "corporate entrepreneur*" OR "employee entrepreneurship" OR "internal entrepreneurship" OR "corporate ventur*") AND ("digital era" OR "digital transformation" OR digitali* OR "digitalization" OR "Industry 4.0" OR "information technolog*" OR "technology adoption" OR "technology readiness" OR "ICT" OR "artificial intelligence" OR "big data" OR "platform economy" OR "digital platform*")
The final search was executed using the Topic Search (TS) field of WoS, which scans titles, abstracts, author keywords, and Keywords Plus.

Inclusion and Exclusion Criteria

The search process initially yielded 325 documents. To refine the dataset, a multi-step filtering strategy was applied:

Timespan filter:

Publications between 2001and 2025 were retained, reducing the dataset to 310 documents. The starting year was chosen because 2001 marked the first appearance of relevant publications in this domain.

Document type filter:

Only Articles, Review Articles, and Early Access papers were included, excluding editorial materials, book reviews, and conference proceedings. This reduced the dataset to 298 records.

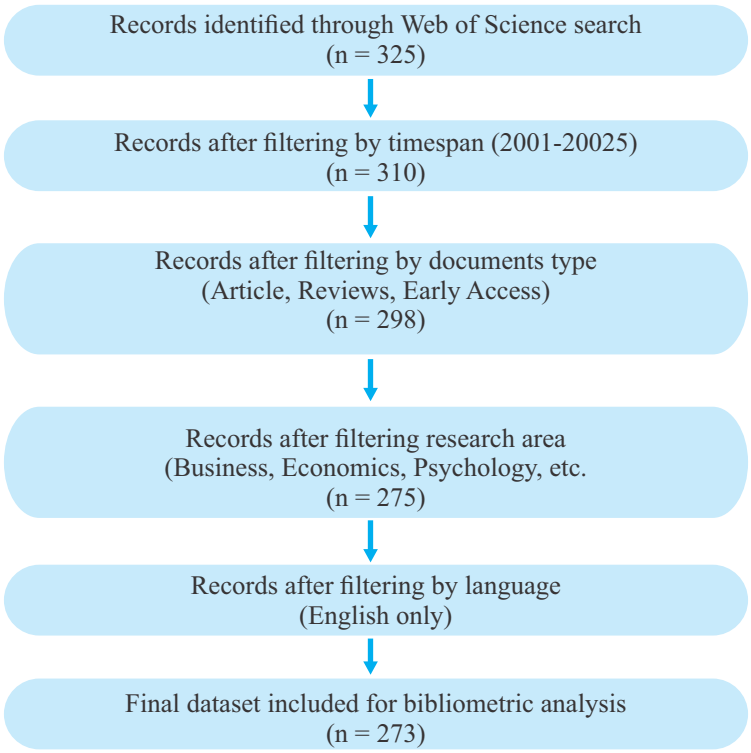
Research area filter:

To ensure relevance, only records classified under Business Economics, Environmental Sciences Ecology, Science Technology Other Topics, Psychology, Educational Research, Public Administration, Social Sciences Other Topics, Government Law, Engineering, Information Science, and Computer Science were retained. This step reduced the dataset to 275 documents.

Language filter:

Only English-language publications were included, yielding a final dataset of 273 documents. This staged refinement ensured that the dataset captured the core body of relevant scholarship while excluding peripheral or unrelated studies.

Figure 1: PRISMA flow diagram



The full records of the 273 documents including titles, abstracts, keywords, author affiliations, source titles, and cited references were exported in plain text format for analysis. To enhance data quality:

- Author names were standardized to account for variations (e.g., "Smith J." vs. "Smith, John").
- Institutional affiliations were harmonized to consolidate duplicates (e.g., "Univ. of London" vs. "University of London").
- Synonymous keywords (e.g., "digitalisation" vs. "digitalization") were merged into unified terms.
- Duplicate records across categories were manually checked and removed.

These steps ensured consistency and improved the validity of network visualizations and thematic analyses.

Analytical Tools and Techniques

The bibliometric analysis combined descriptive statistics and advanced network mapping:

Descriptive analysis:

Publication trends, citation counts, h-index, most productive authors, institutions, journals, and countries were assessed using Microsoft Excel.

Network analysis:

Co-authorship, institutional and country collaborations, co-citation analysis (authors, documents, journals), and bibliographic coupling were conducted using VOSviewer (Van Eck & Waltman, 2010).

Keyword co-occurrence analysis:

Performed to identify thematic clusters and

emerging research streams, highlighting mediating mechanisms and evolving domains of inquiry.

Visualization techniques:

Network maps, cluster visualizations, and temporal evolution overlays were generated to provide intuitive insights into structural and thematic patterns.

The combination of these techniques ensured both breadth and depth in capturing the intellectual and thematic contours of the field.

Methodological Rigor and Reproducibility

To enhance transparency, each filtering step, search query, and inclusion criterion was documented. The reliance on WoS and standardized bibliometric software ensures that the study is replicable by future scholars (Donthu et al., 2021). Furthermore, robustness checks were conducted by varying clustering resolutions in VOSviewer and re-validating keyword merging to ensure the stability of thematic interpretations.

Results and Discussion

This section presents the bibliometric results and interprets their implications for the scholarly understanding of entrepreneurial leadership and intrapreneurial behaviour in the digital era.

RQ1: Evolution of Research on EL and IB

The bibliometric performance analysis shows that research on entrepreneurial leadership (EL) and intrapreneurial behaviour (IB) has grown significantly over the past two decades. As illustrated in Figure 2, the number of publications increased gradually between 2001 and 2010, before accelerating rapidly after 2015, coinciding with the growing relevance of digital transformation in organizational research. The citation trajectory follows a similar pattern with a surge in attention toward the late 2010s, confirming that the field is moving from an emergent to a consolidating stage.

