

# Using Bibliometric Analysis to Explore Research Trend of Electronic Word-of-Mouth from 1999 to 2011

Yannjy Yang, Chih-Chien Wang, and Ming-Cheng Lai

**Abstract**—The study aims to identify the research trend of electronic word-of-mouth. By analyzing 15,898 citations of 327 articles published in journals in Social Sciences Citation Index (SSCI) and Science Citation Index (SCI) in a twelve years period between 1999 and 2011. The study maps the intellectual structure of the electronic word-of-mouth research area. The results provide fundamental insights and recent development on the development of electronic word-of-mouth research.

**Index Terms**—Bibliometric, literature review, electronic word-of-mouth (eWOM), SSCI/SCI.

## I. INTRODUCTION

Word of mouth (WOM) is interpersonal informal communication among consumers about products and services [1-3]. Prior to the popularization of Internet, consumers shared their evaluation to and usage experience of the product or services by interpersonal oral communication. Now consumers can share their product experience to others online, due to the high penetration of Internet and the emergence of Web 2.0. EWOMs refer to WOMs on Internet, which are usually diffused by many Internet applications, such as online forums, electronic bulletin board systems, blogs, review sites, and social networking sites [4].

Recently, eWOMs play a critical role in consumers' choices [5]. For consumers, reading eWOM information could help to reduce search costs, uncertainty, and risks associated with the purchase of unfamiliar products. Unlike traditional WOMs which are distributed among existed social networks, eWOM often occurs among people who have little, if any, relationship with each one. EWOMs allow consumers to obtain product review from a vast, geographically dispersed group of people, who have experience on the product, rather than just from the few people they know [6-7]. Besides, eWOM spreaders can be anonymous to share their opinions without revealing their identities [8-10]. Anonymous nature and wide range of contents of eWOM extend the scope of WOM which traditionally embedded in individuals' direct social network [11]. The impacts of eWOMs significantly increase since they can be spread widely and may last long since they can be archive for years.

Literatures have indicated the importance of eWOMs in consumer marketing and how great of the potential impact of

eWOMs can have on the consumers' decision-making process. The eWOM research is blooming for the past few years and attracts the sight from both academics and practice. This study aims to provide a comprehensive understanding of recent trends of eWOM research. To accomplish this goal, this study used bibliometric techniques and literature review to the eWOM articles which listed in Science Citation Index (SCI) and Social Science Citation Index (SSCI) during the 12-year period of 1999–2011.

Bibliometric analysis is a research technique using quantitative and statistical analyses to describe distribution patterns of research articles with a given topic and a given time period [12, 13]. This paper makes use of bibliometric approaches to reveal research trend of eWOM and to serve as a roadmap of eWOM both academics and practitioners. The purposes of this study are to:

- 1) Analyze distribution of eWOM articles, such as publication years, countries of authors, published journals, and citation times.
- 2) Analyze the citation and co-citation relations among eWOM articles.

This paper is structured in four sections. The first section provides a brief introduction for this study. Then, the second section introduces bibliometric techniques that used in this study. Next, this study explains the analysis results. Finally, we conclude the article with a discussion of limitations and implications for future research.

## II. METHODOLOGY

The study scanned titles and abstracts of journal articles to identify valuable papers in the eWOM field. The primary sources of databases were Social Science Citation Index and Sciences Citation Index. This study restricted articles publication during the years 1999-2011. We chose 1999-2011 as the research period since eWOM research original appeared in the top-rank marketing journals in the period [14].

This procedure collected 363 articles. To confine the range of the articles, this study selected only 327 journal article and omitted 36 articles of conference proceedings, meeting abstracts, editorial materials, and software reviews.

This study aims to explore the recent development of eWOM research by the identified 327 articles. Although this search was not exhaustive, we hope that it serves as a comprehensive base for an understanding of recent trend of eWOM research.

