

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Library Philosophy and Practice (e-journal)

Libraries at University of Nebraska-Lincoln

3-1-2021

**Bibliographic coupling and co-citation networking analysis
determining research contributions of business school between
1965-June, 2020: With special reference to Indian Institute of
Management, India.**

Mahendra Kumar Sahu Dr

Management Development Institute, sahumahendrak9@gmail.com

Follow this and additional works at: <https://digitalcommons.unl.edu/libphilprac>



Part of the [Library and Information Science Commons](#)

Sahu, Mahendra Kumar Dr, "Bibliographic coupling and co-citation networking analysis determining research contributions of business school between 1965-June, 2020: With special reference to Indian Institute of Management, India." (2021). *Library Philosophy and Practice (e-journal)*. 5210. <https://digitalcommons.unl.edu/libphilprac/5210>

Bibliographic coupling and co-citation networking analysis determining research contributions of business school between 1965-June, 2020: With special reference to Indian Institute of Management, India.

Mahendra Kumar Sahu
Librarian, Management Development Institute, Murshidabad
Email: sahumahendrak9@gmail.com.
Mobile: 9437598807

Abstract

The literature on business management recognizes the amalgamation of both the formal and informal dimensions that researchers perceived, could provide useful information to modern companies and business managers. As a result of this advancement, the paper tries to mapping the field of business management research contributed by IIMs. These research works consummated by applying bibliometric analysis. Total 7751 scientific articles published in different journals indexed in the Scopus from 1965 to 2020 retrieved from Scopus Database. Further, the data were analyzed, applying Bibliographic coupling & Co-citation analysis through VOSviewer software. The conclusions of the study facilitate to explore the most persuasive publication, author collaboration, and the most productive institution that contributed to the Business Research.

Keywords: Bibliometrics , VOSviewer, Bibliographic coupling, Co-citation

Introduction

Business schools across the country contribute significantly to research management and serve a vital role in social and economic development. The paper evaluates the effectiveness of research contributed by the Indian Institute of Management community from 1965 and 2020. The bibliographic information of this paper was retrieved from the Scopus database. The findings demonstrate a significant development towards collaborative research among researchers throughout the top Business school or Universities of the World, some of which are in the USA, Europe, and Asia. The conclusions are pretty distinct from several other fields of management, where Asian countries, particularly India, strive to be dominant. The Indian Institute of Management, Ahmadabad, is both the most productive and the most influential institution. Assessment of relevant literature shows that several publications appear to become more inspired by their respective origins. The journal "Marketing intelligence and planning" is the most bibliographically linked, whereas IIM Ahmedabad's "Vikalpa" appeared as the most productive Journal. However, certain publications have a more general profile by getting published from many other countries throughout the World.

Literature Review

Ferreira, (2018) His literature on art-based management recognizes that the combination of formal and informal dimensions that artists see can provide valuable insights for modern