Figure 2. Annual publication trends (2001–2025)

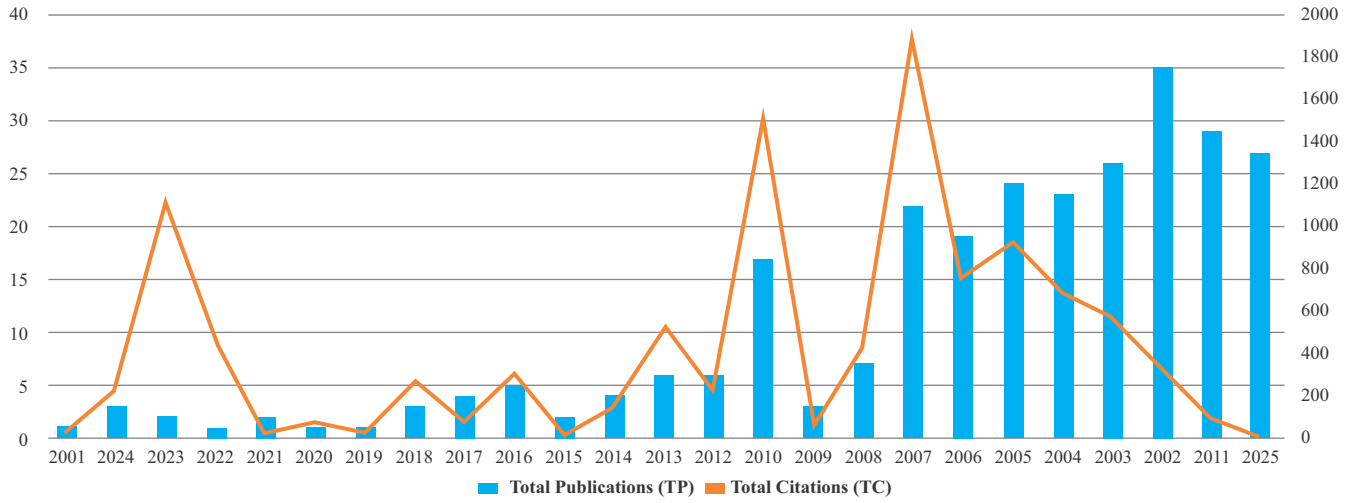


Table 1 further highlights that the years 2017–2023 account for the majority of high-impact publications, reinforcing the argument that EL and IB have become increasingly central in discussions of organizational adaptability and innovation. This aligns with broader scholarship suggesting that digital technologies have redefined leadership and intrapreneurship as critical enablers of resilience (Kraus et al., 2021; Verhoef et al., 2021).

Table 1: Evolution of published articles and citations from 2001–2025

Years	TP	TC	CPP	Authors	Journals	Countries	H-Index	% of 273
2001	1	15	15	1	1	1	1	0.366
2002	3	228	76	7	3	2	3	1.099
2003	2	1132	566	3	2	1	1	0.733
2004	1	458	458	3	1	1	1	0.366
2005	2	26	13	3	2	1	2	0.733
2006	1	74	74	2	1	1	1	0.366
2007	1	29	29	2	1	1	1	0.366
2008	3	276	92	8	3	2	3	1.099
2009	4	66	16.5	7	4	3	3	1.465
2010	5	298	59.6	12	5	4	5	1.832
2011	2	8	4	5	2	1	2	0.733
2012	4	147	36.75	9	4	4	4	1.465
2013	6	522	87	17	6	8	6	2.198
2014	6	222	37	13	6	7	5	2.198
2015	17	1537	90.41	53	10	14	14	6.227
2016	3	53	17.67	8	3	4	3	1.099
2017	7	422	60.29	12	5	7	7	2.564
2018	22	1904	86.55	70	22	16	16	8.059
2019	19	736	38.74	52	14	14	13	6.96
2020	24	924	38.5	73	19	16	16	8.791
2021	23	695	30.22	93	19	29	15	8.425
2022	26	566	21.77	77	20	16	14	9.524
2023	35	345	9.86	112	34	32	12	12.821
2024	29	94	3.24	105	23	25	5	10.623
2025	27	10	0.37	88	20	25	2	9.89

Note: TP – Total Publications; TC – Total Citations; CPP – Citations per Publication
Source: Authors' compilation from Web of Science

Interpretation:

The temporal evolution demonstrates that EL–IB scholarship is not a niche domain but an increasingly mainstream field shaped by the digital era.

RQ2: Influential Contributors, Institutions, Countries, and Journals

Turning to RQ2, the analysis identifies the leading contributors shaping this research domain. Table 2 reveals that Newman, Renko, and Bagheri are among the most prolific authors, each contributing significantly to the understanding of entrepreneurial leadership and its behavioural outcomes. Their works are also among the most cited, as shown in Table 3, underscoring their role in providing conceptual foundations.

Table 2. Most prolific authors in EL–IB research

Author	TP	TC	CPP	h-Index
Newman A	7	957	136.71	7
Bagheri A	5	275	55	5
Hoang G	5	131	26.2	4
Luu TT	5	131	26.2	4
Pu B	5	69	13.8	3
Yang J	5	77	15.4	4
Nguyen TT	4	128	32	4
Sahibzada UF	4	83	20.75	3
Yi LF	4	33	8.25	3
Akram U	3	116	38.67	3

Notes: TP = total publications; TC = total citations; CPP = citations per publication.
Source: Authors' compilation from Web of Science

Table 3. Most cited documents

		Journal	TC	Year
A model of strategic entrepreneurship: The construct and its dimensions	Ireland, RD; Hitt, MA; Sirmon, DG	Journal of Management	1397	2003
Entrepreneurial leadership: developing and measuring a cross-cultural construct	Gupta, V; MacMillan, IC; Surie, G	Journal of Business Venturing	566	2004
Innovation, Dynamic Capabilities, and Leadership	Schoemaker, Paul J. H.; Heaton, Sohvi; Teece, David	California Management Review	510	2018
Understanding and Measuring Entrepreneurial Leadership Style	Renko, Maija; El Tarabishy, Ayman; Carsrud, Alan L.; Braennback, Malin	Journal of Small Business Management	435	2015
Leadership for organizational adaptability: A theoretical synthesis and integrative framework	Uhl-Bien, Mary; Arena, Michael	Leadership Quarterly	433	2018
The effects of employees' creative self-efficacy on innovative behavior: The role of entrepreneurial leadership	Newman, Alexander; Tse, Herman H. M.; Schwarz, Gary; Nielsen, Ingrid	Journal of Business Research	329	2018
Crafting Business Architecture: The Antecedents of Business Model Design	Amit, Raphael; Zott, Christoph	Strategic Entrepreneurship Journal	290	2015
Disentangling the antecedents of ambidexterity: Exploration and exploitation	Koryak, Oksana; Lockett, Andy; Hayton, James; Nicolaou, Nicos; Mole, Kevin	Research Policy	245	2018

Leadership, creativity and innovation: a meta-analytic review	Lee, Allan; Legood, Alison; Hughes, David; Tian, Amy Wei; Newman, Alexander; Knight, Caroline	European Journal of Work and Organizational Psychology	238	2020
Entrepreneurial leadership: Insights and directions	Leitch, Claire M.; Volery, Thierry	International Small Business Journal-Researching Entrepreneurship	216	2017

Notes: TC = total citations
Source: Authors' compilation from Web of Science

At the institutional level (Table 4), universities in the United States and Europe dominate, reflecting the Western-centric origins of this literature. Yet, as Figure 3 demonstrates, institutional collaboration networks are becoming increasingly international, with emerging contributions from Asia, particularly China and India. This trend mirrors the global diffusion of digital entrepreneurship practices.