The foregoing extensive literature search procedures resulted in a total of 327 articles met all the criteria. These articles cited 15,898 publications as references, including

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Y.-J. Yang is with the National Cheng Chi University (e-mail: 92359503@nccu.edu.tw).

C.-C. Wang is with the National Taipei University, Sansia District, New Taipei City 239, Taiwan. (e-mail: wangson@mail.ntpu.edu.tw).

M.-C. Lai is with National Taipei College of Business, (e-mail: laimc@mail.ntcb.edu.tw).

journal articles and books.

This study attempted to describe trends and development of eWOM by analyzing the two types of information; they are the 327 selected articles and the 15,989 references. This study conducted analyses to bibliographic data of the 327 selected articles to observe distribution of publication years, country of author, published journal, and cited times by other scholars. These analyses aimed to describe recent trends of eWOM research. In addition, this study analyzed data from the 15,989 references. The study used citation analysis to compute the frequency of citation of the references used in all the articles analyzed, in order to identify the literatures that had made strong impact on the eWOM area. This study also performed a co-citation analysis based on tracking pairs of journal article that are cited together in a given article.

This study used BIBEXCEL [15] and PAJEK [16] software to acquire citation and co-citation analysis. Those analyses can help follow-up researchers to understand the research trends of eWOM field in the recent years.

### III. RESULTS

#### A. Distribution of the Year of Publication

Figure 1 illustrates the historical development of the number of published eWOM articles. The distribution of annual publication output is shown in Figure 1 from 1999 to 2011. The eWOMs are distributed majorly by internet. The blossoming of Internet and social network websites enhance the influence of eWOMs. As depicted, only a few of eWOM research articles are published before 2005. Nevertheless, the amount of published articles dramatically increased from 8 articles in 2005 to 120 articles in 2011. The increase in the number of articles on the topic has reflected the growing attention of scholars in the field of eWOM. This demonstrates that academics and researchers gradually pay attention to eWOM phenomenon and eWOM studies are still valued within academia.

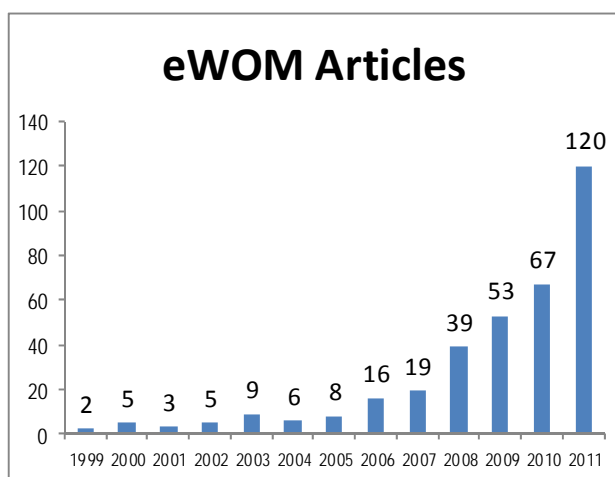


Fig. 1. EWOM publication trends from 1999 to 2012.

#### B. Distribution of e-WOM by Authors' Countries

Table 1 reveals distribution of authors' countries of the 327 eWOM papers. Based on author affiliations, the study identified countries producing the most publications on e-WOM from 1999 to 2011. The five most prolific countries

in e-WOM research were USA (55.35%), Taiwan (10.40%), China (7.34%), South Korea (7.34%), and England (5.81%). Scholars of these countries were interested in eWOM research and played important roles in the field.

TABLE I: DISTRIBUTION OF EWOM ARTICLES BY AUTHORS' COUNTRIES

Countries	Articles	Percentage(% of 327)
USA	181	55.35%
Taiwan	34	10.40%
China	24	7.34%
South Korea	24	7.34%
England	19	5.81%
Netherlands	18	5.50%
Australia	15	4.59%
Canada	12	3.67%
Germany	11	3.36%
France	7	2.14%
Singapore	7	2.14%
Spain	7	2.14%

Notes: Countries with more than 5 eWOM articles are listed.

