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Knowledge management and social media: A scientometrics survey

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C H R O N I C L E

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A B S T R A C T

The purpose of this research is to study the role of the social media for knowledge sharing. The study presents a comprehensive review of the researches associated with the effect of knowledge management in social media. The study uses Scopus database as a primary search engine and covers 1858 of highly cited articles over the period 1994-2019. The records are statistically analyzed and categorized in terms of various criteria using an open source software package named *R*. The findings show that researches have grown exponentially during the recent years and the trend has continued at relatively stable rates. Based on the survey, knowledge management is the keyword which has carried the highest citations followed by social media and social networking. Among the most cited articles, papers published by researchers in United States have received the highest citations, followed by United Kingdom and China.

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1. Introduction

In the competitive world of today, knowledge has become a strategic source for many organizations. Davenport and Prusak (1998) believe that organizations must distinguish themselves from others based on what they know. Knowledge management (KM) has become a kind of fashion and management style since the 1990s and it is associated with the systematic and consistent process of coordinating the wide-ranging activities of the organization, including the acquisition, creation, storage, sharing and application of knowledge by individuals and groups to reach organizational objectives (Rastogi, 2000). The effect of KM projects on the overall success of the organization has been widely acknowledged. However, what factors and how they can succeed are questions which needs extensive investigation. Thus, in various researches conducted in this field, the effects of different factors on the success of management projects have been studied.

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Among the various business policies, there are different issues which are effective in building an appropriate infrastructure and context to support the KM process. Human resource management policies concentrating on attracting and retaining talent are considered as a kind of organizational culture which embraces new ideas and learning.

KM achieves the objectives of the firm by optimally utilizing the knowledge or the capabilities of a firm to implement intellectual capital and collective knowledge to reach its objectives through a process including knowledge generation, knowledge sharing and use it with the help of technology. Moreover, Social media is one of the most essential issues associated with KM. Studies have shown that different countries have used social media in knowledge management Yates and Paquette (2010), explained how social media technology was used and how this tool was implemented to share information in an earthquake in different countries.

There is usually a difference in the use of social media in large organizations and small and medium enterprisess (SMEs). According to McAdam and Reid (2001), large organizations apply knowledge management based on social media than small firms do. In their study, large organizations were organized by more than 250 people and SMEs were managed by fewer than 250 people. Of course, SMEs have unique characteristics that affect these activities that lead to organizational effectiveness.The most important of these activities are associated with how they manage knowledge. The impact and usage of social media in SMEs have become important in recent years and social media has played an important role for the success of the firms. Therefore, SMEs can also use the social media to share information and exchange ideas. The results show that given the importance of SMEs in the economy, in Germany, for example, SMEs have gone to social media such as blogging, wikis, but there are still many problems with them to accept social media. Another issue is the impact of the cost-effective social media exchange on information sharing (Meske & Stieglitz, 2013).

Another issue is that in general, social media makes information more accessible. In fact, the information sharing is initially considered as an alternative, and then continuously emerges into businerss structure through sharing information between less-known individuals (Majchrzak et al., 2013). Majchrzak et al. (2013) studied the effect os of using social media in knowledge management processes in metal industry. Social media tools such as Facebook reviews, wikis, and blogs, and knowledge management processes are the process of creating, disseminating, and using useful information. Also, the reasons for not using social media in the process of knowledge management and the benefits of using it, from the users' perspective working in these organizations was examined by Majchrzak et al. (2013). The research findings indicated that about half of the surveyed people implemented social media in their knowledge management each day. The use of the media became popular in terms of the number of times in both the metal industries and research institutes, respectively, and 70% and 47.1% of the people each year used these media in their knowledge management activities in the organization, respectively.

Location, motivation and social capital through the social networking business can reduce information sharing problems. These challenges include the place of business, the motivation to share information and social capital (Fulk & Yuan, 2013). Social media has had a great impact on sport, which is reviewed by studying 70 articles on how information is shared and knowledge management is used in sport through social media. Three categories of social media in this case include behavioral, strategic, and focused on consumption. Social media in the field of sports management refers to the collection of communications between individuals and brands. Interest is very important in this regard and the present age has been called the "age of communication". In this era, mass communication has been transformed into a new form and has affected the developments of the human society, due to the application of communicative means, whose extent and influence is enormous. As part of the modern society structure and one of the most comprehensive and widely available media systems, the media plays an important role in all countries in various political, cultural, social, economic and other fields.

