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Additional Information

Customer Relationship Management (CRM): A Bibliometric Analysis

Keywords

Customer Relationship Management; CRM; Business Intelligence; Marketing; Customer Service; Services; Sales Force Automation.

Abstract

This is a bibliometric study of the publications about Customer Relationship Management (CRM), as one of the nowadays most implemented and extended Enterprise Management Software. The objective of this paper is twofold: on the one hand to analyze the impact and focus of influence of the different authors and entities that have been researching on CRM, and secondly to determine (based on the results of the bibliometric study of the publications on CRM) if it may be of interest to investigate and deepen the benefits and impact on CRM results as a modern and leading enterprise management solution.

Bibliometrics is a fundamental field of information science that studies bibliographic material quantitatively. This study presents a bibliometric overview of CRM research using the Web of Science database, identifying the most prolific and influential journals, authors, institutions and countries, considering the period since 1900 to 2017. A database with 1.685 results has been analyzed, showing as main results that Expert Systems with Applications is the most prolific Source title or journal in the field, Verhoef P.C. from Groningen University is the most cited author and Van den Poel D. from Ghent University is the most prolific author with 31 published papers. Ghent University is the most productive institution with the highest number of published papers, and University of Maryland College Park has published the most cited papers. It also shows that USA is definitely the most influential Country with the highest number of published papers (the second one is UK with nearly the third of publications) and with the highest number of citations (again, the second one is UK with the fifth part of citations that USA). Specially interesting the rank of Spain, where the investigation is taking place, with the eight rank on published papers and the twelfth rank on paper citations.

Based on the results, we can conclude that, effectively and as it was assumed, CRM is a booming and very interesting solution as a trending topic to continue researching in subsequent papers.

Introduction

This document is a workout studying the influence that Customer Relationship Management (CRM) is having among the modern business world. This technology is one of the modernist components of the Business Intelligence suite (Dumas et al., 2018), specifically focused on the customer (external) information (Negash and Gray, 2008). The main objective of this paper will therefore be to review the literature on previous bibliometric studies, and in case of not finding any modern study of a complete scope on CRM, develop a bibliometric study on CRM that allows to know the most influential sources of information and research on technology, and identify the most influential papers for further studies on the value and applicability of the benefits of using CRM in modern companies.

CRM was initially considered a key tool for managing and optimizing the sales force automation. Since the 1970s where it was firstly launched into the market (Buttle, 2004), CRM has been experienced a process of adaptation to the modern business needs, mostly in a very changing and dynamic world where changing needs makes more and more critical the use of a customizable tool. Nowadays, one of the most challenging hits for a successful enterprise is to convert the collected data into actionable information, and here CRM becomes a key technical solution as a valuable tool for identifying, extracting and transforming data into it.

44 This is how enterprises demand and receive more return from their investments, especially with applications
45 such as sales-force automation, service automation, and marketing automation.

46 Seeing the market value and specifications for CRM and matching them with the most valuable features for
47 successful firms in the modern competitive market, this paper plans to state the influence and value of this
48 CRM technology through a bibliometric study of the published papers about its content, value, benefits, and
49 influence. This paper plans to review firstly the literature about the solution CRM, and secondly about
50 bibliometrics (the science that will help us understand which the most valuable focus of research activity
51 around CRM are).

52 After literature review, there is a description of the methodology for getting a clear picture of the volume
53 and influence of published researches and studies. The raw tables for the publishing journals are presented
54 in this study ranked per timely evolution, per number of citations, per prolific and influential authors, per
55 productive and influential institutions, and finally per Country.

56 The conclusion has to be with the growing influence that CRM is having day after day, and with the core
57 authors, core institutions, and core countries for CRM technology investigation efforts. The main outcome
58 is then the global actual picture where CRM investment is being located, and the most influential papers and
59 researchers that may help understand the market value of CRM.

60 These outcomes give rise to subsequent studies on CRM, to determine the impact of the use of this technology
61 on business results and on the improvement of the supplier-customer relationship in a sustainable business
62 management environment.

63 **Literature Review**

64 This paper follows the Bibliometric analysis methodology, a scientific methodology for studying and
65 classifying bibliographic material quantitatively. Recent studies showed that bibliometrics can provide a lot
66 of information regarding a research discipline. Nowadays it has become a very popular way to assess the
67 state of the art of a scientific discipline, mostly with the actual easy access to scientific literature through the
68 Internet (Allen et al., 2009). The objective of this study is to identify the most influential research and the
69 main trends over time for the subject we are interested on, being for this a very useful tool bibliometrics as
70 it provides a general picture of the research area in study.

71 ***Customer Relationship Management (CRM)***

72 CRM was born in the 1970s, as a new tool for managing and optimizing the sales force automation inside
73 the Enterprises (Buttle, 2004). CRM has arrived nowadays to be one of the most popular tools for Enterprise
74 Information Management, not only for sales and marketing purposes by helping organizations manage
75 customer interactions more effectively (King and Burgess, 2008) but also for knowledge management and
76 for organizational behavior understanding. CRM was defined as a combination of processes, people and
77 technology looking for the best understanding of a company's customers (Chen and Popovich, 2003). It is
78 also the modern integration approach of relationship management when customer retention and relationship
79 management is the main focus.

80 CRM has become a way to survive in a globalized market where enterprises need to gain competitive
81 advantages, not only the leading-edge ones but also all the competitive targeted ones (Buttle, 2004).
82 Customer Relationship Management is much more than a software to install, it is a real reinvention of the
83 way we do business, the way we put the customer in the main and definite central point of all our view and
84 efforts (Chen and Popovich, 2003; Guerola-Navarro et al., 2020). In this world were all the industrial and
85 final customers expect to be cared and dealt as special and irreplaceable ones, the information got in the past
86 about customers and relationships becomes critical and valuable from the beginning to the end. CRM has
87 become a business necessity not only for High sized enterprises but also for the Small and Medium
88 enterprises wanting to compete and survive in the twenty-first century. For these enterprises there is the clear
89 need to become customer-centric focused and firmly decided to reach the targeted Customer Loyalty.

90 Customer loyalty is the most valued outcome of marketing from a relational perspective. Relationship
91 marketing is the global marketing approach to offering more than a core product in order to satisfy the long-
92 term value needs for the customers (Grönroos, 1997). Customer Relationship Management is a key tool for
93 adopting a true relational marketing plan and for considering the customer is in a relational mode. Despite

94 of the initial bad publicity that CRM had with high levels of failure during project implementations, Customer
95 centric orientation makes really CRM a valued and needed technology that seems to be here to stay.

96 *Bibliometrics*

97 Regarding bibliometrics, there was provided a first definition focused on the use of this discipline in the
98 1980s, leaving the concept open for further development (Broadus, 1987). This initial concept has been
99 modernly updated by (Bar-Ilan, 2008) from the general perspective of informetric, having said that the
100 Internet has potentized the scope of these studies. Bibliometric studies have evolved since then, incorporating
101 new technologies as key tools to determine the influence of authors, institutions, countries, etc. in the field
102 of scientific and research publications. In the most recent publications, the influence of the use of powerful
103 computer tools for data analysis is observed, especially in terms of data processing capacity when large
104 volumes of information are available (Deng and Lin, 2012; Yin, 2013; Cadez, 2013; James et al., 2015;
105 Zyoud and Fuchs-Hanusch, 2017; Liang and Liu, 2018). In the current bibliometric studies on Big Data and
106 Business Intelligence, we can clearly see the importance and increasing impact that these tools are having on
107 the ability to process data in general, and as a focus of bibliometric study in particular (Liang and Liu, 2018;
108 Vicedo et al., 2018; Gil et al., 2010).

109 Looking into the most popular topics for bibliometrics studies, there is still not a huge amount of publications
110 about CRM, but this study shows how CRM interest has been significantly growing-up during last years all
111 over the scientific world. CRM has been identified as one of the greatest technological contributions to
112 enterprises in the 21st century (Chao et al., 2007). Despite of the impact of CRM in the modern management
113 structures, there are still few studies based on bibliometrics analysis for CRM. It also studied the technology
114 trends and forecasts of CRM from 1991 to 2005 (Chao et al., 2007). It was compared data mining and CRM
115 trends using bibliometrics for years 1989 to 2009 by (Tsai, 2011). The present paper has the aim to extend
116 the period of bibliometrics research until 2017, given that CRM is one of the most relevant technologies in
117 modern era for increasing workforce productivity in the Information Age (Attaran et al., 2019).

118 Nevertheless, there are many sciences and research areas where Bibliometrics has been used since it was
119 introduced in the 1980s. Seeing the influence areas of CRM as Management solution, is very interesting to
120 evaluate how bibliometrics has been empowering the research studies about three directly related areas:
121 Management, Economics, and Marketing. Economics has been one of the sciences where more attention has
122 been put on by bibliometric analysis from multiple perspectives. The influence of economic journals was
123 studied by several researchers (Autor, 2012; Card and DellaVigna, 2013; Kocher and Sutter, 2001; Laband,
124 2013; Laband and Piette, 1994; Stern, 2013; Sternberg and Litzenberger, 2005; Süßmuth et al., 2006),
125 identifying the most influential journals, authors, and institutions. Marketing has been another focus area for
126 these studies. Citation analysis was used for analyzing the influence of marketing journals (Baumgartner and
127 Pieters, 2003), and a ranking between the publications in the major journals was established (Tellis et al.,
128 1999). Some other studies have analyzed the influence of marketing scholars, institutions and countries (Chan
129 et al., 2009; Chan et al., 2012a; Chan et al., 2012b; Stremersch and Verhoef, 2005). One of the many
130 disciplines where bibliometrics has been used is the paper by Podsakoff et al. (2008) in Management; in this
131 study the authors developed a method for identifying the most influential authors and institutions, through
132 the number of publications and the citation analysis. Similar studies in management developed by other
133 authors are available, including (Gomez-Mejia and Balkin, 1992; Kirkpatrick and Locke, 1992; Trieschmann
134 et al., 2000).