#### C. Distribution of e-WOM Articles by Journals

EWOM research is significantly spread out among different journals (see Table 2). The 327 source articles were published in 155 journals, where represented eWOM research was investigated by academics from many different disciplines. Table 2 depicts the top 9 journals that publish at least seven articles. Journal of Interactive Marketing was ranked first, with 17 (5.20%) articles, followed by Journal of Business Research (11 articles, 3.36%), Journal of Advertising Research (10 articles, 3.06%), Journal of Marketing Research (9 articles, 2.75%), Journal of Management Information Systems (9 articles, 2.75%), and Decision Support Systems (9 articles, 2.75%).

Table 2 notes that some important and renowned journals had published eWOM articles. Nevertheless, none of the mainstream journals appeared an overwhelming percentage of eWOM-related research. Even the top one journal, Journal of Interactive Marketing, published 5.20% articles only. Among the journals which published most eWOM research, Journal of Interactive Marketing, Journal of Advertising Research, Journal of Marketing Research, and International Journal of Advertising belong to the marketing field. Journal of Management Information Systems, Decision Support Systems, and International Journal of Electronic Commerce belonged to the MIS fields. Journal of Business Research and Management Science are journals for business and management fields. These results revealed that eWOM should be an inter-discipline research field that attracts attention from various journals of different fields.

#### D. Cited Times of eWOM Articles

Citation times reflect articles' impact to academics of both eWOM and other fields. The Table 3 listed the eWOM articles which were frequently cited by other articles. EWOM articles which received at least 50 citations are shown in Table 4. As indicated, the top 5 articles were Dellarocas (2003), Srinivasan, Anderson, and Ponnnavolu (2002),

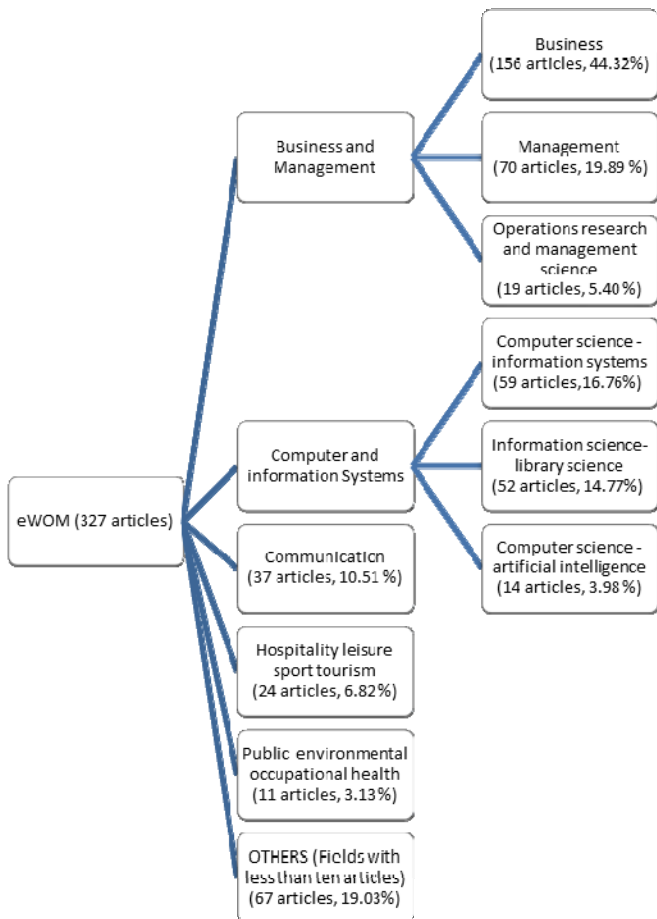


Fig. 2. Discipline distribution of eWOM research from 1999 to 2012.