entrepreneurs and business managers. Further, the analysis carried out in this study is used to identify clusters of Articles on art-based management, which are the most influential authors in the field, where they come from, and the respective authors networks of authorship by using VOSviewer software.(Van Eck & Waltman, 2017) Illustrated how two software, CitNetExplorer and VOS viewer can be used to cluster publications and investigate the subsequent clustering solutions.Laengle, Modak, Merigo, & Zurita, (2018) utilizes the visualization of similarities viewer software to analyze the bibliographic couplings, co-citations, citations, co-authorships and co-occurrences of keywords by using WOS & VOS viewer software.Kuan, Chen, & Huang, (2019) in his study proposes a simple measure, combined relevance, to counter the impact of coupling strength of the aged. He conducted a patent research study and found that coupled patents demonstrated a temporal pattern associated with their ages (how long ago they were issued) and span of time (their distance in time).Shukla, Merigó, Lammers, & Miranda, (2020), (Boyack & Klavans, 2010) presented a graphical mapping of the bibliographic information by using the VOS viewer software. WoS Database had been used to analyse the network analysis of the extracted metadata. Ma, (2012) first introduces the basic problems of author bibliographic coupling including the relationship between author bibliographic coupling and document bibliographic coupling as well as the three calculation methods of author coupling strength, namely, simple method, minimum method and combined method. Youtie, Kay, & Melkers, (2013) examine changes in bibliographic coupling indicators alongside changes in co-authorship networks and a social network survey of center participants.Karakus, Ersozlu, & Clark, (2019) analysed the publications related to Augmented Reality in education and describing the features of those studies. He used VOSviewer software to find out most linked strength of author, country, source and organisation by deploying bibliographic coupling techniques. Grauwin & Jensen, (2011) developed a set of routines that allows to draw different maps of the research carried out in a scientific institution using SQL and used ISI web database. Habib & Afzal, (2017) Investigates the accuracy of paper recommendation can be further improved by using proximity analysis in bibliographic coupling. Based on the observation that with the use of proximity analysis the accuracy in cases of co-citation analysis has improved, Farrukh, Meng, Wu, & Nawaz, (2020) examined the trend of publication in the Business Strategy and the Environment Journal by deploying bibliographic coupling network since its inception in 1992 to 2019.(Merigó, Pedrycz, Weber, & de la Sotta, 2018) presents a bibliometric overview of the leading publication and citation trends occurring in the journal using Web of science database.Belussi et al., (2019) provide a systematic analysis of the recent state of business model research by mapping the research landscape to identify key research publications, journals relevant to the development of business management literature, and key research areas.(Sahu, (2020) tries to provide a bibliometric approach to analysing Nature Reviews Cancer, a Springer Nature Journal that is published monthly and indexed in the Scopus database.

Objectives of the study

The main purpose of this paper is to examine the status of contributed publications by IIMs as retrieved from the Scopus database.

- (1) To explore the bibliographical coupling in the literature published by IIMs.
- (2) To determine co-citation patterns coupling in the literature published by IIMs.

Methodology

For the present study, the Scopus database has been deployed to retrieve bibliographic data of publications contributed by IIMs from 1965 to June 2020. Apart from 20 IIMs, only 17 IIMs publications were available in the Scopus Database. A total of 8,624 documents were found in the form Journals, Conferences, Edited Book, etc. "The pragmatic methods depend on the number of publications in the area, that were chosen based on simple

keywords"¹⁶ "IIM Ahmedabad" "IIM Bangalore" "IIM Calcutta" "IIM Nagpur" "IIM Amritsar" "IIM Udaipur" "IIM Kashipur" "IIM Shirmaur" "IIM Visakhapatnam" "IIM Sambalpur" "IIM Ranchi" "IIM Bodh Gaya" "IIM Shilong" "IIM Kozhikode" "IIM Tiruchirappalli" "IIM Indore" "IIM Jammu" "IIM Raipur" "IIM Lucknow" "IIM Rohtak".

The extracted publications were systematically examined to certain their identity. The data were evaluated by using VOSviewer software. "Bibliographic mapping and co-citation maps and clusters are produced by VOSviewer mapping and clustering. VOS works for visualizing similarities. VOSviewer introduces a unique mapping technique that could be an alternative to the well-known Multidimensional Scaling (MDS) technique"¹⁴.

Results

Bibliographic Coupling

Bibliographic coupling is referring to the connectivity of objects is measured on the basis of the number of references they share. The strength of their relatedness (coupling) becomes more when a document receives more citations. It provides the similarities of the two works' subject matter in the form of documents, source, author, organization, and countries

Document

In total of 7751 documents were retrieved, to analyse the most quality document further, it was filtered based on highest citations. The minimum number of citations was capped (10) and finally, 1612 documents were retrieved. Out of 7751 articles 1612 articles meets the threshold and for each of the 1612 documents, The overall frequency of bibliographic coupling to other documents has been determined..Table-1 revealed the documents with the greatest total link strength are as follows:--

1. Deb M " Evaluation of customers mass preferences in India fuzzy AHP approach, Journal of advances in management research, 2012, 9(1), 29-44".
2. Anand G, Kodali R, Santosh kumar B " Development of analytic process for selection of material handling systems in the design of flexible manufacturing systems, Journal of advances in Management research, 2011, 8(1), 123-147".