135 Having said that CRM has not been one of the most popular subjects of bibliometrics study, this paper aims
136 to place the most important centers of influence of CRM within recent scientific literature. These centers of
137 influence, having reviewed previous bibliometric studies, should logically be considered among the authors,
138 entities, journals, and most influential countries on this subject. The methodology used to detect these centers
139 of influence as well as their relative importance in the world of CRM publications are detailed below.
140 Subsequently, they present the results of the bibliometric study carried out with the data on the publications
141 from the beginning of the years until the end of 2017.

142 **Methodology**

143 The final objective of this paper is to study the impact of the publications of each author, entity, country, etc.
144 for which a methodology that reviews and measures the productivity of each of them is used, mainly and as

145 previously stated, through the number of publications, number of citations, and the h-index. This
146 methodology is explained below, as well as the results obtained.

147 This article analyses the information got through considering total number of papers, total citations and the
148 h-index (Merigó et al., 2015), including authors, institutions and countries in the study. There have been
149 several approaches on how to classify the value of research (Podsakoff et al., 2008):

- 150 - The publication count has usually been considered as the best measure for establishing the
151 productivity of an author, institution or country (Borokhovich et al., 1995), but it has many
152 limitations because there is no fixed way to determine how to compare and differentiate the specific
153 nature of each paper.
- 154 - The use of the impact factor provided by WoS has been criticized, despite of having been commonly
155 accepted traditionally as relevant indicator. Nowadays, it is becoming more relevant to use a five-
156 year impact factor, due to the easiness of manipulation of the impact factor by using a self-citation
157 policy.
- 158 - The number of citations is the most common indicator for measuring the influence of a paper, author,
159 institution or Country, despite of having also some limitations on measuring the relevance of this
160 indicator.
- 161 - A highly accepted index is the *h*-index (Hirsch, 2005). This index combines publications and
162 citations under same framework. An *h*-index of 50 for a set of papers means that at least 50 papers
163 have received 50 citations or more. The combination of publications and citations seems to be really
164 valuable information, but it has still some limitations.

165 The database that is going to be used is Web of Science (WoS), owned by Thomson & Reuters. WoS covers
166 most of the known scientific disciplines with more than 50.000.000 papers in more than 15.000 journals. We
167 assume that WoS refers only high-quality journals, with on time publication and review of papers, scientific
168 criteria for reviewing process and a wide dissemination through the Internet and most used channels for
169 scientific papers publication. Regarding authorship and institutions, one unit has been given to each author
170 or institution that have contributed to the paper. Talking about authorship, this paper tries to identify the
171 influence and productivity for each of them, being the publication count a reflect of the number of papers
172 published for each author, it does not mind if the papers are single authored or not. This is the way to detect
173 the authors with highest number of papers published, giving a general view of the total production of each
174 author.

175 There is not a specific section in WoS for CRM, or even for Business Analytics, so there is the need for
176 refine the results by filtering and considering and/or dismissing the results depending on the main focus of
177 the journals and the papers included on them. The Database "Web of Science Core Collection" is the core
178 one for this study, included in the Web of Science. Currently there is no category like "Data mining" or
179 "Business analytics" that may be the most fitting ones for this study research, so there is the need for looking
180 for the best categories and searching areas to describe the study focus. Considering the subject in study, the
181 interesting topics to select have been: "CRM" OR "Customer Relationship Management", that are the
182 acronym and the complete name of the subject in study. Closing year 2017, the timespan for this study will
183 be from 1900 to 2017, receiving a global amount of 10,038 results from Web of Science Core Collection
184 related to these topics and timespan. The 2018 results will not be considered because there are still some of
185 them being revised and for some months expected to be published, and that would made not consistent the
186 static view of the global picture at the moment.

187 Considering the areas where Customer Relationship Management can be determinant main topic of study,
188 further fine tuning has been to select the following refining categories in the left tree of Web of Science with
189 a global amount of 3,543 results:

- 190 - BUSINESS (1,245),
- 191 - MANAGEMENT (1,022),
- 192 - COMPUTER SCIENCE INFORMATION SYSTEMS (1,020),
- 193 - OPERATIONS RESEARCH MANAGEMENT SCIENCE (576),
- 194 - COMPUTER SCIENCE THEORY METHODS (563),
- 195 - COMPUTER SCIENCE INTERDISCIPLINARY APPLICATIONS (547),
- 196 - ECONOMICS (338),
- 197 - INFORMATION SCIENCE LIBRARY SCIENCE (290),
- 198 - COMPUTER SCIENCE SOFTWARE ENGINEERING (248),

199 - BUSINESS FINANCE (150).
 200 Another important field for refining has been to select the Document Types interesting for this research:
 201 ARTICLE (1,646), REVIEW (35), NOTE (0), LETTER (4). The Results shown in the final research have
 202 been a global amount of 1,686.
 203

204 Results

205 This section presents the main results found in WoS concerning the publishing journals in CRM research,
 206 the evolution of published papers, the most cited papers, the most prolific authors, institutions and countries.

207 *Publishing journals*

208 The most influential Journals or Source Titles in the CRM field are clearly EXPERT SYSTEMS WITH
 209 APPLICATIONS and JOURNAL OF MARKETING, assessed by the different variables considered in this
 210 study, mainly considering the h-index and number of papers with more than 100 citations. The second group
 211 of influence is composed by INDUSTRIAL MARKETING MANAGEMENT, JOURNAL OF THE
 212 ACADEMY OF MARKETING SCIENCE, DECISION SUPPORT SYSTEMS, and JOURNAL OF
 213 BUSINESS RESEARCH, again considering the h-index and the total number of papers published by them
 214 and their citations. The rest of the Journals are ranked in this study according to their influence. There are
 215 four columns showing the number of papers with more than 100, 50, 25 and 10 citations, as the way for
 216 considering the influence of each paper published in these journals.

217 In Table 1 there are shown the results of this research. EXPERT SYSTEMS WITH APPLICATIONS and
 218 JOURNAL OF MARKETING have published the most cited papers in CRM, especially considering the
 219 JOURNAL OF MARKETING that has the highest number of citations (4.885) despite of being the third one
 220 regarding published papers what makes for it the highest ratio of total citations per published paper (143,68).
 221 The Journal or Source Title with highest number of published papers is EXPERT SYSTEMS WITH
 222 APPLICATIONS with 88.
 223

Table 1. The 20 most influential CRM research journals according to WoS

R	Name	h	TC	TP	TC/TP	>100	>50	>25	>10	IF	5-IF
1	EXPERT SYSTEMS WITH APPLICATIONS	32	3.094	88	35,16	6	17	42	69	3.768	3.711
2	JOURNAL OF MARKETING	29	4.885	34	143,68	16	23	30	32	7.338	9.592
3	INDUSTRIAL MARKETING MANAGEMENT	26	2.105	57	36,93	4	13	26	42	3.678	4.488
4	JOURNAL OF THE ACADEMY OF MARKETING SCIENCE	20	2.381	31	76,81	6	13	18	23	8.448	9.810
5	DECISION SUPPORT SYSTEMS	20	1.894	29	65,31	5	11	17	26	3.565	4.574
6	JOURNAL OF BUSINESS RESEARCH	19	1.446	33	43,82	4	10	14	25	2.509	3.689
7	MARKETING SCIENCE	16	1.004	20	50,20	2	8	16	17	2.794	3.918

8	JOURNAL MARKETING RESEARCH	OF	15	1.516	21	72,19	3	9	12	16	3.854	5.678
9	INDUSTRIAL MANAGEMENT DATA SYSTEMS		14	776	33	23,52	1	5	8	16	2.948	2.724
10	MANAGEMENT SCIENCE		14	578	19	30,42	0	2	11	16	3.544	4.927
11	JOURNAL INTERACTIVE MARKETING	OF	13	949	18	52,72	3	6	11	14	3.864	9.472
12	JOURNAL SERVICE RESEARCH	OF	13	1.547	18	85,94	3	8	11	14	6.842	7.099
13	EUROPEAN JOURNAL MARKETING	OF	11	569	19	29,95	2	2	6	12	1.497	2.545
14	JOURNAL BUSSINESS & INDUSTRIAL MARKETING	OF	10	333	29	11,48	0	1	3	9	1.833	2.062
15	TOTAL QUALITY MANAGEMENT & BUSINESS EXCELLENCE		10	339	28	12,11	0	0	3	10	1.526	1.971
16	JOURNAL SERVICES MARKETING	OF	10	313	20	15,65	0	1	3	10	2.408	2.817
17	SERVICE INDUSTRIES JOURNAL		7	171	17	10,06	0	0	2	5	1.258	1.686
18	LECTURE NOTES IN COMPUTER SCIENCE		6	192	37	5,19	0	1	1	4	0.402	-
19	AFRICAN JOURNAL BUSINESS MANAGEMENT	OF	4	67	18	3,72	0	0	0	1	1.105	1.105
20	MARKETING AND CONSUMER BEHAVIOR: CONCEPTS, METHODOLOGIES, TOOLS, AND APPLICATION		0	0	23	0,00	0	0	0	0	-	-

Abbreviations: R = Rank; Name = Name of the Journal or Source Title; h = h-index; TC = Total Citations; TP = Total Papers; TC/TP = ratio total Citations per Published Paper; >100, >50, >25, >10 = number of papers with more than 100, 50, 25, 10 citations; IF = Impact Factor 2017; 5-IF = five-year Impact Factor 2017.