Table 4. Most productive institutions

Institutions	TP	TC	CPP	h-Index	% of 273
Deakin University	9	1008	112	9	3.297
University of London	8	606	75.75	7	2.93
Monash University	7	785	112.14	7	2.564
Royal Melbourne Institute of Technology Rmit	7	89	12.71	4	2.564
State University System of Florida	7	95	13.57	4	2.564
Swinburne University of Technology	7	234	33.43	6	2.564
Comsats University Islamabad Cui	6	142	23.67	4	2.198
Babson College	5	91	18.2	3	1.832
Jiangsu University	5	161	32.2	5	1.832
Sichuan Agricultural University	5	69	13.8	3	1.832

Notes: TP = total publications; TC = total citations; CPP = citations per publication.
Source: Authors' compilation from Web of Science

Figure 3: Institutional collaboration network

Table 5 highlights that journals such as the *Journal of Business Venturing*, *International Journal of Entrepreneurial Behavior & Research*, and *Journal of Small Business Management* serve as central publication platforms. Their prominence is further reinforced by the journal co-citation network (see **Figure 9** in RQ3), which illustrates how these outlets anchor the discourse.

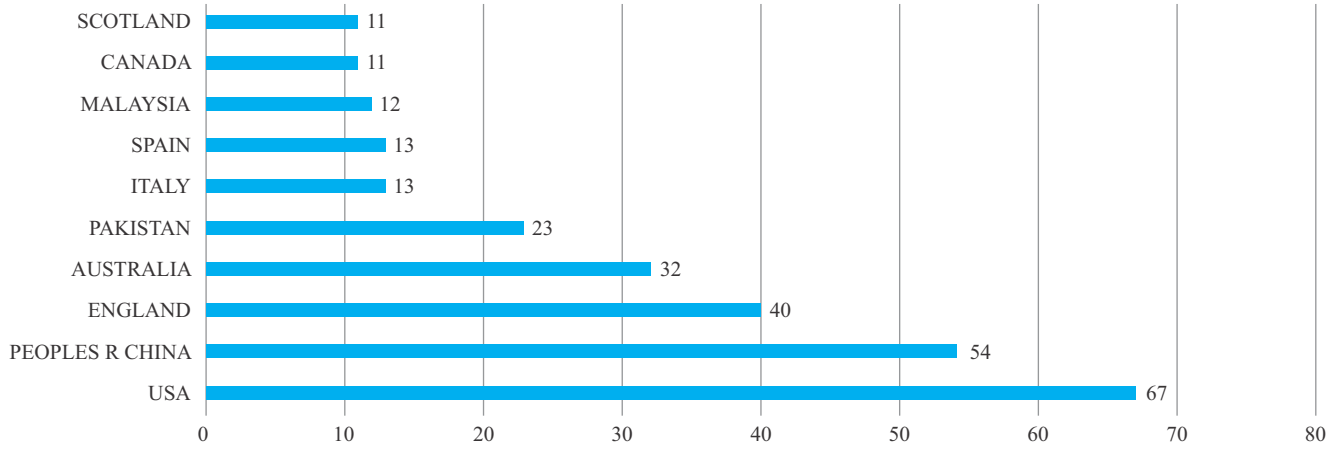
Table 5. Core journals publishing EL–IB studies

Institutions	TP	TC	CPP	h-Index	% of 273
Journal Name	TP	TC	CPP	H-Index	% of 273
Sustainability	21	313	14.9	10	7.692
Journal of Small Business Management	15	1201	80.07	14	5.495
Frontiers in Psychology	8	73	9.13	5	2.93
European Journal of Innovation Management	7	236	33.71	5	2.564
Journal of Business Research	7	562	80.29	6	2.564
International Small Business Journal Researching Entrepreneurship	6	417	69.5	6	2.198
Business Horizons	4	49	12.25	3	1.465
International Journal of Management Education	4	64	16	4	1.465
Journal of Innovation Knowledge	4	74	18.5	2	1.465
Journal of Management Studies	4	273	68.25	4	1.465

Notes: TP = total publications; TC = total citations; CPP = citations per publication.
Source: Authors' compilation from Web of Science

Country-level analysis (Figure 5) shows the United States as the leading contributor, followed by the UK, China, and India. Figure 6 further reveals a fragmented but expanding pattern of international collaboration, where strong intra-regional clusters dominate but cross-regional partnerships are limited.

Figure 5. Country-level distribution of publications.



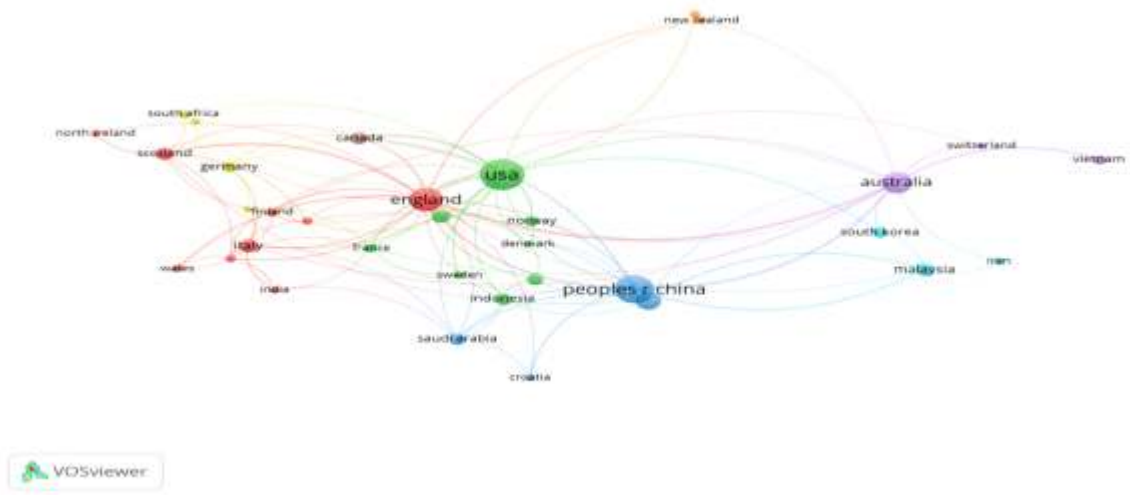


Figure 6: Country-level collaboration network

Interpretation:

While Western scholars and institutions have historically shaped the field, the rise of Asian contributions suggests a more pluralistic and globally relevant research community is emerging.