Table-1
Top-10 most linked document

Sl.No	Document	Citations	Total Link
1	Deb M. (2012)	12	1635
2	Anand G. (2011)	14	1633
3	Ketkar S. (2010)	12	146

4	Ketkar S. (2009)	11	144
5	Sreeram A. (2017)	13	54
6	Rai R.K. (2016)	12	52
7	Jaiswal A.K. (2010)	18	51
8	Kern D. (2011)	17	47
9	Singh R. (2011)	18	45
10	Schumann J.H. (2010a)	15	39

sinha a. (2018b)



Figure: 1 Visual representation of bibliographic coupling: Documents

Top-10 most linked sources

Five documents and ten citations are considered in this analysis to retrieve the link strength of bibliographic coupling from the sources. Out of 2515 sources, only 273 sources meet the threshold. Table-2 explored the top-10 most linked sources, the journal “ Marketing intelligence, and planning” is the highest (3604) total link strength placed number one position followed by Journal of business research (3594) and Vikalpa, (3494).

Table-2
Top-10 most linked sources

Sl.No	Source	Documents	Citations	Total link strength
1	Marketing intelligence and planning	41	504	3604
2	Journal of business research	54	86	3594
3	Vikalpa	323	32	3494
4	Journal of Indian business research	58	172	2986
5	International journal of human resource management	29	66	2934
6	IIMB management review	120	156	2828
7	Journal of retailing and consumer services	37	136	2393
8	Personnel review	20	15	2351
9	Benchmarking	47	34	2348
10	Global business review	66	155	2210

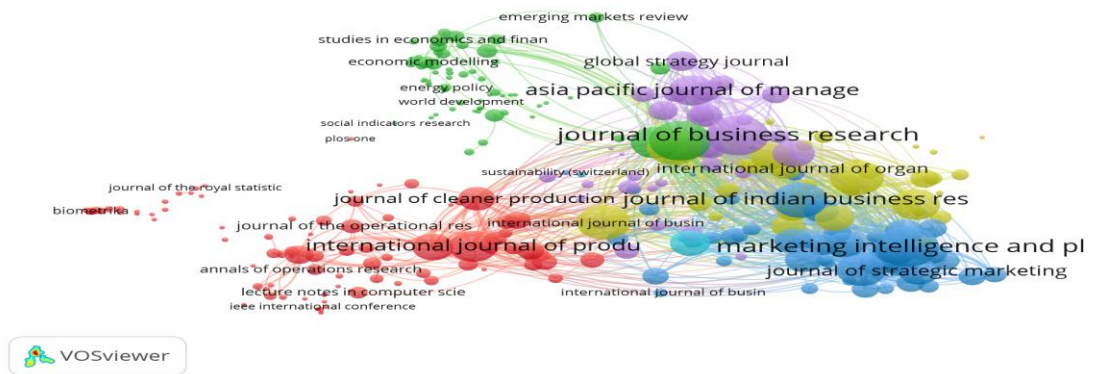


Figure: 2 Visual representation of bibliographic coupling; Sources

Top-10 most author

In terms of authorship, 5 documents and 10 citations per author are considered to retrieve the author link strength in this study. Out of 6384 authors, 273 authors meet the threshold. Table- 3 depicts that Khare A is ranked topmost position, he has received 8463 total link strength, followed by Gupta S and Das G , have received 7347 & 4857 total link strength respectively.

Table-3
Top-10 Author link

Sl. No	Author	Documents	Citations	Total link strength
1	Khare A.	64	57	8463
2	Gupta S.	102	81	7347
3	Das G.	31	10	4857
4	Singh S.	91	110	4795
5	Mishra A.	43	186	4645
6	Lu Y.	18	12	4211
7	Gupta V.	33	192	3836
8	roy s.	78	124	3593
9	Singh R.	70	18	3134
10	Prashar S.	39	16	2818

