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An analysis of research published in the International Journal of Managing Projects in Business from 2008 to 2019

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Abstract

Purpose: This study examines scholarly communications in the *International Journal of Managing Projects in Business* (IJMPB) and identifies the journal's leading trends from 2008 to 2019.

Methodology: This study analyzed a sample of 522 articles published in the IJMPB since its inception in 2008 until 2019. A set of bibliometric measures was used in the study to identify publication trends, citation structures, leading authors, institutions, and countries. Additionally, analysis of research methodologies, industrial sectors, and research themes of the articles was carried out through a rigorous content analysis. To examine the changes in journal expansion over time, the duration of publications (from 2008 to 2019) was divided into three sub-periods.

Findings: The study findings show that 793 authors from 370 institutions and 58 countries contributed to the journal during this period. In terms of contributions, Australia and the Scandinavian countries are at the top, while Asian and African countries occupy a lower position. Moreover, among authors, Derek H.T. Walker was found to be the most prolific with the highest weighting score and number of articles. Similarly, RMIT University of Australia emerged as the most productive institution. The articles were predominantly case studies followed by mixed methods (i.e., both surveys and interviews are used for data collection). Most of the articles in the sample were related to project management in general. However, several articles reported on construction, information technology (IT), and manufacturing projects.

Practical implications: This study is useful for the researcher community to understand the journal's scientific productivity. Further, it will also help identify dominant topics in the field of project management.

Originality: This is the first comprehensive review article presenting a general overview of the journal's leading trends and researchers since its inception in 2008.

Keywords: Project management, IJMPB, bibliometric study, single journal study

Paper type: Literature review

1 Introduction

Project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements (PMI, 2004). The Project Management Body of Knowledge (PMBOK) is a set of standard terminology and guidelines for project management published and updated by the Project Management Institute (PMI). The PMBOK has identified ten knowledge areas of project management: integration, scope, time, cost, quality, procurement, human resources, communications, risk management,

and stakeholder management (PMI, 2004), which are considered important for project success. In addition, a separate stream of literature based on contingency theory states that projects are different in terms of contingency factors. In other words, this theory proposes that there is no "one-size-fits-all" approach. For the success of a project, it is important to identify its type and apply the appropriate project management approach based on characteristics (Dvir, Sadeh, & Malach-Pines, 2006). The application of project management to new sectors and areas has led to a continuous change in demand for the discipline, and different approaches have been used to examine the changes (Crawford, Pollack, & England, 2006; Themistocleous & Wearne, 2000). The project management field has grown and matured in many directions. It has shown significant increase in diversity of subjects and application of research methodologies (Clegg, 2013). Further, research in new phenomenon in project management leads to the need for development of new theory in the long term (R Muller & Shao, 2013). Although, the analysis of the previous literature show that research in project management is less quantitative (Ralf Muller, Sankaran, & Drouin, 2013). However, project management is a dynamic field, which undergoes continuous changes. Therefore, regular assessment of the field is recommended. A commonly used approach to assess changes and develop a discipline is to review academic journals. Academic journals are important sources of literature that provide cutting-edge research findings and assist researchers in developing new frameworks and producing new publications (Lee, Wu, & Tsai, 2009). Therefore, a review of the literature published in relevant journals strongly influences research development and future trends in the domain area (Tsai & Lydia Wen, 2005).

Bibliometric analysis is a commonly used technique to review the knowledge structure and development and research trends by analyzing a particular journal (Yu & Shi, 2015). It gives a broad picture of the journal and provides the inner structural pattern (Yu, Xu, Kao, & Lin, 2017). It is used to explore the characteristics, quality, and status of journals in the research area (Nebelong-Bonnevie & Frandsen, 2006). It is a retrospective approach that identifies leading trends in the journal (Schwert, 1993). Bibliometric analysis provides information about the scientific productivity of the journal in terms of the contribution made by authors, institutions, and countries (Martínez-López, Merigó, Valenzuela-Fernández, & Nicolás, 2018). In the literature of bibliometric, a range of approaches has been used to assess the contributions of authors, institutions, and countries. For example, Cancino et al. (2017) conducted a general bibliometric overview of Computers & Industrial Engineering to analyze influential topics, authors, institutions, and countries based on their citation data (Cancino, Merigó, Coronado, Dessouky, & Dessouky, 2017). Chan, Lai, & Liano (2012) have used a threshold citation method to identify frequently cited articles, influential authors, and institutions in marketing research (Chan, Lai, & Liano, 2012). Another group of researchers (Betts & Lansley, 1995; Osei-Kyei & Chan, 2015) used the weighting method suggested by Howard et al. (1987) to measure the contributions of authors in multi-authored articles (Howard, Cole, & Maxwell, 1987). It assumes that the first author contributes more than the second author does. Based on the authenticity and

clarity of the results achieved through this method, multiple review studies have used it (Ke, Wang, Chan, & Cheung, 2009; Yi & Wang, 2013).

This study analyzes articles published in *International Journal of Managing Projects in Business* (IJMPB) over the past 12 years to identify the current trends in the literature. A cautious approach must be adopted to avoid muddling analysis and development of the journal with the development of the relevant field, although both are closely related. With a unique focus, the IJMPB is a well-known journal in the field of project management. According to the journal's official website, it seeks to advance theory, research, and practice of all aspects of project management. It is one of the rapidly growing journals with a highly respected position among journals on project management within a short period. The 2019 journal citation report indicates that the IJMPB had an impact factor of 1.989 in 2019 and succeeded in the category of Q1 journals. Journals of category Q1 are considered prestigious journals by the researcher community. The IJMPB attracts articles from scholars across various departments and institutions and received comprehensive citations from researchers worldwide. In the last 12 years since its inception in 2008, the IJMPB has published various types of studies, including empirical studies, review studies, case studies, and conceptual studies, discussing a broad range of topics on project management. The journal's comprehensiveness in terms of diversity in studies has convinced us to review the published works of the journal. This may be a good representation of project management as a discipline. We opted for bibliometric analysis to assess quality characteristics, ability to diffuse knowledge, authorship and collaboration patterns, and popularity in the research community. We expect that bibliometric analysis of the IJMPB will provide useful information to all stakeholders.

This study aims to present a bibliometric overview of the leading trends of IJMPB and explore its contribution to the field of project management. The study identifies the publication and citation structure, frequently cited articles, leading authors, institutions, and countries, as well as collaboration between authors. It also analyzes the research methodologies, industrial sectors, and research topics covered by the IJMPB during the last 12 years from 2008 to 2019. To the best of our knowledge, this is the first comprehensive review of the IJMPB. This study may help scholars to understand the content structure, development process, and contribution of the IJMPB. It will provide information to scholars about influential subjects and research in project management. However, this study is not the sole source of research activities in project management. Many journals must be considered to understand the accurate picture of research activities in project management.

The remainder of this paper is organized as follows. Section 2 discusses the research methodologies, including data extraction, components of the framework, and method used for weighting contributions in this study. The next section presents the results by analyzing publication trends, citation structures, leading authors, institutions, and countries, as well as analysis of research methodologies, industrial sectors, and

content analysis. Section 4 discusses the study findings in detail. This section also presents the study limitations and recommendations for future research. Section 5 concludes by summarizing the results and study findings.

2 Research methodology

This section discusses the data extraction process, components of the framework (database), and methodology used for weighting the contributions of authors, institutions, and countries.

