Forty years of Computers & Industrial Engineering: A bibliometric analysis

Christian Cancino [a], José M. Merigó [a,*], Freddy Coronado [a], Yasser Dessouky [b], Mohamed Dessouky [c]

[a] Department of Management Control and Information Systems, School of Economics and Business, University of Chile, Av. Diagonal Paraguay 257, 8330015 Santiago, Chile
[b] Department of Industrial and Systems Engineering, San Jose State University, San Jose, California, CA 95192-0085, USA
[c] Department of Industrial and Systems Engineering, University of Southern California, 3715 McClintock Avenue, Los Angeles, CA 90089-0193, USA

ARTICLE INFO

ABSTRACT

Computers & Industrial Engineering (CIE) is a leading international journal in the field of industrial engineering, whose first issue was published in 1976. Motivated by its 40th anniversary in 2016, this study aims to develop a bibliometric analysis of the publications of the journal between 1976 and 2015. The objective is to identify the leading trends of the journal in terms of impact, topics, universities and countries. In doing so, the work uses the Web of Science Core Collection database to analyze the bibliometric data. Additionally, the work also uses the visualization of similarities (VOS) viewer software to map graphically the bibliographic material. The graphical analysis uses bibliographic coupling, co-citation, citation, co-authorship and co-occurrence of keywords. This paper also offers an editorial perspective of the journal's policy, editorial process, and performance progress.

© 2017 Elsevier Ltd. All rights reserved.

1. Introduction

Computers & Industrial Engineering (CIE) is one of the leading journals in the field of industrial engineering. Dr. Hamed K. Eldin, the founding editor, published the first issue in 1976. The publisher of the journal was Pergamon press, which was later acquired by Elsevier. In 1998, Mohamed Dessouky from the University of Southern California, USA, became editor-in-chief after Eldin passed away unexpectedly in December 1997. Today, the journal is very well recognized in the scientific community. In the 2016 Journal Citation Reports of Thomson & Reuters Web of Science, CIE had an impact factor of 2.623 and was ranked in the 9th position out of 44 journals in the Web of Science category of Engineering, Industrial. The journal also appears in the Web of Science category of Computer Science, Interdisciplinary Applications in the 28th position out of 105 journals.

In 2016, the journal celebrated its 40th anniversary. This milestone stimulated an interest in conducting a general bibliometric analysis of the principal trends that have occurred in the journal during this period. The study analyzes the productivity and influence of the journal and shows the leading topics, authors, institutions and countries. For doing so, the work uses the Web of Science (WoS) Core Collection database to collect and analyze the bibliographic material. Moreover, the paper also uses the visualization of similarities (VOS) viewer software (Van Eck & Waltman, 2010) to map graphically the bibliographic data. For developing the mapping analysis, the work uses bibliographic coupling (Kessler, 1963), co-citation (Small, 1973), citation, co-authorship and co-occurrence of keywords. Note that Uys, Schutte, and Van Zyl (2011) developed a textual analysis perspective of CIE. However, still nobody has developed a general bibliometric overview of the journal.

In the literature, it is very common to develop some special activities when the journal reaches a significant anniversary including the organization of an editorial (Barley, 2016; Shugan, 2006), a review (Van Fleet et al., 2006) or a special issue (Meyer & Winer, 2014). Particularly, it is very interesting to develop a bibliometric overview of the journal because it gives some general and historical results that permit to develop a retrospective evaluation (Schwert, 1993). Many studies have already been developed a long time ago (Heck & Bremser, 1986). However, in recent years it is becoming very popular and practical, due to the strong technological development of computers and internet over the last years. For example, García-Merino, Pereira-do-Carmo, and Santos-Álvarez (2006) developed a bibliometric analysis of the first twenty-five years of Technovation, Biemans, Griffin, and Moenaert (2007) of the first twenty years of Journal of Product Innovation Management and Dereli, Durmusoglu, Delibas, and Avlanmaz (2011) of the papers published in Total Quality Management & Business

* Corresponding author.
E-mail addresses: cancino@fen.uchile.cl (C. Cancino), jmerigo@fen.uchile.cl (J.M. Merigó), fcoronadom@fen.uchile.cl (F. Coronado), yasser.dessouky@sjsu.edu (Y. Dessouky), dessouky@usc.edu (M. Dessouky).