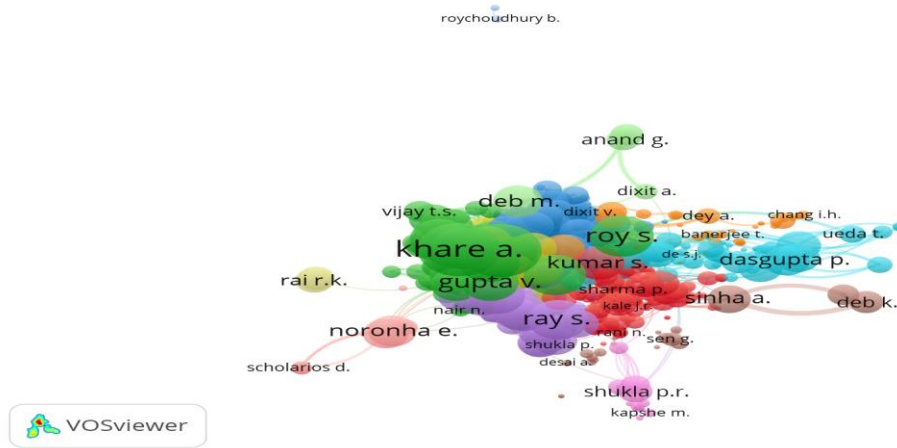


Figure:-3 Visual representation of bibliographic coupling; Author

Top ten most linked Institution

Total 10526 numbers of Institutions across the globe have collaboratively been linked and contributed their research. Apart from 10526 Institutions, only 239 institutions meet the thresholds. Table- 4 revealed that all the institutions belong to India are received the highest link. IIM Ahmedabad, India (6567) received the highest link strength followed by IIM Bangalore (4605), and IIM Lucknow, India has received 3814 link strength.

Table-4
Top-10 most linked Institution

Sl.No	Organization	Documents	Citations	Total link strength
1	Indian Institute of Management, Ahmedabad, India	579	450	6567
2	Indian institute of Management, Bangalore, India	257	34	4605
3	Indian institute of Management, Lucknow, india	144	41	3814
4	Indian Institute of Management Bangalore, India	96	21	3204
5	Indian Institute of Management, Indore, India	76	157	2952
6	Indian Institute of Management, Calcutta, India	225	25	2882
7	Indian Institute of Management, Calcutta, India	122	137	2706
8	Indian Institute of Management, Calcutta, India	99	109	2706
9	Indian institute of Management, Bangalore, India	71	29	2466
10	Indian Institute of Management, Ahmedabad, India	68	18	2460

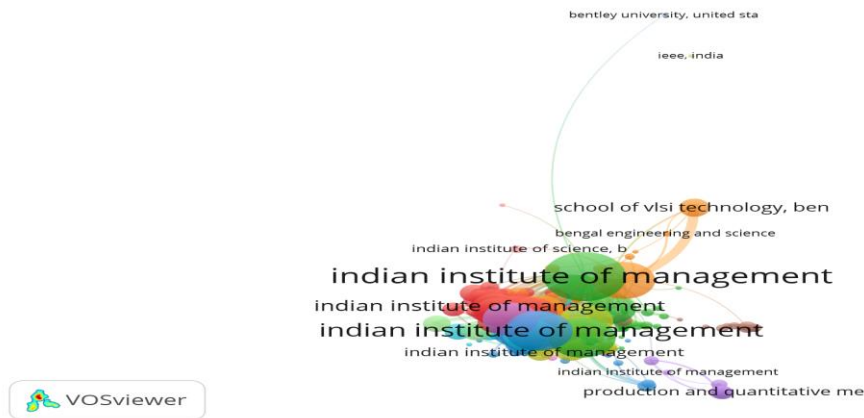


Figure:-4 Visual representation of bibliographic coupling; Institutions

Top-10 most linked Country

In regards to most linked country, 151 countries collaboratively contributing research in the fields of Business Research. These data have been analyzing by filtering five documents and ten citations per country. Table-5 revealed, the countries with the highest link strength appeared in India with 472495 total link strength followed by the US, (251289), and UK (97630).

Table-5
Top-10 most linked Country

Sl. No	Country	Documents	Citations	Total link strength
1	India	7722	557	472495
2	United States	1079	189	251289
3	United Kingdom	303	67251	97630
4	Canada	180	266	58068
5	China	120	215	56184
6	Germany	113	2206	48591
7	Australia	128	1708	41025
8	Netherlands	96	1605	25315
9	France	73	3672	22261
10	Switzerland	39	776	18377