TABLE II: DISTRIBUTION OF ELECTRONIC WORD OF MOUTH ARTICLES BY JOURNALS

Journals (Abbreviation)	Articles	%
Journal of Interactive Marketing (JIM)	17	5.20%
Journal of Business Research (JBR)	11	3.36%
Journal of Advertising Research (JAR)	10	3.06%
Journal of Marketing Research (JMR)	9	2.75%
Journal of Management Information Systems (JMIS)	9	2.75%
Decision Support Systems (DSS)	9	2.75%
International Journal of Advertising (IJA)	8	2.45%
Marketing Science (MKS)	8	2.45%
International Journal of Electronic Commerce (IJEC)	7	2.14%

Note: the above journals published more than 5 eWOM articles.

Anderson (2004), Chevalier and Mayzlin (2006), and Godes and Mayzlin (2004). All these five articles received more than 181 citations. Dellarocas(2003)’s article of “The digitization of word of mouth: promise and challenges of online feedback mechanisms” was most frequently cited by other authors and with 310 cited times, and it is able to state that the article is acquired the focus of attention. When researchers or academics want to study the eWOM research, the top articles in the Table 4 should be “must read articles”, particularly Dellarocas (2003)’s article.

TABLE III: CITED TIMES OF EWOM ARTICLES

EWOM Research (Authors, Journal, Year)	Cited Times
Dellarocas, C, Management Science, 2003	310
Srinivasan, SS; Anderson, R; Ponnnavolu, K, Journal Of Retailing, 2002	218
Anderson, KD, Journal Of Neurotrauma, 2004	214
Chevalier, JA; Mayzlin, D, Journal Of Marketing Research, 2006	210
Godes, D; Mayzlin, D, Marketing Science, 2004	182
Mayzlin, D, Marketing Science, 2006	64
Litvin, SW; Goldsmith, RE; Pan, B, Tourism Management, 2008	62
Garbarino, E; Strahilevitz, M, Journal Of Business Research, 2004	62
Black, DW; Belsare, G; Schlosser, S, Journal Of Clinical Psychiatry, 1999	55
Dellarocas, C; Zhang, XQ; Awad, NF, Journal Of Interactive Marketing, 2007	54
Foster, RC; Lanningham-Foster, LM; Manohar, C; McCrady, SK; Nysse, LJ; Kaufman, KR; Padgett, DJ; Levine, JA, Preventive Medicine, 2005	52

Note: The above highly influence electronic word of mouth article were published in 1999-2011 and received at least 50 citation.

TABLE IV: JOURNALS CITED BY EWOM RESEARCH

Journal name	Cited Times
Journal of Marketing	655
Journal of Consumer Research	641
Journal of Marketing Research	556
Journal of Interactive Marketing	430
Marketing Science	321
Management Science	316
Journal of Advertising Research	258
Journal of Business Research	229
Journal of Retailing	213
Journal of Academy of Marketing Science	195
Advances in Consumer Research	160
Information Systems Research	156
MIS Quarterly	150
Journal of Service Research	140
Journal of Personality and Social Psychology	140
International Journal of Electronic Commerce	136
Harvard Business Review	122
Communication of ACM	112
Journal of Management Information Systems	110

E. Journals Cited by eWOM Articles

Distribution of cited journal by eWOM articles reflects knowledge source of eWOM. Table 4 presents the frequently cited journals, which come from the 327 e-WOM articles’ reference ties within. It could be found the highly cited and influential journals in the eWOM research. For instance, Journal of Marketing was cited 655 times, Journal of

Consumer Research was cited 641 times, while Journal of Marketing Research was cited 556 times by the 327 e-WOM articles. The top 4 and 5 journals were Journal of Interactive Marketing and Marketing Science which received 430 and 321 citation, respectively. All the top five journals were marketing and consumer research journals, which revealed that marketing journals were major knowledge source of eWOM research and played significant roles in the field.

Besides, table 3 also revealed that the 327 e-WOM articles also cited frequently journals of a variety of fields, including business, information systems, and psychology. Figure 3 revealed the knowledge source of e-WOM research.