Excellence between 1995 and 2008. Merigó, Mas-Tur, Roig-Tierno, and Ribeiro-Soriano (2015a) developed a bibliometric overview of the Journal of Business Research between 1973 and 2014 and Cobo, Martínez, Gutiérrez-Salcedo, Fujita, and Herrera-Viedma (2015) for the first twenty-five years of Knowledge-Based Systems. Recently, motivated by the thirtieth anniversary, Merigó, Blanco-Mesa, Gil-Lafuente, and Yager (2017) presented an overview of the International Journal of Intelligent Systems and Valenzuela, Merigó, Johnston, Nicolás, and Jaramillo (2017) of the Journal of Business & Industrial Marketing. Finally, note that nowadays, there are many studies published in this direction and probably in the future (Laengle et al., 2017).

This paper first presents an editorial perspective of journal's history, policy, editorial process and performance. Section 3 briefly describes the bibliometric methods used throughout the paper. Section 4 presents the bibliometric results of the WoS Core Collection and Section 5 develops a graphical analysis of the bibliographic material. Section 6 gives a short description of the main findings and conclusions of the paper.

2. Editorial perspective

From the first year of its publication, 1976, Computers & Industrial Engineering sponsored the first of a series of conferences labeled "International Conference on Computers & Industrial Engineering (ICC&IE)", which continued without interruption until today. From the beginning, the journal followed a rigorous double-blind review process. The publication offered one volume of 4 issues in this first year. In subsequent years it expanded to contain 2 volumes of 4 issues each a year. It contained a good number of special issues dedicated to topics of current interest. However, it also offered special issues containing selected papers from the proceedings of the ICC&IE, which were not reviewed. This practice was discontinued in the early 2000s since it shed a doubt on the rigor of reviewed papers. At about the same time, the journal sought to enhance the rigor and quality of the published papers by appointing area editors specialized in the areas which they are handling.

Table 1
CIE submission rejection statistics.

Year	CAIE submission rejection statistics Submissions						
	TS	DR	% DR	ER	% ER	TR	% TR
2006	533	54	10.13%	96	18.01%	150	28.14%
2007	688	130	18.90%	287	41.72%	417	60.61%
2008	734	245	33.38%	301	41.01%	546	74.39%
2009	850	183	21.53%	258	30.35%	441	51.88%
2010	971	216	22.25%	319	32.85%	535	55.10%
2011	1.089	273	25.07%	382	35.08%	655	60.15%
2012	1.126	301	26.73%	347	30.82%	648	57.55%
2013	1.147	354	30.86%	432	37.66%	786	68.53%
2014	1.255	478	38.09%	430	34.26%	908	72.35%
2015	1.663	603	36.26%	559	33.61%	1.162	69.87%
2016	1.805	656	36.34%	701	38.84%	1.357	75.18%
Total	11.861	3.493	29.45%	4.112	34.67%	7.605	64.12%

Abbreviations: TS = All submissions made in the year; DR = Desk rejections returned by editors without entering the editorial process; %DR = Percentage of desk rejections to total submissions; ER = Editorial rejections rejected by editors after editorial reviews; %ER = Percentage of editorial rejections to total submissions; TR = Total rejections; % TR = Percentage of total rejections to total submissions.

Table 2
Computers & Industrial Engineering key indicators.

Year	TC	JIF	IF-SC	5Y-IF	CiteScore[a]
1997	397	0.117	0.096	N/A	N/A
1998	447	0.105	0.076	N/A	N/A
1999	467	0.093	0.063	N/A	N/A
2000	540	0.128	0.128	N/A	N/A
2001	656	0.391	0.372	N/A	N/A
2002	735	0.270	0.260	N/A	N/A
2003	909	0.413	0.391	N/A	N/A
2004	906	0.632	0.557	N/A	N/A
2005	960	0.347	0.300	N/A	N/A
2006	1.487	0.650	0.566	N/A	N/A
2007	1.538	0.554	0.505	1.058	N/A
2008	2.389	1.057	0.973	1.637	N/A
2009	3.161	1.491	1.215	2.055	N/A
2010	3.179	1.543	1.265	1.823	N/A
2011	3.499	1.589	1.293	1.872	2.92
2012	4.135	1.516	1.248	2.028	2.78
2013	5.060	1.690	1.369	2.382	2.81
2014	5.700	1.783	1.553	2.412	2.80
2015	6.359	2.086	1.674	2.517	3.13
2016	8.227	2.623	2.128	2.859	3.41

Abbreviations: TC = Total citations; JIF = 2-year impact factor; IF-SC = Journal impact factor without journal self-cites; 5Y-IF = 5-year impact factor.

[a] CiteScore measures the average citations received per document published in this title. CiteScore values are based on citation counts in a given year to documents published in three previous calendar years, divided by the number of documents in these three previous years.