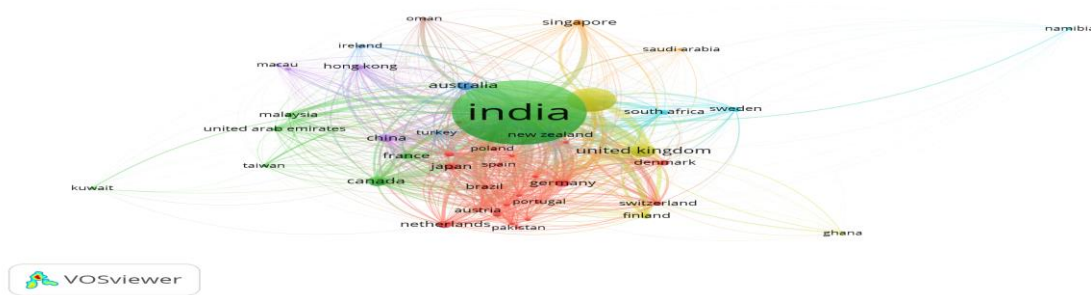


Figure:-5 Visual representation of bibliographic coupling; Country

Co-Citation analysis

Co-citation refers to the relatedness of items is determined based on the number of times they cited together. It occurs when two items i.e author and document citing in another article, could be a measure of proximity to these items. The Co-cited analysis is being created based on the indexed data of Scopus. It includes cited references, cited sources, and co-citation author.

Top-10 most Co-cited reference

Relationships among cited references have been analyzed applying co-citation analysis of references. The cited references were fixed with a minimum of 10 cited references. Total 282208 citation references were generated, 227 cited references were meet the threshold. Table-6 clearly shows “Barney, j., firm resources and sustained competitive advantage (1991) journal of management, 17 (1), pp. 99-120” appeared as highest link strength (87) followed by “Fornell, C., Larcker, D.F., evaluating structural equation models with unobservable variables and measurement error (1981), journal of marketing research, 18 (1), pp. 39-50” and “Wernerfelt, B., A resource-based view of the firm (1984) strategic management journal, 5 (2), pp. 171-180”, both have 71 and 52 link strength respectively

Table-6
Top-10 most linked Cited reference

Sl.No	Cited Reference	Citations	Total link strength
1	Barney, j., firm resources and sustained competitive advantage (1991) journal of management, 17 (1), pp. 99-120	67	87
2	Fornell, c., larcker, d.f., evaluating structural equation models with unobservable variables and measurement error (1981) journal of marketing research, 18 (1), pp. 39-50	111	71
3	Wernerfelt, b., a resource-based view of the firm (1984) strategic management journal, 5 (2), pp. 171-180	34	52
4	Podsakoff, p.m., mackenzie, s.b., lee, j.y., podsakoff, n.p., common method biases in behavioral research: a critical review of the literature and recommended remedies (2003) journal of applied psychology, 88 (5), pp. 879-903	53	46
5	Anderson, j.c., gerbing, d.w., structural equation modeling in practice: a review and recommended two-step approach (1988) psychological bulletin, 103 (3), pp. 411-423	66	44

6	Elango, b., pattnaik, c., building capabilities for international operations through networks: a study of indian firms (2007) journal of international business studies, 38 (4), pp. 541-555	21	43
7	hanna, t., rivkin, j.w., estimating the performance effects of business groups in emerging markets (2001) strategic management journal, 22 (1), pp. 45-74	28	43
8	guillen, m.f., business groups in emerging economies: a resource-based view (2000) academy of management journal, 43 (3), pp. 362-380	16	42
9	zaheer, s., overcoming the liability of foreignness (1995) academy of management journal, 38 (2), pp. 341-363	20	37
10	teece, d.j., pisano, g., shuen, a., dynamic capabilities and strategic management (1997) strategic management journal, 18 (7), pp. 509-533	51	36