2.1 Data extraction

The sample used in this study comprises articles published in the IJMPB from 2008 to 2019 (included). The total number of articles published during this period was 541 collected from the official website of the IJMPB. However, we excluded a few articles (n=19) because of missing or ambiguity in the information required for the study. The final sample size comprised 522 articles. All the sample articles were carefully examined to extract the required information. The information includes authors' characteristics (number and order of authors, contribution of authors, their institutions, and present country) and study characteristics (research theme of articles, industrial sector, research methodology, and year of publication). Additionally, we collected the number of citations for each article from Scopus (https://www.scopus.com). It is important to mention that slight invariance can be found in the number of total articles (TA) published per year between Scopus and the sample used in this study because of the difference in procedures and inclusion criteria for articles. Further, to understand the evolution of the journal (IJMPB), and the impact of the social science citation index (SSCI), the twelve-year duration (2008–2019) was divided into three sub-periods: 2008–2012, 2013–2016, and 2017–2019. The hypothesis being the first sub-period corresponds to the formative periods of the journal, the second is the emerging period, and the third sub-period is the impact of accepting the journal SSCI. The data were extracted by a single researcher and cross-checked by another researcher. In case of disagreement, both researchers discussed before reaching an agreement. However, information, including the study theme, research methodology, and industrial sector were clearly mentioned and easily identified in the articles. Therefore, no serious difficulties were encountered during data extraction. This method is consistent with previous research works (Betts & Lansley, 1995; Kitchenham et al., 2009). All the collected data were arranged in Microsoft Office Excel for subsequent analysis and interpretation.

2.2 Study framework

This study used bibliometric analysis, which considers the number of articles published per year, sources of information, number of citations, classification of research methods, industrial sectors, and

research themes of the articles. This multifaceted classification provides a broad overview of the journal and project management disciplines. The framework used in this study is a comprehensive form of various bibliometric measures used in previous studies (Betts & Lansley, 1995; Casillas & Acedo, 2007; Ding, Rousseau, & Wolfram, 2016; Kitchenham et al., 2009; Martínez-López et al., 2018).

Citation analysis is important to determine the impact or quality of an article. For each article in this study, the number of citations was recorded from Scopus and grouped according to the year of publication to assess the annual citation structure. Citation thresholds, to identify highly cited articles, were similar to those in previous research (Cancino et al., 2017). For instance, the number of articles that received more than 100, 50, 20, 5, or 1 were recorded annually. The journal's top-30 frequently cited articles were also presented separately to know more about the influential subjects in the field.

Structuring the sources of information makes it easy to see the contributions of authors, institutions, and the journal's geographical spread. It tells how many authors and institutions contribute to the journal and their geographical distribution. It also identifies the concentration and spread of the journal's research activities. Further, as mentioned above, the duration was divided into three sub-periods to record the changes in the contributions of authors, institutions, and countries over time. The procedure used in this study is consistent with previous studies (Martínez-López et al., 2018; Yi & Wang, 2013). Moreover, collaborations between authors were also identified to understand the social structure of science and communication between them using the Subramanyam (1983) formula . This method is in line with a previous study (C. Swain, Swain, & Rautaray, 2013).

$$\text{Degree of collaboration} = \frac{\text{NM}}{(\text{NS}+\text{NM})}, \qquad (2)$$

where:

NM = number of multiple authored articles, and NS = number of single-authored articles.

Research methodologies refer to a set of procedures used in the collection of data or evidence for analysis to find solutions to the research problem (Goundar, 2012). A multiple categorization of research methods is suggested in the literature. Orlikowski and Baroudi (1991) grouped research methods into two categories: conceptual and empirical. Conceptual research refers to studies that formulate concepts, models, and frameworks, where empirical research is based on observations, experiments, and verified evidence. They subdivided empirical studies into surveys, interviews, case studies, multi-methods, and experiments . Betts and Lansley (1995) classified articles as reviews, case studies, and empirical data . Ayat et al. (2020) classified research methods as surveys, interviews, theoretical methods, mixed methods, and review studies . To simplify categorization, this study has classified research methods as reviews, conceptual methods, surveys, interviews, case studies, and mixed methods (using more than one method). This will help in understanding the prevailing research methodologies used in project management.

The industrial sector is another important dimension of the framework that analyzes whether articles focus on a specific industrial sector or a general aspect of project management. It provides a comprehensive overview of project management applications across various sectors. Previous studies have also investigated the coverage of industrial sectors in the *International Journal of Project Management* and *Project Management Journal* (Betts & Lansley, 1995; Themistocleous & Wearne, 2000).

Research theme analysis provides information about trends in the discipline. For analyzing research themes in articles, the list of keywords was initially reviewed. It was found that some of the keywords were generic, while some were not good indications of the research contents. Therefore, all the sampled 522 articles were scanned to identify the research theme that best represented the scope of each article. Two independent authors performed the analysis. All related topics/research themes were categorized based on their similarities in content. For example, all the themes related to project management knowledge were grouped into a single category. Similarly, articles related to knowledge and learning were grouped into separate categories, primarily to help identify the hotspot and focus of the discipline. This will also help in guiding future research activities.

2.3 Methods for measuring contribution

In the literature, various methods have been used to weigh the contributions of authors, institutions, and countries. In this study, a quantitative method proposed by Howard et al., (1987) was used to identify the contribution of authors in multi-authored articles. The method assumes that the first author contributes more than the second author. The same method has also been used in other literature review studies, such as (Yi & Wang, 2013) and (Osei-Kyei & Chan, 2015). The formula for the method is given in Equation (1) as follows:

$$\frac{1.5^{n-i}}{\sum_{i=1}^{n} 1.5^{n-i}} \qquad (1)$$

where n denotes the number of authors in an article and "i" is the order of the author.

The score matrix based on Equation (1) is given in Table 1.

Table 1: Score matrix for multi-authored papers

No. of authors	Order of authors				
	1	2	3	4	5
1	1				
2	0.6	0.4			
3	0.47	0.32	0.21		
4	0.42	0.28	0.18	0.12	
5	0.38	0.26	0.17	0.11	0.08

The same method has been used for weighting the contributions of institutions and countries. For instance, an institution or country of the first author valued more than the institution or country of the second author in terms of contributions, and so on. It is important to mention here that the order of authors may not always reflect their contributions appropriately. For example, the principal investigator may take the last position of the corresponding author. Therefore, the number of articles published by each author was also identified to assess their contribution in a different way, in addition to calculating the weighting score.

3 Results and Analysis

This section presents the results based on the data extracted from the 522 sampled articles published in the IJMPB between 2008 and 2019 (included). To analyze the data, weighting methods, rankings, and content analysis were used in this study. The results are presented in the following subsections.

3.1 Publication structure

The publication trend shows the variation in the number of articles published by a journal in a certain unit of time. This section presents the publication annual trends followed in the IJMPB from 2008 to 2019 (included). Note that the publication year of an article in this study refers to the date on which the IJMPB published the article online. The data show that until 2018, the journal published articles at an average of 39 per volume (one volume per year) ranging from 33 to 51 articles. However, the data indicate an unprecedented increase in the number of publications, particularly in 2019 as shown in Figure 1. Approximately 82 articles were published in 2019, the highest number since the inception of the journal. Analysis of the data also shows that the current increasing trend continued in 2020, as 73 articles have already been published in the year until date (October 2020) and more are expected in the upcoming months. This shows that journals have attracted more researchers in recent years.

