The state of the art of innovation management: insights from a retrospective review of the *European Journal of Innovation Management*

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Abstract

Purpose – Innovation goes beyond creation, concentrating on enhancement, which is essential for advancement. Since 1998, the *European Journal of Innovation Management* (*EJIM*) has been a leading forum dedicated to thought leadership and research on the advances in innovation management. Given that *EJIM* has run over two decades, the time is now opportune to reflect on the journal's contributions to innovation management. Thus, this paper aims to retrospectively review the productivity, impact and knowledge of innovation management research in *EJIM*.

Design/methodology/approach – This paper adopts a bibliometric methodology to engage in a retrospective review of *EJIM*. The bibliographic data of 757 papers published in *EJIM* from 1998 to 2021 were retrieved from Scopus and analyzed using performance analysis and science mapping techniques.

Findings – The productivity (publication) and impact (citation) of innovation management research curated by *EJIM* have grown prolifically over time. Though *EJIM* operates with a European title, the journal receives and publishes contributions worldwide (e.g. Asia, Europe, North America, South America and Oceania). Noteworthily, the knowledge of innovation management research in *EJIM* can be divided into four categories: basic themes (general), which comprise innovation, open innovation, new product development and product and process innovation; motor themes (well-developed), which consist of organizational culture and innovation and leadership and creativity; niche themes (very specialized), which include dynamic capabilities and business model innovation; and emerging or declining themes (weakly developed or marginalized), which is made up of research and development (R&D) and green innovation.

Originality/value – This paper offers a seminal retrospection of *EJIM* and the journal's productivity, impact and contribution to innovation management.

Keywords Bibliometric analysis, Bibliometric review, Business model innovation, Creativity, Dynamic capabilities, Green innovation, Innovation, Leadership, New product development, Process innovation, Product

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Paper type Research paper

1. Introduction

Innovation has a profound presence in both academia (Kamboj *et al.*, 2022; Kirjavainen *et al.*, 2022; Lacan, 2021; Nambisan *et al.*, 2017; Parra-Requena *et al.*, 2022; Rahman *et al.*, 2022) and the industry (e.g. Amazon, Facebook, Incyte, Netflix, Salesforce, ServiceNow, Tesla, Unilever and Workday) [1]. The proliferation of innovation can be attributed to its significance for individuals (e.g. fulfilling needs through innovative products and services), organizations (e.g. forging competitiveness through innovative product, process, services and business models) and nations (e.g. solving grand and complex challenges such as planetary health and sustainable development goals) (Ciasullo *et al.*, 2022; Lim, 2019, 2022a, 2022b).

Innovation research has never been confined to any single discipline, signaling the relevance of innovation across disciplines—for example, agriculture and food science (Grimsby, 2021), business management (Teece, 2010; Urbinati *et al.*, 2022a, b), environmental science (Kashan *et al.*, 2022) and healthcare (Lehoux *et al.*, 2021), among others. The diversity of the innovation literature may be attributed to the nature of innovation itself as a complex, multidimensional phenomenon (Wolfe, 1994).

The management of innovation is as important as the development of the innovation itself. With innovation management, an innovation will have a greater chance of fulfilling its promise; left unmanaged, the potential of that innovation may not be realized. Recognizing the importance of innovation management, the academic community has actively engaged and published innovation management research in a plethora of journals dedicated to innovation management, such as *European Journal of Innovation Management* (*EJIM*), *Journal of Innovation and Knowledge* (*JIK*), *Journal of Product Innovation Management* (*JPIM*) and *Technovation*.

EJIM is a leading forum for advances in innovation management. The journal has a multi-decade history of publishing original, pragmatist and rigorous research on innovation management, ranging from product, service, and process innovation to market, organization and social innovation across individuals, teams, organizations, industries, nations and regions using a variety of tangible and intangible resources, tools and strategies. Examples of noteworthy innovation management research published by *EJIM* include the challenges of innovation (Cumming, 1998), data driven orientation in innovative start-ups (Visvizi *et al.*, 2022), firm capability, open innovation and firm performance (Pundziene *et al.*, 2021), green innovation (Oduro *et al.*, 2022), implementation of open innovation for citizen science (Ciasullo *et al.*, 2022) and radical innovation (Urbinati *et al.*, 2022a, b), individual and team based idea generation for innovation (McAdam and McClelland, 2002), innovative employee behavior (Bysted, 2013; Khaola and Coldwell, 2018), organizational creativity climate and innovation (Lin and Liu, 2012), product innovation (Alegre *et al.*, 2006) and sustainable innovation (Román *et al.*, 2022), among others.

Since its inception in 1998, *EJIM* has grown both in terms of quantity and quality. *EJIM* started off with three issues annually in 1998, growing to four issues annually in 2000 and five issues annually in 2019. The journal has published more than 700 articles in the last 25 years, making a significant impact in the scientific community, as seen through impact metrics such as Clarivate Analytics Web of Science Impact Factor (4.750 in 2021) and Scopus CiteScore (7.5 in 2021) and rankings such as Scimago Journal Rank (Q1 in 2021).

In conjunction with *EJIM*'s silver jubilee (25-year run), this paper aims to retrospectively review the productivity, impact, and knowledge of innovation management research in *EJIM*. Retrospective reviews of journals are a valuable resource that enable editors, editorial board

members, published and potential authors, readers and reviewers to gain a state-of-the-art understanding of the journal's evolution, contributors and contributions—as seen through the recent retrospective reviews of *Business Strategy and the Environment* (Kumar *et al.*, 2021b), *Career Development International* (Varma *et al.*, 2022a), *Contemporary Accounting Research* (Baker *et al.*, 2022), *Economic Modeling* (Pattnaik *et al.*, 2022), *Electronic Commerce Research* (Kumar *et al.*, 2021a), *European Journal of International Management* (Kumar *et al.*, 2022b), *International Journal of Bank Marketing* (Kumar *et al.*, 2021c), *Journal of Advertising* (Donthu *et al.*, 2022b), *Journal of Advertising Research* (Donthu *et al.*, 2022a), *Journal of Business Research* (Donthu *et al.*, 2020), *Journal of Behavioral and Experimental Economics* (Kumar *et al.*, 2022a), *Journal of International Marketing* (Donthu *et al.*, 2021), *Journal of Research in Interactive Marketing* (Lim *et al.*, 2022b), *Management International Review* (Mukherjee *et al.*, 2021), *Personnel Review* (Varma *et al.*, 2022), *Social Indicators Research* (Kumar *et al.*, 2021d) and *The Service Industries Journal* (Viglia *et al.*, 2022), among others.