*F. Literatures Cited by eWOM Articles*

Table 5 lists the frequency of the literatures which were cited by 327 eWOM articles. These articles were knowledge source of eWOM research. Among the top five articles in table 5, Chevalier (2006), Henning-Thurau (2004), Dellarocas (2003), and Godes (2004) were eWOM research, while Brown (1987) discuss about traditional WOMs. Chevalier (2006)'s article entitled "The effect of word of mouth on sales: Online book reviews" which focus on the influence of online book reviews on sales of book. Henning-Thurau (2004)'s article entitled "Electronic word-of-mouth via consumer-opinion platforms: What motivates consumers to articulate themselves on the internet." purposed a better understanding to the motivations behind a consumer's decision to engage in eWOM communication on web-based consumer-opinion platforms. Brown (1987) accounted for the relationship between different roles played by weak and strong social and word-of-mouth referral behavior. Godes (2004)'s articles entitled "Using online conversations to study word-of-mouth communication" stated the relationship between TV viewership behavior and WOM.

*G. Co-citation Analysis*

The co-citation analysis reveals the knowledge structure of the eWOM field. The study utilized graph layout to reveal co-citation relationship among cited literatures. The algorithm proposed by Kamada & Kawai(1989) was used for drawing the graph. Figures 4 shows the co-citation-based network of cited references with at least 20 citations, which are also listed in Table 5. The wide of the lines between nodes represents the strength of co-citation links. The size of nodes represents the citation time of references. Only relationships with 10 or more co-citations were showed in Figure X. As Figure X revealed, Chevalier (2006), Henning-Thurau (2004), Dellarocas (2003), Godes (2004), and Brown (1987) were in the core of the co-citation relationship. These five articles represent the five branch of knowledge source of eWOM.

**IV. CONCLUSIONS AND DIRECTIONS FOR FUTURE RESEARCH**

The study presented a bibliometric study of eWOM field. After searching the SCI/SSCI database, the study found 327 eWOM articles in the period of 1999 to 2011. The study found that Journal of Interactive Marketing, Journal of Business Research, Journal of Advertising Research, Journal of Marketing Research, Journal of Management Information Systems, Decision Support Systems, International Journal of Advertising, Marketing Science, and International Journal of Electronic Commerce published most eWOM articles. The results reveal that although WOM is a tradition consumer research topic, the eWOM articles published in consumer research journals as well as business research and information system related journals.



Fig. 3. Knowledge source of eWOM research.

By the citation and co-citation analysis, researchers could figure out the highly influence eWOM articles as well as the knowledge base of eWOM articles. Our results illustrate the intellectual structure of eWOM research.

Even though the body of research has the undeniable value of offering informative insights into the knowledge structure of eWOM, it has some limitations. First, our search keywords may be incomplete, and many valuable papers may not have been included. Besides, the sample articles were chosen from 1999 to 2011, which might influence the generalization of the study. However, we still trust the study provides a valuable integration and different perspective on eWOM research. Believe this paper will provide a useful briefing for new comers of the field.

