

## **BIBLIOGRAPHIC REVIEW OF CRM ADOPTION AND PRACTICES IN DIFFERENT SECTORS ACROSS GEOGRAPHIES**

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### **Abstract**

This study aims to perform citation, trend, keyword & co-citation analysis of a noteworthy body of scholarly publications on Customer relationship management published over the two last decades. The research publications having “Customer Relationship Management” in their title were extracted from Scopus; around 1119 such publications were identified and are being considered for the study. The data set is analysed using VosViewer software. The results indicate that the highest number of publications was observed in the year 2010, this indicates that maximum research on Customer relationship management was done in this year. The maximum citations on publications were observed in 2005 and the highest number of citations per publication was seen in the period of 2000-2009. The United States contributed the most to the research on customer relationship management in terms of total number of publications. The research focus of literature on Customer relationship management revolved around customer satisfaction, relationship marketing and data mining. From the analysis performed in the paper one thing can be concluded that CRM has diverse applications and can be applied in any business with ease and benefits the business in learning about their customers, optimizing interactions and increasing productivity.

**Key words:** Customer Relations, CRM, Bibliographic analysis, VOS viewer, Publication, Citation

### **Introduction**

With the immense Global competition and ever changing dynamic environment, there is an urgent need for companies to understand customer's needs and ends. Communication is one of the most important components between the companies and their customers, which enhances profit and customer satisfaction. The era of COVID-19 has shifted the focus of the companies more on communication as people are buying less but engaging more on social media and other platforms. There is a need to establish humanitarian connection through engaged communication between the company and the customer to retain its trust on the company and to ensure future purchases. “Developing a relationship with customers is the best way to gain their loyalty” (Dowling, 2002). Traditionally spreadsheets and emails were used to create a data-based system and analyse customer interactions and focus on improving customer satisfaction, but managing and analysing such big data was a tough task. This is where Customer Relationship Management (CRM) played a revolutionary role, the concept started in the 1970s where the companies evaluated customer satisfaction using annual surveys. CRM refers to the use of technology to manage all your relationships with existing customers and potential customers. “A close relationship with customers requires a strong coordination between information technology (IT) and marketing departments to retain customers for a long time” (Ibrahim, Hamid, Babiker, & Yassin, 2015). CRM system implies use of tools that allow the company to manage contact, sale, production and many more. Tom Siebel was the first to develop a CRM product named Siebel systems in 1993. The concept popularised in 1997 with the efforts of Siebel, Gartner and IBM. In my opinion, customers are the most important asset for the majority of the companies and they must have the knowledge about the type of customers, their behaviour and their response to their content, it becomes very difficult for the companies to store this data and this develops an urgent need for a central place to store all this information. CRM system proves to be the one stop solution for the above situation providing a centre place to store all the data related to leads and customers, making it easy

for every person in your company to get an insight view of the customer relations, their needs and wants. As it is well said “the importance of customer satisfaction cannot be denied as happy customers are like free advertising for the company” (Kotler, 2012), the companies should focus more on customer satisfaction along with its other objectives, and make use of CRM systems for better organisation of data and efficient output. The CRM System has evolved over time and with the developments in human and technology capabilities, its scope has also widened. It is not only used by corporations but also has its utility in the banking sector.

Numerous researches have been carried out in the past two decades on CRM, it becomes essential to analyse the different papers published by various deemed authors and to determine the various trends in its development. This paper aims to analyse all the papers published in Customer relationship management between 2000-2020 and conduct a bibliometric analysis to analyse different aspects of the research on the subject.

### **Importance of Customer Relationship Management**

“At its core, customer relationship management (CRM) is all of the activities, strategies and technologies that companies use to manage their interactions with their current and potential customers” (Kulpha, 2017). A saying is often heard from various businesses “Customer is the king”, well CRM fulfils the objective. Company’s earnings are affected by customer retention and their loyalty, and the core objective of CRM is to build personal relationships with the customer and in return receive customer retention and their loyalty. The most important aspect of CRM is that it can be implemented in numerous ways including social media, mobile technology, chat, e-mail and various other marketing tools.

**Learning** is one of the most important benefits of CRM. It is the best possible system that enables the business to understand the needs of their customers by analysing their purchase history and determining the customer trends, it also allows determining the optimum audience for the promotion tactics.

**Optimization** is another important pro of customer relationship management; a CRM system accommodates the business in improving interactions with the customers by simplifying various complex processes, it increases the satisfaction level among the customers. Apart from interactions with the existing customers, CRM plays an important role in determining and attracting potential customers for the business.

**Increased productivity** is another important benefit of using CRM solutions. It is practically impossible and time consuming for a team of employees to input data manually and search databases for relevant information, CRM solutions provide full automation of this process, making this task more efficient. Data mining is a crucial part of CRM, it collects all the data related to the customers and the sales information at a single platform. It allows creating effective reports based on different databases for more efficient analysis in just a few basic steps. This automation enables the team to focus more on analysing the data, converting the prediction into customers and increasing profit and sales.

**Customer Retention** is one of the most important aspects of CRM. According to a report by Bain & Company, it is 6 to 7 times cheaper to keep an existing customer rather than getting a new one. CRM fulfils this objective beautifully; it assists in keeping interactions with the existing customers by prompting and making you remember to reach out to customers who feel neglected as you have not been in touch with them for long. It reminds you to send follow up emails and fulfil your promises.

Customer Relationship Management is a dynamic concept and is used by every sector of the economy, no matter what its services are, each and every business requires CRM as an effective management tool. It offers industry specific benefits.