To provide a retrospective review of *EJIM*, this paper adopts a bibliometric methodology. In essence, a bibliometric methodology enables independent systematic reviews of the literature, such as the present one, to acquire and analyze a large corpus of papers in an automated, objective, and seamless way, which would otherwise be challenging if done manually (Lim *et al.*, 2022a). Noteworthily, bibliometric analytical techniques such as performance analysis and science mapping rely on quantitative statistical methods to evaluate the performance and map the content of scientific literature (Donthu *et al.*, 2021). The resulting outcomes of reviews using a bibliometric methodology are rich (Bamel *et al.*, 2022; Lim *et al.*, 2022b) and valuable for advancing theory (e.g. establishing nomological networks) and practice (e.g. objective evaluation of productivity and impact) (Mukherjee *et al.*, 2022).

In line with the convention of retrospective reviews using a bibliometric methodology, this paper will provide answers to the following research questions (RQs):

RQ1. What are the publication and citation trends of innovation management research in *EJIM*?

RQ2. Who are the most prolific and impactful contributors (authors, institutions and countries) of innovation management research in *EJIM*?

RQ3. What are major themes and topics of innovation management research in *EJIM* and how have they evolved over time?

From a theoretical perspective, this paper contributes to establishing the nomological network (Mukherjee *et al.*, 2022) of innovation management research in *EJIM*. Noteworthily, this paper unpacks the major themes characterizing innovation management research in *EJIM*, revealing the categories of themes (i.e. basic, motor, niche, emerging or declining themes) and the historical trajectory of topical evolution (1998–2021) in the journal.

From a practical perspective, this paper contributes to an objective evaluation of the productivity and impact of the contributors and contributions (Mukherjee *et al.*, 2022) of innovation management research in *EJIM*. The list of contributors (i.e. authors and institutions) can serve as a directory for experts of innovation management research, whereas the publication and citation trends can inform future editorial efforts at *EJIM*.

The rest of the paper is structured as follows. The next sections disclose the methodological design of this retrospective review, followed by a performance analysis and a science mapping of innovation management research at *EJIM*. Finally, the paper concludes with key takeaways and suggestions enriching understanding on innovation management and taking *EJIM* to greater heights.

2. Methodology

2.1 Review method

This paper adopts a bibliometric approach to review the innovation management research published in *EJIM*. Unlike alternative approaches using a manual content analysis (e.g. framework reviews, thematic reviews), the bibliometric approach relies on quantitative measures (e.g. publications, citations) and technology (e.g. scientific database, software) to curate and analyze the review corpus (Lim *et al.*, 2022a). The bibliometric approach is firmly established and widely regarded as a highly objective and pragmatic approach for reviewing a large corpus of papers (Bamel *et al.*, 2020; Donthu *et al.*, 2021; Mukherjee *et al.*, 2022; Pereira and Bamel, 2021, 2022; Pereira *et al.*, 2021). The two broad categories of bibliometric analytical techniques are performance analysis, which evaluate productivity and impact, and science mapping, which map the intellectual structure of major themes and topics (Donthu *et al.*, 2021; Mukherjee *et al.*, 2022).

2.2 Corpus curation

The bibliographic data of innovation management research in *EJIM* was searched and retrieved from Scopus, which is one of the largest and most used scientific databases to obtained bibliographic data of scientific research (Paul *et al.*, 2021). "European Journal of Innovation Management" was searched in the source title, returning 757 relevant papers published in *EJIM* between 1998 and 2021. The bibliographic data and the full-text of these papers were downloaded and used in the analysis.

2.3 Corpus analysis

The retrospective review of innovation management research in *EJIM* is performed using bibliometric analytical techniques in the form of performance analysis and science mapping.

In terms of performance analysis, the review employs a content analysis and reports on the productivity (publication) and impact (citation) of innovation management research in *EJIM*. This is done using various metrics (e.g. total publications [TP], sole-authored publications [SA], co-authored publications [CA], total citations [TC], average citations per publication [TC/TP]), which inform performance evaluation in general (i.e. publication and citation trend) and in relation to the journal's most prolific contributions (i.e. most cited papers and most citing journals) and contributors (i.e. authors, institutions, countries).

In terms of science mapping, the review employs a keyword co-occurrence analysis. This analysis creates clusters of keywords (topics) that frequently appear together, wherein each cluster represents a specific theme. Through this analysis, this review reports on (1) the strategic map that maps the categories of themes (i.e. basic, motor, niche, emerging or declining themes) and (2) the Sankey graph that maps the historical trajectory of topical evolution (1998–2021) of innovation management research in *EJIM*.

The bibliometric analyses were carried out using the bibliometrix package in the R software (Aria and Cuccurullo, 2017), and the results—i.e. the productivity, impact and knowledge of innovation management research in *EJIM*— are reported in the next sections.

3. Results

3.1 Performance analysis (RQ1 and RQ2)

3.1.1 Publication and citation trend (RQ1). The bibliographic information of innovation management research in *EJIM* is presented in Tables 1 and 2.

In terms of *publication metrics*, the journal has published 757 papers between 1998 and 2001 (Table 1). Conceptual and empirical papers account for more than 90% (703 out of 757) while review papers make up about 8% (54 out of 757) of papers published in *EJIM*.

Metric	Statistic
Period of coverage	1998–2021
Panel A. Publication metrics	
Total publications (TP)	757
Articles	703
Reviews	54
Single-authored publications (SA)	160
Co-authored publication (CA)	597
Panel B. Citation metrics	
Total citations (TC)	21,997
Average citations per publication (TC/TP)	29.05
Panel C. Co-authorship metrics	
Number of contributing authors (NCA)	1,671
Authors of single-authored publications (ASA)	152
Average authors per publication (NCA/TP)	2.21
Average publications per author (TP/NCA)	0.45
Collaboration index (CI)	2.41
Panel D. Article metrics	
Author's keywords	1,766
References	45,347

Note(s): Based on bibliographic data retrieved from Scopus. TC = Total citations received up to May, 2022