From the point of view of knowledge management, learning from e-learning to social learning is essential for knowledge management. An important issue is the role of social capital in the media. The relationship between the use of social media and employees' creativity with the knowledge management approach is another issue and aims at examining the role of social media and the creativity of individuals.

2. The propsoed study

In this paper, we present a comprehensive bibliometrix study to learn more about different studies associated with the relationship between knowledge management and knowledge sharing. The study uses a bibliometrix software package embeded in R as a datamining package. Bibliometrix R package is a tool for quantitative research in scientometrics and bibliometrics. Bibliometrix package provides various routines for importing bibliographic data from Scopus, Clarivate Analytics' Web of Science, PubMed and Cochrane databases, performing bibliometric analysis and building data matrices for co-citation, coupling and scientific collaboration analysis (Aria & Cuccurullo, 2017). The proposed study of this paper performs a survey on Scopus database using two keywords of "knowledge management" and "social media". We have collected the first 1858 records with the highest citations, imported into R-software package and analyzed the results.

2.1 Annual Scientific Production

With the objective of ascertaining the international evolution of the subject, a broad range of study was carried out. A total of 1858 original articles and reviews were published on this subject.

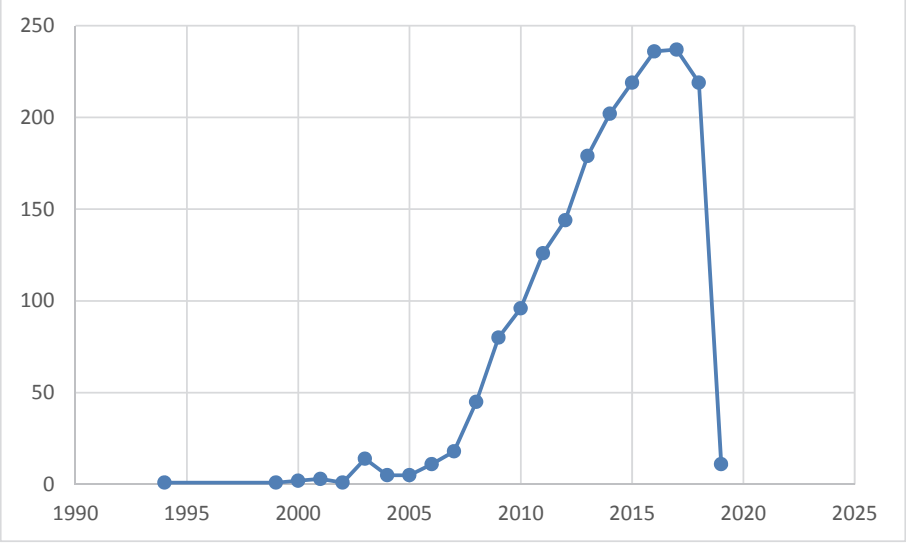

Fig. 1. The Scopus publications on the analysis of social media and knowledge management from 1994 to 2019

Fig. 1 shows the annual number of articles published in both the social media and knowledge management issues in the Scopus database for a period of 25 years, from 1994 to 2019. As can be seen, the production of content has been increasing in recent years.

2.2. The themes in reviewed articles

The search of articles on the Scopus site was accomplished with two keywords "Social Media" and "Promotion". In Scopus, there were 1856 articles related to these keywords. Then the articles were arranged according to the highest citation, and among them, we reviewed 130 articles which received the highest citations. In Table 1, we have presented the areas covered by all 130 articles. Fig. 2 shows the structure of the most popular words used in the literature.