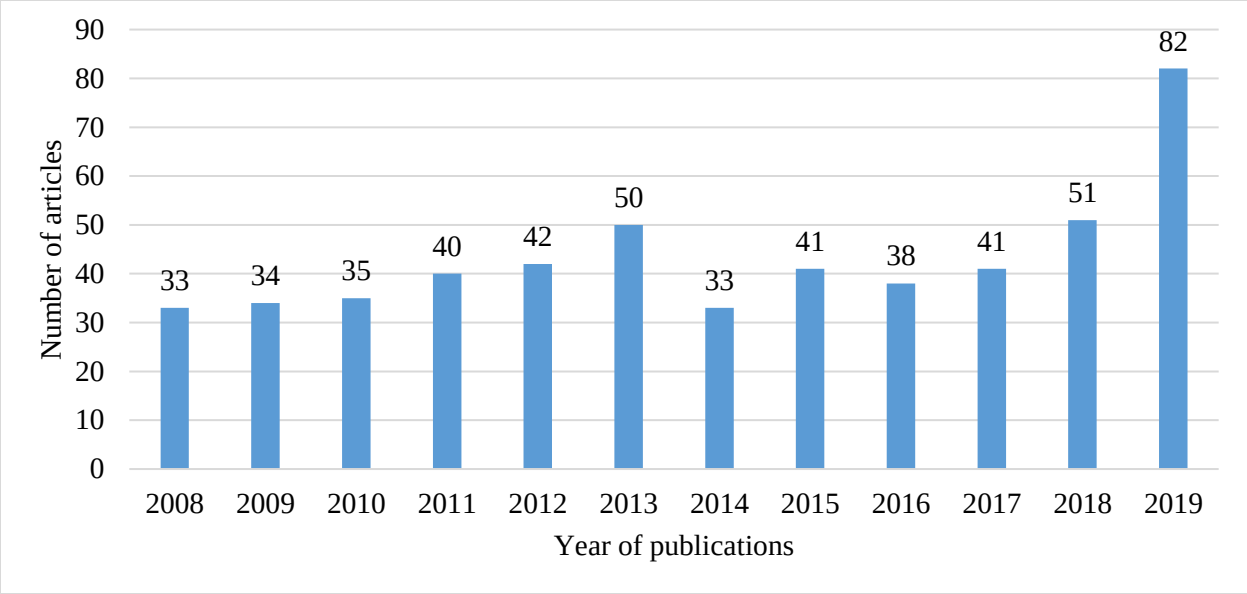

Figure 1: Annual trend of publications (2008–2019)

3.2 General citation structure

This section shows the citation structure of the articles published in the IJMPB from 2008 to 2019, as given in Table 2. The table presents detailed information about article citations, including total articles (TA) per year, total citations (TC), average citations per article ($AC_{article}$), average citations per year (AC_{year}), no citations (NC), and h-index for each volume. The data show that articles published in recent years received the highest average citations per year, whereas articles published in the earlier years received the highest number of average citations per article. The h-index varies between 7 and 17 for individual volumes. One of the strongest reasons for the high number of citations for older articles is their longer visibility duration.

Table 2: General citation structure of articles published in IJMPB

Year	**≥100**	**≥50**	**≥20**	**≥5**	**≥1**	**NC**	**TA**	**TC**	**$AC_{article}$**	**AC_{year}**	**h-index**
2008	0	4	8	19	5	0	34	698	20.52	58.16	17
2009	2	4	9	17	3	0	35	899	25.68	81.72	17
2010	0	4	6	21	4	0	35	615	17.57	61.5	14
2011	0	1	8	19	12	0	39	492	12.61	54.66	14
2012	1	0	9	30	4	0	44	674	15.31	84.25	15
2013	0	1	7	29	13	1	51	575	11.27	82.14	13
2014	0	0	7	18	4	4	33	451	13.67	75.16	14
2015	0	0	6	20	12	2	40	403	10.07	80.6	12
2016	0	0	5	30	7	0	41	466	11.36	116.5	13
2017	0	0	2	25	9	2	39	325	8.34	108.33	11
2018	0	0	2	25	19	3	50	307	6.14	153.5	9
2019	0	0	0	10	62	25	97	203	2.09	203	7

3.3 Frequently cited articles

Articles that are frequently cited and published in the IJMPB are considered in this section. Table 3 presents the 30 most cited articles. In case of a tie between two articles, that is, in terms of number of citations, a recently published article appears first. The results also show that the list of the top 30 frequently cited articles only includes articles published between and 2008–2016. No articles were published during the past three years (2017, 2018, 2019). This indicates the low chances of recently published articles being included in the list of frequently cited articles. Therefore, to identify the frequently cited articles in recently published volumes, three highly cited articles in each volume published during the last three years (2017, 2018, 2019) are presented separately in Table 4.

Table 3: Frequently cited articles published in IJMPB

S.No.	TC	Article title	Authors	Year	Citations/year
1	131	Critical success factors in projects: Pinto, Slevin, and Prescott–the elucidation of project success	Muller R., Jugdev K.	2012	16.37
2	117	Building information modelling demystified: Does it make business sense to adopt BIM?	Aranda-Mena G., Crawford J., Chevez A., Froese T.	2009	10.63
3	107	The Delphi technique: a method for testing complex and multifaceted topics	Grisham T.	2009	9.27
4	87	Sustainable development and project stakeholder management: What standards say	Eskerod P., Huemann M.	2013	12.42
5	60	Project business as a research field	Artto K., Kujala J.	2008	5
6	59	Project relationship management and the Stakeholder Circle	Bourne L., Walker D.H.T.	2008	4.91
7	58	Risk management applied to projects, programs, and portfolios	Sanchez H., Robert B., Bourgault M., Pellerin R.	2009	5.27
8	58	Project management in the international development industry: The project coordinator's perspective	Ika L.A., Diallo A., Thuillier D.	2010	5.8
9	55	Top management involvement in project management: Exclusive support practices for different project scenarios	Zwikael O.	2008	4.58
10	55	Project strategy: strategy types and their contents in innovation projects	Artto K., Martinsuo M., Dietrich P., Kujala J.	2008	4.58

11	55	The importance of soft skills in complex projects	Azim S., Gale A., Lawlor-Wright T., Kirkham R., Khan A., Alam M.	2010	5.5
12	53	Project management in small to medium-sized enterprises: A comparison between firms by size and industry	Rodney Turner J., Ledwith A., Kelly J.	2009	4.81
13	53	Reducing opportunistic behavior through a project alliance	Laan A., Voordijk H., Dewulf G.	2011	5.89
14	52	Exploring corruption practices in public procurement of infrastructural projects in Ghana	Osei-Tutu E., Badu E., Owusu-Manu D.	2010	5.2
15	52	Dynamic capability through project portfolio management in service and manufacturing industries	Killen C.P., Hunt R.A.	2010	5.2
16	51	Comparing the leadership styles of functional and project managers	Rodney Turner J., Muller R., Dulewicz V.	2009	4.63
17	50	The influence of a collaborative procurement approach using integrated design in construction on project team performance	Forgues D., Koskela L.	2009	4.54
18	48	Re-conceptualizing "Building Back Better" to improve post-disaster recovery	Mannakkara S., Wilkinson S.	2014	8
19	48	Analyzing delay causes and effects in Ghanaian state housing construction projects	Amoatey C.T., Ameyaw Y.A., Adaku E., Famiyeh S.	2015	9.6
20	41	Learning investments and organizational capabilities: Case studies on the development of project portfolio management capabilities	Killen C.P., Hunt R.A., Kleinschmidt E.J.	2008	3.41
21	41	Research and the future of project management	Morris P.W.G.	2010	4.1
22	40	Improvisation and agile project management: a comparative consideration	Leybourne S.A.	2009	3.63
23	39	Understanding project success through analysis of project management approach	Rolstadas A., Tommelein I., Morten Schiefloe P., Ballard G.	2014	6.5
24	38	The impact of project methodologies on project success in different project environments	Joslin R., Muller R.	2016	9.5
25	38	Anatomy of public-private partnerships: their creation, financing and renegotiations	Sarmento J.M., Renneboog L.	2016	9.5
26	36	A project management prospective in achieving a sustainable supply chain for timber procurement in Banda Aceh, Indonesia	Zuo K., Potangaroa R., Wilkinson S., Rotimi J.O.B.	2009	3.27
27	36	Construction project procurement routes: An in-depth critique	Oyegoke A.S., Dickinson M., Khalfan	2009	3.27