Table 1. Bibliometric information of innovation management research in *EJIM*

Year	TP	TCP	SA	CA	TC	TC/TP	PPC
1998	12	0	8	4	0	0	0.00
1999	12	1	4	8	2	0.17	4.17
2000	19	3	5	14	3	0.16	6.98
2001	18	12	5	13	13	0.72	19.67
2002	19	20	11	8	30	1.58	25.00
2003	20	43	**7**	13	76	3.80	43.00
2004	24	40	10	14	84	3.50	32.26
2005	26	71	10	16	155	5.96	47.33
2006	26	92	10	16	234	9.00	52.27
2007	28	124	7	21	294	10.50	60.78
2008	25	156	4	21	477	19.08	68.12
2009	23	170	7	16	593	25.78	67.46
2010	25	184	5	20	619	24.76	66.43
2011	26	214	10	16	858	33.00	70.63
2012	25	230	7	18	983	39.32	70.12
2013	24	246	5	19	1,069	44.54	69.89
2014	25	260	7	18	1,136	45.44	68.97
2015	24	273	2	22	1,257	52.38	68.08
2016	28	311	7	21	1,538	54.93	72.49
2017	30	322	4	26	1,653	55.10	70.15
2018	32	357	8	24	1,767	55.22	72.71
2019	41	390	3	38	2,059	50.22	73.31
2020	112	461	13	99	2,620	23.39	71.58
2021	113	563	7	106	3,315	29.34	74.37

Note(s): Based on bibliographic data retrieved from Scopus. TP = Total publications. SA = Sole-authored publications. CA = Co-authored publications. TC = Total citations. TC/TP = Total citations per publication. PPC = Proportion of cited publication

Table 2. Publication and citation trends of innovation management research in *EJIM*

This observation can be attributed to the fact that new knowledge is produced by the former and that the latter plays a facilitating role in knowledge creation and thus written periodically rather than on a consistent basis (Lim *et al.*, 2022a). The ratio of single-authored to co-authored papers is at 1:3.7, which represents a healthy mix of individual thought leadership and research group discoveries. Noteworthily, the number of papers published by *EJIM* has increased over time, from 10s to 20, 30, 40s, and more recently, 100s of papers (Table 2), which reflects burgeoning research interest in innovation management and the journal's recognition of the need to respond to the growth of high-quality research in the field.

In terms of *citation metrics*, the journal has accumulated more than 20,000 citations within its 25-year run, with an average of more than 20 citations per paper (Table 1), which signifies the impact of innovation management research published by the journal. The growth in the citations received each year is also noteworthy, with the proportion of cited publication reaching more than 70% in 2020 and 2021 despite a significant increase in the number of papers published (Table 2), indicating that the additional space created has indeed been filled by high-quality (impactful) innovation management research.

In terms of *co-authorship metrics*, the journal's papers have been contributed by 1,671 authors, wherein 152 authors have published single-authored papers (Table 1). These statistics show that *EJIM* receives multiple sole-authored contributions from individual authors (SA:160) and multiple co-authored contributions from research groups (CA:597). On average, each author has 0.45 papers, each lead author has collaborated with 2.41 co-authors, and each paper has 2.21 authors, which imply that high-quality innovation management research is possible with a small research group of two to three co-authors.

In terms of *article metrics*, the journal's papers have been described with 1,766 different keywords by the authors (Table 1), which reflect the broad range of topics covered by *EJIM*. Noteworthily, the journal's papers have been grounded on 45,347 different references, which signal the diversity of knowledge required to support the wide scope of topics on innovation management covered and published by *EJIM*.

3.1.2 Most cited papers and most citing journals (RQ1). The most cited papers and the most citing journals of innovation management research in *EJIM* are presented in Tables 3 and 4, respectively.

The *most cited papers* reflect "which" innovation management research in *EJIM* that has produced the greatest impact (citations) (Table 3). The most cited paper is Martins and Terblanche (2003), which highlights the importance of organization strategy, structure and support mechanism to foster a culture that encourages innovative individual and group behavior. The second most cited paper is Wang and Ahmed (2004), which provides a scale for measuring organizational innovativeness through the lenses of behavior, product, process, market and strategic innovativeness. The third most cited paper is de Jong and Den Hartog (2007), which shows how leaders can promote innovative behavior among employees through a behavioral inventory consisting of monitoring, delegating and supporting mechanisms. Other impactful topics noted through other highly-cited papers include green innovation (Doran and Ryan, 2012), innovation climate and culture (Ahmed, 1998; Dobni, 2008), innovation capabilities and competencies (Assink, 2006; Jantunen, 2005; Kandampully, 2002; Keskin, 2006), new product development (Shen *et al.*, 2000; Zhang and Doll, 2001), open innovation (Antikainen *et al.*, 2010; Bogers, 2011; Elmquist *et al.*, 2009) and innovation in SMEs (Avermaete *et al.*, 2003; Scozzi *et al.*, 2005; Varis and Littunen, 2010), among others.

The *most citing journals* reflect "where" innovation management research in *EJIM* has made the greatest impact (citations) (Table 4). Other than *EJIM* itself, the journals that have cited *EJIM* the most include *Sustainability*, *International Journal of Innovation Management* and *Technological Forecasting and Social Change*, which highlight the importance of innovation management research published in the journal in contributing to the sustainability agenda, the general practice of innovation management, and the progress of

