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The role of information systems in communication through social media

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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 provide a conceptual overview on published studies and articles related to social media and information systems as two independent, continuous and interdependent concepts. The research data is from the survey for two social media keywords and information systems from the Scopus site, which is one of the main scientific search engines. Due to a large number of findings, the study area was limited to 6 major areas of social sciences, business management, economics, arts and humanities, psychology and decision-making sciences, and 5185 articles were found. To investigate and analyze the findings, the Romethometrics and bibliometrics library of R Studio software were used. Biblimetrix was a method for studying and evaluating quantitative scientific texts using mathematical and statistical methods. The data obtained from this research is useful for scholars, researchers, decision-makers and those interested in social media and information networks in the political, economic, social and cultural spheres.

1. Introduction

With a brief overview of the history of several centuries of human civilization, we find that information has been one of the major factors for the development and evolution of civilizations. Societies that quickly and accurately compile and analyze their information and use the results correctly have always been more successful than others and have affected other people and communities. The diversity, evolution, and transformation of the media have exposed researchers with a wide range of information and their impact on information has had a dramatic effect on the world. By contemplating in the current information world, the use of new technologies, which has found a tremendous place in community services and revolutionized the transmission, storage and retrieval of information, is inevitable (Farhadi, 2012: 13). From the first half of the 20th century, scientific communication has been at the center of sociological studies as one of the main mechanisms affecting the institution of science, and its significance in the production of knowledge has been discussed. In recent decades, with the expansion of the information society, the development of electronic communications, and the elimination of spatial con-

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straints in virtual relationships, the field of scientific communication has once again attracted the attention of scholars with the use of new concepts (Mohammadi, 2007). Scientific communication is a subset of social communication. The system of communication in science is based on the transfer of information and the results of scientific activities through a network of experts and a system of review by academic colleagues. The information society is a community that uses knowledge and information and related technologies to accelerate the economic, social, cultural and human development. One of the pillars of the information society is the creation and expansion of high-capacity, long-distance communication systems that are accessible from all parts of the world. Paul Safo, a researcher at the Institute for Future Studies, considers information as a wave that will soon affect us, significantly and we need to learn how to control this vast amount of information (Ibid. 02). The important point is that information literacy in this community is a necessity. According to the American Library Association definition, information literacy is referred to as "a set of capabilities that individuals can use to help identify the time needed for information and to locate and effectively use the information they need" (Khaleghi & Siamak, 2010:10).

All media, according to the nature, level of influence, capacities, facilities, type of message, audience etc. can play their role in accordance with expectations of the information society (Ghasemi Hamedani & Amiri, 2015). The media interconnects the components of the information society from one society to another society and from one generation to another generation, and it is in some way one of the most important channels of scientific communication. Contemporary media, more than any other communication technology, have made it possible to transfer and extract high-volume and low-cost information, and more control over the content, as well as the possibility of choice from users. Each media, in accordance with their nature, can be a factor in the process of forming scientific communications (Shamsi & Soleimani, 2016). Meanwhile, due to the ever-expanding and high-speed development of social media technology, the media outlets have surpassed other media and have spread across the globe to all the societies in a striking way, and the necessary social media and information systems have influenced each other.

Virtual social networks are a type of social media that most closely resembles a human society and allows individuals to communicate with a large number of other people, regardless of time, place, political, cultural and economic constraints. Researchers have shown that social networking and the use of various social media types have the benefits of being present in this virtual community, such as the support of others, information, emotions, and emotions, and often need real life aspects. The physical presence of people is not among them in these virtual communities.

2. Social media and information systems

Media is like any medium that transports cultures and thoughts such as newspapers, magazines, radio, television, satellite, internet, etc. In this definition, it should be added: Media is a vehicle that plays the role of information bearer and it is a pre-designed message and is an intermediary between the transmitter and receiver of the message that has evolved over time (Ahmadzadeh Kermani, 2012: 551). Media plays a variety of roles in the community, which can be related to the role of news, education, guidance, leadership, entertainment, and propaganda. According to the definition given in the media, databases are a kind of medium that plays the role of the bearer of coherent scientific information and serves as a medium for information seekers. Today, with the growth of scientific and research activities, a wealth of information has emerged, partly due to the existence of the media itself. The increasing amount of information and the increasing number of its producers are the most important factors that make it difficult to retrieve information in this environment. Today, the problem with the researcher is how to identify the mass of untrusted information and topics. In addition to web search skills and information seeking skills for more effective access to information, print and print retrieval systems (bibliography, index, etc.) and electronic systems (databases) of interest search (Farhadi, 2012: 118). "Social media is composed of democratic content, and understanding the role of the media is not just the dissemination of information, but also the production of information and share it," said Brien Solis in describing social media. Social media describes online tools that people use to share content, profiles, views, experiences, and thoughts. Social media is the innovation and initiative of systems that connect people to one another,

provide opportunities for providing and presenting content among them, and extract and process social knowledge and knowledge (Kay Lewis, 2010) . The benefits of using social media in research activities are high visibility in search engines. Social networking sites, blogs, wikis, cookies, and forums are among the following social media categories.

3. Research Methodology

To conduct this research in a citation and library way, electronic resources have been reviewed on the subject of research. The research work began with the search for the two keywords of social media and information systems by the Scopus search engine, and according to the very diverse number published, they are limited to six major areas of social sciences, business management, economics, art and science Human, psychology of science and decision making. In this research, two main terms were considered as independent variables and related terms as dependent variables. This research has been accomplished quantitatively and analyzes the data obtained from Biblioshiny software.

4. Booklet (Biblimetrics)

This is a method for studying, evaluating, evaluating and evaluating quantitative scientific texts using mathematical methods and statistics. The purpose of the work of bibliometric studies is based on four main variables including authors, scientific publications, references and references. The bibliometrics is the origin of other areas of quantitative measurement (Scientometrics, Informatics and Webometrics). The bibliometric questionnaire deals with textual and citation indicators.

5. Biblioshiny Data

5.1. Dataset

Table 1 shows the main information found by Scopus, including the number of entries, the search time zone, the related key words, the author-specific features, and the type of material found on the keywords of social media and information systems.

Table1
The main findings of Scopus data related to the keywords of social media and information systems

Description	Results
Documents	1999
Sources (Journals, Books, etc.)	913
Keywords Plus (ID)	9319
Author's Keywords (DE)	4458
Period	2003 – 2018
Average citations per documents	17.47
Authors	5947
Author Appearances	7317
Authors of single-authored documents	180
Authors of multi-authored documents	5767
Single-authored documents	189
Documents per Author	0.336
Authors per Document	2.97
Co-Authors per Documents	3.66
Collaboration Index	3.19
Document Types	
Article	827
Article in Press	3
Book	3
Book Chapter	8
Conference Paper	984
Editorial	31
Letter	8
Note	30
Review	93
Short Survey	12

5.2. Annual Science Production

In Fig. 1, the production shows the contents of articles, books, and various researches conducted in the years from 2003 to 2018. Fig. 1 shows the trend of the occurance of the keywords and we can observe that social media and information systems have appeared mostly in 2016.

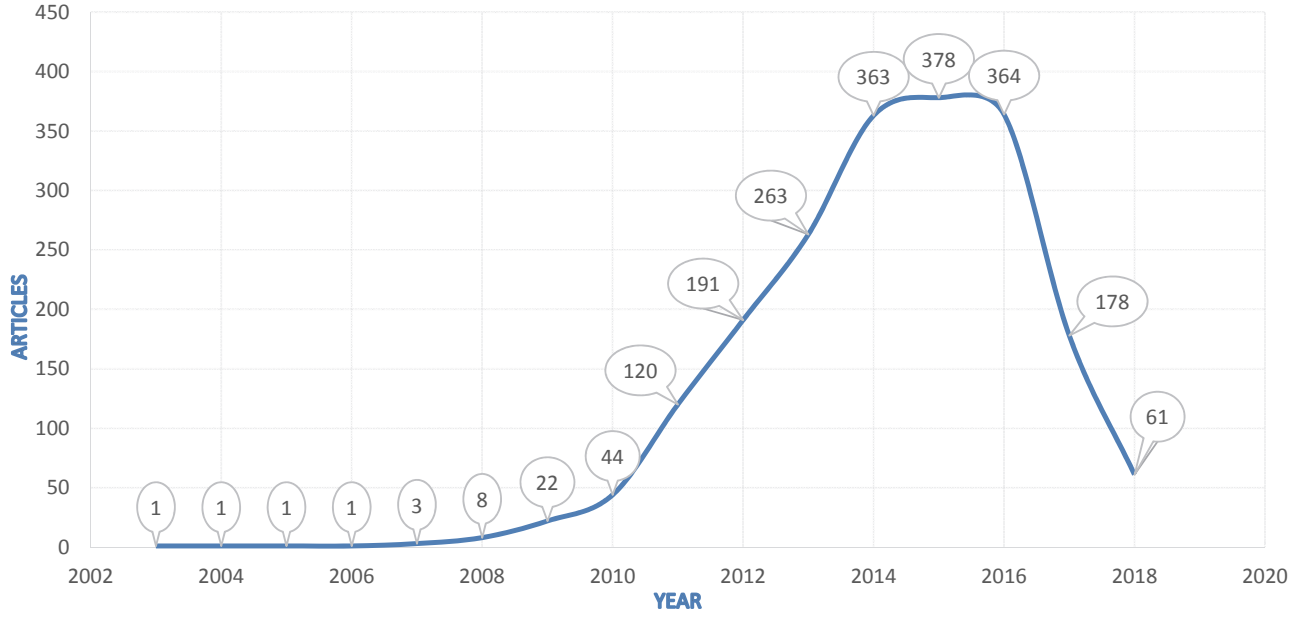

Fig. 1. Generating annual science related to social media keywords and information systems

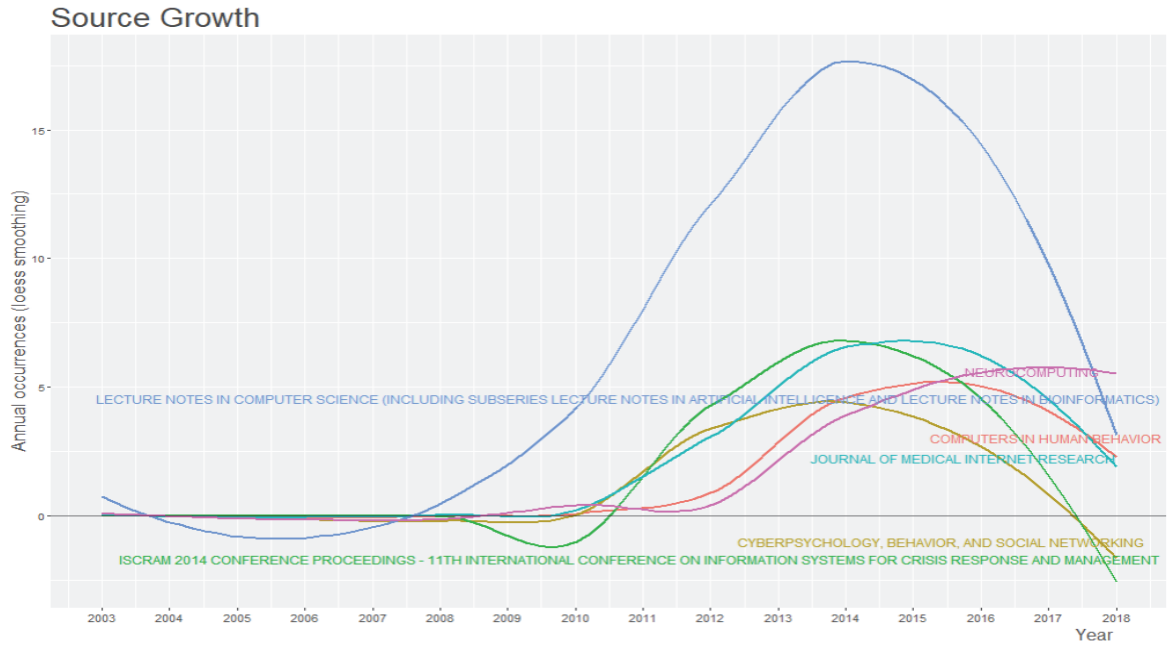

Fig. 2. Source Dynamics

5.3. Source Dynamics

Fig. 2 shows the growth rate of resources based on annual events. Graphs show the dynamics of various fields in the production of science, which use the keywords of social media and information systems each year. Here there are 6 groups to be displayed and computer science materials related to the field of social media in 2014 had the highest rates.

5.4. Corresponding Author's Country

As shown in Fig. 3, the association of the number of articles produced by the authors in two colored turquoise (single-country publishers) and red (multi-country publishers) is specified. The largest number of authors of texts and materials belong to the United States, Australia and Germany.