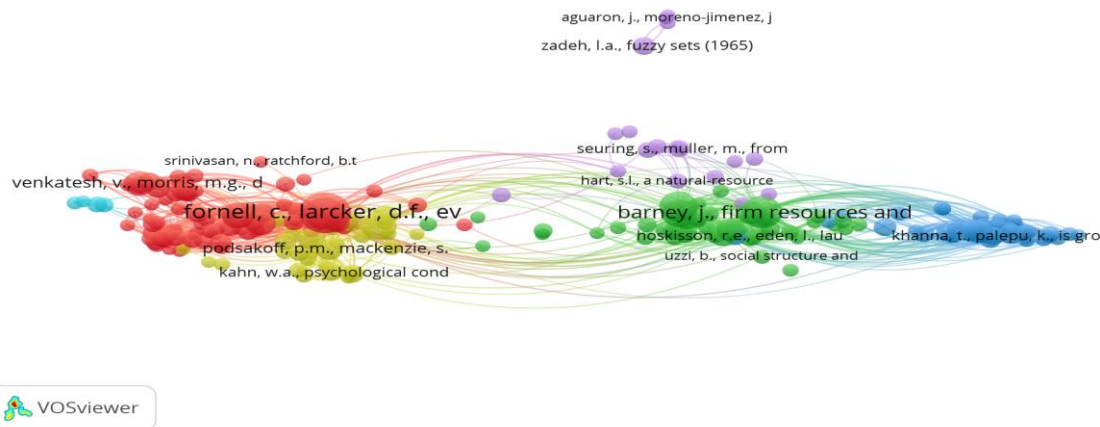


Figure:-6 Visual representation of Co-citation: reference

Top-10 most Cited Sources

In this analysis, 10 citations have been applied to generate the highest link strength source of co-citation. Total 84412 sources retrieved, 2921 sources meet the threshold. Table-7 revealed that the Journal “strategic management journal” received (67571) highest link strength, followed by “academy of management journal (62579) and academy of management review (44422).

Table-7
Top 10 most linked co-cited source

Sl.No	Source	Citations	Total link strength
1	Strategic Management Journal	2999	67571

2	Academy of Management Journal	2910	62579
3	Academy of Management Review	2222	44422
4	Journal of Marketing	2539	33649
5	Journal of International Business Studies	1440	33036
6	Journal of Management	1434	32456
7	Organization science	1313	30735
8	Journal of Business Research	1929	29230
9	Administrative Science Quarterly	1329	28038
10	Journal of Marketing Research	1790	26002

Figure:-7 Visual representation of Co-citation: Sources

Top-10 most co-citation author

This analysis has been recognized through the relationship between authors, whose articles are cited in the same publications. A minimum 20 number of citations of an author have been considered in this study. 196671 authors have appeared, 4384 authors are meet the threshold. Table-8 explored that Khanna, T appeared as the highest linked co-citation author. He has received a total of 29523 linked strength followed by Podskoff P.M and Kumar. V, both have received 23260 and 22270 linked strength respectively.

.Table-8

Top-10 most linked co-citation Author

Sl.No	Source	Citations	Total link strength
-------	--------	-----------	---------------------

1	Khanna, T.	489	29523
2	Podsakoff, P.M.	450	23260
3	Kumar, V.	416	22270
4	Hair, J.F.	447	21490
5	Mackenzie, S.B.	384	19980
6	Fornell, C.	382	19386
7	Parasuraman, A.	416	17805
8	Sarkis, J.	332	17163
9	Bagozzi, R.P.	348	16795
10	Zeithaml, V.A.	383	16634

khanna, t.
shukla, p.r.
sushamgarthy, a.

cottler, t.



Figure:-8 Visual representation of Co-citation: Author

Discussion

The study analyzed the publications contributed by IIMs, India deploying network analysis, particularly (bibliographic coupling and co-citation) through VOSviewer software. In the context of Bibliographic coupling, top-10 linked the strength of Document, Author, Source, Organisation, and Country is analyzed. The article “ Evaluation of customers mass preferences in India fuzzy AHP approach”, written by Deb M has received the highest linked strength. She is currently working in IIM Kashipur and published this document in the Journal of advances in management research in 2012. The source category “ Journal of Marketing Planning” publishing by Emerald Insight has secured the highest link. The first issue of the journal was published in the year 1983 with three issues. Currently, it publishes 7 issues per year. Dr. A Khare, Assistant Professor Marketing of IIM Trichy received the highest author link strength. Similarly, “IIM Ahmadabad emerged highest organization link and India has appeared as the highest country link.

In the context of Co-Citation; the reference document “Barney, J., firm resources and sustained competitive advantage (1991) journal of management, 17 (1), pp. 99-120” established the highest link as most of the researcher of IIM might have cited the said document in their publications. Likewise, the journal “strategic management journal” of

Willy online journal emerged as the highest link in the Journal co-citation link and Khanna T, of Harvard University, emerged as the highest link in author co-citation.