Title	Author(s)	Year	TC	C/Y
Building organisational culture that stimulates creativity and innovation	Martins and Terblanche	2003	826	43.47
The development and validation of the organisational innovativeness construct using confirmatory factor analysis	Wang and Ahmed	2004	576	32.00
How leaders influence employees' innovative behaviour	De Jong and Den Hartog	2007	543	36.20
Culture and climate for innovation	Ahmed	1998	383	15.96
Innovation as newness: What is new, how new, and new to whom?	Johannessen, Olsen, and Lumpkin	2001	357	17.00
Market orientation, learning orientation, and innovation capabilities in SMEs: An extended model	Keskin	2006	344	21.50
Inhibitors of disruptive innovation capability: A conceptual model	Assink	2006	252	15.75
Measuring innovation culture in organizations: The development of a generalized innovation culture construct using exploratory factor analysis	Dobni	2008	244	17.43
Innovation as the core competency of a service organisation: The role of technology, knowledge and networks	Kandampully	2002	228	11.40
The open innovation paradox: Knowledge sharing and protection in R&D collaborations	Bogers	2011	228	20.73
Motivating and supporting collaboration in open innovation	Antikainen, Mäkipää, and Ahonen	2010	226	18.83
Knowledge-processing capabilities and innovative performance: An empirical study	Jantunen	2005	211	12.41
A measurement scale for product innovation performance	Alegre, Lapiedra, and Chiva	2006	204	12.75
The fuzzy front end and success of new product development: A causal model	Zhang and Doll	2001	199	9.48
Exploring the field of open innovation	Elmquist, Fredberg, and Ollila	2009	194	14.92
An integrated approach to innovative product development using Kano's model and QFD	Shen, Tan, and Xie	2000	192	8.73
Types of innovation, sources of information and performance in entrepreneurial SMEs	Varis and Littunen	2010	183	15.25
Determinants of innovation in small food firms	Avermaete, Viaene, Morgan, and Crawford	2003	172	9.05
Regulation and firm perception, eco-innovation and firm performance	Doran and Ryan	2012	159	15.90
Manufacturing firms and integrated solutions: Characteristics and implications	Windahl, Andersson, Berggren, and Nehler	2004	151	8.39
Fostering innovation: The role of market orientation and organizational learning	Jiménez-Jimenez, Sanz, and Hernandez-Espallardo	2008	149	10.64
The impact of outside-in open innovation on innovation performance	Inauen and Schenker-Wicki	2011	143	13.00
Methods for modeling and supporting innovation processes in SMEs	Scozzi, Garavelli, and Crowston	2005	140	8.24
The role of trust in organisational innovativeness	Ellonen, Blomqvist, and Puumalainen	2008	137	9.79
Antecedents and performance impacts of product versus process innovation: Empirical evidence from SMEs located in Turkish science and technology parks	Ar and Baki	2011	135	12.27

Note(s): Based on bibliographic data retrieved from Scopus. TC = Total citations. C/Y = Citations per year

Table 3.
Most cited papers on innovation management research in *EJIM*

Journal	TC
European Journal of Innovation Management	456
Sustainability	401
International Journal of Innovation Management	251
Technological Forecasting and Social Change	171
Journal of Business Research	157
Industrial Marketing Management	137
Journal of Cleaner Production	137
Journal of Knowledge Management	127
Technology Analysis and Strategic Management	110
Technovation	109
Journal of Business and Industrial Marketing	108
International Journal of Business Innovation and Research	105
Creativity and Innovation Management	103
International Journal of Innovation and Technology Management	103
Management Decision	101
Journal of Product Innovation Management	97
Journal of Open Innovation Technology Market and Complexity	86
R and D Management	86
International Journal of Production Economics	73
Business Strategy and the Environment	65
Frontiers in Psychology	65
Journal of Manufacturing Technology Management	65
International Journal of Technology Management	64
International Journal of Innovation Science	63
Journal of Engineering and Technology Management	62
Total Quality Management and Business Excellence	62
Journal of Small Business and Enterprise Development	61
Journal of Technology Management and Innovation	61
Espacios	60

Note(s): Based on bibliographic data retrieved from Scopus

Table 4.
Most citing journals of innovation management research in *EJIM*

technological and societal advancement. Other most citing journals such as *Journal of Business Research*, *Industrial Marketing Management*, *International Journal of Production Economics*, *Journal of Small Business and Enterprise Development* and *Total Quality Management and Business Excellence* demonstrate the impact of innovation management research produced by *EJIM* in shaping the progress of businesses such as SMEs and business functions such as marketing, production and quality management, whereas most citing journals such as *Creativity and Innovation Management*, *Frontiers in Psychology* and *R and D Management* show the importance of creativity, psychology, and research and development (R&D) in enabling innovation and innovation management. Noteworthily, the presence of premier journals such as *Journal of Business Research*, *Journal of Product Innovation Management* and *Technovation* in the list of most citing journals is a testament to the high-quality insights on innovation management curated by *EJIM*.

3.1.3 Most prolific and impactful contributors (RQ2). The most prolific authors, institutions and countries contributing to innovation management research in *EJIM* are presented in Tables 5–7, respectively.

In terms of the *most prolific authors*, Federico Frattini, Vittorio Chiesa and Raffaella Manzini share the top spot with nine papers each, followed by Roberto Verganti, Tommaso Buganza and Pervaiz K. Ahmed with eight, seven, and six papers each in *EJIM* (Table 5). In terms of the *most impactful authors*, Pervaiz K. Ahmed emerged top with 1,148 citations, followed by Federico Frattini with 238 citations and Vittorio Chiesa with 227 citations.

Author	TP	SA	CA	TC	TC/TP	NAY	PAY
Frattini F	9	0	9	238	26.44	5	1.80
Chiesa V	9	0	9	227	25.22	4	2.25
Manzini R	9	0	9	189	21.00	6	1.50
Verganti R	8	0	8	125	15.63	6	1.33
Buganza T	7	0	7	114	16.29	6	1.17
Ahmed P.K.	6	1	5	1,148	191.33	4	1.50
Bigliardi B	5	0	5	209	41.80	5	1.00
Styhre A	5	1	4	81	16.20	5	1.00
Pech R.J.	5	2	3	68	13.60	3	1.67
Sääksjärvi M	5	0	5	46	9.20	5	1.00
Yasir M	5	0	5	40	8.00	2	2.50
Bortoluzzi G	5	0	5	37	7.40	4	1.25
Ortt J.R.	4	0	4	182	45.50	4	1.00
Schiavone F	4	0	4	172	43.00	4	1.00
Afsar B	4	0	4	136	34.00	3	1.33
Lazzarotti V	4	0	4	118	29.50	4	1.00
Galati F	4	0	4	112	28.00	3	1.33
Trabucchi D	4	0	4	52	13.00	3	1.33
Hong J	4	0	4	51	12.75	3	1.33
Majid A	4	0	4	33	8.25	2	2.00

Note(s): Based on bibliographic data retrieved from Scopus. TP = Total publications. SA = Sole-authored publications. CA = Co-authored publications. TC = Total citations. TC/TP = Average citations per publication. NAY = Number of active years. PAY = Productivity per active year