### **Bibliometric analysis**

“A bibliometric analysis is performed to evaluate both research trends and scholarly networks in different research disciplines” (Eck & Waltman, 2010) (Eck & Waltman, 2010)). The term bibliometrics was first used by Alan Pritchard in his paper “Statistical Bibliography or Bibliometrics?” In 1969. He described the term as “the application of mathematics and statistical methods to books and other media of communication” (Pritchard, 1969). Biometric analysis refers to utilisation of statistical methods to analyse scholarly publications, books and articles. It is used by various researchers to know the impact of their field, impact of research and particular paper. The first step in bibliometric analysis is to analyse, extract and organise the data in an effective manner, as it makes it easier to identify various aspects of the research paper. Various software’s are used for bibliometric analysis, which includes: VOS Viewer, Cite Net Explorer, Bib excel and many more. One of the most important areas of it is citation analysis, which helps to establish links between authors and their papers. Another important area in Co-Citation coupling which is used to analyse the subject similarity between two papers. While conducting a bibliometric analysis of scholarly publications, a person can identify the most cited author, most influential publications, contribution of various countries in the research and the research focus of authors over the period of 20 years. Keeping all this in mind, a dataset of all papers published in the area of CRM between 2000-2020 was created for conducting bibliometric analysis

### **Objectives**

On the basis of our dataset and methodology, 6 objectives are identified on which the further research would be carried out. Following are the objectives:-

1. To analyse various papers and journals published in the field of customer relationship management in the period between 2000-2020 and analyse the publishing trends of such publications.
2. To determine the contribution of countries/territories to the research in the field of CR
3. To determine the most influential publications in the field of CRM.
4. To determine the contribution of authors and analyse the changes in their collaborative structure.
5. To analyse the most used author’s keywords and most frequently occurring keywords and use this data to determine the research focus during different periods.
6. To perform co-occurrence network analysis and determine the most frequently occurring keywords in the publications.

### **Research Approach**

For conducting bibliometric analysis, a proper data set of all the papers with well organised structure is required. For this purpose, Scope was used and all the publications in the area of CRM were extracted and stored in csv. file in an organised format. Around 1119 such publications were identified as having “Customer Relationship Management” in their titles and were extracted for further research. The data was organised with headings such as authors, authors id, citations, number of pages, sources and the total number of publications.

For efficient and diversified analysis of the papers, the period of 20 years was divided into a period of 2 decades i.e. from 2000-2009 and 2010-2019. This bifurcation would help to identify research focus, total number of issues and citation in a particular timeline and compare it with others. The method used in this paper is somewhat similar to the method used by Dejian Yu, Wanru Wang\*, Wenyu Zhang and Shuai Zhang in their

paper: *A bibliometric analysis of research on multiple criteria decision making* (Yu, Zhang, Zhang, & Wang, 2018)

## **Methodology**

The data set extracted from Scopus is now evaluated using bibliometric analysis software **VOS Viewer**. The VOS Viewer software is easy to use and provides diverse options/features for analysis of data. VOS implies "visualisation of similarities". The software evaluates the data and presents bibliometric maps and networks based on citations, co-citation links, co-authorship and co-keywords. Unlike most computer programs that are used for bibliometric mapping, VOS Viewer pays special attention to the graphical representation of bibliometric maps, the functionality of VOS Viewer is especially useful for displaying large bibliometric maps in an easy-to-interpret way (Eck & Waltman, 2010) Nodes and lines are used to create bibliometric maps, nodes indicate the authors and publications and the lines connecting the nodes indicate the link between the two. VOS viewer also offers text mining, which allows it to identify the most frequently used terms extracted from the publication and create a co-occurrence network out of them. This co-occurrence network provides an idea of the research focus of the papers over the period. In VOS Viewer one can easily zoom in on the maps for a better and detailed view of the links and relationships between the nodes. The software is preferred for bibliometric analysis as it can evaluate 10000 items and produce large maps using the evaluated data, it even allows to take screenshots of the map for further use.

The results from conducting the analysis is then compared based on TP (total number of publications, TC (total number of citation) and TC / TP (Citation per publication), these are taken as a base to identify the most cited author, most influential publication, contribution of countries to the research, collaborative structure between the authors and the research focus.

## **Results and Analysis**

Bibliometric analysis requires a data set for it to evaluate, data was extracted from sci=opus and organised under various heads including author, total issues, number of citations, affiliation, year of publication and the keywords. This data was evaluated using Vos Viewer and following are the results and observations-

Firstly, we shall analyse the publication trends of papers published in the field of CRM in the last 2 decades. The graph below provides an overview into the trends of publication during different time periods.

### **Publishing trends of the publications in the field of CRM**

Figure-1 provides an insight into the trends of publication in CRM in the last two decades (2000-2020). It is clearly determinable from the graph that in the period 2000-2009, there were not that significant amount of publications. There was a boost of publications in the period 2010-2019, with 2010 having the most number of publications ever in the CRM field and 2019 having the second most publications in the CRM field. The above fact clearly signifies that maximum research was conducted in the period 2010-2019 and that too maximum in 2010. The decade of 2000-2009 being the starting point had a comparatively lesser number of publications but as observed in table-1, the period had the highest number of citations.