4.3 RQ3: Intellectual Foundations and Thematic Clusters

RQ3 examines the intellectual structure and thematic clusters of the field. The author co-citation network (Figure 7) highlights the centrality of Gupta, Renko, and Antoncic, whose foundational works established the conceptual linkage between leadership, intrapreneurship, and innovation. Complementarily, the document-level co-citation map (Figure 8) identifies seminal studies such as Gupta et al. (2004), Renko et al. (2015), and Antoncic & Hisrich (2003) as intellectual anchors.

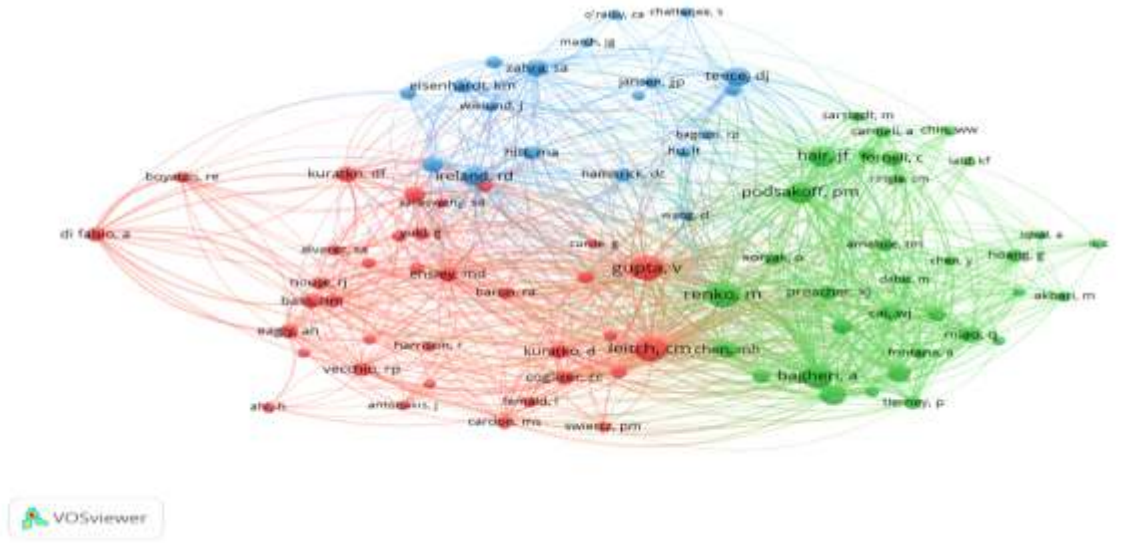


Figure 7: Author co-citation network

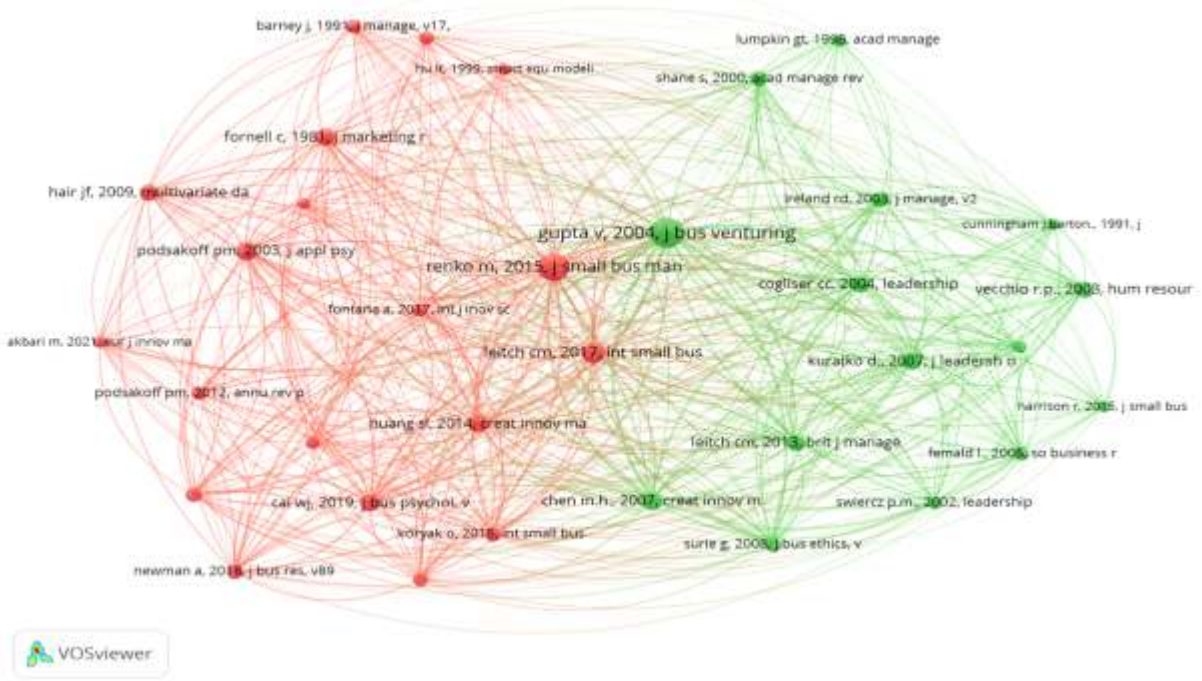


Figure 8: Document-level co-citation network

The journal co-citation map (Figure 9) illustrates the interdisciplinary nature of the domain, connecting entrepreneurship and management outlets with psychology and innovation journals, reflecting the cross-disciplinary interest in EL and IB.