Table 5.
Top contributing authors of innovation management research in *EJIM*

Institution	TP	TC	TC/TP	NAY	PAY
Polytechnic University of Milan, Italy	28	465	16.61	14	2.00
Chalmers University of Technology, Sweden	18	532	29.56	13	1.38
Delft University of Technology, Netherlands	12	268	22.33	12	1.00
AArhus Universitet, Denmark	12	303	25.25	9	1.33
Parthenope University of Naples, Italy	9	63	7	3	3.00
Universidad de Murcia, Spain	9	398	44.22	7	1.29
Università di Parma, Italy	9	196	21.78	8	1.13
Hazara University Pakistan	9	179	19.89	4	2.25
Università Carlo Cattaneo, Italy	8	120	15	6	1.33
LUT University, Finland	7	168	24	6	1.17
Tampere University, Finland	6	142	23.67	6	1.00
University of Padua, Italy	6	185	30.83	6	1.00
Aalborg University, Denmark	6	139	23.17	6	1.00
University of Bradford, UK	6	609	101.5	3	2.00
Radboud Universiteit, Netherlands	6	79	13.17	5	1.20
University of Ljubljana, Slovenia	6	43	7.17	4	1.50
Tongji University, China	6	55	9.17	3	2.00
Aalto University, Finland	6	133	22.17	4	1.50
Università della Calabria, Italy	5	147	29.4	4	1.25
University of Science and Technology of China, China	5	50	10.00	3	1.67

Note(s): Based on bibliographic data retrieved from Scopus. TP = Total publications. TC = Total citations. TC/TP = Average citations per publication. NAY = Number of active years. PAY = Productivity per active year

Table 6.
Top contributing institutions of innovation management research in *EJIM*

Country	TP	TC	TC/TP	TC/TCP	NAY	PAY
Italy	106	2,059	19.42	21.01	21	5.04
United States	83	2,779	33.48	34.31	24	3.45
United Kingdom	79	3,750	47.47	61.48	24	3.29
China	71	384	5.41	6.51	5	14.20
Spain	64	1,720	26.88	28.67	23	2.78
Sweden	56	1,438	25.68	26.15	21	2.66
Finland	46	1,843	40.07	40.96	21	2.19
Netherlands	38	1,598	42.05	42.05	20	1.90
Australia	38	1,302	34.26	34.26	17	2.23
France	38	581	15.29	17.61	15	2.53
Germany	36	885	24.58	24.58	16	2.25
Pakistan	35	348	9.94	10.88	4	8.75
Denmark	28	815	29.11	29.11	15	1.86
Brazil	22	110	5.00	6.88	8	2.75
Canada	18	500	27.78	35.71	9	2.00
Turkey	17	817	48.06	58.36	10	1.70
Norway	15	607	40.47	40.47	11	1.36
Greece	13	412	31.69	31.69	11	1.18
Portugal	14	151	10.79	12.58	7	2.00
Switzerland	13	539	41.46	44.92	9	1.44

Table 7.
Top contributing countries of innovation management research in *EJIM*

Note(s): Based on bibliographic data retrieved from Scopus. TP = Total publications. TC = Total citations. TC/TP = Average citations per publication. NAY = Number of active years. PAY = Productivity per active year

Noteworthily, Pervaiz K. Ahmed was the Founding Editor of *EJIM*. His average citations per paper is also the highest (TC/TP: 191.33) and his seminal papers on the culture and climate for innovation (Ahmed, 1998) and the measurement of organizational innovativeness (Wang and Ahmed, 2004) are among the most cited papers in the journal.

In terms of the *most prolific institutions*, Polytechnic University of Milan in Italy emerges top with 28 papers, followed by Chalmers University of Technology in Sweden with 18 papers and Delft University of Technology in the Netherlands and AArhus Universitet in Denmark with 12 papers each (Table 6). In terms of the *most impactful institutions*, University of Bradford in the UK takes top spot with 609 citations, followed by Chalmers University of Technology in Sweden with 532 citations and Polytechnic University of Milan in Italy with 465 citations. Noteworthily, the biggest contributor to the University of Bradford's standing is Pervaiz K. Ahmed through his seminal paper on the culture and climate for innovation (Ahmed, 1998). He moved to the University of Wolverhampton, another institution in the UK, where he published the other seminal paper on organizational innovativeness (Wang and Ahmed, 2004). He is now affiliated with Sunway University in Malaysia.

In terms of the *most prolific countries*, Italy emerges top with 106 papers, followed by the USA with 83 papers and the United Kingdom with 79 papers (Table 7). In terms of the *most impactful countries*, the United Kingdom takes top spot with 3,750 citations, followed by the USA with 2,779 citations and Italy with 2,059 citations. The other top contributing countries include Australia, Brazil, Canada China and Pakistan, which indicate that *EJIM* does publish innovation management research outside Europe (e.g. Asia, North America, South America and Oceania), though most of its contributions at the time of writing continue to come from Europe (e.g. Denmark, Finland, France, Germany, Greece, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey and the United Kingdom).

3.2 Science mapping (RQ3)

3.2.1 Themes in the intellectual structure (RQ3). The intellectual structure of innovation management research in *EJIM* was established using a keyword co-occurrence analysis and illustrated using a strategic map via the bibliometrix package in the R software (Aria and Cuccurullo, 2017; Zupic and Čater, 2015). The keyword co-occurrence analysis groups the keywords that authors list for their *EJIM* papers based on their co-occurrences, wherein keywords (topics) that frequently appear together form a cluster that reflects a common theme (Donthu *et al.*, 2021a). In total, 10 themes were revealed by the keyword co-occurrence analysis, which were mapped on the strategic map. The strategic map is a two-dimensional graph with two axes—i.e. degree of development (density) and degree of relevance (centrality)—that result in four quadrants reflecting the categories of themes (Figure 1):

(1) *Basic themes* are *general themes* that have high centrality but low density (bottom-right quadrant) such as *innovation*, *open innovation*, *new product development* and *product and process innovation*;

(2) *Motor themes* are *well-developed themes* that have high centrality and density (top-right quadrant) such as *organizational culture and innovation* and *leadership and creativity*;

(3) *Niche themes* are *very specialized themes* that have low centrality but high density (top-left quadrant) such as *dynamic capabilities* and *business model innovation*; and

(4) *Emerging or declining themes* are *weakly developed or marginalized themes* that have low centrality and density (bottom-left quadrant) such as *R&D* and *green innovation.*

3.2.1.1 Basic themes (RQ3). The *basic themes* of innovation management research in *EJIM* are (1) innovation, (2) open innovation, (3) new product development and (4) product and process innovation. These themes are considered to be general and thus they have high relevance to innovation management in its broadest sense.