224

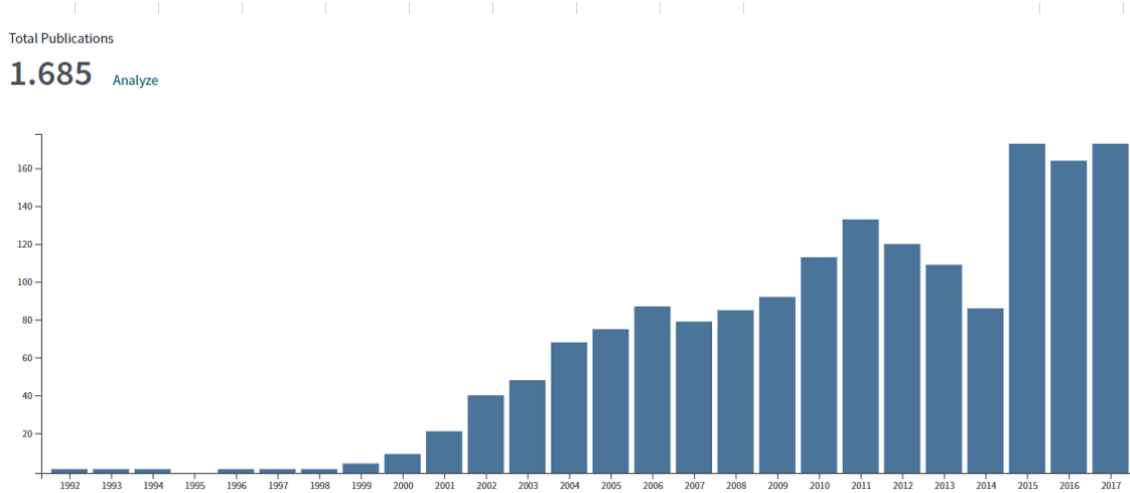
225 The second influence group considers INDUSTRIAL MARKETING MANAGEMENT, JOURNAL OF THE
226 ACADEMY OF MARKETING SCIENCE, DECISION SUPPORT SYSTEMS, and JOURNAL OF

227 BUSINESS RESEARCH, all of them with pretty higher number of citations than the next influence group,
 228 but far from the two first ones. INDUSTRIAL MARKETING MANAGEMENT has the second highest
 229 number of published papers (57) even higher than the JOURNAL OF MARKETING mentioned above in the
 230 first influence group of Journals. On other hand, the JOURNAL OF THE ACADEMY OF MARKETING
 231 SCIENCE has the second globally highest ratio of total citations per published paper (76,81). Important to
 232 say the four Journals included in this group, have higher ratio of total citations per published paper than the
 233 first ranked one EXPERT SYSTEMS WITH APPLICATIONS which has the highest number of published
 234 papers (88).
 235

236 *Evolution of published articles*

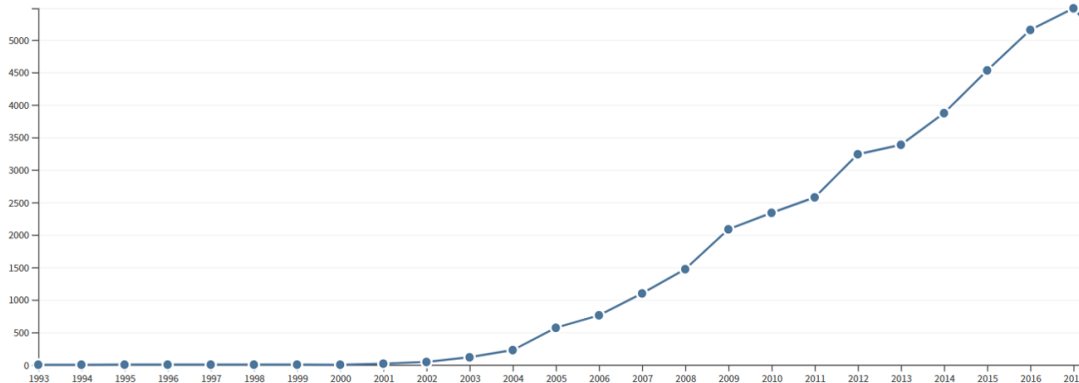
237 As shown in Table 1, there are only 5 journals with at least 20 published papers about Customer Relationship
 238 Management, and only 7 Journals with more than 1.500 citations. That means that CRM has not a currently
 239 relevant position as research field in WoS.

240 Despite of not being a very common research field in WoS, Fig 1 shows that CRM is becoming an
 241 increasingly threated subject of research in the last decade. As it is shown in Fig 1, CRM started being studied
 242 in 1992 with only 1 testimonial article, and it was in year 2000 when it started the takeoff with 9 papers. It
 243 has doubled in 2001 with 21 papers, and it was growing with lineally progression until the 133 papers in
 244 2011. Then the .com enterprises entered in a crisis period that made this research topic lineally decrease of
 245 interest until the 86 papers in 2014. The three last columns, corresponding to the last three years, show the
 246 impact and the influence of this topic as high potential research topic for nowadays, with 174 papers in 2015,
 247 164 papers in 2016, and 173 papers in 2017.
 248



249
 250 *Fig 1. Number of annual publications in CRM in WoS (articles, letters, notes, and reviews) since 1900*

251
 252 On other hand, concerning number of citations, Fig 2 show how the papers on CRM started increasing the
 253 number of citations from the 1 citation in year 2000 until the 5.490 citations in 2017, again with a lineal
 254 progression that shows how the potential and influence of this research topic has become more and more
 255 important and relevant.
 256



257
258

Fig 2. Number of annual citations in CRM in WoS (articles, letters, notes, and reviews) since 1900

259

260 Furthermore, if we look to the Table 2 the citation structure for the 1.685 considered papers, we can firstly
261 see that the number of citations is very low compared to other disciplines where several papers receive more
262 than 1.000 citations (Merigó et al., 2015). Other relevant conclusion is that it is worth studying only the
263 period since year 2000 to 2017, as the research results are nearly the same that in all time period research.
264 Furthermore, it is clear that most of the papers receive less than 50 citations (1.3334 papers that makes the
265 80% of the global studied 1.685 results).

266

Table 2. General citation structure in CRM research in WoS

Citations	All time		2000 – 2017	
	Number of papers	% Papers	Number of papers	% Papers
> 500 citations	4	0,237	4	0,239
> 200 citations	32	1,899	31	1,851
> 100 citations	88	5,223	86	5,134
> 50 citations	227	13,472	224	13,373
<= 50 citations	1.334	79,169	1330	79,403
Total	1.685	100,000	1675	100,000

267

The most influential articles in CRM research of all time

268

269 Over the last decade, more widely since year 2000, many influential papers have been published in CRM
270 research. Table 4 shows a list with the 50 most cited papers in CRM of all time. Analyzing this table there is
271 a clear view on which are the most influential papers in CRM research.

271

272 The Journal of Marketing has 13 papers in the list, being the journal with highest number of papers in the
273 list. Next there are two journals with 4 papers each one in the list, namely Journal of the Academy of
274 Marketing Science, and Decision Support Systems. With 3 papers in the list there are several journals or
275 source types: Expert Systems with Applications, Industrial Marketing Management, Journal of Service
276 Research, and MIS Quaterly.

276

277 The most cited paper of all time in CRM research in the list, was published in 2003 by Burnham, Frels,
278 and Mahajan, with 592 citations currently. There are three other papers that have also received more than
279 500 citations: the second one was published by Reinartz, Krafft, and Hoyer in 2004, the third one by Payne
and Frow in 2005, and the fourth one by Verhoef in 2003.