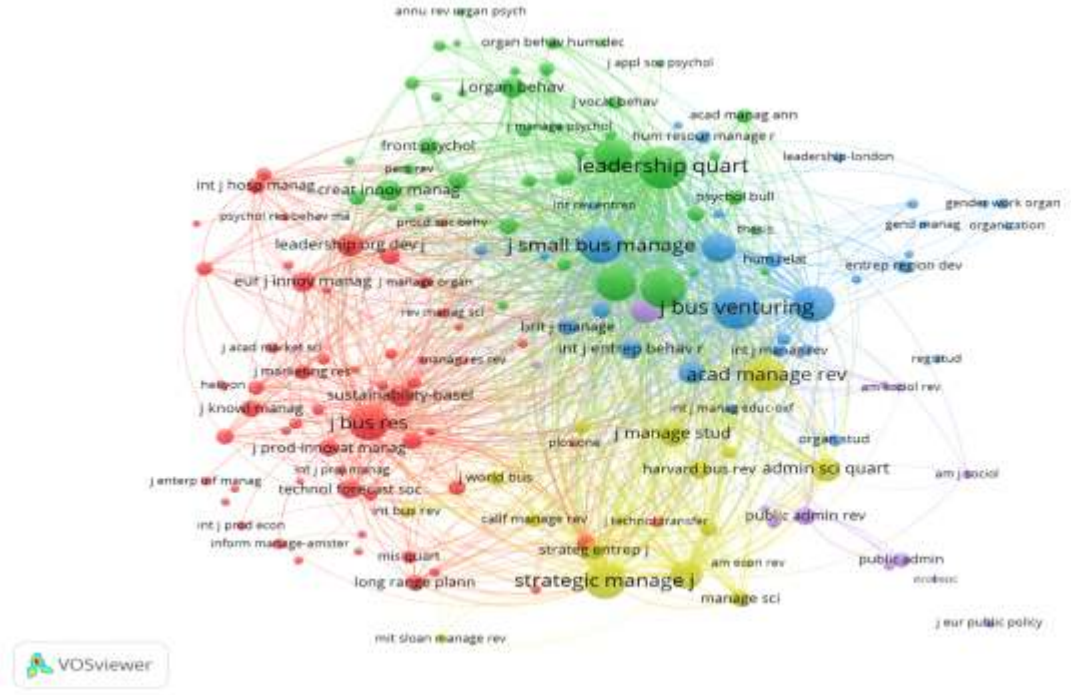


Figure 9. Journal co-citation network

The keyword co-occurrence network (Figure 10) provides a powerful lens to uncover the conceptual structure of scholarship on entrepreneurial leadership and intrapreneurial behaviour in the digital era. By mapping the most frequently co-occurring author keywords and indexed terms, four dominant clusters emerge, each representing a thematic stream that anchors or extends the discourse. These clusters not only reflect the intellectual diversity of the field but also reveal how digital transformation has reconfigured research trajectories in recent years.

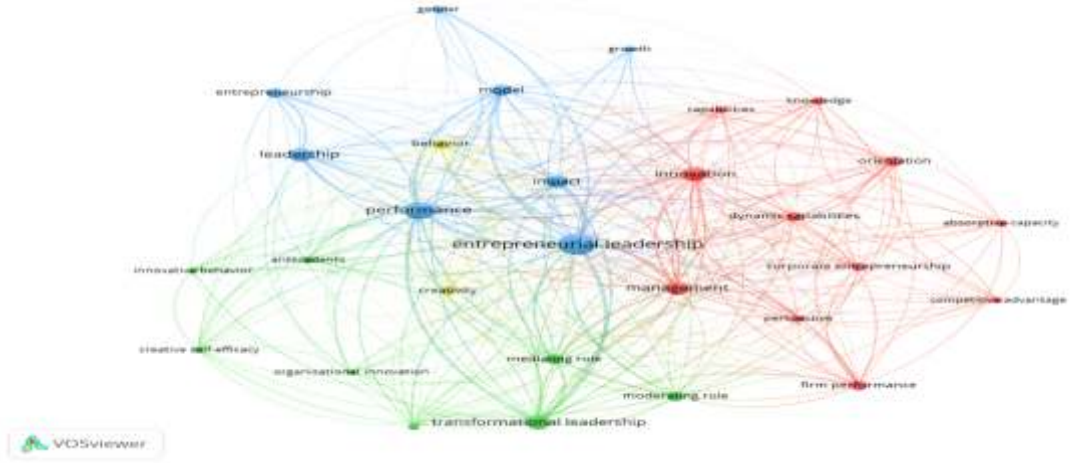


Figure 10: Keyword co-occurrence network

Cluster 1: Entrepreneurial Leadership and Intrapreneurship (The Core Nexus)

The first cluster represents the conceptual heart of the field, with keywords such as *entrepreneurial leadership*, *intrapreneurship*, *corporate entrepreneurship*, and *employee-driven innovation*. This stream is anchored in the recognition that entrepreneurial leadership (EL) is distinct from traditional leadership forms because it emphasizes vision, opportunity recognition, risk tolerance, and the fostering of innovation among employees (Gupta et al., 2004; Renko et al., 2015). In parallel, intrapreneurship has long been recognized as a critical mechanism for firms to sustain competitive advantage by leveraging employees' innovative potential within organizational boundaries (Antoncic & Hisrich, 2003; Kuratko & Audretsch, 2013). The co-occurrence of these terms suggests that scholars increasingly view entrepreneurial leadership as a catalyst for intrapreneurial behaviour, shaping employees' willingness to initiate, champion, and implement new ideas.

Cluster 2: Digital Transformation and Technology Adoption

A second cluster highlights the digital context in which EL–IB relationships are embedded, with prominent keywords including *digital transformation*, *Industry 4.0*, *technology adoption*, *ICT*, and *digital platforms*. The growing centrality of this cluster reflects a paradigm shift: organizations today rely on entrepreneurial leaders not only to encourage innovation but also to navigate the disruptive pressures of digitalization (Verhoef et al., 2021; Kraus et al., 2021).

Here, entrepreneurial leadership is increasingly conceptualized as an enabler of organizational ambidexterity in digital environments balancing exploration of novel digital opportunities with the exploitation of existing capabilities (Osiyevskyy & Dewald, 2015). Moreover, the presence of terms like *big data*, *artificial intelligence*, and *platform economy* indicates that intrapreneurial activity is being reframed around digital affordances, where employees leverage emerging technologies to

create new value propositions inside firms.

Cluster 3: Psychological and Behavioural Mediators

The third cluster emphasizes the individual-level mechanisms that connect entrepreneurial leadership to intrapreneurial outcomes. Keywords such as *motivation*, *psychological empowerment*, *organizational support*, *creativity*, and *employee engagement* dominate this space. This cluster resonates strongly with established leadership theories, including transformational and authentic leadership, which highlight the role of psychological empowerment in motivating extra-role behaviours (Thomas & Velthouse, 1990; Spreitzer, 1995).