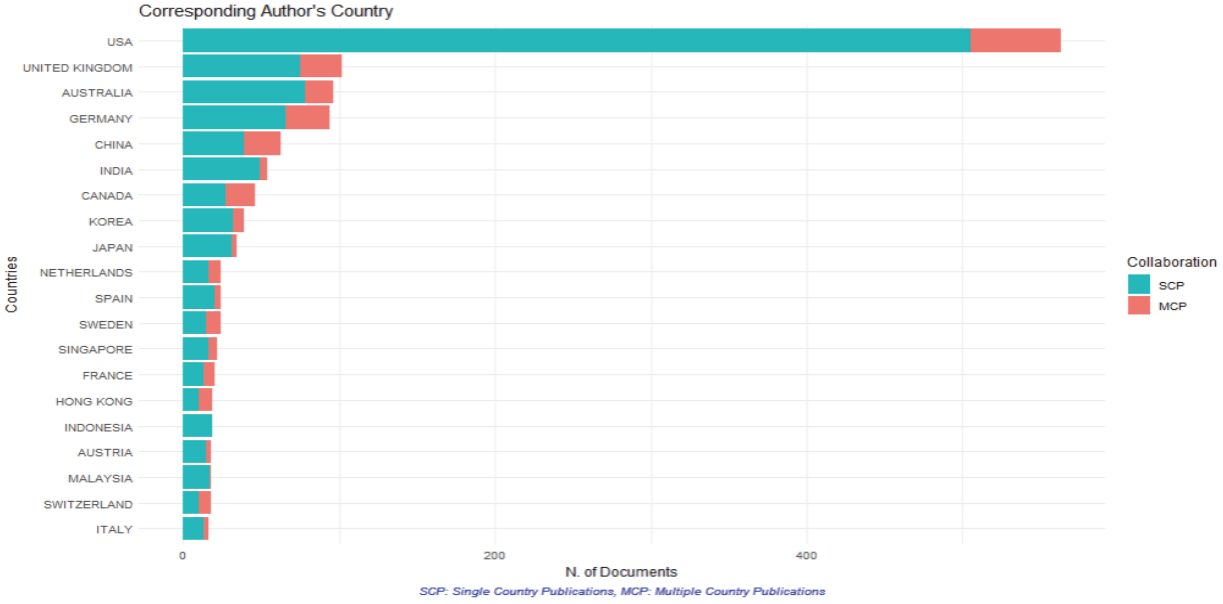

Fig. 3. Corresponding Author's Country

5.5. Highly cited papers

The above are the various information related to the cprresponding author’s countriy, source dynamics and the production of annual science. Here, we briefly describe the content and the publishers with the highest citation given in Table 2 where the top 200 creators with the highest citation are listed. According to the results, Chou et al. (2009) have the highest rates of citation. Given the rapid changes in the communication landscape created using the Internet and social media, it is very important to develop a better understanding of these technologies and their impacts on health communications. The first step in this effort is to identify the features of the current social media users. The report updates the use of current social media to help keep track of the growth of social media and promotion or promotion of health through effective use of social media. The purpose of the study is to identify the social and health factors associated with current adult social media users in the United States.

The second study is the evaluation of the profile, patterns of use, satisfaction and perceived effects among the users of electronic cigarettes (Etter & Bullen, 2011). Among the 3,587 participants who use e-cigarettes containing nicotine, 92% of them said electronic cigarettes helped them quit smoking. The reason for the use of electronic cigarette was that it claimed that libido, less poisonous, to counter the eagerness of smoking and smoking cessation or avoidance, was cheaper than smoking and confronted

with situations where smoking was prohibited. Examining Tweeter and 10 social networking services by Thelwall et al. (2013) has revealed thar tool measurements have many contributors through the social network and can be used as primary indicators of paperwork and usefulness. However, there is a lack of systematic scientific evidence that alternative metrics were a proxy valid for the impact or utility tools. In this study, 11 sensors were compared with scientific websites for 76 to 208,739 pubMed articles. The study also introduced a simple test to overcome the prejudices caused by citing and reusing Windows. However, comparison of articles and metric values for articles published at different times, even in the same year, can eliminate or reverse this relationship, and so publishers and medical professionals should take the time impact when using instrumentation tools for articles ranked. Finally, the coverage of all metric tools, except for Twitter, seems to be low, so it is not clear if they are common enough to be useful in practice.

These articles and many other articles are based on the classified information that is referenced to the audience through social media and can be obtained through the receipt or prevalence of this information and social feedback. In all fields of science and research, social media is used as a bridge between the target community and researchers for the exchange of information. Direct and easy communication without intermediaries with users, audiences are the benefits of these media.

Table 2

The summary of the most cited articles

Paper	Total Citations	TC per Year
CHOU WYS, 2009, J MED INTERNET RES	475	48
ETTER JF, 2011, ADDICTION	413	52
THELWALL M, 2013, PLOS ONE	355	59
LEE HUGHES A, 2009, INT J EMERG MANAGE	336	34
SUTTON J, 2008, PROC ISCRAM - INT CONF INF SYST CRISIS RESPONSE MANAGE	333	30
YIN J, 2012, IEEE INTELL SYST	308	44
LEE CS, 2012, COMPUT HUM BEHAV	285	41
HONG L, 2011, PROC INT CONF COMPANION WORLD WIDE WEB, WWW	283	35
DE CHOUDHURY M, 2013, INT CONF WEBLOGS SOC MEDIA, ICWSM	275	46
ARAMAKI E, 2011, EMNLP - CONF EMPIR METHODS NAT LANG PROCESS , PROC CONF	275	34
STRASBURGER VC, 2013, PEDIATRICS	247	41
LEE VENTOLA C, 2014, P T	239	48
KAMEL BOULOS MN, 2011, INT J HEALTH GEOGR	209	26
SALATHÉ M, 2011, PLOS COMPUT BIOL	196	25
RATKIEWICZ J, 2011, PROC INT CONF COMPANION WORLD WIDE WEB, WWW	191	24
MALTHOUSE EC, 2013, J INTERACT MARK	184	31
DENNISON L, 2013, J MED INTERNET RES	177	30
IMRAN M, 2015, ACM COMPUT SURV	176	44
TRAINOR KJ, 2014, J BUS RES	176	35
BERTOT JC, 2012, TRANS GOV PEOPLE PROCESS POLICY	174	25
WANG C, 2012, COMMUN ASSOC INFO SYST	173	25
BRONIATOWSKI DA, 2013, PLOS ONE	166	28
HUGHES AL, 2009, ISCRAM - INT CONF INF SYST CRISIS RESPONSE MANAGE	166	17
MOSES III H, 2013, JAMA	164	27
NAPOLITANO MA, 2013, OBESITY	155	26
SALATHÉ M, 2012, PLOS COMPUT BIOL	155	22
SWAN M, 2012, J PERS MED	152	22
CRAMPTON JW, 2013, CARTOGR GEOGR INF SCI	150	25
BENNETT S, 2012, COMPUT EDUC	150	21
SARKER A, 2015, J BIOMED INFORMATICS	141	35
LEONARDI PM, 2014, INF SYST RES	141	28
STEFANIDIS A, 2013, GEOJOURNAL	139	23
LEE VENTOLA C, 2014, P T-a	137	27
IMRAN M, 2013, ISCRAM CONF PROC - INT CONF INF SYST CRISIS RESPONSE MANAGE	133	22
TREDINNICK L, 2006, BUS INF REV	133	10
FARRELL H, 2012, ANNU REV POLIT SCI	132	19
BORNMANN L, 2014, J INF	123	25

MIDDLETON SE, 2014, IEEE INTELL SYST	122	24
LIU SB, 2008, PROC ISCRAM - INT CONF INF SYST CRISIS RESPONSE MANAGE	120	11
NABI RL, 2013, CYBERPSYCHOL BEHAV SOC NETWORKING	117	20
SAXTON GD, 2013, INF SYST MANAGE	116	19
PORIA S, 2016, NEUROCOMPUTING	113	38
KRAWCZYK B, 2016, PROG ARTIF INTELL	109	36
CHAE B, 2015, INT J PROD ECON	109	27
TSAY J, 2014, PROC INT CONF SOFTWARE ENG	109	22
YE S, 2010, LECT NOTES COMPUT SCI	108	12
DJAHEL S, 2015, IEEE COMMUN SURV TUTOR	107	27
HUGHES AL, 2008, PROC ISCRAM - INT CONF INF SYST CRISIS RESPONSE MANAGE	105	10
HAJLI MN, 2014, TECHNOL FORECAST SOC CHANGE	103	21
XIANG Z, 2015, J RETAIL CONSUM SERV	102	26
TENNANT B, 2015, J MED INTERNET RES	101	25
WU L, 2013, INF SYST RES	100	17
SARKER A, 2015, J BIOMED INFORMATICS-a	99	25
MOHAMMAD SM, 2012, *SEM - JT CONF LEX COMPUT SEMANT	99	14
THACKERAY R, 2013, J MED INTERNET RES	94	16
MALHOTRA A, 2012, PROC IEEE/ACM INT CONF ADV SOC NETWORKS ANAL MIN , ASONAM	92	13
MCNAB C, 2009, BULL WHO	91	9
TERPSTRA T, 2012, ISCRAM CONF PROC - INT CONF INF SYST CRISIS RESPONSE MANAGE	84	12
STARBIRD K, 2010, ISCRAM - INT CONF INF SYST CRISIS RESPONSE MANAGE : DEFINING CRISIS MANAGE , PROC	84	9
MARÍA MUNAR A, 2011, INT J CULT TOUR HOSP RES	82	10
MORRIS MR, 2010, ICWSM - PROC INT AAAI CONF WEBLOGS SOC MEDIA	81	9
CAO N, 2012, IEEE TRANS VISUAL COMPUT GRAPHICS	76	11
ANDREU-PEREZ J, 2015, IEEE TRANS BIOMED ENG	74	19
HUANG D, 2015, IEEE TRANS VISUAL COMPUT GRAPHICS	74	19
HARPAZ R, 2014, DRUG SAF	74	15
CHUNG N, 2015, TELEMATICS INF	72	18
DESAI T, 2012, PLOS ONE	72	10
WATSON HJ, 2014, COMMUN ASSOC INFO SYST	71	14
BRAVO-MARQUEZ F, 2014, KNOWL BASED SYST	71	14
ALLEN HG, 2013, PLOS ONE	71	12
HACHINSKI V, 2010, STROKE	71	8
NGUYEN TH, 2015, EXPERT SYS APPL	70	18
WU Y, 2014, IEEE TRANS VISUAL COMPUT GRAPHICS	70	14
MORENO MA, 2013, CYBERPSYCHOL BEHAV SOC NETWORKING	70	12
SINGH AG, 2012, J RHEUMATOL	70	10
CAVERLEE J, 2010, INF SCI	70	8
PANAHI S, 2013, J KNOWL MANAGE	68	11
SHERCHAN W, 2012, PROC - IEEE INT CONF MOB DATA MANAGE , MDM	68	10
MASTRANDREA R, 2015, PLOS ONE	67	17
ZHENG X, 2015, NEUROCOMPUTING	67	17
ZHONG B, 2011, COMPUT HUM BEHAV	67	8
BOSCH H, 2013, IEEE TRANS VISUAL COMPUT GRAPHICS	66	11
CARAGEA C, 2011, INT CONF INF SYST CRISIS RESPONSE MANAGE : EARLY-WARNING SYST PREPAREDNESS TRAIN , ISCRAM	66	8
KLEINBERG JM, 2007, PROC ACM SIGKDD INT CONF KNOWL DISCOV DATA MIN	66	6
DE LA TORRE-DÍEZ I, 2012, TELEMEDICINE E-HEALTH	65	9
CHEONG F, 2011, PACIS - PAC ASIA CONF INF SYST : QUAL RES PAC	65	8
MANSFIELD SJ, 2011, MED J AUST	65	8
FOTH M, 2011, PROC ACM CONF COMPUT SUPPORT COOP WORK CSCW	64	8
OH O, 2010, PROC INTER CONF INF SYS	64	7
OBAR JA, 2015, TELECOMMUN POLICY	63	16
XU JM, 2012, NAACL HLT - CONF NORTH AM CHAPTER ASSOC COMPUT LINGUIST : HUM LANG TECHNOL , PROC CONF	63	9
CHAE J, 2014, COMPUT GRAPHICS (PERGAMON)	62	12
CHIANG RHL, 2012, ACM TRANS MANAGE INF SYST	62	9
CAIN J, 2011, AM J PHARM EDUC	62	8
RHODES SD, 2011, AM J MEN'S HEALTH	62	8
STIEGLITZ S, 2014, BUSIN INFO SYS ENG	61	12
MA WWK, 2014, COMPUT HUM BEHAV	61	12
STARBIRD K, 2012, ISCRAM CONF PROC - INT CONF INF SYST CRISIS RESPONSE MANAGE	61	9