The largest basic theme is *innovation*, which comprise topics such as innovation strategy, partnerships, networks, entrepreneurialism and innovation diffusion. This is also seen through the studies under this theme involving innovation strategies (Dos Santos Paulino, 2014; Hoholm and Strønen, 2011; Koch and Artmayr, 2020), partnerships and networks for innovation (Barbaroux, 2012; Cosma *et al.*, 2022; Voltan and De Fuentes, 2016) and innovation diffusion

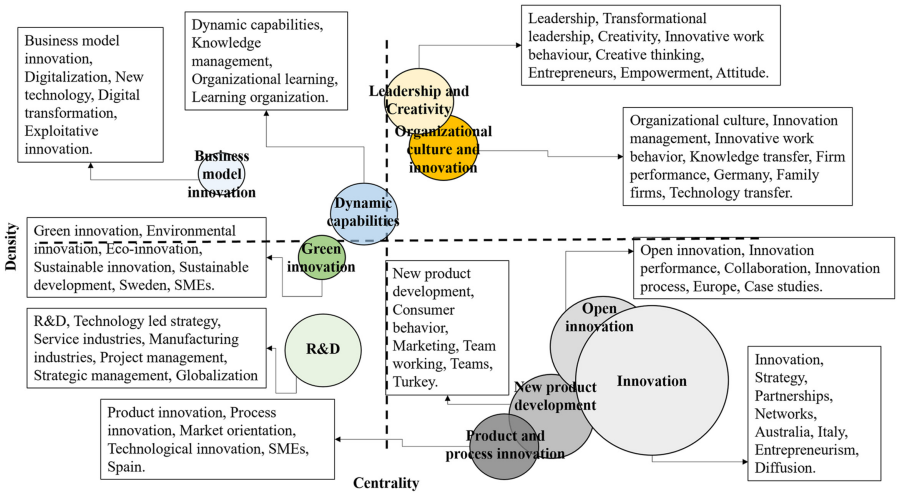

Figure 1.
Strategic map of innovation management research themes in *EJIM*

(Steiber *et al.*, 2021; Vikkelsø *et al.*, 2021), among others. This theme will remain central to innovation management as a basic theme. This theme may nurture new topics that could mature into a motor theme—it is unlikely to become a motor theme itself due to its generic nature.

The second largest basic theme is *open innovation*, which contain topics such as innovation performance, collaboration, and innovation process. The research under this theme appeared in 2011 and grew exponentially thereafter, ranging from open innovation adoption (Bigliardi *et al.*, 2012; Schroll and Mild, 2011) to the determinants of open innovation (Barjak and Heimsch, 2021; Ystrom *et al.*, 2015), the manifestation of open innovation in start-ups and SMEs (Aleksić *et al.*, 2022; Idrissi Fakhreddine and Castonguay, 2019; Spender *et al.*, 2017; Usman and Vanhaverbeke, 2017), the value of collaboration (Caldas *et al.*, 2019; Doloreux and Lord-Tarte, 2013; O'Connor *et al.*, 2021), and the outcomes of open innovation (Franco *et al.*, 2022; Frank *et al.*, 2022), including innovation performance (Farzaneh *et al.*, 2021; Lazzarotti *et al.*, 2017; Zhong *et al.*, 2022). The majority of research under this theme is situated in the European context and case studies appeared to be a prominent research approach to study open innovation. These revelations suggest that open innovation may transition into a motor theme in the future, provided that new research improves on contextual diversity and the strength of its evidences (e.g. correlational, causal).

The third largest basic theme is *new product development*, which consists of topics such as consumer behavior, marketing, team working and teams. The research under this theme has remained steadfast over time (1999–2021). Among the key aspects and tools vital for new product development include business models and big data analytics capabilities (Sun and Liu, 2020), cross functional team and leadership (Valle and Avella, 2003), customer participation (Naeem and Di Maria, 2021), knowledge, skills, values and norms (Jensen and Harmsen, 2001), market information effectiveness (Hart *et al.*, 1999), market research (Trott, 2001), organizational integration (Millson, 2013) and social media (Sun and Liu, 2021). It is interesting to note that this line of research was mainly conducted during the early 2000s and has started to appear again in recent years. The focus has also evolved from employees, leadership, and teams to capabilities and strategies such as big data analytics, business model and social media. Nevertheless, the generic nature of new product development suggests that this theme will likely remain as a basic theme, though topics such as big data analytics may evolve into a motor theme along with other new-age technologies (e.g. artificial intelligence, cloud computing, Internet of things and machine learning) that are emerging through the industrial revolution.

The fourth and smallest basic theme is *product and process innovation*, which constitute topics such as product innovation, process innovation, market orientation and technological innovation. This is also seen through the studies under this theme involving the determinants of product (Aydin, 2021; Zhang, 2011) and process innovation (Chang *et al.*, 2022; Ramírez-Alesón and Fernández-Olmos, 2020) as well as the adoption of technological innovation (Henao-García and Cardona Montoya, 2021; Saaksjarvi, 2003). There is a notable presence of research on SMEs and in the Spanish context under this theme. This theme is likely to remain as a basic theme due to its generic nature and coverage.

3.2.1.2 Motor themes (RQ3). The *motor themes* of innovation management research in *EJIM* are (1) *organizational culture and innovation* and (2) *leadership and creativity*. These themes are considered to be well-developed and thus they are highly popular and relevant research areas of innovation management.

The first motor theme is *organizational culture and innovation*, which captures topics such as innovation management, innovative work behavior, knowledge transfer, firm performance and technology transfer. This is also seen through the studies under this theme involving organizational culture is an antecedent or an important aspect of customer satisfaction (Moon and Choi, 2014), firm innovation (Uzkurt *et al.*, 2013), innovative practices (Brandyberry, 2003), innovative work behavior (Afsar and Umrani, 2019), open innovation (Barjak and Heimsch, 2021), organizational innovativeness (Ghosh and Srivastava, 2022) and product innovation

(Valencia *et al.*, 2010). The aspect of knowledge transfer as part of organizational culture and innovation is also noteworthy, as seen through the studies on knowledge and technology transfer (Best *et al.*, 2016), governance of university-industry knowledge transfer (Rossi, 2010) and knowledge transfer and collaborative product development (Houman Andersen and Balslev Munksgaard, 2009). Similarly, innovative work behavior is another prominent feature of this theme that has been studied in conjunction with cultural intelligence (Afsar *et al.*, 2021), knowledge management capabilities (Anser *et al.*, 2021), servant leadership (Khan *et al.*, 2021: Haider *et al.*, 2021) and trust and knowledge sharing (Kmieciak, 2021). There is a notable presence of research focusing on family firms and in the German context under this theme.