Table 1
Articles themes

No.	Articles	Total Citation	knowledge management	social media	social networking (online)	internet	information management	knowledge-sharing	education	data mining	information systems	Twitter	knowledge based systems	organization and management	communication	Knowledge exchange	human resource management	knowledge transfer
1	Straub, 1994	436	√	√														
2	Yates & Paquette, 2010	416	√	√				√										
3	Kane et al., 2010, 2012	283	√	√	√													
4	Rao, 2010	267	√	√	√					√		√						
5	Olsen, 2007	243	√															
6	Kamel Boulos, 2011	214		√		√						√		√				
7	Mcadam, 2001	203	√															
8	Majchrzak et al., 2001	191		√	√			√										
9	Wei, 2012	174	√							√								
10	Treude, 2011	173	√	√		√			√							√		
11	Bozeman, 2013	142	√	√	√	√	√						√					
12	Leonardi, 2014	141	√		√			√										
13	Price et al., 2014	133		√		√												
14	Sartorius et al., 2010	133	√															
15	Tredinnick, 2006	133	√	√		√	√											
16	Martín-de-Castro et al., 2011	130	√															
17	Saerbeck et al., 2010	130	√						√		√							√
18	Khoury & Ioannidis, 2014	125	√	√		√												
19	Egbu et al., 2005	121	√				√						√					
20	Martinelli et al., 2008	119	√															
21	Barua et al., 2014	117	√															
22	Kinsella et al., 2011	117	√	√	√							√						
23	Stellefson 2013	112		√		√												
24	Popescu, 2010	111	√	√	√													
25	Peersman, 2011	106		√	√													
26	Tang & Liu, 2009	101	√	√														
27	Mohammadi et al., 2014	100	√															√
28	Wu, 2013	100	√	√														
29	Castrén, 2015	98		√					√									
30	Goodchild et al., 2010	97	√								√							√
31	Sizov, 2010	96		√	√													
32	Wang et al., 2013	92	√		√								√					
33	Chua & Banerjee, 2013	90	√	√														
34	Bjerregaard, 2010	89	√													√		
35	de Albuquerque et al., 2013	88		√								√						
36	Gibbs et al., 2013	87	√	√				√										
37	Wang, 2011	84	√					√										
38	Aboujaoude et al., 2015	79	√	√		√												
39	Brandtzæg, 2010	79	√				√											
40	Wodzicki et al., 2012	78	√	√	√											√		
41	McGlohon et al., 2008	77	√	√		√				√								
42	Hines et al., 2006	77	√															
43	Ackerman et al., 2013	76	√					√										
44	Boulos et al., 2011	76		√			√											
45	Sophia van Zyl, 2009	76	√															
46	Allen et al., 2013	73		√		√												
47	Kasiviswanathan et al., 2011	71	√	√														
48	Ma et al., 2011	70	√					√	√						√			
49	Currie, 2003	70	√															
50	McGee et al., 2013	69	√							√		√						
51	Filo et al., 2015	68		√														
52	Fulk & Yuan, 2013	67	√	√	√			√										
53	Poblete et al., 2011	67	√	√	√							√						

Table 1
Articles themes (Continued)

No.	Articles	Total Citation	knowledge management	social media	social networking (online)	internet	information management	knowledge-sharing	education	data mining	information systems	Twitter	knowledge based systems	organization and management	communication	Knowledge exchange	human resource management	knowledge transfer
54	Ngai et al., 2015	66		√	√													
55	McMinn et al., 2013	63	√	√	√							√						
56	Ma et al., 2014	61	√	√	√		√	√										
57	Dahlander et al., 2014	60	√	√														
58	Kupavskii et al., 2012	60	√	√				√										
59	Ma et al., 2015	58	√		√													
60	Beck et al., 2014.	58	√	√	√											√		√
61	Razmerita et al., 2014	58	√	√														
62	Verhoef & Lemon, 2013	58		√														
63	Ison et al., 2011	56	√															
64	Nordfeldt et al., 2010	56		√		√												
65	Charles-Smith et al., 2015	55		√														
66	Baker et al., 2014	54		√		√									√			
67	Palacios-Marqués et al., 2017	54	√		√	√										√	√	
68	Leist 2013	54		√														
69	Sigala & Chalkiti, 2015	52	√	√														
70	Bharati et al., 2015	52	√	√														
71	Lin, 2012	52	√	√									√					
72	Grassi et al., 2011	52		√	√													
73	Basly, 2007	52	√															
74	Thackeray et al., 2013	51	√	√								√						
75	Firan et al., 2010	51	√	√														
76	Wu et al., 2008	51	√								√							√
77	Burkhard, 2005	51	√															
78	Deshpande et al., 2013	50		√		√							√					
79	Levine & Prietula, 2012	50	√	√		√												
80	Yin et al., 2011	50	√	√	√							√						
81	Dixon, 2011	50	√	√														
82	Robillard et al., 2013	49		√		√					√							
83	Cambria et al., 2012	49	√	√							√			√				
84	Leonardi 2015	48	√		√		√	√			√				√			
85	Munar 2012	48		√														
86	Zhang et al., 2015	47	√	√	√			√									√	
87	Cui et al., 2012	47	√	√	√							√						
88	Wright et al., 2009	47	√															√
89	Xu et al., 2016	46		√	√								√					
90	Meske & Stieglitz, 2013	46		√	√												√	
91	Zhao et al., 2016	45	√		√													
92	Dunkel, 2015	45		√	√		√											
93	Gao et al., 2012	45	√	√														
94	Barbieri et al., 2010	45	√	√	√													
95	Vayena & Tasioulas, 2013	44		√														
96	Capó-Vicedo et al., 2011	44	√	√														
97	Chen, 2012	43		√		√									√			
98	Sobaih et al., 2016	42		√	√				√									
99	Wagner et al., 2014	41	√	√									√					
100	Sigala & Chalkiti, 2014	41	√	√														
101	(Zhu et al., 2013	41		√														√
102	Demuth et al., 2012	41	√												√		√	
103	Kwahk & Park, 2016	40	√	√	√		√	√										
104	Hemsley & Mason	40	√	√														
105	Cox, 2012	39	√															
106	Tsai et al., 2009	39	√															
107	Palen & Anderson, 2016	38		√														