			M.M.A., McDermott P., Rowlinson S.		
28	36	Looking again at current practice in project management	Fortune J., White D., Jugdev K., Walker D.	2011	4
29	36	Projectification in the public sector – the case of the European Union	Godenhjelm S., Lundin R.A., Sjoblom S.	2015	7.2
30	35	Managing project portfolios: balancing flexibility and structure by improvising	Jerbrant A., Karrbom Gustavsson T.	2013	5

Table 4: Top three highly cited articles in each volume published during 2017–2019

S.No	TC	Article title	Authors	Year	Citations/ year
1	29	The top 10 universal delay factors in construction projects	Zidane Y.J.T., Andersen B.	2018	14.5
2	23	Evaluation of project success: a structured literature review	Albert M., Balve P., Spang K.	2017	7.66
3	22	Megaprojects redefined–complexity vs cost and social imperatives	Pitsis A., Clegg S., Freeder D., Sankaran S., Burdon S.	2018	11
4	21	Agile project management with Scrum: A case study of a Brazilian pharmaceutical company IT project	Azanha A., Argoud A.R.T.T., de Camargo Junior J.B., Antoniolli P.D.	2017	7
5	20	Sustainable infrastructure development challenges through PPP procurement process: Indian perspective	Agarchand N., Laishram B.	2017	6.66
6	18	Ranking the risk categories in international projects using the TOPSIS method	Dandage R., Mantha S.S., Rane S.B.	2018	9
7	18	Linking trust and collaboration in project teams to project management success	Bond-Barnard T.J., Fletcher L., Steyn H.	2018	9
8	13	Linking transformational leadership and "multi-dimensions" of project success: Moderating effects of project flexibility and project visibility using PLS-SEM	Zaman U., Nawaz S., Tariq S., Humayoun A.A.	2019	13
9	11	The future of the management of projects in the 2030s	Walker D., Lloyd-Walker B.	2019	11
10	11	Causes of delays on construction projects: a comprehensive list	Durdyev S., Hosseini M.R.	2019	11

3.4 Author contributions

There are several ways to measure the relative contributions of individuals, institutions, and countries to the journal. In this study, weighting score methods were used to measure their contributions. Note that "author" in this study refers to any person whose name has appeared as the first author or co-author in any article published in the IJMPB. The data show that 793 authors have published research works in the IJMPB during the specified period (2008–2019). Table 5 presents a list of the top 15 leading contributors in the journal based on their weighting scores. The table also includes the university and country where the authors are currently working, and the number of articles published by them. The results show that the most prolific author is Derek H.T. Walker with 27 articles and a weighting score of 10.21. The second, third, and fourth ranks were occupied by Thommie Burström, Stephen Fox, and Markus Hällgren (09 articles each), respectively. The results reveal a situation that few authors have made major contributions and several authors have small contributions at the start of the journal (in the first sub-period). However, the contributions of the prolific authors reduced considerably in later sub-periods. This situation of higher disproportionate contributions from authors at the beginning is similar to the results of several other related journals (Betts & Lansley, 1993; Merigo, Blanco-Mesa, Gil-Lafuente, & Yager, 2017).

Table 5: Author ranking based on contributions to IJMPB during 2008–2019

Author	**Score**	**Rank**	**Number of articles**	**Institution**	**Country**
Derek H.T. Walker	10.21	1	27	Royal Melbourne Institute of Technology (RMIT) University	Australia
Thommie Burström	7.12	2	9	Hanken School of Economics (former Umea˚ University)	Finland
Stephen Fox	7.09	3	9	VTT Technical Research Centre of Finland, Espoo	Finland
Markus Hällgren	5.69	4	9	Umeå university	Sweden
Bjorn Andersen	5.21	5	18	Norwegian University of Science and Technology (NTNU)	Norway
Stephen Jonathan Whitty	5.20	6	10	University of Southern Queensland	Australia
Michelle Turner	4.61	7	7	RMIT University	Australia
Miia Martinsuo	4.30	8	10	Tampere University of Technology, Tampere	Finland
Kirsi Aaltonen	4.05	9	10	University of Oulu	Finland
Karlos Artto	4.04	10	9	Aalto University	Finland
Rolf A. Lundin	4.04	11	7	Jönköping University	Sweden
Mattias Jacobsson	3.86	12	7	Umea˚ University	Sweden

Ole Jonny Klakegg	3.38	13	6	Norwegian University of Science and Technology (NTNU)	Norway
Ralf Müller	3.08	14	9	BI Norwegian Business School, Oslo	Norway
Andrew J. Sense	3.07	15	4	University of Wollongong	Australia

As mentioned above, the duration has been split into three sub-periods to see if there is any trend over the life of the journal and the role of different authors, as given in Table 6. The table shows that all three sub-periods reveal cases that slip into and out of the top ranks. However, the third sub-period (2017–2019) is significantly different from the other two sub-periods. There is very little overlap between the third sub-period and the other two sub-periods. The data also show that out of the top ten prolific authors, there were three prolific authors in the first sub-period (2008–2012), two in the second sub-period, and one in the third sub-period belonging to the editorial board. This confirms the editorial board's efforts in the early years of the journal's development. The authors also show that there were 280 authors in the first sub-period, 293 authors in the second sub-period, and 360 authors in the third sub-period who published their articles in IJMPB. This indicates that the journal has attracted new groups of authors to publish research in the journal over a period.