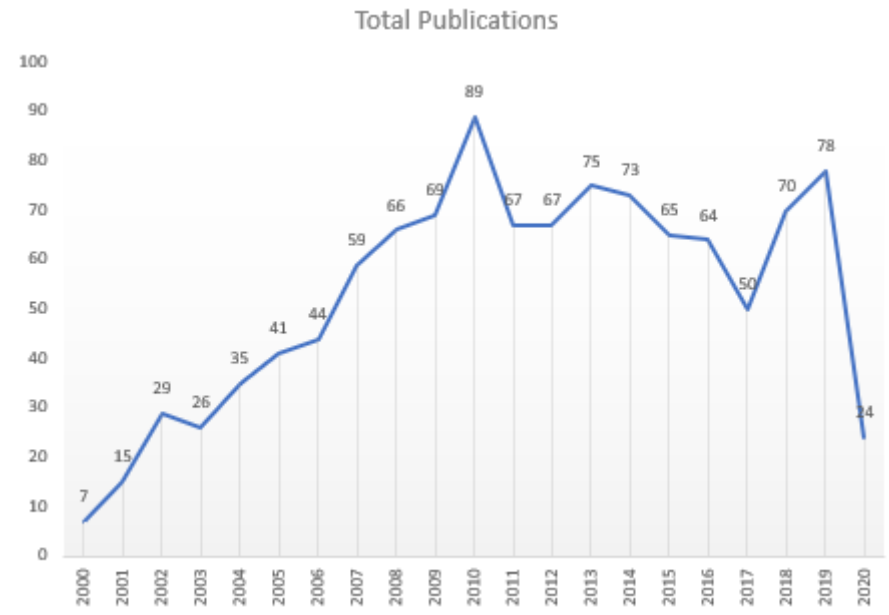


Figure-1 - Year wise frequency of publication in the field of CRM

After analysing the publishing trend, it becomes necessary to determine the period having the most number of citations and citation per publication.

#### Year wise frequency of total citations and citations per publication per year

The table below provides a year wise total number of publications, citations and citations per publication of the publications in the field of CRM.

Table 1- Year wise total number of total publications, total citations and citations per publication

Year	TP	TC	Citation per publication
2019	78	60	0.76
2018	70	186	2.65
2017	50	183	3.66
2016	64	453	7.07
2015	65	209	3.21
2014	73	436	5.97
2013	75	550	7.33
2012	67	490	7.31
2011	67	1122	16.74
2010	89	950	10.67

Year	TP	TC	Citation per publication
2009	69	713	10.33
2008	66	722	10.93
2007	59	1135	19.23
2006	44	1028	23.3
2005	41	3329	81.1
2004	35	2327	66.4
2003	26	2349	90.3
2002	29	1400	48.2
2001	15	699	46.6
2000	7	269	38.4

Table-1 and Figure-2 provides an insight into the number of citations and citations per publication of CRM publications from 2000-2020. It is observed in the table that the maximum number of citations have been observed in the period of 2000-2009, with 2005 having the most number of citations. This indicated that the period has some significant and relevant research papers of deemed authors that were cited the most and had the long-lasting impact. The period 2010-2019 saw significantly fewer citations.

If we shift our focus to the citations per publication per year, 2003 has the maximum number of citations per publication per year (81.1), which indicates that the publications that were published in 2005 received an average 81 citations per year. The publications between 2000-2009 obtained more citations on an average, in terms of citations per publication per year.

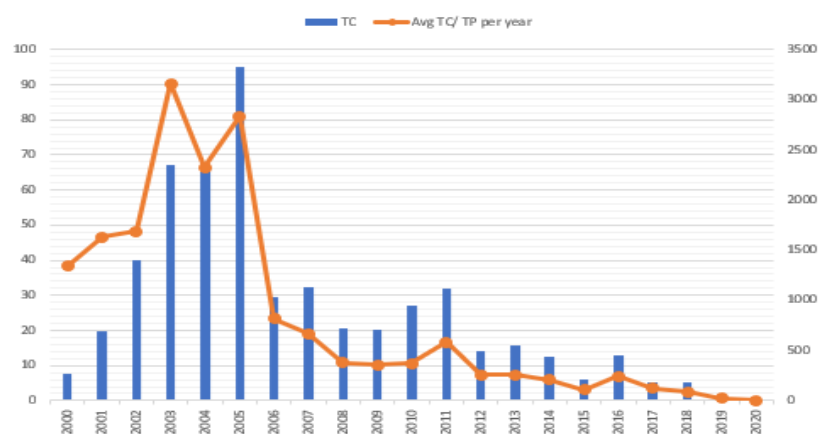


Figure 2 - Year wise frequency of total citations and citations per publication per year

The above explanations provide a complete overview of the year wise trends of publications and the contribution of different periods in the growth of research in the field of CRM.

### Contribution of Countries/Territories to Customer Relationship Management Research

The table-2 gives detailed information about the top 10 contributing countries and ranks them on the basis of their total publications (TP). Total citations and total publications in 3 different timelines are depicted to better understand and compare the performance of the countries

Table 2- Top 10 contributing countries in 2 decades

Rank	Countries	TP	TC	TC/TP	2000-2009		2010-2019	
					TP	TC	TP	TC
1	United States	195	8408	43.1	123	7181	72	1227
2	China	134	620	4.6	43	391	90	229
3	India	97	326	3.3	12	71	77	255
4	Taiwan	93	1511	12.3	39	790	54	721
5	United Kingdom	79	2966	37.5	29	2401	47	471
6	Iran	66	372	5.6	7	19	58	353
7	Malaysia	52	194	3.7	6	52	43	142
8	Germany	42	1660	39.5	18	1412	24	248
9	Australia	41	591	14.1	15	231	26	360
10	Hong Kong	29	643	22.1	14	432	15	211

The United States is ranked the first with the highest number of publications in the last two decades, followed by China with 134 publications and India with 97 publications. If we compare on the basis of total number of citations (TC), then the top 3 contributing countries are United States, United Kingdom and Germany. Although India and China have the second and third highest total publications (TP) and China has the third highest total citation (TC), their performance in average citation per publication (TC/TP) is comparatively quite low that other lesser contributing countries in terms of publications. Germany, despite having only 42 publications has the third highest total citations (TC) and also is in the top after the United States in terms of average citation per publication (TC/TP).

Table-2 also enables us to analyse the trends in publication of the top 10 contributing countries. In the period between 2000-2009, the United States had the maximum number of publications i.e. 80, followed by China and Taiwan.