Conclusion

The present study illustrated the valuable insights of IIM's research behavior through bibliometric analysis. The research depended on Scopus-restricted bibliometric data, such as data from multiple sources, which could change the outcome and merit further study. "Bibliometric analysis is a useful method for obtaining a comprehensive assessment of a particular research area or journal" (Shukla, N. et al....(2020). Such assesses may be of considerable significance to stakeholders interested in a particular field of research or journal to formulate strategies and relevant issues. The demographic of this study is primarily for the academicians, who have contributed their scholarly output to different journals, Books, Conferences. In addition, such studies may do provide a valid research agenda or guidelines to be explored in this study on the basis of the present trajectory of a particular research area.

In summary, the past 59 years IIMs have placed it most valued institution not only for their academic excellence but also for contributing research remarkably across the Globe. The proliferation in publications, citations, co-citation, and coupling among the authors indicates that IIM's contribution towards research is mounting tallness as a primary academic platform in multiple research domains and advancing information.

References

- Belussi, F., Orsi, L., & Savarese, M. (2019). Mapping Business Model Research: A Document Bibliometric Analysis. *Scandinavian Journal of Management*, 35(3). <https://doi.org/10.1016/j.scaman.2019.101048>
- Boyack, K. W., & Klavans, R. (2010). Co-citation analysis, bibliographic coupling, and direct citation: Which citation approach represents the research front most accurately? *Journal of the American Society for Information Science and Technology*. <https://doi.org/10.1002/asi.21419>
- Farrukh, M., Meng, F., Wu, Y., & Nawaz, K. (2020). Twenty-eight years of business strategy and the environment research: A bibliometric analysis. *Business Strategy and the Environment*, 29(6). <https://doi.org/10.1002/bse.2521>
- Ferreira, F. A. F. (2018). Mapping the field of arts-based management: Bibliographic coupling and co-citation analyses. *Journal of Business Research*, 85(October 2016), 348–357. <https://doi.org/10.1016/j.jbusres.2017.03.026>
- Grauwin, S., & Jensen, P. (2011). Mapping scientific institutions. *Scientometrics*. <https://doi.org/10.1007/s11192-011-0482-y>
- Habib, R., & Afzal, M. T. (2017). Paper recommendation using citation proximity in bibliographic coupling. *Turkish Journal of Electrical Engineering and Computer Sciences*. <https://doi.org/10.3906/elk-1608-180>
- Karakus, M., Ersozlu, A., & Clark, A. C. (2019). Augmented reality research in education: A bibliometric study. *Eurasia Journal of Mathematics, Science and Technology Education*.

<https://doi.org/10.29333/ejmste/103904>

Kuan, C. H., Chen, D. Z., & Huang, M. H. (2019). Bibliographically coupled patents: Their temporal pattern and combined relevance. *Journal of Informetrics*, 13(4).

<https://doi.org/10.1016/j.joi.2019.100978>

Laengle, S., Modak, N. M., Merigo, J. M., & Zurita, G. (2018). Twenty-Five Years of Group Decision and Negotiation: A Bibliometric Overview. *Group Decision and Negotiation*, 27(4). <https://doi.org/10.1007/s10726-018-9582-x>

Ma, R. (2012). Author bibliographic coupling analysis: A test based on a Chinese academic database. *Journal of Informetrics*. <https://doi.org/10.1016/j.joi.2012.04.006>

Sahu, M. K. (2020). Nature Reviews Cancer : A Bibliometric Study, 5(2), 33–40.

Shukla, N., Merigó, J. M., Lammers, T., & Miranda, L. (2020). Half a century of computer methods and programs in biomedicine: A bibliometric analysis from 1970 to 2017.

Computer Methods and Programs in Biomedicine, 183.

<https://doi.org/10.1016/j.cmpb.2019.105075>

Van Eck, N. J., & Waltman, L. (2017). Citation-based clustering of publications using CitNetExplorer and VOSviewer. *ArXiv*, 1–25.

Youtie, J., Kay, L., & Melkers, J. (2013). Bibliographic coupling and network analysis to assess knowledge coalescence in a research center environment. *Research Evaluation*.

<https://doi.org/10.1093/reseval/rvt002>