Table 6: Ranking of authors based on their contributions during the three sub-periods

2008–2012			2013–2016				2017–2019	
Authors	Country	Scores	Authors	Country	Scores	Authors	Country	Scores
Derek H.T. Walker	Australia	5.60	Derek H.T. Walker	Australia	3.71	Bjorn Andersen	Norway	3.43
Markus Hällgren	Sweden	4.69	Michelle Turner	Australia	3.67	Stephen Jonathan Whitty	Australia	2.40
Stephen Fox	Finland	3.89	Thommie Burström	Finland	3.52	Kirsi Aaltonen	Finland	2.31
Andrew J. Sense	Australia	3.07	Stephen Fox	Finland	3.20	John. R. Tuner	Ireland	1.94
Thommie Burström	Finland	3.00	Rolf A. Lundin	Sweden	2.24	Shankar Sankaran	Australia	1.94
Ole Jonny Klakegg	Norway	2.60	Mark Mullaly	Canada	2.00	Stephen Keith McGrath	Australia	1.80
Kersti Nogeste	Australia	2.60	Pertti Lahdenperä	Findland	2.00	Wouter Thierie	Belgium	1.80
Erling S. Andersen	Norway	2.47	Mattias Jacobsson	Sweden	1.94	Bronte van der Hoorn	Australia	1.60
Karlos Artto	Finland	2.38	Bjorn Andersen	Norway	1.80	Gro Holst Volden	Norway	1.60
Lynda Bourne	Australia	2.20	Beverley Lloyd-Walker	Australia	1.67	Beata Jałocha	Poland	1.46
Thomas Grisham[1]	USA	2.20	Anna Jerbrant	Sweden	1.67	Anna-Maija Hietajärvi	Finland	1.41
Lavagnon A. Ika	Canada	2.07	Arthur W. Shelley	Australia	1.60	Catherine P. Killen	Australia	1.40

3.4.1 Authorship pattern

To analyze the authorship pattern, the articles were classified into four separate categories as articles written by one author, two authors, three authors, and more than three authors, as given in Table 7. The degree of collaboration among authors for the overall period (2008–2019) as well as for each sub-period was calculated separately using the Subramanyam (1983) formula explained in the above section. The results show that the number of single-authored articles (NS) declines over time. In the first sub-period, single authored articles were 31.35%, which declined to 20.37% and 16.091% in the second and third sub-periods, respectively. The data also show that the number of multi-authored articles was higher during all three sub-periods and increased further over time. Further, the degree of collaboration between researchers also increased from 0.68 to 0.83 during the period.

Table 7: Authorship pattern and degree of collaboration

Author characteristics	Total (2008–2019)		Time period					
			2008–2012		2013–2016		2017–2019	
	Total articles	Percentage	NS	Percentage	NS	Percentage	NS	Percentage
Article with one author	119	22.75%	58	31.35%	33	20.12%	28	16.09%
Articles with two authors	199	38.04%	66	35.29%	76	46.34%	58	33.33%
Articles with three authors	130	24.85%	38	20.32%	39	23.78%	53	30.46%
Articles with more than three authors	75	14.34%	24	12.83%	16	9.76%	35	20.11%
Degree of authorship collaboration	0.77	100	0.68	100	0.79	100	0.83	100

3.4.2 Contributions of institutions

This section discusses the contributions of institutions that were investigated using a weighting method. The list of 20 most productive institutions (institutions that published a large number of articles in the IJMPB) based on their weighting scores are presented in Table 8. The table also shows the number of articles originating from the institution as the first author ($NA_{first\ author}$). The results show that RMIT, Norwegian University of Science and Technology, and Umea University are the top three leading universities in the IJMPB. The top 20 most productive institutions are in mostly from Australia, the Scandinavian countries, and the United Kingdom (UK). The results further show that 370 academic and non-academic institutions worldwide contributed to the journal during these periods. From this perspective, the IJMPB is quite diverse and has influenced many institutions globally. However, the top 10 most productive institutions shared 29.41% of the total contribution to the journal, according to the cumulative weighting scores ($Score_{cum}$). This reflects the concentration of contributions from the most productive institutions.

Further, the contributions of the top ten most productive institutions during these three sub-periods are presented separately to observe the changes over time, as given in Table 9. The results show that the RMIT contributed highest during the first and second sub-periods. This is the only university that has remained in the list of the top ten most-contributing institutions list during all the sub-periods. The results further show that the top ten most-contributing institutions attribute 38.92% weight in the first sub-period, 35.17% in the second sub-period, and 30.28% in the third sub-period. There is a decreasing trend in the cumulative weight of the top ten most contributing institutions over time. The data about institutions further reveal that 104 institutions contributed to the journal in the first sub-period, 145 institutions in the second sub-period, and 172 institutions in the third sub-period. This indicates the emergence of new institutions

and authors as contributors to the journal. Data analysis further shows that academicians from institutes of higher learning published around 92.45% of the articles during this specified period in IJMPB, where non-academic institutions contributed only 7.65% of the total contributions.

Table 8: Contribution by institutions during 2008–2019

S.No.	Institution	Country	NA $_{\text{first author}}$	Score	Score $_{\text{cum}}$	Rank
1	RMIT University	Australia	34	35.51	6.29%	1
2	Norwegian University of Science and Technology	Norway	31	28.13	11.27%	2
3	Umeå University	Sweden	25	23.93	15.51%	3
4	University of Quebec at Montreal	Canada	15	14.47	18.07%	4
5	BI Norwegian Business School	Norway	11	13.21	20.41%	5
6	University of Technology Sydney	Australia	12	12.05	22.54%	6
7	University of Southern Queensland	Australia	12	12	24.67%	7
8	VTT Technical Research Centre of Finland	Finland	11	9.64	26.37%	8
9	University College London	UK	8	8.88	27.95%	9
10	Tampere University of Technology	Finland	8	8.28	29.41%	10
11	University of Oulu	Finland	8	7.96	30.82%	11
12	Aalto University	Finland	9	7.37	32.13%	12
13	The University of Manchester	UK	7	6.6	33.30%	13
14	Helsinki University of Technology	Finland	5	6.49	34.45%	14
15	Queensland University of Technology	Australia	5	4.59	35.26%	15
16	Cranfield University	UK	5	4.58	36.07%	16
17	University of Southern Denmark	Denmark	4	4.3	36.83%	17
18	Jönköping University	Sweden	3	4.04	37.55%	18
19	The University of Auckland	New Zealand	3	3.99	38.25%	19
20	Ghana Institute of Management and Public Administration	Ghana	4	3.82	38.93%	20

Table 9: Contributions by institutions during the three sub-periods

2008–2012			2013–2016			2017–2019		
Institution	Score (%)	Rank	Institution	Score (%)	Rank	Institution	Score (%)	Rank
RMIT University	11.96	1	RMIT University	16.21	1	Norwegian University of Science and Technology	16.42	1
Umea University	5.44	2	Norwegian University of Science and Technology	7.2	2	University of Southern Queensland	7	2
Helsinki University of Technology	4.99	3	Umeå University	6.07	3	University of Technology Sydney	6.68	3
University of Quebec at Montreal	4.31	4	BI Norwegian Business School	5.68	4	University of Oulu	5.6	4

University of Technology Sydney	2.36	5	VIT Technical Research Centre of Finland	5.6	5	Dalian University of Technology	3.43	5
The University of Manchester	2.26	6	Aalto University	4.6	6	University of Quebec at Montreal	3.4	6
BI Norwegian School of Management	2.04	7	Tampere University of Technology	3.4	7	RMIT University	3.37	7
Loughborough University	2.01	8	University College London	3	8	Vrije Universiteit Brussel	3	8
University College Cork	1.85	9	University of Southern Queensland	3	8	University of Southern Denmark	2.7	9
University of Cape Town	1.69	10	Jönköping University	2.24	9	University of South Australia	2.54	10

3.4.3 Geographic spread of research activities in IJMPB

- This section discusses the countries of authors who published articles in the IJPMB from 2008 to 2019. Note that "country" refers to the country in which the author is currently working. The list of the most contributing countries of researchers who published articles in the IJMPB is given in Table 10. The data show that authors from 58 countries published articles in the IJMPB during the specified period. Among them, Australia is ranked the topmost contributor with 110 authors who published 112 articles in the IJMPB during the stated period. The results further show that authors from the top 15 countries published 431 articles (76.98%) out of 522 articles as first authors. This indicates the concentration of research activities in these countries. However, the concentration of the research activities in the top 15 countries significantly shrank in the latter two sub-periods. The analysis of the articles published in IJPM during the first ten years (1983-1992) also show that a huge number of articles were mainly communicated from few countries such as UK, USA, Denmark, Germany, and Australia (Betts & Lansley, 1995). In this regard, IJMPB has followed similar strategy for establishing the journal as IJPM.