280 The study has also considered the number of citations per year, as way to discriminate the results depending
281 not only in the absolute amount of citations, but also in the relative amount of citations per year. The paper
282 with highest amount of citations per year was published by Brodie, Hollebeek, Juric, and Ilic in 2011, with
283 59,50 citations per year. The second most cited paper per year was published by Lu, Wu, Mao et al. in
284 2015, with 44,75 citations per year currently.
285

Table 3. The 50 most cited papers in CRM research

Journal	R	TC	Title	Author/s	Year	C/Y
JOURNAL OF THE ACADEMY OF MARKETING SCIENCE	1	592	Consumer switching costs: A typology, antecedents, and consequences	Burnham, TA; Frels, JK; Mahajan, V	2003	37,00
JOURNAL OF MARKETING RESEARCH	2	584	The customer relationship management process: Its measurement and impact on performance	Reinartz, W; Krafft, M; Hoyer, WD	2004	38,93
JOURNAL OF MARKETING	3	538	A strategic framework for customer relationship management	Payne, A; Frow, P	2005	38,43
JOURNAL OF MARKETING	4	504	Understanding the effect of customer relationship management efforts on customer retention and customer share development	Verhoef, PC	2003	31,50
DATA KNOWLEDGE ENGINEERING	& 5	480	Workflow mining: A survey of issues and approaches	Van der Aalst, WMP; Van Dongen, BF; Herbst, J; Maruster, L; Schimm, G; Weijters, AJMM	2003	30,00
JOURNAL OF SERVICE RESEARCH	6	476	Customer Engagement: Conceptual Domain, Fundamental Propositions, and Implications for Research	Brodie, Roderick J.; Hollebeek, Linda D.; Juric, Biljan; Ilic, Ana	2011	59,50
DECISION SUPPORT SYSTEMS	7	428	An empirical analysis of the antecedents of electronic commerce service continuance	Bhattacharjee, A	2001	23,78
JOURNAL OF MARKETING	8	394	Marketing, business processes, and shareholder value: An organizationally embedded view of marketing activities and the discipline of marketing	Srivastava, RK; Shervani, TA; Fahey, L	1999	19,70
EXPERT SYSTEMS WITH APPLICATIONS	9	330	Application of data mining techniques in customer relationship management: A literature review and classification	Ngai, E. W. T.; Xiu, Li; Chau, D. C. K.	2009	33,00
JOURNAL OF MARKETING	10	322	A customer relationship management roadmap: What is known, potential pitfalls, and where to go	Boulding, W; Staelin, R; Ehret, M; Johnston, WJ	2005	23,00
JOURNAL OF MARKETING	11	322	The role of relational information processes and technology use in customer relationship management	Jayachandran, S; Sharma, S; Kaufman, P; Raman, P	2005	23,00
JOURNAL OF MARKETING	12	321	The influence of cause-related marketing on consumer choice: Does one good turn deserve another?	Barone, MJ; Miyazaki, AD; Taylor, KA	2000	16,89

JOURNAL SERVICE RESEARCH	OF	13	280	Challenges and opportunities in multichannel customer management	Neslin, Scott A.; Grewal, Dhruv; Leghorn, Robert; et al.	2005	21,54
JOURNAL BUSINESS RESEARCH	OF	14	273	The effect of web interface features on consumer online purchase intentions	Hausman, Angela V.; Siekpe, Jeffirey Sam	2009	27,30
JOURNAL OPERATIONS MANAGEMENT	OF	15	273	The impact of enterprise systems on corporate performance: A study of ERP, SCM, and CRM system implementations	Hendricks, Kevin B.; Singhal, Vinod R.; Stratman, Jeff K.	2007	22,75
JOURNAL MARKETING	OF	16	261	Why do customer relationship management applications affect customer satisfaction?	Mithas, S; Krishnan, MS; Fornell, C	2005	18,64
INFORMATION SYSTEMS		17	252	Business process mining: An industrial application	van der Aalst, W. M. P.; Reijers, H. A.; Weijters, A. J. M. M.; et al.	2007	21,00
CALIFORNIA MANAGEMENT REVIEW		18	248	A framework for customer relationship management	Winer, RS	2001	13,78
JOURNAL MARKETING	OF	19	247	Interaction orientation and firm performance	Ramani, Girish; Kumar, V.	2008	22,45
HARVARD BUSINESS REVIEW		20	243	Understanding customer experience	Meyer, Christopher; Schwager, Andre	2007	20,25
JOURNAL OF THE ACADEMY OF MARKETING SCIENCE	OF	21	238	How can corporate social responsibility activities create value for stakeholders? A systematic review	Pelozo, John; Shang, Jingzhi	2011	29,75
HARVARD BUSINESS REVIEW		22	236	Avoid the four perils of CRM	Rigby, DK; Reichheld, FF; Schefter, P	2002	13,88
JOURNAL MARKETING	OF	23	230	The Role of Customer Gratitude in Relationship Marketing	Palmatier, Robert W.; Jarvis, Cheryl Burke; Bechkoff, Jennifer R.; et al.	2009	23,00
JOURNAL PRODUCT INNOVATION MANAGEMENT	OF	24	228	Virtual Customer Environments: Testing a Model of Voluntary Participation in Value Co-creation Activities	Nambisan, Satish; Baron, Robert A.	2009	22,80

JOURNAL SERVICE RESEARCH	OF	25	221	Customer Engagement as a New Perspective in Customer Management	Verhoef, Peter C.; Reinartz, Werner J.; Krafft, Manfred	2010	24,56
JOURNAL MARKETING	OF	26	220	Dynamic customer relationship management: Incorporating future considerations into the service retention decision	Lemon, KN; White, TB; Winer, RS	2002	12,94
DECISION SUPPORT SYSTEMS		27	213	Knowledge management and data mining for marketing	Shaw, MJ; Subramaniam, C; Tan, GW; et al.	2001	11,83
JOURNAL INTERACTIVE MARKETING	OF	28	207	Interactions in virtual customer environments: Implications for product support and customer relationship management	Nambisan, Satish; Baron, Robert A.	2007	17,25
MIS QUARTERLY		29	207	Reconceptualizing compatibility beliefs in technology acceptance research	Karahanna, Elena; Agarwal, Ritu; Angst, Corey M.	2006	15,92
JOURNAL RETAILING	OF	30	207	Building and sustaining profitable customer loyalty for the 21st century	Kumar, V; Shah, D	2004	13,80
JOURNAL ADVERTISING	OF	31	206	Consumer responses to corporate social responsibility (CSR) initiatives - Examining the role of brand-cause fit in cause-related marketing	Nan, Xiaoli; Heo, Kwangjun	2007	17,17
INDUSTRIAL MARKETING MANAGEMENT		32	203	An evaluation of divergent perspectives on customer relationship management: Towards a common understanding of an emerging phenomenon	Zablah, AR; Bellenger, DN; Johnston, WJ	2004	13,53
MARKETING SCIENCE		33	192	Marketing models of service and relationships	Rust, Roland T.; Chung, Tuck Siong	2006	14,77
JOURNAL MARKETING	OF	34	183	The hidden minefields in the adoption of sales force automation technologies	Speier, C; Venkatesh, V	2002	10,76
DECISION SUPPORT SYSTEMS		35	179	Recommender system application developments: A survey	Lu, Jie; Wu, Dianshuang; Mao, Mingsong; et al.	2015	44,75
JOURNAL OF THE ACADEMY OF MARKETING SCIENCE	OF	36	179	Customer relationship dynamics: Service quality and customer loyalty in the context of varying levels of customer expertise and switching costs	Bell, SJ; Auh, S; Smalley, K	2005	12,79
JOURNAL INTERACTIVE MARKETING	OF	37	178	Key Issues in Multichannel Customer Management: Current Knowledge and Future Directions	Neslin, Scott A.; Shankar, Venkatesh	2009	17,80

JOURNAL MARKETING	OF	38	177	Is Market Orientation a Source of Sustainable Competitive Advantage or Simply the Cost of Competing?	Kumar, V.; Jones, Eli; Venkatesan, Rajkumar; et al.	2011	22,13
JOURNAL MARKETING RESEARCH	OF	39	175	Customer channel migration	Ansari, Asim; Mela, Carl F.; Neslin, Scott A.	2008	15,91
MIS QUARTERLY		40	169	HOW INFORMATION MANAGEMENT CAPABILITY INFLUENCES FIRM PERFORMANCE	Mithas, Sunil; Ramasubbu, Narayan; Sambamurthy, V.	2011	21,13
INDUSTRIAL MARKETING MANAGEMENT		41	168	Demand chain management-integrating marketing and supply chain management	Juttner, Uta; Christopher, Martin; Baker, Susan	2007	14,00
EUROPEAN JOURNAL MARKETING	OF	42	161	Role of electronic trust in online retailing - A re-examination of the commitment-trust theory	Mukherjee, Avinandan; Nath, Prithwiraj	2007	13,42
JOURNAL MARKETING	OF	43	155	The long-term impact of loyalty programs on consumer purchase behavior and loyalty	Liu, Yuping	2007	12,92
EXPERT SYSTEMS WITH APPLICATIONS		44	154	Churn prediction in subscription services: An application of support vector machines while comparing two parameter-selection techniques	Coussement, Kristof; Van den Poel, Dirk	2008	14,00
JOURNAL BUSINESS RESEARCH	OF	45	151	The role of brand/cause fit in the effectiveness of cause-related marketing campaigns	Pracejus, JW; Olsen, GD	2004	10,07
MIS QUARTERLY		46	149	INTERFIRM STRATEGIC INFORMATION FLOWS IN LOGISTICS SUPPLY CHAIN RELATIONSHIPS	Klein, Richard; Rai, Arun	2009	14,90
EXPERT SYSTEMS WITH APPLICATIONS		47	149	An LTV model and customer segmentation based on customer value: a case study on the wireless telecommunication industry	Hwang, H; Jung, T; Suh, E	2004	9,93
DECISION SUPPORT SYSTEMS		48	148	Identification of influencers - Measuring influence in customer networks	Kiss, Christine; Bichler, Martin	2008	13,45
INDUSTRIAL MARKETING MANAGEMENT		49	148	Creating customer knowledge competence: managing customer relationship management programs strategically	Campbell, AJ	2003	9,25

JOURNAL OF THE 50 146 The differing and mediating roles of trust and relationship Aurier, Philippe; N'Goala, 2010 16,22
ACADEMY OF commitment in service relationship maintenance and Gilles
MARKETING development
SCIENCE

Abbreviations are available in Table 1 except for C/Y = Citations per Year

287 *The most prolific and influential authors*

288 Regarding the study of the most influential authors in Customer Relationship Management research, table 4
 289 presents the 50 authors that have received the highest number of citations.