GENEROUS N, 2014, PLOS COMPUT BIOL	60	12
WHITTINGTON R, 2014, J STRATEGIC INFORM SYST	60	12
GEORGE DR, 2013, CLIN OBSTET GYNECOL	60	10
PARIS CM, 2012, ANN TOUR RES	59	8
CHASSIAKOS YR, 2016, PEDIATRICS	58	19
ZHAO J, 2014, IEEE TRANS VISUAL COMPUT GRAPHICS	58	12
CHEN X, 2014, IEEE TRANS LEARN TECHNOL	58	12
NOULAS A, 2013, PROC IEEE INT CONF MOBILE DATA MANAGE	58	10
JANSEN BJ, 2011, J INF SCI	58	7
YANG M, 2015, J BIOMED INFORMATICS	57	14
VELASCO E, 2014, MILBANK Q	57	11
PUIU D, 2016, IEEE ACCESS	56	19
OYEYEMI SO, 2014, BMJ (ONLINE)	56	11
REUTER T, 2012, PROC ACM INT CONF MULTIMEDIA RETR , ICMR	56	8
HU Y, 2015, COMPUT ENVIRON URBAN SYST	55	14
UTZ S, 2015, CYBERPSYCHOL BEHAV SOC NETWORKING	55	14
EL-BELTAGY SR, 2013, INT CONF INNOVATIONS INF TECHNOL, IIT	55	9
LI YM, 2013, DECIS SUPPORT SYST	55	9
PREOT'IUC-PIETRO D, 2015, ACL-IJCNLP - ANNU MEET ASSOC COMPUT LINGUIST INT JT CONF NAT LANG PROCESS ASIAN FED NAT LANG PROCESS , PROC CONF	54	14
EMERY SL, 2014, TOB CONTROL	54	11
COPPERSMITH G, 2014, PROC INT CONF WEBLOGS SOC MEDIA, ICWSM	54	11
LEIST AK, 2013, GERONTOLOGY	54	9
MATTHEWS A, 2016, BMJ (ONLINE)	53	18
PIT SW, 2014, BMC MED RES METHODOL	53	11
ASHKTORAB Z, 2014, ISCRAM CONF PROC - INT CONF INF SYST CRISIS RESPONSE MANAGE	53	11
CLAYTON RB, 2013, CYBERPSYCHOL BEHAV SOC NETWORKING	53	9
REUTER C, 2013, ISCRAM CONF PROC - INT CONF INF SYST CRISIS RESPONSE MANAGE	53	9
BURTON SH, 2012, J MED INTERNET RES	53	8
BULL SS, 2011, J PEDIATR PSYCHOL	53	7
MOHAMMAD SM, 2015, INF PROCESS MANAGE	52	13
GENTILE DA, 2014, JAMA PEDIATR	52	10
KOCH H, 2013, INF SYST J	52	9
PHANG CW, 2013, INF MANAGE	52	9
HILL D, 2016, PEDIATRICS	51	17
ISHWARAPPA I, 2015, PROCEDIA COMPUT SCI	51	13
BROWN J, 2014, J MED INTERNET RES	51	10
SUTTLES J, 2013, LECT NOTES COMPUT SCI	51	9
XU SX, 2013, MIS QUART MANAGE INF SYST	51	9
SULIS E, 2016, KNOWL BASED SYST	50	17
LUKYANENKO R, 2014, INF SYST RES	50	10
THACKERAY R, 2013, BMC CANCER	50	8
WITTEMAN HO, 2012, VACCINE	50	7
VAROL O, 2017, PROC INT CONF WEB SOC MEDIA, ICWSM	49	25
KRASNOVA H, 2015, INF SYST RES	49	12
SUN G, 2014, IEEE TRANS VISUAL COMPUT GRAPHICS	49	10
DESHPANDE O, 2013, PROC ACM SIGMOD INT CONF MANAGE DATA	49	8
PALACIOS-MARQUÉS D, 2015, MANAGE DECIS	48	12
YUAN P, 2014, J MED INTERNET RES	48	10
LIU SB, 2014, COMPUT SUPPORTED COOP WORK CSCW INT J	48	10
THOMSON R, 2012, ISCRAM CONF PROC - INT CONF INF SYST CRISIS RESPONSE MANAGE	48	7
LIU ILB, 2010, PACIS - PAC ASIA CONF INF SYST	48	5
SUTTON JN, 2010, ISCRAM - INT CONF INF SYST CRISIS RESPONSE MANAGE : DEFINING CRISIS MANAGE , PROC	48	5
SUGIMOTO CR, 2017, J ASSOC SOC INF SCI TECHNOL	47	24
LEONARDI PM, 2015, MIS QUART MANAGE INF SYST	47	12
PEPPER JK, 2014, NICOTINE TOB RES	47	9
ALTHEIDE DL, 2013, COMMUN THEORY	47	8
ST LOUIS C, 2012, BMJ (ONLINE)	47	7
XU Z, 2016, CONCURR COMPUT	46	15
LIU W, 2015, SIGNAL PROCESS	46	12
ZHANG X, 2015, COMPUT HUM BEHAV	46	12
XIE H, 2014, NEURAL NETW	46	9

TUAROB S, 2014, J BIOMED INFORMATICS	46	9
TENG S, 2014, ONLINE INFO REV	46	9
ST. DENIS LA, 2012, ISCRAM CONF PROC - INT CONF INF SYST CRISIS RESPONSE MANAGE	46	7
JERNIGAN DH, 2014, J PUBLIC HEALTH POLICY	45	9
ST. DENIS LA, 2014, ISCRAM CONF PROC - INT CONF INF SYST CRISIS RESPONSE MANAGE	45	9
KAPOOR KK, 2018, INF SYST FRONT	44	44
ANDERSON KM, 2011, PROC INT CONF SOFTWARE ENG	44	6
BRAHIMI T, 2015, COMPUT HUM BEHAV	43	11
MACAFEE T, 2012, CYBERPSYCHOL BEHAV SOC NETWORKING	43	6
CHEN AT, 2012, PATIENT EDUC COUNS	43	6
THORSON K, 2016, COMMUN THEORY	42	14
LLODRÀ-RIERA I, 2015, TOUR MANAGE	42	11
DESMET A, 2014, CYBERPSYCHOL BEHAV SOC NETWORKING	42	8
GHOSE A, 2014, MANAGE SCI	42	8
FUJISAWA T, 2014, NUCLEIC ACIDS RES	42	8
BATOOL R, 2013, IEEE/ACIS INT CONF COMPUT INF SCI , ICIS - PROC	42	7
FUNG A, 2013, INT STUD REV	42	7
CHRISTOPHER GIBBONS M, 2011, PERSPECT HEALTH INF MANAG	42	5
XU Z, 2016, EURASIP J WIRELESS COMMUN NETWORKING	41	14
KO PRT, 2015, J CLIN SLEEP MED	41	10
SIGALA M, 2014, COMPUT HUM BEHAV	41	8
TAPIA AH, 2013, ISCRAM CONF PROC - INT CONF INF SYST CRISIS RESPONSE MANAGE	41	7
HORVATH KJ, 2012, AIDS BEHAV	41	6
SCHUMACHER KR, 2014, PEDIATRICS	40	8
RICHTER A, 2013, ECIS - PROC EUR CONF INF SYST	40	7
FAUSTO S, 2012, PLOS ONE	40	6
JUNG JJ, 2012, EXPERT SYS APPL	40	6
KWAHK KY, 2016, COMPUT HUM BEHAV	39	13
VYAS AN, 2012, J MED INTERNET RES	39	6
DELERUE H, 2012, J SYST INF TECHNOL	39	6
LARSON K, 2011, INTER CONF INFOR SYS 2011	39	5
POWER DJ, 2011, J DECIS SYST	39	5
ROSEN D, 2011, SOC NETW ANALYSIS MIN	39	5
DEANE KHO, 2015, BMJ OPEN	38	10
AMON KL, 2014, ACAD PEDIATR	38	8
ADALI S, 2012, PROC IEEE/ACM INT CONF ADV SOC NETWORKS ANAL MIN , ASONAM	38	5
FERRARA E, 2013, COSN - PROC CONF ONLINE SOC NETWORKS	37	6
HARLOW S, 2014, J COMPUTER-MEDIATED COMMUN	36	7
HAWKINS CM, 2014, J AM COLL RADIOL	36	7
YUAN YC, 2013, J AM SOC INF SCI TECHNOL	36	6
BERGSMA S, 2013, NAACL HLT - CONF NORTH AM CHAPTER ASSOC COMPUT LINGUIST : HUM LANG TECHNOL , PROC MAIN CONF	36	6

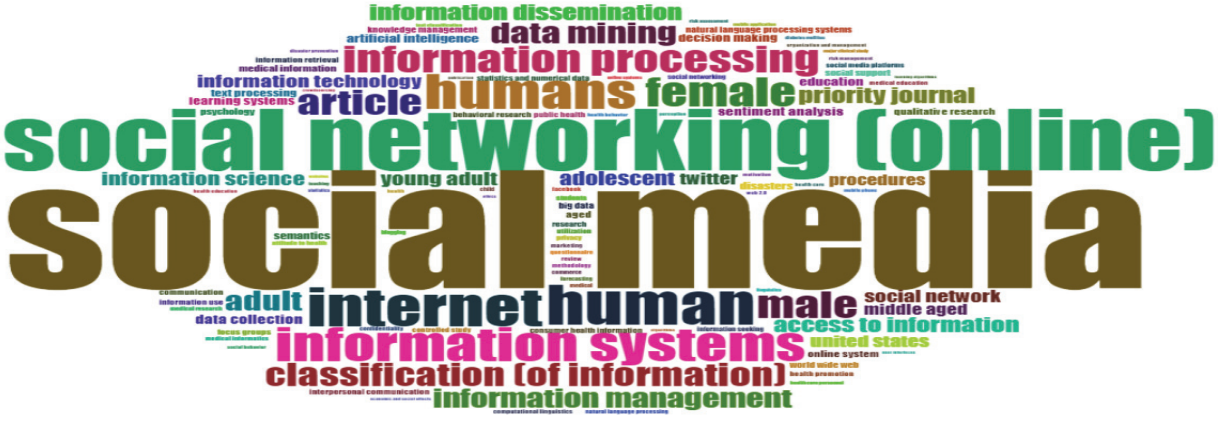

Fig. 4. The frequency of the keywords used in different studies

5.6. Word cloud

To understand the use of keywords used with social media words and operating systems, cloud keywords are used for mental imagery. As shown in Fig. 4, “social media”, “online social networks”, “information systems”, “personal Internet”, “information process” and “information management” are the primary keywords used in the documents produced.

5.7. Word Dynamics

To display the dynamics of the keywords in the study, the use of each word per year is used to grow and compare with other words. The dynamics in this text means the behavior of a component or subject in several dimensions. As shown in fig. 5, The two keywords; namely “social media” and “humankind” are the most dynamic in the texts between 2013 and 2015.

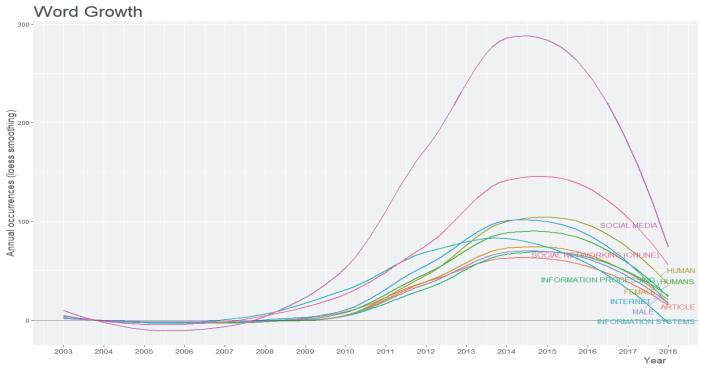

Fig. 5. Word Dynamics

5.8. The most popular keywords

In addition to the search for studies conducted around the two keywords of social media and information systems, the more commonly used keywords, along with their frequency, are described in Table 1.