Within this domain, entrepreneurial leadership is theorized to enhance employees' intrinsic motivation and self-efficacy, thereby fostering a sense of ownership and risk-taking conducive to intrapreneurship (Bagheri, 2017; Newman et al., 2018). The co-occurrence of *organizational support* with psychological constructs underscores the importance of contextual enablers when leaders create a climate of trust, autonomy, and tolerance for failure, employees are more likely to engage in innovative and entrepreneurial behaviour (Amabile & Pratt, 2016).

Cluster 4: Performance, Innovation, and Sustainability Outcomes

The final cluster centres on *performance*, *innovation*, *sustainability*, and *competitive advantage*. This reflects the outcome-oriented orientation of the field, where intrapreneurship is studied not as an end in itself but as a pathway to superior organizational outcomes. Scholars increasingly frame entrepreneurial leadership and intrapreneurial behaviour as strategic levers for achieving innovation performance, sustainable competitiveness, and long-term resilience(Covin & Slevin, 1991; Zahra, 1996).

Interestingly, the co-occurrence of *sustainability* alongside *innovation performance* suggests a more recent turn in the literature: organizations are leveraging intrapreneurship not only to generate economic returns but also to advance sustainability goals (Rauter et al., 2019). This aligns with the rise of sustainability-oriented entrepreneurship and the embedding of environmental and social dimensions into digital innovation processes.

Interpretive Synthesis of Keyword Clusters

The four clusters collectively highlight that the field is conceptually multidimensional. Entrepreneurial leadership forms the theoretical anchor, intrapreneurship provides the behavioural expression, digital transformation sets the contextual stage, and psychological/organizational factors explain the mechanisms through which leadership translates into outcomes. Finally, performance and sustainability represent the ultimate objectives, framing intrapreneurship as a means for firms to remain agile, innovative, and socially responsible in the digital era.

This structure suggests that future research should focus more systematically on linking clusters together, for instance, examining how digital transformation (Cluster 2) moderates the EL–IB link (Cluster 1), mediated through psychological mechanisms (Cluster 3), to drive innovation and sustainability outcomes (Cluster 4). Such integrative approaches would significantly enrich both theory and practice in this emergent field.

Bibliographic coupling of documents and journals (Figures 11–12) confirms these clusters, with recent work clustering around digital transformation and sustainability themes.

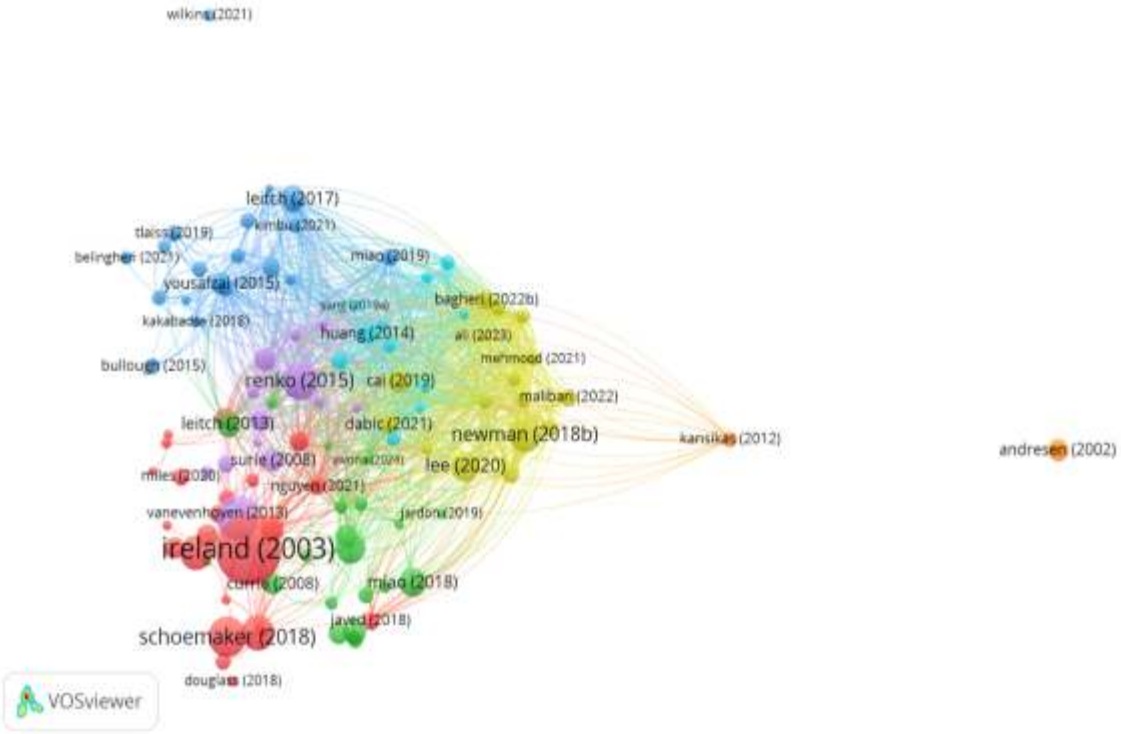


Figure 11. Document-level bibliographic coupling

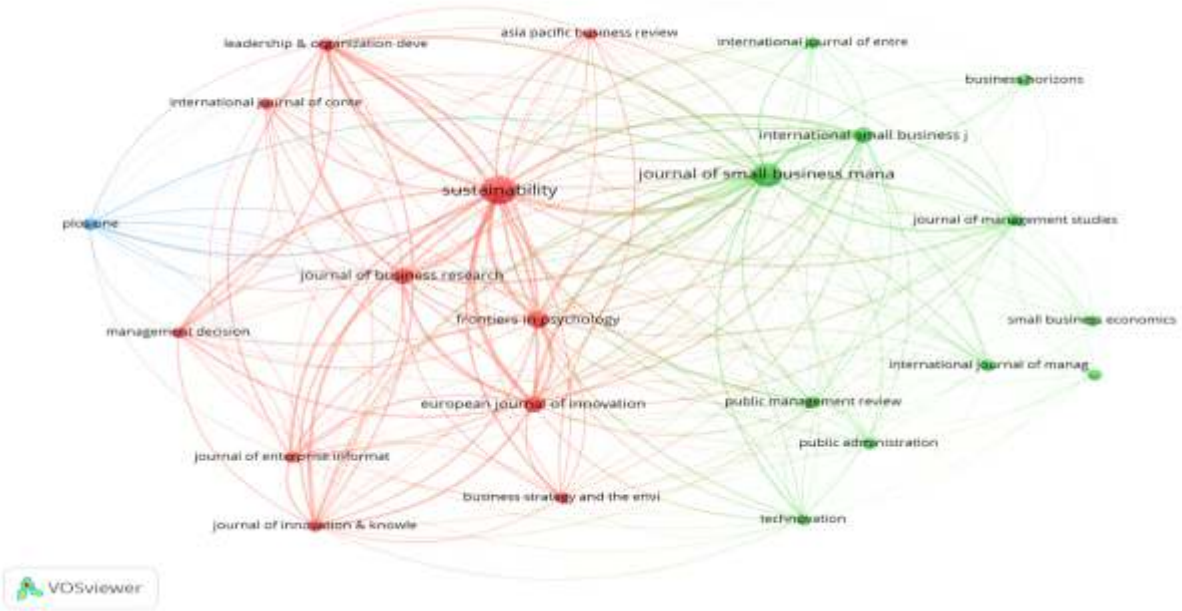


Figure 12. Journal-level bibliographic coupling

Interpretation:

The field is built on strong theoretical foundations but has diversified into multiple research streams. The bibliometric mapping clarifies how distinct perspectives converge, providing a roadmap for future integrative research.

RQ4: Mediating Factors and Future Research Directions

Finally, RQ4 focuses on mediating mechanisms and future research avenues. A re-examination of the keyword co-occurrence map (Figure 10) highlights empowerment, self-efficacy, and organizational support as the most prominent mediators through which EL influences IB. These mechanisms are consistent with prior evidence that entrepreneurial leaders shape employee initiative by fostering confidence, autonomy, and a supportive climate (Bagheri, 2017; Newman et al., 2018).

Figure 10 synthesizes these mediators and moderators, showing that while psychological and organizational enablers are well-established, digital literacy, technology capabilities, and sustainability-oriented intrapreneurship remain underexplored. Contextual moderators such as cultural values and industry digital intensity also appear sporadically, suggesting the need for comparative, cross-cultural analyses.

Emerging directions include examining digital capabilities as mediators, exploring multi-level dynamics (individual–team–organizational), and assessing the role of EL-driven intrapreneurship in advancing sustainability and societal value creation.

Interpretation:

The field has identified core mediators but remains fragmented in addressing digital- and sustainability-related mechanisms, leaving ample scope for future theorization and empirical work.

Integrated Discussion

Taken together, the answers to RQ1–RQ4 demonstrate that EL–IB scholarship has grown rapidly, is shaped by influential contributors, and is anchored in four thematic clusters spanning leadership, intrapreneurship, digital transformation, and sustainability. Mediating mechanisms such as empowerment and digital readiness connect leadership behaviours to intrapreneurial outcomes, but gaps remain in exploring multi-level and cross-cultural dynamics.

Overall Insight:

Entrepreneurial leadership emerges as a strategic enabler of intrapreneurship in digitally transforming organizations, with growing relevance for both theory and practice.

Conclusion and Implications

Conclusion

This study set out to systematically map the intellectual and thematic landscape of research on entrepreneurial leadership (EL) and intrapreneurial behaviour (IB) in the digital era. Through a bibliometric analysis of 273 publications indexed in the Web of Science Core Collection (2001–2025), the study addressed four guiding research questions. The results demonstrate that the field has grown significantly in output and impact since 2015 (RQ1), is shaped by a relatively small group of influential scholars, institutions, and journals while becoming increasingly global (RQ2), and is anchored in four major thematic clusters integrating leadership, intrapreneurship, digital transformation, and sustainability (RQ3). Furthermore, the analysis identified psychological empowerment, self-efficacy, and organizational

support as central mediating mechanisms, while pointing to emerging but underexplored areas such as digital literacy, technology capabilities, and sustainability-oriented intrapreneurship (RQ4).

By synthesizing these insights, the study contributes a consolidated knowledge map of the EL–IB nexus, clarifies its intellectual foundations, and highlights opportunities for future research. Entrepreneurial leadership emerges not only as a leadership style but as a strategic enabler of intrapreneurship in digitally transforming organizations, reinforcing its role in driving resilience, innovation, and long-term competitiveness.

Theoretical Implications

The study advances theory in several ways. First, it positions EL as a distinct and integrative construct that links leadership studies with intrapreneurship and digital transformation, thus extending leadership theory beyond traditional transformational or transactional paradigms. Second, the identification of mediating mechanisms highlights the need for multi-level theoretical models that connect leader behaviour, employee cognition, and organizational context. Third, the thematic mapping underscores the potential for integrating digital transformation theory, dynamic capabilities, and sustainability perspectives into future EL–IB research. This provides a foundation for building holistic frameworks that capture the complexity of entrepreneurial leadership in contemporary organizations.

Practical Implications

For practitioners, the findings offer actionable insights. Entrepreneurial leaders play a critical role in creating environments where employees are empowered and motivated to engage in intrapreneurship. Organizations should therefore:

- Foster psychological empowerment by granting autonomy and encouraging initiative-taking.
- Invest in digital readiness by equipping employees with digital skills and tools that enable innovative behaviour.
- Strengthen organizational support systems through resource allocation, recognition, and tolerance for risk-taking.

Furthermore, organizations seeking resilience in the digital economy should cultivate leadership that embraces agility, cross-functional collaboration, and ecosystem engagement. These practices not only enhance intrapreneurship but also contribute to sustainable innovation and long-term competitiveness.

Limitations and

This study is not without limitations. The analysis relied exclusively on the Web of Science database, which, while rigorous, may exclude relevant work indexed in Scopus or other repositories. The use of citation-based techniques, although objective, may privilege established works over emerging contributions.

Future Research Agenda

Future research could address these limitations by adopting multi-database approaches, conducting longitudinal analyses to track thematic shifts, and employing mixed bibliometric–qualitative reviews for deeper insights. Empirically, future studies should test the mediating and moderating mechanisms identified here, explore cross-cultural variations in the EL–IB relationship, and examine the role of intrapreneurship in advancing digital sustainability. By pursuing these avenues, scholars can strengthen the theoretical integration of leadership, intrapreneurship, and digital

transformation, while offering evidence-based recommendations for practice.

Contributions to Knowledge and Practice

This study makes several distinctive contributions to both academic scholarship and managerial practice:

Contributions to Knowledge

First bibliometric synthesis of EL–IB in the digital era:

While prior reviews have separately examined entrepreneurial leadership, intrapreneurship, or digital leadership, this study is the first to integrate all three domains into a unified bibliometric mapping, providing a consolidated knowledge base.

Identification of intellectual foundations and thematic clusters:

Through co-citation and keyword analyses, the study uncovers four dominant clusters—(i) EL–IB nexus, (ii) digital transformation and technology adoption, (iii) psychological and behavioural mediators, and (iv) innovation, performance, and sustainability outcomes—clarifying the conceptual evolution of the field.