290 Verhoef P.C. is the author with the highest number of citations, appearing not far from him two more authors
 291 with more than 1.000 citations. These two authors are, in second position Van den Poel D., and the third
 292 Kumar V. The fourth author is Krafft, with less than 1.000 citations but almost on the border of that point of
 293 cut.

294 Regarding the precedence of the most productive and influential authors, interesting to say that the most of
 295 them come from USA (14 authors in a list of 50). The second and third Country regarding influential authors,
 296 are Taiwan and UK (represented in the list by Wales and England), both with 6 appearances.

297

Table 4. The 50 most productive and influential authors in CRM research

R	Author name	Institution	Country	TP	TC	TC/T P	h	>= 100	>= 50	>= 20
1	VERHOEF PC	Univ Groningen	Netherlands	18	1.690	93,89	14	4	10	14
2	VAN DEN POEL D	Univ Ghent	Belgium	31	1.431	46,16	21	4	11	22
3	KUMAR V	Georgia State Univ	USA	20	1.100	55,00	14	3	6	14
4	KRAFFT M	Univ Munster	Germany	7	953	136,1 4	6	2	4	5
5	NESLIN SA	Tuck Sch Business Dartmouth	USA	8	747	93,38	8	3	3	6
6	FROW P	Univ Sydney	Australia	5	688	137,6 0	4	1	2	3
7	PAYNE A	Univ New South Wales	Australia	5	688	137,6 0	4	1	2	3
8	PALMATIER RW	Univ Washington	USA	6	610	101,6 7	5	3	5	5
9	JOHNSTON WJ	Georgia State Univ	USA	5	547	109,4 0	4	2	2	2
10	THOMAS JS	So Methodist Univ	USA	5	529	105,8 0	5	2	4	4
11	VENKATES AN R	Univ Virginia	USA	10	519	51,90	9	1	5	8
12	JONES E	Louisiana State Univ	USA	4	425	106,2 5	4	2	4	4
13	LEMON KN	Boston Coll	USA	5	407	81,40	5	1	3	4
14	RUST RT	Univ Maryland	USA	6	404	67,33	5	1	3	5
15	LARIVIERE B	State Univ Ghent	Belgium	4	307	76,75	4	2	3	3
16	COUSSEME NT K	Univ Catholique Lille	France	4	267	66,75	4	1	2	4
17	HOMBURG C	Univ Mannheim	Germany	4	257	64,25	4	0	2	4

18	YEN DC	Miami Univ	USA	5	255	51,00	5	0	2	4
19	PRINZIE A	Univ Ghent	Belgium	8	241	30,13	7	0	1	6
20	RYALS L	Cranfield Univ	England	5	221	44,20	5	1	1	2
21	LEE WB	Hong Kong Polytech Univ	Peoples China	R 6	209	34,83	6	0	1	4
22	CHOY KL	Hong Kong Polytech Univ	Peoples China	R 7	205	29,29	6	0	1	4
23	MALTHOUS E EC	Northwestern Univ	USA	5	205	41,00	3	1	2	2
24	BRADLOW ET	Univ Penn	USA	4	183	45,75	4	0	1	4
25	HAENLEIN M	ESCP Europe	France	5	166	33,20	3	1	1	1
26	SOHN SY	Yonsei Univ	South Korea	7	131	18,71	5	0	1	2
27	SCHWEIDEL DA	Emory Univ	USA	5	128	25,60	4	0	0	4
28	CHANG HH	Natl Cheng Kung Univ	Taiwan	5	121	24,20	4	0	1	2
29	KNOX S	Cranfield Univ	England	5	112	22,40	5	0	0	2
30	BIJMOLT THA	Univ Groningen	Netherlands	5	109	21,80	4	0	1	2
31	LAMBERT DM	Ohio State Univ	USA	4	108	27,00	4	0	0	3
32	MAKLAN S	Cranfield Univ	England	5	103	20,60	5	0	0	2
33	CHEN YS	Hwa Hsia Univ Technol	Taiwan	4	101	25,25	2	1	1	1
34	KERAMATI A	Univ Tehran	Iran	4	78	19,50	3	0	0	2
35	CHEN YH	Natl Cheng Kung Univ	Taiwan	4	65	16,25	2	0	1	1
36	HA SH	Kyungpook Natl Univ	South Korea	5	52	10,40	3	0	1	1
37	TERHO H	Univ Turku	Finland	6	46	7,67	4	0	0	0
38	VERBANO C	Univ Padua	Italy	5	40	8,00	3	0	0	1
39	CHANG CT	Aletheia Univ	Taiwan	4	40	10,00	4	0	0	1
40	CHIANG WY	Aletheia Univ	Taiwan	4	40	10,00	4	0	0	1
41	BAECKE P	Univ Ghent	Belgium	4	36	9,00	3	0	0	0
42	KIM J	Sejong Cyber Univ	South Korea	5	35	7,00	3	0	0	0
43	DOERR M	Fdn Res & Technol Hellas	Greece	4	32	8,00	3	0	0	1
44	KU ECS	Natl Kaohsiung Univ	Taiwan	4	25	6,25	3	0	0	0
45	CREMA M	Univ Padua	Italy	4	18	4,50	2	0	0	0
46	TUDHOPE D	Univ South Wales	Wales	6	14	2,33	3	0	0	0
47	NICCOLUCCI F	PIN	Italy	5	12	2,40	2	0	0	0

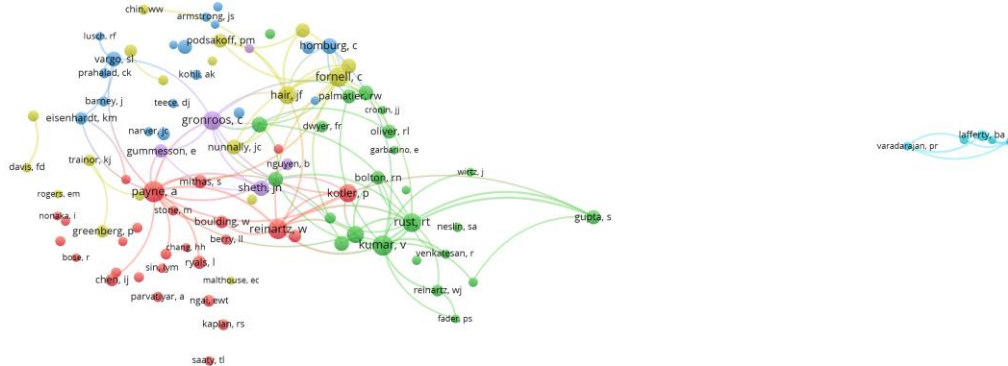
48	VLACHIDIS A	Univ South Wales	Wales	5	11	2,20	2	0	0	0
49	BINDING C	Univ South Wales	Wales	4	9	2,25	2	0	0	0
50	KHASAWNE H R	Jordan Univ Sci & Technol	Jordan	4	0	0,00	0	0	0	0

Abbreviations available in table 1 and table 3, except for Univ = University.

298

299 Another interesting view on influence of the authors publishing on Customer Relationship Management
300 research is the study of the co-citations between them. Considering them and using a graphic interface
301 (VosViewer), we can see in Fig 3 the connections between authors that have cited each other studies about
302 this subject.

303



304

305 *Fig 3. Author co-citations with threshold of 20 citations showing 100 most representative connections*

306

307 Fig 3 shows an isolated group of co-cited authors where Lafferty is the most relevant one. The rest of the
308 relationships show a very interactive picture where most of the authors have been co-cited by the others, with
309 some special relevant ones: Payne, Reinartz, Gronroos, Hair, Fornell, Kotler, Kumar, Rust. This research
310 has been made reducing the field of study to the 100 most representative connections and considering only
311 the authors with at least 20 citations.

312

313 *The most productive and influential institutions*

314 The two institutions with highest number of published papers in CRM research are Ghent University (from
315 Belgium) and Hong Kong Polytechnic University (from Peoples R China), with more than 30 papers in the
316 subject. Not far from them, with more than 20 published papers there are Georgia State University (from
317 USA) and University of North Carolina (also from USA).

318 Concerning the influence of each institution, University of Maryland College Park (from USA) is the one
319 with highest number of total citations (2.070). Next one in the rank is University of Texas Austin (from

320 USA), with 1.991 citations, near the 2.000. In the next group of influence there are 6 Universities with more
321 than 1.000 citations: Cranfield University from England (UK), Ghent University from Belgium, Georgia
322 State University from USA, University of Groningen from Netherlands, Erasmus University of Rotterdam
323 from Netherlands, and University of Munster from Germany. In the first eight positions regarding number of
324 citations, there are then three Universities from USA and two from Netherlands.