TABLE V: LITERATURES FREQUENTLY CITED BY ONLINE ELECTRONIC WORD OF MOUTH RESEARCH

Referred literature (leading author, vol, page, Journal)	Cited Times
Chevalier JA, 2006, V43, P345, Journal of Marketing Research	84
Henning-Thurau T, 2004, V18, P38, Journal of Interactive Marketing	75
Dellarocas C, 2003, V49, P1407, Management Science	64
Godes D, 2004, V23, P545, Marketing Science	61
Brown JJ, 1987, V14, P350, Journal of Consumer Research	47
Arndt J, 1967, V4, P291, Journal of Marketing Research	42
Herr PM, 1991, V17, P454, Journal of Consumer Research	41
Senecal S, 2004, V80, P159, Journal of Retailing	39
Liu Y, 2006, V70, P74, Journal of Marketing	39
Bickart B, 2001, V15, P31, Journal of Interactive Marketing	37
Richins ML, 1983, V47, P68, Journal of Marketing	31
Phelps JE, 2004, V44, P333, Journal of Advertising Research	27
Fornell C, 1981, V18, P39, Journal of Marketing Research	27
Hennig-Thurau T, 2003, V8, P51, International Journal of Electronic Commerce	27
Dellarocas C, 2007, V21, P23, Journal of Interactive Marketing	25
Brown J, 2007, V21, P2, Journal of Interactive Marketing	23
Sundaram DS, 1998, V25, P527, Advances in Consumer Research	22
Hoffman DL, 1996, V60, P50, Journal of Marketing	22
Bone PF, 1995, V32, P213, Journal of Business Research	22
Bass FM, 1969, V15, P215, Management Science	22
Mayzlin D, 2006, V25, P155, Marketing Science	21
Dellarocas C, 2006, V52, P1577, Management Science	20
Anderson JC, 1988, V103, P411, Psychology Bulletin	20
Litvin SW, 2008, V29, P458, Tourism Management	20

Note: The above literatures were cited by 20 or more Electronic Word of Mouth articles published in 1999-2011.

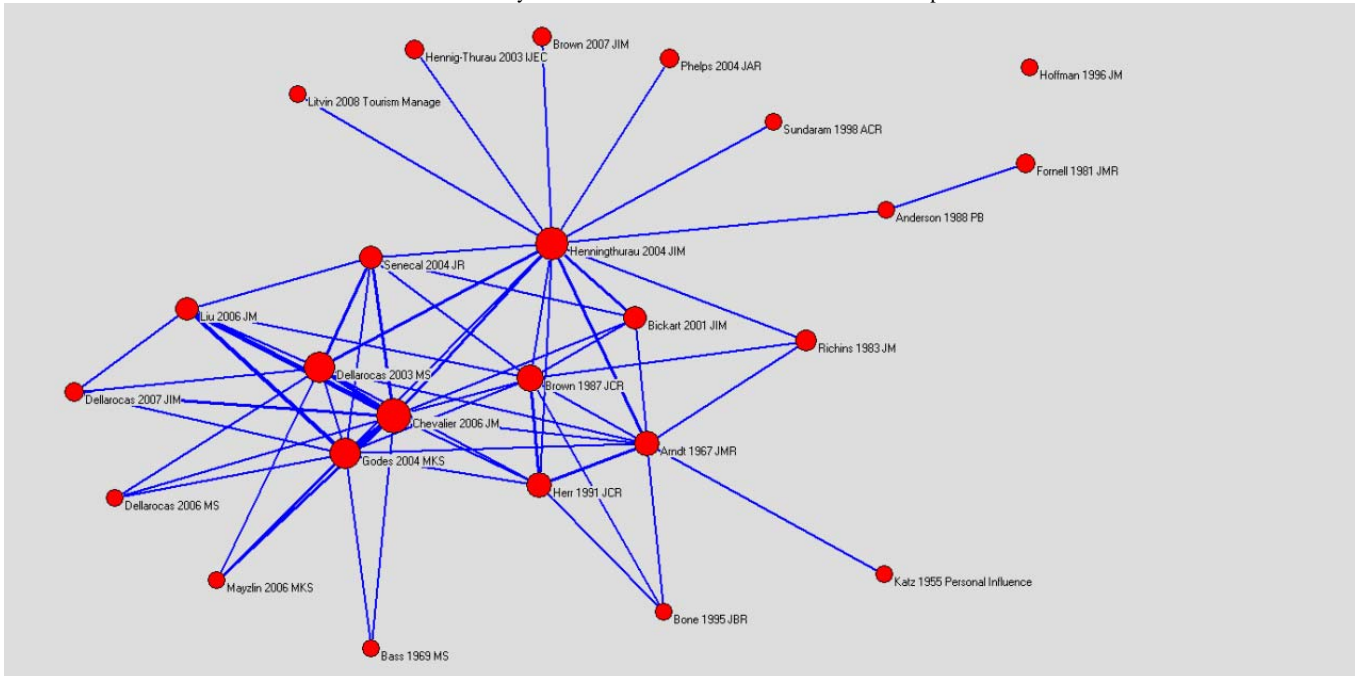


Fig. 4. Co-citation network of references with at least 20 citations.