Theorization of mediating mechanisms:

The findings highlight psychological empowerment, self-efficacy, and organizational support as core mediators of the EL–IB relationship, while also identifying digital readiness and sustainability orientation as emerging yet underexplored themes.

Advancing theoretical integration:

By linking leadership, intrapreneurship, and digital transformation, the study extends traditional leadership theory and provides a foundation for multi-level, cross-disciplinary frameworks that better capture the realities of innovation in digital contexts.

Contributions to Practice

Guidance for entrepreneurial leaders:

The study emphasizes the role of entrepreneurial leaders in fostering intrapreneurship by empowering employees, encouraging risk-taking, and supporting opportunity recognition, especially in digital environments.

Digital readiness as a strategic lever:

Organizations are encouraged to invest in digital skills, technologies, and culture, enabling employees to translate leadership vision into intrapreneurial action.

Organizational support mechanisms:

Firms should establish structures that provide resources, recognition, and psychological safety, thereby sustaining intrapreneurship and innovation.

Sustainability and long-term competitiveness:

Entrepreneurial leadership should be leveraged not only to drive digital innovation but also to align intrapreneurship with sustainable business models, ensuring resilience and value creation in dynamic markets.

Graphical and Conceptual Contribution Models

To visually consolidate the study's insights, two complementary representations are provided: a Graphical Contribution Framework and a Conceptual Contribution Model.

The Graphical Contribution Framework (Figure 13) integrates the findings from the bibliometric analysis. Entrepreneurial leadership (EL) is positioned as the starting point, mediating mechanisms such as psychological empowerment, self-efficacy, organizational support, and digital readiness are placed at the centre, and intrapreneurial behaviour (IB) is shown as the outcome. This framework also incorporates the four thematic clusters identified in the study -(i) EL–IB nexus, (ii) digital transformation and technology adoption, (iii) psychological and behavioural mediators, and (iv) innovation and sustainability outcomes—highlighting the intellectual structure and emerging research streams. The framework underscores the study's contribution in mapping the field, integrating fragmented scholarship, and identifying new directions for inquiry.

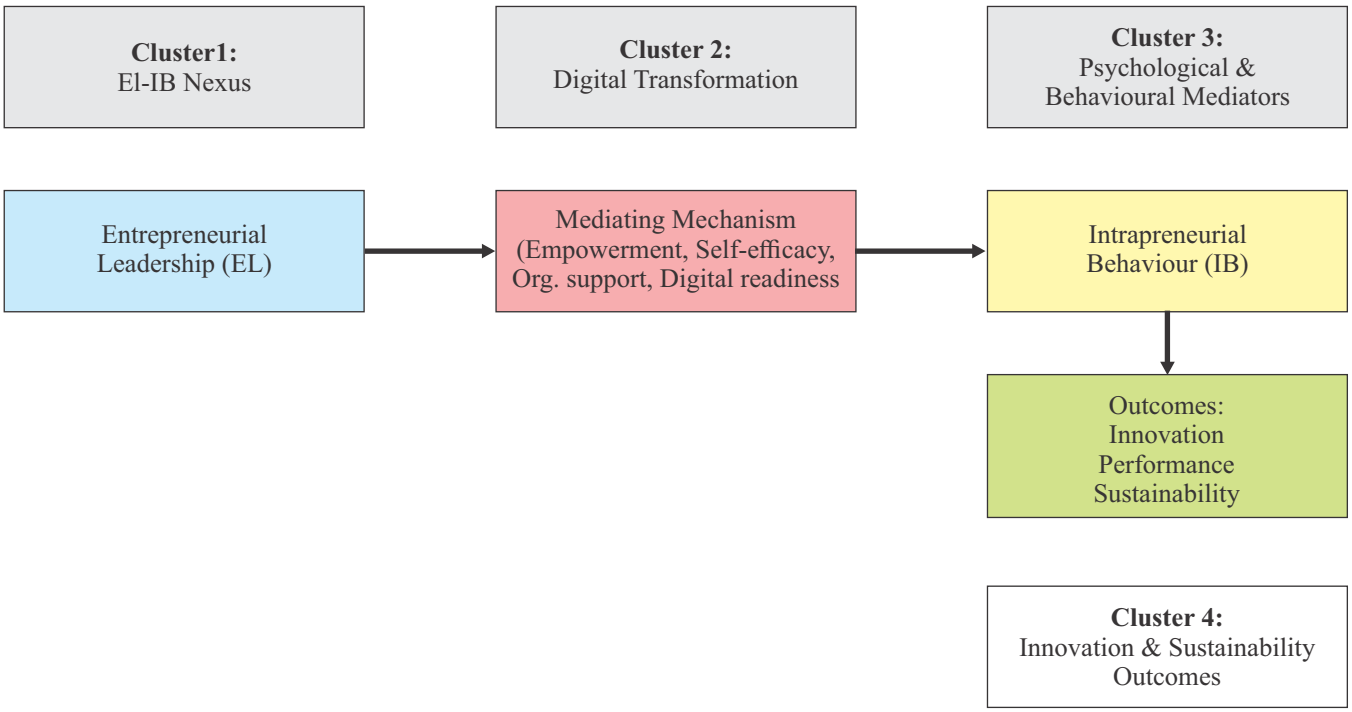


Figure 13. Graphical Contribution Framework of entrepreneurial leadership and intrapreneurial behaviour in the digital era, illustrating mediating mechanisms, outcomes, and thematic clusters

The Conceptual Contribution Model (Figure 14) provides a cleaner, theory-building perspective. It presents a parsimonious pathway where entrepreneurial leadership fosters intrapreneurial behaviour through key mediating mechanisms, ultimately leading to outcomes such as innovation, performance, and sustainability. Unlike the broader framework, this model emphasizes the causal logic and theoretical contribution of the study, showing how leadership behaviours can be systematically linked to intrapreneurship and organizational outcomes in digitally transforming contexts. This conceptual representation can guide future empirical studies in testing mediating and moderating mechanisms, while also serving as a foundation for developing integrated models of leadership and intrapreneurship.

Figure 14. Conceptual Contribution Model of the entrepreneurial leadership–intrapreneurial behaviour relationship in the digital era, highlighting mediators and outcomes

Together, these two visuals provide complementary value: the framework situates the study within the bibliometric mapping of research trends and clusters, while the model sharpens its theoretical contribution by distilling the key causal relationships.

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