Table 3
The most popular keywords used in studies associated with social media and information system

Terms	Frequency	Terms	Frequency
social media	1729	procedures	162
social networking (online)	899	data collection	139
human	587	sentiment analysis	128
internet	567	education	123
humans	511	artificial intelligence	121
information systems	500	learning systems	119
female	420	decision making	116
information processing	394	Disasters	109
male	393	text processing	108
article	365	Semantics	104
classification (of information)	339	Aged	100
data mining	304	online system	99
adult	292	qualitative research	97
information management	274	medical information	93
information dissemination	228	psychology	92
priority journal	227	social support	88
access to information	219	knowledge management	87
adolescent	199	world wide web	87
information science	196	big data	86
young adult	193	natural language processing systems	86
information technology	186	focus groups	80
social network	180	communication	79
united states	176	information use	79
twitter	170	information retrieval	78
middle aged	163	interpersonal communication	78

5.9. Co-citation, Co-author and Co-word

The following information is from the conceptual, social and cognitive structure of the software. In Co-Citiation analyzes, clusters identified references and intellectual citation citations under different areas of the subject or field of science. In co-word analyzes, clusters identified from text information can be considered as conceptual or semantic groups of various topics examined by researchers.

5.9.1. Co-occurrence Network

Scientific maps are depicted using various techniques and methods, both of which are the occurrence of vocabulary. One of the most important words or key words of a document is the one used to study the conceptual structure of a research domain. The occurrence of the keywords in the title, abstract, or article of the article is examined. The occurrence of keywords also indicates the cognitive relation between a single set of documents. Based on the analysis of the occurrence of vocabulary, one can extract scientific subjects and discover their correlation directly from the thematic content (Callon et al., 1986). By comparing the resulting maps in different time periods, the dynamics of science can be traced (He, 1999). Accordingly, the present study aims to answer the question of how the knowledge of social media and information systems is formed from the subject matter and how these interfaces are interconnected. If the keywords are grouped in a cluster, it probably reflects most of them. Each cluster has a different number of subject keywords. In the software, there is an ability to see the location of the occurrence by clicking on each word of the network with other words and clusters. Cluster analysis is in fact a kind of classification technique that helps create heterogeneous groups in a set of complex data. In clustering, objects are classified into different groups based on the similarity or distance of their bugs. On the basis of the analysis method, one can extract scientific subjects and discover their relation directly to the subject matter.

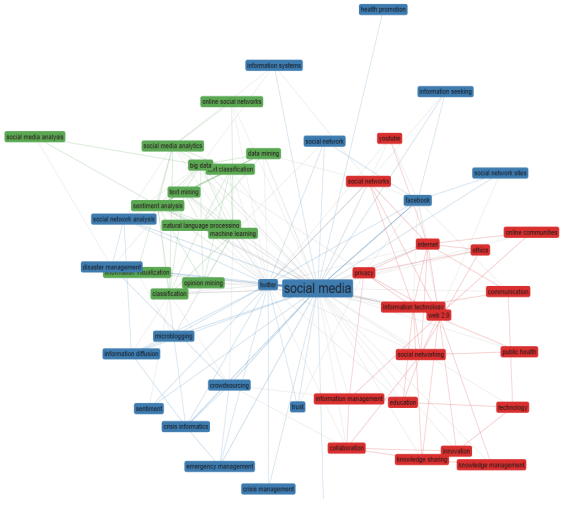

Fig. 6. Co-occurrence network(Author's keywords)

In the Fig. 6, the clusters are marked with blue, green, and red colors based on the keywords that represent the congruent groups. Based on the maps drawn from the analysis of the documents studied, such concepts as: "Tweeter", "Web 2.0", "Information Technology", "Big Data", "Social Networks", "Facebook", "Text Categories", and the "Internet" are among the most widely used topics in the field of social media at the International level are considered. Drawing up co-occurrence maps at different time points shows the changes and sustainabilities in concepts and terms related to the field of social media and information systems. Some words like "machine learning" as one of the vertices of a green cluster, with just a little bit from the top of the pyramid, which is social media, indicates that these two words are present in many articles.

5.9.2. Co-Citation Network

Citation analysis is one of the quantitative methods in the field of bibliometrics and scientometrics that reviews scientific texts based on the counting of the number of citations accrued to them. In citation analysis studies, references cited in the texts are counted and reviewed and vrious analyzes are executed based on it. Citation analysis examines the relationship between citation and citation documents. In the citation analysis, according to references to relevant references, it is clear that the more referrals to a reference, the greater the relevance of the reference in relation to the subject matter will be.

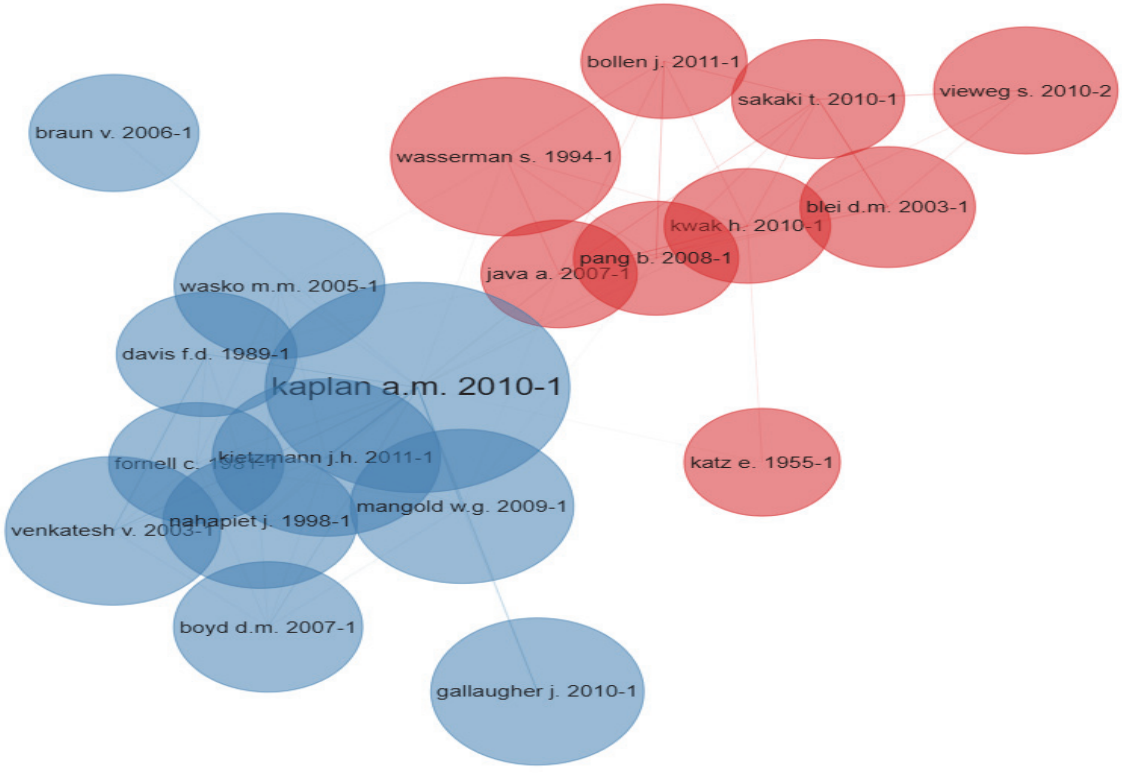

Fig. 7. Co-Citation network (2003-2018)

According to Fig. 7, the most cited reference is Kaplan (2010). The main purpose of the present research is to map the citation map of the leading authors of the field of social media and information systems based on scientific articles indexed during the years from 1955 to 2018. The present research is a science-based research, and uses bibliometric techniques such as citation analysis. Creating a citation link between social media writers and information systems reflects the intellectual relationship between the authors of this field, and all the writers of the field of social media and information systems are not necessarily part of the influential authors.

5.9.3. Factorial Analysis

Co-Word Analysis: The aim of the co-word analysis is to map the conceptual structure of a framework using the word co-occurrences in a bibliographic collection. The analysis can be performed through dimensionality reduction techniques such as Multidimensional Scaling (MDS), Correspondence Analysis (CA) or Multiple Correspondence Analysis (MCA).

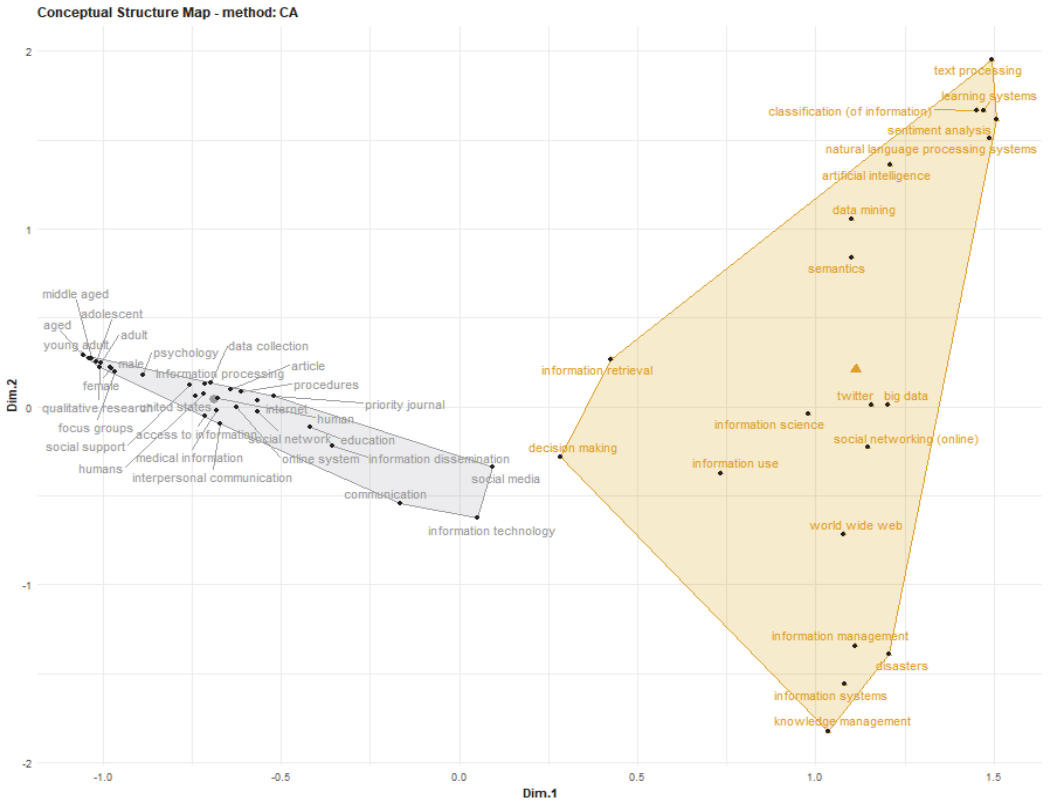

Fig. 8. Conceptual structure map, Factorial analysis (CA)

In Fig. 8, we show an example using the function conceptualStructure that performs a CA to draw a conceptual structure of the field to identify clusters of documents which express common concepts. Results are plotted on a two-dimensional map.

5.9.4 Thematic Map

Thematic analysis analyzes enable us to identify and analyze the evolution of the thematic areas of a scientific discipline, and in the next step, identifying scientific gaps would require further consideration in future research and prediction of future trends in the development of that field of science. Both citation and lexical analysis are two common methods for constructing strategic and subject-matter maps of a domain. Simultaneous use of these two methods can be used to compare both citation and lexical patterns and, by compensating for the shortcomings of the two methods, we may create a new perspective on scientific research. Thematic or thematic maps are used for lexical analysis of the science map, which is derived from key word clusters. These clusters are considered as themes. Each research theme derived from this process is used by two parameters (density and center) as the two meanings and the mean values of each cluster, which categorizes the themes into 4 sections. A theme with a keyword and its internal communications forms a network graph called the tetamical network. Each tributary network is named one of the most significant and relevant keyword associated with the same theme. Thematic map is a strong visual design and we can analyze the themes by which quadrant they are located.

Q1) Top right Quadrant: Engine Themes - Good Themes by Finding and Important for the Research Structure.
Q2) The top left quadrant: Emerging and emerging themes and poorly developed, marginal.
Q3) Left quadrant: Very special and special themes, important for the subject of research, but not developed.

Q4) The bottom right quadrant: The main themes - The themes are well developed with in-house relationships, but with trivial external relations (just a margin for the topic).