Table 1
Articles themes (Continued)

108	Allen et al., 2013	38	√	√	√						√				
109	Clark & Kinoshita, 2007	38	√	√		√									
110	Zahedi et al., 2016	37	√				√	√							√
111	Eid & Al-Jabri, 2016	37	√		√		√		√						
112	Jones et al., 2014	37		√									√		
113	Davoodi et al., 2013	37	√		√										
114	Müller & Stocker, 2011	37	√	√				√							
115	Can, 2013	36	√	√	√						√				
116	Yuan et al., 2013	36	√					√							
117	Väyrynen et al., 2013	36	√	√											
118	Zubiaga et al., 2011	36	√	√	√						√				
119	Banerjee et al., 2009	36	√	√	√	√									
120	Chen et al., 2012	35	√					√							
121	Brown et al., 2016	34		√											
122	Livingston et al., 2013	34		√											
123	Cyril Eze et al., 2013	34	√					√							
124	Roblek et al., 2013	34	√	√	√							√			
125	Baehr & Alex-Brown, 2010	34	√	√	√			√							
126	Fujisaka et al., 2010	34		√	√		√							√	
127	Chau & Maurer, 2005	34	√					√							
128	Lim & Buntine, 2014	33	√		√				√		√				
129	Shenouda et al., 2012	33		√											
130	Bernhardt et al., 2011	33		√											

2.3 The most common keywords and Temporal Analysis

Table 2 demonstrates some of the most popular keywords used in the studies associated with knowledge management. As observed from the results of Table 1, “knowledge management” and “Social media” and “social networking”, are three keywords known in the literature.

Table 2
The most popular keywords used in studies associated with knowledge management and social media

words	Occurrences	words	Occurrences
knowledge management	1170	virtual reality	54
social media	1090	diabetes mellitus	54
social networking (online)	673	interpersonal communication	53
human	296	e-learning	53
internet	262	innovation	52
humans	232	competition	52
information management	222	learning systems	52
female	189	self care	51
article	173	knowledge transfer	51
male	155	qualitative research	51
knowledge-sharing	154	questionnaire	49
education	153	artificial intelligence	49
information dissemination	144	psychology	48
adult	135	online systems	48
data mining	125	social networks	46
information systems	109	motivation	46
decision making	104	social sciences computing	45
human computer interaction	95	aged	45
knowledge based systems	95	health care personnel	44
procedures	89	public health	44
organization and management	88	semantic web	43
semantics	88	health education	42
communication	84	management science	42
research	83	social media platforms	40
economic and social effects	80	design	40
priority journal	80	forecasting	39
knowledge	77	learning	38
world wide web	76	commerce	38
attitude to health	75	natural language processing systems	38
young adult	68	review	38
behavioral research	67	technology	38
adolescent	66	user interfaces	37
middle aged	66	disasters	37
social network	65	medical information	35

Table 2
The most popular keywords used in studies associated with knowledge management and social media

web 2.0	65	management	35
attitudes	64	mobile devices	35
health knowledge	64	risk management	35
practice	64	social interactions	35
health promotion	63	social sciences	35
industry	63	sustainable development	34
knowledge engineering	63	facebook	34
students	63	medical education	34
twitter	63	risk assessment	33
human resource management	62	awareness	33
knowledge acquisition	61	big data	33
information retrieval	59	collaboration	33
societies and institutions	59	sales	33
teaching	58	telemedicine	32
websites	58	child	32
information technology	57	controlled study	32
surveys	57	health care	32
social support	55	medical informatics	32
united states	55	ontology	31
knowledge management	55	knowledge exchange	30