The second motor theme is *leadership and creativity*, which encapsulates topics such as transformational leadership, innovative work behavior, creative thinking and attitude. This is also seen through studies under this theme involving creativity whose antecedents include experience (Tien *et al.*, 2019), leadership (Politis, 2005), and organization pride (Durrah *et al.*, 2021). This is also a notable presence of research on entrepreneurs and empowerment under this theme.

These themes are expected to remain as motor themes due to their centrality to innovation management, and their continued development remains promising, especially in light of the contemporary realities (e.g. digital transformation) in the future of work in the new normal, which necessitate a re-imagination and the curation of new ways to foster and manage innovation effectively and successfully.

3.2.1.3 Niche themes (RQ3). The *niche themes* of innovation management research in *EJIM* are (1) *dynamic capabilities* and (2) *business model innovation*. These themes are considered to be very specialized as they are well-developed but not highly central to innovation management based on current research in the journal.

The first niche theme is *dynamic capabilities*, which includes topics such as knowledge management, organizational learning, and learning organization, which have relevance for cultivating and maintaining dynamic capabilities. The research under this theme appeared in the early 2000s with studies examining the role of knowledge management in innovation process and innovation outcome, and with the passage of time, the research has shifted toward examining the more contemporary forms of fostering dynamic capabilities such as organizational learning (Domínguez-Escrig and Mallén-Broch, 2021; Farzaneh *et al.*, 2021; Tian *et al.*, 2020) and related explanatory factors such as network ties (Farrukh *et al.*, 2021; Pace and Miles, 2020) in influencing innovation performance. Noteworthily, further research into contemporary topics such as network ties (collaboration, competition) can propel this theme into a motor theme in the future, as seen through the spatial movement of this theme that is hovering into the motor theme quadrant.

The second niche theme is *business model innovation*, which incorporates topics such as digitalization, new technology, digital transformation and exploitative innovation. Noteworthily, the research under this theme has emerged in 2016 through Taran *et al.*'s (2016) paper that offers an ontological classification of more than 70 business model configurations in categories such as value proposition, value segment, value configuration, value network and value capture. The research under this theme has continued to proliferate thereafter, especially from 2019 onwards, involving the role of big data in the digital innovation process (Capurro *et al.*, 2021) and exploitive and explorative innovation capabilities (Su *et al.*, 2021), the role of digitalization in value creation (Tavoletti *et al.*, 2022), firm competitiveness (Pang *et al.*, 2019), and Industry 4.0 (Dressler and Paunovic, 2021). With the growing importance of digitalization and the equivalent innovation that needs to transpire in business models, it is expected that this theme will transition into a motor theme in the future.

3.2.1.4 Emerging or declining themes (RQ3). The *emerging or declining themes* of innovation management research in *EJIM* are (1) *R&D* and (2) *green innovation*. These themes are considered to be weakly developed or marginalized because they are not central not well developed based on current research in the journal.

The first emerging or declining theme is R&D, which involves topics such as technology led strategy involving project management and strategic management across manufacturing and service industries in response to globalization trends. This is seen through research that looks at the knowledge sources for innovation (Abdul Basit and Medase, 2019), the human side of innovation (Henao-García and Cardona Montoya, 2021), and the management of disruptions in large organizations (Wallin *et al.*, 2022). These topics are the emerging areas, whereas earlier topics relating to technology led strategy have declined.

The second emerging or declining theme is *green innovation*, which is made up of topics such as environmental innovation, eco-innovation, sustainable innovation and sustainable development. This is also seen through studies on the antecedents of green innovation (Cui *et al.*, 2021; Song *et al.*, 2021), the antecedents of green innovation adoption in SMEs (Jun *et al.*, 2021), the democratization of the innovation process and eco-innovation (Weigt-Rohrbeck and Linneberg, 2019), the environmental innovation benefits (Di Paola and Russo Spena, 2021), the relationship between green innovation and firm value (Asni and Agustia, 2021), and the innovation capabilities for eco-innovation (Ostermann *et al.*, 2022). It is evident that research under this theme is fairly coherent and the internal ties of topics within this theme would increase over time. The publication timeline of research under this theme also suggest that this is emerging rather than declining theme. The spatial movement of this theme that is close to both the niche and motor theme quadrants reaffirms the potential of this theme, though explicit efforts will be needed to not only enrich the insights in this theme, but also to position the theme's relevance more centrally to innovation management.

3.2.2 Topical evolution in the intellectual structure (RQ3). The Sankey diagram is used to examine the temporal movements of popular topics from one time period to another (Bamel *et al.*, 2021). This diagram is useful to gain an understanding of the historical evolution of research in the field (Aria *et al.*, 2020). To construct the Sankey diagram to depict the historical evolution of innovation management research topics in *EJIM*, this review considered author keywords with a minimum occurrence of two, a minimum cluster frequency of five, and a minimum weight index of 0.12 in the inclusion index weighted by word occurrences. Since this review considered the *EJIM* scholarship from 1998 to 2021, the trajectory of the scholarship was divided into three time periods: 1998 to 2006, 2007 to 2014, and 2015 to 2021. The logic behind dividing 1998 to 2021 period in these three-time zone is: comparable time zones in terms of number of years and sufficient quantity of research during these time zones. The resulting diagram is presented in Figure 2 and a detailed summary of topical emergence, divergence and convergence is provided in Table 8.

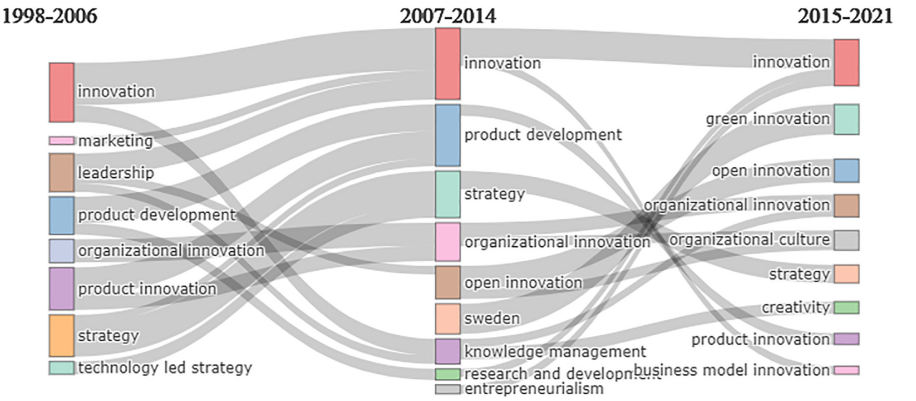

Figure 2.
Historical evolution of innovation management research topics in *EJIM*