REFERENCES

- [1] J. Arndt, "Role of product-related conversations in the diffusion of a new product," *Journal of Marketing Research*, vol. 4, pp. 291–295, 1967.
- [2] E. W. Anderson, "Customer satisfaction and word of mouth," *Journal of Service Research*, vol. 1, pp. 5-17, 1998.
- [3] E. Dichter, "How word-of-mouth advertising works," *Harvard Business Review*, vol. 44, pp. 147-166, Nov./Dec.1966.
- [4] R. E. Goldsmith, *Encyclopedia of E-Commerce, E-Government and Mobile Commerce*, Hershey, Pennsylvania, U.S.A: Idea Group Publishing, 2006.

- [5] J. Sweeney, G. Soutar, and T. Mazzarol, "Factors influencing word of mouth effectiveness: Receiver perspectives," *European Journal of Marketing*, vol. 42, pp. 344-364, 2008.
- [6] B. T. Ratchford, D. Talukdar, and M.-S. Lee, "A model of consumer choice of the Internet as an information source," *International Journal of Electronic Commerce*, vol. 5, no. 3, pp. 7-22, 2001.
- [7] M. K. O. Lee, C. M. K. Cheung, K. H. Lim, and C. L. Sia, "Understanding customer knowledge sharing in web-based discussion boards: An exploratory study," *Internet Research*, vol. 16, pp. 289-303, 2006.
- [8] C. Dellarocas, "The digitization of word of mouth: promise and challenges of online feedback mechanisms," *Management Science*, vol. 49, pp. 1407-1424, 2003.
- [9] R. E. Goldsmith, and D. Horowitz. Measuring motivations for online opinion seeking. *Journal of Interactive Advertising*. vol.6, no.2, pp.1-16.2006. [Online]. Available: <http://jiad.org/article76>
- [10] S. Sen, and D. Lerman, "Why are you telling me this? An examination into negative consumer reviews on the web," *Journal of Interactive Marketing*, vol. 21, no. 4, pp. 76-94, 2007.
- [11] C. Dellarocas, "The digitization of word of mouth: Promise and challenges of online feedback mechanisms," *Management Science*, vol. 49, no. 10, pp. 1407-1424, Oct, 2003.
- [12] T. C. Almind and P. Ingwersen, "Informetric analyses on the World Wide Web: Methodological approaches to 'webometrics'," *Journal of Documentation*, vol. 53, no. 4, pp.404-26, 1997.
- [13] F. López-Muñoz, C. Alamo, F. J. Quintero-Gutiérrez, and P. García-García, "A bibliometric study of international scientific productivity in attention-deficit hyperactivity disorder covering the period 1980-2005," *European Child and Adolescent Psychiatry*, vol. 17, no. 6, pp. 381-391, 2008.
- [14] M. Breazeale, "Word of mouse: An Assessment of electronic word of mouth research," *International Journal of Market Research*, vol. 51, no. 3, pp. 297-319, 2008.
- [15] O. D. Persson, R. Danell, and J. Wiborg Schneider, "How to use Bibexcel for various types of bibliometric analysis," In *Celebrating scholarly communication studies: A Festschrift for Olle Persson at his 60th Birthday*, ed. F. Åström, R. Danell, B. Larsen, J. Schneider, pp 9-24. Leuven, Belgium: International Society for Scientometrics and Informetrics, 2009.
- [16] V. Batagelj, and A. Mrvar, Pajek, "Program for large network analysis," *Connections*, vol. 21, no. 2, pp. 47-57, 1998.

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