Table 10: Contributions by countries from 2008 to 2019

S.No.	Country	Number of articles			Number of authors	Score
		First authored articles	Co-authored articles	Total articles		
1	Australia	91	21	112	108	89.04
2	United Kingdom	58	10	68	91	55.62
3	Finland	57	2	59	60	53.56
4	Norway	55	11	66	65	53.46
5	Sweden	46	8	54	44	45.85

6	Canada	40	8	48	52	35.80
7	USA	24	14	38	44	25.90
8	Netherlands	17	9	26	25	10.27
9	Denmark	10	3	13	17	8.9
10	China	10	1	11	25	8.65
11	France	10	5	15	13	8.41
12	India	9	0	9	15	8.32
13	Ireland	8	1	9	16	7.87
14	Brazil	7	5	12	26	7.83
15	New Zealand	6	4	10	10	7.2

The results given in Table 11 show that Australia, the UK, the United States (US), Canada, and the Scandinavian countries have consistently maintained their positions in the top ten countries over all sub-periods. However, the weighting scores have been reduced over time in prominent countries. This suggests that the journal has attracted more authors from different countries with time to publish their research in IJMPB.

Table 11: Contribution during three sub-periods

S.No.	**Total**		**Time period**					
	2008–2019		**2008–2012**		**2013–2016**		**2017–2019**	
	Countries	**Score**	**Countries**	**Score**	**Countries**	**Score**	**Countries**	**Score**
1	Australia	91.42	Australia	44.32	Australia	26.14	Australia	24.79
2	UK	55.62	UK	26.68	Finland	20.67	Norway	21.78
3	Finland	53.56	Canada	21.08	Norway	18.26	UK	13.05
4	Norway	53.46	Sweden	20.99	Sweden	17.52	Finland	12.33
5	Sweden	45.85	Finland	20.27	UK	16.61	Canada	10.58
6	Canada	35.80	Norway	15.75	USA	7.83	China	9.03
7	USA	25.90	USA	13.62	Canada	6.42	Sweden	8.74
8	Netherlands	10.27	France	3.65	Denmark	5.6	Brazil	6.18
9	Denmark	8.9	Ireland	3.47	Netherlands	5.01	USA	5.1
10	China	8.65	Netherlands	3.12	Brazil	2.72	India	4.34
11	France	8.41	New Zealand	3.21	Italy	2.39	Belgium	4
12	India	8.32	South Africa	2	India	2.32	Germany	3.98
13	Ireland	7.87	India	2	Malaysia	2.07	France	3.61
14	Brazil	7.83	Hong Kong	1.51	Ghana	2	South Africa	3.34
15	South Africa	7.21	Germany	1.06	Ireland	2	Austria	3.34

To analyze the geographic spread of the research activities in the journal further, the weighting scores and percentage values for various world regions were calculated, as shown in Table 12. The analysis shows that the major contributions are from Australia, North America, and Europe, particularly the Scandinavian countries, during all the sub-periods. However, it is also obvious from the data that the contribution of the leading regions shrinks over time. This suggests an increasing geographic spread of

authors over a period who published articles in the journal. In the first sub-period, there were authors from only 26 countries who published articles in the journal, and the number of countries (NC) of authors increased in the second and third sub-periods to 39 and 48 countries, respectively, as shown in Table 12.

Table 12: Contribution by regions in the three sub-periods

	2008–2012			2013–2016			2017–2019		
Regions	NC	Scores	%age	NC	Scores	%age	NC	Scores	%age
Australia	2	47.53	26.45%	2	28.07	17.18%	3	27.85	15.16%
North America	2	34.7	19.31%	2	14.25	8.72%	2	15.68	8.53%
Latin America	0	0	0	3	4.19	2.56%	2	6.65	3.62%
Scandinavia	4	58.01	32.28%	4	62.89	38.48%	4	46.57	25.35%
other European	6	28.91	16.09%	15	36.62	22.41%	17	51.78	28.18%
Asia	10	7.58	4.22%	9	9.8	6.00%	16	29.09	15.83%
Africa	2	3	1.67%	4	7.6	4.65%	3	6.12	3.33%
Total	26	179.73	100	39	163.42	100	47	183.74	100

3.5 Classification of articles by research methods

The research methods used by scholars in the journal to explore various aspects of project management are analyzed. As shown in Table 13, articles published in the IJMPB have been classified into six categories based on their research methodologies. The results show that the case study method occupies the top position (n=94 articles), followed by a mixed study (which used both interview and questionnaire survey for data collection). The results further show a decline in the number of case studies and conceptual studies and an increase in the number of review studies and surveys over a period. This may suggest that the way of expressing the thought content of researchers changed during the stated period. The analysis of methodologies of articles published in IJPM, PMJ, and IEEE Transaction of Engineering Management (IEE_TEM) from 1997 to 2007 also show that literature review, and case studies have been increased, whereas conceptual papers have been decreased significantly in IJPM and PMJ. The surveys have also increased in IJPM and IEEE-TEM and declined in PMJ (Söderlund, Morris, & Pinto, 2012). The possible reason for the varying trend of case studies can be the difference in stages of IJMPB and the aforementioned journals, which has discussed in detail in the subsequent section. However, the common trends in all these journals including IJMPB show that the research in project management is less quantitatively oriented.

Table 13: Classification of research methods

S.No.	Type of method	Number of methods			
		All	2008–2012	2013–2016	2017–2019
1	Case study	94	47	24	23
2	Review study	80	22	22	35
3	Conceptual study	80	34	29	17
4	Survey	70	14	24	32
5	Interview	80	27	25	28
6	Mixed method	93	37	28	28
7	other	25			

3.6 Classification of articles by industrial sector

The distribution of articles published in the IJMPB across different industrial sectors explains the level of application and diffusion of disciplines across sectors. The analysis showed that majority of the articles related to project management in a generic way and were grouped in the category of General, which consists of 377 articles (71.26%), as can be seen in Table 14. These articles focus on the general aspects of project management without specifying any industrial sector. Another chunk of articles (n=82 articles) focused on the construction industry, which includes various types of building-and infrastructure-related projects. Information technology (n= 45 articles) had the third highest number of related articles. This category included information technology(IT), information and communications technology (ICT), information services (IS), research and development (R&D), technology innovation, software, web development services, social media, and telecommunications. Furthermore, there were articles related to manufacturing (n=15 articles), energy (n=9 articles), agriculture (n=1 articles), and supply chain management (n=1 articles) published in IJMPB during the specified period. The classification of the articles by industrial sectors published in IJPM and PMJ during 1990- 1998 also show larger number of articles in general category followed by construction industry (Themistocleous & Wearne, 2000). However, there is no published article in these journals during the period (1990-1998) related to Information technology industry. This difference may explain that the information technology sector got attention from the researchers in project management field recent times as shown in the previous studies (Ayat, Imran, Ullah, & Kang, 2021; Kwak & Anbari, 2009).