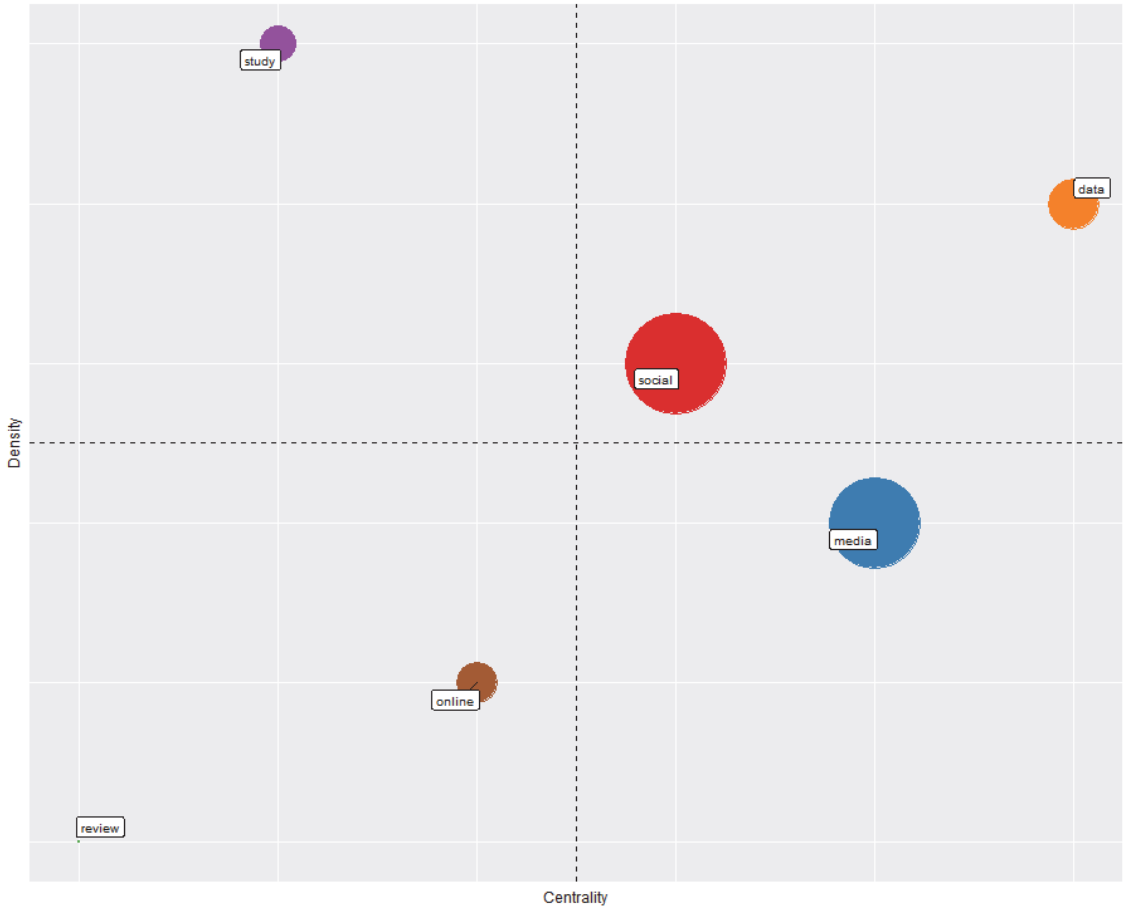

Fig. 9. Thematic map

As we see in Fig. 9, the terms “social” and “data” are very important for the structure of all research, and they were used in all periods of time. The word “study” is an important and emerging theme associated with other keywords. The word “media” is a very popular word used in time stats along with other keywords. The words “online” and “revising” are the words that can be focused more on the current time and are one of the important issues for research in the present and future.

5.10. Country Collaboration Map

This map shows the relevance of the countries that have contributed to the text. Scientists and researchers from both China and the United States have been most involved in producing science in texts related to the keywords of information systems and social media.

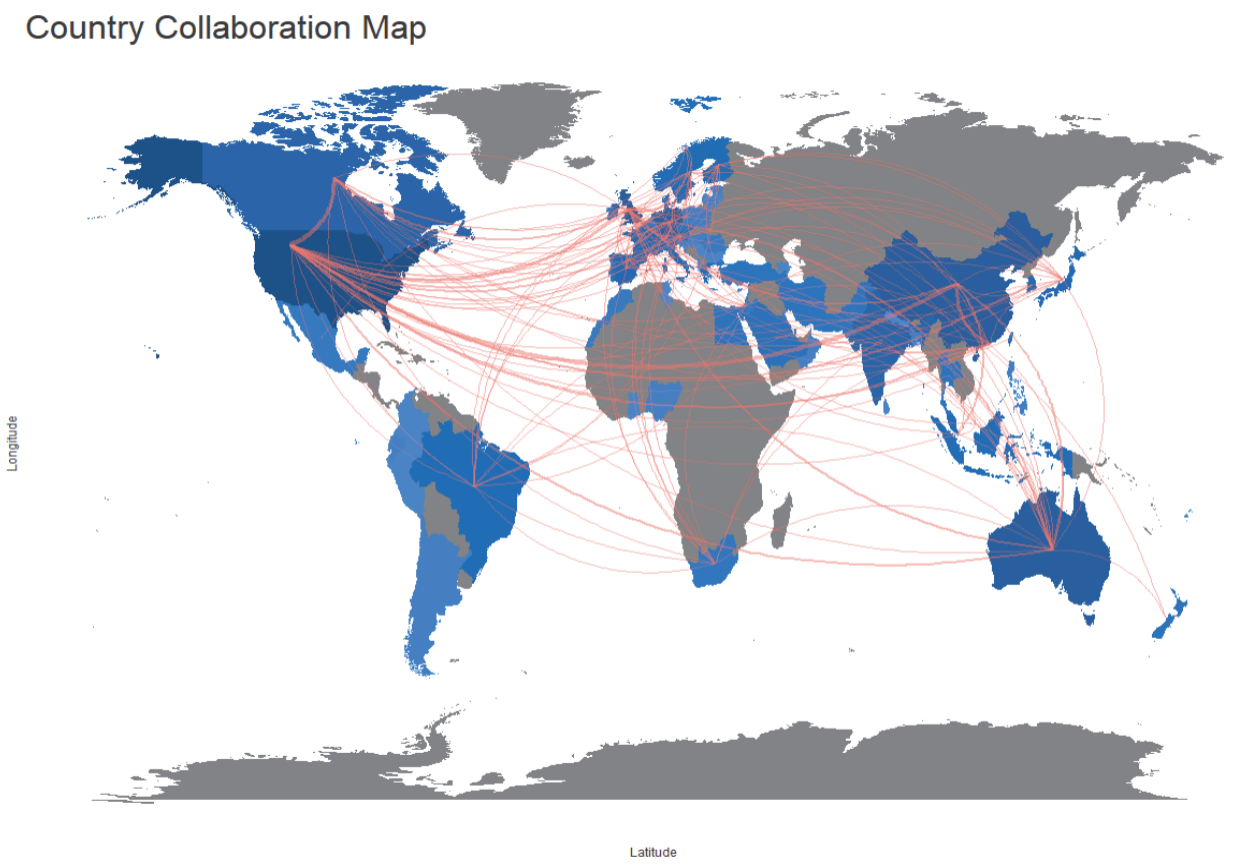

Fig. 10. Country collaboration map

6. Conclusion

In this study, we tried to obtain the information obtained from the software in terms of the amount of work and studies carried out and the science produced in the context of the two words of social media and information systems, and with the information obtained from the diagrams and tables. Both the vocabulary and the occurrence of the mentioned keywords, the conceptual structure of these domains and the relationship between the subject areas have been identified. The obtained data and the analysis of the results of the analyzes carried out in this study have indicated that the scope of the subject areas in the field of social media and information systems has evolved over time and dynamically expanded between 2009 and 2016. In the years to come, there has been a decline and new issues such as social networks, online media and online systems have grown, and issues related to information systems have also grown in the human and medical spheres. The ongoing flow of scientific production in these two domains, as well as other scientific fields, creates continuous changes in its structure. Given the wide range of scientific disciplines, each day, it engages more with other sciences. Some areas of social media science and information systems are becoming more and more relevant to the needs of societies and countries, and issues are being expanded. Also, the results have shown that the textbook of this domain is a domain that is rich in resources from different disciplines, that is, it has broad interdisciplinary relations. It is worth noting that although studies related to the visualization of subjects and subject areas of the research area and the coincidence of its vocabulary do not themselves offer specific policy suggestions or options, they can, however, be able to understand the state of knowledge and direct the scientific policy. Drawings illustrate a clear picture of research topics in the field of social media and the relationships between different subjects. These maps, in different periods of time, show changes and persistence in concepts and terms related to the field of social media and information systems. Some words are present in all the years studied, such as community and data, while others disappear over time. New concepts are emerging as a reminder of existing words and in interaction with new developments and technologies. Drawing a

lexical map based on the key words in the titles of the articles that were considered in this study, will allow more texts to be mapped as Boswell and Himrex have put forward.

In general, analyzes such as concurrent analysis and vocabulary are capable of answering such questions, which issues of the scientific community are more focused on? Are there different scientific areas and sub-areas? And what is the evolutionary course? And what are the likely issues in the near future in the minds of scientists? The results of this study have shown that, in principle, more research should be accomplished by combining different approaches to reveal the gap of the capabilities or methods of scientometric design maps that play an important role in policy and planning. The soft training and various indicators used to map and analyze the map should be on the agenda of Scientology Counselors.

References

Adali, S., & Golbeck, J. (2012, August). Predicting personality with social behavior. *In Advances in Social Networks Analysis and Mining (ASONAM), 2012 IEEE/ACM International Conference on* (pp. 302-309). *IEEE.*

Ahmadzadeh Kermani, Ruhollah (2012). Reflections in Culture and Media. *Tehran: Chapar.*

Allen, H. G., Stanton, T. R., Di Pietro, F., & Moseley, G. L. (2013). Social media release increases dissemination of original articles in the clinical pain sciences. *PloS One, 8*(7), e68914.

Altheide, D. L. (2013). Media logic, social control, and fear. *Communication Theory, 23*(3), 223-238.

Amon, K. L., Campbell, A. J., Hawke, C., & Steinbeck, K. (2014). *Facebook as a Recruitment Tool for Adolescent Health Research: A Systematic Review. Academic Pediatrics, 14*(5), 439-447.

Anderson, K. M., & Schram, A. (2011, May). Design and implementation of a data analytics infrastructure in support of crisis informatics research (NIER track). *In Proceedings of The 33rd International Conference on Software Engineering* (pp. 844-847). *ACM.*

Andreu-Perez, J., Leff, D. R., Ip, H. M., & Yang, G. Z. (2015*).* From wearable sensors to smart implants--toward pervasive and personalized healthcare. *IEEE Transactions on Biomedical Engineering, 62*(12), 2750-2762.

Aramaki, E., Maskawa, S., & Morita, M. (2011, July). Twitter catches the flu: detecting influenza epidemics using Twitter. *In Proceedings of the Conference on Empirical Methods in Natural Language Processing* (pp. 1568-1576). *Association for Computational Linguistics.*

Ashktorab, Z., Brown, C., Nandi, M., & Culotta, A. (2014, May*).* Tweedr: Mining twitter to inform disaster response. *In ISCRAM.*

Batool, R., Khattak, A. M., Maqbool, J., & Lee, S. (2013, June). Precise tweet classification and sentiment analysis. *In Computer and Information Science (ICIS), 2013 IEEE/ACIS 12th International Conference on* (pp. 461-466). *IEEE.*

Bennett, S., Bishop, A., Dalgarno, B., Waycott, J., & Kennedy, G. (2012). Implementing Web 2.0 technologies in higher education: A collective case study. *Computers & Education, 59*(2), 524-534.

Bergsma, S., Dredze, M., Van Durme, B., Wilson, T., & Yarowsky, D. (2013). Broadly improving user classification via communication-based name and location clustering on twitter. *In Proceedings of the 2013 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies* (pp. 1010-1019).

Bornmann, L. (2014). Do altmetrics point to the broader impact of research? *An Overview of Benefits and Disadvantages of Altmetrics. Journal of Informetrics, 8*(4), 895-903.

Bosch, H., Thom, D., Heimerl, F., Püttmann, E., Koch, S., Krüger, R., & Ertl, T. (2013*).* Scatterblogs2: Real-time monitoring of microblog messages through user-guided filtering. *IEEE Transactions on Visualization and Computer Graphics, 19*(12), 2022-2031.

Boulos, M. N. K., Resch, B., Crowley, D. N., Breslin, J. G., Sohn, G., Burtner, R., ... & Chuang, K. Y. S. (2011). Crowdsourcing, citizen sensing and sensor web technologies for public and environmental health surveillance and crisis management: trends, OGC standards and application examples. *International Journal of Health Geographics, 10*(1), 67.

Brahimi, T., & Sarirete, A. (2015). Learning outside the classroom through MOOCs. *Computers in Human Behavior*, 51, 604-609.

Bravo-Marquez, F., Mendoza, M., & Poblete, B. (2014). Meta-level sentiment models for big social data analysis. *Knowledge-Based Systems*, 69, 86-99.