325 If we look into the number of citations per published paper, there are clearly three Universities in the highest
326 positions of the rank: University of Texas Austin (USA), University of Maryland College Park (USA) and
327 Eindhoven University of Technology (Netherlands).

328 Considering the global picture of all indicators, the most productive and influential entity is Ghent University
329 from Belgium, with the highest number of published papers, the highest h-index, and the fourth position in
330 the rank of total number of citations.

331 Institutions from all over the world have contributed to Customer Relationship Management research during
332 all the time, but it is clear than a great majority of them are established in USA. There are 25 institutions
333 from USA between the 50 world wide more productive and influential institutions in CRM research, exactly
334 half of the total quantity of institutions contributing to the subject. Other relevant countries are Taiwan (5
335 institutions), South Korea (4 institutions), and with 3 institutions each one: Peoples R China, Netherlands,
336 and England (UK).

337 Special case to consider is the Islamic Azad University from Iran, with 10 published papers, nearly to most
338 Universities of the list , but with really small number of citations (only 25) very far from the rest of the
339 institutions.

340

Table 5. The 50 most productive and influential institutions

R	Institution	Country	TP	TC	TC/TP	h	>=	>=	>=	ARWU	QS
							100	50	20		
1	GHENT UNIVERSITY	Belgium	31	1.431	46,16	21	4	11	22	61	58.4
2	HONG KONG POLYTECHNIC UNIVERSITY	Peoples R China	R 30	948	31,60	15	1	4	12	201-300	106
3	GEORGIA STATE UNIVERSITY	USA	25	1.366	54,64	16	4	7	15	-	701-750
4	UNIVERSITY OF NORTH CAROLINA	USA	22	686	31,18	13	0	5	12	30	-
5	CRANFIELD UNIVERSITY	England	19	1.684	88,63	13	4	7	11	-	45
6	NORTHWESTERN UNIVERSITY	USA	19	938	49,37	11	3	6	10	25	34
7	UNIVERSITY OF GRONINGEN	Netherlands	17	1.204	70,82	13	4	8	13	66	120
8	UNIVERSITY OF MARYLAND COLLEGE PARK	USA	17	2.070	121,76	14	7	10	14	51	126
9	UNIVERSITY OF CONNECTICUT	USA	15	979	65,27	13	2	7	12	301-400	373
10	UNIVERSITY OF MUNSTER	Germany	15	1.094	72,93	8	2	5	7	-	-
11	TEXAS A M UNIVERSITY COLLEGE STATION	USA	14	876	62,57	12	2	6	9	-	-

12	UNIVERSITY OF VIRGINIA	USA		14	677	48,36	11	1	7	9	151-200	192
13	ERASMUS UNIVERSITY ROTTERDAM	Netherlands		13	1.121	86,23	11	2	7	11	-	179
14	NATIONAL CHENG KUNG UNIVERSITY	Taiwan		13	268	20,62	10	0	1	5	301-400	234
15	UNIVERSITY OF PENNSYLVANIA	USA		13	558	42,92	12	0	6	10	16	19
16	UNIVERSITY OF WASHINGTON	USA		13	760	58,46	9	4	6	7	14	66
17	YONSEI UNIVERSITY	South Korea		13	301	23,15	9	0	2	5	301-400	107
18	DARTMOUTH COLLEGE	USA		12	846	70,50	10	3	4	8	201-300	183
19	KOREA ADVANCED INSTITUTE OF SCIENCE TECHNOLOGY KAIST	South Korea		12	442	36,83	11	0	4	9	-	-
20	UNIVERSITY OF TEXAS AUSTIN	USA		12	1.991	165,92	11	4	8	11	-	63
21	CHINESE ACADEMY OF SCIENCES	Peoples China	R	11	167	15,18	6	0	1	4	-	51-100
22	EWHA WOMANS UNIVERSITY	South Korea		11	217	19,73	6	0	2	3	401-500	319
23	NATIONAL CHENGCHI UNIVERSITY	Taiwan		11	91	8,27	7	0	0	0	-	601-650
24	UNIVERSITY OF PADUA	Italy		11	233	21,18	7	0	1	5	201-300	-
25	UNIVERSITY OF WASHINGTON SEATTLE	USA		11	683	62,09	7	4	5	5	-	-
26	CITY UNIVERSITY OF HONG KONG	Peoples China	R	10	366	36,60	7	1	2	5	201-300	55
27	DUKE UNIVERSITY	USA		10	948	94,80	9	4	5	9	26	26
28	INTERNATIONAL BUSINESS MACHINES IBM	India		10	400	40,00	6	0	5	6	-	-
29	ISLAMIC AZAD UNIVERSITY	Iran		10	25	2,50	2	0	0	0	-	-
30	LOUISIANA STATE UNIVERSITY	USA		10	569	56,90	8	2	4	7	301-400	651-700

31	NATIONAL CHUNG CHENG UNIVERSITY	Taiwan	10	168	16,80	7	0	1	2	-	801- 1000
32	NATIONAL TSING HUA UNIVERSITY	Taiwan	10	159	15,90	8	0	1	2	401- 500	163
33	PURDUE UNIVERSITY	USA	10	233	23,30	8	0	2	4	301- 400	100
34	TAMKANG UNIVERSITY	Taiwan	10	109	10,90	5	0	0	2	-	-
35	UNIVERSITY OF GEORGIA	USA	10	489	48,90	8	1	3	5	201- 300	431
36	UNIVERSITY OF HOUSTON	USA	10	472	47,20	7	2	5	6	201- 301	651- 700
37	UNIVERSITY OF SOUTH CAROLINA	USA	10	571	57,10	8	1	3	6	-	561- 570
38	EMORY UNIVERSITY	USA	9	634	70,44	7	1	3	5	101- 150	148
39	INDIANA UNIVERSITY BLOOMINGTON	USA	9	387	43,00	7	0	3	6	101- 150	323
40	NATIONAL UNIVERSITY OF SINGAPORE	Singapore	9	280	31,11	6	0	3	4	85	11
41	SEOUL NATIONAL UNIVERSITY	South Korea	9	146	16,22	5	0	1	1	101- 150	36
42	TEMPLE UNIVERSITY	USA	9	150	16,67	6	0	1	3	301- 400	651- 700
43	UNIVERSITY OF LONDON	England	9	322	35,78	6	0	2	6	151- 200	351
44	UNIVERSITY OF MANCHESTER	England	9	301	33,44	6	1	2	5	34	29
45	UNIVERSITY OF MISSOURI COLUMBIA	USA	9	430	47,78	6	2	4	5	-	591- 600
46	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	USA	9	290	32,22	8	0	2	6	-	83
47	UNIVERSITY OF TEHRAN	Iran	9	92	10,22	3	0	0	2	301- 400	701- 750
48	UNIVERSITY OF TEXAS AT SAN ANTONIO UTSA	USA	9	89	9,89	4	0	0	2	-	-
49	COLUMBIA UNIVERSITY	USA	8	551	68,88	7	3	5	5	8	16
50	EINDHOVEN UNIVERSITY OF TECHNOLOGY	Netherlands	8	967	120,88	7	1	4	7	301- 400	99

Abbreviations available from table 1 and table 3; ARWU and QS = Ranking in the general ARWU and QS university rankings

341

342 **Country analysis**

343 Its very interesting to create a worldwide picture of the country origin of the publications. Country relates in
 344 this case to the institution that publishes the paper, but it does not consider the nationality of the researchers
 345 who wrote the pushed paper. This makes a tricky situation because lot of researches are used to moving into
 346 other countries as USA and UK.

347 Table 6 shows that USA is clearly the more productive Country with 561 published papers, very far from the
 348 183 papers published by the second one in this case UK. Third Country in this rank is Taiwan, followed by
 349 Peoples R China and Germany.

350 Regarding total number of citations, again USA is clearly the most influential Country in Customer
 351 Management Relationship research with 21.966 citations currently. Very far from USA, UK counts with
 352 4.737 citations, being the second more influential Country. Third there is Germany with 3.359 citations, and
 353 fourth in the rank there is Netherlands with 3.304 citations so far.

354 Special mention deserves Spain, where we are developing this research from Universitat Politècnica de
 355 València. Spain appears in a commendable eight position of the total of published papers rank.

356 Finally, in order to take a relative picture of the most productive and influential countries, it's worth to
 357 consider the population of each Country and to consider the ratios between total number of papers and total
 358 number of citations modelled by the Country population. With this ratio in consideration, Taiwan appears
 359 the first as the most productive country on Customer Relationship Management research, with 6,92 papers
 360 per million of population. Next to Taiwan there are Cyprus (5,93 papers per million of population) and
 361 Finland (with 5,81 papers per million of population). This ratio moves down some of the most productive
 362 Countries due to their high Population, for example USA now appears in the seventeenth position, UK in the
 363 ninth position, and Peoples R China in the forty fourth position at the bottom of the list.

364 Same occurs if we divide the total number of cites by the population of the Country. In this case Netherlands
 365 comes to the first position in the rank, followed by Belgium, New Zealand, Singapore, and Taiwan. USA and
 366 UK which were considered the most absolute influential Countries regarding total number of citations, now
 367 appear in eighth and seventh position respectively.