Table 14: Classification of articles by industrial sectors

S.No.	Industrial sector	No. of Papers
1	General	377
2	Construction	82
3	Information technology	45
4	Manufacturing	13
5	Energy	9
6	Agriculture	1
7	Supply chain management	1

3.7 Content characteristics

All the articles published in the IJMPB since its inception until 2019 were grouped into seven categories based on their similarities in research themes. The procedure of categorizing articles based on their research themes has been explained in the methodology section appropriately. Each category is briefly discussed in the following sub-sections.

3.7.1 Project management knowledge areas

Project management knowledge areas are subjects related to the project management body of knowledge (PMBOK). Over time, this category received 139 articles, the highest number among all categories. The most frequent subjects are risk management (Fernando, Walters, Ismail, Seo, & Kaimasu, 2018; Hartono, 2018), project communication (Ziek & Anderson, 2015), stakeholder management (ElWakeel & Andersen, 2019; Nguyen, Chileshe, Rameezdeen, & Wood, 2019), project procurement (Noor, Khalfan, & Maqsood, 2013), project overruns (Asiedu & Adaku, 2019), and project governance (Lappi & Aaltonen, 2017). The large number of articles related to project management knowledge areas indicate their importance to the project management researcher community. Note that there are closely related categories to this category such as humane factor and skill development, project organization, and project management characteristics, which have been placed in separate categories to analyze them more precisely.

3.7.2 Human skills and performance

Human skills and performance attracted the second highest number of articles in the IJMPB. There were approximately 69 related articles in this category, including articles related to human skills, performance, and roles in managing projects. There were 23 articles in the subject area of project managers, the highest among all subjects in this category. Other subjects in this category include allocation and levelling of human resources (Celkevicius & Russo, 2018), importance of soft skills (Azim et al., 2010), capability development (McEvoy, Brady, & Munck, 2016), and formal training (Aramo-Immonen,

Koskinen, & Porkka, 2011). The category also consists of studies related to project leadership (Cullen & Leavy, 2017; Sankaran, 2018), client capabilities (Adam, Lindahl, & Leiringer, 2019), contractor skills (Taylor, Walker, & Maqsood, 2015), and project team (Emil Berg & Terje Karlsen, 2014). This indicates the importance of human skills in project management.

3.7.3 Project organization

There are 62 articles in this category project organization. This category comprises articles related to project management in various organizational setups, environments, and industrial sectors, such as information technology (Hadaya, Cassivi, & Chalabi, 2012), software development (Nilsson & Wilson, 2012), sanitation infrastructure (Beauséjour, 2009), small-and medium-sized enterprises (J. Rodney Turner, Ledwith, & Kelly, 2009), and business projects (Hoon Kwak, Watson, & Anbari, 2008). Further, the category also includes articles related to projectification (Godenhjelm, Lundin, & Sjöblom, 2015), temporary organizations (Nuhn & Wald, 2016), organizational design (Miterev, Turner, & Mancini, 2017), holding environment (Culmsee & Awati, 2012), organizational challenges (Aarseth, Rolstadås, & Andersen, 2013) and organizational productivity (Blomquist & Wilson, 2009).

3.7.4 Project management characteristics

There are around 50 articles published in IJMPB related to various aspects of project management. This is an important category of articles that discusses various topics such as project management standards (Hällgren, Nilsson, Blomquist, & Söderholm, 2012), project management contributions (Aubry, Hobbs, & Thuillier, 2009), flexibility of project management (Jalali Sohi, Bosch-Rekveldt, & Hertogh, 2019), ethics in project management (Müller & Bredillet, 2014), political and social dimensions of project management (Hodgson & Cicmil, 2008), changes in project management (Blomquist & Lundin, 2010), maturity in project management (Pasian, Sankaran, & Boydell, 2012), rethinking project management (Svejvig & Grex, 2016), and future of project management (Morris, 2010).

3.7.5 Project characteristics

This category consists of articles that discuss certain aspects of a project. There are around 36 IJMPB articles, which fall into this category. The most frequent research theme in this category is project success (Ika, Diallo, & Thuillier, 2011), project failure (Damoah & Akwei, 2017), project complexity (Sage, Dainty, & Brookes, 2011), project challenges (Matthews, Stanley, & Davidson, 2018), project reliability (Turner, Kutsch, & Leybourne, 2016), project marketing (John Rodney Turner & Lecoeuvre, 2017), project conflict prevention (Ross, 2009), and project environment (Li, Xu, Sun, & Ding, 2019). Some studies also have discussed the contexts of multi-organizational (Smulders, Lousberg, & Dorst, 2008), multi-national, and multi-discipline projects (Fox, 2009).

3.7.6 Learning and knowledge development

There are 24 articles focusing on learning and knowledge creation activities during project management. This stream includes learning from crisis in projects (Hällgren & Wilson, 2011), learning from a failed ERP implementation (Venugopal & Suryaprakasa Rao, 2011), learning theory (Jugdev & Mathur, 2013), and learning techniques (Ssegawa & Kasule, 2015). Knowledge integration (Koskinen, 2012), knowledge development and transfer in projects (Andersen & Vidar Hanstad, 2013), knowledge of virtual projects (Marabelli, Rajola, Frigerio, & Newell, 2013), effective knowledge creation in projects (Canonico, Söderlund, de Nito, & Mangia, 2013), knowledge management framework (D. E. Swain & Lightfoot, 2016), and systematization of knowledge management in projects (Davidson & Rowe, 2009).

3.7.7 Diverse category

About 42 articles have examined other diversified subjects such as innovation (Maqsood & Finegan, 2009), cultural differences and decision-making (Müller, Spang, & Ozcan, 2009), cross-cultural intelligence (Konanahalli et al., 2014), supply chain (Khalfan & Maqsood, 2012), sustainability (Agarchand & Laishram, 2017), academic and practitioner collaborative research(Walker et al., 2008), and mentorship in academia (Zackariasson, 2014).

4 Discussion of results

As discussed above, a sample of 522 IJMPB articles were analyzed in this study. The analysis shows a sudden increase in publications from 2018 onward in the journal. A possible reason for the abrupt increase in the number of articles is its indexing with the SSCI. The journal was first accepted by the SSCI in 2017 and received its first impact factor in 2018. The SSCI is a list of reputed and high-impact journals that meet strict quality criteria. Scholars consider this category of journals as highly prestigious. Therefore, attracting more articles by the journal after its acceptance of SSCI is the strongest reason. There can be other reasons, such as the gradual development of the journal and its diffusion among the larger researcher communities, and continuous evolution of the project management field.

The citation structure is an indicator of the impact and quality assessment of articles. The data show that articles published in IJMPB received a reasonable number of citations, which indicates the quality and popularity of the research work published in the IJPMB among scholars. Further, the results show that the citation structure of the IJMPB articles improves over time. However, articles published during the early years of the journal's establishment also received a higher number of citations, indicating the upright policy of publishing quality research in journals. To develop the journal in its early years, the founding editors adopted some careful measures to ensure publications from several well-established researchers. The analysis of frequently cited articles shows that topics such as project success, stakeholder management, capability development, procurement approaches, agile projects, PPP projects, and future project

management, received higher citations. Similarly, citation data covering the past three years of the sample area, as given in Table 4, also show studies related to the causes of project delays, project success, project strategy, agile project management, procurement management, project risk, and future of project management, among others. The highlighted articles can also be used as guidelines for scholars to identify the most interesting and influential subjects of research in the discipline.