Broniatowski, D. A., Paul, M. J., & Dredze, M. (2013). National and local influenza surveillance through Twitter: an analysis of the 2012-2013 influenza epidemic. *PloS One, 8*(12), e83672.

Brown, J., Ryan, C., & Harris, A. (2014). How doctors view and use social media: a national survey. *Journal of Medical Internet Research, 16*(12).

Bull, S. S., Breslin, L. T., Wright, E. E., Black, S. R., Levine, D., & Santelli, J. S. (2011). Case study: An ethics case study of HIV prevention research on Facebook: The Just /we study. *Journal of Pediatric Psychology, 36*(10), 1082-1092.

Burton, S. H., Tanner, K. W., Giraud-Carrier, C. G., West, J. H., & Barnes, M. D. (2012). "Right time, right place" health communication on Twitter: value and accuracy of location information. *Journal of Medical Internet Research, 14*(6).

Cain, J., & Policastri, A. (2011). Using Facebook as an informal learning environment. *American Journal of Pharmaceutical Education, 75*(10), 207.

Cao, N., Lin, Y. R., Sun, X., Lazer, D., Liu, S., & Qu, H. (2012). Whisper: Tracing the spatiotemporal process of information diffusion in real time. *IEEE Transactions on Visualization and Computer Graphics, 18*(12), 2649-2658.

Caragea, C., McNeese, N., Jaiswal, A., Traylor, G., Kim, H. W., Mitra, P., & Yen, J. (2011, May). Classifying text messages for the Haiti earthquake. *In Proceedings of The 8th International Conference on Information Systems for Crisis Response and Management (ISCRAM2011)*.

Caverlee, J., Liu, L., & Webb, S. (2010). The SocialTrust framework for trusted social information management: Architecture and algorithms. *Information Sciences, 180*(1), 95-112.

Chae, B. K. (2015). Insights from hashtag# supplychain and Twitter Analytics: Considering Twitter and Twitter data for supply chain practice and research. *International Journal of Production Economics*, 165, 247-259.

Chae, J., Thom, D., Jang, Y., Kim, S., Ertl, T., & Ebert, D. S. (2014). Public behavior response analysis in disaster events utilizing visual analytics of microblog data. *Computers & Graphics,* 38, 51-60.

Chassiakos, Y. L. R., Radesky, J., Christakis, D., Moreno, M. A., & Cross, C. (2016). Children and adolescents and digital media. *Pediatrics, 138*(5), e20162593.

Chen, A. T. (2012). Exploring online support spaces: using cluster analysis to examine breast cancer, diabetes and fibromyalgia support groups. *Patient Education and Counseling, 87*(2), 250-257.

Chen, X., Vorvoreanu, M., & Madhavan, K. (2014). Mining social media data for understanding students' learning experiences. *IEEE Transactions on Learning Technologies, 7*(3), 246-259.

Cheong, F., & Cheong, C. (2011). Social Media Data Mining: A Social Network Analysis of Tweets during the 2010-2011 Australian Floods. *PACIS, 11*, 46-46.

Chiang, R. H., Goes, P., & Stohr, E. A. (2012). Business intelligence and analytics education, and program development: A unique opportunity for the information systems discipline. *ACM Transactions on Management Information Systems (TMIS), 3*(3), 12.

Chou, W. Y. S., Hunt, Y. M., Beckjord, E. B., Moser, R. P., & Hesse, B. W. (2009). Social media use in the United States: implications for health communication. *Journal of Medical Internet Research, 11*(4).

Chung, N., & Koo, C. (2015). The use of social media in travel information search. *Telematics and Informatics, 32*(2), 215-229.

Clayton, R. B., Nagurney, A., & Smith, J. R. (2013). Cheating, breakup, and divorce: Is Facebook use to blame? *Cyberpsychology, Behavior, and Social Networking, 16*(10), 717-720.

Crampton, J. W., Graham, M., Poorthuis, A., Shelton, T., Stephens, M., Wilson, M. W., & Zook, M. (2013). Beyond the geotag: situating 'big data'and leveraging the potential of the geoweb. *Cartography and Geographic Information Science, 40*(2), 130-139.

De Choudhury, M., Gamon, M., Counts, S., & Horvitz, E. (2013). Predicting depression via social media. *ICWSM, 13*, 1-10.

De la Torre-Díez, I., Díaz-Pernas, F. J., & Antón-Rodríguez, M. (2012). A content analysis of chronic diseases social groups on Facebook and Twitter. *Telemedicine and E-Health, 18*(6), 404-408.

Deane, K. H., Flaherty, H., Daley, D. J., Pascoe, R., Penhale, B., Clarke, C. E., & Storey, S. (2014). Priority setting partnership to identify the top 10 research priorities for the management of Parkinson's disease. *BMJ Open, 4*(12), e006434.

Denis, L. A. S., Hughes, A. L., & Palen, L. (2012, April). Trial by fire: The deployment of trusted digital volunteers in the 2011 shadow lake fire. *In Proceedings of the 9th International ISCRAM Conference.*

Denis, L. A. S., Palen, L., & Anderson, K. M. (2014, May). Mastering social media: An analysis of Jefferson County's communications during the 2013 Colorado floods. *In ISCRAM.*

Dennison, L., Morrison, L., Conway, G., & Yardley, L. (2013). Opportunities and challenges for smartphone applications in supporting health behavior change: qualitative study. *Journal of Medical Internet Research, 15*(4).

Desai, T., Shariff, A., Shariff, A., Kats, M., Fang, X., Christiano, C., & Ferris, M. (2012). Tweeting the meeting: an in-depth analysis of Twitter activity at Kidney Week 2011. *PloS One, 7*(7), e40253.

Deshpande, O., Lamba, D. S., Tourn, M., Das, S., Subramaniam, S., Rajaraman, A., & Doan, A. (2013, June). Building, maintaining, and using knowledge bases: a report from the trenches. *In Proceedings of the 2013 ACM SIGMOD International Conference on Management of Data* (pp. 1209-1220). *ACM.*

DeSmet, A., Veldeman, C., Poels, K., Bastiaensens, S., Van Cleemput, K., Vandebosch, H., & De Bourdeaudhuij, I. (2014). Determinants of self-reported bystander behavior in cyberbullying incidents amongst adolescents. *Cyberpsychology, Behavior, and Social Networking, 17*(4), 207-215.

Djahel, S., Doolan, R., Muntean, G. M., & Murphy, J. (2015). A communications-oriented perspective on traffic management systems for smart cities: Challenges and innovative approaches. *IEEE Communications Surveys & Tutorials, 17.*

El-Beltagy, S. R., & Ali, A. (2013, March). Open issues in the sentiment analysis of Arabic social media: A case study. *In Innovations in Information Technology (iit), 2013 9th International Conference on* (pp. 215-220). *IEEE.*

Emery, S. L., Vera, L., Huang, J., & Szczypka, G. (2014). Wanna know about vaping? Patterns of message exposure, seeking and sharing information about e-cigarettes across media platforms. *Tobacco Control, 23*(Suppl 3), iii17-iii25.

Etter, J. F., & Bullen, C. (2011). Electronic cigarette: users profile, utilization, satisfaction and perceived efficacy. *Addiction, 106*(11), 2017-2028.

Farhadi, Robabeh (2012farha). Information and Communication Technology*: Principles and Applications, Tehran: Librarian.*

Farrell, H. (2012). The consequences of the internet for politics. *Annual Review of Political Science, 15.*

Fausto, S., Machado, F. A., Bento, L. F. J., Iamarino, A., Nahas, T. R., & Munger, D. S. (2012). Research blogging: indexing and registering the change in science 2.0. *PloS One, 7*(12), e50109.

Ferrara, E., Varol, O., Menczer, F., & Flammini, A. (2013, October). Traveling trends: social butterflies or frequent fliers? *In Proceedings of the First ACM Conference on Online Social Networks* (pp. 213-222). *ACM.*

Foth, M., Choi, J. H. J., & Satchell, C. (2011, March*)*. Urban informatics. *In Proceedings of the ACM 2011 Conference on Computer Supported Cooperative Work* (pp. 1-8). *ACM.*

Fujisawa, T., Okamoto, S., Katayama, T., Nakao, M., Yoshimura, H., Kajiya-Kanegae, H., & Kaneko, T. (2014*)*. CyanoBase and RhizoBase: databases of manually curated annotations for cyanobacterial and rhizobial genomes. *Nucleic Acids Research, 42*(D1), D666-D670.

Fung, A., Russon Gilman, H., & Shkabatur, J. (2013). Six models for the internet+ politics. *International Studies Review, 15*(1), 30-47.

Generous, N., Fairchild, G., Deshpande, A., Del Valle, S. Y., & Priedhorsky, R. (2014). Global disease monitoring and forecasting with Wikipedia. *PLoS Computational Biology, 10*(11), e1003892.

Gentile, D. A., Reimer, R. A., Nathanson, A. I., Walsh, D. A., & Eisenmann, J. C. (2014). Protective effects of parental monitoring of children's media use: a prospective study. *JAMA Pediatrics, 168*(5), 479-484.

George, D. R., Rovniak, L. S., & Kraschnewski, J. L. (2013). Dangers and opportunities for social media in medicine. *Clinical Obstetrics and Gynecology, 56*(3).

Ghasemi Hamedani, Iman and Amiri, Moses (2014). "Investigating the Role of Mass Media on Behavior Change" (9) (34): 73-95

Ghose, A., Ipeirotis, P. G., & Li, B. (2014). Examining the impact of ranking on consumer behavior and search engine revenue. *Management Science, 60*(7), 1632-1654.

Gibbons, M. C. (2011). Use of health information technology among racial and ethnic underserved communities. *Perspectives in Health Information Management/AHIMA, American Health Information Management Association, 8(winter).*

Hachinski, V., Donnan, G. A., Gorelick, P. B., Hacke, W., Cramer, S. C., Kaste, M., ... & Skolnick, B. E. (2010). Stroke: working toward a prioritized world agenda. *International Journal of Stroke, 5*(4), 238-256.

Hajli, M. N. (2014). The role of social support on relationship quality and social commerce. *Technological Forecasting and Social Change, 87,* 17-27.

Harlow, S., & Guo, L. (2014). Will the revolution be tweeted or Facebooked? Using digital communication tools in immigrant activism. *Journal of Computer-Mediated Communication, 19*(3), 463-478.

Harpaz, R., Callahan, A., Tamang, S., Low, Y., Odgers, D., Finlayson, S., & Shah, N. H. (2014). Text mining for adverse drug events: the promise, challenges, and state of the art. *Drug safety, 37*(10), 777-790.

Hawkins, C. M., Hillman, B. J., Carlos, R. C., Rawson, J. V., Haines, R., & Duszak Jr, R. (2014). The impact of social media on readership of a peer-reviewed medical journal. *Journal of the American College of Radiology, 11*(11), 1038-1043.

Hong, L., Dan, O., & Davison, B. D. (2011, March). Predicting popular messages in twitter. In Proceedings of the 20th international conference companion on World wideweb (pp. 57-58). *ACM.*

Horvath, K. J., Danilenko, G. P., Williams, M. L., Simoni, J., Amico, K. R., Oakes, J. M., & Rosser, B. S. (2012). Technology use and reasons to participate in social networking health websites among people living with HIV in the US. *AIDS and Behavior, 16*(4), 900-910.

Huang, D., Tory, M., Aseniero, B. A., Bartram, L., Bateman, S., Carpendale, S. & Woodbury, R. (2015). Personal visualization and personal visual analytics. *IEEE Transactions on Visualization and Computer Graphics, 21*(3), 420-433.

Hughes, A. L., & Palen, L. (2009). Twitter adoption and use in mass convergence and emergency events. *International Journal of Emergency Management, 6*(3-4), 248-260.

Hughes, A. L., & Palen, L. (2009). Twitter adoption and use in mass convergence and emergency events. *International Journal of Emergency Management, 6*(3-4), 248-260.

Hughes, A. L., Palen, L., Sutton, J., Liu, S. B., & Vieweg, S. (2008, May*)*. Site-seeing in disaster: An examination of on-line social convergence. *In Proceedings of the 5th International ISCRAM Conference* (pp. 44-54). Washington, DC.

Imran, M., Castillo, C., Diaz, F., & Vieweg, S. (2015*)*. Processing social media messages in mass emergency: A survey. *ACM Computing Surveys (CSUR), 47*(4), 67.

Imran, M., Elbassuoni, S., Castillo, C., Diaz, F., & Meier, P. (2013, May). Extracting information nuggets from disaster-related messages in social media. *In Iscram.*

Jansen, B. J., Sobel, K., & Cook, G. (2011). Classifying ecommerce information sharing behaviour by youths on social networking sites. *Journal of Information Science, 37*(2), 120-136.