The period 2010-2019, China emerged as the new top player with 90 publications, followed by India with 77 publications. In this period a major jump in total publications was observed from India, Iran, Malaysia and Germany, which were performing poorly back in 2000-2009.

Considering every aspect of the table, the United States had contributed the most to the research on Customer Relationship Management and had helped in the gradual development of it.



Figure 3- Distribution of most contributing Countries/Territories in the research of Consumer Relation Management

Figure-3 provides a map representation of the top 10 contributing countries having the highest number of publications in the field of Customer Relationship Management. The degree of darkness of colour represents more publications in comparison to others. It is clearly observed in the map that the maximum contribution is from the regions of North America, East Asia, Asia and Europe

#### **Most influential publication**

Table-3 lists the top 20 influential publications in the field of Customer relationship management on the basis of their total number of citations (TC). The most influential publications can be determined by taking in consideration their citation, the publication with the most number of citations is the most influential one and so on.

Table 3- Top 20 most influential publications according to TC

Rank	Title	Author	Year	TC	TC/TP
1	"A strategic framework for customer relationship management"	Payne A., Frow P.	2005	868	21.1
2	"The customer relationship management process: Its measurement and impact on performance"	Reinartz W., Krafft M., Hoyer W.D.	2004	813	23.2
3	"Understanding the Effect of Customer Relationship Management Efforts on Customer Retention and Customer Share Development"	Verhoef P.C.	2003	674	25.9
4	"Understanding customer relationship management (CRM): People, process and technology"	Chen I.J., Popovich K.	2003	502	19.3
5	"The role of relational information processes and technology use in customer relationship management"	Jayachandran S., Sharma S., Kaufman P., Raman P.	2005	495	12.0



Rank	Title	Author	Year	TC	TC/TP
6	"A customer relationship management roadmap: What is known, potential pitfalls, and where to go"	Boulding W., Staelin R., Ehret M., Johnston W.J.	2005	450	10.9
7	"Why do customer relationship management applications affect customer satisfaction?"	Mithas S., Krishnan M.S., Fornell C	2005	392	9.5
8	"Interactions in virtual customer environments: Implications for product support and customer relationship management"	Nambisan S., Baron R.A.	2007	326	5.5
9	"An evaluation of divergent perspectives on customer relationship management: Towards a common understanding of an emerging phenomenon"	Zablah A.R., Bellenger D.N., Johnston W.J.	2004	309	8.8
10	"Dynamic customer relationship management: Incorporating future considerations into the service retention decision"	Lemon K.N., White T.B., Winer R.S.	2002	302	10.4
11	"An integrated framework for customer value and customer-relationship-management performance: A customer-based perspective from China"	Wang Y., po lo H., Chi R., Yang Y.	2004	297	8.4
12	"From social media to social customer relationship management"	Baird C.H., Parasnis G.	2011	281	4.1
13	"Knowledge-enabled customer relationship management: Integrating customer relationship management and knowledge management concepts"	Gebert H., Geib M., Kolbe L., Brenner W.	2003	271	10.4
14	"Data mining techniques for customer relationship management"	Rygielski C., Wang J.-C., Yen D.C.	2002	267	9.2
15	"Customer Relationship Management (CRM) in Financial Services"	Peppard J.	2000	250	35.7
16	"Creating customer knowledge competence: Managing customer relationship management programs strategically"	Campbell A.J.	2003	210	8.0
17	"Cross-functional issues in the implementation of relationship marketing through customer relationship management"	Ryals L., Knox S.	2001	203	13.5
18	"Customer relationship management: Finding value drivers"	Richards K.A., Jones E.	2008	194	2.9
19	"Making customer relationship management work: The measurement and profitable management of customer relationships"	Bose R.	2005	192	4.6
20	"Customer relationship management: Key components for IT success"	Bose R.	2002	187	6.4

The most influential publications in the field of a research paper are the ones with the highest number of citations. In this case, the most influential publication is: *A strategic framework for customer relationship management* by Payne A. and P. Frow. This paper helps in broadening the definition of CRM and to enhance its role for attaining maximum customer value.

Second most cited and influential publication is: *The customer relationship management process: Its measurement and impact on performance* by Reinartz W., Krafft M. and W.D. Hoyer, this paper focuses on providing a proper framework and process of CRM processes and analyses its impact on performance.

*Understanding the Effect of Customer Relationship Management Efforts on Customer Retention and Customer Share Development* follows it by P.C. Verhoef is the third most cited paper with 674 citations, this paper is intended to investigate the effect of customer relationship management and relationship marketing on customer retention and customer share development. Other papers are related to role of social media on CRM, impact of Customer relationship management on consumer satisfaction, data mining techniques and role of CRM in financial services

It is observed from the above table that most of the influential publications were published in the period of 2000-2009; this signifies the contribution of the period in development of the research on Customer relationship management. Among the top papers, 4 have received more than 500 citations.

#### Citation network of most influential publication

Figure-4 provides network visualization of top 20 most influential publications. This network analysis would help us to identify the links and citations between the influential publications. An evaluation of divergent perspectives on customer relationship management: Towards a common understanding of an emerging phenomenon has the maximum number of links with other papers including: Customer relationship management: Finding value drivers. It is followed by Understanding the Effect of Customer Relationship Management Efforts on Customer Retention and Customer Share Development follows it authored by P.C. Verhoef which has 4 links with papers including: Dynamic customer relationship management: Incorporating future considerations into the service retention decision and The customer relationship management process: Its measurement and impact on performance. This indicated that all the top 20 papers are linked to one another and have been cited from each other directly or indirectly.