The data further show that 793 authors from 58 countries and 370 academic and non-academic institutions published their research works in the IJMPB during the study period. This indicates the diffusion of project management discipline to a large group of authors across various regions worldwide. The study also shows that number of authors, institutions, and geographic spread in the research activities of the journal has increased over time. However, increase in the number of authors, institutions, and countries is more prominent during the third sub-period (2017–2019). This may reflect the evolution and growing reputation of the journal among researchers, particularly after its acceptance of SSCI. The results also show that multi-authored articles are higher in number, indicating that research in project management is more likely to be collaborative than solo. Another possible reason may be the extensive data collection procedures used in project management, which are difficult for a single author to perform in a solo study. Several reasons are attributable to the increase in multi-authored articles, such as the development of communication technologies, which have connected researchers across the world and make easy collaborations among the researcher community. As mentioned in Section 3, approximately 92.45% of the articles were published by authors affiliated with an academic institution. The large contribution by academicians from universities was also indicated by other review studies of various disciplines, including project management (Betts & Lansley, 1995), library sciences (Biswas, Roy, & Sen, 2017), and mathematics (Narang, 2004). This may reflect the limited involvement of practitioners in project management research activities. In other words, this may also refer to the gap between academic research and traditional project management tools used in the field. Authors and institutions from Australia, Europe, and South American countries are the most productive contributors to the field. This indicates a higher level of interest in the field of project management in these countries. In particular, the role of North European countries (i.e., the Scandinavian countries) in the development of project management is widely acknowledged. It is also evident from the results that Asian, African, and Latin American regions lag the leading regions in terms of contributions. This may refer to the existence of a gap in project management research activities in different regions worldwide. However, these regions have started to grow and are expected to increase project management research activities and their presence in the IJMPB. The results of the most contributing countries in this study are not much different from the list of the most contributing countries of the review study of IJPM written 25 years ago. This may provide a strong basis for project

management in these countries. At the same time, it may refer to the slow process of the diffusion of project management to new countries.

The results show a higher number of conceptual studies and case studies in the earlier sub-periods. This may partially reflect the involvement of a large number of senior researchers who used their projects as testbeds for new ideas instead of conducting empirical research. This is also supported by the results given in Table 6, which show a higher number of articles from senior authors connected to the editorial board in the earlier sub-periods. Further, the higher number of articles from senior authors in the early years of journal establishment may indicate the editorial board's efforts in the development of the journal. The results further reveal that literature review studies and studies using questionnaire surveys for data collection are increasing, while conceptual studies and case studies have been decreasing over a period. As the discipline of project management is evolving, the literature related to different aspects of project management is also growing. The continuous expansion in the literature may be a possible reason for the increase in the number of review studies. Further, the slowdown in conceptual studies may indicate the development and maturity of the discipline of project management. The growing complexity of projects creates new challenges and issues in managing projects. This may lead to an increase in the number of studies using survey questionnaires for data collection to understand and assess the issues raised in managing projects by recording the opinions of project stakeholders.

The data on industrial sectors reveal that the majority of studies were conducted on various generic subjects of project management. The knowledge areas of PMBOK are the focus areas of the discipline of project management, which provides standard rules and principles for all types of projects. This may be a possible reason for most of the articles focusing on various aspects of project management, irrespective of the nature of the project or the type of industrial sector. In other words, this indicates the generality of project management. Further, the results show that several articles focus on construction projects, including buildings, roads, bridges, and other infrastructure. The construction industry plays an important role in the development of the global economy, and the successful completion of construction projects is important for the sustainability and growth of the economy. This has led to the widespread application of project management tools in construction projects. There are also several studies on information technology, manufacturing, and energy. This indicates the application of project management across diverse sectors.

The subject analysis of the articles shows that project management knowledge areas had the highest number of articles from authors worldwide. The content analysis of IJPM and PMJ also indicates the importance of the project management topics related to knowledge areas including project risk management, time management, project cost, program management, project evaluation, stakeholder relationship (Crawford et al., 2006; Themistocleous & Wearne, 2000). This also specifies that the knowledge areas identified by PMBOK still remained the primary focus of the researchers.

The analysis of research themes shows that besides the PMBOK knowledge areas, human skill development, project characteristics, project organization, project environment, and continuous learning and knowledge development are important areas in project management. In addition to these areas, researchers have also focused on exploring the upcoming challenges, flexibility, diversity, and future of the discipline. Based on the above discussion, we can conclude that the focus of the discipline of project management is PMBOK knowledge areas. The discipline is flexible, diverse in its application, and dynamic in nature.

5 Conclusion

This study presents a comprehensive overview of a sample of 522 articles published in the IJMPB and provides a detailed perspective on the evolution and development of the journal. The study analyzes the annual trends in publications, geographic spread, contributions of authors and institutions, authors' collaboration, citation structure of articles, industrial sectors, research methods, and content analysis of articles. The results show that the journal accommodated scholarly contributions from 793 authors affiliated with 370 institutions across 58 countries. The results also show that a large number of articles originated in Australia and the Scandinavian countries. However, during the past few years, particularly after the journal's acceptance to the SSCI, there has been a huge geographic spread in articles. This indicates the evolution of the journal and also project management activities across different areas of the region. The higher degree of collaboration in the articles denotes that project management is predominantly collaborative rather than solo research.

Further, the number of literature studies and quantitative studies has increased, where case studies and conceptual studies have decreased over time. This suggests a shift in the types of research methods used in project management. The majority of articles are related to generic project management, notwithstanding the nature of the projects and type of industry. Several articles focus on construction projects, followed by the IT sector, and manufacturing projects. Similarly, content analysis indicates that the majority of studies focus on the project management knowledge areas of PMBOK. However, there are several subjects, including human skills development, project characteristics, project organization and environment, knowledge development, learning theories, innovations, and culture. Furthermore, the continues increase of the impact factor of IJMPB over the years indicates the popularity of the work published in this journal among researchers' community. It also shows the commitment and effort of the editorial board to process and publish only quality of research articles from the beginning of the journal. In short, the study suggests that the IJMPB is likely growing, exploring new aspects, reaching new industrial sectors, and geographic regions over time. The study limitations and future research agenda are as follows.

5.1 Limitations of the study

Although this study provides a comprehensive overview of the leading trends in IJMPB, it has a few limitations.

- Several academic journals have published articles related to different aspects of project management. As this study performs a single journal review, it may not provide a complete picture of the leading trends in project management.
- This study assesses publication trends, citation structure, and contributions of authors, their institutions and origins, as well as research subjects, industrial sectors, and research methodologies of the journal through an in-depth content analysis, which provides important information to stakeholders. However, more effort may be required to assess quality by conducting a comparative analysis using contemporary journals in the field.
- After a rigorous method of content analysis, subjects were grouped into seven categories. However, some articles may overlap in these categories.

5.2 Future recommendations

Based on our analysis, we suggest the following future research recommendations.

- The IJMPB was accepted as a social citation index in 2017. Three years may not be adequate to assess the impact of the SSCI indexing on the journal. Therefore, it may be reassessed after a few years to understand the impact of the SSCI indexing on the IJMPB and stability in the project management discipline.
- This was a single-journal review article. In future, a comparative study of the IJMPB with other contemporary project management journals will provide more information about the evolution of these journals and the discipline of project management.

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