368

Table 6. The most productive and influential Countries in CRM research

R	Country	TP	TC	TC/T P	h	Pop	TP/P op	TC/P op	>= 100	>= 50	>= 20
1	USA	561	21.966	39,16	77	325.719,18	1,72	67,44	57	130	252
2	UK	183	4.737	25,89	35	66.022,27	2,77	71,75	7	24	57
3	TAIWAN	163	2.476	15,19	27	23.545,96	6,92	105,16	1	11	39
4	PEOPLES R CHINA	130	2.731	21,01	30	1.386.395,00	0,09	1,97	4	11	42
5	GERMAN Y	110	3.359	30,54	26	82.695,00	1,33	40,62	6	15	32
6	SOUTH KOREA	85	2.021	23,78	24	51.466,20	1,65	39,27	3	13	29
7	AUSTRAL IA	69	1.307	18,94	21	24.598,93	2,81	53,13	2	5	22
8	SPAIN	60	858	14,30	16	46.572,03	1,29	18,42	1	6	14

9	ITALY	57	611	10,7 2	15	60.551,42	0,94	10,09	0	3	13
10	INDIA	56	428	7,64	10	1.339.180, 13	0,04	0,32	0	4	6
11	FRANCE	54	1.538	28,4 8	16	67.118,65	0,80	22,91	4	6	14
12	NETHERL ANDS	52	3.304	63,5 4	28	17.132,85	3,04	192,8 5	7	18	34
13	CANADA	51	1.941	38,0 6	19	36.708,08	1,39	52,88	6	13	19
14	BELGIUM	43	1.685	39,1 9	24	11.372,07	3,78	148,1 7	4	14	26
15	IRAN	37	258	6,97	8	81.162,79	0,46	3,18	0	0	4
16	FINLAND	32	434	13,5 6	11	5.511,30	5,81	78,75	0	3	7
17	TURKEY	30	262	8,73	9	80.745,02	0,37	3,24	0	0	6
18	GREECE	22	317	14,4 1	8	10.760,42	2,04	29,46	0	2	6
19	SWITZER LAND	22	142	6,45	5	8.466,02	2,60	16,77	0	1	2
20	SINGAPO RE	20	653	32,6 5	10	5.612,25	3,56	116,3 5	2	5	8
21	SWEDEN	19	172	9,05	7	10.067,74	1,89	17,08	0	1	3
22	BRAZIL	16	220	13,7 5	5	209.288,28	0,08	1,05	1	1	3
23	PORTUGA L	16	337	21,0 6	6	10.293,72	1,55	32,74	1	2	4
24	NORWAY	14	162	11,5 7	8	5.282,22	2,65	30,67	0	0	3
25	DENMAR K	13	148	11,3 8	7	5.769,60	2,25	25,65	0	0	2
26	MALAYSI A	13	65	5,00	5	31.624,26	0,41	2,06	0	0	1
27	JAPAN	12	210	17,5 0	6	126.785,80	0,09	1,66	0	1	4
28	POLAND	12	60	5,00	4	37.975,84	0,32	1,58	0	0	1
29	AUSTRIA	11	303	27,5 5	5	8.809,21	1,25	34,40	1	2	4
30	NEW ZEALAND	11	630	57,2 7	6	4.793,90	2,29	131,4 2	1	1	4
31	SOUTH AFRICA	11	88	8,00	3	56.717,16	0,19	1,55	0	1	1
32	ISRAEL	9	204	22,6 7	6	8.712,40	1,03	23,41	0	2	4
33	ROMANI A	8	13	1,63	2	19.586,54	0,41	0,66	0	0	0
34	SLOVENI A	8	81	10,1 3	4	2.066,75	3,87	39,19	0	0	2
35	UKRAINE	8	4	0,50	1	44.831,16	0,18	0,09	0	0	0

36	CYPRUS	7	15	2,14	2	1.179,55	5,93	12,72	0	0	0
37	IRELAND	7	63	9,00	4	4.813,61	1,45	13,09	0	0	1
38	LITHUANIA	7	58	8,29	4	2.827,72	2,48	20,51	0	0	0
39	SAUDI ARABIA	7	11	1,57	1	32.938,21	0,21	0,33	0	0	0
40	SLOVAKIA	7	18	2,57	3	5.439,89	1,29	3,31	0	0	0
41	CROATIA	6	73	12,17	3	4.125,70	1,45	17,69	0	1	1
42	PAKISTAN	6	17	2,83	2	197.015,95	0,03	0,09	0	0	0
43	RUSSIA	6	4	0,67	1	144.495,04	0,04	0,03	0	0	0
44	THAILAND	6	31	5,17	2	69.037,51	0,09	0,45	0	0	0
45	BOSNIA HERCEGOVINA	5	3	0,60	1	3.507,02	1,43	0,86	0	0	0
46	PERU	5	66	13,20	3	32.165,49	0,16	2,05	0	0	2
47	BANGLADESH	4	22	5,50	1	164.669,75	0,02	0,13	0	0	1
48	CHILE	4	45	11,25	3	18.054,73	0,22	2,49	0	0	1
49	CZECH REPUBLIC	4	11	2,75	2	10.591,32	0,38	1,04	0	0	0
50	HUNGARY	4	10	2,50	1	9.781,13	0,41	1,02	0	0	0

Abbreviations from table 1 and table 3, except for Pop = Population (thousands); TP/Pop = Studies per millions of Population; TC/Pop = Citations per millions of Population

369

370 Conclusion

371 This paper has presented a global overview of the Customer Relationship Management during all its lifecycle
372 up-to-nowadays, with clear conclusions about the takeoff of this technology since year 2.000, and with
373 increasingly influence in the market and the scientific research. The picture obtained about Customer
374 Management Relationship (CRM) has been developed by using bibliometric indicators. The results were
375 generated by using Web of Science (WoS), a general scientific database widely considered currently as one
376 of the most influential one for scientific research. The main contribution of this paper is to use the modern
377 bibliometric tools in order to show how the influence of CRM has been increasing during last decades, being
378 this study supported by the different modern indicators that are being usually considered in the literature.
379 This stated growing influence of CRM during last decades, is the pillar for future invests on investigation
380 about how market is perceiving the value of CRM and which benefits is this technology bringing to modern,
381 dynamic, and successful firms nowadays. Besides, the identified as the most influential authors, institutions,
382 and countries, may be the main study sphere for new and future researches in this field.

383 After the study, we can conclude that the most influential Journals or Source Titles in the CRM field are
384 clearly EXPERT SYSTEMS WITH APPLICATIONS and JOURNAL OF MARKETING, assessed by the
385 different variables considered in this study, mainly considering the h-index and number of papers with more
386 than 100 citations. The second group of influence is composed by INDUSTRIAL MARKETING
387 MANAGEMENT, JOURNAL OF THE ACADEMY OF MARKETING SCIENCE, DECISION SUPPORT

388 SYSTEMS, and JOURNAL OF BUSINESS RESEARCH, again considering the h-index and the total number
389 of papers published by them and their citations. A challenge of this study is the low number of journals
390 publishing about CRM all over the time; this issue permits, on other hand, a most selective research, focusing
391 in the highest quality ones.

392 Concerning the qualitative evolution of the subject in the publishing and citing registries, it shows a clear
393 point of inflection in year 2000, where both number of papers published, and number of citations, started
394 the take-off with a lineal progression. Only since year 2011 to year 2014 the number of publications were
395 lightly going down, but quickly recovering the increasing tendency in 2015.

396 Clear enough seems the number of citations to conclude about the youngness of the technology. Only 20
397 percent of the all-time papers have been cited more than 50 times, showing the long path that technology has
398 still to walk in order to arrive to a mature point where the volume of researches and publications may convert
399 it into a study hit.

400 USA and UK are clearly the most productive and influential Countries concerning most of the analyzed
401 parameters. The most productive authors (with the highest number of publications) come from USA,
402 followed by US and Taiwan. In the same line, institutions from all over the world have contributed to
403 Customer Relationship Management research during all the time, but it is clear than a great majority of them
404 are established in USA: 25 institutions from USA are between the 50 world wide more productive and
405 influential institutions in CRM research, exactly half of the total quantity of institutions contributing to the
406 subject, followed by Taiwan, South Korea, Peoples R China, Netherlands, and England (UK). Finally, if we
407 consider the Countries themselves, the absolute indicators show again the prominent position of USA as the
408 Country with the highest number of papers and citations, far from the second one UK. Other countries like
409 Taiwan, Peoples R China, and Germany stand out about papers published, and other ones as Netherlands,
410 Taiwan, Peoples R China, South Korea, Canada, and Belgium stand out about number of citations.

411 The main findings of this paper are useful for obtaining a global overview of the state of the art in Customer
412 Relationship Management research according to bibliometric information. The main indicators studied and
413 analyzed have been the number of papers published, the total amount of citations, the h-index, and the most
414 cited items in each category, all of them key indicators for bibliometric analysis. There is a first limitation
415 on this study, considering that this paper aims to be informative in order to identify some relevant research,
416 but also stating that this study is based in the Web Of Science (WoS) so other influential research that is not
417 collected in the WoS is not included in this study. The second limitation is that the ranks used to present the
418 information, in order to classify and analyze the information, are purely informative and not an official result,
419 based on the bibliometric data found in the WoS. Therefore, this paper only provides general information for
420 the general understanding of the field of CRM, but many other issues could be considered in order to getting
421 a complete picture of the state of the art.