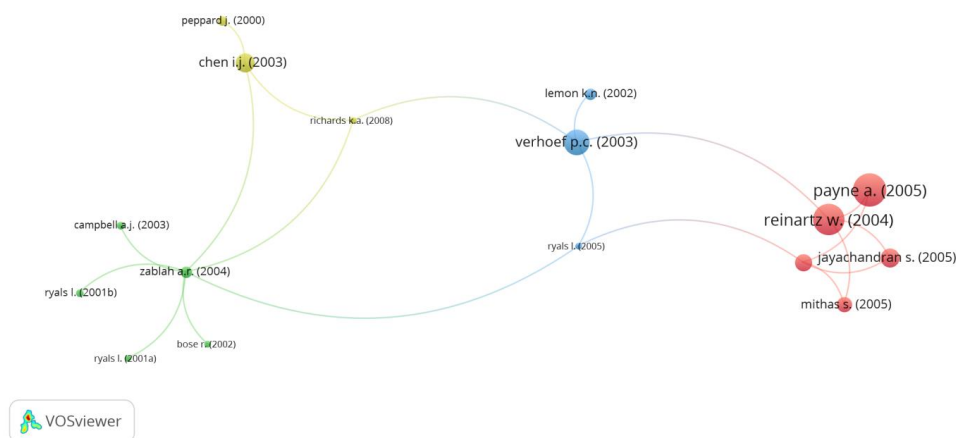


Figure 4- Citation network of the top 20 most influential publications in  
Customer relationship management

The table below provides detailed analysis of top 20 most cited authors, indication their contribution to the research. The authors are being ranked on the basis of the total number of citations they have and shall be compared on the same basis. The table also provides the h-index of the authors.

#### Contribution of Authors to the research

It is clearly observed in the paper that among the top 20 most cited authors having maximum contribution to the research are from the United States. The authors are ranked on the basis of the total number of citations (TC) they have and the table also provides information about their affiliation and their h-index as mentioned in Scopus

Table 4 - Top 20 most cited authors

Rank	Author	Affiliation/Institution	TC	TP	TC/TP	h-index
1	A. Payne	University of New South Wales (UNSW), Australia	1210	4	302.5	24
2	P. Frow	The University of Sydney, Australia	1035	6	172.5	19
3	D.C.Yen	Miami University, United States	662	6	110.3	1
4	Y. Wang	National Penghu University, Taiwan	390	4	97.5	-
5	W. Brenner	Universität St. Gallen, Switzerland	387	5	77.4	20
6	J. Fjermestad	New Jersey Institute of Technology, United States	256	13	19.7	18
7	V. Kumar .	J. Mack Robinson College of Business, United States	231	4	57.75	54
8	Jr.	Oklahoma State University, United States	185	4	46.25	-
9	C. Bull	Manchester Metropolitan University, United Kingdom	184	7	26.2	6
10	Y. Xu	Heilongjiang University of Science and Technology, Harbin, China	167	5	33.4	1
11	N.C. Romano Jr.	College of Business Administration, Oklahoma State University	166	9	18.4	18
12	B. Sun	Cheung Kong Graduate School of Business, United States	158	6	26.3	19
13	M. Sigala .	University of the Aegean, Greece	134	4	33.5	-
14	A.Keramati	University of Tehran, Iran	119	5	23.8	16
15	N.C.Romano	Oklahoma State University, United States	110	5	22	18
16	R. Alt	Universität Leipzig, Germany	108	4	27	16
17	R. Rahimi	University of Wolverhampton, United Kingdom	105	6	17.5	-

Rank	Author	Affiliation/Institution	TC	TP	TC/TP	h-index
18	H. Karjaluoto	University of Jyväskylä, Finland	103	7	14.7	25
19	A.D. Smith.	Robert Morris University, United States	88	5	17.6	24
20	R.Schierholz	Universität St. Gallen, Switzerland	81	7	11.5	7

A. Payne is ranked first with 1210 TC, one of his publications: *A Strategic Framework For Customer Relationship Management* is ranked as the most influential publication in the field of CRM and received the most number of citations. A Payne is followed by P. Frow was the second most cited author with 1035 total citations. P. Frow and A. Payne's authored publication: The role of multichannel integration in customer relationship management is among the top 20 most influential publications in the field of CRM. The third most cited author with 662 number of citations is D.C. Yen, his co-authored publication: Industrial management and data systems is among the most influential publications. If we consider citations per publication, Table clearly indicates the contribution of 20 authors having the maximum number of citations, and the contribution of A. Payne, P. Frow and D.C. Yen is very crucial for the research development in the field of CRM.

After analysing the contribution of authors to the research in the field of CRM, it becomes necessary for us to determine and analyse their collaborative structure, spot out the links between them.

### Collaborative structure of the authors

Figure-5 provides an insight into the collaborative structure of the top 20 most cited authors, this analysis would enable us to identify the links between them. The most cited author A. Payne has the strongest link with Frow P. as both have co-authored the most cited paper: *A strategic framework for Customer relationship management*. J. Fjermestad has collaboration with N.C. Romani and N.C. Romani J. and J. Fjermestad and N.C. Romani J. have co-authored numerous papers one of them being *Electronic commerce customer relationship management: An assessment of research and it received 89 citations*. Rest other authors have no or single co-co authorship as observed in the figure.

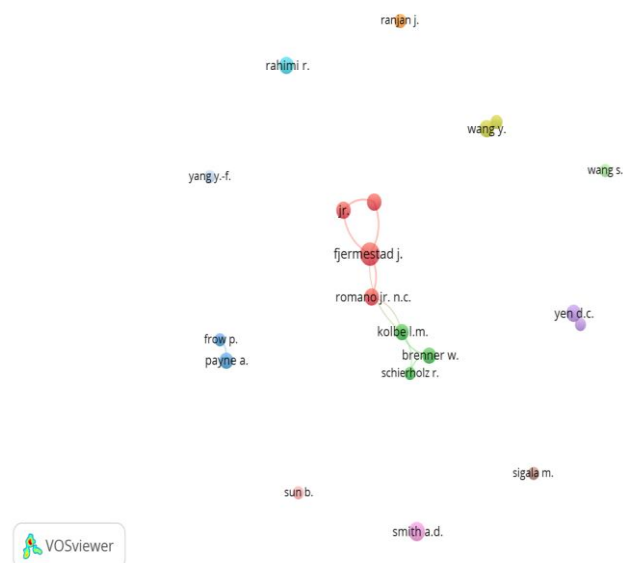


Figure 5- Collaborative structure of top 20 author

Keywords are the best tool to identify the research focus of the author, or on what aspect of CRM the author had the most attention on. Hence, the images below provide visualization networks of all the keywords used in the paper, based on their occurrences they have been mapped. The one having the highest number of occurrences is intended to be the research focus in the given period.