Jernigan, D. H., & Rushman, A. E. (2014*). Measuring youth exposure to Alcohol Marketing on Social Networking Sites: Challenges and Prospects. Journal of Public Health Policy, 35*(1), 91-104.

Jung, J. J. (2012). Online named entity recognition method for microtexts in social networking services: A case study of twitter*. Expert Systems with Applications, 39*(9), 8066-8070.

Kaplan, A. M., & Haenlein, M. (2012). Social media: back to the roots and back to the future. *Journal of Systems and Information Technology, 14*(2), 101-104.

Kapoor, K. K., Tamilmani, K., Rana, N. P., Patil, P., Dwivedi, Y. K., & Nerur, S. (2018). Advances in social media research: past, present and future. *Information Systems Frontiers, 20*(3), 531-558.

Kay Lewis, Boby (2010). "Social Media and Strategic Communication: Attitudes and Attitudes of College Students"*, International Public Relations, Scientific and Educational Journal.*

Khaleghi, Narges and Siamak, Marzieh (2010). Teaching Information Literacy Skill*s, Tehran: Librarian; Qom University*.

Kleinberg, J. M. (2007, August*)*. Challenges in mining social network data: processes, privacy, and paradoxes. *In Proceedings of The 13th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining* (pp. 4-5). ACM.

Koch, H., Leidner, D. E., & Gonzalez, E. S. (2013). Digitally enabling social networks: resolving IT–culture conflict. *Information Systems Journal, 23*(6), 501-523.

Krasnova, H., Widjaja, T., Buxmann, P., Wenninger, H., & Benbasat, I. (2015). Research note—why following friends can hurt you: an exploratory investigation of the effects of envy on social networking sites among college-age users. *Information Systems Research, 26*(3), 585-605.

Krawczyk, B. (2016). Learning from imbalanced data: open challenges and future directions. *Progress in Artificial Intelligence, 5*(4), 221-232.

Kwahk, K. Y., & Park, D. H. (2016). The effects of network sharing on knowledge-sharing activities and job performance in enterprise social media environments. *Computers in Human Behavior, 55, 826-839.*

Larson, K., & Watson, R. (2011). The value of social media: toward measuring social media strategies.

Lee, C. S., & Ma, L. (2012). News Sharing in Social Media: The Effect of Gratifications and Prior Experience. Computers in Human Behavior, 28(2), 331-339.

Leist, A. K. (2013). Social media use of older adults: a mini-review. *Gerontology, 59*(4), 378-384.

Leonardi, P. M. (2014). Social media, knowledge sharing, and innovation: Toward a theory of communication visibility. *Information Systems Research, 25*(4), 796-816.

Leonardi, P. M. (2015). Ambient awareness and knowledge acquisition: using social media to learn 'who knows what'and 'who knows whom'.

Li, Y. M., & Li, T. Y. (2013). Deriving market intelligence from microblogs. *Decision Support Systems, 55*(1), 206-217.

Liu, I. L., Cheung, C. M., & Lee, M. K. (2010). Understanding Twitter Usage: What Drive People Continue to Tweet? *Pacis, 92*, 928-939.

Liu, S. B. (2014). Crisis crowdsourcing framework: Designing strategic configurations of crowdsourcing for the emergency management domain. *Computer Supported Cooperative Work (CSCW), 23*(4-6), 389-443

Liu, S. B., Palen, L., Sutton, J., Hughes, A. L., & Vieweg, S. (2008, May). In search of the bigger picture: The emergent role of on-line photo sharing in times of disaster. *In Proceedings of the Information Systems for Crisis Response and Management Conference (ISCRAM)* (pp. 4-7).

Liu, W., Liu, H., Tao, D., Wang, Y., & Lu, K. (2015*).* Multiview Hessian regularized logistic regression for action recognition. *Signal Processing, 110,* 101-107.

Llodrà-Riera, I., Martínez-Ruiz, M. P., Jiménez-Zarco, A. I., & Izquierdo-Yusta, A. (2015). A multidimensional analysis of the information sources construct and its relevance for destination image formation. *Tourism Management, 48,* 319-328.

Lukyanenko, R., Parsons, J., & Wiersma, Y. F. (2014). The IQ of the crowd: understanding and improving information quality in structured user-generated content. *Information Systems Research, 25*(4), 669-689.

Ma, W. W., & Chan, A. (2014*).* Knowledge sharing and social media: Altruism, perceived online attachment motivation, and perceived online relationship commitment. *Computers in Human Behavior, 39*, 51-58.

Macafee, T., & De Simone, J. J. (2012). Killing the bill online? Pathways to young people's protest engagement via social media. *Cyberpsychology, Behavior, and Social Networking, 15*(11), 579-584.

Malhotra, A., Totti, L., Meira Jr, W., Kumaraguru, P., & Almeida, V. (2012, August*).* Studying user footprints in different online social networks. *In Proceedings of the 2012 International Conference on Advances in Social Networks Analysis and Mining (ASONAM 2012*) (pp. 1065-1070). *IEEE Computer Society.*

Malthouse, E. C., Haenlein, M., Skiera, B., Wege, E., & Zhang, M. (2013). Managing customer relationships in the social media era: Introducing the social CRM house. *Journal of Interactive Marketing, 27*(4), 270-280.

Mansfield, S. J., Morrison, S. G., Stephens, H. O., Bonning, M. A., Wang, S. H., Withers, A. H., ... & Perry, A. W. (2011). Social media and the medical profession. *Med J Aust, 194*(12), 642-4.

María Munar, A. (2011). Tourist-created content: rethinking destination branding. *International Journal of Culture, Tourism and Hospitality Research, 5*(3), 291-305.

Mastrandrea, R., Fournet, J., & Barrat, A. (2015). Contact patterns in a high school: a comparison between data collected using wearable sensors, contact diaries and friendship surveys. *PloS One, 10*(9), e0136497.

Matthews, A., Herrett, E., Gasparrini, A., Van Staa, T., Goldacre, B., Smeeth, L., & Bhaskaran, K. (2016). Impact of statin related media coverage on use of statins: interrupted time series analysis with UK primary care data. *Bmj, 353,* i3283.

McNab, C. (2009). What social media offers to health professionals and citizens?

Middleton, S. E., Middleton, L., & Modafferi, S. (2014). Real-time crisis mapping of natural disasters using social media. *IEEE Intelligent Systems, 29*(2), 9-17.

Mohammad, S. M. (2012, June). # Emotional tweets. In Proceedings of the First Joint Conference on Lexical and Computational Semantics-Volume 1: Proceedings of the main conference and the shared task, and Volume 2: Proceedings of the Sixth International Workshop on Semantic Evaluation (pp. 246-255). *Association for Computational Linguistics.*

Mohammad, S. M., Zhu, X., Kiritchenko, S., & Martin, J. (2015*).* Sentiment, emotion, purpose, and style in electoral tweets. *Information Processing & Management, 51*(4), 480-499.

Mohammadi, Akram (2008). "Effect of scientific communication on production", *Journal of Sociology of Iran, 8* (1).

Moreno, M. A., Goniu, N., Moreno, P. S., & Diekema, D. (2013). Ethics of social media research: common concerns and practical considerations. *Cyberpsychology, Behavior, and Social Networking, 16*(9), 708-713.

Morris, M. R., Teevan, J., & Panovich, K. (2010). A Comparison of Information Seeking Using Search Engines and Social Networks. *ICWSM, 10,* 23-26.

Moses, H., Matheson, D. H., Dorsey, E. R., George, B. P., Sadoff, D., & Yoshimura, S. (2013). The anatomy of health care in the United States. *Jama, 310*(18), 1947-1964.

Nabi, R. L., Prestin, A., & So, J. (2013). Facebook friends with (health) benefits? Exploring social network site use and perceptions of social support, stress, and well-being. *Cyberpsychology, Behavior, and Social Networking, 16*(10), 721-727.

Napolitano, M. A., Hayes, S., Bennett, G. G., Ives, A. K., & Foster, G. D. (2013). Using Facebook and text messaging to deliver a weight loss program to college students. *Obesity, 21*(1), 25-31.

Nguyen, T. H., Shirai, K., & Velcin, J. (2015). Sentiment analysis on social media for stock movement prediction. *Expert Systems with Applications, 42*(24), 9603-9611.

Noulas, A., Mascolo, C., & Frias-Martinez, E. (2013, June). Exploiting foursquare and cellular data to infer user activity in urban environments. *In Mobile Data Management (MDM), 2013 IEEE 14th International Conference on* (Vol. 1, pp. 167-176). *IEEE.*

Obar, J. A., & Wildman, S. S. (2015). Social media definition and the governance challenge-an introduction to the special issue.

Oh, O., Kwon, K. H., & Rao, H. R. (2010, August). An Exploration of Social Media in Extreme Events: Rumor Theory and Twitter during the Haiti Earthquake 2010. *In Icis (Vol. 231).*

Oyeyemi, S. O., Gabarron, E., & Wynn, R. (2014). Ebola, Twitter, and misinformation: a dangerous combination. *Bmj, 349*, g6178.

Palacios-Marqués, D., Merigó, J. M., & Soto-Acosta, P. (2015). Online social networks as an enabler of innovation in organizations. *Management Decision, 53*(9), 1906-1920.

Panahi, S., Watson, J., & Partridge, H. (2013). Towards tacit knowledge sharing over social web tools. *Journal of Knowledge Management, 17*(3), 379-397.

Paris, C. M. (2012*). Flashpackers:* An emerging sub-culture Annals of Tourism Research, *39*(2), 1094-1115.

Pepper, J. K., Emery, S. L., Ribisl, K. M., & Brewer, N. T. (2014). How US adults find out about electronic cigarettes: implications for public health messages. *Nicotine & Tobacco Research, 16*(8), 1140-1144.

Phang, C. W., Zhang, C., & Sutanto, J. (2013). The influence of user interaction and participation in social media on the consumption intention of niche products. *Information & Management, 50*(8), 661-672.

Pit, S. W., VO, T., & Pyakurel, S. (2014). The effectiveness of recruitment strategies on general practitioner's survey response rates–a systematic review. *BMC Medical Research Methodology, 14*(1), 76.

Poria, S., Cambria, E., Howard, N., Huang, G. B., & Hussain, A. (2016). Fusing audio, visual and textual clues for sentiment analysis from multimodal content. *Neurocomputing, 174,* 50-59.

Power, D. J., & Phillips-Wren, G. (2011*).* Impact of social media and Web 2.0 on decision-making. *Journal of Decision Systems, 20*(3), 249-261.

Preotiuc-Pietro, D., Lampos, V., & Aletras, N. (2015). An analysis of the user occupational class through Twitter content. *In Proceedings of the 53rd Annual Meeting of the Association for Computational Linguistics and the 7th International Joint Conference on Natural Language Processing (Volume 1: Long Papers)* (Vol. 1, pp. 1754-1764).

Puiu, D., Barnaghi, P., Tönjes, R., Kümper, D., Ali, M. I., Mileo, A. & Gao, F. (2016*).* Citypulse: Large scale data analytics framework for smart cities. *IEEE Access, 4,* 1086-1108.

Ratkiewicz, J., Conover, M., Meiss, M., Gonçalves, B., Patil, S., Flammini, A., & Menczer, F. (2011, March*).* Truthy: mapping the spread of AstroTurf in microblog streams. *In Proceedings of The 20th International Conference Companion on World Wide Web* (pp. 249-252). ACM.

Reuter, C., Heger, O., & Pipek, V. (2013, May*).* Combining real and virtual volunteers through social media. *In Iscram.*

Reuter, T., & Cimiano, P. (2012, June). Event-based classification of social media streams. *In Proceedings of the 2nd ACM International Conference on Multimedia Retrieval* (p. 22). ACM.

Rhodes, S. D., Hergenrather, K. C., Vissman, A. T., Stowers, J., Davis, A. B., Hannah, A., ... & Marsiglia, F. F. (2011). Boys must be men, and men must have sex with women: A qualitative CBPR study to explore sexual risk among African American, Latino, and white gay men and MSM. *American Journal of Men's Health, 5*(2), 140-151.

Richter, A., & Riemer, K. (2013). The Contextual Nature of Enterprise Social Networking: A Multi Case Study Comparison. *In ECIS* (p. 94).

Rosen, D., Barnett, G. A., & Kim, J. H. (2011). Social networks and online environments: when science and practice co-evolve. *Social Network Analysis and Mining, 1*(1), 27-42.

Salathé, M., & Khandelwal, S. (2011). Assessing vaccination sentiments with online social media: implications for infectious disease dynamics and control. *PLoS Computational Biology, 7*(10), E1002199.

Salathé, M., Bengtsson, L., Bodnar, T. J., Brewer, D. D., Brownstein, J. S., Buckee, C & Vespignani, A. (2012). Digital epidemiology. *PLoS Computational Biology, 8*(7), E1002616.