Fig. 2. The frequency of the keywords used in our survey

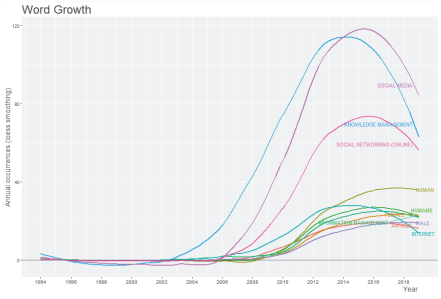

Fig. 3. Word dynamics

As shown in Fig. 2, "knowledge management", "social media", "social networking", "information management", "knowledge-sharing", "human", "information systems", and "internet" are the research hotspots with a high frequency of the keywords used in different project. Zhang et al. (2015) performed a survey based on dynamic topic modeling for monitoring market competition from online text and image data state and reported that social media monitoring could provide companies with temporal summaries of highly overlapped or discriminative topics against their major competitors. There has also been different studies on the analysis of emotions in social media for commercial purposes (e.g. Cakra & Trisedya, 2016), deep sentiment analysis for analyzing business ads in social media (Jang et al., 2013) and sentiment analysis of Hollywood movies on Twitter (Hodeghatta, 2013). Fig. 3 also presents the world dynamics of different words.

2.4. Conceptual structure, Co-occurrence network

A keywords co-occurrence network (KCN) concentrates on understanding the knowledge components and knowledge structure of a scientific/technical field by examining the links between keywords in the literature. Fig. 4 presents the analysis methods based on KCNs used in theoretical and empirical studies to explore research topics and their relationships in selecting scientific fields. If keywords are grouped into the same cluster, they are more likely to reflect identical topics. Each cluster has different number of subject keyword.

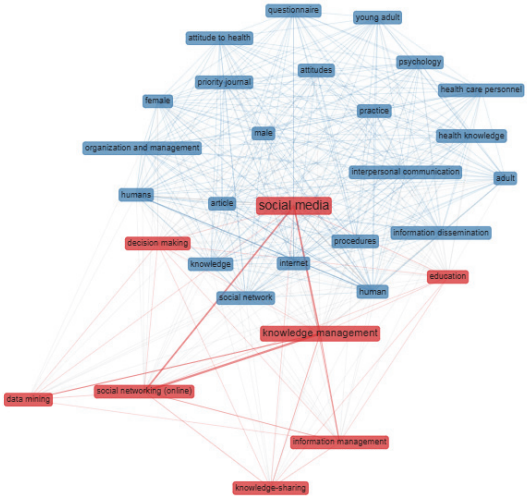

Fig. 4. Co-occurrence network (2011-2019)

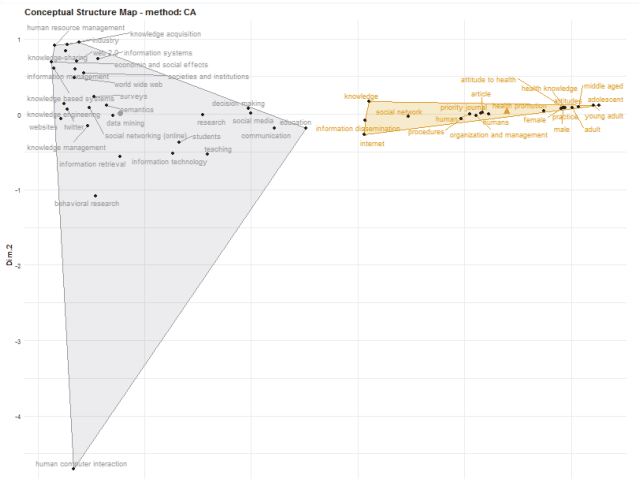

Fig. 5. Conceptual structure Map, method: CA

2.5. Conceptual structure map, Correspondence analysis

Co-word analysis aims at representing the conceptual structure of a framework using co-occurrence of words. The words can be replaced by authors' keywords, keywords plus, and terms extracted from titles or abstracts. The conceptual structure function produces three kinds of mapping as listed: conceptual structure map, factorial map of the documents with the highest contributes and factorial map of the most cited documents. Conceptual structure map is shown in Fig.5 and according to our results, cluster 1 has the most keywords, which means the attention of the researchers to the subject matter of the study.

2.6. Thematic map and historical direct citation network

Co-word analysis draws clusters of keywords, which are the themes in the study. In the strategic diagram presented in Fig. 7 the vertical axis measures the density – i.e., the strength of the internal links within a cluster represented by a theme –, and the horizontal vertical axis the centrality – i.e. the strength of the links between the theme and other themes in the map. Thematic map is a very intuitive plot and we can analyze themes according to the quadrant in which they are placed:

(Q1) upper-right quadrant: motor-themes;
(Q2) lower-right quadrant: basic themes;
(Q3) lower-left quadrant: emerging or disappearing themes;
(Q4) upper-left quadrant: very specialized/ niche themes.