## Keywords analysis

Keywords are a major aspect of a research paper; they assist in identifying the research focus of the paper.

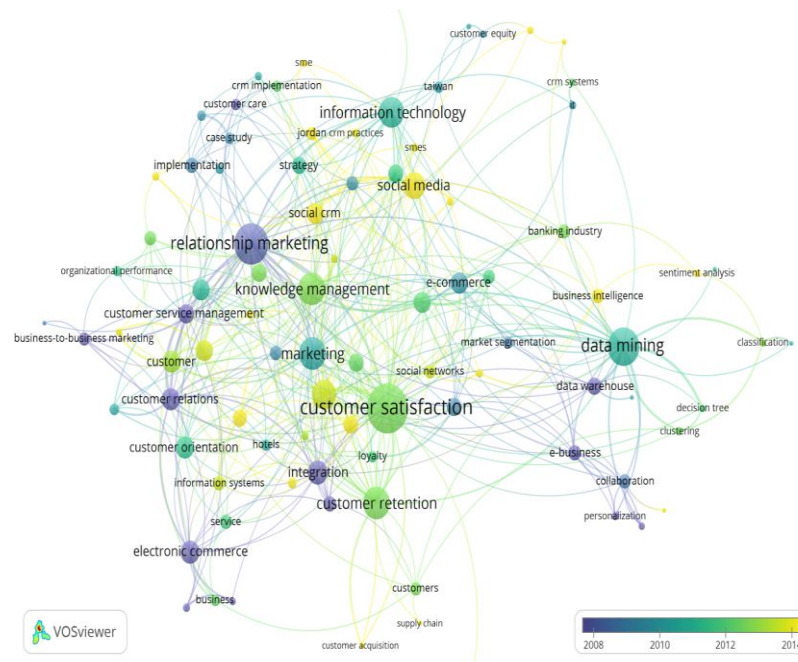


Figure 6 (a) Overlay visualization view of co-occurrence author keywords

Figure-6(a) provides an overlay visualization of co-occurrence network of authors keywords, that have been used at least 5 times in a paper. Colour depicts the year/ period in which they were used. The circles in the map denote the number of links a word has, bigger the circle higher the number of links. Web of lines shows the link between the words, a strong link is observed when two words are closer to each other, closer the words stronger the link. As customer relationship management and CRM are a part of the title, they must be ignored in this analysis. Customer satisfaction is the keyword with maximum links i.e. 41 and average publication year 2012, it is used with marketing, customer retention, customer value, customer relations etc. it is intended to be having the most links as the motive behind CRM is to provide maximum satisfaction to the customers. Customer satisfaction is followed by relationship marketing having 33 links and average publication year 2008, it is used with keywords including customer retention, data mining, e-commerce, marketing etc. it is followed by data mining having 30 links and average publish year as 2010, which is linked to with customer retention, customer satisfaction, integration, electronic commerce, relationship marketing and many others. It is also observed from the above analysis that customer retention and data mining is used with all the three top keywords in respect to their co-occurrence links, this signifies their importance in customer relationship management.

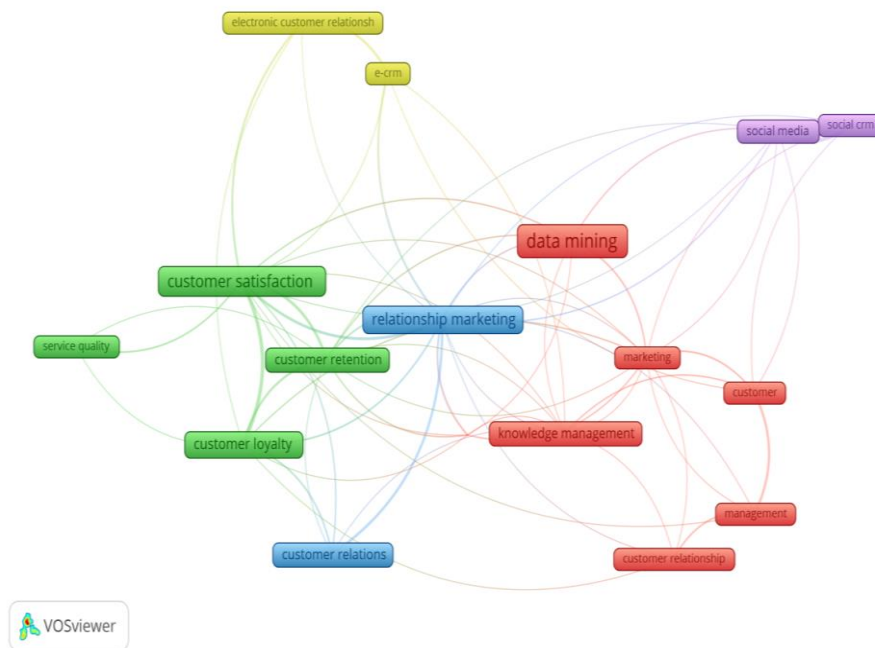


Figure 6 (b) Top 20 keywords used by authors

Figure 6(b) gives an insight into the top 20 most frequently used keywords in the papers with their co-occurrence networks. The above network visualisation is based on the total number of occurrences, the squares denote the words, bigger the square higher the number of occurrences of the word. The terms in relation with Customer relationship management including customer relationship management are excluded while analysis is done, as they are intended to be present in all the publications. The most frequently used keyword by the authors is data mining with 63 occurrences. Data mining is an important aspect of customer relationship management as it allows to extract data from the past and predict future outcomes from it. Data mining is followed by customer satisfaction having 52 occurrences, customer satisfaction and increase in sales is the major motive of Customer relationship management. Hence, we can conclude that data mining, customer satisfaction and relationship marketing are an important aspect in Customer relationship management as they have been mentioned in most of the papers.