Time period 1 (1998–2006)		Time period 2 (2007–2014)			Time period 3 (2015–2021)		
Main themes	Main themes	Forgone themes	New themes	Main themes	Forgone themes	New themes
• Innovation	• Innovation	• Leadership	• Open innovation	• Innovation	• Product development	• Green innovation
• Product innovation	• Product development	• Product innovation	• Sweden	• Green innovation	• Sweden	• Creativity
• Leadership	• Strategy	• Technology led strategy	• Knowledge management	• Open innovation	• Knowledge management	• Organizational culture
• Product development	• Organizational innovation	• Marketing	• R & D	• Organizational innovation	• R & D	• Business model innovation
• Strategy	• Open innovation		• Entrepreneurialism	• Organizational culture	• Entrepreneurialism	
• Organizational innovation	• Sweden			• Strategy		
• Technology led strategy	• Knowledge management			• Creativity		
• Marketing	• R & D			• Product innovation		
	• Entrepreneurialism			• Business model innovation		

Note(s): Based on bibliographic data retrieved from Scopus

Table 8.
Temporal movements of main themes of innovation management research in *EJIM* across three time periods between 1998 and 2021

Between 1998 and 2006, the main topics of innovation management in *EJIM* comprise innovation, product innovation, leadership, product development, strategy, organizational innovation, technology led strategy and marketing. These topics, which are innovation-focused (e.g. innovation, organizational innovation, product development and product innovation) or business-focused (e.g. leadership, marketing, strategy), represent the foundational areas of innovation management research in the initial years of the journal.

Between 2007 and 2014, the major topics of innovation management in *EJIM* contain innovation, product development, strategy, organizational innovation, open innovation, Sweden, knowledge management, R & D and entrepreneurialism. While some topics such as innovation, organizational innovation, product development, and strategy continue to be researched, other topics such as marketing and technology led strategy have disappeared and merged with innovation and strategy, respectively. New topics such as entrepreneurialism, knowledge management, open innovation, R&D, and Sweden have also emerged during this period.

Between 2015 and 2021, the popular topics of innovation management in *EJIM* consist of innovation, green innovation, open innovation, organizational innovation, organizational culture, strategy, creativity, product innovation and business model innovation. Like the previous period, some topics have disappeared and merged with other topics. For example, entrepreneurialism and R&D have been built into innovation, whereas Sweden has transitioned into green innovation with greater diversity of research in this area. Other new topics such as business model innovation, creativity and organizational culture signal fresh opportunities for innovation management research.

4. Conclusion

This paper aimed to retrospectively review the productivity, impact, and knowledge of innovation management research in *EJIM*. Using a bibliometric methodology, this paper acquired and analyze the bibliographic data of 757 papers published in *EJIM* from 1998 to 2021, revealing several noteworthy insights and implications.

To begin, *EJIM*'s productivity and impact have improved over time (RQ1). The journal witnessed a significant milestone in 2020, where it increased its publication by 276% from 2019 (i.e. from 41 in 2019 to 113 in 2021). The same level of publication productivity continued in 2021. The total citations that the journal receives annually have also continuously been on an upward trajectory. Noteworthily, the proportion of cited publication was maintained at above 70% in 2020 and increased to a record high of 74% in 2021, which signals that the journal has not compromised on quality (citation impact) despite increasing its quantity (publication productivity). Therefore, the journal's strategy to increase publication opportunities of high-quality innovation management research is seen to be rewarding.

In addition, *EJIM*'s impact is also seen through the journals that have cited *EJIM*, ranging from innovation management journals, including *EJIM* itself, as well as journals dedicated to other research areas such as general business (e.g. SMEs), marketing, production, quality management, sustainability, sociology and technology (RQ1). The presence of premier journals that appear on the list of journals citing *EJIM* the most is also a testament of *EJIM*'s impact in the scientific community. The list of the top cited papers in *EJIM* are specific exemplars of the kind of innovation management research published in the journal that is shaping the field and beyond.

Moving on, the most prolific and impactful contributors (i.e. authors, institutions and countries) of innovation management research in *EJIM* is predominantly from Europe (RQ2). Nevertheless, the journal has a track record of publishing high-quality research on innovation management from Asia, North America, South America and Oceania. Moving forward, *EJIM* may wish to scale the contributions from these regions as well as underrepresented regions (e.g. Africa) in order to improve the diversity and inclusivity of the research that it publishes. This may be done through various strategic initiatives such as conference participation, special issues and paper development workshops with authors from these regions.

Last but not least, the intellectual structure of *EJIM* is very rich, encompassing innovation management research that spans across 10 themes (RQ3). The basic themes (general) include *innovation*, *open innovation*, *new product development* and *product and process innovation*. While it is unlikely that *innovation*, *new product development*, and *product and process innovation* will transition from a basic to a motor theme due to their generic nature and coverage, they could facilitate the emergence of new topics that, along with *open innovation*, transition into a motor theme in the future. The motor themes (well-developed) include *organizational culture and innovation* and *leadership and creativity*—they are highly popular and central to innovation management. The niche themes (very specialized) include *dynamic capabilities* and *business model innovation*—they may transition into motor themes in the future, provided that they continue to expand on topics that reflect contemporary realities with explicit relevance to innovation management. The emerging or declining themes (weakly developed or marginalized) include *R&D* and *green innovation*. The former has been around for some time but has been reignited with contemporary topics, whereas the latter is clearly emerging, with a strong potential to transition into a motor theme in the future.

Taken collectively, it is important that prospective authors intending to submit and publish their innovation management research in any one of the journal's main themes to be aware of contemporary realities and make an explicit connection to demonstrate how their research is central to innovation management in order to support the maintenance of existing motor themes and the transition of basic, emerging or declining and niche themes into motor themes in the future. Such contemporary realities, as espoused by Lim (2022b), may include the changes in the international environment and how firms can respond to these changes innovatively; the innovations that can contribute to planetary health and sustainability; the adoption and adaptation of business model innovation; the changes required in innovation in order to for the innovation resonate to evolving generational profiles; and the re-imagination of innovation in the new normal with new-age technologies, among others. To this end, the retrospective and prospective insights offered herein should be useful to *EJIM*'s editors, editorial board members, published and potential authors, readers and reviewers to gain a state-of-the-art understanding of the journal's current and future contributions in innovation management.

Note

1. https://www.forbes.com/innovative-companies/list/

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