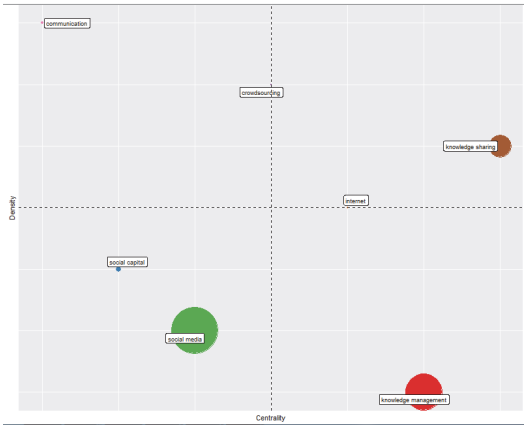

Fig. 6. Thematic map

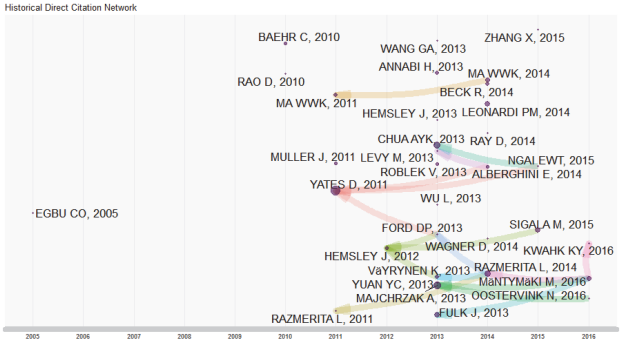

Fig. 7. Historical direct citation network

According to our survey, knowledge sharing is the most popular topic in our survey. The historiographic map is a graph proposed by E. Garfield to represent a chronological network map of the most relevant direct citations resulting from a bibliographic collection (See Fig. 7). The citation network technique provides the researchers with a new modus operandi which may significantly influence future historiography.

2.7 Social structure, Contributions of countries

This figure shows which countries have the highest citation, and which countries have been cited. As we can observe from the results of Fig. 8, there were strong collaboration between the researchers from the United States and other researchers all over the world. Studies show that researchers from the United States (923 articles), UK (306 articles), Germany (224 articles), and the Canada (196) have played a major role in scientific production of knowledge management and social media.

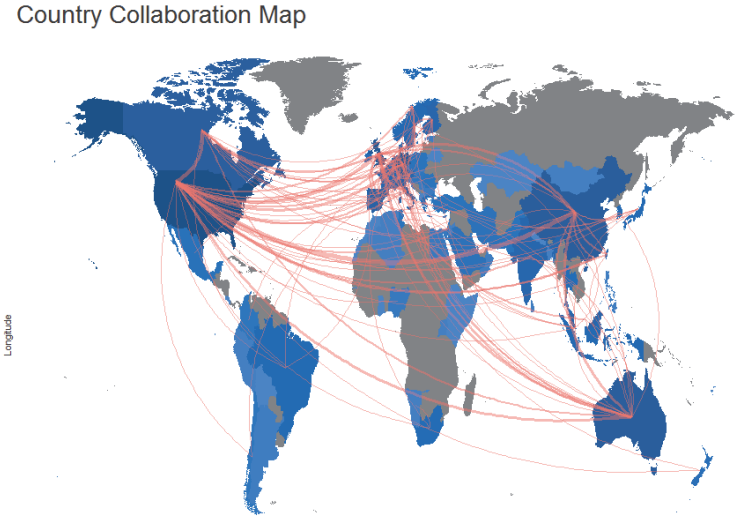

Fig. 8. Country collaboration map

One of the other important areas of research is the study of the scientific production of countries.

3. Conclusion

Nowadays, more and more organizations and companies are integrating social software packages into their internal and external communication strategies and redesigning their traditional knowledge management processes to meet the needs and expectations of global conversational markets and net generation knowledge workers. One good way of knowledge management can be accomplished through social media. The present study has concluded that knowledge management could help managers promote the knowledge sharing among employees. This could increase the productivity of the organizations. The results of the present study has indicated that there was an increasing trend on measuring the effects of social media on knowledge management and knowledge sharing.

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