### Research Focus

Figure-7 provides a visualization map of all the keywords used in the papers based on their occurrences, three different maps show the occurrences of keywords in 2 different timelines i.e. from 2000-2009 and 2010-2019

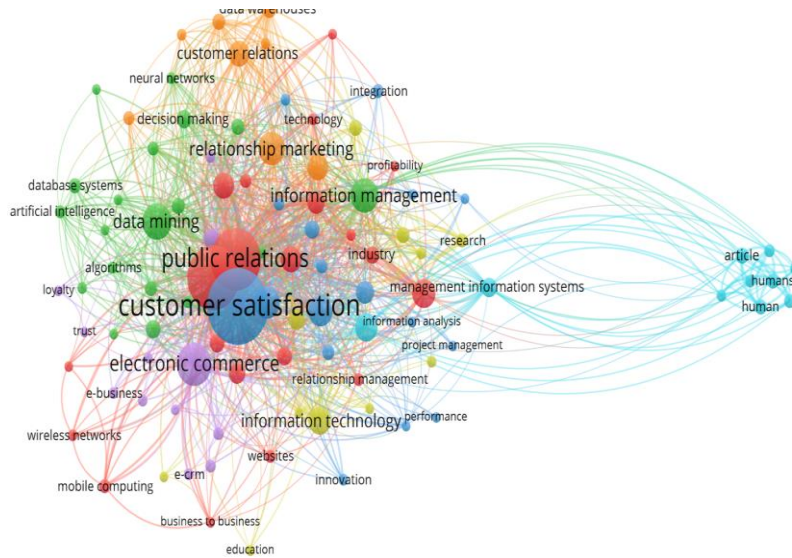


Figure 7A- Co-keyword network in different period (A) 2000-2009

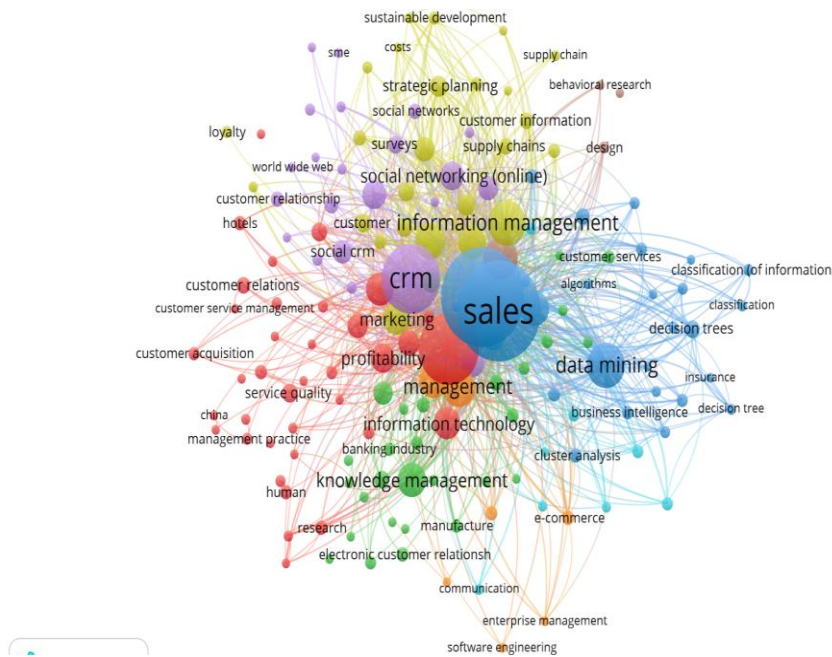


Figure 7B- Co-keyword network in different period (B) 2010-2019

Keywords are an important aspect of a research paper or any document, it basically highlights the focus of the research and conveys the meaning of the author. So, these keywords are an essential tool to identify the research focus of the papers in the different timelines and observe the changes over the period. Hence, the co-occurrence network analysis of keywords is conducted here. The circular nodes depict the keywords based on their occurrences, the bigger the circular node the greater the occurrences. Lines show the links between the two words, closer the word stronger the link.

Customer relations management have been ignored while conducting this analysis as they are a part of the title, hence they are intended to be used in the papers.



Figure (A) highlights the keywords used in the period 2000-2009, the research focus was on customer satisfaction as it has the highest number occurrences, followed by sales, public relations and electronic commerce. Customer satisfaction has major links with almost all the keywords as it is the desired end result of every activity performed under CRM.

Figure (B) highlights the keywords used in the period 2010-2019, the research focus was mainly on sales as it has 232 occurrences, followed by public relation, customer satisfaction and data mining. There has been an increased shift on sales aspect and new focus has been developed i.e. public relations.

It is crystal clear from the above explanations, the research focus revolved around consumer satisfaction, sales and data mining. However, over the periods of public relation, e-commerce and information management directed the focus towards them. Hence, we can say that these all are an important aspect of customer relationship management, some having their impact on CRM or on some CRM might be having an impact.

The table below provides an insight into the co-citation between the top 20 sources of publications. Co-citation analysis enables researchers to identify similar relationships between papers, authors and sources.