422 The future research efforts may have to be with identifying the most important benefits that the three CRM
423 modules (Sales, Marketing, and Services) can provide the companies with after deploying and effectively
424 using this technology. This would be the base for setting the key clues for showing the critical success factors
425 for companies directly related to the use of CRM solutions.

426 It is thus determined as a general conclusion that the growing interest in the study of CRM is the
427 demonstration of how the search for sustainable business management models can be based on the intensive
428 and efficient use of CRM as a key technological solution for effective and successful business management.
429 Having determined which authors, entities, and countries are most influential in this field of study, as well
430 as having identified the most influential papers, will be the basis for initiating the next research initiatives in
431 this field.

432 **References**

433 Allen, L., Jones, C., Dolby, K., Lynn, D., & Walport, M. (2009). Looking for landmarks: the role of
434 expert review and bibliometric analysis in evaluating scientific publication outputs. *PloS one*, 4(6),
435 e5910.

436 Attaran, M., Attaran, S., & Kirkland, D. (2019). The Need for Digital Workplace: Increasing Workforce
437 Productivity in the Information Age. *International Journal of Enterprise Information Systems*
438 (*IJEIS*), 15(1), 1-23.

439 Autor, D. (2012). The Journal of Economic Perspectives at 100 (Issues). *Journal of Economic*
440 *Perspectives*, 26(2), 3-18.

441 Bar-Ilan, J. (2008). Informetrics at the beginning of the 21st century—A review. *Journal of*
442 *informetrics*, 2(1), 1-52.

443 Baumgartner, H., & Pieters, R. (2003). The structural influence of marketing journals: A citation analysis
444 of the discipline and its subareas over time. *Journal of marketing*, 67(2), 123-139.

445 Borokhovich, K. A., Bricker, R. J., Brunarski, K. R., & Simkins, B. J. (1995). Finance research
446 productivity and influence. *The journal of finance*, 50(5), 1691-1717.

447 Broadus, R. Toward a definition of “bibliometrics” Scientometrics. 1987; 12 (5–6): 373–379. doi:
448 10.1007. *BF02016680*.

449 Buttle F. (2004). Customer Relationship Management. Concepts and Tools. Oxford, UK: Elsevier,
450 Butterworth-Heinemann.

451 Cadez, S. (2013). Social change, institutional pressures and knowledge creation: A bibliometric
452 analysis. *Expert systems with applications*, 40(17), 6885-6893.

453 Card, D., & Della Vigna, S. (2013). Nine facts about top journals in economics. *Journal of Economic*
454 *Literature*, 51(1), 144-61.

455 Chan, K. C., Lai, P., & Liano, K. (2012). A threshold citation analysis in marketing research. *European*
456 *Journal of Marketing*, 46(1/2), 134-156.

457 Chan, K. C., Seow, G. S., & Tam, K. (2009). Ranking accounting journals using dissertation citation
458 analysis: A research note. *Accounting, Organizations and Society*, 34(6-7), 875-885.

459 Chan, K. C., Tong, J. Y., & Zhang, F. F. (2012). Accounting journal rankings, authorship patterns and
460 the author affiliation index. *Australian Accounting Review*, 22(4), 407-417.

461 Chao, C., Jen, W., Chi, Y., & Lin, B. (2007). Determining technology trends and forecasts of CRM
462 through a historical review and bibliometric analysis of data from 1991 to 2005. *International Journal*
463 *of Management and Enterprise Development*, 4(4), 415-427.

464 Chen, I. J., & Popovich, K. (2003). Understanding customer relationship management (CRM) People,
465 process and technology. *Business process management journal*, 9(5), 672-688.

466 Deng, G. F., & Lin, W. T. (2012). Citation analysis and bibliometric approach for ant colony
467 optimization from 1996 to 2010. *Expert Systems with Applications*, 39(6), 6229-6237.

468 Dumas, M., La Rosa, M., Mendling, J., & Reijers, H. A. (2018). Process-Aware Information Systems.
469 In *Fundamentals of Business Process Management* (pp. 341-369). Springer, Berlin, Heidelberg.

470 Gil Gómez, H., Arango Serna, M. D., & Oltra Badenes, R. F. (2010). Evolution and trends of information
471 systems for business management: the M-Business. A Review. *Dyna*, 77(163), 181-193. Gomez-Mejia,
472 L. R., & Balkin, D. B. (1992). Determinants of faculty pay: An agency theory perspective. *Academy of*
473 *Management journal*, 35(5), 921-955.

474 Grönroos, C. (1997). Value-driven relational marketing: from products to resources and
475 competencies. *Journal of marketing management*, 13(5), 407-419.

476 Guerola-Navarro, V., Oltra-Badenes, R. y Gil-Gomez, H. (2020). Análisis de la relación entre el grado
477 de introducción de CRM y los beneficios de la empresa a través del Desempeño Organizacional y la
478 Innovación Empresarial. *3C Empresa. Investigación y pensamiento crítico*, 9(1), 65-63. doi:
479 <http://dx.doi.org/10.17993/3cemp.2018.070436.65-85>

480 Hirsch, J. E. (2005). An index to quantify an individual's scientific research output. *Proceedings of the*
481 *National academy of Sciences*, 102(46), 16569-16572.

482 James, T. L., Cook, D. F., Conlon, S., Keeling, K. B., Collignon, S., & White, T. (2015). A framework
483 to explore innovation at SAP through bibliometric analysis of patent applications. *Expert Systems with*
484 *Applications*, 42(24), 9389-9401.

485 King, S. F., & Burgess, T. F. (2008). Understanding success and failure in customer relationship
486 management. *Industrial Marketing Management*, 37(4), 421-431.

487 Kirkpatrick, S. A., & Locke, E. A. (1992). The development of measures of faculty scholarship. *Group*
488 *& Organization Management*, 17(1), 5-23.

489 Kocher, M. G., & Sutter, M. (2001). The institutional concentration of authors in top journals of
490 economics during the last two decades. *The Economic Journal*, 111(472), 405-421.

491 Laband, D. N. (2013). On the use and abuse of economics journal rankings. *The Economic*
492 *Journal*, 123(570), F223-F254.

493 Laband, D. N., & Piette, M. J. (1994). The relative impacts of economics journals: 1970-1990. *Journal*
494 *of economic Literature*, 32(2), 640-666.

495 Liang, T. P., & Liu, Y. H. (2018). Research landscape of business intelligence and big data analytics: A
496 bibliometrics study. *Expert Systems with Applications*, 111, 2-10.

497 Merigó, J. M., Gil-Lafuente, A. M., & Yager, R. R. (2015). An overview of fuzzy research with
498 bibliometric indicators. *Applied Soft Computing*, 27, 420-433.

499 Negash, S., & Gray, P. (2008). Business intelligence. In *Handbook on decision support systems 2* (pp.
500 175-193). Springer, Berlin, Heidelberg.

501 Podsakoff, P. M., MacKenzie, S. B., Podsakoff, N. P., & Bachrach, D. G. (2008). Scholarly influence in
502 the field of management: A bibliometric analysis of the determinants of university and author impact in
503 the management literature in the past quarter century. *Journal of Management*, 34(4), 641-720.

504 Stern, D. I. (2013). Uncertainty measures for economics journal impact factors. *Journal of Economic*
505 *Literature*, 51(1), 173-89.

506 Sternberg, R., & Litzenberger, T. (2005). The publication and citation output of German Faculties of
507 Economics and Social Sciences-a comparison of faculties and disciplines based upon SSCI
508 data. *Scientometrics*, 65(1), 29-53.

509 Stremersch, S., & Verhoef, P. C. (2005). Globalization of authorship in the marketing discipline: does it
510 help or hinder the field?. *Marketing Science*, 24(4), 585-594.

511 Süßmuth, B., Steininger, M., & Ghio, S. (2006). Towards a European economics of economics:
512 Monitoring a decade of top research and providing some explanation. *Scientometrics*, 66(3), 579-612.

513 Tellis, G. J., Chandy, R. K., & Ackerman, D. S. (1999). In search of diversity: The record of major
514 marketing journals. *Journal of Marketing Research*, 36(1), 120-131.

515 Trieschmann, J. S., Dennis, A. R., Northcraft, G. B., & Nieme Jr, A. W. (2000). Serving constituencies
516 in business schools: MBA program versus research performance. *Academy of Management*
517 *Journal*, 43(6), 1130-1141.

518 Tsai, H. H. (2011). Research trends analysis by comparing data mining and customer relationship
519 management through bibliometric methodology. *Scientometrics*, 87(3), 425-450.

520 Vicedo, P., Gil, H., Oltra-Badenes, R., & Merigó, J. M. (2018, January). Critical Success Factors on
521 ERP Implementations: A Bibliometric Analysis. In *International Conference on Modelling and*
522 *Simulation in Management Sciences* (pp. 169-181). Springer, Cham.

523 Yin, M. S. (2013). Fifteen years of grey system theory research: A historical review and bibliometric
524 analysis. *Expert systems with Applications*, 40(7), 2767-2775.

525 Zyoud, S. H., & Fuchs-Hanusch, D. (2017). A bibliometric-based survey on AHP and TOPSIS
526 techniques. *Expert Systems*

527