Sarker, A., & Gonzalez, G. (2015*)*. Portable automatic text classification for adverse drug reaction detection via multi-corpus training. *Journal of Biomedical Informatics, 53,* 196-207.

Sarker, A., Ginn, R., Nikfarjam, A., O'Connor, K., Smith, K., Jayaraman, S & Gonzalez, G. (2015). Utilizing social media data for pharmacovigilance: a review. *Journal of Biomedical Informatics, 54,* 202-212.

Saxton, G. D., Oh, O., & Kishore, R. (2013). Rules of crowdsourcing: Models, issues, and systems of control. *Information Systems Management, 30*(1), 2-20.

Schumacher, K. R., Stringer, K. A., Donohue, J. E., Yu, S., Shaver, A., Caruthers, R. L., & Russell, M. W. (2014*). Social media methods for studying rare diseases. Pediatrics, Peds-2013.*

Shamsi, Mahnaz and Soleimani, Maryam (2015). "The Study of the Relationship between Scientific Communication and Media with Emphasis on Social Media*." Book Seal Autumn and Winter 2015 Issue 17 and 18*

Sherchan, W., Jayaraman, P. P., Krishnaswamy, S., Zaslavsky, A., Loke, S., & Sinha, A. (2012, July). Using on-the-move mining for mobile crowdsensing. *In Mobile Data Management (MDM), 2012 IEEE 13th International Conference on* (pp. 115-124). *IEEE.*

Sigala, M., & Chalkiti, K. (2014). Investigating the exploitation of web 2.0 for knowledge management in the Greek tourism industry: An utilisation–importance analysis. *Computers in Human Behavior, 30,* 800-812.

Singh, A. G., Singh, S., & Singh, P. P. (2012). YouTube for information on rheumatoid arthritis--a wakeup call? *The Journal of Rheumatology,* Jrheum-111114.

St Louis, C., & Zorlu, G. (2012). Can Twitter predict disease outbreaks? *Bmj, 344,* e2353.

Starbird, K., & Stamberger, J. (2010, May). Tweak the tweet: Leveraging microblogging proliferation with a prescriptive syntax to support citizen reporting. *In Proceedings of The 7th International ISCRAM Conference* (Vol. 1, pp. 1-5). *Seattle, WA: Information Systems for Crisis Response and Management.*

Starbird, K., Muzny, G., & Palen, L. (2012, April). Learning from the crowd: collaborative filtering techniques for identifying on-the-ground Twitterers during mass disruptions. *In Proceedings of 9th International Conference on Information Systems for Crisis Response and Management, ISCRAM* (pp. 1-10).

Stefanidis, A., Crooks, A., & Radzikowski, J. (2013*)*. Harvesting ambient geospatial information from social media feeds. *GeoJournal, 78*(2), 319-338.

Strasburger, V. C., Hogan, M. J., Mulligan, D. A., Ameenuddin, N., Christakis, D. A., Cross, C., & Moreno, M. A. (2013). Children, adolescents, and the media. *Pediatrics, 132*(5), 958-961.

Sugimoto, C. R., Work, S., Larivière, V., & Haustein, S. (2017). Scholarly use of social media and altmetrics: A review of the literature. *Journal of the Association for Information Science and Technology, 68*(9), 2037-2062.

Sulis, E., Farías, D. I. H., Rosso, P., Patti, V., & Ruffo, G. (2016). Figurative messages and affect in twitter: Differences between# irony, # sarcasm and# not. *Knowledge-Based Systems, 108,* 132-143.

Sun, G., Wu, Y., Liu, S., Peng, T. Q., Zhu, J. J., & Liang, R. (2014). *EvoRiver:* Visual analysis of topic coopetition on social media. *IEEE Transactions on Visualization and Computer Graphics, 20*(12), 1753-1762.

Suttles, J., & Ide, N. (2013, March). Distant supervision for emotion classification with discrete binary values. In International Conference on Intelligent Text Processing and Computational Linguistics (pp. 121-136). *Springer, Berlin, Heidelberg.*

Sutton, J. N. (2010, May). Twittering Tennessee: Distributed networks and collaboration following a technological disaster. *ISCRAM.*

Sutton, J. N., Palen, L., & Shklovski, I. (2008). Backchannels on the front lines: Emergency uses of social media in the 2007 Southern California Wildfires (pp. 624-632). *University of Colorado.*

Swan, M. (2012). Health 2050: The realization of personalized medicine through crowdsourcing, the quantified self, and the participatory biocitizen. *Journal of Personalized Medicine, 2*(3), 93-118.

Tapia, A. H., Moore, K. A., & Johnson, N. J. (2013, May). Beyond the trustworthy tweet: A deeper understanding of microblogged data use by disaster response and humanitarian relief organizations. *In ISCRAM.*

Teng, S., Wei Khong, K., Wei Goh, W., & Yee Loong Chong, A. (2014). Examining the antecedents of persuasive eWOM messages in social media. *Online Information Review, 38*(6), 746-768.

Tennant, B., Stellefson, M., Dodd, V., Chaney, B., Chaney, D., Paige, S., & Alber, J. (2015). EHealth literacy and Web 2.0 health information seeking behaviors among baby boomers and older adults. *Journal of Medical Internet Research, 17*(3).

Terpstra, T., De Vries, A., Stronkman, R., & Paradies, G. L. (2012). Towards a realtime twitter analysis during crises for operational crisis management (pp. 1-9). Burnaby: Simon Fraser University.

Thackeray, R., Burton, S. H., Giraud-Carrier, C., Rollins, S., & Draper, C. R. (2013). Using Twitter for breast cancer prevention: an analysis of breast cancer awareness month. *BMC cancer, 13*(1), 508.

Thackeray, R., Crookston, B. T., & West, J. H. (2013). Correlates of health-related social media use among adults. *Journal of medical Internet research, 15*(1).

Thelwall, M., Haustein, S., Larivière, V., & Sugimoto, C. R. (2013). Do altmetrics work? Twitter and ten other social web services. *PloS one, 8*(5), e64841.

Thomson, R., Ito, N., Suda, H., Lin, F., Liu, Y., Hayasaka, R., & Wang, Z. (2012, April). Trusting tweets: The Fukushima disaster and information source credibility on Twitter. *In Proceedings of the 9th International ISCRAM Conference* (pp. 1-10). *Vancouver: Simon Fraser University.*

Thorson, K., & Wells, C. (2015). *Curated flows*: A framework for mapping media exposure in the digital age. *Communication Theory, 26*(3), 309-328.

Trainor, K. J., Andzulis, J. M., Rapp, A., & Agnihotri, R. (2014). Social media technology usage and customer relationship performance: A capabilities-based examination of social CRM. *Journal of Business Research, 67*(6), 1201-1208.

Tredinnick, L. (2006). Web 2.0 and Business: A pointer to the intranets of the future? *Business Information Review, 23*(4), 228-234.

Tsay, J., Dabbish, L., & Herbsleb, J. (2014, May). Influence of social and technical factors for evaluating contribution in GitHub. *In Proceedings of the 36th International Conference on Software Engineering* (pp. 356-366). ACM.

Tuarob, S., Tucker, C. S., Salathe, M., & Ram, N. (2014). An ensemble heterogeneous classification methodology for discovering health-related knowledge in social media messages. *Journal of Biomedical Informatics, 49,* 255-268.

Utz, S., Muscanell, N., & Khalid, C. (2015). Snapchat elicits more jealousy than Facebook: A comparison of Snapchat and Facebook use. *Cyberpsychology, Behavior, and Social Networking, 18*(3), 141-146.

Varol, O., Ferrara, E., Davis, C. A., Menczer, F., & Flammini, A. (2017*). Online Human-bot Interactions: Detection, Estimation, And Characterization. ArXiv Preprint ArXiv:* 1703.03107.

Velasco, E., Agheneza, T., Denecke, K., Kirchner, G., & Eckmanns, T. (2014). Social media and internet-based data in global systems for public health surveillance: a systematic review. *The Milbank Quarterly, 92*(1), 7-33.

Ventola, C. L. (2014). Mobile devices and apps for health care professionals: uses and benefits. *Pharmacy and Therapeutics, 39*(5), 356.

Ventola, C. L. (2014). Social media and health care professionals: benefits, risks, and best practices. *Pharmacy and Therapeutics, 39*(7), 491.

Vyas, A. N., Landry, M., Schnider, M., Rojas, A. M., & Wood, S. F. (2012). Public health interventions: reaching Latino adolescents via short message service and social media. *Journal of Medical Internet Research, 14*(4).

Wang, C., & Zhang, P. (2012). The evolution of social commerce: The people, management, technology, and information dimensions. *CAIS, 31*(5).

Watson, H. J. (2014). *Tutorial*: Big data analytics: Concepts, technologies, and applications. *CAIS, 34, 65.*

Whittington, R. (2014). Information systems strategy and strategy-as-practice: a joint agenda. *The Journal of Strategic Information Systems, 23*(1), 87-91.

Witteman, H. O., & Zikmund-Fisher, B. J. (2012). The defining characteristics of Web 2.0 and their potential influence in the online vaccination debate. *Vaccine, 30*(25), 3734-3740.

Wu, L. (2013). Social network effects on productivity and job security: Evidence from the adoption of a social networking tool. *Information Systems Research, 24*(1), 30-51.

Wu, Y., Liu, S., Yan, K., Liu, M., & Wu, F. (2014). Opinionflow: Visual analysis of opinion diffusion on social media. *IEEE Transactions on Visualization and Computer Graphics, 20*(12), 1763-1772.

Xiang, Z., Magnini, V. P., & Fesenmaier, D. R. (2015). Information technology and consumer behavior in travel and tourism: Insights from travel planning using the internet. *Journal of Retailing and Consumer Services, 22,* 244-249.

Xie, H., Li, Q., Mao, X., Li, X., Cai, Y., & Rao, Y. (2014). Community-aware user profile enrichment in folksonomy. *Neural Networks, 58,* 111-121.

Xu, J. M., Jun, K. S., Zhu, X., & Bellmore, A. (2012, June). Learning from bullying traces in social media. In Proceedings of the 2012 conference of the North American chapter of the association for computational linguistics: Human language technologies (pp. 656-666). *Association for Computational Linguistics.*

Xu, S. X., & Zhang, X. (2013). Impact of Wikipedia on market information environment: Evidence on management disclosure and investor reaction. *Mis Quarterly,* 1043-1068.

Xu, Z., Zhang, H., Hu, C., Mei, L., Xuan, J., Choo, K. K. R., & Zhu, Y. (2016). Building knowledge base of urban emergency events based on crowdsourcing of social media. *Concurrency and Computation: Practice and Experience, 28*(15), 4038-4052.

Xu, Z., Zhang, H., Sugumaran, V., Choo, K. K. R., Mei, L., & Zhu, Y. (2016). Participatory sensing-based semantic and spatial analysis of urban emergency events using mobile social media. *EURASIP Journal on Wireless Communications and Networking, 2016*(1), 44.

Yang, M., Kiang, M., & Shang, W. (2015*).* Filtering big data from social media–Building an early warning system for adverse drug reactions. *Journal of Biomedical Informatics, 54,* 230-240.

Yin, J., Karimi, S., Lampert, A., Cameron, M., Robinson, B., & Power, R. (2015, June). Using social media to enhance emergency situation awareness. *In Twenty-Fourth International Joint Conference on Artificial Intelligence.*

Yuan, P., Bare, M. G., Johnson, M. O., & Saberi, P. (2014*).* Using online social media for recruitment of human immunodeficiency virus-positive participants: a cross-sectional survey. *Journal of Medical Internet Research, 16*(5).

Yuan, Y. C., Zhao, X., Liao, Q., & Chi, C. (2013). The use of different information and communication technologies to support knowledge sharing in organizations: From e-mail to micro-blogging. *Journal of the American Society for Information Science and Technology, 64*(8), 1659-1670.

Zhang, X., Gao, Y., Yan, X., de Pablos, P. O., Sun, Y., & Cao, X. (2015). From e-learning to social-learning: Mapping development of studies on social media-supported knowledge management. *Computers in Human Behavior, 51,* 803-811.

Zhao, J., Cao, N., Wen, Z., Song, Y., Lin, Y. R., & Collins, C. (2014). # FluxFlow: Visual analysis of anomalous information spreading on social media. *IEEE Transactions on Visualization and Computer Graphics, 20*(12), 1773-1782.

Zhong, B., Hardin, M., & Sun, T. (2011). Less effortful thinking leads to more social networking? The associations between the use of social network sites and personality traits. *Computers in Human Behavior, 27*(3), 1265-1271.