### Co-citation and Citation analysis of top-20 sources of publication

Table-6 provides a list of top 20 sources of publication ranked on the basis of total citations.

Table 6- Total citations and link strengths of top 20 sources of publications

Rank	Sources	Total citation	Total Link strength
1	Journal of marketing	1833	33572
2	Harvard business review	714	11728
3	Industrial marketing management	625	11438
4	Journal of the academy of marketing science	553	12983
5	Journal of marketing research	526	12304
6	Journal of business research	373	8544
7	Mis quarterly	369	5594
8	Business process management journal	369	4749
9	Expert systems with applications	293	3569
10	European journal of marketing	291	6560
11	Strategic management journal	235	5295
12	Decision support systems	229	3580
13	Journal of marketing management	223	4876
14	Journal of service research	221	5276
15	Journal of interactive marketing	218	4550
16	Management science	210	3536
17	Journal of retailing	179	3506
18	Marketing science	170	4277
19	International journal of hospitality management	169	3057
20	International journal of contemporary hospitality management	163	3032

*Journal of Marketing* has the most number of citations as compared to others, followed by *Harvard business review* with 714 publications and *Industrial marketing management* with 625 Citation. This signifies their contribution in the research on Customer relationship management.

Co-citation network analysis enables researchers to identify similar relationships between papers, authors and sources. The figure-8 provides a network visualization of the co-citation network of the top 20 sources of publications. All the top 20 sources are linked to each other, *Journal of marketing* appears to be the central node having the strongest links. Followed by *Journal of the academy of marketing science* and *Journal of marketing research*.



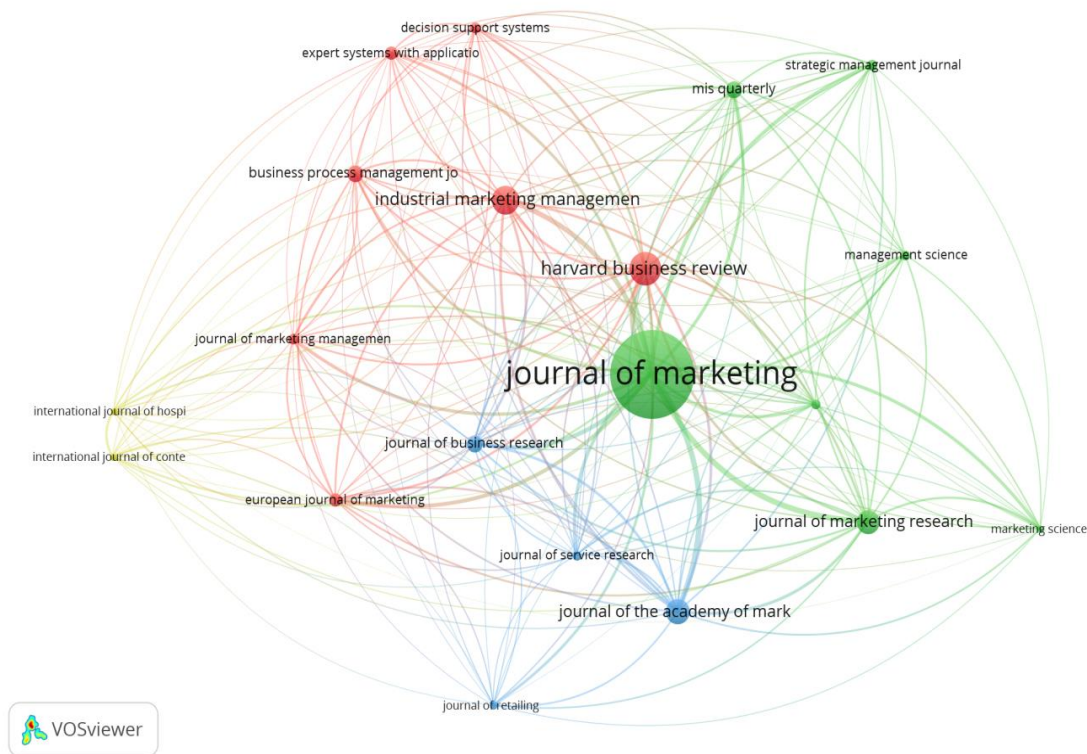


Figure 8- Co-citation network of top 20 sources of publications

## Conclusion

Importance of CRM has increased over the decades and various developments have been made, various researches have helped in the development of such aspects and create better understanding of it. To achieve the underlined objectives of the paper, bibliometric analysis of the papers on Customer relationship management were conducted considering various aspects. The objective of the paper included analysing trends in publication, contribution of countries, most influential publications, most cited author, keyword analysis and research focus. For better analysis and result evaluation of trends in publication, contribution of countries, research focus and keyword analysis the period of 20 years was divided into 3 decades i.e. 2000-2009 and 2010-2019. This bifurcation enabled us to compare and analyse the changes in the research and CRM over the periods. According to the trends in publication, 2000- 2009 saw very less number of publications and a boost was observed in 2010-2019 with the maximum number of publications in 2010. Major contribution in the field of CRM was observed from contributions from the regions of North America, East Asia, Asia and Europe. A. Payne is the most cited author and has contributed the most to the research. His publication: *A strategic framework for customer relationship management* received maximum citation and is considered to be the most influential publication in the field of CRM. Hence, from all the above analysis, one thing can be concluded that CRM has diverse applications and can be applied in any business with ease and benefits the business in learning about their customers, optimizing interactions and increasing productivity.

The fact that this publication has its limitations cannot be ignored as it extracted only one publication catalogue, which is Scopus and did not take Web of Sciences and Google scholar into consideration.

Hence, the scope of this paper is limited due to analysis of limited resources. In future papers I plan to take all the available aspects and resources into consideration and provide more focused and accurate results and rankings..

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